Dayananda Sagar University Bengaluru

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Samshodhana Sagara

2021 - 2022

Book of Research Abstracts

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Dedications

Founders who crafted our Institutions

Late Shri. R. Dayananda Sagar

Dayananda Sagar Institution is named in honour of its founder president Late Shri R Dayananda Sagar. He was a great, confident leader who saw no reason why, as an Indian, he could not provide education for all sections of society. Best known for his pivotal role in setting up the Mahatma Gandhi Vidya Peetha Education Trust (MGVP), Late Shri R Dayananda Sagar also played an important role in the education sector of the emerging India.

Late Smt. Chandramma Sagar

Wife of the founder, Late Smt Chandramma Sagar was a Doctor by profession - a Triple FRCS from London, Edinburgh and Glasgow. She was in the panel of Doctors for the President of India.

Editorial Committee

- Dr.M. K Banga, Professor & Dean-Research, DSU.
- Dr. Udaya Kumar Reddy K R, Professor & Dean, School of Engineering (SOE).
- Dr. Sunil S. More, Professor & Dean, School of Basic and Applied Sciences.
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- Dr. Sharmila J, Professor& Principal, College of Nursing Sciences, School of Allied Health Sciences.
- Dr. V Murugan, Professor& Principal, College of Pharmaceutical Sciences, School of Allied Health Sciences.
- Dr. Vijay Kumar, Professor & Principal, College of Physiotherapy, School of Allied Health Sciences.

Message from the Hon. Chancellor

Dayananda Sagar University (DSU) continues to pursue the spirit of facilitating human excellence through higher education and its consistent efforts have been recognized many times earlier and which also continued in 2021-2022 with the Times Business Awards as the Best Emerging University.

This year, at the 5th Convocation of the University, the second batch of doctoral scholars who have successfully cleared the requirements for the award of doctorate degrees were conferred their degrees. The research and consultancy endeavor of DSU continues with its focus on funded research projects with grants from Central & State Government organizations, consultancies in collaboration with various companies, patent applications and research publications done in National/International Journals & Conferences.

Samshodhana Sagara 2021-22, the Book of Research Abstracts compiles the research conducted and published by the faculty members, research scholars and students at DSU during the last Academic year. The research culture of DSU encourages all to continue theirpassionate and intellectual efforts to contribute to the enhancement of knowledge in their respective domains.

All the Best!

Dr. D. Hemachandra Sagar
Chancellor – Dayananda Sagar University

Message from the Hon. Pro Chancellor

At Dayananda Sagar University (DSU) we are committed to the focus on research and generating intellectual patents, by upholding the highest standards of research ethics. Research focus enables the creation of knowledge and influence the expansion of the body of knowledge for the sustainable welfare of humanity, environment and the planet. Importance of knowledge creation necessitates the creation & utilization of suitable resources that facilitates conduct of research in the most appropriate manner. DSU is proud to award doctorate degrees to its second batch of research scholars in the year 2021 and the awardees received their degrees at the 5th Convocation of the University.

Along with the conduct of research, the dissemination of research outcomes, undertaken with utmost care and focus on upholding the highest standards of ethics, is necessary to ensure that knowledge creation initiated in a domain can motivate further developments by researchers whose intellectual curiosity encourages them to develop, extend and pursue novel ideas, discover and explore new research aspects while simultaneously working on collaborative & funding opportunities for the conduct of suitable interdisciplinary and multidisciplinary research that benefit all nationally and internationally. Our annual publication of '**Samshodhana Sagara 2021-2022'** is an

Effort in the direction towards highlighting and disseminating the research endeavors of our University Faculty members, researchers and students.

Accreditation & Global rankings for Universities and Higher Educational Institutions mandate monitoring various research output parameters along with teaching and learning outcomes. The present edition of '**Samshodhana Sagara 2021-2022',** DSU's annual publication of the Book of Abstracts, is a compilation of the research work done during the period August 01, 2021 to July 31, 2022. This edition also showcases the IPs generated by our faculty members and research scholars during the period.

Dr. D. Premachandra Sagar
Pro Chancellor –Dayananda Sagar University

Message from the Hon. Vice Chancellor

At the outset I would like to take this opportunity to thank the BOG, BOM, AC, RIC and FC of Dayananda Sagar University (DSU) for their support and guidance in our continuous endeavor to create excellence at the University. We would like to gratefully acknowledge the encouragement and support received from Dr. D. Hemachandra Sagar (Hon'ble Chancellor of DSU and Chairman of MGVPT) and Dr. D. Premachandra Sagar (Hon'ble Pro Chancellor of DSU and Vice Chairman of MGVPT), Ms. Tintisha Sagar (BOG member and Joint Secretary of MGVPT), Mr. Rohan Sagar (BOG member and Joint Secretary of MGVPT), Mr. Galiswamy (Secretary of MGVPT), Prof. H.P.Khincha (DSU Evangelist) and Mr. K. Jairaj (DSU Advisor and Former Additional Chief Secretary of GOK) in achieving this success.

Dayananda Sagar University (DSU), established by Mahatma Gandhi Vidya Peetha (MGVP) Trust under Karnataka Act No 20 of 2013, is a State Private University that started its programs of study from the academic year 2015-16. DSU is being mentored and nurtured by its visionary Hon'ble Chancellor Dr. Hemachandra Sagar and proactive Hon'ble Pro Chancellor Dr. Premachandra Sagar who both are highly qualified. DSU offers UG and PG in addition to PhD programs at present in the areas of Engineering, Commerce, Management, Applied Science, Health Science and Arts as well as Humanities. Offering high quality education to the students by providing world-class infrastructure, industry partnered innovation labs, qualified faculty, employability oriented curriculum and ample opportunities for learning to become competent professionals in their fields of specialization has been the tradition of DSU.

DSU encourages research among its faculty and students by providing the requisite support in creating high-end research facilities, providing research seed grant, supporting conference travel, organizing conferences, and the filing of patents

DSU has been bringing out a book of research activities (named as **"Samshodhana Sagara"**) to record the research achievements. This book contains the research accomplishments of Academic Year i.e., August 01, 2021 to July 31, 2022. The year has been a moderately good year for DSU as it could accomplish 125 International and 56 national Journal publications, 42 International and 14 national Conference papers, 39 books & book chapters, securing 3 patents,working on 12 sponsored projects and 08 consulting & Corporate training assignments. We have recorded all these accomplishments in '**Samshodhana Sagara 2021-2022'** and determined to achieve higher quality research accomplishments in the years to come to ensure a unique position for DSU in higher education sector of the country.

I am delighted, as Vice-Chancellor of DSU, to place before you all the edition of '**Samshodhana Sagara 2021-2022'**. We remain highly obliged, as ever, to receive your valuable feedback and inputs for scaling up the high-quality research activities at DSU.

Dr. K.N. Balasubramanya Murthy,
Vice Chancellor - Dayananda Sagar University

Foreword by the Registrar

All our efforts are especially dedicated to our respected and beloved Founders, Late Shri R Dayananda Sagar and Late Smt. Dr. Chandramma Sagar. We are also thankful to the Management of DSU for their continuous support and guidance. As a University we remain strongly committed to the spirit of facilitating human excellence through higher education and conduct of research upholding the highest standards of research ethics for the benefit of all stakeholders. This year during DSU's 5th Convocation, the second batch of doctoral scholars who have successfully defended their Ph.D Thesis and Viva-Voce received their degrees.

Dayananda Sagar University (DSU) remains strongly committed to the focus on research and our annual publication, '**Samshodhana Sagara 2021-2022',** is a compilation of the abstracts of research publications, patents, on-going funded projects and consultancy assignments that have been done by the Faculty Members and Research Scholars at DSU during the period of 1st August'2021 to 31st July'2022.

The present edition of '**Samshodhana Sagara 2021-2022'** highlights **279** abstracts of publications and sixteen patents that resulted from the research work conducted by our Faculty Members and Research Scholars belonging to different Schools of DSU i.e. the School of Engineering , School of Basic & Applied Sciences, School of Allied Health Sciences, School of Medicine, School of Commerce and Management, School of Arts, Design & Humanities which were successfully published in various reputed International & National Journals, presented at various International & National Conferences, selected as Book Chapters & accepted for Patents. The book also lists twelve on-going funded projects & Ten consultancies & training assignments of DSU.

'**Samshodhana Sagara 2021-2022'** thus celebrates the annual research related accomplishments of the University's Faculty and Research Scholars.

Dr.Puttamadappa C,
Registrar-Dayananda Sagar University

From the Editorial Board

This Edition of '**Samshodhana Sagara 2021-22'** is dedicated to Late Barrister Shri R. Dayananda Sagar and his better half, Late Smt. Dr. Chandramma Sagar, triple FRCS from London, Edinburg and Glasgow, the founders of Mahatma Gandhi Vidya Peetha Trust, on the eve of Centenary Celebrations of Late Barrister Shri R. Dayananda Sagar. We take this opportunity to thank, Dr. D Hemachandra Sagar, the Chancellor and Dr. D Premachandra Sagar, Pro-Chancellor who have been very supportive in bringing out this Edition and approving the same. Our sincere thanks are due to Prof. K N Balasubramanya Murthy, our Hon. Vice Chancellor who insists on only quality publication without exception and his encouragement in every stage of bringing out this Edition. We also thank Prof. R. Janardhan, the Pro Vice Chancellor for his constent help in this initiative. We thank profusely Prof. Puttamadappa C, the Registrar, for his constant support in various initiativestaken up by the Research Cell.

It gives me immense gratification to release the 7th Edition of '**Samshodhana Sagara 2021-22'**, the collection of research publications, patents and the research abstracts at various conference proceedings in International and National conferences during the Academic Year 2021-2022. We have attempted to include only such publications which are published in peer reviewed and refreed journals. Books and Book chapters published by the faculty members in International Publications are also made part of 'Samshodhana Sagara'. This collection also provides the list of Research projects which are funded by DST, SERB/DST, DBT, GST, VGST, Dassault Systems - La foundation and other funding agencies. There are 181 publications in International and National Journals, 56 International & National Conference presentations, 39 Book Chapters and 03 Patent Publications. There are twelve on-going Projects and eight Consultancy & Training assignments for the year.

I thank all my colleagues in the Editorial Board from various Departments, Colleges and Schools who have helped us in editing this collection and bringing out this Edition. We sincerely hope that more quality publications are accomplished by our faculty members and research scholars in the years ahead.

We will be thankful for any feedbacks and suggestions for improving the quality and look and feel of 'Samshodhana Sagara' in the future.

Dr. M K Banga,
Dean Research - Dayananda Sagar University.

For Editorial Board.

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Department of Chemistry School of Engineering

INTERNATIONAL JOURNAL PUBLICATIONS

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CHIJ-01	Murali Krishna Chaitanya M.K. Mannava, Manish Kumar Bommaka, Rambabu Dandela, **K. Anand Solomon** and Ashwini Nangia	Fluorobenzoic acid coformers to improve the solubility and permeability of the BCS class IV drug naftopidil	Chemical Communication Volume 58, Pages 5582-5585 (2022)	58
CHIJ-02	Murali Krishna Chaitanya M.K. Mannava, Anilkumar Gunnam, Anurag Lodagekar, Nalini R Shastri, Ashwini Nangia and **Dr. K. Anand Solomon**	Enhanced solubility, permeability, and tabletability of Nicorandil by salt and cocrystal formation	CrystEngComm Volume 23, Pages 227-237 (2021)	59
CHIJ-03	C Manjunatha, S Lakshmikant, L Shreenivasa, N Srinivasa, **S Ashoka**, BW Shivraj c, Manickam Selvaraj, Ujwal Shreenag Meda, G Satheesh Babu	Development of novel non-stoichiometric hybrid Co3S4/@Co0.85Se nano composites for an evaluation of synergistic effect on OER performance	Surfaces and Interfaces Volume 25, Pages 101161 (2021)	60
CHIJ-04	Srinivasa N, Rangaswamy P, Manjunatha C, **Ashoka S**	Mesoporous LiTiPO4F Nanoparticles: A New Stable and High performance Bifunctional Electrocatalyst for Electrochemical Water Splitting	Surfaces and Interfaces Volume 25, Pages 101188 (2021)	62
CHIJ-05	V.G. Dileepkumar, C. Pratapkumar, R. Viswanatha, Rapela R. Maphanga, C. Madhu, N. Srinivasa, **S. Ashoka**, Zhong Chen, S. Rtimi, K. Jayaramulu, Gyorgy Szekely and M.S. Santosh	Nanostructured NaFeS2 as a Cost-Effective and Robust Electrocatalyst for Hydrogen and Oxygen Evolution with Reduced Over potentials	Chemical Engineering Journal Volume 426, Pages 131315 (2021)	63

CHIJ-06	J. Shivakumara, Manickam Selvaraj, **S. Ashoka**, R. Hari Krishna, C. Manjunatha, Mika Sillanpääg	Enhancement of photoluminescence of Cd0.95Eu0.05SiO3 phosphor using Na+ and K+ as charge compensators	Chemical Physics Volume 551, Pages 111319 (2021)	65
CHIJ-07	Nishchith B. **S, Ashoka** S, Mahesh P Bhat, Mahaveer D Kurkuri, Shashidhara Acharya, Rajendra Kumar, Yogesh Kalegowd	Reversible Surface Reconstruction of Na3NiCO3PO4: A Battery Type Electrode for Pseudocapacitor Applications	Journal of Power sources Volume 520, Pages 230903 (2021)	66
CHIJ-08	Shreenivasa L, Yogeeshwari R.T, Prashanth S. Adarakatti, **Ashoka S**	Glycine-nitrate derived Cobalt-Doped BiPO4: An Efficient OER Catalyst for Alkaline Electrochemical Cells	Solid State Sciences Volume 124, Pages 106803 (2021)	67

INTERNATIONAL BOOK CHAPTERS

ID	Author(s)	Title of the Paper	Publication Details	Page No.
CHIIN B-01	Prashanth S.A, **S. Ashoka**	Recent advances in inorganic nanostructured materials for electrochemical water splitting	Electrochemistry ISBN: 978-1-78801-692-6, pages 178-217 (2022)	68
CHIIN B-02	Prashanth Shivappa Adarakatti, **S Ashoka**	Nanocomposite Materials Interface for Heavy Metal Ions Detection	Bentham Books ISBN: 2589-2207 Pages 163-187 (2022)	69

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INTERNATIONAL JOURNAL PUBLICATIONS

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MATIJ-01	**Dr. Komala B**	The onset of Darcy–Brinkman–Rayleigh–Benard convection in a composite system with thermal diffusion	Heat Transfer- Wiley library ISSN: 2688-4542, (2021)	71
MATIJ-02	Shankar Narayan S, Saha S., **Bhattacharjee A**	A 2D FSI mathematical model of blood flow to analyze the hyper-viscous effects in atherosclerotic COVID patients.	Results in Engineering ISSN: 2590-1230, Pages 100-275, (2022)	72
MATIJ-03	**Dr. Supriya Devi**	Finite element analysis over transmission region of coronavirus in CFD analysis for the respiratory cough droplets	Ain Shams Engineering Journal ISSN: 101766 Volume 13 (2022)	73

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Department of Physics School of Engineering

INTERNATIONAL JOURNAL PUBLICATIONS

ID	Author(s)	Title of the Paper	Publication Details	Page No.
PHYIJ-01	**K Vijaya Kumar,** K Sreekanth, T. Siddaiah, N.O Gopal, N. Krishan Jyothi, Ch. Ramu	Thermal, Structural, Optical and Electrical Conductivity studies of Pure and Mn2+ doped PVP films	South African Journal of Chemical Engineering DOI: doi.org/10.106/j.sajce.2020.09.003 Volume 36, (2021)	75

INTERNATIONAL CONFERENCE PUBLICATIONS

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PHYIC-01	**K Vijaya Kumar,** N Krishan Joythi, K Tarakeswara Rao, V Naveen Kumar, M Gnana Kiran, K Deepthi, M C Rao, Syed Inthiyaz	Structural, Impedance and dielectric studies of PAN based Na+ ion conducting polymer electrode membrane system	International congress on membranes and membrane assisted processes, DOI:10.1016/j.matpr.2021.07.123 Volume 51, (2021)	76

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PHYIB-01	**K Vijaya Kumar**	Structural, Optical and electrical studies of PAN-Based Gel polymer electrolytes for solid state battery applications	Intech Publishers, ISSN: 978-1-83969-645-9, DOI:10.5772/intechopen.98825 (2021)	77

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Department

Of
Aerospace Engineering
School of Engineering

INTERNATIONAL JOURNAL PUBLICATIONS

ID	Author(s)	Title of the Paper	Publication Details	Page No.
ASEIJ-01	**G K Suryanarayana** and Gireesh Y	Effect of Wind Tunnel Model Blockage on Aerodynamic Characteristics at Transonic Speeds	Journal of Spacecraft and Rockets https://doi.org/10.2514/1.A35222 Volume 59, Page 353 (2021)	79
ASEIJ-02	**G K Suryanarayana** D.P Singh, Sumukh Surya, G. Jagadeesh	Nonlinear model for supersonic airintake buzz	Aerospace Science and Technology https://doi.org/10.1016/j.ast.2022.107567 Volume 126 (2022)	80

INTERNATIONAL CONFERENCE PUBLICATIONS

ID	Author(s)	Title of the Paper	Publication Details	Page No.
ASEIC-01	L K Dhananjaya Kumar, **Sripad S Kulkarni**	Investigation of Mechanical and Corrodion properties of Graphine or Glass fibre reinforced Al 2024 hybrid Composites	ICAMBC 2022	81

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ASENC-01	D B Singh, Gireesh Y, **G K Suryanarayana** and G Jagadeesh	Passive control of transonic unsteady pressure fluctuation using Aerodisc	48th Conference on Fluid Mechanics and Fluid Power	82

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Of

Computer Science &Engineering

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INTERNATIONAL JOURNAL PUBLICATIONS

ID	Author(s)	Title of the Paper	Publication Details	Page No.
CSEIJ-01	**MA Chawla,** S D Morgera	On the Geometry of Interacting Axon Tracts in Relation to Their Functional Properties	BioRxiv 10.1101/2022.03.29.486317 Pages 1-16 (2022)	84
CSEIJ-02	**MA Chawla,** S D Morgera	Computer Study of Metric Perturbations Impinging on Coupled Axon Tracts	In Preparation	85
CSEIJ-03	Fathima Ghouse, Kavitha Paranjothi, **Revathi Vaithiyanathan**	Dysgraphia Classification based on the Non-Discrimination Regularization in Rotational Region Convolutional Neural Network	International Journal of Intelligent Engineering and Systems, INASS Volume 15, Issue 1, PP 55-63 DOI: 10.22266/ijies2022.0228.06 November 2021	86
CSEIJ-04	Yashwanth G, Karthik R, Yashaswini N L, Yakshitha K C, Anusha J, **Dr. Revathi V**	AUTOMATED IMAGE CAPTION GENERATOR FOR VISUALLY IMPAIRED	Journal of Emerging Technologies and Innovative Research, JETIR, Volume 9, Issue 4, PP 496-501 ISSN-2349-5162 April 2022	87
CSEIJ-05	Arpitha V, A. Soumi Narayani, Abhilasha M S, Varshini S A, Sparsha Yadav M, **Dr. Revathi V**, Akshatha Venkatesh Prasad	Comparative Study on the Prediction of Remaining Useful Life of an Aircraft Engine	International Research Journal of Engineering and Technology (IRJET), IRJET, Volume 9, Issue 5, PP 1448-1455, e-ISSN: 2395-0056 May 2022	88

ID	Author(s)	Title of the Paper	Publication Details	Page No.
CSEIJ-06	Sannasi Chakravarthy, S.R., **Bharanidharan, N**., Rajaguru, H.	Multi-Deep CNN based Experimentations for Early Diagnosis of Breast Cancer	IETE Journal of research, 10.1080/03772063.2022 .2028584, Feb 2022	89
CSEIJ-07	**Nazmin Begum**, Chaithra K, Banda Preeta, Aanchal Jain, Haasini T S, Amogh G Padukone	EMOTION RECOGNITION USING CNN	International Journal for Research in Engineering Application & Management, IJREAM, Volume 7, Issue 10, PP 124-127 ISSN: 2454-9150 January 2022	90
CSEIJ-08	**Dr. Bondu Venkateswarlu**, Subba Reddy Meruva	Review of Association Mining Methods for the Extraction of Rules Based on the Frequency and Utility Factors	International Journal of Information Technology Project Management, IGI Global Platform, Volume 12, Issue 4, PP 1-10 ISSN: 1938-0232 • eISSN: 1938-0240 Dec 2021	91
CSEIJ-09	**Dr. Renukadevi M.N**, Kavya, Misha Bharathi, Namratha B R	FACIAL EMOTION RECOGNITION	International Research Journal of Engineering and Technology (IRJET), Fast Track publications, Volume 9, Issue 6, PP 1-4 e-ISSN:2395-0056 p-ISSN: 2395-0072 June 2022	92
CSEIJ-10	**J. Saha**, S. Roy, T.K. Das, K. Purkait, C. Chowdhury	Designing Data Validation Framework for Crowd-Sourced Road Monitoring Applications	Journal of Institutions of Engineer India Series, Springer, 10.1007/s40031-022-00713-x January 2022	93
CSEIJ-11	A. Saha, S. Rajak, **J. Saha**, C. Chowdhury	A Survey of Machine Learning and Meta-heuristics Approaches for Sensor-based Human Activity Recognition Systems	Journal of Ambient Intelligence Humanized Computing, Springer, 10.1007/s12652-022-03870-5 May 2022	94
CSEIJ-12	**Renukadevi M.N,** Cauvery Raju**, Rajesh T.M**	Detection of tumours from MRI scans using Segmentation techniques	Proceedings of the Second International Conference on Electronics and Sustainable Communication Systems (ICESC-2021) IEEE Xplore October 2021	95

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CSEIC-01	**Tina Babu, Rekha R Nair**	Colon Cancer Prediction with Transfer Learning and K-Means Clustering	7th International Conference on Emerging Applications of Information Technology (EAIT 2022) ISSN: 2367-3370 (2022)	96
CSEIC-02	**Debanjali B**	Scatter Index: An alternative measure of dispersion based on relative frequency of occurrences	International conference on innovative computing and communication, Scopus, November 2021	97
CSEIC-03	**Bharanidharan N**; Darshan Kalyan B S; K Bala Vishnu Vardhan Reddy; Devaki Naga Nithesh; Deepak E; Dharnesh Kumar B	Indoor Navigation using Li-Fi & IoT Technologies	6th International Conference on Trends in Electronics and Informatics (ICOEI) DOI: 10.1109/ICOEI53556.2022.9776645 May 2022	98
CSEIC-04	Jana S; **Bharanidharan N;** ShanmukhaNagasai P; Saravan Kumar K; V Mani Nageshwar	Diabetes Prediction Using Machine Learning Algorithms	8th International Conference on Advanced Computing and Communication Systems (ICACCS) DOI: 10.1109/ICACCS54159.2022.9785073	99
CSEIC-05	**Arjun Krishnamurthy**, CD Karthik, Shradha C	SKELETAL BONEAGE DETERMINATION USING DEEP LEARNING	International Conference on Ambient Intelligence in Health Care ISSN No. 2320-6632 April 2022	100

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CSEI B-01	**Prof. Chhaya Suryabhan Dule**	A novel authentication technique for cloud data storage security	Nova Science Publisher ISBN: 978-1-68507-615-3 Pages 244 April 2022	102
CSEI B-02	**Dr. Sindhu P Menon**	Identifying Stars/Galaxies: A hybrid classification for celestial sources	Smart Innovation, Systems and Technologies, Springer Springer, ISSN No.2190-3018 DOI: 10.1007/978-981-16-9705-0_11 Pages 103-116 2022	103
CSEIB-03	**Bharanidharan N,** Harikumar Rajaguru	Modified Adam to Update Control Parameters of Crow Search Algorithm in Transformation Technique Based Dementia MRI Image Classification	IFMBE Proceedings, Springer DOI: 10.1007/978-3-030-93564 - 1_14 Pages 121-131 2022	104
CSEIB-04	**Bharanidharan N,** Sannasi Chakravarthy S.R, Rajaguru, Harikumar	Improved Bald Eagle Search Optimization for Enhancing the Performance of Supervised Classifiers in Dementia Diagnosis	IFMBE Proceedings, Springer DOI: 10.1007/978-3-030-90724-2_6 Pages 59 - 66 2022	105
CSEIB-05	Sannasi Chakravarthy S.R, **Bharanidharan N,** Rajaguru H	Fusion of Deep Features for Classification of Breast Cancer Using Multi-Deep CNNs	IFMBE Proceedings, Springer DOI: 10.1007/978-3-030-90724-2_5 Pages 49 - 57 2022	106

CSEIB-06	Aswath S, **Bharanidharan N**, Valarmathi R.S, Rajaguru Harikumar	Modified Spotted Hyena Optimizer Based Leukemia Microscopic Images Classification	IFMBE Proceedings, Springer DOI: 10.1007/978-3-030-90724-2_13 Pages 123 - 131 2022	107

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Department

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Computer Science & Technology

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INTERNATIONAL JOURNAL PUBLICATIONS

ID	Author(s)	Title of the Paper	Publication Details	Page No.
CSTIJ -01	**Jasma Balasangameshwara**	Demand-side management in smart electricity grids: a review	International Journal of Intelligent Enterprise, Interscience Publishers (IEL) DOI: 10.1504/IJIE.2021.117989 Page No: 436-458 Volume 8 2021	109

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ID	Author(s)	Title of the Paper	Publication Details	Page No.
CSTNJ -01	Ramandeep Kaur	A CLOUD COMPUTING FAULT DETECTION ANALYSIS	Shodhsamhita: Journal of Fundamental & Comparative Research Page No: 87- 92 Volume 7 2021	110

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Electronics and Communication Engineering

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INTERNATIONAL JOURNAL PUBLICATIONS

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ECEIJ-01	**Anna Merine George**, Dr. S.Y. Kulkarni, Dr. Ciji Pearl Kurian	Gaussian Regression Models for Evaluation of Network Lifetime and Cluster-Head Selection in Wireless Sensor Devices	IEEE Access DOI: 10.1109/ACCESS.2022.3152804 ISSN: 2169-3536 Pages: 20875 – 20888 Volume 10, Feb 2022	112
ECEIJ-02	G. Anshika, G. Shruthi, **G. Baishali**, **V. Radhakrishna**, S. Vijay, **K. Saara**	Investigations on rGO on silicon-based UV photon detector	Applied Physics A Springer DOI: 10.1007/s00339-021-04986-9 Pages: 1-11 Volume 127, October 2021	113
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CDIJ-12	**Archana Shetty**, Nidha Gaffoor, Aparna Muralidhar	Appendiceal Enterobius Vermicularis infestation discovered incidentally in a case of sigmoid volvulus: A Rare Co-occurrence	Trop J Pathol Microbiol DOI: https://doi.org/10.17511/jopm.2022.i01.05 2022	292
CDIJ-13	Nidha Gaffoor, **Archana Shetty**, Nirupama Murali, Supriya T R, Aakanksha Koul	Doppelganger solitary pedunculated tumours in pelvic girdle of obese Females: Histopathological study of three cases.	Journal of Clinical and Biomedical Sciences 2022	293
CDIJ-14	Nidha Gaffoor **Archana Shetty** Nirupama M Supriya TR	Encapsulated Fat Necrosis Of The Mesentery: Surgical Intervention By Inquisitive Obstretrician Leading To Newer Insights For The Pathologist	International Journal of Medical Laboratory Research (IJMLR) DOI: http://doi.org/10.35503/IJMLR.2022.7107 2022	294
CDIJ-15	**B.Raghavendra**	Utilization Pattern Of Anti-Microbial Drugs In Ophthalmology Department At A Tertiary Care Hospital	International Journal of Pharmaceutical Sciences and Research DOI: 10.13040/IJPSR.0975-	295

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CDIJ-16	Chaitra ND, Veena CN, Kumar MP, Nagendra PK, Murthy NS.	Faster reading techniques – A method to ameliorate performance among first MBBS students.	Natl J Physiol Pharm Pharmacol DOI: 10.5455/njppp.2021.11.05150202119052021 2021	296
CDIJ-17	Murthy NS, Veena CN, Kumar MP	A Study on Effective Use of Technology in Training First MBBS Students for Foundation Course During Pandemic Era	Natl J Physiol Pharm Pharmacol DOI: 10.5455/njppp.2022.12.10383202125102021 2021	297
CDIJ-18	**Dr. Shiva Murthy N**	Medical Treatment Options Available for Mucormycosis.	Journal of Pharmacovigilance and Drug research DOI: https://doi.org/10.53411/jpadr.2021.2.4.4 2021	298
CDIJ-19	**Pratibha Nadig**, Meharban, A,Kevin Manohar Sallis	Establishing genetic markers of insulin resistance in a long-term high fat diet and low dose streptozotocin induced experimental type-2 iabetes mellitus model of insulin resistance and evaluation of seed extracts of Syzigium cumini	Journal of herbmed Pharmacology DOI: 10.34172/jhp.2021.38 2021	299
CDIJ-20	Meharban Asanaliyar, **Pratibha Nadig**	In-vivo anti-diabetic activity of hydro-ethanolic seed extract of Syzigium cumini (L.)	Biomed Pharmacol J DOI: htpps://dx.doi.org/10.13005/BPJ/2119 2021	300
CDIJ-21	Meharban Asanaliyar, **Pratibha Nadig**, Nagakumar Bharatham	In vitro anti-diabetic activity, bioactive constituents, and molecular modelling studies with sulfonylurea receptor1 for insulin secretagogue activity of seed extract of Syzygium cumini (L.)	Herbmed Pharmacol DOI: 10.34172/jhp.2021.35 2021	301
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CDIJ-23	**Anand D Meundi**	Assessment of quality of life among HIV infected people on antiretroviral therapy in a	International Journal of Community Medicine And Public Health DOI: 10.18203/2394-	303

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CDNJ -02	Mohana Kumari Chidananda	Combined Analysis of Anti SARS-CoV-2 IgG and IgM Responses in COVID19 Patients in India	Indian Journal of Clinical Biochemistry DOI: https://doi.org/10.1007/s12291-021-00986-x Page No: 485-491 Volume : 36(4) 2021	305
CDNJ -03	**Dr. Ganesh Prasad B R**	Myths and awareness among rural population about orthodontic extractions during fixed mechanotherapy	Journal of Advanced Medical and Dental Sciences Research DOI: 10.21276/jamdsr 2021	306
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CDNJ -09	**Archana Shetty**, Anindita Saha, Komala H N	Morphological types of anaemia integrated with distribution of red cell and platelet indices: Study in a rural tertiary healthcare center	Indian Journal of Pathology and Oncology DOI: https://doi.org/10.18231/j.ijpo.2021.009 2021	311
CDNJ -10	**Archana Shetty ,** Chahita Verma , Vijaya Chowdappa	Frequency of micronuclei in oral mucosal smears of female municipal sweepers with betel quid chewing practice	Journal of Pathology of Nepal DOI: 10.3126/jpn.v11i1.31677 2021	312
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CDNJ -13	Hima Sree Edupuganti, PV Nikhil, Jessica Minal , **Archana Shetty** , Kanna Sandhyarani	Xanthoma of Fallopian Tube in Young Female- An Uncommon Entity	Journal of Clinical and Diagnostic Research DOI: 10.7860/JCDR/2022/52435.16146 April, 2022	314
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CDNJ -15	Nidha Gaffoor Hima Sree Edupuganti **Jessica Minal Archana Shetty** Supriya T R Aparna Muralidhar	Idiopathic calcinosis cutis of the right iliac region: Common lesion at uncommon	Indian Journal of Case Reports DOI: https://doi.org/10.32677/ijcr.v7i12.3231 2022	316
CDNJ -16	Pooja Roy, **Pratibha Nadig**, CA Jayashankar	Adverse drug reaction monitoring through active surveillance in the inpatients of general medicine ward of a tertiary care hospital	APIK J Int Med [serial online] DOI: 10.4103/ajim.ajim_7_21 Page No: 22-27 Volume 10 Issue 1 2022	317
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CDNJ -22	Dr. Brunda N K	Comparing knowledge, attitude, practice and stigma among healthcare students of Bangalore city: a cross sectional study.	Indian Journal of Community Health DOI: https://doi.org/10.47203/IJCH.2021.v33i04.020 2021	323
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CAMIJ - 02	**Dr.Roohi Kursheed Khan**	Impact of Competency Management on Employee Self-development for retention in large scale industries	Webology ISSN: 1735-188X	333

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CAMNJ - 01	Dr. Sathish Pachiyappan , **Dr. Chandrakala.G**	Do the Macroeconomic factors Influence the volatility of Gold Price?: An empirical study	Journal of Commerce & Accounting Research, Publishingindia, ISSN: 2277-2146 Volume 11, Issue 2 Page No - 37-44 April 2022	334

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CAM IC-01	**Prof. Suneeta Hegde**	Analysis of skill enhancement program introduced by government of India to up skill the human capital	SSRN DOI: https://dx.doi.org/10.2139/ssrn.3841886 May 2021	335
CAM IC-02	**Prof. Suneeta Hegde,** Ms. Deepti Hegde	Artificial intelligence for mitigating patent process hurdles.	ICCTSET ISSN (Online) 2394-2320 Vol 9, Issue 10, October 2022	336

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CAMIB-01	**Dr. G. Chandrakala** P. Sathish	Fluctuations of West Texas Intermediate (WTI) Oil Price pre and during Covid -19 times: An Event Study"	COVID 19: Impact and Response volume III ISBN: 978-81-953600-9-3 https://www.bhumipublishing.com/book/ Page No: 170-177 2021	337
CAMIB-02	**Dr. Jyoti Mishra**	Digital Business	Himalaya Publishing House ISBN: ISO 9001:2015 CERTIFIE Page No: 1-347 2021	338

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MGSNB-02	**Prof. Capt. A. Nagaraj Subbarao, Dr. Shweta Tewari, Prof. V.V. Rajan**	20 days of self-management	Bluerose publishers, ISBN: 978-935-47-2727-6 https://amzn.to/3GAEDiI 2022	342
MGSIB-01	**Dr. H.N. Shylaja**	Business Correspondents' Perspective on Financial Inclusion Initiatives: An Empirical Analysis	Palgrave Macmillan, Singapore ISBN: 978-981-16-2652-4 DOI: https://doi.org/10.1007/978-981-16-2652-4_4 Page No: 73-93 2021	343

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DSUP -02	**Prof Dr.K. Muthuchelian** **Dr. Farhan Zameer** Dr. Sinjitha S Mambiar **Dr.M. Gnana Ruba Priya** Dr. Saravanan Dr.C. Suganya Dr. Ganesan Dr.Asha Kannan Ap	Selective Intracellular Targeting of Cancer cells and methods of use there of	Intellectual Property India, Application Number: 202241008869; Application Type: Ordinary; Date Of Publication: 21.02.2022	345
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DSUT-02	Shwetha V (BAS16PPAS01)	Preparation and cocktails of extracts from medicinal plants as first aid formulation for snakebites	BASIC AND APPLIED SCIENCES	SBAS	Dr. Sunil S More & Dr. Gautham S.A.	348
DSUT-03	Spoorthi B.C. (BAS16PPAS02)	Investigations on intestinal neuropeptides as anti-Colitogenic agents in ulcerative colitis: implications on mitochondrial function for the maintenance of colon epithelial tract.	BASIC AND APPLIED SCIENCES	SBAS	Dr. Sunil S More & Dr. Arpan Maity	349
lDSUT-04	Shreenivasa L. (ENG16PPBS01)	Synthesis and Characterization of Nanostructured Metal Vanadates and Their Application as Cathode Materials for Lithium Ion Battery	CHEMISTRY	SOE	Dr. Ashok S	350
DSUT-05	Tambrallimath Vijay (ENG16PPME03)	Synthesis and Characterization of Graphene Filled PC-ABS Based Nanocomposite Developed by Fused Deposition Modelling	ME	SOE	Dr. Saravanan Bavan & Dr. R. Keshava Murthy	351
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DSUT-09	Venu Suma Avani (ENG16PPCS05)	Human Facial Expression Recognition and Classification using the Properties of Geometrical Features of Various Facial Regions	CSE	SOE	Dr. Shaila S G	356
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DSUT-12	Sofiqul Islam (HSC16PPPH03)	Validated Chromatographic Methods for Quantification of New Related Compounds in Drug Substances by RP-HPLC Technique	PHARMACY	SHS	Dr. V Murugan	361
DSUT-13	Pankaj Satapathy (BAS17PPAS04)	Phytobioactive Intervention on Diabetic Neuropathy and Microbiome Dysfunction in Drosophila	BASIC AND APPLIED SCIENCES	SBAS	Dr. Farhan Zameer & Dr. Sunil S More	362
DSUT-14	Srinivasa N (ENG17PPBS07)	Synthesis and Characterization of Nanostructured Materials for Energy Conversion System	CHEMISTRY	SOE	Dr.Ashok S	363

DSUT-15	Sumalatha Rani Talapathi (BAS17PPAS03)	Crystal Structure Determination and Biophysical Characterization of Cyclin Dependent Kinase 2 with Small Molecule Inhibitors for Structure Guided Drug Design	BASIC AND APPLIED SCIENCES	SBAS	Dr. Sunil S More & Dr. Narasimha Rao	364
DSUT-16	Prasanna M S M (ENG16PPCS03)	Sentiment Analysis and Polarity Classification of Sarcastic and Non-Sarcastic Sentences Using Phrase and Clause Patterns	CSE	SOE	Dr. Shaila S G	365
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DSUT-19	Murali Krishna Chaitanya (ENG16PPBS02)	Novel Cocrystals and Salts of Drug Molecules to Improve Physicochemical Behavior, Permeability and Tabletability	CHEMISTRY	SOE	Dr. K Anand Solomon & Prof. Ashwini Kumar Nangia	370

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DEPARTMENT OF CHEMISTRY
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CHIJ-01

Fluorobenzoic acid coformers to improve the solubility and Permeability of the BCS class IV drug naftopidil

Murali Krishna Chaitanya Mannava [1], Manish Kumar Bommaka [2], Rambabu Dandela [3], K. Anand Solomon [4] and Ashwini Nangia [5]

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Chemical Communication
ISSN: 1359-7345, Issue 58, Page 5582-5585 (2022)

Abstract

Crystalline salts of the low solubility and low permeability drug naftopidil were investigated with mono-, di-, tri-, and tetrafluorobenzoic acids as coformers to show that 245TFBA (2,4,5-trifluorobenzoic acid) is the optimal salt with faster dissolution and high permeability, thereby opening the study of fluorinated coformers in pharmaceutical cocrystals and salts.

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CHIJ-02

Enhanced solubility, permeability, and tabletability of Nicorandil by salt and cocrystal formation

1 Murali Krishna Chaitanya M.K. Mannava, 2 Anilkumar Gunnam, 3 Anurag Lodagekar, 4 Nalini R Shastri, 5 Ashwini Nangia and 6 Dr. K. Anand Solomon

1Department of Chemistry, University of Hyderabad
2 Department of Chemistry, Dr. Reddy's Institute of Life Sciences
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CrystEngComm
ISSN: 1724-1734, Volume 23, Pages 227 (2021)

Abstract

Cocrystallization is a rational selection crystal engineering approach for the development of novel solid forms with enhanced physicochemical and mechanical properties. Nicorandil (NCR) is a niacinamide vitamin derivative used to treat angina pectoris. A binary solid form screen of NCR with homologous dicarboxylic acids afforded NCR–oxalic acid (NCR–OA, 1 : 1), NCR–fumaric acid (NCR–FA, 1 : 1), NCR–succinic acid (NCR–SA, 1 : 1), and NCR–suberic acid (NCR–SBA, 1 : 0.5). The binary solids were characterized by powder X-ray diffraction, IR and NMR spectroscopy, and DSC. NCR–FA and NCR–SBA were crystallized by slow evaporation from chloroform and toluene solvents, respectively. Single crystal X-ray diffraction confirmed that NCR–FA is a molecular salt, while NCR–SBA is a neutral cocrystal. NCR and the FA anion are connected via the robust carboxylate⋯pyridinium synthon, whereas in the NCR–SBA cocrystal, the components associate via the carboxylic acid⋯pyridine synthon. The phase stability, solubility, dissolution rate, diffusion rate and tabletability studies have demonstrated that the binary solids exhibit improved physical and mechanical properties compared to the NCR drug. Specifically, the NCR–FA salt and NCR–SBA cocrystal have higher solubility, dissolution rate, and hardness at lower pressures, making the formulation suitable for tablet compression.

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CHIJ-03

Development of novel non-stoichiometric hybrid Co3S4/@Co0.85Se nano composites for an evaluation of synergistic effect on OER performance

1 C Manjunatha, 2 S Lakshmikant, 3 L Shreenivasa, 4 N Srinivasa, 5 S Ashoka, 6 BW Shivraj c, 7 Manickam Selvaraj, 8 Ujwal Shreenag Meda, 9 G Satheesh Babu

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Surfaces and Interfaces

ISSN: 2468-0230, volume 25, pages 101161 (2021)

Abstract

Water electrolysis powered by renewable energy sources to produce green hydrogen is a very promising and sustainable alternative to fossil fuels, as well as one of the best approaches for significantly reducing carbon footprints and controlling pollution. In this study,novelhybridnon-stoichiometric nanocomposite Co3S4/Co0.85Se electrocatalyst materials were synthesized using a simple and one-pot eco-friendly hydrothermal method. The as-prepared samples were characterized using X-ray diffraction (XRD) and field emission scanning electron microscope (FESEM) for structural features. Crystalline phases of Co3S4, Co0.85Se, and mixed phases in the hybrid samples were confirmed through XRD. Uniformly distributed agglomerated nanoparticles (30-80 nm) of Co3S4, clearly distinguishable nan aggregates (20-90 nm) of Co0.85Se, and nanoflakes covered with nanoparticles (30-150 nm) of Co3S4/Co0.85Se were confirmed by FESEM. The synergistic effects of the hybrid nanocomposite due to the combination of Co3S4 (containing two different oxidation states of cobalt) and non-stoichiometric Co0.85Se, was investigated towards the oxygen evolution reaction (OER). The electrocatalytic studies confirmed that the Co3S4/Co0.85Se electrocatalyst exhibited a low over potential of 362 mV @ +30 mA.cm−2 towards the OER in an alkaline solution in

comparison with Co3S4 and Co0.85Se electro catalysts. Furthermore, a low over potential of 1.59 V at a high current density and a high electrochemical active surface area (*ECSA*) of 210 cm2 was achieved due to the combined effects of chemical coupling between the Co3S4 and Co0.85Se. Chronoamperometric studies revealed excellent stability of the hybrid nanocomposite samples with negligible changes in the over potential, even after 30 hours of testing. The synergetic effect of cobalt chalcogenides due to the nanoscale interaction was confirmed by the enhanced electro catalytic activity.

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Mesoporous LiTiPO4F Nanoparticles: A New Stable and High performance Bifunctional Electrocatalyst for Electrochemical Water Splitting

1 Srinivasa N, 2 Rangaswamy P, 3 Manjunatha C, 4 Ashoka S

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Surfaces and Interfaces

ISSN: 2468-0230, volume 25, pages 101188 (2021)

Abstract

Design of efficient and stable bifunctional electro-catalysts made of non-precious metals is a field of intense research in order to bring hydrogen production from laboratory to industrial scale. TiO2 is considered as electrochemically inactive may be due to the poor surface reactivity. Manipulating the electronic structure and stability of TiO2 to work under realistic conditions is crucial for the optimal production of hydrogen and oxygen. Herein, new class of titanium compound, LiTiPO4F, has been identified as a water splitting electrocatalyst. The resulted new mesoporous LiTiPO4F has been used as an efficient bifunctional electro-catalyst, to catalyse HER and OER, in alkaline medium, for the first time. The proposed LiTiPO4F catalyst demonstrated an ultrahigh electrocatalytic activity and stability towards HER and OER. The proposed mesoporous LiTiPO4F delivers ηOER, 100 mA cm−2 = 310 mV with Tafel slope of 93 mV dec−1 and ηHER, -100 mA cm−2 = -290 mV with small Tafel slope of 48 mV dec−1, revealing good OER/HER activity.

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CHIJ-05

Nanostructured NaFeS2 as a Cost-Effective and Robust Electrocatalyst For Hydrogen and Oxygen Evolution with Reduced Overpotentials

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Chemical Engineering Journal
ISSN: 1385-8947, volume 426, pages 131315 (2021)

Abstract

One of the biggest challenges currently in the field of energy generation and conservation is to develop a stable, scalable and cost-effective electrocatalyst with reduced overpotentials for both hydrogen evolution reaction (HER) and oxygen evolution reaction (OER). This unprecedented effort presents a robust, non-costly ternary alkali metal-based chalcogenide (NaFeS2) as an effective and highly active electrocatalyst prepared by the hydrothermal method. The monocrystalline nature of the NaFeS2 nanostructures was shown using SAED patterns. The differences in the atomic radii of Na and Fe favors the formation of Fe-S bonds largely contributing to the enhanced electrocatalytic activity of NaFeS2. Further, a decrease in the kinetic energy of the catalytic reaction increases the electrocatalytic property of NaFeS2. We also highlighted the contribution of the high

surface area, the Fermi level and the d-orbitals of Fe in enhancing the OER. NaFeS2/NF shows a current density of 200 mA cm−2 with a small potential of 1.60 V and an overpotential of 370 mV indicating that the material possesses a remarkable electrocatalytic activity outperforming other electrocatalysts in the category. Further, by displaying a potential of −220 mV, NaFeS2/NF attained a current density of −100 mA cm−2, demonstrating a significantly improved HER performance of the electrocatalyst. Also, at a potential of −220 mV, the material exhibited a high stability at a continuous electrolysis of about 30 h. The density functional theory (DFT) calculations indicated that out of the possible adsorption sites on the NaFeS2 surface, only (0 1 0) and (1 0 0) exhibit catalytically preferential adsorption energy (EH) values, which are eventually responsible for the superior electrocatalytic activity. Finally, both the experimental studies and the DFT calculations complement each other and present NaFeS2 as a potentially promising bifunctional electrocatalyst for water splitting applications, which can be scaled-up and deployed for large-scale hydrogen productions.

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CHIJ-06

Enhancement of photoluminescence of Cd0.95Eu0.05SiO3 phosphor Using Na+ and K+ as charge compensators

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Chemical Physics
ISSN: 0301-0104, Volume 551, pages 111319 (2021)

Abstract

Despite its high photoluminescence (PL) performance, cadmium silicate (CdSiO3) as a luminescence host has not been comprehensively studied. In this article, we present a simple solution combustion method for the synthesis of Na+ and K+ co-doped Cd0.95Eu0.05SiO3 phosphor. The influence of charge compensators such as Na+ and K+ on the luminescence performance of Cd0.95Eu0.05SiO3 was systematically investigated. X-ray diffraction results confirms that Cd0.95Eu0.05SiO3:Na+ and Cd0.95Eu0.05SiO3: K+ phosphors are in monoclinic phase and found to increase in the crystallinity as concentration of Na+ and K+ increases. Scanning electron microscope images exhibit agglomerated particles having nanoscale dimension. PL excitation spectra of Cd0.95Eu0.05SiO3, Cd0.95Eu0.05SiO3: Na+ and Cd0.95Eu0.05SiO3: K+ phosphors exhibit excitation peaks in the ultra-violet (UV), near-UV and far-UV regions. Very interestingly, the intensity of PL emission was found to increase with increase in the Na+ and K+ concentrations. The optimum co-dopant concentrations were found to be 7 mol% for both phosphors. The emission intensity of 613 nm peak was enhanced by a factor of 1.78 and 1.66 with Na+ and K+ co-doping respectively. The enhancement in PL emission has been explained by the mechanism of charge compensation and phosphor crystallinity. The PL results confirms that these phosphors could be potential materials for optoelectronic applications.

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CHIJ-07

Reversible Surface Reconstruction of Na3NiCO3PO4: A Battery Type Electrode for Pseudocapacitor Applications

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Journal of Power sources
ISSN: 0378-7753, Volume 520, pages 230903 (2021)

Abstract

Recently, a new class of mixed polyanionic compounds with general formula Na3MPO4CO3 (M = Ni, Mn, Fe, Co, Cu), discovered through high-throughput computations have attracted much attention for its secondary battery applications and safety aspects. Here, we combine electrochemical measurements with inductively coupled plasma-optical emission spectrometer (ICP-OES), energy-dispersive X-ray (EDX), field emission scanning electron microscopy (FESEM), high-resolution transmission electron microscopy (HRTEM), X-ray diffraction (XRD), Raman spectroscopy, x-ray photoelectron spectroscopy (XPS), and an ab-initio DFT approach to unravel the dynamic self-limiting surface restructuring of Na3NiCO3PO4 in aqueous 1 M KOH/NaOH electrolyte. The etching of lattice CO32-, PO43- and Na serves as the key to trigger the surface reconstruction. This work establishes a fundamental understanding of the pseudocapacitance mechanism associated with surface self-reconstruction of mixed polyanionic compounds. The reconstruction-derived self-limiting dense Ni(OH)2 layers at the surface and its oxidation to NiOOH at anodic potentials can be attributed to the observed high-performance pseudocapacitive behavior. The surface reconstructed Na3NiCO3PO4 electrode exhibits high specific capacitance (2378.2 F g−1 at 1 A g−1). The assembled symmetric pseudocapacitor delivers a high energy density (57.2 Wh kg−1), power density (1500 W kg−1) at 1 Ag-1 and long cycle life (13000 cycles) with 100% retention.

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CHIJ-08

Glycine-nitrate derived cobalt-doped BiPO4: An efficient OER catalyst for alkaline electrochemical cells

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Solid State Sciences
ISSN: 0301-0104, Vol. 124, pages 106803 (2020)

Abstract

The investigation of cost effective and earth abundant electro-catalyst to catalyze oxygen evolution reaction (OER) is highly desirable for the development of future sustainable energy. Herein, a facile one step glycine-nitrate decomposition method has been proposed to synthesize crystalline un-doped and cobalt doped BiPO4. The prepared un-doped and cobalt doped BiPO4 have been evaluated as potential electro-catalysts for OER. The XRD, XPS and ICP-OES results reveal that BiPO4 undergo surface reconstruction during OER and thereby converted into Bi2O3. Thus, the *in situ* formed Bi2O3 is the real active catalyst to catalyze OER where 5% cobalt doped BiPO4 exhibits excellent OER activity in terms of low over potential of 328 mV and 394 mV to afford the current density of 10 and 50 mA cm−2 respectively, which is much lower than that of the un-doped BiPO4 (480 mV). Besides, the polarization curves of 5% cobalt doped BiPO4 shows negligible difference in over potential even after 20 h of continuous electrolysis, demonstrating excellent stability in alkaline KOH. This work demonstrates intrinsic electro-catalytic activity of phosphate based electro-catalyst can be improved by doping with suitable transition metal and through surface reconstruction.

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INTERNATIONAL BOOK CHAPTERS

CHIINB-01

Recent advances in inorganic nanostructured materials for electrochemical water splitting

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Royal Society of Chemistry
ISBN: 978-1-78801-692-6, Volume 16 (2021)

Abstract

The production of hydrogen and oxygen by electrochemical water splitting reaction has gained significant attention in recent years. This chapter presents the recent advances on the development of efficient electrocatalysts to catalyze hydrogen evolution reaction (HER) and the oxygen evolution reaction (OER). Particularly, inorganic nanostructured materials developed for the electrocatalysis of HER and OER have been discussed in detail where the synthetic protocol is adopted to produce efficient electrocatalysts based on cobalt, iron, nickel and molybdenum, are highlighted.

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CHIINB-02

Nanocomposite Materials Interface for Heavy Metal Ions Detection

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Bentham Books

ISBN: 2589-2207, Pages 163 - 187 (2022)

Abstract

This reference reviews the reported literature on new approaches of nanocomposite material preparation and their applications in the development of physical, chemical, electrochemical, biological, fluorescence and colorimetric sensors. Sensor nanomaterials have been extensively used to amplify signals in the detection of a range of chemicals including toxic gases, biochemical nutrients, ions, explosives, pesticides and drugs to name a few. 14 chapter contributions highlight state-of-the-art sensors in recent years by outlining the synthesis, role and progress of nanocomposite materials in fabricating flexible and multifunctional sensing platforms in sensor technologies.

Chapters first introduce the reader to nanocomposite materials and their role in making a wide array of sensors including metal-organic, graphene-based and polymeric sensors. The chapters then progress into applications of sensors for the detection of chemicals such as blood glucose, heavy metal and other toxic ions, hydrazine, humidity and explosive. Each chapter explains the required materials for electrodes and material components for a specific sensor platform with additional information about sample collection, threshold values and perspectives where appropriate.

The book is intended as a compilation of knowledge for designing novel nanocomposite materials to be used as sensing platforms in sensor technologies. It serves as an informative resource for a broad range of readers including graduates and post-graduates, Ph. D. scholars, faculty members and professionals working in the area of material science, the healthcare industry, biological sciences, medical sciences, and environmental sciences.

DEPARTMENT OF MATHEMATICS
SCHOOL OF ENGINEERING

Publication Summary

International Journals	**03**	**(MATIJ-01 – MATIJ-03)**

DEPARTMENT OF MATHEMATICS
SCHOOL OF ENGINEERING
INTERNATIONAL JOURNAL PUBLICATIONS

MATIJ-01

The onset of Darcy–Brinkman–Rayleigh–Benard convection in a composite System with thermal diffusion

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Heat Transfer- Wiley library,

ISSN: 2688-4542 Vol. 8, No. 4, 1473-79, Aug 2021

Abstract

The effect of thermal diffusion on the onset of double- diffusive convection is analyzed by considering a composite system of the fluid-saturated porous layer. The porous layer of the composite system is modeled employing the Darcy–Brinkman–Rayleigh–Benard model. The boundaries of the composite system are assumed to be rigid-rigid under normal gravitational force. The governing equations satisfying the Darcy–Brinkman–Rayleigh–Benard model are solved using the regular perturbation method. A mathematical expression is derived for the critical thermal Rayleigh number by solving the coupled equation. The impact of various physical parameters on the onset of convection is graphically represented under the influence of the Soret effect and the stability of the system is analyzed.

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MATIJ-02

A 2D FSI mathematical model of blood flow to analyze the hyper-viscous Effects in atherosclerotic COVID patients.

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Results in Engineering
ISSN: 2590-1230 Vol. 12, Page No. 100275,2022

Abstract

Recent researches on COVID 19 has been extended to analyze the various morphological and anatomical changes in a patient's body due to the invasion of the virus. These latest studies have concluded that there happens a high rise in the viscosity of the blood in a COVID 19 patient, supported by the extensive analysis of the clinical data. In the present paper, a mathematical model in the form of a differential equation system has been proposed to disclose the various changes that occur in the flow across the stenosis of an arterial segment. The consequences of the hyperviscosity of blood on the blood flow characteristics in a stenosed artery are analyzed by solving the model using a finite element method (FEM) solver. A laminar flow coupled with solid mechanics through the Fluid-Structure Interaction (FSI) interface has been studied using an Arbitrary Lagrangian-Eulerian (ALE) method. For the first time, the mathematical model was used to analyze the hyper-viscous flow condition in COVID 19 patients. The present research is mainly based on the numerous clinical reports enlisting the various morphological, hematological, and rheological changes in the blood.

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MATIJ-03

Finite element analysis over transmission region of coronavirus in CFD analysis for the respiratory cough droplets

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Ain Shams Engineering Journal,
ISSN: 101766 Vol. 13, Issue 6, 2022

Abstract

The pandemic outbreak of COVID-19 is worldwide now which requires a novel solution to control the fast-spreading virus. The coronavirus analysis over the contaminated area and its speed of transmission if examined can prevent the spread of COVID-19. A wide range of such problems could be simplified through finite element analysis for a better solution. Many computational fluid dynamics problems could be solved by the finite element method (FEM) effectively by utilizing finite elements. A remarkable linear triangular element meshing over the transmission region between the individuals has been generated by triangular unstructured meshes to analyze the velocity of the virus. The flow intensity of the coronavirus has been analyzed within the standard specified distance recommended by WHO between two individuals at 1.83 m to hinder the spread of COVID-19. Extended work has fabulously extracted the element and nodal information from the discretization region. Moreover, it has been effectively utilized to simplify the numerical solutions of FEM and improve its efficiency to a larger extent. We have discretized the region of transmission of respiratory cough droplets carrying coronavirus from an infected person and the intensity and the speed of the transmission have been computed. The velocity of the transmission of coronavirus has been analyzed by solving an elliptical partial differential equation (PDE) over the region around the mask of an infected individual at a specified distance of 1.83m. Infectious transmission of COVID-19 in different environmental conditions is of numerous complexities to work on and analyze the growth of the infectious coronavirus. Mathematical models formulated for respiratory cough droplets carrying coronavirus can be very efficiently simplified through FEM when the information of the velocity of flow and existence of the coronavirus at the particular stage of transmission region is known. The present study of different temperatures and analysis of wind factors during the transmission process can help to reduce the infection risk between individuals if the recommended specified distance is maintained within the individuals. It is very helpful to formulate and implement a suitable guideline for this pandemic time.

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DEPARTMENT OF PHYSICS
SCHOOL OF ENGINEERING

Publication Summary

International Journal	**01**	**(PHYIJ-01)**
International Conference	**01**	**(PHYIC- 01)**
International Book chapters	**01**	**(PHYIB-01)**

DEPARTMENTS OF PHYSICS
SCHOOL OF ENGINEERING
INTERNATIONAL JOURNAL PUBLICATIONS

PHYIJ- 01

Thermal, Structural, Optical and Electrical Conductivity studies of Pure And Mn2+ doped PVP films

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Journal of Physics B: Atomic, Molecular and Optical Physics
ISSN: 09534075, Volume 53, pages (2020)

Abstract

Pure and Mn2+ ions doped (1 to 5 mol%) PVP polymer electrolytes were prepared by solution casting method by using double distilled water as a solvent. Thermogravimetric curves of the pure and Mn2+ doped polymer films show three distinct steps of weight loss. The Enhanced amorphous nature of PVP polymer film due to doping has been identified from X-ray diffraction analysis. SEM images appear the smoothest, uniform and homogenous surface, suggesting a good ordering structure. The optical band gaps of the films showed a decreasing trend with increasing dopant concentration. The FTIR spectra confirmed the complexation between the Mn2+ ions and the host polymer in terms of changes in intensity and certain bands position. The conductivity data, showed that 5 mol% Mn2+ doped PVP polymer electrolyte had shown maximum ionic conductivity of 3.21 × 10−8 S/cm at room temperature. From all the characterization results, 5mol% of Mn2+ ion-doped PVP polymer electrolyte exhibits better properties which are more suitable for fabricating solid-state batteries and other electrochemical devices.

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DEPARTMENTS OF PHYSICS
SCHOOL OF ENGINEERING
INTERNATIONAL
CONFERENCE PUBLICATIONS

PHYIC- 01

Structural, Impedance and dielectric studies of PAN based Na+ ion conducting Polymer electrode membrane system

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International congress on membranes and membrane assisted processes, MG University, Kottayam, India

Volume 51, pages 1168-1171(2022)

Abstract

Polymer electrolytes have become more prominent due to various important applications in electro-chemical appliances and other rechargeable cells. Polymer polyacrylonitrile (PAN) based sodium iodide (NaI) doped composite conducting polymer electrolyte was synthesized by solution cast method. The prepared conducting polymer electrolyte films were mechanically stable and transparent. Complexation of the composition, interaction between cation of salt and nitrogen of PAN and vibrational modes of ions was confirmed by Fourier transform infrared spectroscopic (FTIR) studies. The electrical conductivity and dielectric properties information was obtained by LCR meter through impedance study for the prepared electrolyte films. Dielectric constant, dielectric loss and AC conductivity were observed for PAN: NaI (90:10; 80:20; 70:30; 60:40) composition. The dielectric behavior was analyzed using ε1 and ε11 values. The ε1 and ε11 values are high at lesser frequencies and less at higher frequencies.

DEPARTMENTS OF PHYSICS
SCHOOL OF ENGINEERING
INTERNATIONAL
BOOK CHAPTER

PHYIC- 01

Structural, Optical and electrical studies of PAN-Based Gel polymer electrolytes For solid state battery applications

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Intech Publishers, UK

ISSN: 978-1-83969-645-9 (2021)

Abstract

Gel polymer electrolyte films (GPEs) based on polyacrylonitrile (PAN) complexed with NaF salt and an Al2O3 nanofiller were prepared via solution cast method. Structural studies were performed to investigate the order of conductivity under the influence of salt and nanofillers. The prepared films were characterized using energy dispersive x-ray spectrometry (EDS) to determine the chemical composition in wt%. EDS studies reveal that PAN–NaF with Al2O3 ceramic filler decreases the degree of crystallinity with increasing concentration of the nanofiller. The UV–Vis spectrum was recorded by a Hewlett-Packard HP8452A diode array spectrometer. The structural effect of salt and nanoparticles on the conductivity was also confirmed by UV–Vis spectroscopy. The mechanical properties of the prepared polymer electrolytes were determined using a Universal Tensile Machine (Instron Model 5565, Canada) with a constant crosshead speed of 10 mm/min. The addition of nanoparticles increased both the modulus and the strength of the polymer nanocomposites. Both the tensile strength and Young's modulus increased with increasing functionalized nanoparticle loading. The change in transition temperature caused by the incorporation of the Al2O3 nanofiller and plasticizer into the PAN+NaF complex was studied by differential scanning calorimetry (DSC) analysis. Additionally, DSC thermograms were recorded to measure the glass transition temperature and melting temperature of PAN-based electrolytes using a Mettler instrument. Conductivity studies were carried out for all the prepared polymer electrolytes to understand the conduction mechanism. The role of the ceramic phase is to reduce the melting temperature, which is ascertained from DSC. The sample containing PAN:NaF (70:30) exhibits the highest conductivity of 1.82 x 10−4 S cm−1 at room temperature (303 K) and 2.96 x 10−3 S cm−1 at 378 K. The polymer electrolytes considered in the present study exhibited an Arrhenius type of conduction. The polymer electrolyte containing 3 wt% Al2O3 nanofiller showed an ionic conductivity of 5.96 × 10−3 S cm−1. To determine transfer numbers, Wagner's polarization method can be used. From these studies, it is observed that the conduction mechanism is predominantly due to ions. Using this (PAN–NaF– Al2O3) (70:30:3) electrolyte, a solid-state electrochemical cell was fabricated, and its discharge profiles were studied under a constant load of 100 kΩ. Finally, several cell profiles associated with this cell were evaluated and reported.

DEPARTMENT OF AEROSPACE ENGINEERING SCHOOL OF ENGINEERING

Publication Summary

International Journal	**02**	**(ASEIJ-01- ASEIJ-02)**
International Conference	**01**	**(ASEIC-01)**
National Conference	**01**	**(ASENC-01)**

DEPARTMENT OF AEROSPACE ENGINEERING
SCHOOL OF ENGINEERING
INTERNATIONAL JOURNAL PUBLICATIONS

ASEIJ-01

Effect of Wind Tunnel Model Blockage on Aerodynamic Characteristics at Transonic Speeds

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Journal of Spacecraft and Rocket
Volume 59, Issue 1 (2022)

Abstract

The present studies show that the overall aerodynamic parameters of launch vehicle / missile type non-lifting miodels in wind tunnels show significant sensitivity to model blockage. Blockage increases CNa and the pean value of Cd0, but does not affect the drag divergence Mach number. Empirical relations to quantify the increase in these parameters have been determined and the accuracies of curve fits found to be good. However, definite correlations of CPMa and the location of center of pressure could not be established.

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Nonlinear model for supersonic airintake buzz

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Aerospace Science and Technology
Volume 126, 107567, (2022)

Abstract

Air-intake buzz was initiated at Mach number of 3.0 on a two-dimensional isolated air-intake model in a wind tunnel by throttling the exit area. Schlieren images of shock oscillation around the intake entry during buzz were recorded using a high-speed camera. The recordings show a strong coupling between the bow-shock at the cowl lip and the oblique shock from the ramp. Image analyses were carried out, considering each image as a matrix of pixels and the change of intensity of light analyzed. A dominant frequency of 103.8 Hz (Strouhal no = 0.008 based on throat height) associated with the shock oscillations and harmonics of the shock oscillations are indicated. Phase-plots of the intensity and the rate of change of intensity show nearly perfect ellipse after filtering at the dominant frequency. Thus, the buzz phenomenon is associated with a limit-cycle oscillation as in a nonlinear Van-Der Pol oscillator. The computed damping factor synchronizes with the amplitude at all times, establishing that buzz is a stable and self-sustained oscillation with equilibrium between inertial and damping forces. It is proposed that a control scheme based on feed-forward control system using a suitable forcing function could be mathematically developed to suppress supersonic air-intake buzz.

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ASEIC-01

Investigation of Mechanical and Corrodion properties of Graphine or Glass fibre reinforced Al 2024 hybrid Composites

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Journal of Spacecraft and Rocket
Volume 59, Issue 1 (2022)

Abstract

Aluminium alloy 2024, due to its high strength & Fatigue resistance is used in aircraft structural application. The development of hybrid composites involves a combination of two or more reinforcement in a single matrix .The present proposed work focuses on evaluation of mechanical properties and corrosion behaviour of Aluminium 2024 alloy metal matrix composites by the addition of desirable reinforcements. The main objective of this research work is to develop hybrid aluminium composite which was fabricated using stir casting process considering two reinforcements such as graphene and R-glass fiber and Al2024 as a base alloy matrix. The casted aluminium alloy were machined as per ASTM standards and mechanical tests such as tension test and compression test were conducted on hybrid aluminium composite specimens based on the weight percentage of reinforcements and further the developed hybrid composites were subjected to study corrosion behaviour and corrosion test was conducted by dipping specimens in 0.25 N, 0.5 N, 0.75 N, 1 N hydrochloric acid solution as a corrodent for duration of 96 h with increment of 24 h by using weight loss method .Morphological study of the developed aluminium hybrid composites after corrosion test was carried out using scanning electron microscope.

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ASENC-01

Passive control of transonic unsteady pressure fluctuation using Aerodisc

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48th Conference on Fluid Mechanics and Fluid Power
Volume 57, Issue 5 (2021)

Abstract

Shock wave and boundary layer interactions (SWBLI) are known to generate very high levels of unsteady pressure fluctuations which can trigger transonic buffet over the payload region of a launch vehicle. Experiments were carried out on a typical launch vehicle model in the NAL 0.6m wind tunnel to measure the pressure fluctuations over the payload region. It was found that a passive Aerodisc protruding upstream of the nose of the vehicle very significantly alleviates the pressure fluctuations, especially in the low-frequency band, which is crucial for launch vehicles. The effectiveness of the Aerodisc in the alleviation of SWBLI is demonstrated in this paper through analyses of unsteady pressure data.

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
SCHOOL OF ENGINEERING

Publication Summary

International Journals	**12**	**(CSEIJ-01 – CSEIJ-12)**
International Conferences	**05**	**(CSEIC-01 – CSEIC-05)**
Book Chapters	**11**	**(CSENB-01 – CSEIB-06)**

CSEIJ-01

On the Geometry of Interacting Axon Tracts in Relation to Their Functional Properties.

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BioRxiv

Pages 1-16 (2022)

Abstract

It is well known that demyelination associated with multiple sclerosis alters coupling between axons in a diseased nerve tract due to exposure of ion channels. In this work we ask the question whether the presence of electric elds as a coupling mechanism between nerve axons, has any impact on the expected conduction properties of the nerve under focal demyelination. Using an approximate geometry for a bundle of three axons, we allow electric elds generated at a node of Ranvier to inuence other nodes of Ranvier on dierent axons. In order to introduce focal demyelination, we allow a new type of structure, intermediate between a node and an internodal segment. We nd that the nerve's conduction proles are dierent with and without eld-based coupling. This is important because it opens up the possibility for an experimental investigation to study whether eld-based coupling predominates over current-based coupling. Fields and currents may also be measured using dierent methods and so there are implications for bio-instrumentation. From a systems perspective, the study is based on a novel equation which allows electric elds to act as sources of current at axons' nodes of Ranvier, thereby generating new behaviors from the set of coupled partial dierential equations that model the electrodynamics of the nerve. In addition to our simulation study of focal demyelination, we present a justication for a certain geometric W-matrix used in our phenomenological 2019 model. We also provide the rst simulations of a tract of tortuous axons, showing the impact of tract tortuosity on conduction velocity. The tortuous model is analyzed geometrically to illustrate the mechanism of synchronization. Finally, this same model is shown to be castable as a learning machine - a formulation that has neuroscience implications.

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CSEIJ-02

Computer Study of Metric Perturbations Impinging on Coupled Axon Tracts

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BioRxiv

Pages 1-8 (2022)

Abstract

Metric perturbations are deviations from a homogeneous space-time background. In this paper, the authors extend an earlier investigation by using high precision computer simulations and show that there is definite impact of metric perturbations, that is, gravitational radiation, on the time-coded information conducted by a tract of neural axons as found in the human central nervous system.

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CSEIJ-03

Dysgraphia Classification based on the Non-Discrimination Regularization in Rotational Region Convolutional Neural Network

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International Journal of Intelligent Engineering and Systems

ISSN: 2185-3118, Volume 15, Issue 1, Pages 55-63, (2021)

Abstract

Dysgraphia is a handwriting disorder and the classification of dysgraphia in children's handwritten images helps to identify the dysgraphia patient effectively and also prevents low self-esteem. Traditional methods of dysgraphia classification based on experts manually classify the dysgraphia that requires more cost and time. Few researches apply the machine learning and deep learning techniques for the classification of dysgraphia and existing models have the limitations of over fitting problems in the training process. In this research, the Non-Discrimination Regularization in Rotational Region Convolutional Neural Network (NDR-R2CNN) is proposed to improve the efficiency of dysgraphia classification. The balancing parameters are introduced in the loss function to balance the class in the training and eliminate the features to reduce the over fitting problem. The collected children's handwriting data were used to evaluate the performance of the proposed NDR-R2CNN model. The proposed NDR-R2CNN model has the advantages of effective feature analysis and non-discrimination word analysis. The NDR-R2CNN model has the accuracy of 98.2 % and the SMOTE+SVM method has 90.2 % accuracy in Dysgraphia classification. The result shows that the NDR-R2CNN model has 98.2 % accuracy and the existing CNN has the accuracy of 94.2 %.

Keywords: Dysgraphia, Handwriting data, Non-discrimination regularization, over fitting and rotational region convolutional neural network.

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CSEIJ-04

AUTOMATED IMAGE CAPTION GENERATOR FOR VISUALLY IMPAIRED

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Journal of Emerging Technologies and Innovative Research

ISBN: 2349-5162, Volume 9, Issue 4 Pages h496-h501 (2022)

Abstract

Image processing is used in various industries and is one of the most advanced technologies used in Google, the medical field etc. google vision is one of the most used APIs in our daily lives for image labelling, face and landmark detection, optical character recognition (OCR), and tagging of explicit content, etc. The widely used google photos and iCloud use image processing to recognize the scenario of the photo and facial recognition. Image processing can help the visually impaired describe their surroundings. A voice-based image caption generation which is built using encoder-decoder architecture is used to describe the image. Images of the surroundings are used to generate captions which will be read aloud to the visually impaired so that they'll get a stronger sense of what's happening around them. As an encoder, we have a pre-trained Resnet50 model where ResNet-50 is a convolutional neural network which is 50 layers deep. This network learns rich feature representations for a large range of images. Besides extracting high-level features from images using Resnet50, we also maintain the image colour composition using OpenCV techniques which also helps the model to extract the features from small components within the image. As a decoder, we have an LSTM network. Long remembering (LSTM) is a recurrent neural network (RNN) architecture and contains the Time Distributed Layer that's, it can process not only single image data points but also entire sequences of image data.

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CSEIJ-05

Comparative Study on the Prediction of Remaining Useful Life of an Aircraft Engine

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International Research Journal of Engineering and Technology (IRJET)
ISSN (Online): 2395-0056, Volume 9, Issue 5, Pages 1448- 1455, May 2022

Abstract

Aviation Safety is a major component of the Aviation Industry. The practice of preventive maintenance and Prognostic Health Management is a new area for research in the Aviation industry. The improvement of different safety systems and scheduled maintenance of airplane engines is beneficial in reducing operational and maintenance costs. The abundant information available from flight systems through different sensors recording data at different situations is helpful to obtain data patterns. The study of these data patterns obtained from the complex sensor data, post data-normalization and the removal of noise, helps to evaluate the 'Remaining-Useful Life' (RUL) of the airplane engine. 'Supervised Machine Learning' is a division of machine learning where the model is trained with labelled training data. To train the model we will be using the CMAPSS dataset for RUL prediction. This study aims to introduce a comparison between different supervised machine-learning models based on the RUL of the aircraft engines. The predictions made would be helpful to schedule maintenance of airplane engines only when required, preferably, once the threshold RUL value is reached.

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CSEIJ-06

Multi-Deep CNN based Experimentations for Early Diagnosis of Breast Cancer

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IETE Journal of research

(Feb-2022)
https://www.tandfonline.com/doi/full/10.1080/03772063.2022.2028584

Abstract

Breast cancer is one of the deadly cancer types that causes high mortality among women globally. Meanwhile, Deep Learning (DL) emerges as the most frequently utilized and rapidly developing branch of classical machine learning. The study examines a modern Computer-Aided Diagnosis (CAD) framework that uses DL to extract features and classify them for aiding radiologists in breast cancer diagnosis. This is accomplished through four distinct experimentations aimed at identifying the most optimal method of effective classification. Here, the first uses Deep CNNs that are pre-trained, such as AlexNet, GoogleNet, ResNet50, and Dense-Net121. The second is based on experiments using Deep CNNs to extract features and applying them onto a Support Vector Machine algorithm using three different kernels. The next one involves the fusion of different deep features for demonstrating the classification improvement by fusion of these deep features. The final experiment involves Principal Component Analysis (PCA) for reducing the computational cost and for decreasing the larger feature vectors created during fusion. The above said experimentations are carried out in two different mammogram datasets namely MIAS and IN breast. The classification accuracy attained for both datasets through the fuzing of deep features (97.93% for MIAS and 96.646% for IN breast) is the highest compared with the state-of-the-art frameworks. In contrast, the classification performance did not enhance while applying the PCA on combined deep features; but the decrease in execution time provides a reduced computational cost.

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CSEIJ-07

EMOTION RECOGNITION USING CNN

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International Journal for Research in Engineering Application & Management,
ISSN: 2454-9150, Volume 7, Issue 10, Jan 2022, Pages 124-127

Abstract

Recognition of human emotions plays a vital role in understanding of the human brain when exposed to different situations. Although humans can recognize a person's facial expressions without problem or delay, machine expression identification remains a challenge. Several studies on feature extraction, face identification, and expression classification approaches have been published in recent years, but developing an automated system that does this task is difficult. We have implemented a machine learning model using fer2013 dataset(implemented on google colab/jupyter). This model has been developed using deep learning techniques such as convolutional neural networks(CNN) and python libraries(openCV). In comparison to other image classification techniques, CNNs require very little preprocessing. The model has been trained with input as images which produces output in the form of text. One of the most important findings of our study was that most of the models used CNN approach with an accuracy of 75% to 90%

Keywords— Convolutional Neural Networks, Deep Learning, Emotion Recognition, Fer2013, Machine Learning

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CSEIJ-08

Review of Association Mining Methods for the Extraction of Rules Based on the Frequency and Utility Factors

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International Journal of Information Technology Project Management
ISSN: 1938-0232 • eISSN: 1938-0240, Volume 12, Issue 4, December 2021, Pages 1-10

Abstract

Association rule defines the relationship among the items and discovers the frequent items using a support-confidence framework. This framework establishes user-interested or strong association rules with two thresholds (i.e., minimum support and minimum confidence). Traditional association rule mining methods (i.e., apriori and frequent pattern growth [FP-growth]) are widely used for discovering of frequent itemsets, and limitation of these methods is that they are not considering the key factors of the items such as profit, quantity, or cost of items during the mining process. Applications like e-commerce, marketing, healthcare, and web recommendations, etc. consist of items with their utility or profit. Such cases, utility-based itemsets mining methods, are playing a vital role in the generation of effective association rules and are also useful in the mining of high utility itemsets. This paper presents the survey on high-utility itemsets mining methods and discusses the observation study of existing methods with their experimental study using benchmarked datasets.

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CSEIJ-09

FACIAL EMOTION RECOGNITION

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International Research Journal of Engineering and Technology (IRJET)
ISSN: 2395 - 0072, Volume 9, Issue 6, Pages 1-4, 2022

Abstract

Human emotions are mental states of sentiments that occur without conscious effort and are accompanied by physiological changes in facial muscles that result in facial expressions. As a result, this study provides an approach for real-time recognizing facial emotion using image processing and AI techniques. Emotion recognition relies heavily on face detection. Sad, glad, surprise, fear, anger, neutral, and other emotions are all characterized as such. The Haar cascade method and the Convolutional Neural Network are used here. In the CNN technique, processes such as pooling and followed by flattening, whereas the Haar cascade algorithm uses Haar feature selection and cascading classifiers. Face emotion recognition is more effective nowadays, and many applications use it in real time for security purposes

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CSEIJ-10

Designing Data Validation Framework for Crowd-Sourced Road Monitoring Applications

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Journal of Institutions of Engineer India Series B
ISSN 2250-2114, 2022

Abstract

With the wide availability of smartphone sensing and the Internet connections, mobile crowd sourcing (MCS) has become a promising paradigm for collecting opinions and providing services to the citizens. In the smart city context, crowd data, both in the form of their opinions and in the form of sensing data from their smartphones are very useful for scalable monitoring of resource demand and planning. Since these devices are portable, it is carried by almost every citizen, thus making them ubiquitous. However, the main bottleneck of such crowd intelligence-based services is data validation as opinions can be biased, influenced by some factors not relevant to the problem in focus. So, in this paper, a data validation framework utilizing machine learning techniques for mobile crowdsourcing applications is proposed. It is focused on MCS-based road monitoring applications. The idea of crowd sourced urban area road monitoring application (CURMA) presented in the paper is implemented and results show the crucial need for such data validation frameworks

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CSEIJ-11

A Survey of Machine Learning and Meta-heuristics Approaches for Sensor-based Human Activity Recognition Systems

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Journal of Ambient Intelligence Humanized Computing
ISSN: 1868-5145, May -2022,

Abstract

Human Activity Recognition (HAR) is an important research area that has profound applications in healthcare, security and surveillance. Starting from traditional machine learning approaches to the recently evolving deep learning techniques, researchers have exhibited significant contributions in the HAR field in the last decade. Recently, meta-heuristic approaches have added a new dimension to this field by improving efficiency and effectiveness of activity recognition in terms of feature selection, feature extraction and parameter tuning of collected data from wearable as well as Smartphone sensors. Accordingly, this paper presents a comprehensive survey of the classic combination of machine learning and deep learning with meta-heuristic algorithms that has revolutionized HAR systems. The applications, and the underlying challenges associated with existing sensor based HAR systems are also discussed. Based on the recent state-of-the-art literature, the open issues on this topic are identified and presented in this paper for further research in this field.

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CSEIJ- 12

Detection of tumours from MRI scans using Segmentation techniques

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Proceedings of the Second International Conference on Electronics and Sustainable Communication Systems (ICESC-2021)
IEEE Xplore
ISSN No. 978-1-6654-2867-5, Issue 21 (October-2021)

Abstract

Medical Image segmentation is complex and challenging task due to the distinct features of biomedical images. MRI scan is commonly used in treating brain, prostate, uterus cancer, ankle and foot cancers. The proposed research work utilizes the real medical images of uterus cancer, brain tumour and throat cancer images obtained from Sagar hospital. MRI images are likely to suffer from the noises such as Gaussian noise, salt pepper noise and speckle noise. Henceforth, noise removal is a very important task to make the image clear with high accuracy and suitable for further diagnosis process. In our paper, the proposed tumour image processing involves three stages 1) converting RGB images to grayscale, 2) pre-processing the images using Gaussian, median and anisotropic filters for noise removal and image enhancement 3) Tumour segmentation using watershed and active contour method. The proposed research work has compared the results of watershed and active contour method. Also, it leverages the ability to find the area and perimeter values of tumour, which indicates the size of brain tumours that provide more accuracy compared to other existing algorithms. Watershed algorithm gives better results, when compared to active contour method, since tumour area using watershed segmentation is more accurate than active contour method.

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INTERNATIONAL CONFERENCE PUBLICATIONS

CSEIC-01

Colon Cancer Prediction with Transfer Learning and K- Means Clustering

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7th International Conference on Emerging Applications of Information Technology (EAIT 2022)
ISSN: 2367-3370, (2022)

Abstract

The automatic diagnosis of colon cancer is important for patients and their prognosis through the analysis of histopathological images. Traditional feature extraction methods, on the other hand, can only extract some low-level features of images, and prior knowledge is required to select useful features, which can be greatly influenced by humans.As a result, we presented an analysis of histopathological images of colon cancer using supervised and unsupervised deep convolutional neural networks. The balanced subclasses are then turned up and down, right and left, and rotated counter clockwise by 90 and 180 degrees to overcome the influence of the imbalanced histopathological images in subclasses.The proposed experimental results for supervised histopathological image classification of colon cancer displays that InceptionV3 and InceptionResNetV2 based histopathological image classification of colon cancer is superior to existing methods. These results indicate that the InceptionResNetV2 network is the best deep learning architecture for diagnosing colon cancers by analysing histopathological images.As a result, InceptionResNetV2 was used to extract features from colon cancer histopathological images in order to perform unsupervised image analysis.In addition, a new autoencoder network was built to transform the features extracted by InceptionResNetV2 to a low-dimensional space in order to perform image clustering analysis. The test results reveal that using our proposed autoencoder network produces better clustering results than using only the InceptionResNetV2 network.

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CSEIC-02

Scatter Index: An alternative measure of dispersion based on relative Frequency of occurrences

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ICICC
Scopus (November 2021)

Abstract

Dispersion is a statistical term which is used to describe the variability of a dataset. In statistics and probability, the coefficient of variation (CV) is a widely used as a standardized measure of dispersion. However CV is not advisable in applications where mean of dataset is close to zero. In this paper we have derived an alternate measure of dispersion called Scatter Index which is based on relative frequency of observations. The novelty of the study is that the derived SI not only describes the consistency of a set of frequency of observations when mean value closes to zero but it can also be used to quantify how scattered or localized the frequency of observation is within dataset irrespective of its mean value.

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CSEIC-03

Indoor Navigation using Li-Fi & IoT Technologies

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2022 6th International Conference on Trends in Electronics and Informatics (ICOEI) (May 2022)

Abstract

While visiting huge business establishment like big institutions and giant hospitals people are generally unaware of buildings architecture, basic features and also find it difficult to navigate. People visiting such establishments are baffled in amidst of throng to reach out for indoor destination they are looking for, where the conventional GPS fails to operate. An indoor navigation system which utilizes Light Fidelity technology and Internet of Things has been proposed. This technology makes use of the light fixtures in a building and capable of guiding the user to his/her destination through a mobile application. Li-Fi is a wireless short range visible light communication which used visible light spectrum to transmit data. It cannot pass through opaque objects and requires line of sight. These properties of Li-Fi ensure that it provides accurate positional information. In a Li-Fi system LED acts as transmitter and a light sensor acts as the receiver. The LEDs are provided with unique positional information which is transmitted to the receiver when it comes in the range of the transmitter. From the receiver this data is saved in cloud and an android application taps this data and represents the position of the user in a map and further guides to his/her destination. This system ensures a hassle-free experience for the user in an indoor environment.

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CSEIC-04

Diabetes Prediction Using Machine Learning Algorithms

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8th International Conference on Advanced Computing and Communication Systems (ICACCS)
2022

Abstract

Diabetes patients with poor control is a kind of diabetes that affects the body's metabolism characterized by an abnormal rise in blood sugar levels due to insulin deficiency, tissue insulin sensitivity, or both. In the sphere of medicine, the diabetes system is quite beneficial. Diabetes prevention is critical, and utmost caution should be exercised to avoid it. Diabetes has now become a frequent condition affecting People of different ages, from toddlers to senior citizens. It is possible to control diabetes if it is detected early enough. Machine learning algorithms are utilized in the health-care system to carry out this analytical method. In order to conduct medical diagnostics, to analyze vast amounts of medical data and build machine learning models, methods of machine learning are utilized. The application of machine learning Models are created using data received from patients, users can improve their prediction results. To achieve this goal, we'll employ a variety of machine learning techniques to perform early diabetes prediction in a human body or a patient faster and more accurately. Techniques for machine learning, by constructing models from datasets obtained from patients, we can improve your prediction results. This model will predict diabetes using a dataset, we used Machine Learning Classification and ensemble techniques. K-nearest neighbor, Decision Tree and Random Forest are the three types of method. When compared to other models, the accuracy of each model is varied. It reveals that the model is capable of accurately predicting diabetes with a high level of accuracy.

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CSEIC-05

SKELETAL BONEAGE DETERMINATION USING DEEP LEARNING

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International Conference on Ambient Intelligence in Health Care
ISSN No. 2320-6632 (2022)

Abstract

In today's clinical diagnosis of dental patients, skeletal maturity assessment is a unique bio-marker. Bone Age Assessment (BAA) is used to diagnose endocrinological and growth abnormalities by comparing the patient's bone age and chronological age. Several methods for determining skeletal maturity have been devised, however the two most significant approaches that employ left hand and wrist radiographs are the Greulich-Pyle and Tanner- Whitehouse methods as mentioned in [1]. While these approaches are well known, they are exceedingly time-consuming and rely on an experienced radiologist who would have to assess the bone age using a hand atlas as a reference every time. In this paper we use Convolutional Neural Networks (CNN) to successfully predict the maturity of bone age from hand X- ray images of patients aged 4 to 17 years old. The examination effort of radiologists, for example, is a restriction of manual clinical processes. Since the manual methods are subject to observer variability, developing computer-aided and automated systems for bone age evaluation is advantageous. We compare the existing Deep Convolutional Neural Networks (DCNN) like VGG16, VGG19, Inception models to our own custom Regression Model in this paper.
Keywords: BAA · CNN · Deep learning · Regression

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NATIONAL BOOK CHAPTERS

CSENB-01

Embedded and Real Time Systems

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Scientific International Publishing house
ISBN: 9789394002333, pages 200 (2022)

Abstract

An embedded system is an electronic system that are designed to perform a dedicated function within a larger system. Real-time systems are those that can provide guaranteed worst-case response times to critical events, as well as acceptable average-case response times to noncritical events. When a real-time system is designed as an embedded component, it is called a real-time embedded system. Real-time embedded systems are widespread in consumer, industrial, medical, and military applications. As more and more of our daily life depends on embedded technologies, the demand for engineers with the skill set on the development of real-time embedded software has soared in recent years. Developing software for real-time embedded systems involves many activities, including requirements specification, timing analysis, architecture design, multi-tasking design, and cross-platform testing and debugging. This book takes a synergetic approach to introducing fundamental concepts and topics related to the development of real-time embedded systems. In particular, readers may find with ease that this book has two intertwining themes: design principles and engineering practices.

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INTERNATIONAL BOOK CHAPTERS

CSEIB-01

A novel authentication technique for cloud data storage security

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Nova Science Publisher
ISBN: 978-1-68507-615-3, pages 244 (April 2022)

Abstract

Cloud computing solutions have been gaining traction in the commercial world due to their capacity to provide on-demand access to resources, govern the software environment, and augment existing systems. As a result, universities worldwide have included cloud computing and related technologies in their curricula, and information technology organizations are speeding up their skill-set evolution to better prepare for emerging cloud technologies and public expectations, such as new services.

The primary goal is to present the most up-to-date information about cloud computing technologies and applications. This book provides a detailed introduction of the research fields, recent work, and open research questions in the emerging field of cloud computing. Also, the present book will look for potential research areas and technologies that will make it easier to build a global market for cloud computing services that support scientific, industrial, business, and consumer applications. The benefits associated with cloud computing are enormous, and for rapid development, there is a massive requirement of research and development in this field. Cloud Computing Infrastructure for Enabling Future Technology Advancement aims to make readers and researchers understand the internals of cloud computing and how cloud technology can be used for enabling future technology development.

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CSEIB-02

Identifying Stars/Galaxies: A hybrid classification for celestial sources

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Smart Innovation, Systems and Technologies, Springer
ISBN: 2190-3018, pages 103-116 (2022)

Abstract

Millions of stars and galaxies exist in our universe. A large numbers of surveys have come into existence in astronomy to monitor these data. This has added to a lot of data in the data pool problem of star galaxy classification which is daunting because even though there are a number of techniques available each of them has their own strengths/weaknesses. A typical method of star/galaxy classification is using neural networks. This method is further improved in this work by using a hybrid technology. In this paper, a combination of ANN and fuzzy neural network of type 2 is used, wherein the inputs are fuzzy and its weights are crisp. Data from various surveys have been combined to get a larger data set. It is evident from the results that this hybrid approach of using fuzzy and ANN improves the overall classification over any individual classification methods. The manuscript argues convincingly in favour of the efficacy of the hybrid approach.

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CSEIB-03

Modified Adam to Update Control Parameters of Crow Search Algorithm in Transformation Technique Based Dementia MRI Image Classification

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[2] Bannari Amman Institute of Technology, Sathyamangalam, India

IFMBE Proceedings
ISSN: 16800737, Springer, Page No 121-131 (2022)

Abstract

This research paper focuses on classifying brain MRI images into two classes: Non-Dementia & Dementia. Crow Search Algorithm is used as transformation method for converting non-linearly separable data points into linearly separable data points. The accuracy enhancement in Support Vector Machine and K-Nearest Neighbor classifiers through the usage of this transformation technique is analyzed in this paper. To increase the efficiency of Crow Search Algorithm as transformation technique, modified Adam method is newly proposed. Support Vector Machine and K-Nearest Neighbor classifiers provide Balanced Classification Accuracy of 72% and 68% respectively while usage of Crow Search Algorithm with modified Adam as transformation technique in Support Vector Machine and K-Nearest Neighbor classifiers provide Balanced Classification Accuracy of 90% and 86%.

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CSEIB-04

Improved Bald Eagle Search Optimization for Enhancing the Performance of Supervised Classifiers in Dementia Diagnosis

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IFMBE Proceedings
ISSN: 16800737, Springer, Page No 59-66 (2022)

Abstract

Evolutionary algorithms are widely used to improve the performance of machine learning techniques through various approaches. This paper focuses on increasing the accuracy of the machine learning techniques in diagnosing dementia through the usage of Improved Bald Eagle Search Optimization as a transformation technique. In the proposed Improved Bald Eagle Search Optimization, the control parameters are updated using the entropy-based gradient to reduce the error rate of the classification algorithm. Magnetic resonance images of 52 dementia and 52 non-dementia subjects obtained from the OASIS database are considered in this research work. Raw intensity values are taken as features and given as input to the transformation technique based on Improved Bald Eagle Search Optimization. Then the transformed values are classified through one of the three different supervised classifiers namely Naïve Bayes, Linear Discriminant Analysis, and Support Vector Machine. The accuracy of Support Vector Machine is 64% when no transformation technique is used and it is increased to 88% when Improved Bald Eagle Search Optimization is used for transforming the features.

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CSEIB-05

Fusion of Deep Features for Classification of Breast Cancer Using Multi-Deep CNNs

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[1] Department of CSE, School of Engineering, Dayananda Sagar University, Bangalore, India

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IFMBE Proceedings
ISSN: 16800737, Springer, Page No 49-57 (2022)

Abstract

Breast cancer remains a deadly disease that frightens women in several parts of the world. At the same time, deep learning becomes the widely used and fast-growing area of traditional machine learning. The work experiments a newer computer-aided diagnosis (CAD) tool that comprises of feature extrication and classification through deep learning for assisting radiologists in breast cancer classification in mammogram images. And this is done by three different experimentations for determining the optimum way of robust classification. Herein, the first one makes use of pretrained Deep CNNs namely AlexNet, GoogleNet, Res-Net50, and DenseNet121. The second one is based on the experimentation of extracting features using the Deep CNNs and applied to a support vector machine (SVM) model. The last one is based on fusing the deep features for designing a robust classification framework. All these experimentations are evaluated using MIAS database. And finally, the results reveal that the fusing of deep features enhanced the classification performance of SVM, i.e., this deep feature fusion (feature set_3) with SVM provides a maximum classification accuracy of 96.739% than other approach.

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CSEIB-06

Modified Spotted Hyena Optimizer Based Leukemia Microscopic Images Classification

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[2] Department of ECE, Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology, Chennai, India
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IFMBE Proceedings
ISSN: 16800737, Springer, Page No 123-131 (2022)

Abstract

Applications of accurate machine learning techniques in medical field are increasing every day. This research paper proposes a novel Modified Spotted Hyena Optimizer as transformation technique to improve the performance of popular machine learning algorithms in classifying the Leukemia microscopic images. In the proposed transform, control parameter of Spotted Hyena Optimizer is found using Weightless Swarm Algorithm iteratively. Microscopic images of 26 leukemia and 26 normal subjects are obtained from C-NMC website and considered in this study. Statistical features namely mean, variance, skewness and kurtosis are extracted from microscopic images and given as input to the proposed transform. Then the transformed values are given as input to any one of the four supervised classifiers: K-Nearest Neighbor, Decision Trees, Random Forest, and Stochastic Gradient Descent. When the Modified Spotted Hyena Optimizer is for transforming the features in Stochastic Gradient Descent classifier, highest accuracy of 90% is achieved while the accuracy offered is only 65% when no transform is used.

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DEPARTMENT OF COMPUTER SCIENCE & TECHNOLOGY SCHOOL OF ENGINEERING

Publication Summary

International Journals	**01**	**(CSTIJ-01)**
National Journals	**01**	**(CSTNJ-01)**

DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY
SCHOOL OF ENGINEERING
INTERNATIONAL JOURNAL PUBLICATIONS

CSTIJ-01

Demand-side management in smart electricity grids: a review

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International Journal of Intelligent Enterprise, Interscience Publishers (IEL)
ISSN: 1745-3232, Vol. 8, Issue 4, Page No 436-458, (2021)

Abstract

Smart grids are enabling technologies for the functioning of electrical grids and the country's economy. In smart grid networks, managing energy efficiency is an upcoming challenge. The energy is consumed by appliances in the residential sector, even during peak times. It results in wastage of energy up to some extent. Demand-side management (DSM) is a primary concept in the emerging smart grid. Thus, DSM balances vitality utilization every day utilizing various procedures, as it influences every customer's unit cost. This survey highlights different types of DSM and briefs about different approaches of DSM in the residential area. The individual approach of DSM may use a load scheduling algorithm, it can be optimized technique or load shifting algorithm to achieve reduced electricity cost and optimal electricity energy consumption. The advantages of each approach are specified using energy parameters like energy cost, peak load, peak to average ratio, research gap is highlighted with delay, user comfortability.

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NATIONAL JOURNAL PUBLICATIONS

CSTNJ-01

A CLOUD COMPUTING FAULT DETECTION ANALYSIS

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Shodhsamhita: Journal of Fundamental & Comparative Research
ISSN: 2277-7067, Volume 7, NCRTE -2021 (Special Issue),
Page No 87-92, (2021)

Abstract

Cloud computing provides a collaborative and challenging environment to the users. It has made software, platform, and infrastructural resources available as a service which is available on demand and is easily scalable. Accessibility of cloud computing is hampered due to it being vulnerable to failures. To utilize cloud services to their maximum extent it is important to effectively handle issues related to reliability and availability in cloud computing. Several types of faults may occur in cloud computing environments leading to failure and performance degradation. Therefore, fault detection is an important requirement to achieve high availability in cloud computing. Data of cloud systems is collected, monitored and used to identify the state of a cloud system and helps in Fault detection. In this paper we have done the literature survey of various fault detection methods in cloud computing.

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING SCHOOL OF ENGINEERING

Publication Summary

International Journals	**06**	**(ECEIJ-01 – ECEIJ-06)**
International Conferences	**03**	**(ECEIC-01 – ECEIC-03)**
International Book chapters	**06**	**(ECEIB-01 - ECEIB-06)**

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
SCHOOL OF ENGINEERING
INTERNATIONAL JOURNAL PUBLICATIONS

ECEIJ-01

Gaussian Regression Models for Evaluation of Network Lifetime and Cluster-Head Selection in Wireless Sensor Devices

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[2]Department of Electronics & Communication Engineering, Reva University, Bangalore, India
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IEEE Access
ISSN: 2169-3536, volume 10, Page No 20875 – 20888 (Feb 2022)

Abstract

The paper presents a model predictive approach for evaluating network lifetime and cluster head selection for a wireless sensor network. The dynamic parameters of a wireless sensor network are collected using Smart Mesh IP Power and performance calculator. The study considers a machine learning approach to combine clustering with the optimal routing protocol. The hop depth, advertising, number of Motes, backbone, routing, reporting interval, payload size, downstream frame size, supply voltage, and path stability are the predictors, and the current consumption, data latency, and build time are the response variables to establish the models for estimating the power and performance of the network. The remaining energy in each node, distance from the base station, and data transmission rate are the predictors, and the priority of the cluster head is the response variable to establish models for achieving an optimal routing path in a wireless sensor network. The standard tree, Support Vector Machine, Ensemble, and Gaussian process regression models for lifetime estimation are analyzed in comparison with the Smart Mesh IP tool, and the models for cluster head selection are investigated in comparison with ANFIS based models. This novel approach concentrates on the effect of various dynamic parameters on network lifetime prediction.

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ECEIJ-02

Investigations on rGO on silicon-based UV photon detector

[1] **G. Anshika,** [2] **G. Shruthi,** [3] **G. Baishali,** [4] **V. Radhakrishna,** [5] **S. Vijay,** [6] **K. Saara**

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[4] Space Astronomy Group, U R Rao Satellite Centre, ISRO, Bangalore, India
[5] Department of Instrumentation and Applied Physics, Indian Institute of Science, Bangalore, India

Applied Physics A (Springer), Volume 127, Issue 863, October-2021

Abstract

The possibility of using reduced graphene oxide field effect transistor (rGOFET) on a high resistivity silicon as a photon detector in bottom gate FET architecture has been explored in this work. Highly conductive reduced graphene oxide (rGO) is synthesized from graphene oxide (GO) by a hybrid technique using hydroiodic acid (HI) fumes and thermal annealing for 6 h on the substrate itself. The rGOFET device is irradiated from top and bottom at different gate-source voltages ranging between 50 mV and 5 V and a comparison of its performance is done. The fabricated device has shown significant response to photons in the UV range peaking at 256 nm with a responsivity of 0.15 A/W at 5 V when irradiated from top and 0.095 A/W at 5 V when irradiated from bottom. The response time of the device measured is 0.23 s, and recovery time is 0.12 s.

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ECEIJ-03

Real time implementation of fiber Bragg grating sensor in monitoring Flat wheel detection for railways

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[2] Department of Electronics & Communication Engineering,
the Oxford College of Engineering, Bangalore, India

Engineering Failure Analysis, Elsevier Journal, Volume

138, Issue 106376, Pages 1-13, April 2022

Abstract

Wheel flats are a key source of issues in railway systems, as they generate significant wear on both the infrastructure and the train carriages. Flat zones on the wheel tread are created by the wheel sliding unintentionally on the rail. They can cause serious damage to the train and accidents, so identifying worn wheels is critical for human safety and rail transit. The purpose of this study is to present the real-time implementation of fiber Bragg grating sensors on rail tracks and to investigate the train's flat wheel status. By considering passenger train running at speed 70kmph, it has been monitored for 35 sec in the interrogator. Real time analysis of strain induced in the rail was calculated and it has been found from the sensor reading there is peak value of strain of the order of 303.4 με which implies that wheel flatness is present whereas for normal wheel strain value is minimal up to 173.23 με. By collecting experimental strain data simulation has been done and shift in peak wavelength at 1550.804 nm and reflectivity obtained was 89.3% for flat wheel. Simulation result shows that there is a remarkable wavelength shift for the flat wheel and normal wheel from the Bragg center wavelength.

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ECEIJ-04

Compactness Measure of Rail Wheel Rolling Contact of the Freight Wagon

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Dayananda Sagar University, Bangalore -560068, India
[2] Department of Electronics & Communication Engineering,
the Oxford College of Engineering, Bangalore, India

International Journal of Information Technology, Springer, May 2022

Abstract

This paper describes the measure of compactness using finite element analysis and stress–strain characteristics of freight wagon considering loaded and unloaded condition of wagon weight. Freight train wagons are used to carry various goods from one part to other parts of country. In terms of preserving the originality of the contact load transfer, the use of accurate finite element loading and boundary conditions has been a significant use. The main idea is to study the strain behaviour of goods wagon for empty and gross load condition. As the weight varies from low to high that means from 22.47t to 88.47t strain induced on rail increases linearly with the wagon load. This analysis is important as it determines the capacity to carry maximum load and to build weigh in motion system. By use of optical simulator, fiber Bragg grating is designed to observe change in Bragg's wavelength with the wagon load.

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ECEIJ-05

Plasmonic Biosensor with Gold and Titanium Dioxide Immobilized on Photonic Crystal Fiber for Blood Composition Detection

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IEEE Sensors Journal,
Volume 22 Issue 9, Pages 8474-8481, May 2022

Abstract

This paper proposes a photonic crystal fiber (PCF) based plasmonic biosensor for the detection of various blood compositions like red blood cells (RBCs), hemoglobin (HB), white blood cells (WBCs), plasma, and water. The finite element method (FEM) has been used to simulate and quantitatively evaluate this biosensor. The gold and titanium dioxide coated PCF operates on the surface plasmon resonance (SPR) theory, where the gold layer acts as a plasmonic material, and the titanium dioxide layer improves adhesion between the gold layer and the PCF surface. SPR occurs at the interface between gold and the sensing channel, when the core propagation mode is coupled with the surface plasmon polariton (SPP) mode in the vicinity of the phase-matching point. Due to the occurrence of SPR, the loss peak is noticed in the core propagation mode, and this loss peak is extremely sensitive to the various blood compositions that each have their unique refractive index (RI) poured into the sensing channel of the PCF. The proposed biosensor has maximum wavelength sensitivity of 12400 nm/RIU. However, the maximum amplitude sensitivity is −574.3 RIU −1. Furthermore, with the maximum detection limit of 0.02, the refractive index resolution varies from 8.06×10−6RIU to 5.0×10−5RIU. As a result, it is safe to say that this biosensor will work admirably in terms of detecting blood compositions. Thus, the proposed biosensor will explore the broad realms of medical diagnostics.

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ECEIJ-06

Wide-Band Frequency Tunable Antenna for 4G, 5G/Sub 6 GHz Portable Devices and MIMO Applications

[1] Shivleela Mudda, [2] Gayathri KM, [3] Mudda Mallikarjun

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[3] Sreenidhi Institute of Science and Technology India

Progress in Electromagnatic Research C, Volume 118, Pages 25-41, Jan 2022

Abstract

A compact (25×28×1.57 mm3) and wide-band multimode frequency tunable antenna with a defected ground structure (FRDGS) for 4G and 5G conformal portable devices and multi-band wireless systems is presented in this article. In a previous study, frequency reconfigurable antenna designs only used the method of adding slots on the patch or ground. In this study, a combination of multiple slots, partial ground, and defective ground structure techniques are utilized to attain the advantages of compactness, wide impedance bandwidth, and steady radiation pattern. Multiple slots on the top layer of the substrate and F-shaped slot etched at the bottom make the proposed antenna. Two PIN Diodes are inserted in the F-shaped slot for frequency reconfiguration, allowing the antenna to switch between different resonances. Analyses high frequency structure simulator 15.0v is used to simulate the antenna parameters. This antenna performance is demonstrated using measured and simulated data. The simulated and measured results clearly show that the proposed antenna can switch among six dissimilar resonant frequency bands via various modes of operation across the frequency spectrum from 2.3 to 8.9 GHz. The antenna works in a variety of commercial bands, such as WLAN/Bluetooth (2.4– 2.5 GHz), LTE/4G (2.3–2.7 GHz), S-band (2–4 GHz), Radio Navigation (2.7–2.9 GHz), and 5G/sub-6 (3.3–4.9 GHz), according to simulations and experiments. The proposed design features narrowband, wideband, and ultra-wideband properties with a consistent radiation pattern, adequate gain (1.6 to 5.8 dB), and high radiation efficiency (86 to 94%) in a small package. Furthermore, the performance comparison of the proposed antenna with that of the state-of-the-art antennas in terms of compactness, frequency configurability, number of operating bands, and impedance bandwidth demonstrates the novelty of the proposed antenna and its potential application in multiple wireless applications.

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INTERNATIONAL CONFERENCE PUBLICATIONS

ECEIC-01

Detection of Plasmodium Falciparum Parasite Intraerythrocytic Stages using One Dimensional Distributed Bragg Reflector Biosensor

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Electronic ISBN: 978-1-6654-3240-5
Print on Demand (PoD) ISBN: 978-1-6654-3241-2
IEEE, 2021

Abstract

This work proposes, the design and analysis of 1D Distributed Bragg Reflector (DBR) with a central micro cavity to sense the presence of Plasmodium falciparum parasite which causes malaria disease. Early detection of malaria is a vital requirement in biomedical applications. Plasmodium falciparum parasite enter human body with the byte of infected female Anopheles mosquitoes. This parasite resides in the human Red Blood Cells and starts invading RBCs by growing and multiplying in the cell. P. falciparum undergoes various erythrocytic stages in the host RBC cells. Detection of these infected stages of RBC is utmost important by using appropriate diagnostic techniques. 1D Photonic Crystal biosensors find its application for the early detection of malignant cells. Here, a multi-layered DBR structure is designed and analyzed for the detection of P. falciparum parasite in its various stages in the analyte. The proposed structure uses N=3 layers for the initial analysis and is finally chosen as 8 layers to enhance the Q factor. The central defect cavity length is varied to choose proper defect length which gives better sensor sensitivity. The obtained sensitivity and Q factor for the proposed structure is 4500nm/RIU and 8333 respectively. Form the attained simulation results it is justifiable that the proposed sensor can be used for the detection malaria disease in its early stage.

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ECEIC-02

Flask Based Web App on Diabetes Prediction Using Machine Learning

[1] Ananya M. Menon, [2] G. Navya Jyothi, [3] K. Bhavana & [4] K. Saara

[1,2,3,4] Department of Electronics and Communication, Dayananda Sagar University, Bengaluru, India

2nd International Conference on Recent Trends in Machine Learning, IoT, Smart Cities and Applications, ISBN: 978-981-16-6407-6 (2021)

Abstract

Diabetes is one of the lethal diseases in the world. Around 1.6 million deaths were encountered in 2016 due to diabetes. With the detriment caused due to the conventional methods used to predict diabetes, machine learning is making a huge boom in the healthcare sector. With the humongous data being gathered everyday big data techniques are applied to find insights and make predictions. We have implemented this on Spyder 4.1.5 and deployed it on Heroku. In this work, we build different classification algorithms using the diabetes dataset and subsequently make a flask based web app. The experimental results show that random forest is efficient and provides better accuracy of 81.168%.

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ECEIC-03

Dual core photonic crystal fiber based carbon dioxide gas sensor

[1] Sneha Sharma, [2] Vijay Shanker Chaudhary, [3] Dharmendra Kumar

[1] Department of Electronics and Communication, Dayananda Sagar University, Bengaluru, India
[2] Department of Electronics and Communication Engineering Madan Mohan Malaviya University of Technology Gorakhpur, India

Workshop on Recent Advances in Photonics (WRAP) 2022
ISBN- 978-1-6654-0702-1 (2022)

Abstract

A dual-core photonic crystal fiber carbon dioxide sensor is designed and investigated using COMSOL software. The fiber is having two cores that are separated by another air hole which can act as a sensing region when it is filled with analyte. The sensor is based upon RI principle and CO2 RI varies with various parameters such as temperature, humidity and concentration etc. The different modes of the sensor are determined and RI difference, coupling length of the two cores and sensitivity of the device is presented. The proposed sensor gives a sensitivity of 11250nm/RIU with length 0.5cm.

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ECEIB-01

INTERNATIONAL BOOK CHAPTERS

Lethal Vulnerability of Robotics in Industrial Sectors

S Sivaramakrishnan[1]

[1]Department of Electronics and Communication Engineering, School of Engineering, Dayananda Sagar University, Bangalore-560114, India

Big Data Management in Sensing Application in AI and IoT
ISBN- 9788770224147, Pages 227-238 (2021)

Abstract

The book is centrally focused on human computer Interaction and how sensors within small and wide groups of Nano-robots employ Deep Learning for applications in industry. It covers a wide array of topics that are useful for researchers and students to gain knowledge about AI and sensors in nanobots. Furthermore, the book explores Deep Learning approaches to enhance the accuracy of AI systems applied in medical robotics for surgical techniques. Secondly, we plan to explore bio-nano-robotics, which is a field in nano-robotics that deals with automatic intelligence handling, self-assembly and replication, information processing and programmability.

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ECEIB-02

Forecasting Time Series Data Using ARIMA and Facebook Prophet Models

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Big Data Management in Sensing Application in AI and IoT
ISBN- 9788770224147, Pages 47-60 (2021)

Abstract

Forecasting a parameter of interest in the time series data, based on the past values helps resource optimization in case of sensor networks, or to meet the demand of the society in case of analyzing essential commodity time series data or it helps in better analysis of a company value in near feature based on the revenue generated in the past. Auto Regression Integrated Moving Average (ARIMA) model is used to predict the future value of energy dissipation in case of sensor network, product, sales, share market fluctuation, essential commodity, etc. Facebook Prophet model is launched by Facebook which is an open-source library which can be used to analyze data which shows the variation in trend and seasonality. In this article, the number of passengers using aircraft is predicted using the ARIMA model and the Facebook Prophet model. Both the model performs well for the data considered and in ARIMA model, choosing the fundamental parameter for analysis of the data is challenging as compared to Facebook Prophet model as the latter uses in-built library function to ease the task.

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ECEIB-03

Part of the Advances in Sustainability Science and Technology book series (ASST)

Anna Merine George[1], Kurian, C.P. [2], Sravan, C [3] Garg, H [4]

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Sustainable Energy and Technological Advancements
ISBN- 978-981-16-9032-7, Pages 759–771 (2021)

Abstract

Building automated control schemes and connected systems are part of the innovative building concept. This paper presents a low-cost Raspberry Pi-based connected system suitable for climate-responsive control of window blinds and luminaire and focuses on indoor solar panel-based power management for connected systems. The power management block, along with the control part, makes the automation scheme self-sustained. A prototype of the connected system and the SIMULINK assisted design of the power management system is developed. This paper also investigates the implementation of uploading the data to a suitable cloud server for future monitoring and control using the Internet of things. This work provides two solutions for the power management system, a constant output voltage of 7 and 3.3 V, to suffice the maximum level with a suitable battery capacity for working the control modules.

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ECEIB-04

Smart Innovation, Systems and Technologies book series (SIST, volume 224)

[1] R.Navya, [2] R.Devaraju

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Smart Computing Techniques and Applications
ISBN- 9789811615023, Volume 224, Pages 327–336 (2021)

Abstract

Sea clutter is an unwanted return or echo signal which exhibits non-linearity and disarray and is random in nature. The reliable way of detecting the moving targets in the presence of clutter background has always been a setback in radar signal processing. The unwanted sea clutter greatly influences the target detection, which biases its characteristics and increases the difficulty of radar detection. With the development of advanced radar processing methods, the sea clutter can be suppressed considerably and targets can be detected reliably. In this paper, we report a review on current development in clutter suppression, clutter modeling based on the statistical modeling of sea clutter, which covers amplitude features of sea clutter, i.e., Rayleigh distribution, Log-Normal distribution, Weibull distribution, and K-distribution. The current developments in radar target identification methods are also conferred, within the framework of these clutter models. This review article provides a systematic comparison of various methods to suppress the clutter and to detect the target in a sea clutter environment.

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ECEIB-05

Microstrip Antenna Design for Wireless Applications

[1] Mudda, S.S [2] Gayathri, K. M

[1, 2] Department of Electronics and Communication Engineering, School of Engineering, Dayananda Sagar University, Bangalore-560114, India

Importance and Uses of Microstrip Antenna in IoT

ISBN- 978-036-75-5438-5, Pages 352-366 (2021)

Abstract

This book focuses on recent advances in the field of microstrip antenna design and its applications in various fields including space communication, mobile communication, wireless communication, medical implants and wearable applications. Scholars as well as researchers and those in the electronics/ electrical/ instrumentation engineering fields will benefit from this book. The book shall provide the necessary literature and techniques using which to assist students and researchers would design antennas for the above-mentioned applications and will ultimately enable users to take measurements in different environments. It is intended to help scholars and researchers in their studies, by enhancing their the knowledge and skills in on the latest applications of microstrip antennas in the world of communications such as world like IoT, D2D, satellites and wearable devices, to name a few.

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ECEIB-06

Millimeter-Wave Dual-Band (32/38 GHz) Microstrip Patch Antenna for 5G Communication

[1] Hatte, J, [2] Mudda S, [3] Gayathri K.M, [4] Patil R.B.

[1] Department of Electronics and Telecommunication Engineering, G H Raisoni College of Engineering and Management, Wagholi, Pune, Maharashtra, India
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[4] Department of Electronics and Telecommunication Engineering, G H Raisoni College of Engineering and Management, Wagholi, Pune, Maharashtra, India

Recent Innovations in Computing
ISBN- 978-981-16-8891-1, Pages 225–237 (2022)

Abstract

In this paper proposed is a dual-band millimeter-wave antenna for the fifth-generation device applications operating at Ka band is proposed in this paper. The designed antenna uses a substrate layer made up of RT Rogers 5880 material having dimensions of 7.8546 × 9.0356 × 0.8 mm3 with dielectric constant of 2.2 and loss tangent 0.0009 on which radiating patch is loaded with surface area of 3.054 × 4.235 mm2. The antenna resonates at 32 and 38 GHz, respectively. These two frequencies are allotted to 5G communication by ITU. The simulation results of this antenna are in terms of electrical parameters such as Return loss, VSWR, Radiation pattern, and Gain. Performance parameters are further enhanced using defects in ground plane. This antenna can cover both 32 GHz band (31–34 GHz) and 38 GHz band (36.5–40 GHz). The minimum value of return loss, VSWR are −23.6 dB, 1.14 at 32 GHz similarly, −21.5 dB, 1.18 at 38 GHz, respectively. A −10 dB impedance bandwidth obtained at 32 and 38 GHz are 2.8 and 2.85 GHz, respectively. The studied antenna attained the gain of 6.27 and 4.73 dB with almost unidirectional radiation pattern. The propounded antenna is analyzed using HFSS 15.0 software.

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DEPARTMENT OF MECHANICAL ENGINEERING
SCHOOL OF ENGINEERING

Publications Summary

International Journals	**06**	**(MEIJ-01 – MEIJ-06)**
National Journals	**02**	**(MENJ-01- MENJ-02)**
International Conference	**04**	**(MEIC-01 – MEIC-02)**
Book Chapter	**02**	**(MEBC-01 - MEBC-02)**

DEPARTMENT OF

MECHANICAL ENGINEERINGSCHOOL OF ENGINEERING

INTERNATIONAL JOURNAL PUBLICATIONS

MEIJ-01

Thermal integration of reheated organic Rankine cycle (RH-ORC) with gas turbine exhaust for maximum power recovery

[1] Vinayak B Hemadri, [2] PMV Subbarao

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[2] Department of Mechanical Engineering, Indian Institute of Technology Delhi, Hauz Khas, New Delhi 110016, India

Thermal Science and Engineering Progress
Volume 23, 2021

Abstract:

Reheating is a potential modification to the organic Rankine cycle architecture. Reheated ORC (RH-ORC) is integrated as bottoming cycle plant for topping high efficiency, recuperated gas turbine cycle with low exhaust temperature in the present study. The exit temperature of the working fluid after internal heat exchanger (IHE) sets the initial qualifying criterion. Cyclopentane, hexane and benzene qualify as potential working fluids and ORC with saturated operating conditions with these working fluids is considered as base cycle. For a power generating cycle, power recovery becomes priority over efficiency when connected to a waste heat recovery source. The performance of RH-ORC is studied at various reheat pressure ratios for different temperatures. Specific network output of base cycle increases by retrofitting reheating and it leads to enhanced power recovery. Benzene, at a reheat pressure ratio of 0.558 produces maximum power output of 1292.033 kW and 4772.631 kW from the integration of SM-50 and Rolls-Royce WR-21 for a case of reheating at a temperature of 557.15K. The power recovery potential improves when reheating is carried out to a higher temperature. There is an increase in energy efficiency because of reheating.

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MEIJ-02

Impact of Cobalt Oxide Nanoparticles Dispersed in Water in Diesel Emulsion in Reduction of Diesel Engine Exhaust Pollutants

[1] Vinayak B Hemadri, [2] Mrityunjaya Swamy

[1, 2] Department of Mechanical Engineering, Dayananda Sagar University, Bangalore-560114, India

Pollution, Volume 8, Issue 2, Pages 579-593 (2022)

Abstract

The present work is aimed at decreasing pollutants emitted by diesel engine exhaust tailpipe and enhancing performance by incorporating cobalt oxide nanoparticles in water emulsified diesel. Water concentration of 5% and 10% is used to prepare various WD emulsion blends, with nano particle dosage levels of 50PPM and 100PPM. High speed homogenizer and ultrasonicator devices are used to disperse water droplets in diesel. Surfactant mixture of span80 and tween20 is used to achieve long term stability of emulsified fuel. The functional groups of emulsified fuel are analysed using FTIR spectroscopy. The characterization of cobalt oxide nanoparticles is carried using scanning electron microscope. Physiochemical properties such as calorific value, density, viscosity of emulsion blends and pure diesel are determined and compared. Experimental results reveal that addition of cobalt oxide nanoparticles in emulsified fuel with increased dosage of 100PPM shows 23%, 33.3%, 25%, and 44.6% reduction in NOX, HC, CO and smoke emission compared to pure diesel. The improvement in BTE and BSFC were observed for all emulsion blends.

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MEIJ-03

Mixed-Mode Fracture (KI and KII) Evaluation in Epoxy Resin using ASENB Configuration

[1] Shashidhara L C, [2] H. K. Srinivas, [3] C. Anil Kumar, [4] K. S. Narayanaswamy, [5] H. R. Vitala

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JOURNAL OF MINES, METALS & FUELS
Volume 69, Issue 12A, Pages 129-136, December 2021

Abstract:

Asymmetric Single Edge Notched Bend (ASENB) specimen which is exposed to asymmetric 3-point bending is used to estimate the mixed-mode fracture (I/II) in epoxy. The mode I and mode II combination stress intensity factors (SIF) were calculated for various locations of loading points and different crack lengths using the finite element analysis tool ANSYS. By selecting suitable points for the support positions with the loading point mode I to mode II mixities can be achieved. Then, several fracture tests on epoxy resin were conducted using the suggested ASENB specimen. The crack path follows a straight line for mode I fracture and a curved path from the crack initiation angle for mode II fracture and mode II dominant loading. The broken specimen surfaces under various conditions of loading were observed using scanning electron microscopy (SEM). Fractured specimen surfaces of the tested specimens showed reasonably smooth patterns indicating cleavage fracture.

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MEIJ-04

Effect of Reinforcement and Copper Chill on LM13/ZrSiO4/C Hybrid Metal Matrix Composites (HMMCS) — an Experimental and Statistical Analysis

[1] Ravitej Y P, [2] C B Mohan [3] Ananthaprasad M G

[1, 3] Department of Mechanical Engineering, Dayananda Sagar University, Bangalore, India
[2] Center for Incubation, Innovation, Research and Consultancy, Jyothy Institute of Technology, Bengaluru, India

China's Refractories, Volume 30, Issue 4, Pages 7-11, December 2021

Abstract:

Composites place a vital role in the applications of material science, i.e. aerospace, automobile, and marine, etc. Dual reinforcement composites are a trending research area in the field of metal matrix composites. In this research article dual reinforcement, i.e. zirconium silicate (ZrSiO4) and carbon, is added to molten LM13 using the stir casting process in terms of (as cast), (3+3) mass%, (6+3) mass%, (9+3) mass% and (12+3) mass% respectively, using copper as a chill kept toward one end. The tensile, the hardness, and the microstructure of the composite specimens at the chill end and non-chill end are studied. Experimental results are compared with analytical results and tabulated. It is found an increase in reinforcement and chilling effect enhances the properties of the composite. The ultimate tensile strength (UTS) and the hardness increase gradually with the increase in ZrSiO4 addition. The maximum UTS, the hardness and the signal to noise ratio (S/N ratio) for mechanical characterizations are evaluated using Taguchi method. It is found that 9 mass% of ZrSiO4 yields better results than the other combinations. Results are tabulated and compared using statistical tools. Microscopic studies reveal the uniform distribution of matrix and reinforcements with negligible agglomeration.

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MEIJ-05

Evaluation of copper chill on tribological behaviour of LM13/ZrSiO4 /Chybrid Metal matrix composites

[1] Ravitej Y P, [2] C B Mohan and [3] Ananthaprasad M G

[1, 3] Department of Mechanical Engineering, Dayananda Sagar University, Bangalore, India
[2] Center for Incubation, Innovation, Research and Consultancy, Jyothy Institute of Technology, Bengaluru, India

JOURNAL OF MINES, METALS & FUELS
ISSN: 0022-2755, Volume 69, Issue 12A, Pages 129-136, December 2021

Abstract:

Composites place a vital role in applications of material science i.e. aerospace, automobile, marine, etc... Dual reinforcement composites are a trending research area in the field of metal matrix composites. In this research article dual reinforcement i.e. zirconium silicate and carbon are added to molten LM13 using the stir casting process in terms of (3+3), (6+3), (9+3) and (12+3) wt. % respectively using copper as a chill kept toward one end. Tensile, hardness, and microstructural studies are done on the composite specimen at the chill end and non-chill. It is found an increase in reinforcement and chilling effect increases the properties of the composite.

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MEIJ-06

Effect of coir fiber and inorganic filler on physical and mechanical Properties of epoxy based hybrid composites

[1] Kavya H. M, [2] Saravana Bavan, [3] Yogesha B., [4] Sanjay M. R

[1, 2] Dayananda Sagar University, Bengaluru, Karnataka 560078, India
[3] Malnad College of Engineering Mechanical Engineering
[4] Associate Professor at King Mongkut's University of Technology North Bangkok

Polymer Composites, John Wiley & Sons, Inc, 42 (8), 3911-3921(2021)

Abstract:

The present work's target is to study the impact of fly ash or TiC nanoparticles or both on the characteristics of coir fiber epoxy hybrid composites. Mechanical characteristics like tensile, flexural, inter-laminar shear strength, impact strength, shore D hardness, and thermal stability or degradation characteristics were determined. The microstructure of the samples was observed from a scanning electron microscopy. It was observed that the addition of coir fiber, fly ash, and TiC nanoparticles in the epoxy polymer enhanced the mechanical and thermal characteristics of composites. It can be assigned to the better interaction and uniform distribution between the fillers and the epoxy polymer. Fillers acted a critical role in enhancing the characteristics of epoxy hybrid composites. Additionally, water absorption characteristics were also investigated for all specimens. A comparative examination was performed between various fabricated composite specimens. Results exhibited that, the water absorption of the composites improves considerably with the addition of reinforcements. Also, thermogravimetric analysis exhibited that the fabricated epoxy hybrid composites were stable thermally.

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MECHANICAL ENGINEERINGSCHOOL OF ENGINEERING
NATIONAL JOURNAL PUBLICATIONS

MENJ-01

Influence of Change in the Apparent Contact Area, Temperature and Vacuum on Tribo Response of Al6061 and EN8 Pair

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[1] Department of Mechanical Engineering, Dayananda Sagar University, Bangalore-560114, India
[2] Professor, Mechanical Engineering Department, University Visvesvaraya College of Engineering, Bangalore University, Bangalore, India
[3] Deputy Manager, Aircraft Research and Design Centre, HAL, Bangalore, India

Indian Journal of Science and Technology
Volume 14, Issue 28, Pages: 2368-2379 (Aug 2021)

Abstract:

Aluminium and its alloys components are used in aero and space industries where in many cases trioboloading prevails. In space application, in addition to triboloading, the components should also perform in the absence of atmosphere. In the present investigation, attempted has been made to simulate the field conditions in the laboratory by sliding Al6061 alloy pin of different diameters in a vacuum at different temperatures using a vertically configured pin-on-disc test rig. **Method:** The pin diameters were 2, 4, and 6mm and the testing temperatures were 373, 473, and 573K. The normal contact pressure was 0.625MPa and the sliding speed was 0.5ms-1 and both were constant throughout the experiment. The coefficient of friction was monitored using a PC and the worn pin surface was studied in scanning-electron microscope. **Findings:** The result showed that the coefficient of friction at sliding temperatures 373 and 473K was found to be dependent on apparent contact area i.e., pin diameters 2, 4, and 6mm. The coefficient of friction was found to be 3.27 and 2.69 for pin diameter 2mm at temperature 373 and 473K whereas the coefficient of friction was of the range 1.36 to 0.33 for the pin of diameter 4 and 6mm. The scanning-electron-microscopic study revealed uniform plastic deformation for pin diameter of 2mm and non-uniform plastic deformation accompanied with abrasion extrusion phenomenon for the pin of diameters 4 and 6mm. The coefficient of friction at sliding temperature 573K was found to be insensitive to the apparent contact area. The coefficient of friction was in the range of 1.24 to 2.30. The SEM study revealed a large scale of non-uniform plastic deformation accompanied by abrasion, tearing of ridges, extrusion of both ridges, and entrapped wear debris. **Novelty:** It is a generic study for understanding the response of Aluminium for Tribo loading which.

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MENJ-02

Fabrication, micro structural and mechanical characterization of Zircon Particles (ZrSiO4) reinforced Aluminum alloy (MMCs)

Ravitej Y P[1], C B Mohan[2] and Ananthaprasad M G[3]

[1] Department of Mechanical Engineering, Dayananda Sagar University, Bangalore-560114, India
[2] Department of Mechanical engineering, CIIRC Jyothy Institute of Technology, Thataguni, Bangalore 560 082, India
[3] Atal Incubation Center JIT Foundation, Thataguni, Bangalore 560 082, India

Indian Journal of Engineering & Materials Sciences
Volume 28, Pages: 11-18 (Dec 2021)

Abstract:

This paper presents the review on fabrication, Microstructural analysis, and Mechanical Characterization of Zircon silicate Particles (ZrSiO4) / Aluminum Alloy composite using the stir casting method. Aluminum alloy is known for its low density, high ratio of strength and weight, improved mechanical property, and corrosion resistance. Particulate reinforcement is widely preferred because of its isotropic properties which ease the homogenous distribution with the aluminum and its alloy. Zircon particles (ZrSiO4) are the combination of ZrO2, SiO2, Fe3O2, TiO2, and Al2O3. This review encapsulates the recent research work on different fabrication techniques, different characterizations, Microstructural analysis, and Fractroscopic studies on different Aluminum alloy matrix and ceramic materials reinforcement combination composites which improve physical, Corrosion resistant, microstructural, and mechanical properties.

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INTERNATIONAL CONFERENCE PUBLICATIONS

MEIC-01

Influence of Contact Area on Tribo Response of Al 6061 in Ambient and Vacuum Environment

Vinay M S[1] and S Ranganatha[2]

[1] Department of Mechanical Engineering, Dayananda Sagar University, Bangalore-560114, India

[2] Professor, Mechanical Engineering Department, University Visvesvaraya College of Engineering, Bangalore University, Bangalore, India

J. Phys.: Conf. Ser. 2070 012164
ISBN: 2070 012164
August, 2021

Abstract

Aluminium alloys are used in spacecraft and aerospace industries because of their unique properties which are lightweight and high strength. The components of aluminium alloys used in aerospace and space environment are subjected to relative motion which results in the tribo-phenomenon. The designer needs tribo response data for designing components geometrical dimensions. The literature reports inadequate tribo response data, more particularly in a vacuum environment (adverse environment). In the present investigation, experiments were conducted using Al 6061 aluminium alloy pins with different diameters. The cylindrical pin diameters were 2mm, 4mm and 6 mm. The cylindrical pins were slid against a hardened En-8 steel disc. The normal pressure was maintained at 0.625 MPa and the sliding speed was 0.5 ms-1. The estimated friction coefficient from monitored frictional force and normal force and the dependency of estimated friction coefficient on sliding distance for cylindrical pins of different diameters were analysed.

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MEIC-02

Optimization of process parameters for turning machine using Taguchi Super ranking method: A case study in valve industry

Sandeep M J[1], B K Pavan Kumar[2], Yadavalli Basavaraj[3], N Keerthi Kumar[4]

[1] Department of Mechanical Engineering, Dayananda Sagar University, Bangalore-560114, India
[2, 3] Ballari Institute of Technology and Management, Allipura, Ballari 583104, India
[4] BMS Institute of Technology & Management, Avalahalli, Bengaluru 560064, India

Materials Today: Proceedings
Volume 47, Part 10, 2021, Pages 2505-2508, (2021)

Abstract

The turning process in a valve industry plays an important role in the production department, which in turn contributes to the profit of the industry. To get the better results from the machining process it is important to know the contribution level of different cutting parameters like speed of spindle, rate of feed and depth of cut to the machine. In this paper, various levels of process parameters can be optimized by using Taguchi-Super Ranking method providing optimum results enhance machine life. From the results obtained feed rate contributes more to the efficiency i.e., if feed rate is more, efficiency will decrease

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MEIC-03

Vibration based condition monitoring of rotating part using spectrum Analysis: A case study on milling machine

Sandeep M J[1], B K Pavan Kumar[2], Yadavalli Basavaraj[3], N Keerthi Kumar[4]

[1] Department of Mechanical Engineering, Dayananda Sagar University, Bangalore-560114, India

[2, 3] Ballari Institute of Technology and Management, Allipura, Ballari 583104, India

[4] BMS Institute of Technology & Management, Avalahalli, Bengaluru 560064, India

Materials Today: Proceedings
Volume 47, Part 10, 2021, Pages 2505-2508, (2021)

Abstract

In the modern era, maintenance of rotating machines has the major task for accurate diagnosis of fault is much essential. The demand in system focuses on safety, high reliability, reduced downtime and maintenance. The higher level of vibration magnitude identifies the failure to diagnose and maintain proper condition of machines. The techniques incorporated to analyse the signals leads to reliability increase in rotating machines. The vibration signal features like skewness, kurtosis and RMS values represents the degradation information of the machine failure. This proposed data collection, fault detection, diagnosis and prognosis of rotating machines which can increase reliability and accuracy of machine failure. In this paper, we consider the vibration signal levels to identify the failure due to scarcity of data. Mainly data is collected from the rotating machines using vibrometer and obtained spectrums is analyzed by using signal processing techniques which defines clearly the severity level of vibration in a component.

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MEIC-04

Investigation on mechanical properties of Al7075 based MMC Reinforced with Fe3O4

[1]Sandeep M J, [2]K Raghavendra, [3]Sivaramakrishnan, [4]Yadavalli Basavaraj, [5]B K.Pavan Kumar

[1] Department of Mechanical Engineering, Dayananda Sagar University, Bangalore-560114, India

[2, 3, 4, 5] Ballari Institute of Technology and Management, Allipura, Ballari 583104, India

Materials Today: Proceedings
Volume 47, Part 10, 2021, Pages 2505-2508, (2021)

Abstract

This work primarily focuses on Metal Matrix Composites due to their immense usage in the engineering industry. Metal Matrix Composites (MMCs) hold considerably improved mechanical properties with huge sort of applications from automotive to aerospace. In this investigation, aluminum (Al7075) as matrix and 3%, 6%, and 9% weight proportions of iron oxide (Fe3O4) as reinforced Metal Matrix Composite are prepared by the help of the stir-casting method. The stir casting process is adopted due to its rewards like easy manufacturing, low manufacturing cost, and uniform distribution of reinforced particles. The reinforcing particle Fe3O4 takes part in a significant function in the engineering material properties. The investigation reveal enhance in mechanical properties like Tensile, Compression and Hardness Strengths. When juxtapose with primordial Al7075 alloy, the tensile strength is recorded highest as 362 MPa and Yield strength as 262 MPa for 9% wt. reinforced Fe3O4. Also, micro structural studies (SEM & EDS) were done on the newly fabricated Al7075-Fe3O4 Metal Matrix Composite which conveys uniform distribution of Fe3O4 reinforced particle.

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INTERNATIONAL BOOK CHAPTERS

MEBC-01

Comparison on the Combustion Characteristics of the Methyl Esters Of Papaya Oil and Delonixregia Oil and Its Blends on Single Cylinder Diesel Engine

[1]V Dinesh Kumar, [2]KM Mrityunjayaswamy, [3]M Chinnapandian, [4]Vinayak B Hemadri, [5]S Saravanakumar

[1, 4] Department of Mechanical Engineering, Dayananda Sagar College of Engineering, Bangalore 560078, India
[2] Professor, Department of Aeronautical Engineering, AMC Engineering College, Bangalore, Karnataka, India
[3] Professor and Head, Department of Aeronautical Engineering, St. Peter's College of Engineering and Technology, Avadi, Chennai, Tamilnadu, India
[5] Assistant Professor, Department of Automobile Engineering, Easwari Engineering College, Chennai, Tamilnadu, India

Recent Advances in Materials and Modern Manufacturing
Pages 379-388, 2022

Abstract

The increase in demand of fossil fuels, the risk associated in its import from other countries, and more over the hazardous exhaust emission produced during their combustion made many researchers to focus on deriving renewable eco-friendly alternate source. India being rich in agriculture resources, it is possible to produce biofuels from plant seeds. In doing so a huge amount of money that spent for fossil fuel import is being saved. Combustion parameter of a fuel has a strong influence on the engine efficiency. This paper deals in determining the combustion parameter of papaya oil and Delonixregia oil methyl ester on single cylinder diesel engine and is made to run at a speed of 1500 rpm. The results revealed that the combustion parameter of the blend B25 of papaya oil methyl ester is found closer to that of petroleum diesel.

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MEBC-02

Optimization of Vibration-Based Condition Monitoring of Motor Drive End Using Taguchi Technique: A Case Study on Milling Machine

[1] Sandeep M J, [2] B K Pavan Kumar, [3] Yadavalli Basavaraj, [4] N Keerthi Kumar

[1, 4] Department of Mechanical Engineering, Dayananda Sagar College of Engineering, Bangalore 560078, India
[2] Professor, Department of Aeronautical Engineering, AMC Engineering College, Bangalore, Karnataka, India
[3] Professor and Head, Department of Aeronautical Engineering, St. Peter's College of Engineering and Technology, Avadi, Chennai, Tamilnadu, India
[5] Assistant Professor, Department of Automobile Engineering, Easwari Engineering College, Chennai, Tamilnadu, India

Advances in sustainability science and technology
ISSN: 978-981-16-4320-0/ 978-981-16-4321-7
Pages 187–193, 2021

Abstract

The increase in demand of fossil fuels, the risk associated in its import from other countries, and more over the hazardous exhaust emission produced during their combustion made many researchers to focus on deriving renewable eco-friendly alternate source. India being rich in agriculture resources, it is possible to produce biofuels from plant seeds. In doing so a huge amount of money that spent for fossil fuel import is being saved. Combustion parameter of a fuel has a strong influence on the engine efficiency. This paper deals in determining the combustion parameter of papaya oil and Delonixregia oil methyl ester on single cylinder diesel engine and is made to run at a speed of 1500 rpm. The results revealed that the combustion parameter of the blend B25 of papaya oil methyl ester is found closer to that of petroleum diesel.

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COLLEGE OF BIOLOGICAL SCIENCES
SCHOOL OF BASIC AND APPLIED SCIENCES

Publication Summary

International Journals	**21**	**(BIOIJ-01 – BIOIJ -21)**
National Journals	**01**	**(BIONJ-01)**
International Conference	**05**	**(BIOIC-01 – BIOIC-05)**
National Conference	**07**	**(BIONC-01–BIONC-07)**
Book Chapters	**08**	**(BIOB-01- BIOB-08)**

COLLEGE OF BIOLOGICAL SCIENCES
SCHOOL OF BASIC AND APPLIED SCIENCES
INTERNATIONAL JOURNAL PUBLICATIONS

BIOIJ-01

Synergistic effect of photocatalytic, antibacterial and electrochemical activities on biosynthesized zirconium oxide nanoparticles.

[1] L.S Reddy Yadav, [2] B. M. Shilpa, [3] B.P. Suma, [4] R. Venkatesh, [5] G. Nagaraju

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Eur. Phys. J. Plus, Volume 136, Issue 764, July 2021

Abstract

Zirconium oxide nanoparticles (Nps) were synthesized by the ecologically benign and efficient green combustion method by using latex of E-tirucalli plant extract as a fuel. The synthesized powder samples were confirmed for their size and shape from X-ray diffraction and scanning electron microscopy. Fourier transform infrared spectroscopy analysis shows the purity of the prepared material. Structural features of the molecules can be identified using Raman spectroscopy. Qualitative and quantitative analysis of the molecule and energy band gap of the material was estimated by UV–Visible absorption spectroscopy. Photo catalysis system for environmental remediation using zirconium oxide Nps was efficiently approached. Also, antibacterial studies of four bacterial pathogens which are harmful to mankind were shown positively from the prepared Nps. The electrochemical property of the synthesized ZrO2 Nps has been shown by quantifying dopamine at micro-molar concentration levels.

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BIOIJ-02

Structural and binding studies of cyclin dependent kinase 2 with NU6140 inhibitor

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[1,2] Department of Microbiology, School of Basic and Applied Sciences (SBAS), Dayananda Sagar University, Bengaluru, Karnataka, India.

Chemical Biology & Drug Design. ,
Volume 98, Issue 5, August 2021

Abstract

Cyclin-dependent kinase 2 (CDK2) is an established target protein for therapeutic intervention in various diseases, including cancer. Reported inhibitors of CDK2 target the ATP-binding pocket to inhibit the kinase activity. Many small molecule CDK2 inhibitors have been discovered, and their crystal structure with CDK2 or CDK2–cyclin a complex has been published. NU6140 is a CDK2 inhibitor with moderate potency and selectivity. Herein, we report the cocrystal structure determination of NU6140 in complex with CDK2 and confirmation of the binding using various biophysical methods. Our data show that NU6140 binds to CDK2 with a Kd of 800 nM as determined by SPR and stabilizes the protein against thermal denaturation (ΔTm—5°C). The cocrystal structure determined in our study shows that NU6140 binds in the ATP-binding pocket as expected for this class of compounds and interacts with Leu83 and Glu81 with regular hydrogen bonds and with Asp145 via water-mediated H-bond. Based on these data, we propose structural modifications of NU6140 to introduce new interactions with CDK2 that can improve its potency while retaining the selectivity.

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BIOIJ-03

Whole genome global insight of antibiotic resistance gene repertoire and virulome of high - Risk multidrug-resistant Uropathogenic Escherichia coli.

[1]Susweta D. M, [2]Irshad P, [3]Anusree M, [4]Rekha I, [5]Shailaja S, [6]Suresh J, [7]Aishwarya G, [8] Shrestha S, [9] Shome BR.

[1,2,3,4,5,6,7,8]Department of Microbiology, School of Basic and Applied Sciences, Dayananda Sagar University,Bengaluru, Karnataka, India.

[9] ICAR- National Institute of Veterinary Epidemiology & Disease Informatics, Bangalore, India

Microbial Pathogenesis. , Vol.161 December 2021

Abstract

Elucidation of genetic determinants via whole genome sequence (WGS) analyses can help understand the high risk multidrug-resistant (MDR) Uropathogenic Escherichia coli (UPEC) associated with urinary tract infections (UTI) and its evasion strategies from treatment. We investigated the WGS of 30 UPEC strains from UTI samples across the world (2016–2019) and found 25 UPEC strains carrying 2–23 antibiotic resistance genes (ARGs) scattered across 1–3 plasmids per strain. Different ARGs (blaTEM, blaCTXM, blaNDM, blaOXA, blaCMY) encoding extended-spectrum beta-lactamases (TEM, CTXM, CMY) and carbapenemases (NDM, OXA) were found in 24/30, ARGs encoding aminoglycoside modifying enzymes (AAC, APH, AAD) variants in 23/30, trimethoprim ARGs (dfrA17, dfrA12, dfrA5, dfrB4 variants) encoding dihydrofolate reductase in 19/30 and sulfonamide ARGs (sul1, sul2, sul3) encoding dihydropteroate synthase and macrolide ARGs (mph1) encoding macrolide 2' phosphotransferase in 15/30 UPEC strains. Collectively the ARGs were distributed in different combinations in 40 plasmids across UPEC strains with 20 plasmids displaying co-occurrence of multiple ARGs conferring resistance to beta lactam, aminoglycoside, sulfonamide, trimethoprim and macrolide antibiotics. These resistance plasmids belonged to seven incompatibility groups (IncF, IncI, IncC, IncH, IncN, IncB and Col), with IncFI and IncFII being the predominant resistance plasmids. Additionally, we observed co-occurrence of specific mutation pattern in quinolone resistance determining region (QRDR) viz., DNA gyrase (gyrA: S83L, D87N), and topoisomerase IV (parC: S80I, E84V; parE: I529L) in 18/30 strains. The strains also harbored diverse virulence genes, such as fimH, gad, iss, iha, ireA, iron, cnf1 and san. Multilocus sequence typing (MLST) reconfirmed ST131(n = 10) as the predominant global high-risk clonal strain causing UTI. In summary, our findings contribute to better understand the plasmid mediated ARGs and its encoded enzymes that may contribute in antibiotic inactivation/modification or alteration in the antibiotic target site in high risk MDR hypervirulent UPEC strains causing UTI. The study reinforces the need to characterize and design appropriate inhibitors to counterattack different enzymes and devise strategies to curtail resistance plasmid.

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The non-canonical mechanism of ER stress-mediated progression Of prostate cancer

[1] Artem N Pachikov, [2] Ryan R Gough, [3] Caroline E Christy, [4] Mary E Morris, [5] Carol A Casey,
[6] Chad A LaGrange, [7] Ganapati Bhat

[1, 2, 3,4,5,6] Department of Biochemistry and Molecular Biology, University of Nebraska Medical Center, Omaha, NE 68198 USA
[4] Department of Biotechnology, Dayananda Sagar University, Bengaluru, Karnataka, India.

Journal of Experimental & Clinical Cancer Research
Volume 40, Pages 289, September 2021

Abstract

The development of persistent endoplasmic reticulum (ER) stress is one of the cornerstones of prostate carcinogenesis; however, the mechanism is missing. Also, alcohol is a physiological ER stress inducer, and the link between alcoholism and progression of prostate cancer (PCa) is well documented but not well characterized. According to the canonical model, the mediator of ER stress, ATF6, is cleaved sequentially in the Golgi by S1P and S2P proteases; thereafter, the genes responsible for unfolded protein response (UPR) undergo transactivation. Methods: Cell lines used were non-malignant prostate epithelial RWPE-1 cells, androgen-responsive LNCaP, and 22RV1 cells, as well as androgen-refractory PC-3 cells. We also utilized PCa tissue sections from patients with different Gleason scores and alcohol consumption backgrounds. Several sophisticated approaches were employed, including structured illumination superresolution microscopy, Proximity ligation assay, Atomic force microscopy, and Nuclear magnetic resonance spectroscopy. Results: Herein, we identified the trans-Golgi matrix dimeric protein GCC185 as a Golgi retention partner for both S1P and S2P, and in cells lacking GCC185, these enzymes lose intra-Golgi situation. Progression of prostate cancer (PCa) is associated with overproduction of S1P and S2P but monomerization of GCC185 and its downregulation. Utilizing different ER stress models, including ethanol administration, we found that PCa cells employ an elegant mechanism that auto-activates ER stress by fragmentation of Golgi, translocation of S1P and S2P from Golgi to ER, followed by intra-ER cleavage of ATF6, accelerated UPR, and cell proliferation. The segregation of S1P and S2P from Golgi and activation of ATF6 are positively correlated with androgen receptor signaling, different disease stages, and alcohol consumption. Finally, depletion of ATF6 significantly retarded the growth of xenograft prostate tumors and blocks production of pro-metastatic metabolites.

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BIOIJ-05

Performance analysis of Pseudomonas sp. strain SA3 in naphthalene degradation using phytotoxicity and microcosm studies

1 Tirkey, S.R., 2 Ram, S., 3 Mitra, M. et al.

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Biodegradation, Volume: 33, Pages 169–180, Feb 2022

Abstract

The present study is aimed to develop a microbial system for efficient naphthalene bioremediation. A phytotoxicity study was carried out to check the naphthalene detoxification efficiency of Pseudomonas sp. strain SA3 in mung bean (Vigna radiata). For this, administration of the degraded product (supernatant) of 500 mg L−1 naphthalene by Pseudomonas sp. strain SA3 was studied on V. radiata till 168 h. The growth parameters of mung bean seedlings exposed to treated naphthalene solution were statistically similar to distilled water but a twofold decrease when exposed to untreated naphthalene solution. Further, through the soil microcosm study, the naphthalene degradation by pure colonies of Pseudomonas sp. strain SA3 was 6.8% higher as compared to when the natural microflora was mixed with Pseudomonas sp. strain SA3. Further naphthalene degradation by a microcosm model revealed that with an increased concentration of glucose, the carbon dioxide trap rate decreases.

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BIOIJ-06

Plant-Based Synthesis of Gold Nanoparticles and Theranostic Applications: A Review.

[1] Muddapur UM, [2] Alshehri S, [3] Ghoneim MM, [4] Mahnashi MH, [5] Alshahrani MA, [6] Khan AA, [7] Iqubal S, [8] Bahafi A, [9] More SS, [10] Shaikh IA, [11] Mannasaheb BA, [12] Othman N, [13] Maqbul MS, [14] Ahmad MZ.

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Molecules, Volume 24, Issue 4,Feb 2022, Pages 1391

Abstract

Bio nanotechnology is a branch of science that has revolutionized modern science and technology. Nanomaterials, especially noble metals, have attracted researchers due to their size and application in different branches of sciences that benefit humanity. Metal nanoparticles can be synthesized using green methods, which are good for the environment, economically viable, and facilitate synthesis. Due to their size and form, gold nanoparticles have become significant. Plant materials are of particular interest in the synthesis and manufacture of Theranostic gold nanoparticles (NPs), which have been generated using various materials. On the other hand, chemically produced nanoparticles have several drawbacks in terms of cost, toxicity, and effectiveness. A plant-mediated integration of metallic nanoparticles has been developed in the field of nanotechnology to overcome the drawbacks of traditional synthesis, such as physical and synthetic strategies. Nanomaterials0 tunable features make them sophisticated tools in the biomedical platform, especially for developing new diagnostics and therapeutics for malignancy, neurodegenerative, and other chronic disorders. Therefore, this review outlines the Theranostic approach, the different plant materials utilized in Theranostic applications, and future directions based on current breakthroughs in these fields.

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BIOIJ-07

In Silico Molecular Docking and Simulation Studies of Protein HBx Involved in the Pathogenesis of Hepatitis B Virus-HBV

[1] Shaikh IA, [2] Muddapur UM, [3] Krithika C, 4 Badiger S, [5] Kulkarni M, [6] Mahnashi MH, [7] Alshamrani SA, [8] Huneif MA, [9] More SS

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Molecules, Volume 27, Pages 1713, Feb 2022

Abstract

Current drug discovery involves finding leading drug candidates for further development. New scientific approaches include molecular docking, ADMET studies, and molecular dynamic simulation to determine targets and lead compounds. Hepatitis B is a disease of concern that is a life-threatening liver infection. The protein considered for the study was HBx. The hepatitis B X-interacting protein crystal structure was obtained from the PDB database (PDB ID-3MSH). Twenty ligands were chosen from the PubChem database for further in silico studies. The present study focused on in silico molecular docking studies using iGEMDOCK. The triethylene glycol monoethyl ether derivative showed an optimum binding affinity with the molecular target HBx, with a high negative affinity binding energy of −59.02 kcal/mol. Lipinski's rule of five, Veber, and Ghose were followed in subsequent ADMET studies. Molecular dynamic simulation was performed to confirm the docking studies and to analyze the stability of the structure. In these respects, the triethylene glycol monoethyl ether derivative may be a promising molecule to prepare future hepatitis B drug candidates. Substantial research effort to find a promising drug for hepatitis B is warranted in the future.

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BIOIJ-08

A comparative assessment of collagen type 1 from silver carp (fresh water) and milk shark (marine) fish waste.

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3 Biotech, Springer, Volume 82, Issue 12, Feb 2022

Abstract

In this study, a comparative structural and bioactive analysis of collagen extracted from the skin of bony and cartilaginous fishes. The acid-soluble method was followed to extract the collagen from Hypophthalmichthys molitrix (silver carp) and Rhizoprionodon acutus (milk shark) followed by purification using Ion exchange chromatography. A higher yield of collagen was obtained from the skin of SCsk (69.45%) as compared to SHsk (55.29%). SDS PAGE displayed the characteristic α, β bands of the collagen type1. The native conformation and secondary structure stability of collagen were confirmed by FTIR, XRD and CD studies. The SEM micrographs exhibited the layered and fibrillar nature of the collagen from SHsk and SCsk, respectively. Relative solubility and thermal denaturation analysis showed SCsk to be more stable, but SHsk could withstand higher temperatures. 53.65% of antioxidant activity was observed in SCsk collagen as compared to SHsk (45.9%). Haemocompatibility, cell viability and adhesion results also displayed silvercarp skin to be a better source than Shark skin collagen. The results establish the potential of silver carp collagen as a biomaterial that can have many commercial applications in tissue engineering, cosmetics and food industries.

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BIOIJ-09

Bacteriophages: Potential Biocontrol Agents and Treatment Options for Bacterial Pathogens.

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Clinical Microbiology Newsletter
Volume 44, Issue 5, Pages 41-50, March 2022

Abstract

The global report on antibiotic resistance by the World Health Organization features the burden of antimicrobial resistance and the emerging risk of a post-antibiotic era, where therapeutic options will no longer exist for previously treatable diseases. The search for alternative avenues to combat multidrug-resistant (MDR) pathogens has sparked interest in the use of bacteriophages for the treatment of bacterial infections. The unique ability of bacteriophages to infect and kill bacteria without affecting mammalian cells makes them a promising avenue as Biocontrol agents against bacterial pathogens. Phage therapy in both animal and human models has shown promising results. Further, the phage-derived proteins (lytic enzymes), such as endolysins, that are the key weapons used by phages to degrade the bacterial cell have been explored by the scientific community as viable therapeutic options themselves. This review focuses on the prospects of phage therapy; an overview of diverse phages isolated against MDR pathogens; phage-derived proteins as antibacterial agents; phage cocktail development; phage and antibiotic combinational therapy; and the application of phages as Biocontrol agents in agriculture, veterinary science, synthetic biology, and aquaculture. The review emphasizes the therapeutic use of phages and how they might be applied on a large scale if certain limitations and challenges can be overcome.

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BIOIJ-10

Occurrence and characterization of genetic determinants of β- lactam Resistance in E. coli clinical isolates.

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Infection, Genetics and Evolution, Elsevier, Volume 100, Pages 1052 57, June 2022

Abstract

B-lactamase mediated resistance in Escherichia coli is a significant problem that requires immediate attention. Herein, we aim to characterize and understand the dynamics of the genetic determinants of β-lactam resistance (i.e. ESBL, AmpC, and MBL) in E. coli. Out of 203 E. coli isolates, genetic determinants of β-lactam resistance were identified in 50% (n = 101) of isolates. ESBL, AmpC, and MBL resistance determinants were detected in 78%, 40%, and 18% of isolates, respectively with blaCTX-M group 4 (48%), blaCMY (40%), and blaSIM (33%) as the most prevalent β-lactam resistance genes. Among these isolates, 45% harbored plasmid replicon types, with L/M (40%) and Y (33%) as the most dominant replicon types. Integrons were detected in 40% of such isolates, with Class-1 and Class-3 representing 62% and 55%, respectively. Overall, we observed high rate of genetic determinants of β-lactam-resistance in E. coli isolates recovered from patients in clinical settings. The co-occurrence of antimicrobial resistance genes and mobile genetic elements in a high percentage of isolates is a major concern and relates to complex resistance mechanisms. To combat the serious threat of antimicrobial resistance, it is imperative to develop strategies for robust surveillance and understand the molecular basis of resistance acquisition and transmission.

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BIOIJ-11

Characterization of Bioactive Compounds from Acacia concinna and Citrus Limon, Silver Nanoparticles' Production by A. concinna Extract, And Their Biological Properties

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Molecules.
Volume 27, Pages 2715, April 2022

Abstract

The applications of bioactive compounds from medicinal plants as therapeutic drugs are largely increasing. The present study selected the bioactive compounds from Acacia concinna (A. concinna) and Citrus Limon (C. Limon) to assess their phytochemicals, proteins, and biological activity. The plant material was collected, and extraction performed as per the standard procedure. Qualitative analysis was undertaken, and identification of functional organic groups was performed by FTIR and HPLC. Antibacterial, anticancer, antioxidant, ant hyperglycemic, antihyperlipidemic, and inhibition kinetics studies for enzymes were performed to assess the different biological activities. Flavonoids and phenols were present in a significant amount in both the selected plants. A. concinna showed significant antimicrobial activity against Z. mobiles, E. coli, and S. aureus, with minimum inhibition zones (MIZ) of 24, 22, and 20 mm, respectively. C. Limon strongly inhibited all the tested pathogenic bacteria with maximum and minimum MIZ of 32 and 17 mm. A. concinna silver nanoparticles also exhibited potent antimicrobial activity. Both extracts showed substantial antioxidant, antihyperlipidemic, Antidiabetic, anticancer (MCF-7), and anti-urease (antiulcer) properties. To conclude, these plants can be used to treat hyperlipidemia, diabetes, cancer, and gastrointestinal ulcers. They can also serve as antimicrobial and antioxidant agents. Thus, the studied plants must be exploited cost-effectively to generate therapeutic drugs for various diseases.

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BIOIJ- 12

Inhibition of LDL Oxidation and Foam Cell Development of Tannin Methanol Extract from Citrus Limon and Honey Formulation on Cell lines.

[1] Priyaa H.G., [2] Veena S.M, [3] Muddapur U., [4] Sajjanar S., [5] Mirajkar K. K., [6] Anantharaju K.S., [7] More, S.S.

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Pharmacog Res.
Volume 14, Issue 2, Pages 158-165, April 2022

Abstract

Background: C. Limon rich in Vitamin C was shown to have many health benefits having therapeutic properties. Honey was considered as a natural sweetener said to be immune booster. Hence the formulation of C. Limon and honey formulation was studied to prevent oxidation and foam cell inhibition. Objectives: The present study was aimed to isolate tannins from Citrus Limon (C. Limon) fruit juice with a honey mixture to evaluate the antilipidimic and antioxidant activity in cell lines. Materials and Methods: Tannins were isolated from C. Limon fruit juice with a honey mixture with two different solvents, i.e., methanol and water and analysed for antioxidant and LDL oxidation inhibition activity. Further tested on RAW 264.7 and THP-1 cells by employing in-vitro assays for cytotoxicity, foam cell development, inhibiting proliferation and, apoptosis. The tannin methanol extract was characterized using HPLC and GC-MS. Results: The content of total tannins present was found to be 453.96 mg tannic acid equivalent (TAE)/g methanol extract, whereas 415.87 mg TAE/g in tannin aqueous extract. The highest antilipidimic and antioxidant activity were seen in tannin methanol extract. It was seen that 240 µg/mL tannin methanol extract efficiently inhibited oxidation of low-density lipoproteins (55.89% at 5 hr), thus preventing foam cell development, inhibiting proliferation and, apoptosis in cultured RAW 264.7 and THP-1 cells. GCMS revealed certain compounds. Conclusion: This study showed that C. limon with honey tannin methanol extract exhibits potential for antiatherosclerosis activity henceforth, considering the medicinal properties of the active phytochemicals, which can be used as a source of naturally occurring Nutraceuticals, revealed the potential to prevent oxidation and foam cell formation.

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BIOIJ- 13

Escaping mechanisms of ESKAPE pathogens from antibiotics and their targeting by natural compounds.

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Biotechnology Reports,
Volume 34, June 2022

Abstract

The microorganisms that have developed resistance to available therapeutic agents are threatening the globe and multidrug resistance among the bacterial pathogens is becoming a major concern of public health worldwide. Bacteria develop protective mechanisms to counteract the deleterious effects of antibiotics, which may eventually result in loss of growth-inhibitory potential of antibiotics. ESKAPE (Enterococcus faecium, Staphylococcus aureus, Klebsiella pneumoniae, Acinetobacter baumannii, Pseudomonas aeruginosa, and Enterobacter spp.) pathogens display multidrug resistance and virulence through various mechanisms and it is the need of the hour to discover or design new antibiotics against ESKAPE pathogens. In this article, we have discussed the mechanisms acquired by ESKAPE pathogens to counteract the effect of antibiotics and elaborated on recently discovered secondary metabolites derived from bacteria and plant sources that are endowed with good antibacterial activity towards pathogenic bacteria in general, ESKAPE organisms in particular. Abyssomicin C, allicin, anthracimycin, berberine, biochanin A, caffeic acid, daptomycin, kibdelomycin, piperine, platensimycin, plazomicin, taxifolin, teixobactin, and thymol are the major metabolites whose antibacterial potential have been discussed in this article.

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BIOIJ-14

Exploring Banana phytosterols (Beta-sitosterol) on tight junction protein (claudin) as anti-urolithiasis contributor in Drosophila: A phyto-lithomic approach.

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Informatics in Medicine Unlocked,
Volume 29, Pages 100905, March 2022

Abstract

Claudins are a class of transmembrane proteins in the family of tight junction (TJ) proteins. The disrupted functioning of claudins has been found to have a role in urolithiasis (Kidney stones). The current study attempts to identify lead compounds for Drosophila claudin-like proteins Sinuous, Kune-Kune, and Megatrachea adopting the structure-based drug design method. AutoDock 4.2 software is used as a molecular docking tool for the initial docking. Followed by, ligands compounds Beta-Sitosterol (BST), drug molecule and Potassium–Magnesium Citrate (STD), and standard drug were subjected for molecular docking for finding binding energy in the active site of Drosophila claudins like proteins. Molecular dynamics simulations were carried out using GROMOS 54A7 force field package. The study draws the inference that Beta-Sitosterol (BST) potential inhibitor for Drosophila claudins-like proteins. In summary, our computational strategy established novel leads against claudins biomarkers in Drosophila and recommends BST as a potent anti-urolithiatic agent.

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BIOIJ-15

Antioxidant, Anti-Proliferative and Anti-antherosclerotic effect of phytochemicals isolated from Trachyspermum ammi with Honey in RAW 264.7 and THP-1 Cells.

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Pharmacognosy Magazine
Volume 18, Issue 77, Pages 143-151, March 2022

Abstract

Trachyspermum ammi is a common spice with vital medicinal properties used in Ayurveda to treat many ailments. Furthermore, natural Honey is said to have high levels of antioxidants and anti-inflammatory properties. While the combination of both T. ammi and Honey is unexplored in anti-atherosclerotic activity. Materials and Methods: Assays guided isolation of carotenoids, phenolics, and tannins were performed by methanol and aqueous extraction from T. ammi seed powder and honey mixture. Phytochemical screening for antioxidant activity (superoxide radical scavenging activity, nitric oxide radical scavenging activity, and 2, 2-diphenyl-1-picrylhydrazyl scavenging activity) and antilipidemic activity by inhibition of low-density lipoprotein (LDL) oxidation were investigated. Sample showing highest activity with lowest IC50 value from antioxidant and antilipidemic activity was further evaluated on RAW 264.7, THP-1 cells for foam cell inhibition activity, anti-proliferation, antiapoptotic activity, and nitric oxide assay. The sample was characterized using high-performance liquid chromatography (HPLC) and gas chromatography-mass spectrometry (GC-MS). Results: Out of the phytochemicals screened, tannin methanol extract (TME) showed the highest antioxidant activity with IC50 value having 7.11 µg/mL in superoxide scavenging assay, the IC50 value of 1.46 µg/mL by nitric oxide scavenging assay, and followed by IC50 value of 20.83 µg/mL in 2, 2-diphenyl-1-picrylhydrazyl activity. The results showed that it also efficiently inhibited LDL oxidation at 240 µg/mL (71.29% at 5 h)., thus inhibiting foam cell development, preventing proliferation, apoptosis, and nitrate production in cultured RAW 264.7 and THP-1 cells. HPLC analysis showed the presence of tannin in the extract. TME was characterized in GC-MS, which showed 13 prominent compounds. Conclusion: The scientific evidence in the present study showed that the TME from T. ammi seed powder and honey act as an antioxidant and antiatherogenic properties in inhibiting foam cell formation. Hence, this phytochemical can be used for the treatment of atherosclerosis.

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BIOIJ-16

Targeting Imd pathway receptor in Drosophila melanogaster and repurposing of phyto-inhibitors: structural modulation and molecular dynamics

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National Library of Medicine
2022 Mar; 40(4):1659-1670.
DOI: 10.1080/07391102.2020.1831611

Abstract

Dysbiosis is a major cause of disease in an individual, generally initiated in the gastrointestinal tract. The gut, also known as the second brain, constitutes a major role in immune signaling. To study the immunity cascade, the Drosophila model was considered targeting the Imd pathway receptor (2F2L) located in the midgut. This receptor further initiates the immune signaling mechanism influenced by bacteria. To inhibit the Imd pathway, the crystal structure of Imd with PDB: 2F2L was considered for the screening of suitable ligand/inhibitor. In light of our previous studies, repurposing of anti-diabetic ligands from the banana plant namely lupeol (LUP), stigmasterol (STI), β-sitosterol (BST) and umbelliferone (UMB) were screened. This study identifies the potential inhibitor along with the tracheal toxin (TCT), a major peptidoglycan constituent of microbes. The molecular docking and molecular dynamics simulation of complexes 2F2L-MLD, 2F2L-CAP, 2F2L-LUP, 2F2L-BST, 2F2L-STI and 2F2L-UMB elucidates the intermolecular interaction into the inhibitory property of ligands. The results of this study infer LUP and UMB as better ligands with high stability and functionality among the screened candidates. This study provides insights into the dysbiosis and its amelioration by plant-derived molecules. The identified drugs (LUP & UMB) will probably act as an inhibitor against microbial dysbiosis and other related pathogenesis (diabetes and diabetic neuropathy). Further, this study will widen avenues in fly biology research and which could be used as a therapeutic model in the rapid, reliable and reproducible screening of phytobiologics in complementary and alternative medicine for various lifestyle associated complications.

Keywords: Imd; Immunity; diabetes; diabetic neuropathy; dynamics; in silico; lifestyle disorder; simulation.

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BIOIJ-17

Structural modulation of dual oxidase (Duox) in Drosophila melanogaster by phyto-elicitors: A free energy study with molecular dynamics approach

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Informatics in Medicine Unlocked
Volume 27, Pages 100811, December 2021

Abstract

The gut, as a paradigm is considered to be the second brain, plays a pivotal role in maintaining a healthy metabolism and negatively modulates dysbiosis at both the micro and macro levels. The gut-immune barrier is responsible for regulating major immune centers from inflammation, T-cell subsets (Th1, Th2, Th17, and Tregs), chemotaxis, and chemokinesis to death. Oxidative stress is established as a prime reason for leaky gut disorders. Further, the Dual oxidase (Duox) pathway plays a major role in oxidant generation during a bacterial-metabolite attack in the host. The current study attempts to explore the possibilities of repurposing Phytobioactive from the banana plant (Musa sp. var. Nanjangud Rasa Bale) as Duox inhibitors using Drosophila melanogaster as a model system for human biomimics. As a result of our previous studies, well-established antidiabetic ligands were implicated in treating diabetic neuropathy in the fly model. Complexes of Duox-STI, Duox-BST, Duox-LUP, and Duox-UMB were subjected to molecular docking, simulation with Duox-Captopril (CAP) as a standard drug reference. The result elucidates the inhibitory potency of phyto-ligands with their intermolecular interactions. UMB was found to be very much promising as an inhibitor on the Dual oxidase enzyme. This study corroborates the findings on the immune deficiency (IMD) pathway by providing evidence of the effectiveness of phytobioactives. Further, the inference of the study emphasizes to consider Drosophila as a therapeutic research model to probe gut-related disease including Microbiome research to ameliorate immunity, diabetes, and diabetic neuropathy, or any lifestyle metabolic disorders which could lead to the design and development of smarter herbaceuticals.

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BIOIJ- 18

Potential of herbal cocktail of medicinal plant extracts against 'big four' snake venoms from India

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Journal of Ayurveda and Integrative Medicine
Volume 12, Pages 858-864, 2021

Abstract

Background

Venomous snake bites cause acute medical emergencies and are fatal. India accounts for large proportion of snake-bite deaths globally. Medically important 'BIG FOUR' snakes of India are Bungarus caeruleus (krait), Naja (cobra), Echis carinatus (saw-scaled viper) and Daboia russelii (Russell's viper). Polyherbal formulations have been proved to be effective in treatment of diseases than a single formulation.

Objective(s)

To evaluate aqueous ethanolic extract cocktail of Azadirachata indica, Butea monosperma, Citrus limon, Clerodendrum serratum and Areca catechu for antidote potential against BIG FOUR venoms in ex vivo and in vivo model.

Materials and methods

Anti-hemorrhagic and venom neutralization studies were performed in seven-day old chick embryo model for ex vivo studies. In vivo studies were performed using male Swiss albino mice for antivenom potential of herbal cocktail by performing anti-edematic, anti-hemorrhagic, anti-myotoxic activity, and venom neutralization.

Results

Herbal cocktail exhibited differential venom inhibition potential against four venoms tested. Hemorrhagic activity was completely neutralized by the herbal cocktail; myotoxic activities of krait and Russell's viper venom were neutralized; while anti-edematic activity was observed for krait and cobra venom. Herbal cocktail completely neutralized venom lethality (3∗LD50) of krait and saw-scaled viper venom.

Conclusion

Inhibitions of various venom components of all four venoms suggests presence of phytochemicals in herbal cocktail with therapeutic properties. Further studies would help in the development of a formulation as a first-aid towards treatment of snake bite victims.

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BIOIJ-19

Role of Antimicrobial Drug in the Development of Potential Therapeutics

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Evidence-Based Complementary and Alternative Medicine

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Abstract

Population of the world run into several health-related emergencies among mankind and humans as it creates a challenge for the evolution of novel drug discoveries. One such can be the emergence of multidrug-resistant (MDR) strains in both hospital and community settings, which have been due to an inappropriate use and inadequate control of antibiotics that has led to the foremost human health concerns with a high impact on the global economy. So far, there has been application of two strategies for the development of anti-infective agents either by classical antibiotics that have been derived for their synthetic analogs with increased efficacy or screening natural compounds along with the synthetic compound libraries for the antimicrobial activities. However, need for newer treatment options for infectious diseases has led research to develop new generation of antimicrobial activity to further lessen the spread of antibiotic resistance. Currently, the principles aim to find novel mode of actions or products to target the specific sites and virulence factors in pathogens by a series of better understanding of physiology and molecular aspects of the microbial resistance, mechanism of infection process, and gene-pathogenicity relationship. The design various novel strategies tends to provide us a path for the development of various antimicrobial therapies that intends to have a broader and wider antimicrobial spectrum that helps to combat MDR strains worldwide. The development of antimicrobial peptides, metabolites derived from plants, microbes, phage-based antimicrobial agents, use of metal nanoparticles, and role of CRISPR have led to an exceptional strategies in designing and developing the next-generation antimicrobials. These novel strategies might help to combat the seriousness of the infection rates and control the health crisis system.

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Genetic characterization and comparative genomics of a multi-drug resistant (MDR) Escherichia coli SCM-21 isolated from subclinical case of bovine mastitis.

1 Susweta D.M, 2 Satarupa B, 3 Sudhir Jadhao S, 4 Rajeswari Shome, 5 Shome B. R.

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Comparative Immunology, Microbiology and Infectious Diseases Volume 85, Pages 101799, June 2022

Abstract

Escherichia coli is one of the major pathogens causing mastitis that adversely affects the dairy industry worldwide. This study employed whole genome sequence (WGS) approach to characterize the repertoire of antibiotic resistance genes (resistome), virulence genes (virulome), phylogenetic relationship and genome wide comparison of a multi-drug resistant (MDR) E. coli (SCM-21) isolated from a case of subclinical bovine mastitis in Bangalore, India. The genome of E. coli SCM- 21 was found to be of 4.29 Mb size with 50.6% GC content, comprising a resistome of 22 genes encoding beta-lactamases (blaTEM, blaAmpC), polymyxin resistance (arnA) and various efflux pumps (acr, ade, emr,rob, mac, mar, rob), attributing to the bacteria's overall antibiotic resistance genetic profile. The virulome of E. coli SCM-21 consisted of genes encoding different traits [adhesion (ecp, fim, fde), biofilm formation (csg) and toxin production (ENT, esp., FEP, gsp)], necessary for manifestation of the infection. Phylogenetic relationship of E. coli SCM- 21 with other global E. coli strains (n = 4867) revealed its close genetic relatedness with E. coli strains originating from different hosts of varied geographical regions [human (Germany) bos Taurus (USA, Belgium and Scotland) and chicken (China)]. Further, genome wide comparative analysis with E. coli (n = 6) from human and other animal origins showed synteny across the genomes. Overall findings of this study provided a comprehensive insight of the hidden genetic determinants/power of E. coli SCM-21 that might be responsible for manifestation of mastitis and failure of antibiotic treatment. Aforesaid strain forms a reservoir of antibiotic resistance genes (ARGs) and can integrate to one health micro biosphere.

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BIOIJ-21

Antibiotic Susceptibility Patterns of ESβL Producers Isolated from The Mobile Phones

1 Manjula NG, 2 Shilpa Borehalli Mayegowda, 3 L. Priyanka, 4 D. Priyanka, 5 Saad Alghamdi, 6 Shalini Choudary, 7 V. Sanchita, 8 G. Chishmitha, 9 Banan Atwah, 10 Zain Alhindi, And 11 Fahadul Islam

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Evidence-Based Complementary and Alternative Medicine
DOI: 10.1155/2022/1527488 (May 2022)

Abstract

Mobile phones have become an indispensable part of human lives for communication, education, and entertainment activities. This study aims to evaluate the diversity pattern of bacterial contaminants on mobiles and to check antibiotic resistance profiles in 105 samples. The study revealed a contamination of 51% in men and 49% in women, the highest in the 21- to 30-year age group, evidencing the extreme use of mobiles by teenagers. The study observed Gram-negative bacteria (63%) versus Gram-positive bacteria (37%). Overall, Gram-negative bacterial isolates showed the highest sensitivity to antibiotic nitrofurantoin (90%) and the lowest in ampicillin (35%). Gram positive has highest incidence of sensitivity towards tigecycline (100%) and lowest in cefoxitin (20%). ESβL producers were found to be 21.0% and highest being in Klebsiella oxytoca (35%) followed by Klebsiella pneumonia (31%). Staphylococcus pseudintermedius and Staphylococcus capitis have been identified on the mobile phones for the very first time. Interestingly, some soil microbes were also isolated and unfortunately found to have some antibiotic resistance like Raoultella ornithinolytica and Sphingomonas paucimobilis. The results revealed that mobiles were contaminated with multidrug-resistant (MDR) pathogens, and this study also showed that few of the saprophytic soil strains have antibiotic resistance, which can be an alarming situation that needs to be addressed.

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NATIONAL JOURNAL PUBLICATIONS

BIONJ-01

Antibiotic Susceptibility Patterns of ESβL Producers Isolated from The Mobile Phones

1 Manjula NG, 2 Shilpa Borehalli Mayegowda, 3 L. Priyanka, 4 D. Priyanka, 5 Saad Alghamdi, 6 Shalini Choudary, 7 V. Sanchita, 8 G. Chishmitha, 9 Banan Atwah, 10 Zain Alhindi, And 11 Fahadul Islam

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Abstract

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BIOIC-01

Identification of a potential inhibitor for New Delhi metallo - beta lactamase (NDM) from FDA approved drugs - a drug repurposing approach to combat carbapenem resistant bacteria

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BIOSPECTRUM, November 2021
DOI: 10.1080/07391102.2022.2123402

Abstract

Superbugs producing New Delhi metallo-β-lactamase 1 (NDM-1) enzyme is a growing crisis, that is adversely affecting the global health care system. NDM-1 empowers the bacteria to inactivate entire arsenal of β-lactam antibiotics including carbapenem (the last resort antibiotic) and remains ineffective to all the available β lactamase inhibitors used in the clinics. Limited therapeutic option available for rapidly disseminating NDM-1 producing bacteria makes it imperative to identify a potential inhibitor for NDM-1 enzyme. With drug repurposing approach, in this study, we used virtual screening of available Food and Drug Administration (FDA) approved chemical library (ZINC12 database) and captured 'adapalene' (FDA drug) as a potent inhibitor candidate for NDM-1 enzyme. Active site docking with NDM-1, showed adapalene with binding energy -9.21 kcal/mol and interacting with key amino acid residues (Asp124, His122, His189, His250, Cys208) in the active site of NDM-1. Further, molecular dynamic simulation of NDM-1 docked with the adapalene at 100 ns displayed a stable conformation dynamic, with relative RMSD and RMSF in the acceptable range. Subsequently, in vitro enzyme assays using recombinant NDM-1 protein demonstrated inhibition of NDM-1 by adapalene. Further, the combination of adapalene plus meropenem (carbapenem antibiotic) showed synergistic effect against the NDM-1 producing carbapenem (meropenem) resistant clinical isolates (Escherichia coli and Klebsiella pneumoniae). Overall, our data indicated that adapalene can be a potential inhibitor candidate for NDM-1 enzyme that can contribute to the development of a suitable adjuvant to save the activity of carbapenem antibiotic against infections caused by NDM-1 positive gram-negative bacteria. Communicated by Ramaswamy H. Sarma.

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BIOIC-02

Prevention oxidation of LDL and foam cell formation by tannin methanol extraxt Citrus Limon and honey

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9th World Conference on Pharmaceutical Science and Drug manufacturing

Abstract

Atherosclerosis is caused from high plasma concentrations of Low density lipoprotein (LDL), resulting in development of lipid laden plaques on the arterial walls leading to blockage and heart attack. Macrophages takes up Oxidised low density lipoproteins which results in the formation of foam cells, which are critical in the initiation of atherosclerosis. Till today contemporary drugs used for the treatment and prevention are statins, nevertheless, some of these have serious side effects. Medicinal plants have wide range of phytochemicals used for treatment, and are rich in as yet unexplored novel natural products. Ayurveda and Siddha recommends a list of medicines which also serve as food in our daily lives thus called Nutraceuticals. C. Limon was collected and phytochemical (tannin) was extracted using two solvents i.e. water and methanol. Antioxidant assays such as Superoxide, DPPH, and Nitric Oxide scavenging activity was performed. LDL isolation and oxidation inhibition assay were performed and were evaluated. Highest active sample was then subjected to Anti-proliferative, Anti-apoptotic and foam cell inhibition studies on cell lines (Raw 264.7 and THP-1 cells). Significant inhibition and anti-oxidant activity were observed in tannins from methanolic extract. Further, tannin extract was evaluated on RAW264.7, THP-1 cell lines in which foam cell inhibition assay revealed the potential to prevent foam cell formation. Thus active phytochemical acts as antilipidemic and anti-atherogenic property. Hence, contemplating the side effects of Presently available treatment. The present paper provides a comparison of action of Phytochemical and statin on cell lines (RAW 264.7, THP-1) as the major therapy for Atherosclerosis.

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BIOIC-03

Statistical optimization of alkaline and thermostable Polygalacturonase from Pseudomonas spp

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BIOSPECTRUM
November, 2021

Abstract

Polygalacturonases (PG) are pectin degrading enzymes with a wide range of applications in many industries. Due to their wide use, optimizing the parameters that can increase the enzymeyield and activity is the current research focus. In this study, we attempted to statistically optimize the media components of an alkalophilic and thermostable PG producing microorganism, isolated from fruit market soil around Bangalore, India. The isolate was identified as pseudomanos sp. by 16s rRNA sequencing. The enzyme was extracted, and biochemically characterized showing optimum pH and temperature as 9 and 45˚C. It retained 78% of its activity even after 5 hrs at 45˚C making it a highly alkalineand thermostable enzyme. To improve the enzyme production, a design of experiment (DOE) comprising Plackett-Burman (PB), with 10 factors, and response surface methodology (RSM), was applied. PB analysis identified three variables (pH, Incubation time, and Inoculum size), that were significantly affecting the production. The interaction between these variables and further optimization was achieved by RSM where the highest PG activity (123 U/gm) was obtained at pH 9, 66 hrs of incubation, and 10% inoculum size using wheat bran as a solid substrate. A 4.1-fold enhancement in enzyme production from 30.06 U/gm to 124 U/gm was observed. These results are valuable in the production of PG from Pseudomonas using agro- industrial waste that not only reduces the production cost but due to the robust nature of the enzyme, it willimprove the industrial bioprocess and also impact the environment positively.

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BIOIC-04

Valorisation of Pacu Skin Collagen for Enhancing the Burn Wound Healing Process.

[1] Manjushree H K., [2] Prakruti P Acharya. [3] Sunil S More. [4] Aneesa Fasim

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9th World Conference on Pharmaceutical Science And Drug manufacturing, Dec 2021
ISSN: 978-93-92106-00-2

Abstract

The present bioactive bandages and ointments used to treat burn wounds are very scarce and highly priced. They also come with certain disadvantages like, causing excessive dryness that hinders healing and it also leads to hypertrophic scar formation. Collagen is a conserved protein across species and fish collagen, which can be easily extracted has found many applications in field of regenerative medicine and wound healing. Upon fragmentation of collagen, certain sequences called cryptic peptides are released that are known to possess bioactive properties. So the current study focuses on extraction, fragmentation, biophysical characterization and wound healing properties of pacu fish skin collagen. 71.5% collagen type I was extracted from Pacu skin and fragmented using collagenase resulting in a hydrolysate (PaCH). Comparative biophysical analysis (SDS-PAGE, FTIR and CD) of the extracted collagen and hydrolysate showed similar structural conformation. SEM and TGA analysis revealed hydrolysate to be highly porous and thermostable compared to collagen. In vitro studies revealed that the PaCH has high peroxide quenching, antioxidant, antimicrobial and hemocompactible properties. MTT assay proved PaCH to be non-cytotoxic and scratch assay displayed significant wound closure property. The study shows that collagen recycled from Pacu skin is a promising bioactive compound for the fabrication of low cost and effective burn wound healing agents.

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BIOIC-05

Protein-Polysaccharide Scaffold of Fish Collagen and Nano-Hydroxyapatite Crystals for Bone Regeneration

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9th World Conference on Pharmaceutical Science and Drug manufacturing, Dec 2021, ISSN 978-93-92106-00-2

Abstract

Ideal scaffolds for tissue engineering should mimic natural Extra Cellular Matrix (ECM) as much as possible. The aim of the study is to fabricate a biomimetic scaffold from collagen type 1 (swim bladder) and hydroxyapatite (bones) extracted from catla fish waste. The nano crystals of Hydroxyapatite (HA) were obtained by calcifying it at 950°C. The Ca/P ratio of HA was found to be 1.76 which is close to natural hydroxyapatite. Biophysical (XRD, FTIR) analysis confirmed the nano size of HA and spectral (CD, UV) characterisation of collagen type 1 determined its structural integrity. The protein-polysaccharide scaffold was fabricated by combining collagen type 1, HA, hyaluronic acid and chondroitin sulphate in the prescribed ratio (98:80:50:44). The physical and chemical performance of the scaffold was enhanced by EDC-NHS crosslinker. The thermostable nature of the scaffold was determined by TGA analysis and it was also found to be highly porous and hygroscopic by SEM analysis and swelling ratio studies. In vitro studies confirmed the biocompatible nature of scaffold that promotes osteoblast adherence, growth and proliferation with less than 2% toxicity. Thus, the fish waste can be utilized in fabrication of a scaffold that mimics all the properties of natural ECM for enhanced bone regeneration.

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BIONC-01

The wound healing potential of collagen hydrolysate from Shark fish waste

[1] **Manjushree H K,** [2] **Prakruti P Acharya,** [3] **Ganapati Bhat,** [4] **Sunil S More and** [5] **Aneesa Fasim**

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Impact of multipronged approaches of biotechnology on mankind
Sep 2021

Abstract

Skin wounds represent a chief healthcare problem due to an increasing number of trauma and pathophysiological conditions. The present bioactive bandages used to treat burn wounds are available only for first and second degree burns. They have certain disadvantages like causing dryness that hampers the wound healing process resulting in hypertrophic scar formation. Collagen is an extracellular matrix protein that possesses certain sequences known as cryptic peptides that are capable to enhance the wound healing. The current study focuses on assaying peptide mixture from shark (Rhizoprionodon acutus) skin collagen for wound healing properties. Collagen type I was extracted from shark skin and biophysically characterized. Shark skin yielded 60% of collagen. It also displayed α band at 111 kDa in SDS PAGE and FT-IR, CD analysis confirmed that the extracted collagen is of type I. Collagen was fragmented using collagenase resulting in peptide mixture (SHCH). In vitro studies revealed that the SHCH displayed antioxidant activity. The toxicity of SHCH was assessed using a hemolytic assay and MTT assay, which resulted in a sheer 2.4% hemolysis and showed 91% of viability at 0.5mg/ml concentration. The study proves that collagen recycled from shark skin is a promising bioactive compound for the fabrication of low cost and effective burn wound healing agents

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BIONC-02

Synthesis and biophysical characterisation of nano-hydroxyapatite from catla fish bone waste

[1] Prakruti P Acharya, [2] Manjushree H K, [3] V Krishnamurthy, [4] Aneesa Fasim and [5] Sunil S More

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Impact of multipronged approaches of biotechnology on mankind
Sep 2021

Abstract

Fish bone wastes account to many thousand tons annually around the globe which can be Converted into value added products for biomedical applications. In this study, we report an attempt to prepare biocompatible nanosized hydroxyapatite crystals from Catla fish bone wastes by calcification technique. The nano crystals of hydroxyapatite (HA) were obtained by calcifying it at 950°C and the size was confirmed by atomic force microscopy. The identification of functional groups corresponding to HA be determined through FTIR spectra. Crystallinity of the synthesized HA was verified through XRD that exhibited strong diffraction peaks characteristic to HA. The surface morphology and thermo stability of HA was characterized using SEM and thermogravimetric analysis respectively. The Calcium/Phosphorus (Ca/P) ratio was confirmed using EDS and was found to be 1.67. These biophysical studies confirmed the extracted material as HA. Haemocompatibility studies displayed less than 2% toxicity. Additionally, the synthesized HA was examined for cytotoxicity on MG-63 osteoblast cell lines that showed 94% viability at 25µg/ml. Thus, the obtained results illustrate the synthesis of high-quality nano-HA from Catla fish bone waste and it can be used as an alternative to chemically synthesized HA in the field of bone and tissue engineering.

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BIONC-03

Screening, Identification and Biochemical characterisation of an alkalophilic pectinase from a novel Glutamicibacter mysorens JC187 strain

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Impact of multipronged approaches of biotechnology on mankind
Sep 2021

Abstract

Pectinases are hydrolytic enzymes that catalyze pectin degradation through depolymerisation and de-esterification reactions. Therefore, pectinases are used in various commercial sectors such as fruit processing, wine making, paper and pulp, tea and coffee processing, human nutrition, and treatment of industrial waste water etc. Pectinases that display high stability even under harsh industrial conditions are required to meet the needs of industrial sectors and the current research is focused towards this goal. In the present study, we screened and isolated a pectinase producing bacterium from soil samples collected from fruit markets around Bangalore. The isolate was identified as Glutamicibacter mysorens JC187 by 16s rRNA sequencing. The enzyme exhibited enhanced activities at pH 10.00 and 37°C temperature proving it to be a highly alkalophilic enzyme. Kinetic parameters Km and Vmax were 65.2µg and 0.83 µmol/min, respectively. The enzyme was found to be a metalloenzyme as its activity was inhibited in the presence of EDTA. However, the activity was enhanced in the presence of Co2+ and Mn2+, whereas it was inhibited by the Cu2+ and Hg2+ metal ions. Due to the high pH tolerance of Glutamicibacter mysorens JC187 pectinase, it is a potential enzyme that can be used in many industrial bioprocesses.

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BIONC-04

Nanoencapsulated Caffeine Mediated Disruption of Staphylococcus aureus Membrane

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Impact of multipronged approaches of biotechnology on mankind
Sep 2021

Abstract

The cell wall of Staphylococcus aureus is a constituent of virulence factors, enzymes and Toxins. The phytomolecule caffeine is found to show antibacterial properties. The minimum inhibitory concentration of caffeine was shown to be 10 mg/ml. The cell physiology assay of nucleotide leakage and potassium efflux assay showed the leakage of nucleotides and potassium ions. The scanning electron microscopy confirmed the disruption of cell membrane of Staphylococcus aureus. Further, caffeine was Nanoencapsulated using two wall materials to increase its protection, stability and bioavailability. The encapsulation of caffeine with the wall materials revealed the average particle size to be 160 to 180 nm. The zeta potential were in the range of -20.7 to -25.1 and polydispersity index was 0.3 to 0.6. The encapsulation efficiency of the nanoencapsulated caffeine was 97 – 98 %. The encapsulated caffeine showed the slow release profile of caffeine compared to the native caffeine.

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BIONC-05

Antioxidant, antilipidimic, antibacterial and anti-atherogenic activity by prevention of foam cell formation by phytochemical extract of Citrus Limon and Trachyspermum ammi with honey combination

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Impact of multipronged approaches of biotechnology on mankind
Sep 2021

Abstract

Circulating low density lipoprotein (LDL) present in the blood gets converted to Oxidised LDL which is taken up by macrophages, which results in the formation of foam cells, Resulting in development of lipid laden plaques on the arterial walls leading to blockage of the arteries causing critical initiation of atherosclerosis and heart attack. Drugs used for the treatment and prevention are statins till today which has serious side effects. Ayurveda and Siddha recommends a list of medicines which also serve as food in our daily lives thus called Nutraceuticals. Wide range of medicinal plants have phytochemicals used for treatment modules in Ayurveda, and are rich in natural products. Citrus Limon juice and Trachyspermum ammi seed powder was collected mixed with honey. Phytochemicals (tannin, phenolics, carotenoids) was isolated using two solvents i.e. methanol and aqueous extraction. Antioxidant assays such as SO, NO and DPPH activity was performed. LDL was isolated from blood plasma. LDL oxidation inhibition assay were performed and were evaluated. Highest active phytochemical was then subjected to Anti-proliferative, Anti apoptotic and foam cell inhibition studies on RAW 264.7 macrophages and THP-1 cells. Significant LDL oxidation inhibition and antioxidant activity were observed in tannins from methanolic extract. Antagonist activity of tannin extract was performed by well diffusion and MIC evaluated by micro titer 96 wells plate method. Tannin showed antimicrobial activity against 5 different pathogenic bacteria. Further, tannin extract was evaluated on RAW264.7, THP-1 cell lines in which foam cell inhibition assay revealed the potential to prevent foam cell formation, antiproliferation and antiapoptotic activity compared to C. Limon and honey mixture. Thus active phytochemical acts as antilipidemic and anti-atherogenic property. Hence, contemplating the side effects of presently available treatment. The present paper provides a comparison of action of phytochemical and statin on cell lines (RAW 264.7, THP 1) as the major therapy for atherosclerosis

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BIONC-06

Isolation, screening and identification of secondary metabolite from marine actinomycetes against human pathogens causing lower respiratory tract nosocomial infections

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Impact of multipronged approaches of biotechnology on mankind
Sep 2021

Abstract

Today human's biggest concern is rising issues in respiratory organs. Development of antibiotics which are effective with low cost is the need of the hour. Antibiotics are secondary metabolites obtained from bacteria. The untapped source of marine microbes will be a solution to this problem. For collection of samples, areas like estuaries, back water and sediment areas are considered. Places with rich organic sources are good for actinomycetes to grow. Following are the locations in Mangalore from where the samples were collected. Samples collected are serially diluted up to 10-3 and 10-4. Initial screening of Actinomycetes were done by using serial dilutions in 50% water and 50% sea water and then inoculated in Starch Casein Agar and Glucose Asparagine Agar media. Consecutive sub culturing by the method of Agar overlay using specific Hi -media of Actinomycetes Isolation agar and Starch Casein Agar was done. Here serial dilutions were done in purely distilled water. This was followed by Gram's staining. Based on colony morphology, thirty eight isolates were identified. Further screening is in the progressive planning which will be followed by identification of organisms and its active metabolites. Since secondary metabolites are obtained in trace amount, modification of wild-type strain and producing antibiotics in potential amounts should be the focus. The potent secondary metabolite which will have a strong effect on MDR bacteria especially occurring in the lower respiratory tract due to nosocomial infection must be having least side effects on humans and can be produced in bulk at a low price.

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BIONC-07

Investigation of antimicrobial effects of essential oils found in spices (cinnmaon and clove bud) potent against New Delhi Metallo Beta Lactamase (NDM) producing Escherichia coli and Methicillin-Resistant Staphylococcus Aureus (MRSA) clinical isolates

[1] Anusha P, [2] Vandana S, [3] Annapurna B and [4] Susweta Das Mitra

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Impact of multipronged approaches of biotechnology on mankind
Sep 2021

Abstract

World Health Organization released priority list of pathogens requiring research for novel Antibacterial with Carbapenem resistant Enterobacteriacae (CRE) and Methicillin resistant S. aureus (MRSA) placed in top most critical group seeking attention. The emergence of New Delhi Metallo betalactamse (NDM) producing CRE and MRSA has been the biggest blow to both health care and veterinary settings. NDM can hydrolyse all beta-lactam antibiotic including the last resort carbapenem and MRSA can subvert the effect of all antibiotics used for staph infection treatment. In the search for new antibacterial avenues, we in this study investigated the antibacterial activity of essential oils (EO) obtained from Pelargonium graveolens (Geranium), Syzygium aromaticum (Clove bud), Cinnamomum verum (Cinnamon bark), Myristica fragrans (Nutmeg), Boswellia carteri (Frankincense), Melaleuca alternifolia (Tea tree oil), Curcuma longa (Turmeric oil), Matricaria chamomilla (Chamomile) against a panel of 15 MDR strains comprising clinical NDM positive Escherichia coli and MRSA strains. Agar Disc Diffusion found EOs, viz., Cinnamon bark oil and Clove bud oil with most potent antibacterial activity with Minimum Inhibitory Concentration (MIC) ranging from 0.04 – 0.16 mg/mL and 0.16 – 0.64 mg/mL respectively against the MDR strains. Further, Gas chromatography–mass spectrometry (GC-MS) analysis detected Cinnamaldehyde (50.53%) in Cinnamon bark and Eugenol (70.89%) in Clove bud oil as the major components respectively. The study suggests EO (Cinnamon bark oil and Clove bud oil) as a promising plant-derived natural non-antibiotic alternative avenues to combat MDR bacteria. Future studies to test the efficacy of purified compounds invitro and invivo model are prerequisites to strengthen application of EOs widely across different sectors including veterinary setup (disinfectant in poultry farms, etc).

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INTERNATIONAL BOOK CHAPTERS

BIOIB-01

Arbuscular mycorrhizae, a treasured symbiont to agriculture

[1] **Ajay Nair,** [2] **Archana S. Rao,** [3] **L. Bhanu,** [4] **Veena S. More,** [5] **K.S. Anantharaju,** [6] **Sunil S. More**

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New and future developments in microbial biotechnology and bioengineering
ISSN: 978-0-323-85163-3, Pages 45-59 (2021)

Abstract

Food accounts for one of the most basic necessities in human society and the food industry relies solely on agriculture. Agriculture depends almost entirely on chemical fertilizers and pesticides for its sustenance and productivity. But with this chemical over abuse, came a fair share of hazardous effects ranging from environmental pollution, bioaccumulation, bio magnification, to deleterious effects on indigenous microorganisms etc. And therefore, it was the need of the hour to find alternate, eco-friendly approaches such as botanicals, microorganisms and the derived products of biologicals etc. that would improve plant growth and yield. Vesicular Arbuscular Mycorrhizae (VAM) is one such beneficial microorganism, which helps in enhancing the agricultural production by benefitting the plants in many ways. They help plant by enhancing the growth and yield, also many bio stimulants which indirectly helps by protecting the crop from invading pathogens. Therefore, it is crucial that we explore ways in which VAM might prove useful in meeting the global demand for quality food, one which will be safe for human consumption, without any pesticide residues, and also reduces the pollution caused by chemicals. The present chapter, hence, summarizes some of the well documented roles of VAM in enhancing the quality and quantity of production of agricultural commodities.

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BIOIB-02

Fungal Extremozymes in Green Chemistry.

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Extremophilic Fungi
ISSN: 978-981-16-4907-3, Pages 683-708 (2022)

Abstract

An endeavor to accommodate sustainability within chemical manufacturing led to the recently popularized green chemistry. For a chemical process to be green, it must meet the following criteria: avoiding usage of non-biodegradable materials, all industrial processing transformations should lead to minimal waste accumulation, the processes must be cost-effective, both energetically and economically, etc. This is why biocatalysts using enzymes brought about a monumental shift toward a greener chemical process. Since its initial introduction, enzymes have mediated almost all industrial sectors, from pharmaceutics to food industry, pulp, textile, agro-waste management, bioremediation, etc. Recently, met genomic approaches have led to the discovery of enzymes from Extremophilic organisms that thrive under conditions considered optimal for most life on earth. Most of these extreme-loving organisms are bacterial or fungal in origin. Regardless of their origin, it has been demonstrated that Extremozymes produced by them are far more efficient and resilient under the harsh industrial conditions. This makes them preferred candidates to be used as biocatalysts. Recently, several Extremozymes of fungal origin have gained interest as potential industrial biotransformants. This chapter discusses the applications of fungal extremozymes, improves on the synthesis, bioconversions, and bioremediation processes.

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BIOIB-03

Biotechnological Application of Extremophilic Fungi

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Extremophilic Fungi.
ISSN: 978-981-16-4907-3, Pages 315- 346 (2022)

Abstract

White biotechnology (BT), a sustainable and eco-friendly technology, has taken precedence over chemical industries in the last few decades. It has revolutionized the industrial BT sector by exploiting abundant natural resources for the production of important commodities benefiting mankind. Industries employ microorganisms or biomolecules extracted from them for production and processing in various industrial areas such as food and feed, beverages, agriculture, pharmaceutical, textile, leather, paper, detergent, polymers, cosmetics, waste management, etc. Despite the advantages, the use of biomolecules is not substantial because they cannot tolerate harsh industrial conditions, which in turn affects the production process. In the last decade, the industrial research focus has shifted toward extremophiles, organisms that can survive extreme conditions. These organisms have evolved defense mechanisms to survive severe conditions such as high or low temperature, salinity, pressure, pH, radiation, and desiccation. Biomolecules extracted from these organisms have robust characteristics to retain optimum activity even under unnatural conditions. A class of eukaryotes called extremophilic fungi are at the crux of this research focus as they are a reservoir of sturdy biomolecules with many industrial applications. Fungal extremozymes can be easily cultured on agro-industrial waste and also easily purified. All these factors make fungal extremozymes an attractive resource for large-scale, cost-effective, and eco-friendly industrial processes. In addition to extremozymes, extremophilic fungi are an abundant resource of potent cytotoxic, antimicrobial drugs. This chapter focuses on various extremophilic fungi used in the BT industry. It also covers the different extremozymes, biomolecules, and secondary metabolites secreted by them and their potential biotechnological applications.

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BIOIB-04

Extremophilic Fungal Xylanases: Screening, Purification, Assay and Applications.

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Extremophilic Fungi.
ISSN: 978-981-16-4907-3, Pages 367-394(2022)

Abstract

Lignocellulosic biomass is an abundant natural resource that can be utilized for the production of commercial products beneficial to mankind. Biomass degradation and processing is the first step to harness its potential and this is achieved by hydrolase enzymes. Xylanases are one such enzyme that plays a vital role in the degradation of xylan, a major component of lignocellulose. During the last decade, demand for xylanases has markedly increased due to its wide applications not only in the biofuel industry but also in various other industries such as baking, beverage, degumming, paper and pulp, and animal feed. Xylanases are produced by many microorganisms but fungal xylanases are preferred due to their high enzyme production, ease of culturing on cheap agro-industrial substrates, and easy purification. The latest advancement in xylanase research is the discovery of extremophilic fungi (EF) xylanases that have robust characteristics and can retain activity even under harsh industrial conditions such as high or low pH, salt concentrations, pressure, and temperatures. These qualities can drastically benefit the global economics of biofuel production, paper and food industries, and many other industrial production processes. Thus, a detailed review of several techniques of isolation, screening, and characterization of EF xylanases is discussed here. A comprehensive summary of purification and different assay techniques has also been listed to better understand and optimize enzyme extraction. Improved understanding of the biochemical properties of fungal xylanases allows the exploration of xylanases for various inventive industrial and biotechnological uses.

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BIOIB-05

Bioremediation of pesticides containing soil and water.

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Biotechnology for zero waste
ISSN: 9783527832064, Pages 83-94 (2022)

Abstract

Pesticides are the component of contemporary agriculture that helps in obtaining a healthy yield. Pesticide management, destruction of unused pesticides, and detoxification of contaminated soil and water were among the major global issues concerning agriculture, ecological wellbeing, and quality of life as they persist in the surroundings and are biomagnified throughout the food chain. Usually, bioremediation involves complete removal of pesticides by naturally occurring or genetically modified microorganisms and plants. The process is more constructive and eco-friendlier in contrast with traditional, physical, and chemical methods. Bioremediation results in complete or partial conversion of contaminants to microbial biomass and steady nontoxic end products. In this chapter, different bioremediation approaches for pesticides and factors those affect bioremediation process are discussed. The various methods incorporated include bio augmentation, biosparging, biostimulation, bioremediation, bioaccumulation, soil treatment, bioreactors, and phytoremediation.

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BIOIB-06

Biosorption of heavy metal and metal complexed dyes under the influence of various physicochemical parameters.

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Biotechnology for zero waste
ISSN: 9783527832064, Pages 189-205 (2022)

Abstract

The exponential growth of different industries and population affected the quality of the water. Heavy metals, suspended solids, fecal materials, organic, and inorganic dyes are present in the aqueous systems at the levels higher than the permissible limits. Bioremediation of heavy metals in aqueous systems was done through the mechanisms of bacteria, fungi, yeast, and their metabolites. Biosorption takes place between dissolved ions of metal and ligands (such as carboxylic, phosphate, amine, or hydroxyl groups) present on the cell wall of microorganisms. Organic and inorganic toxic dyes will pollute the water bodies through the untreated effluents discharged from industries like textile, tanning, paint, plastic, etc. Biosorption processes will be influenced by pH, metal concentration, biomass, and the surface to volume ratio and temperature.

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BIOIB-07

Extremophiles in sustainable agriculture.

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New and future developments in Microibial Biotechnology and bioengineering.
ISSN: 978-0-323-85577-8, Pages 243-258 (2022)

Abstract

Boundary conditions that support life are created by optimal parameters that are observable and measurable. However, research over the past century has demonstrated that these boundaries have been expanded by organisms in multiple directions. Be it thriving in broad temperature ranges, or the ability to colonize extreme pH, crushing pressure, high salt concentrations, radiations, or metal toxicity, there is a specialized group of organisms that tolerate and survive in such multiple extremes, popularly known as, Extremophiles. Extremophiles represent a key area of research in multiple disciplines, ranging from studies investigating the origin of life, to biological adaptation under harsh conditions. Additionally, bioactive compounds (such as extremozymes) produced by extremophiles are of great commercial interest in areas such as medicine, industries, agriculture etc. because of their biotechnological applications. Agriculture has been the bedrock of human sustenance since the evolution of modern human race. Since its introduction to society, it has been a constant endeavor of science to find ways to improve agricultural practices and its outcome. Especially given how the green sector has suffered because of population explosion, pollution, limited space and other biotic-abiotic stresses. Therefore, exploring the functional relevance of extremozymes in the aforesaid can help in furthering our efforts to improve agricultural practices that would eventually benefit human welfare. Biotic stresses and abiotic stresses are well managed by extremophiles and the enzymes produced by them. Data from Met genomics, recombinant DNA technology, biogeochemical research etc. could be imputed to inspect the applicability of extremozymes and extremophiles in general, in agriculture. This would enable us to expand the green sector in terms of adequate, quality food production. Extremophiles also give hope towards extending agriculture in regions that were once considered uncultivable barren lands, with limited resources. Hence, the present chapter attempts to sum up the tested, prudent applications that extremophiles may have in making agriculture sustainable.

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BIOIB-08

Fungal Amylases and Their Industrial Applications

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Industrially Important Fungi for Sustainable Development, ISSN: 978-3-030-85603-8, Pages 407-434 (2022)

Abstract

Discovering new industrial applications of microorganisms is diverse as they come from a variety of environmental niches. The majority of existing biotechnological applications are of microbial origin and enzymes are the most important among them. Microbial enzymes surpass those from animals and plant sources due to their ease of production and genetic manipulation, diverse catalytic activities, and many more. The role of enzymes in many processes has been known for a very long time in which the enzymes from microorganisms are used particularly for baking, brewing, alcohol production, cheese making, and many others. Starch represents one of the most pervasive and important renewable biological resources that form a major source of the food chain to a large population. Starch hydrolysis forms the basis of many industrial processes, and acid hydrolysis was significant during the earlier days. However, this was almost completely replaced by enzymatic hydrolysis; nowadays, since the availability and abundance of starch hydrolyzing microorganisms, corrosion-free reaction, and specificity of the reaction. One of the major applications of these enzymes is in the food industry and starch hydrolysis yields a diverse range of products such as glucose, maltose and fructose syrups, cyclodextrins, fat mimetics substances, and so on. They also find applications as brewing and baking agents. Enzymatic liquefaction and saccharification of starch require higher temperatures, which demand novel thermostable amylases. In this chapter, we discuss various aspects of amylase enzymes, their sources, application in the food, textile, paper, biofuel/bio-ethanol, detergent, and soap industries with challenges and prospects associated with amylase and associated industries.

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COLLEGE OF PHARMACEUTICAL SCIENCES
SCHOOL OF ALLIED HEALTH SCIENCES

Publication Summary

International Journals	**37**	**(PHSIJ-01- PHSIJ-37)**
National Journals	**19**	**(PHSNJ-01- PHSNJ-19)**
International Conferences	**16**	**(PHSIC-01- PHSIC-16)**
National Conferences	**05**	**(PHSNC-01-PHSNC-05)**
Book/Book Chapter	**09**	**(PHBC01- PHBC09)**

PHSIJ-01

Drug Utilization Pattern, Cost of Illness and Cost-effective Analysis of Antihypertensive Drugs in a Tertiary Hospital- A Cross-Sectional Study

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International Journal of Biochemistry Research & Review
Volume 30(4), Pages 15-23, August 2021

Abstract

Background: Hypertension is a condition with a substantial public health burden and a high risk of cardiovascular disease. The increasing prevalence of hypertension requires the use of cost-effective treatment and effective management of a disease. Hence, this study aims to assess the cost-effectiveness of antihypertension drugs in patients with hypertension and other co- morbidities. Methods: The study was designed as prospective and interventional, with objectives to evaluate the cost of illness, prescribing patterns of different classes of antihypertensive drugs alone or in combination, and cost-effectiveness evaluation of other groups of antihypertensive drugs prescribed. Provided about 40 patients were with antihypertensive drugs of various classes whose health scores were calculated using the EQ-5D-5L questionnaire and calculated the total cost of treatment. Also calculated most common Prescribe antihypertensive medications and the cost-effectiveness of each drug. Results: This study showed that 58% of patients received combination therapy, 42% received monotherapy. Metoprolol was most cost-effective, followed by Carvedilol, which was in the case of

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PHSIJ-02

Comprehensive overview on mucormycosis with recent advancement in treatment

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International journal of engineering technology research and management

ISSN: 2456-9348, Volume 05, Issue 08, Pages 47-49, August 2021

Abstract

Mucormycosis is a life-threatening infection caused by the fungus Mucorales belonging to zygomycetes class. In India in 2021 it has become an epidemic in midst of the covid -19 pandemic , Mucormycosis is causing high mortality in patients with underlying predisposing risk factors like diabetes mellitus ,hematological malignancy,transplantation,immunocompromised individuals and covid associated mucormycosis is seen in patients treatedwith concurrent glucocorticoid therapy. This infection is non communicable, so it does not spread from one person to another. Early diagnosis and early initiation of treatment is required for preventing further spread of the disease and death. This infection is difficult to diagnose as the symptoms shown overlaps with many other known infections Management therapy includes treatment with antifungal medications and surgical debridement of the infected necrotic tissue. Prevention of the infection is possible only by the management of underlying risk factors like by better control of diabetes, restricted use of glucocorticoids, antibiotics.

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PHSIJ-03

Potential applications of nanomedicine for treating Parkinson's disease

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Journal of Drug delivery Science and Technology

Volume 66, Pages 47-49, December 2021

Abstract

Parkinson's disease (PD) is an extrapyramidal, chronic progressive neurodegenerative disorder. It affects approximately 5 million individuals globally, and by 2030, the prevalence and incidence of the disease are envisioned to escalate by more than 30% if no effectual therapies are developed. The existing treatment strategies improve the motor and/or non-motor symptoms temporarily but do not cure or impend the progression of the disease. Most of the conventional treatments are oral dosage forms which have a very low brain specificity. Only efficient brain drug delivery approaches can reduce undesirable side effects and upgrade bioavailability, brain specificity, and patient compliance. The recent nanomedicine available for treating PD, its Neuro therapeutic applications and nanomedicine containing phytopharmaceuticals for treating the disease have been reviewed. It is believed that nanomedicine can improve the lifestyle and life expectancy of PD patients.

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PHSIJ-04

Role of Clinical Pharmacist in the medication adherence behavior of cancer patients: An interventional study

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Le Pharmacien Hospitalier et clinician
Volume 56, Pages 291-297, September 2021

Abstract

Introduction

Medication adherence is an important factor to determine the efficacy of the prescribed therapy. The main objective of this study was to counsel the patients and to assess its impact on medication-taking behaviour among cancer patients visiting the outpatient department.

Materials and methods

Cancer patients were enrolled and were divided randomly into intervention and control groups. The intervention group received information leaflets, face to face medication counselling from clinical pharmacists during the study period, whereas the control group received only conventional care. The medication adherence was measured by the Morisky medication adherence questionnaire at baseline and at the final follow-up. Suitable statistical measures were used to analyse the data.

Results and discussion

In total, 130 subjects (65 patients in the intervention and 65 in control) were enrolled, their medication adherence was assessed. In the intervention group, at baseline, the medication adherence was found to be 6.46 ± 1.36. After counselling patients in the intervention group, their medication adherence improved to 7.71 ± 0.503. The independent *t*-test result revealed that there was a significant difference ($P < 0.05$) in medication adherence among the intervention group after counselling. It was also observed that there was no significant difference in the medication adherence behaviour among the usual care group from baseline until follow-up.

Conclusion

Pharmacist education and counselling have led to clinical and statistically significant differences in the medication adherence behaviour of cancer patients compared to that of the usual care group.

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PHSIJ-05

Impact of compaction and re-compaction on granule properties in dry granulation process

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Journal of Cardiovascular Disease Research
Volume 12, Pages 975-985, September 2021

Abstract

Dry granulation is defined as a process whereby powders of different physical properties are combined to form denser, bigger, permanent masses with the aid of some tangible or intangible external agents. In dry-granulation, roller pressure is the driving force. Careful selection of the quantitative composition of functional ingredients has a big role to play in the scalability of the manufacturing process when drug load is as high as 66.67%w/w. Metformin hydrochloride has an inherent issue of flow ability and compressibility. A high drug load gives little space for other functional inactive ingredients; hence it becomes more critical to choose efficient highly compressible diluent at an equal quantitative ratio with a dry binder. Better compressible diluents along with dry binder also add flexibility and help the recycling granules for better results. A physical property of selected individual ingredients and a mixture of ingredients has a direct impaction on the compressibility of granules, solid fraction, density, and particle size distribution of compressed granules. Current dry granulation study with a composition of Lactose anhydrous and Silicified Microcrystalline Cellulose along with 2% w/w hydroxypropyl cellulose gives the flexibility of recycling to high drug load Metformin hydrochloride granules, this helps to improve its tablet ability.

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PHSIJ-06

Assessment of Knowledge, Attitude and Practice among Hypertensive Patients in a Teaching Hospital

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Journal of Young Pharmacists
Volume 13(3), Pages 279-284, September 2021

Abstract

Objectives: To assess knowledge attitude and practice regarding hypertension and secondary objective was to improve the health related quality of life by means of patient counselling. **Methods:** It was a prospective interventional study which was carried out for six months. Patient's demographic details like were collected in a pre-designed data entry form. KAP questionnaire was used to assess patient's knowledge, attitude and practice components before and after giving counselling session. SPSS18.0 was the statistical software used to analyses the data. **Results:** In a total of 120 male patients were (51.7%) and belong to the age group of 41-60 years. In this study, the pre-counselling KAP was assessed in which 30(25%), 60(50%) and 69(57.5%) patients had good score of knowledge, attitude and practice of Hypertension whereas the post counselling KAP showed that 103(85.83%), 116(96.66%) and 117(97.5%) score respectively. It shows that the patient counselling has a great impact on quality of life. **Conclusion:** It has been observed that hypertension affects the health of patients and education has a major role in improving the health care outcomes. This study concluded that before giving counselling session participants had inadequate information regarding complications of disease which led to worsening of health conditions. After giving intervention these patients showed marked improvement in quality of life.

Key words: Hypertension, Patient counseling, KAP Questionnaire, Brochures, Quality of Life.

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PHSIJ-07

Assessment of Knowledge, Awareness level on Pulse Polio Immunization among Caretakers of Children in Urban Bengaluru.

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Journal of Cardiovascular Disease Research
Volume 12(7), October 2021

Abstract

Introduction: Poliomyelitis, listed in the top 20 communicable diseases, is a highly contagious disease that mainly affects the central nervous system leading to paralysis. Lack of awareness and misconceptions may prevent the acceptance of this Programme. Therefore, this study aims at assessing the knowledge, awareness level on pulse polio immunization among caretakers of children. Methodology: This cross-sectional study was undertaken using semi-opened questionnaire to collect the responses and each response to the questionnaire was given points, allowing for the computation of total scores and subsequent categorization of participants' levels of awareness into well, moderately, and poorly aware. The Chi-square test was employed to determine statistical significance. Results: 35% of the participants came to know about this PPI program through public banners, 27% through friends and family. 68.07% of the participants had the misconception that the polio vaccine should not be given to children with mild illness and 24.5% of the participants had misbelieved that the polio vaccine can prevent other diseases. Two third of them (62.2%) did not know that polio is a communicable disease. Graduates were accountable for 54.61% (71/130) of participants who were well aware of this Programme and it was significant ($\chi 2$ =11.36, DF=7, P=0.043). The mothers had more awareness than the fathers (45.6% vs 41.07%, P=0.426). Conclusion: Though India was declared a polio-free country, more than half of the participants in our study unaware that polio is a communicable disease and transmits through food and water. The dangerous misconception that two-third of them believed that the polio vaccine should not be given if children had a mild illness. Health care professionals, particularly local leaders, should be actively involved in dispelling popular myths and beliefs to keep up our India free of polio.

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PHSIJ-08

Wound Healing Potentials of Phytochemicals from Commonly Used Indo-Africa Vegetables, Fruits & Spices: A Guide to Common Man

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Journal of Cardiovascular Disease Research
ISSN: 0975-3583, 0976-2833, Volume 12(5), Pages 1702-1710, December 2021

Abstract

A wound is an injured tissue in any part of the body that may be due to accidental cuts, can be in the form of nicks, grazes, punctures, scratches, broken knobs, shatter-bruised areas, or essentially any area where there is a break in the skin, etc., that everyone has to meet in everyone's daily life. The main problem with any type of wound is pain and sepsis, to manage these wounds, the allopathy system prescribes multi-combination of antibiotics, which are the main culprits of microbial resistance, side-effects and inadequate management. Hence this chapter focuses on the wound management
Phytochemicals reported from the common vegetable fruits& spices that every individual uses in daily life like pepper (Piper nigrum), pumpkin (Cucurbita pepo), garlic (Alium sativum), Onions (Alium cepa), Bael fruit (Aegle marmelos), Banana (Musa paradisiaca), Mustard (Brassica nigra), pepper (Piper nigrum), Tamarind (Tamarindus indica), Coffee (Coffea arabica) and Green tea (Camellia sinensis). The chapter also explains the importance of these herbs in sense of their phytochemicals and how to use them in wound management.

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PHSIJ-09

A Mini-Review on Molecular Docking Studies and Pharmacological Activities of Stevia rebaudiana

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Asian Journal of chemistry
Volume 33(12), Pages 2919-2923, December 2021

Abstract

Stevia is a small perennial shrub belonging to the Astraceae family with approximately 240 species, which has been used as a natural sweetener. In addition to its sweetening property, it has medicinal values and other uses. Indigenous tribes of South America were using *Stevia rebaudiana* Bertoni for centuries for its medicinal value. Leaves of stevia produce diterpene glycosides (Stevioside and Rebaudiosides), non-nutritive, non-toxic, high-potency sweeteners. The traditional medicinal system is getting more and more appreciation nowadays, but the therapeutic targets for most of these medicines remain unclear, which slows down the novel drug discovery from these natural products. Computational molecular docking studies are effective tools, which are broadly utilized to identify therapeutic targets and interpret molecular aspects of the ligand-protein interactions during drug discovery. Thus, it also enables the extraordinary structural diversity of natural products to be harnessed in an effective manner. The aim of this article is to present a review on the molecular docking studies and pharmacological activities of steviol glycoside isolated from *Stevia rebaudiana*. In this article, the recently published papers about *Stevia rebaudiana* were reviewed, using scientific sites such as Mendeley, PubMed and Google Scholar.

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PHSIJ-10

Neuroprotective effect of chia seed oil nanoemulsion against rotenone induced motor impairment and oxidative stress in mice model of Parkinson's disease

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Advances in Traditional medicine
DOI: 10.1007/s13596-022-00648-0, June 2022

Abstract

Chia seed oil (CSO) was reported to possess various pharmacological effects, however, its usefulness is restricted due to its inadequate solubility, bioavailability and stability. In the present work, efforts were put forward to develop chia seed oil nanoemulsion (CSO NE). The developed CSO NE was exposed to pharmacodynamics evaluation against Parkinson's disease (PD) induced by rotenone (RT) in the mice. Here, the animals were classified into 6 groups: (I) Vehicle control, (II) RT (1 mg/kg S.C.), (III) CSO (200 mg/kg p.o.)+RT, (IV) CSO (400 mg/kg p.o.)+RT, (V) CSO NE (200 mg/kg p.o.)+RT, (VI) CSO NE (400 mg/kg p.o.)+RT. Animals received the treatment 30 min before RT administration for 14 days. The outcomes of the motor/behavioural evaluations (rotarod test and locomotor activity), biochemical evaluations (estimation of malondialdehyde, nitrite, acetylcholine esterase, reduced glutathione, catalase and superoxide dismutase) and histopathological evaluation afrmed that the CSO NE treatment rendered a significant enhancement in the neuroprotective effects as compared to CSO administered alone. These results suggest that the oral bioavailability of CSO was escalated by its conversion to nanoform, thus imparting greater neuroprotection. The potential application of CSO NE was established in the management of PD.

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PHSIJ-11

Instant energy stimulant enriched nutraceutical cube formulation: Low endothermic promoting booster milk drink

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International journal of Health Sciences
Volume 6(S1), Pages 5540-5546, February 2022

Abstract

The need for innovative study and formulation is praised from the claim of those occupational personnel including software Engineers, those who get tremendously tired after their office work 9:00am -05:00pm. That time tea/coffee/health drinks won't work with many pros and cons because it takes a long time to prepare and to initiate action, sometimes addiction, its lengthy preparation and blending processes and single mild stimulation drug efficiency. The method development and preparation of a formulation processing the cumulative effects of CNS stimulant, effective natural vasodilatation, energy boosting to brain, normalize function of immune system to reduce tiredness and fatigue, as brain tonic with caffeine dust, Theobroma Cacao dust, glucose/sucrose, vitamin –C, Brahmi's leaf extract respectively. These components were in the form of solid cubes formulation with dispersible deliquescent additives of sodium citrate. Thus, get soluble in a low temperature 60-70°C of Luke warm liquid medium for drinks. These low temperature instant-energy boosters take less time to prepare and avoid thermo-labile constituent's degradation. This formulation acts as multifactor benefits to the volunteers as instant stimulation and steady energy–brain tonic along with zero recurrent hangovers. Results have been observed in 30 volunteers that after continuous consumption disappeared the feeling intensity of tiredness and fatigue.

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PHSIJ-12

Evaluation of anti-diabetic activity of ethanolic seed extract of datura innoxia mill

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Advances in pharmacology and pharmacy
Volume 10 (1), Pages 69 - 75, February 2022

Abstract

The current research has been performed to substantiate the traditional claim of the anti-diabetic activity of seeds of Datura Innoxia Mill. In rats. This plant contains scopolamine alkaloid, which has been reported to be used in operations as pre-anesthesia, used in delivery, as well as in ocular surgeries and for travel sickness prophylaxis. Datura is a medicinal and hallucinogenic plant that is used everywhere in the globe. Datura is revered in Ayurveda because all parts of the plant have medicinal properties, including the roots, leaves, seeds, and flowers, and have been employed to treat a variety of ailments, including leprosy, rabies, and insanity. Withanolide has recently been found to have potent anti-tumor, anti-inflammatory, anti-bacterial, hepatoprotective, soporfic, cytotoxic, and immune suppressant properties. An alloxan-induced diabetes model in rats was used to test the anti-diabetic activity of an ethanolic extract of the seeds of Datura Innoxia Mill. (Family-Solanaceae). A comparison was made between both the animals treated with extract from seeds and animals treated with known drug for diabetes i.e.., glibenclamide. The extract dose was chosen based on acute oral toxicity tests conducted in accordance with OECD norms. The outcomes revealed the fact that ethanolic extract significantly reduced the glucose levels in blood. The findings supported the use of seeds extract in the treatment of diabetes.

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PHSIJ-13

Exposition of Protein Kinase Targeted Nanoplatforms: An Extensive Review

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Advances in pharmacology and pharmacy
Volume 10 (2), Pages 128-137, March 2022

Abstract

Protein kinases play a prominent role in transferring a phosphate group from ATP (adenosine triphosphate) to serine, tyrosine, or threonine residues. Mutation and dysregulation in their activity lead to an imbalance in the health causing diseases like cancer. Protein kinase inhibitors have proved to be more effective in addressing such impairment caused by the dysregulation of protein kinases. Several protein kinase inhibitors like antibodies and small molecules have been approved by the regulatory bodies like US FDA, and many of them are being developed and expected to enter the clinical trials and subsequently to the market in the near future. However, targeting such kinase inhibitors to the desired site of action remains a challenging process. The current review focuses on the applicability of Nano platforms for targeting protein kinase inhibitors to the desired site of action and thus enhancing the therapeutic efficacy of the drug molecules against cancer. Besides, it also gives a brief idea to the readers about the imaging Nanoplatforms investigated for the detection of protein kinase inhibitor activity along with the list of ongoing clinical trials pertaining to protein kinase inhibitors.

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PHSIJ-14

Neuroprotective effect of Hydrocotyle sibthorpioides against monosodium glutamateinduced excitotoxicity

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Natural Product research
DOI: 10.1080/14786419.2022.2057493, March 2022

Abstract

We aimed to evaluate the neuroprotective effect of H. sibthorpioides against monosodium-glutamate (MSG) induced excitoneurotoxicity in rats. We randomly divided the animals into 11 groups (n ¼ 8) and subjected them to high doses of MSG (2 g/kg body weight) and the test dose (1 week). The test chemicals were H. sibthorpioides extracts of petroleum ether, chloroform, methanol, and water. We used Dizocilpine-hydrogen-maleate as a standard and assessed the cognitive property using Morris-water-maze and elevated-plus-maze. After the experimental period, we evaluated the biochemical parameters. We found chloroform and methanolic extracts significantly enhanced the cognitive behaviour of rats compared to control. Biochemical analysis suggested that there was a high level of antioxidants and lower levels of glutamate and proinflammatory cytokines in the cortex and hippocampus. We concluded that chloroform and methanolic extracts of Sibthorpioides enhanced the level of antioxidants, decreased proinflammatory-cytokines and glutamate in the brain, and thus prevented the monosodium-glutamate-induced-excite-neurotoxicity.

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PHSIJ-15

Assessment of Sleep Quality among Consumers of Selected Medications and Substances

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Journal of Advances in Medicine and Medical Research
Volume 34(10), Pages 18-43, April 2022

Abstract

Background: Sleep is a naturally recurring state of mind and body, characterized by altered consciousness, relatively inhibited sensory activity, reduced muscle activity and inhibition of nearly all voluntary muscles during rapid eye movement (REM) sleep, and reduced interactions with surroundings. It is distinguished from wakefulness by a decreased ability to react to stimuli, but more reactive than a coma or disorders of consciousness, with sleep displaying different, active brain patterns. Some of the most serious potential problems associated with chronic sleep deprivation are high blood pressure, diabetes, heart attack, heart failure, or stroke. Other potential issues include obesity, depression, and impairment in immunity, and lower sex drive.

Method: This was a cross-sectional, survey-based study. The data was collected by one-on-one telephonic and in-person interviews with the respondents. They were informed about the study and recorded their consent in the same data collection form. The consented subjects were administered with a self-assessed questionnaires Pittsburgh sleep quality index (PSQI); the obtained data will be subjected to descriptive statistical methods.

Results: A total number of 502 patients/subjects are included in this study. The age below 30 years showed that the sleep quality was very mildly disturbed(6.65±3.77), in the age category between 30-60 years showed that the sleep quality is little worse or disturbed(11.51±3.60) and in the age category above 60 years showed that the sleep quality is worse(13.31±2.67) than the other two age groups.

Conclusion: Based on the PSQI global score assessment, the age category below 30 years represented that the sleep quality disturbance is very mild, whereas in the middle-aged group between 30-60 years, the sleep quality disturbance is moderate, and in the age category above 60 years the sleep quality disturbance is more than the age as mentioned earlier groups.

Keywords: REMRapid Eye Movement; NREMNonrapid Eye MovementACEAngiotensin-Converting Enzyme inhibitor ARBAngiotensin Receptor Blocker PSQI/PSQS Pittsburgh Sleep Quality Index/Pittsburg sleep Quality of Scores

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PHSIJ-16

The Hypoglycemic and Hypolipidemic Effect of 5- Naphthalidin-2, 4 Thiazolidinedione derivatives in Alloxan Induced Type II Diabetic Model

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Research Journal of Pharmacy and Technology
Volume 15(4), Pages 1505-511, April 2022

Abstract

Objective: The present study was undertaken to study antidiabetic and antihyperlipidemic potentials of 5- naphthalidin-2, 4-thiazolidinediones derivatives and its interaction with rosiglitazone in alloxan-induced diabetic rats. Methods: Diabetes was induced in male Swiss albino rats by single intramuscular injection of alloxan (0.15 mg/Kg i.m) and NIDDM-rats received 4b, 4c or 4d (36 mg/Kg, p.o.). Fasting blood glucose (FBG) levels were measured by glucose-oxidase & peroxidase reactive strips. Serum biochemical parameters such as total cholesterol (TC), triglycerides (TG), very low density lipoprotein (VLDL), low density lipoprotein (LDL) and high density lipoprotein (HDL) cholesterol were estimated. The statistical analysis of results was carried out using Student t-test and one-way analysis (ANOVA) followed by Duncan's Multiple Range Test (DMRT). Results: The results revealed that 4b, 4c and 4d showed promising results by lowering the blood glucose. Moreover, 4c compound displayed high efficiency for lowering lipid profiles compared to others. Conclusion: These results suggest that taking 5- naphthalidin-2, 4 TZD orally twice/day is a valuable treatment for Non-insulin dependent diabetes mellitus (NIDDM) and Hypolipidemic agent. They exert their effects through altering regulation genes in glucose and lipid metabolisms in diabetic rats.

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PHSIJ-17

Crashing of psycological state of Pharmacy students on Corona disaster, dwindle economy: sabtaging student's career by policy makers in India

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Journal of Positive School Psychology
Volume 6(4), Pages 5183-5195, April 2022

Abstract

Background: The purpose of this study is to determine the psychology differences among pharmacy students in India, as well as their influence. High-level government policymakers are also accountable. Ultimately, quality is harmed in a variety of ways.
Methodology: The inquiry began with a process that included selecting 100 respondents from various universities (private, semi-government, and government) and collecting data on teaching quality, ongoing education system monopoly, multimedia influence, and eventually student academic results. Meta data was gathered on various parameters from JU, TU, KKU, LPU, DSU, and UTU via personal contacts, documents, and the PCI portal's mandatory disclosure file. Students' psychological effects were indexed according to their grade, which was evaluated based on a variety of parameters. Result & Discussion: The most prominent components, such as commercialization, low-graded education, and multimedia addictions, were extracted for further investigation from that gradation factorial. Based on the same, a comparison research was conducted between data from public and private universities, revealing a clear figure of Pearson correlation of JU-LPU, JU-DSU, and JU-UTU diverged from JU-TU on the extracted key components. Aside from that, a multiple linear regression analysis was conducted amongst all government universities – JU, TU, and KKU (abroad) – to reflect positive linearity on commercialization data. One-way ANOVA study of the economic worldwide effects of JU, LPU, and UTU through the percent of students recruited through university campus interviews to MNC. Conclusion: This psychological shift is influencing not just the quality of our pharmacies, but also the whole economy and generational interest, with all worldwide specialists yearning for the finest from India. The cause for this is India's policymakers' dilution of the educational system.

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PHSIJ-18

A Review on Traditional and Modern Therapy in Management of Poly Cystic Ovarian Syndrome

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Advances in Pharmacology and Pharmacy
Volume 10(3), Pages 160-172, April 2022

Abstract

Diet and lifestyle of an individual play a major role in maintaining the health of an individual, and any variation associated with these two factors would lead to serious consequences. Polycystic ovarian syndrome is one such condition which is an endocrine disorder observed in teen aged and premenopausal women in modern world, where there is formation of cysts on the ovary/ ovaries. It may be due to increased secretion of androgen, imbalance in doshas (vata, pitta and kapha), improper diet and lifestyle. There are various medicated and non-medicated therapies available for reducing the symptoms and conditions associated with poly cystic ovarian syndrome. Medicated treatment involves maintenance of hormonal balance, Type II diabetes mellitus, infertility, synchronization of the vata, pitta and kapha, insulin resistance, regularization of menstrual cycle, reduction of acne and hirsutism and these are done by administration of allopathic and herbal formulations. Non-medicated treatment includes surgery by which cysts are removed and also by acceptance of healthy lifestyle. This review centers on providing information regarding the medicated and non-medicated treatment available for treating the type of conditions and symptoms consorted with poly cystic ovarian syndrome along with their pros and cons.

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PHSIJ-19

Anti-inflammatory action of schizum cumini by invitro method

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Journal of hospital pharmacy
Volume 17 (1), Pages 13 -23, May 2022

Abstract

The Syzygium cumini (Myrtaceae) is a popular traditional medicinal plant in India. This study was intended to evaluate the anti-inflammatory activity of ethyl acetate and methanol extracts of S.cumini leaves in carrageenan induced paw oedema in wistar rats at the dose level of 200 and 400 mg/kg administrated orally. Both the extracts exhibited significant anti-inflammatory activity, which supports the traditional medicinal utilization of the plant. This study established anti-inflammatory activity of leaves of S.cumini.

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PHSIJ-20

Artificial intelligence in virtual screening: models versus experiments

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Drug Discovery Today
Volume 1, Pages 25-37, May 2022

Abstract

A typical drug discovery project involves identifying active compounds with significant binding potential for selected disease-specific targets. Experimental high-throughput screening (HTS) is a traditional approach to drug discovery, but is expensive and time-consuming when dealing with huge chemical libraries with billions of compounds. The search space can be narrowed down with the use of reliable computational screening approaches. In this review, we focus on various machine-learning (ML) and deep-learning (DL)-based scoring functions developed for solving classification and ranking problems in drug discovery. We highlight studies in which ML and DL models were successfully deployed to identify lead compounds for which the experimental validations are available from bioassay studies.

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PHSIJ-21

Prescribing Pattern of Antibiotics in Bacterial Infectious Diseases in a Corporate Care Hospital

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Asian Journal of Research in Infectious Diseases
Volume 10(1), Pages 34-53, May 2022

Abstract

Background: The antibacterial preparations are commonly used to control various bacterial infections, which may vary from one hospital to other. Hence, understanding the antibiotic practice will help the pharmacist gain knowledge and implement the safe use of drugs. Objectives: To assess the antibacterial use in the management of the selected bacterial infections Methodology: This study is a retrospective, observational, cross-sectional study over six months as per the inclusion & exclusion criteria in the Inpatients. A well-designed questionnaire was used for collecting the required data, and the obtained data were subjected to descriptive statistics. Results and Discussion: Out of 334 cases observed, 54.19% were female, and 45.81% were male. The mean stays 3.81±2.21 days. Acute gastroenteritis was 59.58%, followed by UTI 25.15%. Pneumonia was 8.68%, and 6.29% had COPD. 0.30% had acute gastroenteritis with UTI. 39.87% of patients were overweight18.35% were obese, and only 3.16% were underweight. Most of them were in the age group of 61-70, and the least was from 10-20. The mean age of the patients observed in this study was 55.21 ± 18.46. Single antibiotic therapy in 142 cases, 165 cases had two antibiotics, in 24 instances three antibiotics were used, in 4patients 4 antibiotics were used for management of the infections. The commonly used antibiotics in managing bacterial infections are penicillin, cephalosporin, carbapenem, and macrolides.

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PHSIJ-22

An Overview of Ethnobotany, Phytochemistry and Pharmacological Action of Selected Medicinal Plants

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International Journal of Science and Research (IJSR)
Volume 11, Pages 123-135, May 2022

Abstract

The plants Acorus calamus, Withania somnifera, Clitoria ternatea, Centella asiatica, Wedillia chinensis, Cissus quadrenqularis are the commonly used plants in South India in day-to-day life as part of food as well as to treat many diseases as traditional medicine, Cassytha filiformis is a parasite herb which is used in many parts of the world for traditional medicine. Like food, these are consumed for immunity, energy, vitamin and mineral sources as well ashome remedies for certain health conditions. As a medicine, these plants have many phytochemical constituents which are the reason for their biological activity. Various secondary metabolites were found from these plants including Alkaloids, Terpenoids, Saponins, Tannins, Flavonoids, etc. and multiple biological activities were established by in-vivo and in vitro studies so far. In the future also, studies need to be carried out to bring effective medicines to cure various new diseases in humans.

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PHSIJ-23

Evaluation of therapeutic efficacy of gastrointestinal disorder through developed supra spinal flux neuron- impulsion detection device

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Journal of East china university of Science and Technology
June 2022

Abstract

This designed medical gadget has the ability to trace the action potential (AP) variation over the complete spinal vertebral cord. Due to different locative organ failure and follow-up therapeutic activity, impulsive fluctuation is created across each spinal segment. The device, which is electronically embedded with logistic sensor electrodes and glides over a carbon composite strip conveyor from the C1 (first cervical) to the coccyx (terminal) and vice versa, calibrates the remarked AP through (-emV/emf) during expected organ dysfunction and/or drug administration under therapy. The mechanism praised is the neural electrical flux catching techniques amplifying the AP through a detector device. That's how specifically its traced lumber region and the path physiology of same was perfectly determined through specified interference generated deflected readings. Thus, signifies the detection of neural (ANS) level and its abnormal status in gastrointestinal disorders and after drug therapy. This challenges to confirm, that cross-checking through MRI, leads to duodenum diverticulitis.

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PHSIJ-24

Nanomedicine to deliver biological macromolecules for treating Covid 19

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Vaccine, Volume 40, Pages 3931-3941, June 2022

Abstract

Coronavirus disease (COVID-19) was first reported in December 2019, China and later it was found that the causative microorganism is severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2). As on 3rd June 2021, SARS-CoV-2 has affected 171049741 people worldwide with 3549710 deaths. Nanomedicine such as nanoparticles, liposomes, lipid nanoparticles, virus-like nanoparticles offer tremendous hopes to treat viral infections including COVID-19. Most importantly target specific ligands can be attached on the surface of them and this makes them more target specific and the loaded drug can be delivered to cellular and molecular level. These properties of nano medicines can be utilized to deliver drugs or vaccines to treat viral diseases including SARS-CoV-2 infection. This review discusses about SARS-CoV-2 and the potential application of nano medicines for delivering biological macromolecules like vaccines and drugs for treating COVID-19

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PHSIJ-25

Implementation of Total Error Perception in the Analytical Method Validation for Quantification of Related Substance in Pharmaceutical Formulation

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Journal of Young Pharmacist, ISSN 0975-1483
Volume 13(2), Pages 118-123, July 2021

Abstract

Objectives: This study is initiated to develop a simple and reproducible liquid chromatographic method with ultraviolet detection for the estimation of Sisomicin in Gentamicin pharmaceutical formulation by application of total error statistical tool. Methods: Gentamicin has a weak UV chromophore it is not possible to detect low levels of known related substance of gentamicin using a UV detector. Hence derivatization technique was applied to detect those substances. Chromatographic separation was accomplished by using Thermo scientific Hypersil Gold column (150 x 4.6 mm) and 5µm particle size as stationary phase by isocratic elution with Methanol: Water: Glacial acetic acid: Sodium hexane sulfonate in the ratio 70:25:5:3% v/v/ v/w as mobile phase. Sisomicin was detected at 330 nm within 25 min with a flow rate of 0.5 mL/min. Results: Concurrent results were obtained in the developed analytical method based on total error measurement. Proposed method showed good linearity response (r> 0.995) with limit of quantification at 0.007495 mg/mL, % relative standard deviation less than 1% in repeatability and % recovery was found within 96 to 98 % in accuracy. Accuracy profile result found within the range of ±10% and risk profile ±5% between the two set. Conclusion: This method can separate all the analogues of Gentamicin including known related substances. The finding demonstrated that method could be suitable for quantification of related substances in parental liquid dosage form.

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PHSIJ-26

Subcutaneous Administration of low molecular fraction of CA proteins by Elisa method

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World journal of Pharmacy and Pharmaceutical sciences, Volume 11(7), Pages 236-252, June 2021

Abstract

According to the data obtained during studies on the treatment of candidiasis was found that in the subcutaneous administration after the first and second injection with a dose of C. albicans protein concentration at Subcutaneous level increased therefore Therapeutic effect of C. albicans proteins was studied in white mice. White mice were used to study the therapeutic effects of C. albicans proteins at doses of 1, 2, 3, 4, and 5 mg/ml. Animals were infected i.p. with C. albicans strain CCM 335–867 suspension at a concentration of 20 million cells per 1 ml volume. Mice were injected S.C. in the upper portion of their right hind paw with Candida cell proteins in a volume of 0.2 ml after 5 days, and then again after 14 days. The titer of certain antibodies during immunoassay was used to determine the animal's protective functions 14 days following each injection.

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PHSIJ-27

lnvitro comparative study of essential oils and assessment of antifungal activity

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Dayananda Sagar University, Bengaluru, Karnataka, India

**World journal of Pharmacy and Pharmaceutical sciences,
Volume 11(7), June 2022**

Abstract

To perform a Comparative study of essential oils and assessment of the antifungal properties using in-vitro methods In-vitro screening by potato dextrose agar diffusion method was used to evaluate the antifungal effect of the following essential oils Castor Oil, Almond Oil, Coconut Oil, and Tea Tree Oil. The antifungal efficacy of essential oils against fungus Alternaria has been demonstrated in this study. As a positive control, the typical antifungal medication Fluconazole [32-320 µ/ml] was used. In-vitro antifungal activity of chloroform extracts of the four essential oils against Alternaria was examined and the zone of inhibition was discovered to be a clear function of antifungal activity. As the concentration rises, the level of inhibition rises along with it, on potato dextrose agar medium, the antifungal efficacy of oils was tested. Tea Tree Oil has much higher antifungal activity than Fluconazole [standard medicine], yet Almond Oil has the same activity as Fluconazole. Coconut Oil and Castor Oil had no antifungal properties. In most antifungal activity tests, greater oil concentrations were found to be more effective than lower concentrations. It is proven that Tea tree oil and Almond oil has the potential remedy for fungal infections.

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PHSIJ-28

Assessment of Dispensing Practice of Antibiotics in the Selected Community Pharmacies: A Prospective Study

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Journal of Advances in Medicine and Medical Research, Volume 34(19), Pages 3931-3941, June 2022

Abstract

Introduction: Dispensing is the provision of drugs as set out correctly on a lawful prescription by the pharmacist/Healthcare professional doctor. The over-the-counter sale of antibiotics is a global problem. Antibiotics are very commonly prescribed and dispensed for patients in pharmacies, and it is increasingly recognized as antibiotic misuse. This misuse may increase the treatment cost and the development of antimicrobial resistance. Therefore, an assessment of dispensing patterns of antibiotics is essential to know the standard of pharmacy practice and prevent unnecessary antimicrobial resistance. Objectives: To categorize the class of antibiotics used in the various diseases, check for the appropriateness of the antibiotics observed in the prescription, and understand the pattern of dispensing of antibiotics. Methods: A community-based- a cross-sectional observational study was carried out for six months in selected community pharmacies in Kumaraswamy Layout, Kengeri Bengaluru, Gubbi Tumkur District, Ballari Karnataka, and SrikalahastiAndhra Pradesh. Document The information collected in the data collection form. PIL has been distributed to the study subjects. The data were analyzed using descriptive analysis.

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PHSIJ-29

Journey of Hydrocotyle sibthorpioides Lam.: From traditional utilization to modern therapeutics—A review

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Phototherapy research, Volume 35(4), Pages 1847-1871, 2021

Abstract

Hydrocotyle sibthorpioides Lam. (Araliaceae) is a short and edible medicinal herb, Which is used in the traditional system of medicines. The review aims to report the Current information of H. sibthorpioides on the basis of its botanical and taxonomical Description, traditional use, active Phytoconstituents, pharmacological use and toxicity. The information on H. sibthorpioides with respect to its journey from traditional Uses to scientific validation was gathered based on the online survey. The results From the review signify that the plant is used by the different tribes of the world for The treatment of patients suffering from fever, edema, dysentery, rheumatalgia, Whooping cough, jaundice, throat pain, psoriasis, herpes zoster infection, hepatitis-B

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PHSIJ-30

A Review on Herbal Drugs with Potential Anti-arthritic Activity

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International Journal of Pharmaceutical Sciences and Research
Volume 13(4), Pages 1000-09, April 2022

Abstract

Rheumatoid arthritis (RA) is a general inflammatory disorder touching about 1.3% of the grown-up census of the world. Over the last two decades, a significant development has been done in the thoughtfulness of RA pathophysiology, best outcomes, and successful treatment strategy, and the credit of the significance of diagnostic agents and treating RA near the beginning. Earlier than novel treatments were obtained, RA caused notable incapability and deaths. At present, it is customary that principal diagnostic agents and therapy are significant and helpful. Development in the treatment of RA made it likely to manipulate signs in inflammatory arthritis. The early hour diagnosis and treatment of RA can prevent or reduce the progression of joint erosion to about 90% of patients; by this means irreversible disability can be prevented. In advance and more effective treatment significantly improves the prognosis of RA. The advancement of novel instruments to assess disease activity and recognize remission has brought about innovative treatment strategies to inhibit RA ahead of joint damage forever. The pharmacological therapy consists of the nonsteroidal anti-inflammatory drug (NSAIDs), glucocorticoids (GC); disease-modifying antirheumatic drugs (DMARDs), biological drugs is of two types: 1) Monoclonal antibodies, 2) bisphosphonate agents. The price of a few treatments is considerable, but their use has come down with the advancement of biosimilars. A target-treatment strategy aims to decrease disease activity by around 50% in three months and achieve a reduction of disease succession in six months, with continuous therapy if needed, which can prevent RA-related disability. There is a restoration of attention in plant products because of the present belief that green medicine is safer and more trustworthy than expensive synthetic drugs. The outlook is towards the synchronized multidimensional research intended to correlate botanical and phytochemical activities to exact anti-arthritic activity is achieved.

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PHSIJ-31

Artificial intelligence in Virtual Screening: Model versus experiment

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Drug discovery today,
Volume 7, Pages 1913-1923, July 2022

Abstract

A typical drug discovery project involves identifying active compounds with significant binding potential for selected disease-specific targets. Experimental high-throughput screening (HTS) is a traditional approach to drug discovery, but is expensive and time-consuming when dealing with huge chemical libraries with billions of compounds. The search space can be narrowed down with the use of reliable computational screening approaches. In this review, we focus on various machine-learning (ML) and deep-learning (DL)-based scoring functions developed for solving classification and ranking problems in drug discovery. We highlight studies in which ML and DL models were successfully deployed to identify lead compounds for which the experimental validations are available from bioassay studies.

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PHSIJ-32

Synthesis, Characterization and Evaluation of some newer Pyrimidine derivatives as antiinflammatory agents

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Research Journal of Pharmacy and Technology,

Volume 14 (5), Pages 2529-2533, 2021

Abstract

Pyrimidine is an important baseone of the base formed by hydrolysis of nucleosides. It is an interesting molecule in the medicinal chemistry because of its diversified biological activities. Alloxan which is an oxidation product of Uric acid is also a pyrimidine derivative of interest to a medicinal chemist. Several pyrimidines are reported as antimicrobial, analegesic, anti-inflammatory, antibacterial, and antiparasitic agents. Pyrimidine scaffold is considered as an interesting one due to its various pharmacological properties. In this scheme, an attempt is made to carry out synthesis of some new pyrimidine derivatives. The Starting material Chalcone is synthesized by condensation of various aromatic aldehyde and aromatic ketone. Chalcone is then treated with thiourea and KOH in presence of ethanol to yield pyrimidine derivatives. Then those pyrimidine derivatives were subjected to alkylation and acetylation. The synthesized compounds were characterized and confirmed by IR and 1HNMR spectroscopy and then evaluated for their anti-inflammatory activity. The anti-inflammatory activity of newly synthesized pyrimidine derivatives were carried out by the carrageenan induced rat hind paw edema method by taking Diclofenac sodium as standard.

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PHSIJ-33

Formulation and Evaluation of interpenetrating Polymer Network Microparticles of Diclofenac Sodium

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**Research Journal of Pharmacy and Technology,
Volume 15, Pages 792-798, May 2022**

Abstract

Diclofenac sodium, a model anti-inflammatory drug, has adverse effects like gastric irritation and hepatic toxicity. To overcome these problems Interpenetrating Polymer Network microparticles can be used as a controlled drug delivery system. Preparation of Interpenetrating Polymer Network microparticles using two or more polymer is a novel approach as the polymers produce synergistic effect which could increase the mechanical strength and resilience of the microparticles. The aim of the study was to prepare Interpenetrating Polymer Network microparticles of Diclofenac Sodium using chitosan and Ghatti gum which were used to deliver Diclofenac Sodium to the intestine. Microparticles prepared by emulsion-cross-linking method using gluteraldehyde as a cross-linker were characterized by Fourier Transform Infrared Spectroscopy, Differential scanning calorimetry, Scanning electron microscopy and evaluated for in vitro dissolution rate. Fourier Transform Infrared Spectroscopy studies confirmed the absence of chemical interactions between drug, polymers and cross-linking agent. Differential scanning calorimetric results indicated amorphous dispersion of Diclofenac Sodium into Interpenetrating Polymer Network matrix. Scanning electron microscopy pictures showed that microparticles did not agglomerate and had a rough surface. Hydrated surface after swelling showed spongy porous surface which indicated the mechanism of drug release as diffusion. Particle size ranged between 294 to 366 μm. DS percentage encapsulation efficiency ranged from 84.09 to 96.81%. In vitro release studies indicated a dependence of drug release rates on both the amount of CS and GG used in preparation of microparticles. The release was extended up to 12 h and release rates indicated a non-Fickian and super case II mechanism.

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PHSIJ-34

A Mini-Review on Molecular Docking Studies and Pharmacological Actives of Stevia rebaudiana

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Asian Journal of Chemistry, Volume 21, Pages 2919-2923, December 2021

Abstract

Stevia is a small perennial shrub belonging to the Astraceae family with approximately 240 species, which has been used as a natural sweetener. In addition to its sweetening property, it has medicinal values and other uses. Indigenous tribes of South America were using Stevia rebaudiana Bertoni for centuries for its medicinal value. Leaves of stevia produce diterpene glycosides (Stevioside and Rebaudiosides), non-nutritive, non-toxic, high-potency sweeteners. The traditional medicinal system is getting more and more appreciation nowadays, but the therapeutic targets for most of these medicines remain unclear, which slows down the novel drug discovery from these natural products. Computational molecular docking studies are effective tools, which are broadly utilized to identify therapeutic targets and interpret molecular aspects of the ligand-protein interactions during drug discovery. Thus, it also enables the extraordinary structural diversity of natural products to be harnessed in an effective manner. The aim of this article is to present a review on the molecular docking studies and pharmacological activities of steviol glycoside isolated from Stevia rebaudiana. In this article, the recently published papers about Stevia rebaudiana were reviewed, using scientific sites such as Mendeley, PubMed and Google Scholar.

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PHSIJ-35

Chitosan nanoparticles to enhance nasal absorption and brain targeting of sitagliptin to treat Alzheimer's disease

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**Journal of Drug Delivery Science and Technology,
Volume 61, Pages 102176, February 2022**

Abstract

Alzheimer's disease (AD), a highly complex, irreversible, progressive, challenging as well as fatal neurodegenerative disease of the brain, affects 35 million people around the world. It is estimated that 100 million people are expected to suffer from the disorder by 2050. It was found that sitagliptin (SIT), a dipeptidyl peptidase-4 (DPP-4) inhibitor, produced symptomatic relief of AD. Sitagliptin loaded chitosan nanoparticles (SIT-CS-NPs) were prepared and evaluated for their potential to target sitagliptin into the brain following intranasal (IN) administration. The SIT-CS-NPs were formulated by ionic gelation method. The mean size and zeta potential was 188.4 ± 48.1 nm and 20.8 mV respectively. In vitro SIT release in pH 6.4 phosphate buffer ranged between 49.55 ± 2.62 %w/w and 73.77 ± 2.12 %w/w for 24 h. Animal studies revealed that SIT-CS-NPs increased SIT levels in the brain by 5.07 fold in comparison with free SIT after IN administration.

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PHSIJ-36

Formulation and evaluation of hydrogel based topical delivery of Bael (Aegle marmelos) fruit extract for wound healing.

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**Journal of cardiovascular disease research,
Volume 12(5), Pages 1774-1788, November 2021**

Abstract

Wounds are physical injuries that cause the skin to open or break, or a break in the epithelial integrity of the skin, as well as disturbance of the structure and function of underlying normal tissue. Medicinal plants play indispensable roles to treat various ailments. In the current research Bael fruit extract hydrogel was prepared and optimized with the aim to reach effective concentration at wound site and make it an effective drug delivery system in the wound care. The hydrogel was developed by co-polymeric dispersion method. The prepared hydrogel of different polymeric ratio were evaluated for various parameters. The ideal formulation batch was selected for ex vivo skin permeation studies using Albino Wister rat skin. The formulated hydrogel was found to be brownish translucent in nature. The solubility of extract was 850, 80.18 and 70.75 mg/ml in water, methanol and hydro alcoholic solvent respectively. 3.296 was the partition coefficient of the extract determined using nocturnal-water. FTIR studies revealed that there was no possible interaction between the extract and the polymer. The drug content of the hydrogel ranged from 89.66% - 90.32%. The viscosity of the formulation was found to be in the range of 7573 to 18342 cps. The pH was found to be varying between 3.362 and 5.4, which was suitable for the application of skin. The swelling ratio was maximum for 60 min. The ex vivo permeation of extract from the hydrogel (F6) was found to be 72.64 % at the end of 24 hrs. Release kinetics of formulated hydrogel exhibited non Fickian /anomalous diffusion. F6 formulation significantly increased wound contraction rate compared to the negative control group and control group ($P < 0.05$). From the results obtained it can be concluded that, Bael fruit extract based hydrogel can be considered for the attenuation of wound healing in gram positive bacteria due to its free radical scavenging and anti-oxidant activity.

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PHSIJ-37

Quinazolinone -A Biologically Active Scaffold

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Research Journal of Pharmacy and Technology,
Volume 15, January 2022

Abstract

The heterocyclic fused ring quinazolinone has drawn an enormous consideration owing to its expanded functions in the sector of pharmaceutical chemistry. Quinazolinone is reported for its varied organic actions and compound with complete substitutions furnish at the side of information of a goal with working out of the molecular sorts that will work together with the goal receptors. Quinazolinone is taken into account as a very important chemical for the synthesis of quite a lot of physiological significance and pharmacological utilized molecule. The broad and potent activity of quinazolinone has established it as one of the biologically important scaffolds. This article is an effort to highlight the importance of the quinazolinone in the present context and the promise they hold for the future.

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NATIONAL JOURNAL PUBLICATIONS

PHSNJ-01

A Study on the Cognitive Status in Hypertensive Geriatric Patients Receiving Various Antihypertensive Drugs in a Medical College and Teaching Hospital

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Journal of Hospital Pharmacy
Volume 16(3), Pages 1- 10, August 2021

Abstract

Objectives: The objective of our study is to assess the cognitive status in hypertensive geriatric patients using MoCA questionnaire, to assess the association of various variables in the cognitive status in older adults.

Methods: A prospective observational study was carried out from October 2017 to April 2018 in the inpatient Department of General Medicine. All the demographic details were collected by self-designed data collection form. A specially designed screening tool known as MoCA Questionnaire was used to find out cognitive status. Demographic datas and details regarding drug therapy were reported by descriptive analysis. Association of various variables on cognitive status was evaluated by inferential statistics such as Chi Square test.

Results: A total of 135 hypertensive geriatric patients were included in the study. Based on MoCA screening tool, 63 (46.6%) passed the test and 72 (53.3%) failed the test which shows mild cognitive impairment. On considering the different variables it was found that quality of life, social habits such as smoking and alcoholism, educational status, occupation are having positive relationship with cognitive impairment. There was negative association between cognitive impairment and socio-economic status. Additionally, those who are unemployed and living in rural areas had higher prevalence of cognitive problems.

Conclusion: In this prospective observational study majority participants had mild cognitive impairment based on MoCA screening tool. Here the significance of various variables in the development of cognitive status was assessed. Better knowledge about risk factors and confounding variables will help the health care professionals in reducing cognitive impairment in geriatrics.

Keywords

Cognitive status; Geriatrics; Geriatrics; MoCA questionnaire

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PHSNJ-02

Antimicrobial Susceptibility Sensitivity Pattern in Positive Urine Culture for Urinary Tract Pathogens from Tertiary Care Hospital

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Journal of Drug Delivery and Therapeutics
Volume 11(5), Pages 11- 15, September 2021

Abstract

Hospital specific monitoring studies aims to determine the prevalence of the type of microorganisms that causes urinary infections and to assess the antimicrobial sensitivity pattern. A hospital based short term prospective cross-sectional study was conducted at Sagar Hospital, Bengaluru from August to October 2020. Antimicrobial susceptibility in MIC test was performed for the isolated pathogens by using automated VITEK compact method and stratification was done according to ICU and NON-ICU patients with over 260 urine culture tests of the suspected in-patient for urinary tract infection. All antimicrobial susceptibility data was analyzed using WHONET software 5.6. Sixty-six urine culture tests showed culture positive, 41 from non-ICU and 23 from ICU. Gram-negative bacilli E.Coli (61% in ICU, 52% IN non-ICU) was the most prevalent bacterium, followed by Klebsiella pneumoniae ss. pneumoniae (9% in ICU, 20% IN non-ICU), and Candida albicans 9% prevalence was seen only in ICU isolates. The study shows that the rate of resistance towards ampicillin (100%) was high among gram negative isolates and penicillin (100%) among gram positive isolates. The susceptibility was favorable towards polymixinB, colistin in gram negative organisms and nitrofurantoin, vancomycin in gram positive organisms. The present study revealed that E.Coli is the predominant bacterial pathogen. It also demonstrates there is an increasing resistance to ampicillin (88.2%) and ESBL (90%) among UTI pathogens. While, polymixin B (100%) and colistin was found most effective among gram negative and nitrofurantoin was most effective among gram positive organisms.

Keywords: Antibiotic, antimicrobial resistance, urinary tract infection

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PHSNJ-03

Development and Evaluation of Eudragit Floating Microspheres Containing Ezetimibe

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J Cardiovasc. Dis. Res. 2021
Volume 12(4), Pages 984-995, October 2021

Abstract

The purpose of this research work was to formulate and evaluate the floating microspheres of poorly water-soluble drug, ezetimibe by emulsion solvent diffusion evaporation technique using eudragit RS 100 and eudragit RL 100. The formulated microspheres were characterized for various parameters. The microspheres with Eudragit RS 100 showed drug loading of 20.9 to 81.8% and the particle size of 2.631 to 7.254 µm and the microspheres with Eudragit RL 100 showed drug loading of 63.5 to 73.6%, the particle size distribution of 1.549 to 5.962 µm. The prepared microspheres were white, free-flowing and virtually spherical in shape. The drug release was extended up to 10 h and its release mechanism from formulations followed the super case-II transport which indicated that drug release from floating microspheres by diffusion controlled polymeric relaxation.

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PHSNJ-04

Hepatoprotective and Antioxidant Activity of Ampelocissus Indica against Ccl4 Induced Hepatic Damage in Albino Rats

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Journal of Cardiovascular Disease Research
ISSN: 0975-3583, 0976-2833, Volume 12 Issue 06,
Pages 407-414, October 2021

Abstract

The ethno botanical survey revealed that Ampelocissus indica (AI) has many reported traditional uses such as jaundice, pustules, carbuncles, blood purifier, diuretics, etc. The main purpose of this research is to evaluate the hepatoprotective activity of methanolic extract of Ampelocissus indica (MEAI) in CCl4 induced hepatotoxicity in rats. The protective effect of MEAI was evaluated by measuring biochemical parameters such as ALP, SGOT, SGPT, and total bilirubin. Total phenolic content, in-vitro antioxidant activity and GC-MS analysis of MEAI were conducted. Further antioxidant activity of MEAI was determined by lipid peroxidation (LPO), glutathione (GSH), superoxide dismutase (SOD), and catalase (CAT) levels in the supernatant of liver homogenate. MEAI at doses,250mg/kg and 500mg/kg produced significant ($P<0.05$) hepatoprotection by decreasing the levels of serum enzymes, bilirubin, and lipid peroxidation, while they significantly increased the levels of glutathione (GSH), superoxide dismutase (SOD) and catalase (CAT) in a dose-dependent manner. The hepatoprotective and antioxidant activity of MEAI was comparable to that of the standard drug Silymarin. Histopathological studies showed good recovery in a dose-dependent manner. GC-MS analysis showed that MEAI contains 10 different types of volatile constituents and among these Hexadecanoic acid ethyl ester is a major constituent. Antioxidant and anti-inflammatory activity of Hexadecanoic acid ethyl ester has been reported. Hence the hepatoprotective activity of MEAI may be due to the presence of Hexadecanoic acid ethyl ester.

KEYWORDS: Ampelocissus indica, hepatoprotective activity, CCl4, antioxidant activity, biochemical evaluation, CAD, SOD, G

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PHSNJ-05

Comparative Anti - Inflammatory Potential of Betalains of Hairy Root Culture of Beta Vulgaris and Beta Vulgaris

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World Journal of Pharmacy and Pharmaceutical Sciences
Vol 11, Issue 2, Pages 1166-1175, January 2022

Abstract

The main objective of the present study was the production of Betalains from hairy root culture of Beta vulgaris and comparative evaluation of its anti-inflammatory potential with Beta vulgaris. Hairy roots were initiated using different strains of Agrobacterium Rhizogens such as A.4, A.2/83, A.20/83 and LMG 150; LMG 150 was found to initiate Large number of hairy roots. Hairy roots were further grown on MS media and Betalains was extracted with acidified water and its content was estimated spectrophotometric ally. In -vitro anti-inflammatory activity of Betalains from beetroot and hairy roots was evaluated by membrane stabilization and inhibition of denaturation of albumin methods. Betalains of hairy roots possess significant anti-inflammatory activity in a dose dependent manner, whereas exhibited extremely significant antiinflammatory activity (1000 µg/ml) when compared with Betalains of Beta vulgaris.

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PHSNJ-06

Protective Effect of Celastrus Paniculatus Seeds Extract against Lipopolysaccharide-Induced Paw Edema in Rats

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Journal of Microbiology, Biotechnology and Food Sciences
DOI: 10.55251/jmbfs.4713, Pages 7473, January 2022

Abstract

The present study was designed to evaluate the effect of Celastrus Paniculatus seeds methanolic extract (CPME) against lipopolysaccharide (LPS)-induced paw edema and nociception in rats. Moreover, in-vitro test for soluble epoxide hydrolase (sEH) inhibition activity of CPME was conducted to study its possible mode of action. Celastrus Paniculatus seeds were extracted with methanol by cold maceration for 7 days. The obtained dark brown colored extract was evaluated for preliminary phytochemical screening and subjected for HPTLC analysis. Then the extract was evaluated for its action against LPS-induced paw edema in rats at the dose of 100, 200 and 400 mg/kg body weight by measuring the paw edema, nociceptive bioassays and estimating 5-HETE in serum. In addition, CPME was evaluated for in-vitro sEH inhibition activity. Administration of CPME attenuates LPS-induced paw edema by 22.85% and serum 5-HETE levels by 9.56% ($P<0.001$) and elevated pain threshold by 112.19% ($P<0.001$). The CPME inhibits human, mouse and rat sEH activity with IC50 of 4.60 µg/mL, 4.17 µg/mL and 5.18µg/mL, respectively. The present study results indicate that CPME has protective effect against LPS-induced inflammation and pain in rats. The possible mode of action is attenuation of 5-HETE levels and sEH inhibition. However, further research is warranted to elucidate And isolate the active constituents from Celastrus Paniculatus seeds

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PHSNJ-07

Implementation of Quality by Design Approach for Method Development and Validation: A Review

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Research Journal of Pharmacy and Technology (RJPT)
Volume 15, Pages 167, January 2022

Abstract

QbD is the heart of recent pharmaceutical development. The implementation of QbD principles delivers a cost efficient methodology for delivering quality medicines for users. Regulatory agencies like USFDA and the European medicines agency (EMA) are placing the greater importance on a part of filing. QbD is efficient advances toward progress so as to commence through pre-defined aim and emphasizes manufacturing product and quality process understanding and method control depending on resonance knowledge and quality hazard supervision. Quality cannot be tested in the products but quality should be built by design, it is an essential part of modern approaches to pharmaceutical quality. Under this concept of QbD throughout designing and development of a product. It is important to define the performance profile of the desired product, the quality profile of the target product, and identify critical quality attributes.

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PHSNJ-08

Components and systematic evaluation of Transdermal drug delivery system: A review

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IOSR Journal of Pharmacy and Biological Sciences (IOSR-JPBS)
Volume 17, Pages 43-58, February 2022

Abstract

Transdermal drug delivery systems are devices with a set surface area that distribute a predetermined amount of medicine to the intact skin's surface at a predetermined rate and can be configured for extended release ranging from hours to days. Transdermal patch design and development can be explained as cutting edge. Since the emergence of transdermal treatment systems in the form of patches, the skin has become a particularly appealing route for systemic drug administration. In the realm of controlled drug delivery systems, the development of transdermal drug delivery systems (TDDS) is a game-changer. Because of their distinct advantages, transdermal dosage forms are quickly becoming a preferred alternative to traditional dosage forms. Controlled zero-order absorption, a straightforward manner of administration, and the ability to stop the activity if an unpleasant effect occurs are just a few of the benefits. The development of a transdermal drug delivery system entails a number of activities or steps, beginning with the selection of a drug molecule and continuing with the demonstration of sufficient drug flux or a pharmacokinetic study in an ex vivo and in vivo model, as well as the preparation of a drug delivery system that meets all of the drug molecule's specific needs (physicochemical, Invitro, Invivo). Complex analytical operations and multidisciplinary research is involved in transdermal studies with the evaluation of physicochemical, morphological, and textural features of the transdermal patched may be required to assess the effectiveness of transdermal medicinal devices developed for controlled drug release. This paper presents a review of Transdermal drug delivery system with different available designs with emphasis on different polymeric components of the TDDS, advantages of TDDS, typical evaluation parameters starting from adhesive evaluation of adhesive, physico chemical, In vitro, In vivo evaluation along with other analytical interaction studies.

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PHSNJ-09

Protective effect of Nigella sativa seeds extract against ethanol induced gastric ulcer in rats: Possible soluble epoxide hydrolase inhibition

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Indian journal of Pharmaceutical sciences
Volume 84(1), Pages 41-48, February 2022

Abstract

Nigella sativa seeds methanolic extract was prepared by a simple maceration process. The extract was subjected to preliminary phytochemical screening and high-performance thin-layer chromatography for linoleic and linoleic acid and tested for in vitro soluble epoxide hydrolase inhibition activity. Then the extract (100, 150 and 200 mg/kg) was evaluated against ethanol-induced stomach ulcer in rats using 1-(1-propanoylpiperidin-4-yl)-3-(4-trifluoromethoxy) phenyl) urea (1 mg/kg) and omeprazole (20 mg/kg) as reference standards. The plant extract contains flavonoids, alkaloids, proteins, free amino acids, tannins, flavonoids and linoleic acid. The in vitro soluble epoxide hydrolase inhibition test results reveal that Nigella sativa seeds methanolic extract inhibit human soluble epoxide hydrolase enzyme (half maximal inhibitory concentration=2.619 µg/ml). The Nigella sativa seeds methanolic extract reversed macroscopic and microscopic alteration and attenuated the levels of myeloperoxidase, tumour necrosis factor-alpha, Interleukin-6, 5-hydroxyeicosatetraenoic acid in ulcer rats. These results were comparable with standard control. In conclusion, Nigella sativa seeds methanolic extract has a protective action against ethanolinduced ulcers in rats.

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PHSNJ-10

Role of Pharmacist in Management of Chronic Disease Patients through Medication Therapy Management

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Journal of Hospital Pharmacy
Volume 17(1), Pages 45-58, March 2022

Abstract

The existing healthcare interventions do not address the needs of patients with chronic diseases resulting in suboptimal management. Chronic conditions require consistent care and management even though patients do not visit the clinic/hospital or any other healthcare setting. The important chronic diseases include heart diseases, stroke, cancer, chronic respiratory diseases and diabetes. The increasing burden of chronic diseases especially in the low-income countries, has made the prevention and management of chronic diseases a global priority. In the management of chronic diseases, there should be continuous monitoring on medications, lifestyle management, and health behavior. As no healthcare professional can specifically contribute in this area, pharmacist can fill this void by offering these services. Pharmacists can contribute by improving medication use through individual patient assessments and population-based interventions, and by implementing systematic intervention. Medication Therapy Management is a multi-component intervention that includes medication therapy review, patient medication education, medication monitoring, immunizations, disease self-care and support in association with physician. In this review outcome of pharmacist implemented medication therapy management in cardiovascular disease, diabetes, cancer and asthma has been discussed. This specialized service by pharmacist had a positive.

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PHSNJ-11

Assessment of Self-Medication Practices among the Indian Population: A Survey-Based Study

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Journal of hospital pharmacy
Volume 17(1), Pages 2348-7704, April 2022

Abstract

Background: Self-medication practice is the use of medications without the prescription/supervision of a doctor/ healthcare practitioner. Such practices sometimes may lead to antimicrobial resistance, adverse drug reactions, wrong diagnosis, economic loss, etc. Aim: The study aims to assess the prevalence, reasons, indications, commonly used class of drugs, and side effects experienced with SMPs, as well as the non-prescription use of antibiotics as a self-medication practice among the Indian population. Materials and method: It is an online survey-based, cross-sectional study carried out for six months using a validated, well-designed questionnaire after the pilot study. Four hundred study subjects participated in the survey. The data collected was entered in MS Excel and subject to descriptive statistical analysis. Results: SMP showed the majority in this study was 68%. The study also found that the main reason behind the practice of SM was attributed to the illness being not severe enough to see a doctor. The common indications for which SM was practiced were fever, cold, and cough. Antipyretics and analgesics followed by anti-allergic were the commonly used drug classes for SM. Some of the common side effects that the study subjects experienced due to SM were skin rash and stomach pain. Prevalence of self-medication with antibiotics was found to be 37.50%, reported that 16.7% of the participants changed the dosage of antibiotics during treatment and 16% of the participants changed the antibiotic during the treatment course. About 37.26% of the participants admitted that they stopped taking antibiotics after symptoms disappeared. The common indications for antibiotics were sore throat followed by fever and cough. The common side effects experienced due to antibiotic use were stomach pain, nausea, and vomiting. Conclusion: The present study shows that self-medication is more practiced among the study population, with more than half of the participants practicing it. Considering it a minor illness, without prescription/old prescriptions contributed to SMP. The study also observed that a decent proportion of the population does not know their medications. Therefore, it is essential to educate the public and create awareness regarding SMP. Keywords: SMP: self-medication practice, ADR: Adverse drug reaction, BP: Blood pressure, OTC: Overthe-counter products Antibiotics.

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PHSNJ-12

Development of validation of a rapid and simple analytical separation method for anticancer alkylating agents using application of total error concept

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Journal of Research in Pharmacy
Volume 26(2), Pages 431-433, May 2022

Abstract

A simple and sensitive high-performance liquid chromatographic (HPLC) method is established to separate and quantify the related substance present in two alkylating agents. The use of the traditional approach of analytical validation, in practice or in the literature, is communal. However, statistical verification, that looks separately the two errors (such as absolute bias and repeatability) to make a decision, presents a risk to declare that an analytical method is valid while it is not, or equally. To minimize this peril, a new approach based on the concept of total error was proposed. In this paper, we reveal the applicability and simplicity of the both methods based on the total error approach: accuracy profile and uncertainty profile. Proposed study demonstrated by validation case of a liquid chromatographic LC method for the quantification of related compounds present in two alkylating agents. Both methods showed good linearity response (> 0.995) with repeatability (%relative standard deviation less than 2%) and accuracy (94 to 106%). Accuracy profile was found within the range of ±10% and risk profile ±5% between the two series respectively. The excellence of the total error approach was presented since it enables successfully to validate the analytical procedure as well the calculation of the measurement uncertainty at each concentration level.

KEYWORDS: Related substances; Quantification; Total error; HPLC; Validation

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PHSNJ-13

In silico Prediction of Pyrazoline Derivatives as Antimalarial agents

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Asian J. Pharm. Res
DOI: 10.52711/2231-5691.2022.00018, Volume 12(2),
Pages 119-124, June 2022

Abstract

Malaria is one of the toughest health and development challenges faced by tropical countries. The resistance of malarial parasite to available drugs and currently used chemotherapy made its emergence for development of new drugs. Pyrazoline derivatives have shown good antimalarial activity. In present work, our objective is to explore pyrazoline derivatives with in silico methods for their antimalarial activity. A five-point pharmacophore was developed using 80 molecules having logIC50 ranging from 10.39 to 6.72. The pharmacophore yielded a statistically significant 3D-QSAR model with a high correlation coefficient R2= 0.806772, cross validation coefficient Q2= 0.7154 at four component PLS factor. To evaluate the effectiveness of docking protocol, we have selected crystallographic bound compound to validate our docking procedure. Protein selected for our studies with PDB id is 2BMA having resolution 2.7 Å. Further similar orientations were observed between the superpositions of 80 compounds after pharmacophore and 3D-QSAR poses, pharmacophore and XP docking poses, 3D-QSAR and XP docking poses. These present studies will provide insight in designing novel molecules with better antimalarial activity. Results explained that two aromatic rings and two hydrophobic groups are important for the antimalarial activity. The docking studies of all selected inhibitors in the active site of 2BMA showed crucial hydrogen bond interactions with HIS95, SER97, GLN323, ARG93, ALA321, ALA346, ILE166, ILE102 and PRO96 amino acid residues.

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PHSNJ-14

QSAR and docking studies of some novel piperine analogues as monoamine oxidase inhibitors

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Asian Journal of Research in Pharmaceutical Sciences
DOI: 10.52711/2231-5659.2022.00019, Volume 12(2), Pages 115-122, June 2022

Abstract

Piperine is an attractive target from natural sources for designing of novel compounds for many pharmacological activities. In present work, series of MAO inhibitors were taken and QSAR models were generated using MLRA. The best model were validated using test set, they exhibited r2 0.8427 and q2 0.7852 for MOA-B inhibitors; MAO-An inhibitors showed r2 0.7970 and q2 0.6657. Models. The QSAR models were used to design 70 new piperine analogue and docking studies were performed to check their inhibitory activity. Docking studies were performed using AutoDock, with proteins 2BXR and 2VZ2 for MAO-A and MAO-B inhibitory activity respectively. P12 and P11 for 2BXR showed best binding energy of -5.89 kcal/mol. and -6.43 kcal/mol respectively whereas P1078 and P1090 showed binding energy of -5.86 kcal/mol. and -8.56 kcal/mol for 2VZ2 respectively.

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PHSNJ-15

The Insulinotropic Effect of Thiazolidinedione Derivatives in Type Ii Diabetic Model, Rin-5f Cells, and Its Action on Cultured Human Lung Fibroblast Shows Oxygen Free-Radical Scavenging Activity

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Asian Journal of Pharmaceutical and clinical research
DOI: 10.22159/ajpcr.2021v14i7.40792, Volume 14(7), Pages 111-116, August 2021

Abstract

Objective: Diabetes mellitus is a persistent disorder caused by deficiency in insulin production. Oxidative stress plays an important role in physiopathology of diabetes. The present research determined the antidiabetic and antioxidant effects of 5-naphthalidin thiazolidinediones derivatives.Methods: Both in vitro and in vivo experiments were carried out on diabetes induced male Swiss albino rats by single intramuscular injection of alloxan (0.15 mg/kg i.m) and IDDM-rats received 4b, 4c, or 4d (36 mg/kg, p.o.). The derivatives were further subjected to insulin secretion by RIN-5F cells confirmed Insulinotropic effect. In vitro antioxidant activity was evaluated using enzymatic activities on cell lines In addition, all the synthesized derivatives showed non-toxic effects against a diseased human lung fibroblast (COPD), HCC7231 (TACC CCL-96).Results: The results revealed that 4b, 4c, and 4d showed promising results by substantially lowering the blood glucose levels on 21st day of post-administration. Serum insulin levels substantially rose, suggesting that derivatives exert Insulinotropic effects through different pathways. 4c showed oxygen free-radical scavenging activity. Conclusion: Our study proves that oral administration of 5-naphthalidin-TZD twice a day is a valuable treatment for type II diabetes. It seems to be a good drug moiety endowed significant oxygen free-radical scavenging activity. Keywords: Diabetes, Free-radical scavenging activity, RIN-5F cells, diseased human lung fibroblast.

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PHSNJ-16

Phytochemical Investigation, Antioxidant, and Anti-inflammatory Studies of Atylosia goensis Dalzell

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International Journal of Biology, Pharmacy and Allied Sciences
ISSN: 2277–4998, Volume 10(9), Pages 709-722, September 2021

Abstract

Plant-based medicine gained importance due to its safety margin and multiple benefits. Regular intake of antioxidants is an alternative to avoid serious illness. The current investigation aims to measure the phenolic, flavonoid content, the antioxidant activity of Atylosia goensis Dalzell, and its anti-inflammatory profile. Total phenolic content was estimated by standard colorimetric assays and antioxidant activity was screened using DPPH and Nitric Oxide free radical scavenging assay. The extracts were screened for In vitro COX enzyme inhibition assay with the two is enzymes (COX1&COX-2) and ethanol extract was screened for In vivo anti-inflammatory activity using carrageenan induced rat paw edema model. Results disclosed that total phenolic and flavonoid content for the ethanol extract (38.24±0.72 &97.12±1.63) was found to be higher and is more effective in inhibiting the free radicals in DPPH assay (IC50= 49.53 µg/ml) and Nitric Oxide free radical scavenging assay (IC50=41.26 µg/ml). It is also a potent inhibitor for COX enzyme and a more selective inhibitor for COX-2 (IC50= 65.14µg/ml). The ethanol extract was also reported to be safe at 2000 mg/ kg body weight and exhibited significant anti-inflammatory activity in the selected model in a dose-dependent manner at a dose of 200 and 400 mg/kg body weight. The presence of various secondary metabolites may be responsible either alone or in combination for the observed pharmacological activities. The quantity of the phenolic compounds and flavonoids can be directly correlated to the exhibited antioxidant and anti-inflammatory activities.

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PHSNJ-17

Development of Pharmacognostic parameters for the leaf of Bridelia scandens (Roxb.) Wild

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The Journal of Phytopharmacology
ISSN: 2320-480X, Volume 10(4), Pages 230-235, 2021

Abstract

Background: Pharmacognostic study of medicinal plants is an important parameter for standardization and authentication of plants, with the help of which adulteration and substitution can be prevented. The present study deals with Pharmacognostic profile of leaf of Bridelia scandens (Roxb).Wild. An important traditional plant, belonging to family Euphorbiaceous used to treat various ailments. Methods: The present study includes macroscopic and microscopic studies, quantitative microscopy, and physiochemical characters such as ash value, extractive values, fluorescence analysis, and total phenol And flavonoid content. Results: Macroscopically, the leaves are B. scandens are elliptic – oblong or obavate, dark green above, pale green below lateral veins. Microscopically, leaf consists of thick semicircular midrib and the lamina, cortical zone ending with thick continuous cylinder of sclerenchyma cells. Sclerenchyma cylinder completely enclosed the vascular cylinder of the midrib, consists of only continuous thick layer of phloem. Xylem cylinder consists of numerous short or long radial chains of vessels. The lateral vein is flat on the ad axial side and prominently projecting hemispherical body on the ad axial side. Powder microscopy of leaf revealed the presence of spiral xylem vessels, rosette and Prismatic calcium oxalate crystals and trichomes. A Physiochemical characteristic was also determined. Conclusion: Existing literature revealed that so far, no Pharmacognostic study has been reported on the leaf of B. scandens. Findings from this investigation can be used for its identification and determination of quality and purity of medicinally important plant. Thus exploring the usefulness of pharmacognostic evaluation to validate and authenticate drug.

Keywords: Bridelia scandens, Cyclocytic, Trichome, Euphorbi

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PHSNJ-18

Antifungal Activity of Trema Orientalis by In-Vitro Method

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World Journal of Pharmacy and Pharmaceutical Sciences
ISSN 2278 – 4357, Volume 11(6), Pages 1732-1736,
May 2022

Abstract

Medicinal plants are also called medicinal herbs. Plants synthesize hundreds of chemical compounds for functions including defense against fungi, diseases and herbivorous mammals. Fungal infections may be defined as primary or opportunistic. They can be localized i.e. limited to one region. E.g. localized in a part of the skin, mouth or vaginal, or be invasive i.e. spread to multiple sites. Skin and nail bed infections are also described as 'superficial' while invasive and systemic infections are referred to as 'deep infections'. Antifungal drugs are primarily used to combat infections in immune compromised individuals and post-transplantation. Three classes of antifungals currently in clinical use are polygenes, triazoles, and echinocandins. T. Orientalis is a species of flowering tree in the hemp family, Cannabaceae. It is known by many common names, including charcoal-tree, Indian charcoaltree, pigeon wood, Orientaltrema, and in Hawaii, where it has become naturalized, gunpowder tree, or nalita. Method: In-vitro screening by agar diffusion method was used to evaluate the antifungal effect of plant extract of T. orientalis. The zone of inhibition was measured using Penicillium spp. Results: The results of in-vitro antifungal activity of chloroform extract of T. orientalis was determined against Penicillium spp, at different concentrations and zone of inhibition was found as clear function of concentrations. As the concentrations goes increase, the result of drug concentration increases simultaneously. The chloroform extract of T. Orientalis showed better antifungal activity against Penicillium spp, and zone of inhibition was measured. Conclusion: The result obtained in this study indicates that T. orientalis possess antifungal activity and indicates that it has potential as an effective herbal remedy for
Fungal infection.

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PHSNJ-19

Comparative Study of Anti-Inflammatory Andanthelmintic Activities of T. Orientalis by In-Vitroanthelmintic Activities of T. Orientalis by In-Vitro

[1] Kalpana Divekar, [2] Kaustav Mahapatra, 3 Kiran Bilgundi, 4 Kiran Choudhary, 5 Kalaiyarasu M. and 6 Junaid Mushtaq Peer

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WORLD JOURNAL OF PHARMACY AND PHARMACEUTICAL SCIENCES
ISSN 2278 – 4357, Volume 11(7), May 2022

Abstract

Trema orientalis is an evergreen shrub/tree which can grow up to 18m in height, and up to 1.5 m tall in the savannah... It has a basally swollen bole, heavy branching and has round spread like a crown. Large traces of tannins, Saponins, flavonoids (simiarenol, simiarenone, trematol) are present in the leaves of Orientalis. The above notified phytoconstituent shows various pharmacological effects in different test models. These activities include- laxative, hypoglycemic, antipyretic, analgesic, anti-microbial properties, anticonvulsant activity, and antiplasmodial property. Inflammation is a defensive response when the cells of the body are damaged by microbes, physical agents or chemical agents, which is a form of stress and is characterized by redness, pain, heat, and swelling and loss of function in the injured area, in an attempt to heal itself. Helminthes are regarded as one of the most common agents that cause infection in humans. Some of the examples of diseases caused by helminthes are onchocerciasis and filariasis caused by the filarial worms. Comparative study of anthelmintic and anti-inflammatory study has been done on Trema Orientalis. Method: Invitro screening by inhibition of albumin denaturation, Heat induced hemolysis, Hypo tonicity induced haemolysis, Assessment of Anthelmintic activity (24) methods were uses to evaluate the comparative study of anthelmintic and anti-inflammatory effect of plant extract of T. orientalis. Results: In the Present study the results confirm the potential anti-inflammatory and anthelmintic activity in the extract of Trema orientalis. Also, in the comparative study, it indicates that the extract of Trema orientalis possesses anthelmintic activity to a greater extent than that of anti-inflammatory.

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INTERNATIONAL CONFERENCE PUBLICATIONS

PHSIC-01

Development of Sugar-Based Multifunctional Nano-Carriers for Gene therapy Applications

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Asian Polymer Association (APA)
Bioforum International e-Conference on Day -1 Friday | 27th August, 202 1Polymeric Biomaterials & Bioengineering

Abstract

Advances in the field of nanomedicine have led to the development of various gene carriers with desirable cellular responses. However, unfavorable stability and physicochemical properties have hindered their applications *in vivo*. Therefore, multifunctional, smart nanocarriers with unique properties to overcome such drawbacks are needed. Among them, sugar alcohol-based nanoparticle with abundant surface chemistry, numerous hydroxyl groups, acceptable biocompatibility and biodegradable property are considered as the recent additions to the growing list of non-viral vectors. In this review, we present some of the major advances in our laboratory in developing sugar-based polymers as non-viral gene delivery vectors to treat various diseases. We also discuss some of the open questions in this field.

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PHSIC-02

HPTLC determination of Gefitinib HCl in tablet dosage form

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Virtual Tools in Drug product Development, Bapatla College of Pharmacy

Abstract

Objective

A method for HPTLC was developed and validated for simultaneous estimation of Paracetamol and Zaltoprofen in a pharmaceutical dosage form.

Methods: The Chromatographic separation was achieved on TLC aluminum plates precoated with silica gel G60 F254 as the stationary phase. The mobile phase consisted of Hexane: Chloroform: Methanol in the ratio of 3.5: 5.5: 1v/v/v.

Results: The method was found to be linear in the concentration range of 0.8–4µg/spot for PCM and 0.2–1 µg/spot for ZLT and the correlation coefficient were found to be 0.996 for PCM and 0.998 for ZLT. The% RSD value obtained for intraday precision were 0.237 and 0.377 and for inter-day precision were 0.259 and 0.766 respectively, the low% RSD indicates that proposed method is precise as per ICH guidelines. The accuracy of the method was determined and the mean recovery of PCM was 99.73–100.15% and ZLT was 99.57

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PHSIC-03

Development and Evaluation of Capecitabine loaded Human serum Albumin nanoparticles for Breast cancer

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Virtual Tools in Drug Product Development
DOI: 10.5530/ctbp.2022.3s.61, October 2022

Abstract

Capecitabine is an orally administered chemotherapeutic agent used in the treatment of metastatic breast and colorectal cancers. Albumin nanoparticles indicated high drug loading capacity in a composite with biodegradability and biocompatibility. The aim of the present study is to develop Capecitabine loaded albumin nanoparticles and their evaluation. Capecitabine loaded albumin nanoparticles were prepared by desolation method. The prepared nanoparticles were characterized for mean particle size, zeta potential, and drug loading capacity. The process yields and drug loading ranged between 66%w/w to 84.6%w/w and 5.06%w/w to 15.36%w/w respectively. The mean particle size of nanoparticle size of various batches F1 to F4 were found to be 151.18nm, 134.9nm, 178.8nm, and 151.3nm respectively. The zeta potential of the batch F2 was found to be -21.1mV. The drug release was ranged from 32.75% to 51.2% for 24h depending on drug polymer ratio. The in vitro release studies showed a biphasic release pattern with an initial burst effect followed by sustained release. Release kinetic model revealed that the mechanism of drug release from human serum albumin nanoparticles followed Fickian model.

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PHSIC-04

Clinical outcomes of Convalescent Plasma Transfusion Therapy in Critically Ill Covid-19 Patients: A Systematic Review and Meta-Analysis

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[1] Department of Pharmacy Practice, School of Health Sciences, Dayananda Sagar University, Bangalore, India.

International E-conference on Recent Trends in Pharmaceutical Research, Nirmala College of pharmacy

Abstract

Background: Currently, Convalescent plasma (CP) is considered a favorable treatment option for moderate to critically ill Covid-19 patients. But there were very few systematic reviews focused on the effect of CP on clinical parameters. As a result, we undertook this systematic review to learn more about the safety and clinical benefits of convalescent plasma therapy over standard treatment (control).

Methodology: We searched Pub Med, Embase and other bibliographic databases to find relevant articles between December 2019 and February 2021 and identified 10 relevant articles which compared CP therapy taken in addition to standard medication with the Control group(who received standard medication). Two independent reviewers examined all full-text articles and extracted the required information into a predesigned proforma. Forest plots were drawn using RevMan v.5, a statistical tool offered by the Cochrane database to estimate the pooled effect.

Results: The results of meta-analysis using a random effect model indicated a significant reduction in mortality rate in CP (about 27% risk reduction), a reduced length of hospital stay in about 2 days (Weighted Mean Difference: -2.53, 95% CI, -7.20 to -2.14, P<0.0001), less time to improve clinical symptoms in about 4 days (pooled mean; CP: 10.82 days vs Control: 15.14 days). C - reactive protein (CRP) concentration levels (mg/L) were well controlled with the control group than the CP group and significant changes in lymphocytes and D-dimer values were not observed after CP treatment. It was also found that no difference between CP transfusion and control was seen in improving the oxygen saturation levels.

Conclusion: CP transfusion can be considered safe and showed a significant reduction in mortality and possible benefits in clinical improvement. Patients on CP therapy had no significant benefits in improving inflammatory markers such as CRP, lymphocytes, D-dimer, or oxygen saturation levels over standard drug therapy, according to meta-analysis data.

Keywords: Convalescent plasma covid-19 systematic review meta-analysis

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PHSIC-05

Prescribing Practices of Antibiotics in the Acute Gastroenteritis in a Tertiary Care Hospital: A Retrospective Study

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Emerging frontiers and opportunities: Special Populations and Technologies
Virtual International society of pharmacoeconomic research (ISPOR) Europe 2021
DOI: https://doi.org/10.1016/j.jval.2021.11.1080, VOLUME 25, ISSUE 1, SUPPLEMENT, S221, JANUARY 2022

Abstract

Background

Antibiotics are essential drugs helpful in treating various infectious diseases besides other medications, even in gastroenteritis. Hence, assessment of antibiotic prescribing patterns helps in understanding the use of drugs & standards of clinical practice. 1-5

Objectives

To evaluate the prescribing patterns of antibiotics, its interactions, and Cost involved in gastroenteritis.

Methods

The study was a retrospective observational study carried out for six months in the Medical Records Department of Sagar Hospitals, Bangalore, from January 2018 to January 2020 after obtaining the ethical clearance by using a suitable data collection form. Drug interactions assessed using Micromedex 2.0, Medscape. In addition, the obtained data were subject to descriptive statistics by using SPSS 20 version software.

Results

Among 200 patients, females were 53.27 %, males were 46.3 %. The age category of the patients showed more were 61-70 (25.13%). The mean number of hospital stays are 3.28±1. 78 days. 87.9 % were mixed diet. Antibiotic susceptibility was performed only in 2.5 %. The Majority of the cases are treated empirically and prescribed brand name (92.5%). The serum sodium shows 126.7 ± 36.5. The sequence of antibiotics prescribed showed Metronidazole (34.75%) > Cefotaxime (14.97%) > Amoxicillin + Clavalunic acid (0.56%) and clarithromycin (0.56%) > Ceftazidime (0.28%). The mean antibiotic cost in the management of Gastro entries showed 1176.2±1936.4. 56.8% had antibiotic drug interaction, in which 55.7 % major DDI, Minor was 0.5%. The various mean cost observed in Indian rupees with Biochemistry (654.02 ± 142.7), Hepatology (403.6 ± 269), Hematology (278.2 ± 108.1), Urine analysis, cost (283.2 ± 137.9), other diagnostic test costs (1470.6 ± 1244.59) in acute gastroenteritis.

Conclusions

This study showed the necessity of clinical pharmacy services in the rational drug usage promotion (RDU) of antibiotics: cost, usage, prescribing of antibiotics Minimizing Drug interactions.

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PHSIC-06

L-Rhamnose Ameliorates Isoprenaline (Iso) Induced Myocardial Toxicity and Oxidative Stress in Wistar Rats

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APP- INDO-US CONFERENCE School of Pharmacy, University of Puerto Rico San Juan, Puerto Rico, USA and Arihant school of Pharmacy.
VOLUME 11, ISSUE 06, June 2022

Abstract

The present study was designed to evaluate the effect of Celastrus Paniculatus seeds methanolic extract (CPME) against lipopolysaccharide (LPS)-induced paw edema and nociception in rats. A Moreover, in-vitro test for soluble epoxide hydrolase (sEH) inhibition activity of CPME was conducted to study its possible mode of action. A
Celastrus Paniculatus seeds were extracted with methanol by cold maceration for 7 days. The obtained dark brown colored extract was evaluated for preliminary phytochemical screening and subjected for HPTLC analysis. Then the extract was evaluated for its action against LPS-induced paw edema in rats at the dose of 100, 200 and 400 mg/kg body weight by measuring the paw edema, nociceptive bioassays and estimating 5-HETE in serum. In addition, CPME was evaluated for in-vitro sEH inhibition activity.
Administration of CPME attenuates LPS-induced paw edema by 22.85% and serum 5-HETE levels by 9.56% ($P<0.001$) and elevated pain threshold by 112.19% ($P<0.001$). The CPME inhibits human, mouse and rat sEH activity with IC50 of 4.60 Aug. /mL, 4.17 Aug. /mL and 5.18 Aug. /mL, respectively. The present study results indicate that CPME has protective effect against LPS-induced inflammation and pain in rats. The possible mode of action is attenuation of 5-HETE levels and sEH inhibition. However, further research is warranted to elucidate and isolate the active constituents from Celastrus Paniculatus seeds.

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PHSIC-07

Synthesis of Benzimidazole Derivatives and Study of Their Antioxidant And Anticancer Activities

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[1] College of Pharmaceutical Sciences, Dayananda Sagar University, Bangalore, India.

APP 15TH INDO-US VIRTUAL CONFERENCE
December 2021

Abstract

Abstract Background: A novel series of 2-Substituted Benzimidazole molecules was derived and their chemical structures were established using physiochemical parameters and spectral techniques (1 H-NMR, IR, MS etc.). The synthesized molecules were then evaluated for their antioxidant, anticancer and antimicrobial potential.

Results and discussion: Disc plate method was employed to evaluate the antimicrobial potential against selected fungal and bacterial strains by taking Ketoconazole and cefadroxil as reference antifungal and antibacterial drugs respectively. 2, 2-diphenyl-1-picrylhydrazyl (DPPH) free radical scavenging activity was used to assess the antioxidant potential of the synthesized analogues. Further, the anticancer potential of the selected molecules was assessed against MCF7 cancer cell lines MCF 12A non cancer Celine using MTT assay and Invivo DMBA induced treating Breast cancer by using Rats. The drug-likeness was also evaluated by studying in-silico ADME parameters of the synthesized analogues.

Conclusion: In antioxidant evaluation studies, the analogue 3d with IC50=14.85 µg/mL was found to be the most active molecule. The antimicrobial evaluation outcomes suggested that the molecules 3b, 3d, 3g and 3j possessed moderate to promising activity against the selected species of microbial strains having MIC range 6.9 µM to 27.1 µM. The results of anticancer evaluation revealed that all the screened derivatives possess moderate – significant anticancer potential. 3j performed by Invivo Breast cancer studies the in-silico ADME studies revealed that all the compounds were found to be drug-like.

Keywords: Microwave Synthesis, Antimicrobial, Anticancer, Antioxidant, Characterization, ADME

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PHSIC-08

Formulation and In Vitro Evaluation of Solid Lipid Nanoparticles Containing Curcumin

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College of Pharmaceutical Sciences, Dayananda Sagar University, Kumaraswamy Layout, Bangalore-560078, India

APP 1 5 TH INDO US VIRTUAL CONFERENCE
December 2021

Abstract

Solid lipid nanoparticles (SLNs) are biodegradable nanocarriers-based drug delivery systems composed of lipids. Curcumin has been found to possess various pharmacological activities which includes antiinflammatory, antioxidant, antimicrobial, wound healing and anticancer properties. But it has poor oral bioavailability after oral administration due to low aqueous solubility and extensive first pass metabolism. The aim of the present study was to develop solid lipid nanoparticles containing Curcumin and their in vitro evaluation. The solid lipid nanoparticles containing Curcumin were prepared by solvent diffusion technique with modification. The prepared nanoparticles were characterized for drug loading, particle size and zeta potential. The in vitro Curcumin release was done by dialysis method in methanol. The solid lipid nanoparticles containing Curcumin were successfully prepared by solvent diffusion technique. The drug loading capacity varied and depends on the drug polymer ratio. The Curcumin loaded solid lipid nanoparticles sustained the Curcumin release for a period 24 hours.

Key words: Solid lipid nanoparticles; Curcumin

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PHSIC-09

Instant energy stimulant enriched nutraceutical cube formulation: Low endothermic promoting booster milk drink

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[1] College of Pharmaceutical Sciences, Dayananda Sagar University, Bangalore, India.

International Conference on Medical, Medicines, and Health Science (RICMMHS)
DOI: 10.53730/ijhs.v6nS1.6107, April 2022

Abstract

The need for innovative study and formulation is praised from the claim of those occupational personnel including software Engineers, those who get tremendously tired after their office work 9:00am -05:00pm. That time tea/coffee/health drinks won't work with many pros and cons because it takes a long time to prepare and to initiate action, sometimes addiction, its lengthy preparation and blending processes and single mild stimulation drug efficiency. The method development and preparation of a formulation processing the cumulative effects of CNS stimulant, effective natural vasodilatation, energy boosting to brain, normalize function of immune system to reduce tiredness and fatigue, as brain tonic with caffeine dust, Theobroma Cacao dust, glucose/sucrose, vitamin –C, Brahmi's leaf extract respectively. These components were in the form of solid cubes formulation with dispersible deliquescent additives of sodium citrate. Thus, get soluble in a low temperature 60-70°C of Lukewarm liquid medium for drinks. These low temperature instant-energy boosters take less time to prepare and avoid thermo-labile constituent's degradation. This formulation acts as multifactor benefits to the volunteers as instant stimulation and steady energy–brain tonic along with zero recurrent hangovers. Results have been observed in 30 volunteers that after continuous consumption disappeared the feeling intensity of tiredness and fatigue. Keywords---CNS Stimulant without side effect, ease & fast preparation, nutraceutical cube formulation, novel steady energy brain tonic.

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PHSIC-10

Design, Molecular Docking, Microwave Synthesis of 2-Substituted Benzothiazole derivatives and study of their antioxidant And anticancer activities targeting DHFR Enzyme.

[1] Dr. Gnana Ruba Priya, [2] Arti Mohan

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NIPiCON - IPS 2022, Nirma institute of pharmacy
February 2022

Abstract

Back Ground: A series of 2-Substituted Benzothiazole derivatives was developed and its chemical scaffolds were authenticated by NMR, IR, elemental analyses, and physicochemical properties. The Molecular docking studies, synthesized 2-Substituted Benzothiazole compounds were screened for their in-vitro antioxidant activities and were preliminary screened against two breast cancer MDA-MB-231 and MCF 7 breast cancer cell lines which were compared with Methotrexate. Potent compounds were further evaluated against L929 (noncancerous skin fibroblast) cell line and found highly selective for MCF-7 cells over L929 cells.

Results and discussion: The synthesized Benzimidazole compounds were evaluated for their antioxidant activity using the DPPH, Hydrogen Peroxide Radical Scavenging activity, Nitric oxide, FRAP Assay method were found to exhibit good antioxidant potential against selected. The compounds were also assessed for their anticancer activity exhibited using the MTT assay and were found to elicit ant proliferative activity against the MDA-MB-231 and MCF7 breast cancer cell line, which was comparable to the standard drug.

Conclusion: Antioxidant activity results indicated that compounds 7a, 7c, and 7e to be promising Antioxidant activity and comparable to standard drugs. The anticancer screening results revealed that compounds 7a, 7c, and 7e to show the highest activity against MCF7. There is still scope for more research in this field to discover a novel agent.

Key words: Docking, antioxidant, anticancer, Benzothiazole derivatives

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PHSIC-11

Preclinical Investigation on the Protective Effect of Bacopa Monnieri on Human Neuroblastoma Cell Line SH-SY5Y on Its Progressive Development and Finding on Autism Spectrum Disorder

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Challenging world of health care
JOURNAL OF PHARMACEUTICAL NEGATIVE RESULTS
DOI:10.47750/pnr.2022.13.S09.270, Volume13, Issue9, 2022

Abstract

Autism is a common neurodevelopmental disorder characterised by differences in societ al behaviour and interactive communication, as well as stereotyped, monotonous behavi ours, unjustifiably partial to males and females by a ratio of 4:1, and a lack of understand ing of the role of sex hormones in autism susceptibility. MTT & SRB Cell Viability Assay Proliferation of Cells Assay The entire study was carried out on differentiated SH-SY5Y cells with varying passage numbers. SH-SY5Y human neuroblastoma cell lines were used in this investigation to expose the circumstances. SH-SY5Y cells seldom produce and distribute neuron-specific proteins at levels equivalent to mature neurons. As a result, differentiated SH-SY5Y cells were used in the majority of Neuro research. SH-SY5Y cells were grown and allowed to differentiate for a period of time. Autism spectrum disorder (ASD) is a group of neurodevelopmental diseases marked by a lack of social skills and nonverbal interactions in early childhood, such as decreased eye contact, facial expression, and body motions. SH-SY5Y cell lines were chosen to explore the pattern of ASD. MTT & SRB Cell Viability Assay.

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PHSIC-12

Effect of Kamarkas Gond on metformin tablet formulation

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[1] College of Pharmaceutical Sciences, Dayananda Sagar University, Bangalore, India.

PRIP INNOVATE -7 Scientific Achievements in Nano Drug Targeting
June 2022

Abstract

Formulation and evaluation of Kamarkas gum as a tablet binder employing metformin as a model drug was conducted. Different formulations of tablets using BF gum as a binding agent were prepared. The binder concentrations were 2%, 4% and 6%w/v. Tablets were prepared and subjected for evaluation of hardness, friability, content uniformity etc. The hardness of the tablet increased with increase in concentration of the gum. BF gum at 4% w/v exhibited good binding properties comparable to that of other concentrations of the gum with satisfactory values like Hardness (5.3±0.1-5.4±0.7kg/cm2), Friability (0.42±0.45%w/v), Weight variation (204±1.4-209±1.4), Content uniformity (187.9±0.21-188.3±0.07) which was good compared to other tablets prepared with 2% and 6% gum concentration. Hence, Butea frondosa gum with 4% can be used as a binding agent in the preparation of oral tablets.

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PHSIC-13

Determination of total starch excipient in pharmaceutical dosage form by UV-Visible Spectrophotometry

[1] Dr. Premakumari K.B

[1] College of Pharmaceutical Sciences, Dayananda Sagar University, Bangalore, India.

PRIP INNOVATE -7 Scientific Achievements in Nano Drug Targeting
Pulla Reddy Institute of Pharmacy
June 2022

Abstract

Excipients play a vital role in ensuring that a pharmaceutical formulation meets the standards established by regulatory authorities. Excipients are included in dosage forms to aid manufacture, administration or absorption. Starches are the most widely used excipients in dosage form development. For this study, the UV-Visible Spectrophotometric method was developed and validated for the determination of total starch at a wavelength 620nm. The calibration curve presents linear graph in the concentration range of 68 to 401.33 µg/ml with a correlation coefficient 0.99 while precision and accuracy expressed as RSD were within the acceptance criteria. LOD and LOQ was found to be 33.55 µg/ml and 68.0 µg/ml. Keywords: UV-Visible Spectrophotometer, Maize starch, Excipient and Linearity.

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PHSIC-14

Design and Evaluation of Transferosomal Gel Containing Efinaconazole for Management of Onychomycosis

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PRIP INNOVATE -7 Scientific Achievements in Nano Drug Targeting
JOURNAL OF PHARMACEUTICAL NEGATIVE RESULTS
DOI:10.47750/pnr.2022.13.S09.270, Volume13, Issue9, 2022

Abstract

Efinaconazole is an antifungal drug used to inhibit production of ergo sterol which is the key component of fungal cell membrane. The aim of this study was to formulate Efinaconazole loaded transfersomal gel effective for topical delivery. Initially Efinaconazole loaded transfersomal were prepared by thin film hydration technique and characterized. The best batch of Transferosomal was incorporated into carbopol gel. The drug loaded transfersomal gels were characterized. The pH, viscosity and spread ability were found to be optimum for all formulations. The in-vitro release was controlled over a period of 24 hrs. and release kinetics followed Higuchi kinetic model. The particle size of best formulation was 149.6 nm with -18.1 mV zeta potential. The surface morphology revealed that the transferosomes were found to be spherical in shape. Thus, Transfersomes
proved potential for topical delivery of antifungal drug.

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PHSIC-15

Drug Development: Emerging Technologies: Synthesis, Molecular Docking and Biological evaluation of N-Substituted Benzothiazole Derivatives as Potent DHFR inhibitors for Anti-breast cancer activity

[1] Dr. Gnana Ruba Priya

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KRUPACON PHARMA, Krupanidhi College of pharmacy
2021

Abstract

Background: Breast Cancer is a major health problem for women around the world. Many Benzothiazole derivatives were reported to have potent anticancer activity.
Aims: Our aim in this work is the design and discovery of potent Dihydro folate reductase receptor (DHFR) inhibitors with anti-breast cancer activity containing N-(Substituted 1, 3-benzothiazol-2-yl)-3-(3,5-dimethylphenyl)-3,4-dihydroquinazolin-4-imines pharmacophore.
1. Method: A novel series of hybrid analogues of N-(Substituted 1,3-benzothiazol-2-yl)-3-(3,5-dimethylphenyl)-3,4-dihydroquinazolin-4-imine Derivatives were designed and developed via one-pot synthesis using Sodium anhydrous sulphate as a catalyst. Entire compounds were evaluated for their anticancer activity against MCF-7 (breast cancer), and MCF 12A (normal epithelial breast cell line) using an MTT assay, where they showed the highest inhibitory activity against MCF-7. The molecules were also found to be non-toxic to MCF 12A cells.
N-(1, 3-benzothiazol-2-yl)-3-(3, 5-dimethylphenyl)-3, 4-dihydroquinazolin-4-imine
2. Result: Most of the tested compounds show mild to potent anticytotoxic activity against DHFR Inhibitor.
Keywords: Breast cancer, DHFR, quinazolinone, MC7 cellines, synthesis

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PHSIC-16

Supra-Spinal Neuro-Impulsive Flux Detection Device for Tracing Organ Dysfunction & Therapeutic Efficiency Status

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World Conference on Pharma Industry and Medical Devices
Institute for Engineering Research and Publication
Volume 65, Issue 03, July 2022

Abstract

This designed medical gadget has the ability to trace the action potential (AP) variation over the complete spinal vertebral cord. Due to different locative organ failure and follow-up therapeutic activity, impulsive fluctuation is created across each spinal segment. The device, which is electronically embedded with logistic sensor electrodes and glides over a carbon composite strip conveyor from the C1 (first cervical) to the coccyx (terminal) and vice versa, calibrates the remarked AP through (-emV/emf) during expected organ dysfunction and/or drug administration under therapy. The mechanism praised is the neural electrical flux catching techniques amplifying the AP through a detector device. That's how specifically it's traced lumber region and the path physiology of same was perfectly determined through specified interference generated deflected readings. Thus, signifies the detection of neural (ANS) level and its abnormal status in gastrointestinal disorders and after drug therapy. This challenges to confirm, that cross-checking through MRI, leads to duodenum diverticulitis.

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PHSNC-01

HEPATOPROTECTIVE AND ANTIOXIDANT ACTIVITY OF AMPELOCISSUS INDICA AGAINST CCL4 INDUCED HEPATIC DAMAGE IN ALBINO RATS

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Advanced training program in Phytochemistry, herbal technology and synthetic chemistry
Amity institute of herbal research and Phytochemistry
Journal of Cardiovascular Disease Research
ISSN: 0975-3583, 0976-2833 VOL 12, ISSUE 06, 2021

Abstract

The ethno botanical survey revealed that Ampelocissus indica (AI) has many reported traditional uses such as jaundice, pustules, carbuncles, blood purifier, diuretics, etc. The main purpose of this research is to evaluate the hepatoprotective activity of methanolic extract of Ampelocissus indica (MEAI) in CCl4 induced hepatotoxicity in rats. The protective effect of MEAI was evaluated by measuring biochemical parameters such as ALP, SGOT, SGPT, and total bilirubin. Total phenolic content, in-vitro antioxidant activity and GC-MS analysis of MEAI were conducted. Further antioxidant activity of MEAI was determined by lipid peroxidation (LPO), glutathione (GSH), superoxide dismutase (SOD), and catalase (CAT) levels in the supernatant of liver homogenate. MEAI at doses,250mg/kg and 500mg/kg produced significant ($P<0.05$) hepatoprotection by decreasing the levels of serum enzymes, bilirubin, and lipid peroxidation, while they significantly increased the levels of glutathione (GSH), superoxide dismutase (SOD) and catalase (CAT) in a dose-dependent manner. The hepatoprotective and antioxidant activity of MEAI was comparable to that of the standard drug Silymarin. Histopathological studies showed good recovery in a dose-dependent manner. GC-MS analysis showed that MEAI contains 10 different types of volatile constituents and among these Hexadecanoic acid ethyl ester is a major constituent. Antioxidant and anti-inflammatory activity of Hexadecanoic acid ethyl ester has been reported. Hence the hepatoprotective activity of MEAI may be due to the presence of Hexadecanoic acid ethyl ester.

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PHSNC-02

The hypoglycemic and Hypolipidemic effect of 5-naphthalidin-2, 4 thiazolidinedione derivatives in alloxan induced type ii diabetic model

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CONSORTIUM ON MODERN TOOLS AND TECHNIQUES FOR DRUG DESIGN AND DISCOVERY – A PARADIGM SHIFT
Research Journal of Pharmacy and Technology,
ISSN: 0974-3618, Volume: 15, Issue: 4, 2022

Abstract

Objective

The present study was undertaken to study antidiabetic and antihyperlipidemic potentials of 5-naphthalidin-2, 4-thiazolidinediones derivatives and its interaction with rosiglitazone in alloxan-induced diabetic rats.

Methods

Diabetes was induced in male Swiss albino rats by single intramuscular injection of alloxan (0.15 mg/Kg i.m) and NIDDM-rats received 4b, 4c or 4d (36 mg/Kg, p.o.). Fasting blood glucose (FBG) levels were measured by glucose-oxidase & peroxidase reactive strips. Serum biochemical parameters such as total cholesterol (TC), triglycerides (TG), very low density lipoprotein (VLDL), low density lipoprotein (LDL) and high density lipoprotein (HDL) cholesterol were estimated. The statistical analysis of results was carried out using Student t-test and one-way analysis (ANOVA) followed by Duncan's Multiple Range Test (DMRT).

Results

The results revealed that 4b, 4c and 4d showed promising results by lowering the blood glucose. Moreover, 4c compound displayed high efficiency for lowering lipid profiles compared to others.

Conclusion

These results suggest that taking 5- naphthalidin-2, 4 TZD orally twice/day is a valuable treatment for Non-insulin dependent diabetes mellitus (NIDDM) and Hypolipidemic agent. They exert their effects through altering regulation genes in glucose and lipid metabolisms in diabetic rats.

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PHSNC-03

Formulation, optimization and characterization of pH sensitive quantum dot nanoparticles for lung cancer

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CONSORTIUM ON MODERN TOOLS AND TECHNIQUES FOR DRUG DESIGN AND DISCOVERY – A PARADIGM SHIFT
Research Journal of Pharmacy and Technology,
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Abstract

The current research aimed to formulate Gefitinib loaded zinc oxide quantum dot nanoparticles (GEF-ZnO-QDNPs) by nan precipitation technique. GEF-ZnO-QDNPs were prepared to lengthen circulation time in vivo and thereby enhance targeted absorption of drug. Taguchi model was chosen for optimization and the effect polymer concentration, zinc Sulphate concentration, stirring speed and stirring time at three levels was studied on drug loading and particle size. The nanoparticles were characterized for Fourier transform infra- red spectroscopy which showed no interaction between drug and excipients used. The drug loading was 28-32% for optimized formulation. GEF-ZnO-QDNPs had mean particle size range of 24.2-28.0 nm with negative surface charge indicating high degree of stability. The particles were found to be fluorescent under UV exposure and Quantum Yield (Φ) was found to be 0.36. The % drug release at the end of 24 hrs., was found to be 19.6% using phosphate buffer pH 7.4, whereas, 76.8% and 92.6% drug was released using buffer of pH 6.0 and 5.0 Respectively which is the pH of tumor environment. This shows that the release was pH dependent. The drug release kinetics suggested Higuchi model as possible release mechanism. The results obtained, concludes that GEF-ZnO-QDNPs can be one of the promising pH dependent drug delivery system for targeting lung cancer.

Keywords: Gefitinib, zinc oxide, quantum dots, nan precipitation, nanoparticles

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PHSNC-04

ANTIFUNGAL ACTIVITY OF TREMA ORIENTALIS BY IN-VITRO METHOD

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WORLD JOURNAL OF PHARMACY AND PHARMACEUTICAL SCIENCES
ISSN 2278 – 4357, Volume 11, Issue 6, Pages 1732-1736, May 2022

Abstract

Medicinal plants are also called medicinal herbs. Plants synthesize hundreds of chemical compounds for functions including defense against fungi, diseases and herbivorous mammals. Fungal infections may be defined as primary or opportunistic. They can be localized i.e. limited to one region. E.g. localized in a part of the skin, mouth or vaginal, or be invasive i.e. spread to multiple sites. Skin and nail bed infections are also described as 'superficial' while invasive and systemic infections are referred to as 'deep infections'. Antifungal drugs are primarily used to combat infections in immune compromised individuals and post-transplantation. Three classes of antifungals currently in clinical use are polygenes, triazoles, and echinocandins. T. orientalis is a species of flowering tree in the hemp family, Cannabaceae. It is known by many common names, including charcoal-tree, Indian charcoaltree, pigeon wood, Orientaltrema, and in Hawaii, where it has become naturalized, gunpowder tree, or nalita. Method: In-vitro screening by agar diffusion method was used to evaluate the antifungal effect of plant extract of T. orientalis. The zone of inhibition was measured using Penicillium spp. Results: The results of in-vitro antifungal activity of chloroform extract of T. orientalis was determined against Penicillium spp, at different concentrations and zone of inhibition was found as clear function of concentrations. As the concentrations goes increase, the result of drug concentration increases simultaneously. The chloroform extract of T. orientalis showed better antifungal activity against Penicillium spp, and zone of inhibition was measured. Conclusion: The result obtained in this study indicates that T. orientalis possess antifungal activity and indicates that it has potential as an effective herbal remedy for fungal infection.

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PHSNC-05

Formulation and Evaluation of Imatinib Mesylate loaded nanoparticles for brain tumour targeting

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Department of Pharmaceutics, College of Pharmaceutical Sciences, DSU, Bengaluru -560078

JSS College of Pharmacy, Mysuru, Pharmaceutical Sciences 2022

Abstract

Nanoparticles represent the novel and most versatile class of the delivery systems which Provide means to deliver the therapeutically active agents to a targeted site in a controlled way and also as diagnostic tools. Recently, a number of remarkable applications from the field of nanomedicine (biological agents, chemotherapeutic agents, immunotherapeutic agents and others). For any disease, cell membrane's lipid components, receptors, and the proteins or antigens present on the surfaces of the cell remain as the active and crucial targets in the body. Currently, nanotechnology-mediated delivery of the active moieties are mostly targeted towards the cancer. The aim of the present study was to develop bovine serum albumin nanoparticles to target the delivery of Imatinib Mesylate to the brain cancer with polysorbate 80 as a coating agent. The concentration of bovine serum albumin was varied to formulate four different batches of the IMB loaded BSA nanoparticles. Amongst the four batches, F2 was found to be optimal with the average size of 190 nm, zeta potential of -31.1 mV and drug loading of 24.16% along with the yield of 98%. The in vitro drug release profile showed that the release of Imatinib Mesylate was sustained to a time period of 24 h. The batch F2 was then coated with the surfactant polysorbate 80 to enable the brain targeted delivery of the cargo. The in vitro release of IMB from the polysorbate 80 coated nanoparticles was found to be further more sustained when compared to the F2 formulation at the end of 24 h. The Release kinetics correlation coefficients showed that the r2 values was maximum for the Higuchi model indicating that the release of Imatinib from the BSA nanoparticles was diffusion controlled. The obtained n values from the Korsmeyer Peppas equation was 0.441 for F2 formulation indicating that the release mechanism was Fickian mediated.

Keywords: Bovine serum albumin nanoparticle, Imatinib Mesylate, polysorbate 80, brain Cancer.

BOOK CHAPTERS

PHSIB-01

Microparticulate Drug Delivery System for Crohn's Disease

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Medicinal Plants, Intech open Publisher
DOI: 10.5772/intechopen.105088
ISSN 978-1-80356-033-5, Pages 1-19, 2022

Abstract

Crohn's malady is an interminable idiopathic fiery inside illness condition portrayed by skip injuries and trans mural aggravation which will influence the whole GIT from oral cavity to butt. Introducing side effects are regularly factor and may incorporate the runs, stomach torment, weight reduction, sickness, spewing furthermore, in explicit cases such as cold, feverish conditions. Primary malady phenotypes: illness phenotype, up to third of Patients will create perianal contribution of their sickness phenotype, determination is made with endoscopic as well as radiologic discoveries. Sickness the board is with pharmacologic treatment which is resolved on premise of seriousness of ailment. In spite of the fact that objective of the board is to control aggravation and actuate clinical abatement with pharmacologic treatment most patients require medical procedure f or their infection. Sadly, medical procedure isn't corrective and patients will require progressing treatment much after medical procedure. Crohn's sickness and drugs used to treat the malady procedure; essential consideration doctors assume a significant job in improving the safeguard care the board to decrease danger of entanglements. This article portrays about brief outline of disease, management of disease, diagnosis, treatment mostly multi-particulate frameworks for site explicit medication conveyance to colon in continued and controlled way so tranquilize related reactions by decreasing measurements recurrence can be limited.

Keywords: Crohn's disease, colon drug delivery system, microspheres as medication transporters, stricturoplasty, role of polysaccharides

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PHSIB-02

Green Extraction Techniques for Phytoconstituents from Natural Products

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3

Medicinal Plants, Intech open Publisher
DOI: 10.5772/intechopen.105088
ISSN 978-1-80356-033-5, Pages 1-19, 2022

Abstract

The use of green extraction techniques for extracting Phytoconstituents from natural sources minimizes the amount of solvents needed and the amount of waste generated during the extraction process. Traditional extraction processes generate a lot of solvent waste, which causes a lot of environmental and health issues. Furthermore, by employing automated modern processes, exposure to solvents and vapor is reduced. Green extraction is based on the analytical procedures that employ less energy, allow the use of different solvents and sustainable natural products, and provide a safe and superior extract/product. According to a life cycle analysis of waste created in Active Pharmaceutical Ingredient (API) manufacturing plants, solvent-related waste accounts for 80% of the waste. In case other pharmaceutical companies generate equal amounts of solvent waste, addressing solvent selection, use, recovery, and disposal will go a long way toward tackling the issue. Solvent considerations will feature regularly in the case histories of the drug development process. Natural extracts comprise Phytoconstituents such as proteins, lipids and oils, dietary fibers, carbohydrates, antioxidants, essential oils and fragrances, and colors, and can be found in wide variety of plant materials. In this chapter, we will discuss principles, techniques, and solvents used for green extraction techniques of Phytoconstituents.

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PHSIB-03

Recent Advances in Targeted Nanocarriers Based Drug Delivery

1 Dr. Dilpreet Singh, 2 Mr. Karan Razdan, 3 Dr. Prashanth Tiwari, 4 Mr. Kuldeep Singh

[1] Associate Professor in ISF College of Pharmacy, Moga.
[2, 4] Ph.D research Scholar at University Institute of Pharmaceutical Sciences, Punjab University
[3] College of Pharmaceutical Sciences, Dayananda Sagar University, Bangalore, India

Orange books publications
ISSN 9789390837489, Pages 1-278, 2021

Abstract

Drug Delivery Systems examines the current state of the field within pharmaceutical science and concisely explains the history of drug delivery systems, including key developments. This book covers the fundamentals, oral taste masking, and practical applications of drug delivery. In this book, almost all chapters from the previous are retained and updated and several new chapters added to make a more complete resource and reference. Helps readers understand progress in drug delivery research and applications Updates and expands coverage to reflect advances in materials for delivery vehicles, drug delivery approaches, and therapeutics Covers recent developments including transdermal and ocular delivery, receptor mediate drug delivery applications Adds new chapters on nanoparticles, liposomes, excipients as modulators and transdermal delivery patches.

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PHSIB-04

Cellular and Molecular Pharmacology

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Nirali Publication
ISSN 9789354511868, Pages 1-257, 2021

Abstract

Study of pharmacology of drugs is an integral part of drug discovery process. Both in vivo Studies and in vitro studies are done to study not only the pharmacological action of a drug but also its mechanism of action. For this, a fundamental knowledge on the structure and functions of cellular components and interaction of these components with drugs is required. The branch of Pharmacology which provides this fundamental knowledge is called Cellular and Molecular Pharmacology. Pharmacy Council of India (PCI) has recently introduced a paper called Cellular and Molecular Pharmacology in M. Pharm. (Pharmacology) syllabus so that the students can apply their knowledge in drug discovery process. To study this paper the student has to refer a number of books. There is no book available which covers the entire syllabus. This book presents the entire syllabus of Cellular and Molecular Pharmacology (MPL 104T) in a concise way for the benefit of M. Pharm. (Pharmacology) students. This book can also be used as a reference for the students of 8th Semester B. Pharm. for the elective subject 'Cell and Molecular Biology' (BP 808ET). The book is divided into 5 units. Unit 1 deals with cell biology. Unit 2 deals with cell signaling. Unit 3 deals with tools and techniques used in Molecular Pharmacology. Unit 4 deals with Genomics and Proteomics followed by Immunotherapeutic. Unit 5 deals with cell culture with a chapter on biosimilars at the end. The units and chapters are sequenced as per the PCI syllabus without any deviation for the convenience of students. There are several multiple-choice questions (MCQs) and subjective questions at the end of each unit to help the students prepare themselves for the university examinations trough self-evaluation. Cellular and Molecular Pharmacology is a growing science. Many recent advances come up every day. So, in addition to this book, students are advised to go through recent issues of standard journals for any update. We will try to update the book with recent advances in coming editions. We welcome positive criticism from the readers of this book to improve its content. Your valuable suggestions will strengthen this book in its future editions.

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PHSIB-05

Targeted Nanocarriers for futuristic Drug Delivery

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Notion-Press
ISSN 9781639742950, Pages 1-210, 2021

Abstract

Drug Delivery Systems examines the current state of the field within pharmaceutical science and concisely explains the history of drug delivery systems, including key developments. This book covers the fundamentals, oral taste masking, and practical Applications of drug delivery. In this book, almost all chapters from the previous are retained and updated and several new chapters added to make a more complete resource and reference. Helps readers understand progress in drug delivery research and applications. Updates and expands coverage to reflect advances in materials for delivery vehicles, drug delivery approaches, and therapeutics. Covers recent developments including transdermal and ocular delivery, receptor mediate drug delivery applications. Adds new chapters on nanoparticles, liposomes, excipients as modulators and transdermal delivery patches.

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PHSIB-06

Phytosome for Targeted Delivery of Natural Compounds: Improving Efficacy, Bioavailability, and Delivery across BBB for the Treatment of Alzheimer's disease

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Bentham Science
BMS-CNANOM-2021-23, Pages 90-100, 2022

Abstract

Alzheimer's dementia (AD) is a progressive neurological disorder. Recent studies showed that AD is the most common cause of dementia. There are several symptomatic treatments available to counterbalance the neurotransmitter disturbance. Currently, cholinesterase inhibitors are available for the treatment of mild to moderate AD. In addition to that, meantime (an N-methyl-D-aspartate receptor non-competitive antagonist) is also available for moderate to severe AD. Poor blood-brain barrier permeability is a limitation of existing drugs. These drugs may slow the disease progression, but there are chances of reoccurrence of the disease. Several medicinal plants such as Jasmine sambac, Rosmarinus officinalis, Eucalyptus globules, Nigella sativa, and Acorus gramineus are reported to have neuroprotective effects. Salvia officinalishas cholinergic binding properties. Ginger root extract may prevent behavioral dysfunction in AD. Extensive research on these plants should be carried out. Drug delivery systems such as lipid nanoparticles, polymer nanoparticles, nanomicelles, nano-gels, liposomes, Phytosome, etc., could significantly improve the pharmacokinetics, stability, and efficacy and reduce the side effects. Phytosome have the advantage over other drug delivery systems to selectively target the drugs into the brain. In contrast to traditional approaches, polar Phytoconstituents loaded Phytosome are more bioavailable on the site of brain tissue, as they can easily go for systemic circulation crossing the Blood-Brain Barrier (BBB). Phytosome have a low hazard profile as toxicological outcomes are negligible and assure duration of action at a low risk profile due to upgraded absorption of the active constituents. In addition to this, the improved pharmacodynamics properties of Phytosome make them suitable for the treatment of neurological disorders.

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PHSIB-07

Bioavailability, and Delivery across BBB for the Treatment of Alzheimer's disease

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Frontiers in Clinical Drug Research- HIV
DOI: 10.2174/9789811464454120501
ISSN 978-981-14-6444-7, Pages 95-135, 2021

Abstract

In HIV-1 therapies, dual-drug and triple-drug combinations of antiretroviral therapy (ART) have radically improved the prognosis of HIV-1 infected people. The clinical usage of drug combinations has established high efficacy with constant viral load repression, saving T cells, and low adverse drug reactions compared to mono drug therapy treatment and thus has drawn intensive attention from researchers and pharmaceutical enterprises for HIV treatment and prevention. The switching of antiretroviral regimens from one combination to another is relatively easier for patients experiencing adverse effects or drug toxicities or requesting modification or simplification of their regimen. In addition, the choice of the combination regimen reduces viral resistance drastically when compared to the mono drug regimen. Several two-and three-drug complete regimens like Delstrigo, Complera, Stribild, Dovato, Juluca, etc., were approved by the U.S. Food and Drug Administration (FDA) for the treatment of HIV-1 infection in adults and children. Multiclass combination drug regimens, which include varied classes of antiretroviral agents that work by interrupting the two or more enzymes required for the life cycle of HIV replication, have proved effective in the treatment of HIV infections, resulting in the approval of novel combination regimens for antiretroviral therapy. For complete virologic inhibition, antiretroviral combination regimens should include at least two or preferably three active drugs from two or more classes of nucleoside/nucleotide reverse transcriptase inhibitors (NRTIs or NtRTIs), Protease inhibitors (PIs), and Integrase Strand Transfer Inhibitors (INSTIs). At present, several researchers are focused on developing newer, long-acting formulations of different classes of mono-and dual antiretroviral drugs. Recently, the first and only complete long-acting regimen of extended-release injectable suspension of cabotegravir and rilpivirine by intramuscular gluteal was approved once monthly for HIV treatment by the FDA. Several antiretroviral drugs are under investigation in preclinical and clinical studies through various formulations, such as implants, injectables, intravenous, and subcutaneous. This book chapter aims to summarize the currently available multiple drug combinations information and the development of long-acting antiretroviral drugs for HIV treatment and prevention in the last two decades.

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PHSIB-08

Importance of In-silico tools in Anticancer Drug Discovery from Nature

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Alternative Remedies and Natural products for Cancer Therapy: An Integrative Approach
ISSN 2468-0397, Pages 221-235, 2022

Abstract

Currently, cancer has become one of the major dreadful diseases threatening human health. Natural plant sources play vital role in development of several anti-cancer drugs such as Vincristine, Vinblastine, Vinorelbine, Docetaxel, Paclitaxel, Camptothecin, Etoposide, Teniposide etc. Various chemotherapies fail due to adverse reactions, target specificity and drug resistance of some types of drugs. Researchers attentive in developing drugs that overcome the problems stated above by using natural compounds, which may affect multiple targets with reduced adverse effects and which are effective against several cancer types. Emerging a new drug is a highly complex, expensive and time-consuming endeavor. In traditional drug discovery process ending with a new medicine ready for the market can take up to 15 years and costs more than one billion USD. Fortunately, this situation has changed with the arrival of novel approaches recently. Many new technologies and methodologies have been developed to increase the efficiency of the drug discovery process, and computational methodologies utilize the existing data to generate knowledge that affords valuable understanding for addressing current complications and guiding the further research and development of new natural-derived drugs. Consequently, the application of In-silico techniques and optimization algorithms in drug discovery ventures can provide versatile solution, to understand the molecular-level interactions of chemical constituents, to identify the hit, lead optimization techniques such as ligand-based or structure-based drug design are widely used in many discovery efforts. In this chapter, we first introduce the concept of CADD, In-silico tools etc. In secondly, we describe how these virtual screening has been successfully applied. In addition, we review the concept of natural products anticancer therapies and present some of the most representative examples of molecules identified by its means.

Keywords: In-silico tools, anticancer, drug discovery, cancer, targets, PASS Tool, ADME Tool, virtual screening, ligand, molecular docking, drug likeness, Natural anticancer molecule, Bioinformatics, lead optimization. Phytochemical properties. CADD, Molecular dynamics.

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PHSIB-09

Evaluation of Alpha Amylase & Pancreatic Lipase Inhibitory Activity in Different Extracts of Gymnema sylvestre

[1] **Maida Engels,** [2] **Vanitha S,** [3] **Gowri Narayani,** [4] **Gnana Ruba Priya**

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4 College of Pharmaceutical Sciences, Dayananda Sagar University, Bangalore, India.

Alternative Remedies and Natural products for Cancer Therapy: An Integrative Approach
ISSN 2468-0397, Pages 271-285, 2022

Abstract

Purpose: One of the major health concerns that escalating in alarming rate worldwide is diabetes mellitus. It is a life threatening disorder as it leads to cascade of illness such as obesity, cardiovascular disorders, stroke, organ shut down etc. Gymnema sylvestre also known as insulin plant have been widely used to control diabetes. This study aims to explore the amylase and pancreatic lipase inhibitory activity in different extracts of Gymnema sylvestre. Methods: Extracts of Gymnema sylvestre were prepared using cold maceration and reflux method using solvents such as water, methanol, ether and chloroform. The cold and hot extracts were tested for alpha amylase and pancreatic lipase inhibitory activity to assess the anti-diabetic and anti-obesity properties respectively. Results: Photochemical analysis revealed the presence of alkaloids, cardiac glycosides, tannins, saponins, phenols and flavonoids. The extracts also showed alpha amylase inhibitory activity. Conclusion: The maximum alpha amylase inhibitory activity was exhibited by methanol extract when compared to other extracts.

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COLLEGE OF PHYSIOTHERAPY
SCHOOL OF ALLIED HEALTH SCIENCES

Publication Summary

International Journal	**2**	**(PHTIJ-01 – PHTIJ-02)**
National Journal	**2**	**(PHTNJ-01 – PHTNJ-02)**
International Conference	**5**	**(PHTIC-01 – PHTIC-05)**
National Conference	**1**	**(PHTNC-01)**

COLLEGE OF PHYSIOTHERAPY
SCHOOL OF ALLIED HEALTH SCIENCES
INTERNATIONAL JOURNAL PUBLICATION

PHTIJ-01

TSUNAMI OF EXERCISETHERAPIES FOR COVID-19: A SYSTEMATIC REVIEW AND METANALYSIS OF QUALITATIVE AND QUANTITATIVE IMPROVEMENT ON RESPIRATORY PARAMETERS

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International Journal of Creative Research and Thoughts, Vol 09, Issue 09, Pages b562-b574, ISBN: 2320-2882
September 2021

Abstract

Background: The results of Physiotherapeutic interventions for COVID-19 are less vocal. Also, few studies which have been published have not received the recognition which fall under the category of Physiotherapy. Hence, this systematic review is taken up to derive the significant strategy to deal the current deadliest pandemic. Objective: To determine the relative effectiveness of Physiotherapeutic regimens on qualitative and quantitative respiratory parameters and compare the qualitative and quantitative measures of the well published physiotherapeutic regimens for COVID-19. Method: PRISMA was followed for selection of articles for the study. Experimental studies were searched in Pubmed, Google scholar and Cochrane Library using related keywords and advanced option from 2019 to 2021. PEDro scoring was used to assess the Quality of research. Review manager software 5.3 was used to assess Risk of bias and homogeneity. The study followed PRISMA guidelines to the review and Forest plot was developed for the assessment of effectiveness of the treatment. A total of 38 trials were included in the study. Main results: The schedule of the treatment varied greatly depending on the severity of the subject. Subgroup Analysis performed on qualitative and quantitative improvement of COVID after Exercise therapy regimen showed significant statistical difference. Conclusion: The result of the present study shows strong evidence to support that Exercise therapy regimen works efficiently when used as rehabilitation purpose in COVID-19 subjects by improving by qualitative and quantitative parameters.

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PHTIJ-02

Survey of joint range of motion of hockey and archery players in Punjab: An observational study

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International journal of physical education, sports and health, Vol 09, Issue 01, Pages 164-167, ISBN: 2394-1698

September 2021

Abstract

Background: Range of motion around the joint is the flexibility, which is important for sports performance and injury prevention. Normative data are obtained from a reference population that establishes the baseline distribution for a measurement against which the assessed measurement can be compared. However, studies on normative joint range of motion in India are not widely available.

Objective: To obtain the normative data of shoulder and elbow joint range of motion in archery and hockey players of age group 11-40 years of Punjab.

Method: A sample of 402 players consisting of 210 hockey (92 males and 118 females) and 190 archery (102 males and 90 females) players was selected through convenient sampling. Joint range of motion measurement was done using a universal goniometer.

Result: The normative data of shoulder joint range of motion of hockey players for flexion, extension, abduction, internal rotation, and external rotation are (177-178), (76-77), (176-177), (73) and (84-85) in degrees, respectively. The corresponding values for archery players are (175-177), (74-75), (174-175), (68-86), and (86-87) in degrees, respectively. Conclusion: The archery players demonstrated slightly larger shoulder ROM in comparison to hockey players. The hockey players demonstrated higher elbow ROM in comparison to archery players.

Key words: Normative data, joint range of motion, archery, hockey.

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NATIONAL JOURNAL PUBLICATION

PHTNJ-01

Effect of Yogic Breathing Manoeuvre on Pulmonary Function and VO2 Max in Male Football Players

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Journal of Clinical and Diagnostic Research, Vol 16, Issue 5, Pages 1-4, ISBN: 0973-709X
DOI: https://doi.org/10.7860/JCDR/2022/52122.16346
May 2022

Abstract

Introduction: Yoga has proven to improve spiritual as well as psychophysiological behavior of a human being. This helps them to perform better in their game improving abdominal strength and gives benefits to every player's need. It also helps improve both physical and mental health.

Aim: To analyze the effects of yogic breathing Maneuver on pulmonary functions and Maximal Aerobic Capacity (VO2 max) in male football players.

Materials and Methods: This quasi-experimental study was conducted in Department of Physiotherapy, School of Physiotherapy at D.Y. Patil University, Navi Mumbai, Maharashtra, India, from February 2019 to February 2020. The study included 60 male players within the age group from 18-25 years with at least two years of experience. They were divided into two groups- group A was experimental group and group B was control group. Group A performed pranayama along with routine football specific training and group B performed only football specific training for six weeks. Pre and post values for pulmonary functions and VO2 max were taken by Pulmonary Function Test (PFT) and Queens College step test as outcome measures. The data was analysed using independent t-test. Results: Mean age of group A and group B was 19.7±1.69 years and 20.6±1.89 years, respectively. After doing yogic breathing maneuvers for six weeks, there was a significant (p-value <0.001) improvement in pulmonary function and VO2 max values in male football players for experimental group as compared to control group. The mean difference for Forced Expiratory Volume in 1 second (FEV1) was 0.3% and 0.13% and for VO2 max was 0.71 mL/kg/min and 2.71 mL/kg/min for control and experimental group, respectively.

Conclusion: Implementing regular practice of yogic breathing Manoeuvre along with football training improves pulmonary functions of the football players.

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PHTNJ-02

Effect of Mulligan's Pain Release Phenomenon on TED in Subjects with Subacute Lateral Epicondylitis

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Journal of Complementary and Alternative Medical Research - international, Vol 16, Issue 04, Pages 59-70, ISBN: 2456-6276, November 2021
DOI: 10.9734/jocamr/2021/v16i430298

Abstract

Introduction: Lateral Epicondylitis is an overuse syndrome usually seen in people who perform repeated extension and supination movement of elbow against resistance. Tissue Extensibility Dysfunction (TED) is a term which suggests apparent tightness of the muscle which has occurred due to spasm, lactic acid accumulation, and inflammation or over use. Need of The Study: Many Studies involving manual therapy with different techniques have already demonstrated manual therapy is effective in reducing pain in subjects with lateral Epicondylitis. Very few studies have focused on Mulligan's Pain Release Phenomenon (PRP) which is established to reduce pain and improving range of motion. Also, there is dirth in literature related to tissue extensibility dysfunction occurring in Subacute variant of tennis elbow and the effect of PRP on TED. Hence this study is been undertaken. Methodology: A total of 50 sample size was randomized into 25 per group. Group A consisted of Conventional therapy and Group B consisted of Conventional therapy with Mulligan's PRP. Outcome measures were noted pre therapy and on the 7th day that is post therapy and results were tabulated. Results: The results declare that pain (0.05 and 0.001), grip strength (0.001, 0.001) and disability (0.001, 0.001) showed significant improvement in the scores in both the group whereas muscle stiffness (0.341 and 0.001) significantly improved only in Group B. Conclusion: Mulligan's Pain Release Phenomenon technique can be used to treat Subacute tennis elbow effectively and is known to reduce the muscle stiffness along with pain and disability and improving strength.

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INTERNATIONAL CONFERENCE PUBLICATION

PHTIC-01

Effect of Yoga in Neurorehabilitation in People with Neurological Disorders: A Comprehensive Review of Systematic Reviews

1 Dr. Humair Ahmed B.M

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Mangalore physiocon, Vol 09, Issue 01, Pages 164-167, ISBN: 2394-1698
September 2021

Abstract

Effect Of Yoga in Neurorehabilitation in People with Neurological Disorders: A Comprehensive Review of Systematic Reviews Dr. Humair Ahmed B.M, Assist. Prof. Dept. Of Neurophysiotherpy, College of physiotherapy, Dayananda Sagar university, Bangalore

Objective: Application of yoga is already established and being practiced in condition like cardiovascular, respiratory, orthopedics and psychological disorders as an alternative/complementary therapy. Although we have evidence suggesting the application of yoga is available in many neurological conditions, yet there is lack of evidence suggesting the applications of yoga in neurological conditions in highest hierarchy of evidence in Neurorehabilitation. Thus, the aim of the study is to summarize the applications of yoga in neurological conditions in various neurological disorders.

Methods: Systematic search was done using pub med, science direct, Google scholar, springer's link and Cochrane's review. The literature search was done from recent evidence from 2008 to 2022. The keywords used were YOGA, Neurorehabilitation, neurological disorders, and physiotherapy. Database was searched for systematic reviews and RCTs. The articles selected includes neurological and yoga as the complementary intervention along with or without conventional physiotherapy.

Results: 15 reviews in this study selected based on the inclusion and exclusion criteria. 11 studies reported significant improvement in various outcomes such as, QOL, Motor outcomes, Disability outcomes, functional outcomes and balance outcomes and psychological outcomes.

Conclusion: This review suggested that the yoga and mindful exercises were beneficial to patients with neurological condition by improving different heath related outcomes. Yoga can be a useful tool in integrating Neurorehabilitation.

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PHTIC-02

Association between manual dexterity and domain-specific cognition in subjects with diabetic polyneuropathy

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Asian Pac. J. Health Sci,
DOI: 10.21276/apjhs.2022.9.4.66, ISSN: 2349-0659
2022

Abstract

Introduction: Type 2 Diabetes is a global concern resulting from longstanding hyperglycemia. One of its major complications is diabetic polyneuropathy (DPN). This study aimed to understand if any relationship exists between manual dexterity and domains of cognition in DPN patients. Objectives: To assess manual dexterity and domain specific cognition and to evaluate the association between manual dexterity measure and domain specific cognition score in subjects with DPN. Methods: 64 subjects both male and female (35-75 years) diagnosed with DPN were included. Nine Hole Peg Test for assessing manual dexterity and Montreal Cognitive assessment for assessing domain specific cognition are used as outcome measures. Results: A statistically significant but weak correlation between dexterity and Forward Digit Span (r=0.310) (p=0.013) was found. Delayed recall domain (r=-0.97) (p=0.44) showed inverse correlation with dominant hand dexterity. Statistically significant but weak correlation was found between non-dominant hand dexterity and the domains of Forward Digit Span(r=0.33) (p=0.007), Backward Digit Span (r=0.266) (p=0.034), and Sentence Repetition (r=0.243) (p=0.053). Majority of patients demonstrated intact cognition in Naming Domain (76.6%) (N=49), Forward Digit Span (64.1%) (N=41), Backward Digit Span (75%) (N=48), Abstraction Domain (98.4%) (N= 63) and Orientation Domain (64.1%) (N=41). Conclusions: The results imply that all domains of cognition are not affected. There was no significant association between manual dexterity of dominant and non-dominant hand indicating that dexterity may be independent of cognitive domain in patients with DPN. Keywords: Cognition; Diabetic Mellitus; DPN; Hand Dexterity; Hand function

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PHTIC-03

Effect of COVID-19 on the cardiovascular system and its complications

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Mangalore physiocon,
March 2022

Abstract

Individuals with COVID-19 can present with an influenza-like illness and respiratory tract Infection demonstrating fever (89%), cough (68%), fatigue (38%), sputum production (34%) and/or shortness of breathe (19%). The spectrum of disease severity ranges from asymptomatic infection, mild upper respiratory tract illness, and severe viral pneumonia with respiratory failure and/or death. Current reports estimate that 80% of cases are asymptomatic or mild; 15% of cases are severe (infection requiring oxygen), and 5% are critical requiring ventilation and life support. The rates of admission to an intensive care unit (ICU) are approximately 5%. Half of the patients admitted to the hospital (42%) will require oxygen therapy. Individuals at high risk of developing severe COVID-19 disease may require hospitalization and/or ICU support. Symptoms of COVID-19 can range from mild illness to pneumonia. Some people will have mild symptoms and recover easily, while others may develop respiratory failure and/or become critically ill and require admission to ICU. Physiotherapists who work in primary healthcare facilities are likely to have a role in the management of patients admitted to the hospital with confirmed and/or suspected COVID-19.

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PHTIC-04

Fatigue related scale among people with post-COVID-19

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Mangalore physiocon
March 2022

Background: it is expected that COVID-19 may have an impact on physical, cognitive, Mental and social health status. COVID-19 patients present with persistent pulmonary Function impairment, muscle weakness, pain, fatigue, depression, anxiety, vocational Problems and reduced quality of life to various degrees. Tool of measurement used for Post covid patients is post covid functional status scale (PCFS), 5 level EQ-5D-5L Questionnaire are utilized in order to understand the course and functional status of the Patient.
Objective: The main objective is to provide a multidimensional tool to analyze functional Status, symptoms and community participation.
Search strategy: PUBMED, MEDLINE, GOOGLE SCHOLAR
Design: A cross- sectional study was carried out among post COVID-19 patients. Assessment included fatigue severity scale, post covid functional status scale, 5 level EQ-5D-5L questionnaire
Result: study conducted by Costa Leite, hospital LOS in PCFS scale showed significant Predictor in multivariate models. Machado et al also compared the EQ-5D-5L scores and The intensity of fatigue symptoms between PCFS grades and observed similar results.
Conclusion: The proposed "post-COVID-19 Functional Status (PCFS) scale" could be Assessed upon discharge from the hospital, at 4- and 8-weeks post-discharge to monitor Direct recovery, and at 6 months to assess functional sequelae. The PCFS scale was Demonstrated to be a discriminatory instrument for groups with measured varying Degrees of fatigue, HRQoL, and functional performance.

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PHTIC-05

Recovery of facial expression using functional electrical stimulation after full-face transplantation

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Mangalore physiocon, March 2022

Background: This paper describes the use of functional electrical stimulation on Recovery of facial expression after full face transplantation. A facial expression is One or more motions or positions of the muscles beneath the skin of the face. Facial expressions are a form of nonverbal communication. Facial neuromuscular Re-education is a process of facilitating the return of intended facial movement Patterns. Surface-electromyography (EMG) biofeedback or mirror feedback serve As adjuncts to the re-education process, providing accurate information about Specific muscles and the timing of activation. . Facial expressions result from Either brain activity involving the motor cortex or by activity of a less clearly Defined network of sub cortical nuclei and brain-stem areas. The objective was to Recovery of facial expression. Rehabilitation for facial Neuro-disorders through Physical therapy using electrical stimulation and repetitions of common facial Expressions. The electrical stimulus should carefully localize to the facial muscle Nerve branch serving the specific intended facial movement or expression.
Methods: It is case studies on facial surface electromyography data were collected During basic emotional expressions and primary facial movements from 2 full-face Transplantation patients and healthy individuals to determine a strategy of Functional electrical stimulation and understand the mechanisms of rehabilitation.
Conclusion: At the end of rehabilitation, the patient showed improvements in their Facial symmetry and their ability to perform basic facial expressions and primary Facial movements. Effect of functional stimulation on facial rehabilitation and the Recovery of emotional expressions after rehabilitation was satisfactory to the Patient.
Keyword: Facial Expression, Facial Rehabilitation, Electrical Stimulation, Facial Paralysis, Full- Face Transplantation

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NATIONAL CONFERENCE PUBLICATION

PHTNC-01

An appraisal of publications on the prevalence, assessment and treatment of Diastasis Recti Abdominis in postpartum women.

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Mangalore physiocon, May 2022

Background: Local and systemic changes that occur during pregnancy and delivery return to pre- pregnancy state in the postpartum period (period after delivery). The musculoskeletal issues due to hormonal influence during this period adversely affect Rectus Abdominis muscle causing Diastasis RectiAbdominis (DRA). DRA may result in herniation of abdominal viscera, hamper the posture and interfere with trunk flexion, rotations, respiration, and trunk stability. This may cause compromised support for the Organs in the abdominal and pelvic region. Other common complications associated with DRA include urinary incontinence, fecal incontinence, and pelvic organ prolapse and myofascial pelvic pain. Long term manifestations of DRA are back pain, poor posture, pelvic floor problems and gastrointestinal disturbance. Many studies have been published on the prevalence, assessment, and treatment of DRA. A wide variance exists among the opinions of the authors in this regard. There is a necessity of comprehensive documentation of the findings for further innovations in this field. This study was intended to have an overview of the prevalence, assessment and treatment methods for DRA among the available publications in this domain. Methods: Electronic search of PubMed, Science Direct, Ovid, Scopus, and Web of Science was performed. A data extraction form was structured which included publication information, intervention, outcome measures, citation frequency and other relevant information. Results: Total of 77 articles on DRA in postpartum women were selected for the analysis after applying the exclusion criteria and eliminating the duplicate files. This study documented an increased trend in research in the field of DRA and postpartum in the recent years. Ultrasound imaging was found to be the most reliable tool of assessment in DRA although palpation was well accepted clinically and considerably reliable.

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Publication Summary

International Journals	**23**	**(CDIJ-01 – CDIJ-23)**
National Journals	**30**	**(CDNJ-01 – CDNJ-30)**

DR. CHANDRAMMA DAYANANDA SAGAR UNIVERSITY
(CDSIMER)SCHOOL OF MEDICAL EDUCATION & RESEARCH
INTERNATIONAL JOURNAL PUBLICATIONS

CDIJ-01

Prevalence of stress and associated changes in the personal habits of frontline Healthcare workers during COVID-19 pandemic: A questionnaire based study

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International Journal of Health and Clinical Research,
4(4), 169–177. Retrieved from https://ijhcr.com/index.php/ijhcr/article/view/999

ABSTRACT

Background: Coronavirus disease (COVID-19) pandemic has spread to 198 countries, with approximately 104 million confirmed cases and 2.21 million deaths globally as of January 28. Frontline healthcare workers face a substantially higher risk of infection and death due to excessive COVID-19 exposure. The aimed of the study to assess the prevalence of stress and associated changes in the personal habits of frontline healthcare workers during COVID-19 pandemic - A questionnaire based study.

Material and Methods: It was a cross-sectional, online survey conducted in December 2020 among FHWs who are directly involved in the triage, screening, diagnosing, and treatment of COVID-19 patients and suspects. Demographic characteristics were summarized using descriptive statistics such as frequency and percentages in case of discrete data. Data were exported from the Google Forms to Microsoft Excel spreadsheet and coded.

Result: A total of 332 responses were received and involved in any of the COVID-19 related activities. The 332 participants from across 36 states and including union territory were included in the analysis. The majority of the participants age 25-40 years (86.45%). Male are predominance in our study (53.92%). Of the 332 participants, 81.0% (n = 269/332) were doctors and the remaining 18.9% (n = 63/332) were nurses and OT technician. Anesthesiologist formed the major proportion (n = 145/332; 43.67%). The maximum percentage of experience were 47.59% between 1-5 years. The prevalence of FHWs with sometimes felt nervous and stress was 40.0% (118). The prevalence rates FHWs with fairly often stress was 28.14%.

Conclusion: The frontline healthcare workers are at risk of physical and mental consequences directly as the result of providing care to patients with COVID-19. Even though there are few intervention studies, early data suggest implementation strategies to reduce the chances of infections, shorter shift lengths, and mechanisms for mental health support could reduce the morbidity and mortality amongst Frontline healthcare workers.

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CDIJ-02

Comparison of sublingual nitroglycerine spray with oropharyngeal lignocaine Spray for blunting response to laryngoscopy and intubation

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European Journal of Molecular &Clinical Medicine,

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ABSTRACT

Background: Endotracheal intubation is a common mode of securing the airway for administering general anesthesia. Direct laryngoscopy and endotracheal intubation is almost always associated with hemodynamic changes due to reflex sympathetic stimulation caused by laryngopharyngeal stimulation.
Methods: A prospective, randomized controlled clinical study was undertaken to compare the efficacy of oropharyngeal lignocaine spray (group L,n=30) and sublingual nitroglycerine spray (group N, n=30) in blunting of hemodynamic response to laryngoscopy and intubation belonging to ASA I, posted for surgery under general anaesthesia.
Results: There was statistically significant difference in the mean heart rate between the groups for the first 3 minutes after intubation. Statistical evaluation between the groups showed the mean SBP was statistically significant (p=0.036) for initial 3 mins after intubation and also at 5th 6th & 10th minute. Statistical evaluation between the groups showed that mean DBP 1st minute after intubation was statistically significant (p=0.008). The difference was significant at 4, 5, 6 and 9 min after intubation. Statistical evaluation between the groups did not show any statistical difference in the MAP except at 5th & 6th minute. However, there was no clinically significant difference in any of the above groups.
Conclusion: Both sublingual NTG & lignocaine group successfully blunted the intubation response, sublingual NTG spray was better in suppressing the BP response to laryngoscopy and intubation than oropharyngeal lignocaine spray but lignocaine controlled the HR response better than NTG.

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CDIJ-03

Comparison of magnesium sulphate with lignocaine for blunting response to laryngoscopy andintubation

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European Journal of Molecular &Clinical Medicine,
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ABSTRACT

Background: Haemodynamic changes occurring during direct laryngoscopy and endotracheal intubation are well tolerated by healthy individuals but can be fatal in patients with hypertension, heart disease and intracranial hypertension. Many methods have been tried to obtund these responses.

Methods: 60 consenting patients were randomized to receive 30 mg/kg of magnesium sulphate (MgSO4) in 100 ml saline over 10 min before induction or preservative free 2% lignocaine 1.5 mg/kg diluted to 5 ml with saline 90 secs before intubation. Heart rate, systolic, diastolic & mean blood pressures and time taken to extubate were monitored.
Results: Hemodynamic parameters showed no significant rise at intubation in both the groups. Time taken to extubate was similar in both the groups.

Conclusion: MgSO4 30 mg/kg given intravenously as infusion over 10 minutes prior to induction and lignocaine 1.5 mg/kg given 90 seconds before intubation were comparable in attenuating pressor response to laryngoscopy and intubation with no clinically significant prolongation in time taken to extubate in MgSO4 group

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CDIJ-04

Luminal Cast Plastination of External Auditory Canal as a Teaching Model

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International journal of Advanced Research,
Volume 12, Page No 833-837, ISSN- 2320-5407, Dec 2021
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ABSTRACT

Background: Anatomical models are 3 dimensional, homologous models which present anatomical structures life size or enlarged form. These models not only serve as display material but are also used for mastering medical techniques. Models allow students to touch, feel and look closely at them. Plastination is a technique which uses polymers such as resin and silicone in order to create life-like specimens or models which allow realistic visualization of anatomical aspects that are simply too difficult to describe. The study aims to create a plastinated silicone cast of external auditory canal as a teaching model for students. Methods: 8 cadavers were obtained and the external auditory canals were cleaned. Silicone was injected into the canals and the casts were obtained. Results: The casts so obtained were observed for their S shaped curvature and the two constrictions were also noted. Conclusion: The silicone cast can be used as a museum specimen, to communicate with patients to create awareness about disease process, to educate the public especially in cases of management of deafness and for medical students in surgical training and experimental ontological surgeries.

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CDIJ-05

A Cadaveric Study on Variations of Branching Patterns of Ulnar Nerve in Hand

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10(2): AO28-AO31, 28-31. DOI:10.7860/IJARS/2021/48007:2640

ABSTRACT

Introduction: Anatomical knowledge of variations in the branching patterns of ulnar nerve in hand is very important for the surgeons in diagnosis of peripheral neuropathies and in treating nerve compression syndromes. In addition, knowledge of relationship between deep branch of ulnar nerve and deep palmar arch is important in treating ulnar nerve compression due to post-traumatic pseudo aneurysm, true aneurysm of distal ulnar artery or tortuous ulnar artery.

Aim: To observe the division of ulnar nerve in relation to flexor retinaculum, the variations in the branching patterns of ulnar nerve in hand and the relation between deep branch of ulnar nerve and deep palmar arch.

Materials and Methods: An observational study was conducted in 52 cadaveric hands collected from Department of Anatomy, Chettinad Hospital and Research Institute from August 2013 to Dec 2013. Specimens were fixed in 10% of formalin and dissected. Observations were noted.

Results: Division of ulnar nerve into superficial and deep branch was seen along the middle part of flexor retinaculum in 15 (28.8%) out of 52 specimens. In 5 (9.6%) out of 52 specimens, this division was seen in the distal part of flexor retinaculum. Trunk of ulnar nerve supplying abductor digiti minimi was seen in 5 (9.6%) specimens and accessory abductor digiti minimi in 3 (5.7%) specimens. Superficial branch of ulnar nerve supplying abductor digiti minimi in five specimens and flexor digiti minimi in three specimens. Deep branch of ulnar nerve was seen along the concavity of deep palmar arch in 15 (28.8%) specimens and along the convexity in 23 (44.2%) specimens. In 14 (26.9%) specimens, deep branch of ulnar nerve was seen crossing the deep palmar arch superficially from proximal to distal.

Conclusion: Ulnar nerve presents with many variations in the hand. These variations may lead to entrapment neuropathies which will have varied presentations. Knowledge of these variations will help the general surgeons, orthopedic surgeons and plastic surgeons during various surgical corrections.

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CDIJ-06

The effects of ibuprofen and acetaminophen on orthodontic pain control and interleukin-1β levels in gingival Crevicular fluid

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ABSTRACT

Background: Pain is one of the unpleasant experiences occurring during orthodontic treatment. Non-Steroidal Anti-Inflammatory Drug (NSAIDs) having analgesic properties minimizes discomfort caused by appliance activation. Acetaminophen with weak anti-inflammatory action, is effective in relieving discomfort without hampering Orthodontic tooth movement (OTM). Interleukin -1 β (IL-1β) a potent pro-inflammatory cytokine is reflected in Gingival Crevicular Fluid (GCF) during OTM. The study objective is to determine and evaluate effects of Ibuprofen and Acetaminophen on orthodontic pain control and IL-1β levels in GCF during initial stages of OTM.

Methodology: A total of 30 subjects were divided into three equal groups. Initial levelling and aligning stage were carried out using 0.014'' NiTi. First and second group were prescribed with Ibuprofen and Acetaminophen respectively. Third group was control. Subjects were advised to rate average daily pain quality at (P1)24 hours, (P2) 48hours, (P3)72 hours and (P7)168 hours in all the groups. GCF samples were obtained at four time points and IL-1β levels were evaluated and correlated with pain scores. GCF samples were assayed with commercially available human IL-1β Enzyme-Linked Immunosorbent Assay (ELISA) kit.

Results: IL-1β levels in all the groups increased significantly by 24 hours (T1) from their respective baseline levels, decreased by (T2)48 hours and eventually reached close to baseline levels by 168 hours (T3). No Statistically significant correlation was found between drug groups at 48 hours (T2). There was statistically significant correlation in all the groups at 24 hours, 168 hours. Negative correlation was found between IL-1β levels and pain scoring in drug groups indicating that IL-1β levels increased as OTM progressed, but pain decreased. Positive correlation was found between the two in control group.

Conclusions: Ibuprofen and Acetaminophen have an inhibitory effect on the IL-1β levels and thereby cause impediment to rate of tooth movement. However, they decrease orthodontic pain during initial stages of treatment.

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CDIJ-07

Molecular detection of Mycoplasma pneumoniae in Community acquired

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IP International Journal of Medical Microbiology and Tropical Diseases, 2021

ABSTRACT

Background: Community acquired pneumonia (CAP) remains a common and serious illness despite availability of potent anti-microbial and effective vaccine. Two types of CAP are commonly recognized - typical and atypical. Typical pneumonia is usually caused by bacteria such as Streptococcus pneumoniae, Haemophilus influenzae and Moraxella catharralis, whereas, atypical pneumonia can be caused by Mycoplasma pneumoniae, Chlamydia pneumoniae, Legionella pneuomophila. Mycoplasma pneumoniae is found to be the most common cause of CAP among atypical pathogens and is called "Walking pneumonia". It is a common atypical respiratory pathogen that produces diseases of varied severity ranging from mild upper respiratory tract infection to severe atypical pneumonia and is also responsible for producing a wide spectrum of non-pulmonary manifestations like neurological, hepatic, cardiac diseases, hemolytic anemia, polyarthritis and erythema multiforme which occur in as many as 25% of infected persons. As it lacks cell wall they are resistant to β lactam antibiotics, hence accurate and rapid diagnosis of M. pneumoniae infections is critical to initiate appropriate antibiotic treatment. Identification of M pneumoniae allows narrowing of initial empirical regimen which decreases antibiotic selection pressure and may lessen the risk of resistance. In view of this present study will be conducted in a tertiary care hospital for identification of M pneumoniae in cases of CAP by Polymerase chain reaction (PCR).

Aims: 1. to detect proportion of Mycoplasma Pneumoniae among cases of CAP. 2. Detection of 16SrRNA Mycoplasma pneumoniae by PCR.

Materials and Methods: Clinico-radiologically diagnosed 92 CAP patients were included in the study. Out of which 15 cases were caused by typical CAP pathogens like Streptococcus species, K.pneumoniae & M.tuberculosis. Samples (Sputum/ Bronchoalveolar lavages) from 77 suspected cases of atypical pneumonia are inoculated on PPLO broth (Difco) followed by identification of genus specific 16S rRNA Mycoplasma pneumoniae using PCR.

Results: PCR was found to be positive in 9 (11.68%) out of 77 CAP patients.

Conclusion: PCR was found to be positive in 9 (11.68%) out of 77 CAP patients. Detection of K.pneumoniae is essential for prompt diagnosis and start of empirical therapy, thereby reducing antibiotic selection pressure.

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CDIJ-08

Post salpingectomy intraluminal endometriosis in a premenopausal Lady - an incidental finding often paid less attention to

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International Journal of Reproduction, Contraception, Obstetrics and Gynecology, **Mar; 10(3):1221-1223, 2021.**
DOI: https://dx.doi.org/10.18203/2320-1770.ijrcog20210768

ABSTRACT

Endometriosis of the fallopian tube is often incidentally picked up in hysterectomy specimens that are sent for histopathological examination for other obvious pathological conditions. Post-salpingectomy endometriosis is one such entity that is known to occur in the tip of the proximal stump of the fallopian tube years after tubal ligation. As mere visualization of the endometriotic lesions is inadequate for an accurate diagnosis, histopathologic analysis of the biopsy samples becomes mandatory for confirmation. We report a case of post salpingectomy endometriosis which was incidentally discovered in a peri menopausal lady who was operated for multiple fibroids of the uterus. This case not only highlights an entity which is challenging to visualize radiologically and suspect clinically, but is also underrecognized, as very little attention is given to the fallopian tube during routine grossing.

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CDIJ-09

Blood donation amidst the COVID pandemic: knowledge, attitude and Practice of non-medical professionals

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Global journal of Medicine and Public Health, **Vol. 10, No. 4, 2021, ISSN#- 2277-9604.**

ABSTRACT

Background: The COVID-19 pandemic has affected blood transfusion services globally. A drastic reduction in blood donation has been observed with potential donors hindered by apprehension and confusion. This study was conducted to assess knowledge, attitude and practice related to blood donation among non-medical working professionals, with an emphasis on donation following COVID-19 infection and vaccination.

Methods: A prospective, non-randomized study was conducted between June and October 2021 among non-medical working professionals, with graduate and above education, in the 20–45 years age group. A questionnaire consisting of closed questions was emailed to the participants. Responses were recorded in a MS Excel spreadsheet and analyzed.

Results: A total of 238 participants were included in the study, and different occupations were represented. Engineers (40%) constituted the majority. More than half (144, 61%) of respondents had never donated blood before; one of the main reasons for this is that they had been not approached to donate (47%). 85% of the respondents felt that they could donate blood after receiving a COVID-19 vaccination but 65% responded that they should not if they had ever been infected with COVID-19. The primary source of information regarding blood donation was through academic training in colleges during their course (34%) followed by mass media (25%).

Conclusion: Several factors that hinder blood donation practice among non-medical working professionals, who are a potential source of blood donors, need to be addressed. These include low awareness of donation schemes and poor understanding of who is and is not eligible to donate. Awareness Programmes and blood donation campaigns to motivate potential donors should be scheduled, not only to provide the opportunity to donate but also to help eliminate misconceptions related to blood donation and COVID-19

Keywords: Blood Donation, Awareness, COVID-19, Vaccination, Donor

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CDIJ-10

Establishing New Curriculum of Pathology and its Challenges at a New Medical College

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Journal Of Medical Education. **2021;20(4):e121018**. https://doi.org/10.5812/jme.121018.

ABSTRACT

Background: A competency-based curriculum is the key highlight of medical transformation in India, which provides an outcome-based framework requiring the integration of knowledge, skills, and values, unlike an old curriculum that did not provide a cohesive and comprehensive outlook.

Objectives: We aimed to discuss and evaluate in detail the process and setup of a new competency-based medical curriculum in the Department of Pathology and enlist the assets and challenges while doing the same.

Methods: The new curriculum was set up as per the guidelines provided by the National Medical Council, along with assistance from state university guidelines, articles from the internet and discussions with other universities all over the country.

Conclusions: As compared to the previous curriculum, the new curriculum introduces many positive changes and requires a revolutionary change in the outlook of institutions, faculty, and students. Prior preparedness, flexibility to adopt new changes, consistency and long-term commitment through the transition process from facilitators will go a long way in producing an excellent Indian medical graduate.

Keywords: Pathology, Curriculum, Competency

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CDIJ-11

White Blood Cells in COVID-19: A Study on Viral Induced Cytopathic Changes in the Peripheral Smear

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Journal of Clinical and Diagnostic Research. **2022 Mar, Vol-16(3): EC08-EC11.** DOI: 10.7860/JCDR/2022/53011.16074

ABSTRACT

Introduction: Laboratory parameters are crucial in diagnosis and prognosis of Coronavirus Disease 2019 (COVID-19). It would be of interest to explore morphological changes in infected White Blood Cells (WBCs). A detailed examination of peripheral smears may shed light on pathophysiology of infected cell lines and differentiate them from those in established viral infections like dengue and infectious mononucleosis.

Aim: To study morphological changes of WBCs in peripheral smears of severe and non-severe cases of COVID-19 patients.

Materials and Methods: This cross-sectional study was conducted at a tertiary care center, Dr. Chandramma Dayananda Sagar Institute of Medical Education and Research, Ramanagara, Karnataka, India, from April 2021 to August 2021 on 120 peripheral smears of adult COVID-19 positive cases. Abnormal morphological features were graded by counting 100 cells in each of neutrophils, lymphocytes and monocyte lineage. Changes were compared and analysed between severe and non-severe groups using Statistical Package for Social Sciences (SPSS) software version 26.0. A p-value <0.05 was considered as significant.

Results: The study included total of 120 cases (59 severe and 61 non severe) with a mean age of 47 years. Male to female ratio in severe and non-severe categories were 1:1.2 and 1:0.6, respectively. Severe category patients (n=59) were associated with statistically significant leucocytosis (p-value=0.04), absolute neutrophilia (p-value=0.03) and higher grades of morphological changesabnormal nuclear morphology (p-value=0.002) and PseudoPelger-Huët anomaly in neutrophils (p-value=0.029), plasmacytoid lymphocytes (p-value=0.03), cytoplasmic granularity and atypical lymphocytes (p-value=0.04). Monocytes showed large coalescent vacuoles and cytoplasmic granules (p-value=0.03). Though present in non-severe category (n=61), they were proportionately of lesser grades.

Conclusion: Viral Cytopathic effects in WBC lines on peripheral smear had significant clinical implications on disease severity, undermining need for a comprehensive study of viral induced morphological changes in hospitalized COVID-19 patients.

Keywords: Coronavirus disease 2019, Infections, Leukocytes, Microscopy, Neutrophils

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CDIJ-12

Appendiceal Enterobius Vermicularis infestation discovered incidentally In a case of sigmoid volvulus: A Rare Co-occurrence

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Tropical Journal of Pathology and Microbiology. **VOL 8 NO 1 (2022): JAN-FEB**.
DOI: https://doi.org/10.17511/jopm.2022.i01.05

ABSTRACT

Enterobius Vermicularis is a gastrointestinal parasite mainly affecting children. It is one of the many causes of acute appendicitis. The probability that every case of infestation leads to an appendicealinflammatory response is controversial, as cases with normal histology have been reported. Appendix is subjected to examination only when the patient presents, with symptoms primarily related to it or attributed to obstructive causes of acute abdomen like intussusception, mass lesions, strictures or volvulus. The case presented is an adult who was operated for sigmoid volvulus with incidental finding of Enterobius Vermicularis infestation in the appendix. Though incidental, identification of worms is important as anthelminthic therapy can be curative, avoiding undue surgical interventions.

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CDIJ-13

Doppelganger solitary pedunculated tumours in pelvic girdle of obese Females: Histopathological study of three cases.

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Journal of Clinical and Biomedical Sciences; **12(1):30-33, 2022.**

ABSTRACT

Pedunculated tumours are soft, compressible skin-coloured solitary lesions, predominantly occurring on buttocks and thighs that need to be categorized rightly. We describe three solitary pedunculated masses of the pelvic girdle encountered in obese females. Primary clinical differential diagnoses included fibroepithelial polyps, lipoma, and papilloma and nevus lipomatosus superficialis. Histopathological features helped in narrowing down definitive diagnosis of these look alike lesions as pedunculated lipofibroma or solitary form of Nevus Lipomatosus Cutaneous Superficialis (NCLS) which is a broad-based lesion with aggregates of mature adipocytes extending into the dermis and Fibroepithelial polyp which displays loose dermal fibrocollagenous
Stroma with entrapped blood vessels in the absence of admixed adipose tissue. Though treatment of choice for these lesions is excision, it would be of interest for pathologists to be acquainted with these clinical mimics displaying divergent histology.

Keywords: Adipocytes, Nevus, Pelvis, Polyps

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CDIJ-14

Encapsulated Fat Necrosis of the Mesentery: Surgical Intervention By Inquisitive Obstretrician Leading to Newer Insights For The Pathologist

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International Journal of Medical Laboratory Research (IJMLR)

ABSTRACT

Lesions of the mesentery encompass a wide variety of neoplastic and non-neoplastic entities. Being a metabolically active tissue, it is often subject to trauma and ischemia, which in turn can give rise to encapsulated masses. Encapsulated fat necrosis is one such nodular lesion which is often encountered by radiologists. It presents clinically with nonspecific abdominal symptoms, and many a times is discovered incidentally when imaging is done for other obvious pathologies. Though the lesion is known to shrink over time, surgical resection is often done to rule out other mimics, lip sarcoma being the closest. Encapsulated mesenteric fat necrosis is a rare lesion and more so uncommonly found in association with pregnancy. Vascular hypo perfusion can be one of the hypotheses, although fetal role cannot be ruled out, especially in obese gravid females. We wish to document one such lesion detected intraoperative, picked up incidentally suspecting to be a mesenteric cyst in a gravid obese female without history of trauma or predisposing factors, who underwent caesarian section at an institute in rural set up. The case also describes histopathological features of this interesting lesion for the pathologists.

KEYWORD: Fat necrosis, histopathology, lip sarcoma, lipoma, Mesenteric cyst

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CDIJ-15

UTILIZATION PATTERN OF ANTI-MICROBIAL DRUGS IN OPHTHALMOLOGY DEPARTMENT AT A TERTIARY CARE HOSPITAL

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International Journal of Pharmaceutical Sciences and Research, **2021; Vol. 12(7): 3866-3872**. DOI: 10.13040/IJPSR.0975-8232.12 (7).3866-72

ABSTRACT

Ophthalmologists generally treat ocular infections by giving prophylactic anti-microbial therapy as they do not have data from culture analysis. The indiscriminate use of anti-microbial can lead to drug resistance, difficulty in treating infections, and increased chances of severe ocular damage. The purpose of this study was to analyze the utilization of anti-microbial drugs in the ophthalmology department at a tertiary care hospital. This is an observational study conducted in a tertiary care hospital. Details of total 740 prescriptions were collected from out-patient records and analyzed. The total 740 prescriptions, 56.4% were males, and 43.6% were females. The highest number of patients was in the age group of 61-70 years. Post-operative cataract cases were in maximum (51.9%) followed by conjunctivitis (15.3%). A total of 846 anti-microbial drugs were analyzed from 740 prescriptions. Average number of anti-microbial per prescription was 1.15. Eye drops were the most commonly prescribed dosage formulation. Moxifloxacin was the most commonly prescribed anti-microbial drug as monotherapy. The most commonly prescribed fixed-dose combination was gatifloxacin plus prednisolone. The frequency and the duration of anti-microbial therapy were recorded in all the prescriptions. The present study shows that the prescribing patterns of ophthalmologists are based on clinical knowledge, expertise and is in accordance with the rational utilization of anti-microbial. In this study, the information regarding the frequency and duration of the study were recorded in all the prescriptions. Restraint on polypharmacy revealed in our study could be advantageous in reducing the potential adverse effects and economic burden on the patients.

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CDIJ-16

Faster reading techniques - A method to ameliorate performance among First MBBS students

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National Journal of Physiology, Pharmacy and Pharmacology.
2021 | Vol 11 | Issue 10. DOI: 10.5455/njppp.2021.11.05150202119052021

ABSTRACT

Background: The reading speed depends on the level at which these organs are trained to help the reader use them earnestly. Research related to fast reading courses affirms that the reading speed can be greatly increased without sacrificing comprehension by learning to make use of visual information at a single glance and by ignoring the inner speech. With the change in curriculum by National Medical Commission, adopting faster reading techniques would help in holistic development of future physicians of first contact. Aim and Objectives: The objectives of the study were to study the effects of faster reading techniques on reading and comprehending capabilities among students.

Materials and Methods: Students were instructed to read the material given to them within a time limit of 2 minutes and answer the questions at the end of 2 minutes before and after employing fast reading techniques.

Results: The results of the present study showed a statistically significant increase in reading speed and performance of the individuals after delivering instructions pertaining to fast reading techniques.

Conclusion: In the light of our findings, it is recommended that faculty members in medical education need to train and encourage students extensively on the use of faster reading strategies such as skimming and scanning for better academic performance.

KEY WORDS: Faster Reading Techniques; First Bachelor of Medicine and Bachelor of Surgery Students; Reading Speed; Comprehension; Performance

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CDIJ-17

A study on effective use of technology in training first MBBS students for Foundation course during pandemic era

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National Journal of Physiology, Pharmacy and Pharmacology,
2022 | Vol 12 | Issue 05. DOI: 10.5455/njppp.2022.12.10383202125102021

ABSTRACT

Background: Medical education in India is being revolutionized with the introduction of "Competency-based undergraduate curriculum" for an Indian Medical Graduate. It demands great commitment, flexibility to adopt to changes, and lifelong learning. For this, 1 month foundation course was introduced across the country. Unfortunately, the pandemic had cast its shadow on a conduct of this very pertinent foundation course at a classical offline mode and made a shift to online learning inevitable.

Aim and Objectives: The aim of the study was to study how the use of technology can result in effective delivery of course content through feedback analysis and online objective assessment.

Materials and Methods: Feedback from the students was obtained employing a predesigned questionnaire mailed to them using Google forms and online objective assessment was also conducted after the end of the course.

Results: The majority of the students felt that the topics selected were absolutely essential for the medical profession and scored fairly well in the assessment.

Conclusion: The results of the present indicate that there was not much difference in students perception about the foundation course whether covered through online or offline mode suggesting a blended learning format to be a useful teaching learning method during the post-pandemic phase.

KEY WORDS: National Medical Council; First MBBS; Foundation Course; Online Mode; Feedback; Assessment

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CDIJ-18

Medical treatment options available for mucormycosis

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Journal of Pharmacovigilance and Drug Research, **2(4):14-1 (2021):**
DOI: https://doi.org/10.53411/jpadr.2021.2.4.4

ABSTRACT

Introduction: Mucormycosis is known as a rapidly progressive and invasive lethal fungal infection. The predisposing factors known to potentiate this fungal infection are diabetes mellitus, primary or secondary immunodeficiency, etc. The clinical presentation of these cases may vary from involvement of localized skin infection to disseminated systemic infection.

Methods: In this article, an attempt was made to review the therapeutic guidelines released by European Committee for Antimicrobial Susceptibility Testing (EUCAST) and Clinical and Laboratory Standards Institute (CLSI).

Results: In addition to this, efforts were made to briefly review the evidence available on various formulations of accepted treatment methods including Amphotericin B (AmB), Posaconazole (PSZ), and Isavuconazole (ISZ), and other newer anti-fungal agents such as Voriconazole (VCZ), Echinocandins, etc.

Conclusions: An attempt was also made to discuss the various drugs that can be used as a single agent or combinations considered to be synergistically active and beneficial for the treatment/ prophylaxis of Mucormycosis.

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CDIJ-19

Establishment of long-term high-fat diet and low dose streptozotocin-induced experimental type-2 diabetes mellitus model of insulin resistance And evaluation of seed extracts of Syzygium cumini

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Journal of Herbmed Pharmacology. **2021; 10: 331-338.**
DOI: 10.34172/jhp.2021.38

ABSTRACT

Introduction: The principal mechanism responsible for reducing blood glucose is through insulin-stimulated glucose transport into skeletal muscle. The transporter protein that mediates this uptake is GLUT-4. A defect in this step is associated with reduced glucose utilization in muscle and adipose tissue, as observed in insulin-resistant type-2 diabetes mellitus (T2DM) patients. This study aimed to develop an experimental T2DM model and evaluate altered glucose transporter type 4 (GLUT-4) levels as a biomarker of insulin resistance. Antidiabetic activities of Syzygium cumini hydro-ethanolic seed extracts (SCE) were also evaluated.

Methods: Adult male Wistar albino rats were fed a high-fat diet for 12 weeks and dosed intraperitoneally with streptozotocin (35 mg/kg). After treatment for 21 days, all investigations were done. The homeostasis model of assessment (HOMA) was used for the calculation of insulin resistance (HOMA-IR) and beta-cell function (HOMA-B) index. Diaphragm muscle and retroperitoneal fat were collected for real-time polymerase chain reaction (RT-PCR) studies.

Results: A significant increase in fasting blood glucose, HOMA-IR, and serum lipids, and a decrease in serum insulin and HOMA-B were observed in the diabetic group, effects that reversed following pioglitazone and SCE treatment. The diabetic group showed a down regulation of GLUT-4 expression in skeletal muscle while an increase was observed in adipose tissue.

Conclusion: A high-fat diet and low dose streptozotocin-induced experimental T2DM model of insulin resistance was developed to screen novel insulin sensitizers. Data generated demonstrated that altered GLUT-4 levels could be used as a biomarker of insulin resistance. Antidiabetic activity of S. cumini hydro-ethanolic seed extract was also confirmed in this study.

Keywords: Insulin resistance, Glucose transporter type 4, Homeostasis model of assessment for insulin resist, Real-time polymerase chain reaction, High fat diet, Experimental diabetes

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CDIJ-20

In--vivo Anti-diabetic Activity of Hydro-Ethanolic Seed Extract of Syzygium cumini (L.).

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Biomedical & Pharmacology Journal,
March 2021. Vol. 14(1), p. 241-247 DOI:10.13005/bpj/2119

ABSTRACT
Diabetes mellitus continues to be a major health problem in India and across the world. Over centuries, numerous herbal extracts have been used in the Indian traditional medicine to control elevated blood sugar levels in patients with diabetes. Different aqueous and organic extracts of Syzygium cumini (L.) Skeels have found widespread use owing to their anti-diabetic activity. A systematic study was undertaken to characterize and evaluate the effects of a hydro-ethanolic seed extract (SCE) of Syzygium cumini in a rodent model of experimental type 2 diabetes mellitus. An established model of diabetes mellitus with a combination of streptozotocin and high fat diet (over 12 weeks) in adult male Wistar albino rats, was used in this study. The onset of diabetes mellitus in rats was confirmed with a fasting blood glucose (FBG) of >200 mg/dl. The diabetic rats were allocated into five experimental groups and treated as follows: with vehicle alone, pioglitazone (10 mg/kg), 100mg/kg or 200mg/kg or 400 mg/kg of SCE, respectively for 21 days. The pre and post treatment levels of fasting blood glucose, insulin and lipids were measured from serum obtained from the various treatment groups. In order to measure insulin resistance, a homeostasis model assessment of insulin resistance (HOMA IR) and for measuring the beta cell function a homeostasis model assessment were employed. The results obtained from these studies were analysed using the Analysis of variance (ANOVA) method. Our study demonstrates the SCE preparation to induce a statistically significant dose-dependent reduction in FBG, serum lipid levels and HOMA IR with a concomitant increase in the serum insulin levels and HOMA B. Wistar rats dosed with SCE at 100 and 200 mg/kg body weight demonstrated statistically significant anti-diabetic activity by virtue of improving the pancreatic beta cell function and reduction in insulin resistance.

Keywords: Insulin resistance, HOMA IR, HOMA B, High fat diet, SCE

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CDIJ-21

In vitro anti-diabetic activity, bioactive constituents, and molecular modelling Studies with sulfonylurea receptor1 for insulin secretagogue activity of Seed extract of Syzygium cumini (L.)

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Journal of Herbmed Pharmacology, **2021; 10: 304-312.**
Doi: 10.34172/jhp.2021.35

ABSTRACT

Introduction: Syzygium cumini (L.) has been known to be used for diabetes treatment in traditional Indian and Chinese medicine. The present study focuses on the evaluation for glucose uptake and insulin release in vitro and characterization of phytoconstituents of the hydro-ethanolic extract of Syzygium cumini seed (SCE). Further, this report covers the molecular docking findings of the bioactive constituents on the sulfonylurea receptor 1 (SUR1).

Methods: A glucose uptake assay of SCE was used to estimate the glucose uptake from the cell lysates and the cell culture supernatants using insulin as the reference standard. Insulin release activity of SCE from RIN-5F cells was estimated using enzyme-linked Immunosorbent assay. The phytoconstituents were isolated by preparative HPLC and characterized by mass spectrometry, nuclear magnetic resonance (NMR) and infrared spectroscopy. The molecular docking of bioactive constituents was carried on repaglinide bound to the SUR1

Results: In the presence of SCE, the glucose uptake through L6 myoblast cells increased by 19.91% at 40 µg/mL in comparison with the vehicle control ($P < 0.05$). Moreover, SCE showed 2.8-fold enhancement of insulin release at 40 µg/mL as compared to the vehicle controls ($P < 0.05$). Gallic and ellagic acids were the key phytoconstituents isolated from SCE. Molecular docking studies revealed that both gallic acid and ellagic acid bind to the repaglinide binding pocket of SUR1.

Conclusion: SCE increases the release of insulin and enhances glucose uptake in vitro, which may contribute to its in vivo anti-diabetic activity. The presence of ellagic acid and gallic acid in SCE may be the cause for enhanced insulin release observed with SCE following binding to SUR1.

Keywords: Molecular docking, NMR spectroscopy, Gallic acid, Ellagic acid, RIN-5F cells, L6 myoblasts

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CDIJ-22

Safety of Hydroxychloroquine use for COVID-19 prophylaxis: A questionnaire-based pilot study in healthcare professionals

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Journal of Pharmacovigilance and Drug Research, **Vol 2 No 3 (2021):** DOI: https://doi.org/10.53411/jpadr.2021.2.3.3

ABSTRACT

Introduction: Hydroxychloroquine (HCQ) was recommended for prophylaxis against SARS-COV-2 for the health care professionals by the Indian Council for Medical Research.

Objectives: We conducted this study to explore the safety of Hydroxychloroquine in health care professionals.

Methods: A validated questionnaire was circulated electronically to the health care professionals, who were on HCQ as per ICMR recommended regimen. Questions on specific adverse drug reactions (ADRs) were asked along with other details. The participants were requested to upload the baseline and additional electrocardiograms (ECGs) taken during HCQ prophylaxis. Incidence, severity, causality (relatedness to the drug), expectedness, and seriousness of the ADRs were determined as per the standard guidelines. The ECGs were evaluated for the appearance of significant changes. The observations were analyzed through descriptive statistics. The ECG changes were compared using the Students t-test and the association of risk factors with the ADRs was evaluated using logistic regression analysis

Results: ADRs were observed in 58 (46 %) of 126 participants. Gastrointestinal symptoms followed by headache and skin rashes were commonly observed. The ADRs were mostly mild to moderate in the category, non-serious, and possibly related to HCQ. Significant ECG changes were rare. Diabetes, hypertension, and the use of concomitant medication/s were the risk factors. Except for blurred vision, all the ADRs were unexpected in terms of frequency.

Conclusions: HCQ causes non-specific ADRs of mild to moderate degrees when used as prophylaxis. Though non-serious, almost all were unexpected. ECG changes are probably not frequent in the absence of a pre-existing disease.

Keywords: Adverse drug reactions, COVID-19 prophylaxis, Hydroxychloroquine, SARS-COV-2

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CDIJ-23

Assessment of quality of life among HIV infected people on Antiretroviral therapy in a tertiary hospital, Karnataka

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ABSTRACT

Background: With the availability of highly effective antiretroviral treatment, HIV is transforming into a chronic condition, whose management is now experiencing problems of other chronic diseases, where quality of life (QOL) has become an important component of overall assessment of health care and management. This study was conducted with the objective of assessing the QOL and factors influencing it in HIV infected people on antiretroviral therapy (ART).

Methods: A cross-sectional study was conducted at district ART center, Hassan. Purposive sampling was used to identify 148 HIV infected people on antiretroviral therapy, who were interviewed using a pretested questionnaire, assessing QOL with the World Health Organization (WHOQOL) HIV-BREF.

Results: The average age of the study population was 37.69 years. Majority of them were males 54.7% compared to 45.3% of females. Most of them resided in rural areas (87.8%). The educational status of the subjects was poor with 33.8% of them being illiterates. The mean score was highest for spirituality and social relationships domain and least for psychological domain. Age, education and socioeconomic status did not have any influence on the QOL. There was significant difference between QOL scores and clinical stages. Individuals in stage I and II had better scores compared to stage 3 and 4. QOL scores decreased with decreasing CD4 count.

Conclusions: Our findings suggest that patient-reported measures of health status and related concepts may help provide a feasible, reliable and valid method to assess the impact of HIV/AIDS improve patient outcomes.

Keywords: HIV, AIDS, ART, Quality of life

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DR. CHANDRAMMA DAYANANDA SAGAR UNIVERSITY (CDSIMER)
SCHOOL OF HEALTH SCIENCES
NATIONAL JOURNAL PUBLICATIONS

CDNJ-01

Knowledge about adult basic life support among Interns completing & First year MBBS student who underwent BLS training during foundation Course -An observational study from a tertiary health care center

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Indian Journal of Clinical

Volume 8, Issue 2, Page No 335-340, 2021

DOI: 10.18231/j.ijca.2021.062

ABSTRACT:

Objectives: To assess and compare the knowledge about adult basic resuscitation amongst interns completing their internship and 1s t year MBBS students who underwent three day hands on training in BLS during their foundation course.

Materials and Methods: It's a cross-sectional observational study using a questionnaire comprising of 19 questions to assess the knowledge of BLS among interns completing their internship and 1s t year MBBS students who underwent BLS training during their foundation course.

Results: Majority of the medical students knew that BLS can be performed both outside and inside the hospital settings. (96.1% vs 77%, P =0.001) Knowledge about BLS was poor amongst both the groups. 40 interns (55.4%) had scored ≥ 60% whereas 65 medical students (63.5%) had scored ≥60%. (P value 0.21) indicating comparable knowledge about BLS amongst both the group. Self-grading of knowledge about

BLS was better amongst medical students (P=0.001). 37. 8% of interns and 21.6% of medical students had expanded the terminology AED correctly indicating poor knowledge about defibrillation and defibrillator amongst both the group. Difference was not significant (p = 0.220) Also medical students knowledge about

Heimlich maneuver was poor (52% compared to 70.3% amongst interns) indicating the poor retention of knowledge amongst medical students.

Conclusion: Knowledge about BLS among medical students who underwent training during foundation course was same like that of interns who studied the earlier curriculum and was poor, hence needs inclusion of periodic revision of the knowledge about BLS in the curriculum.

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CDNJ-02

Combined Analysis of Anti SARS-CoV-2 IgG and IgM Responses in COVID19 Patients in India

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Indian Journal of Clinical Biochemistry,
Volume 36, pages485–491 (2021),
DOI https://doi.org/10.1007/s12291-021-00986-x

ABSTRACT

Coronavirus disease 2019 (COVID-19) caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) is a global health problem, India being the second most affected country. The kinetics of antibody response to SARS-CoV-2 in Indian population is not studied yet. To understand serological response in relation to age, gender, time period and severity of disease, Roche Elecsys anti-SARS-CoV-2 test was used which analysed both IgM and IgG. One hundred and three COVID-19 patients were enrolled. Seropositivity was seen in 64% of patients, with 33% at ≤ 7 days, 62% between 8 and 15 days and 81% at ≥ 16 days from the time of admission. Men (65%) showed higher antibody response than women (59%), whereas no difference was observed in Seropositivity with respect to age of the patients. Dynamics of antibody responses revealed individual variations. Patients in ICU had higher antibody reactivity with 67% positivity as compared to 60% positivity in non-ICU patients. Kinetics of antibody response during COVID-19 disease varied in relation to gender, age, time period and severity and these factors might play an important role in treatment and control of COVID-19.

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Myths and awareness among rural population about orthodontic Extractions during fixed mechanotherapy

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Journal of Advanced Medical and Dental Sciences Research,
Vol. 9, Issue 5, May 2021. Doi: 10.21276/jamdsr

ABSTRACT:

Background: India being a developing country, there are still remote villages unaware of the advances in various fields; one such being orthodontics. Myths and misconceptions are present in all cultures, all professions, and on al subject matters. While some dental myths are provincial, others are heard everywhere. Hence; the present study was undertaken for assessing myths and awareness among rural population about orthodontic extractions during fixed mechanotherapy.

Materials & methods: A total of 200 rural participants were enrolled in the present study. All the participants belonged in the age group of 20 to 50 years. A questionnaire was framed and was given to all the participants. Informed consent was taken from all the participants. Questionnaire consisted of questions pertaining to the myths and awareness of the participants in relation to orthodontic extractions during fixed mechanotherapy.

Results: In answer to question "Is eye sight affected because of extraction", 57.5 percent of the subjects said yes. In answer to question "Does tooth extraction lead to systemic disorders", 46 percent of the subjects said yes. In answer to question "Extraction can lead to unaesthetic appearance", 37 percent of the subjects said yes. In answer to question "Does tooth extraction leads to severe malocclusion", 29.5 percent of the subjects said yes. In answer to question "Dental extraction is an extremely painful procedure", 66 percent of the subjects said yes.

Conclusion: Rural aged is a deprived lot and a targeted program to infuse scientific dental practices in them is necessary. Key words: Orthodontic, Malocclusion, Myths.

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CDNJ-04

Assessment of problems faced by orthodontic patients during COVID- 19 pandemic

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Journal of Advanced Medical and Dental Sciences Research**,**
Vol. 9, Issue 6, June 2021,
DOI: 10.21276/jamdsr

ABSTRACT

Background: Different policies and strategies were taken by each affected country to face this pandemic and minimize the number of cases, from partial to complete lockdown, giving that in the absence of a vaccine. The present study was conducted to assess problems faced by orthodontic patients during COVID- 19 pandemic.

Materials & Methods: 60 orthodontic patients age ranged 14- 30 years undergoing orthodontic treatment were enrolled and a questionnaire was prepared in the form of google.com/forms which were sent to all participants through watsapp and were asked to respond.

Results: Mode of communication was phone call in 62%, SMS in 28% and mail in 10%. 45% were strongly disagree, 20% disagree, 5% were somewhat disagree, 10% were neutral, 7% were somewhat agree, 5% were agree and 8% were strongly agree regarding closing the dental clinics to minimize the spread of COVID-19. 13% patients did not stop visiting Orthodontist whereas 87% had not visited since >2 months. Reason for not visiting orthodontist was clinic was closed by 56%, fear of COVID- 19 spread by 20% and above both by 14%. Problems faced by patient was pricing of wires in 20%, ulcers due to wires in 35% and bracket breakage in 28%. 35% did not communicate, 50% communicated once in a week and 15% once in a month with orthodontist. The difference was non- significant ($P< 0.05$).

Conclusion: Most patients undergoing treatment were concerned about their restriction to orthodontic clinic visits

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CDNJ-05

Coronavirus disease -19 vaccination and chemosensory dysfunction

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National journal of physiology, pharmacy and pharmacology
Volume 12, Issue 3, Page No- 296-300, 2022
DOI: 10.5455/njppp.2022.12.08283202104092021

ABSTRACT:

Background: Chemosensory disturbances such as altered smell and taste sensations have a strong impact on health and quality of life. The lack of awareness of these chemosensory symptoms post-coronavirus disease (COVID)-19 vaccination has led to apprehension. When adequately addressed, it can encourage people to take vaccines which are a life-saving tool in this pandemic.

Aims and Objectives: This study aims to assess the prevalence and duration of altered smell and taste post-COVID-19 vaccination.

Materials and Methods: The survey was conducted during January August 2021. The Institutional Ethical Committee clearance was obtained. Data was collected from 242 COVID-19 vaccine beneficiaries majority of them being health care workers by online and offline survey questionnaires. Descriptive analysis was done using SPSS 21.

Results: Out of 250 respondents, 242 completed the study. About 95% of them received CoviShield, 3.8% Covaxin, and 1.3% Pfizer. Perception of altered smell (olfactory dysfunction), taste (gustatory dysfunction), and both smell and taste was reported by 5.8%, 8.27%, and 2.61% of study participants. The mean duration was 3.43 ± 2.03 and 4 ± 1.64 days for altered smell and taste, respectively, with complete recovery.

Conclusion: Chemosensory disturbances were reported in a small percentage of vaccine beneficiaries and all of them recovered within a few days completely without any medications. Vaccines are a critical tool in the battle against COVID-19 and we should emphasize on its health and lifesaving benefits and reassure those chemosensory disturbances have complete recovery.

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CDNJ-06

Rare survival of a young lady with acute Aluminium Phosphide poisoning

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Narayana Medical Journal, **Volume 10, Issue 2. July-December 2021,** DOI: http://dx.doi.org/10.5455/nmj/00000223

ABSTRACT

Aluminium phosphide (ALP) is frequently used as fumigant by farmers and is highly toxic. There is no antidote for ALP poisoning and death rate after suicidal or accidental consumption of this compound is very high. Authors report a rare survival of a young lady with acute ALP poisoning and discuss the management issues of this rare poisoning.

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CDNJ-07

Breastfeeding in the first hour of birth: Science and skills

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Karnataka Pediatric Journal. **Volume 35, Issue 2, October-December 2020**
DOI: 10.25259/KPJ_20_2020

ABSTRACT

Immediate and uninterrupted skin-to-skin contact between mother and newborn should be facilitated soon after birth to initiate breastfeeding. It initiates the newborn infant's internal process to go through nine instinctive steps (namely, crying, relaxation, awakening, activity, resting, crawling, familiarization, suckling, and sleeping). Skin-to-skin contact with the mother soon after birth contributes to an early coordination of five senses in the newborn, namely, sight, hearing, touch, taste, and smell. The oxytocin surge in the 1 st h of birth makes mother to keep the infant close to her chest and also establishes chemical connection between the two. The colostrum odor increases the amount of oxygenated hemoglobin over the olfactory cortex in the newborn within 24 h of life. The skin-to-skin provides the initial colonization of the baby's Microbiome outside the mother. Finally, skin-to-skin contact not only improves the bonding between mother and the infant but also influences infant's self-regulation in the years to come.

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CDNJ-08

Clinical, Demographic, and Electroencephalographic Profile of Hot-Water Epilepsy in Children

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Indian Journal of Pediatrics , **volume 88, pages885–891 (2021)** DOI
https://doi.org/10.1007/s12098-020-03570-y

ABSTRACT

Objectives: The study attempts to characterize the clinical, demographic, risk factors, electroencephalographically, and neuroimaging features of hot-water epilepsy (HWE) in children.

Methods: This is a hospital-based observational study in the pediatric neurology clinic and who met the clinical definition of hot-water epilepsy were studied from January 2017 to October 2018. Clinical history, demographic data, and examination findings were recorded in a pre-structured proforma. Electroencephalography (EEG) and neuroimaging were carried out.

Results: A total of 68 children with male to female ratio of 2.4:1 were studied. The most common age of onset of seizures was between 1 and 5 y. Focal seizures with impaired awareness were the most common semiology (48.5%). Abnormal EEG was detected in 13.2% and abnormal neuroimaging in 4.4% which consisted of incidental abnormalities. No reflex seizures occurred in 35.3% of the children with HWE and the risk factors associated with this were not statistically significant. Clobazam before taking bath helped to achieve seizure control in 85.7% of the children.

Conclusion: Hot-water epilepsy should be suspected in children who develop seizures following a hot-water bath. The most common age of onset is 1-5 y. EEG and neuroimaging are normal in the majority of cases. No reflex seizures occurred in 35.3% of the children.

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CDNJ-09

Morphological types of anaemia integrated with distribution of red cell and platelet indices: Study in a rural tertiary healthcare center

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Indian Journal of Pathology and Oncology, **Volume-8(1): 45-49, 2021.**
DOI: https://doi.org/10.18231/j.ijpo.2021.009

ABSTRACT

Background: Anaemia is a critical global health problem. A good morphological subtyping of anaemia can guide clinician in further patient management. With the advent of automation, red cell and platelet indices are available from the routinely used blood cell counters in the laboratory, these supplemented with peripheral smear examination help in a good categorization of anaemia. Aim of this study is to study the morphological types of anemia's in the adults with the Objectives of Categorization of the anemia's based on morphology and to study the distribution of the red cell and platelet indices in the same.

Materials and Methods: It was a prospective study conducted in the hematology wing of our central diagnostics over a period of three months and a total of 520 cases, which were morphologically classified according to the analyzer indices and peripheral smear. Distribution of the red cell and platelet indices in the different categories of anaemia were also noted.

Results: A majority of the anemia's were microcytic hypochromic in type (67.1%) followed by normocytic normochromic anemia's (26.5%). Increased RDW was seen in microcytic hypochromic anemia's (55%) and normocytic normochromic anemia's (6.9%). The Mean platelet count/ mean platelet volume was increased in microcytic anemia's compared to others.

Conclusion: Anaemia in the rural set up are predominantly of the microcytic in type. A good knowledge of the variation in RBC indices, RDW and platelet /mean platelet volume ratio along with a peripheral smear can help the reporting hematologist identify early stages of iron deficiency anaemia and can give a precise and accurate anaemia categorization at the basic entry level of laboratory investigation.

Key Messages: Interpretation of variation in RBC and platelet indices though often neglected can contribute significantly to categorize the anaemia.

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CDNJ-10

Frequency of micronuclei in oral mucosal smears of female municipal Sweepers with betel quid chewing practice

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Journal of Pathology of Nepal **(2021)**
Vol. 11, 1847-1851. DOI: 10.3126/jpn.v11i1.31677

ABSTRACT

Background: Oral cancer is common worldwide. Study of micronuclei in exfoliated buccal mucosal cells holds great scope in bio monitoring their carcinogenic potential. Betel quid chewing is one of the most common factors contributing to oral cancers. Ours being a developing country, a study was undertaken among female municipal sweepers, majority of who are betel quid chewers, unaware of the harmful effects of the same. We attempted to cytological access the presence and compare the proportion of micronuclei in the right, left buccal mucosa and hard palate of female municipal sweepers with and without betel quid chewing practice.

Materials and Methods: This was a cross sectional study with purposive sampling. Buccal smears were analysed from 30 betel quid chewers & non chewer females for micronuclei. Mean and standard deviation were calculated. Independent T test was used for comparison between groups. P value less than 0.05 was considered statistically significant.

Results: Frequency of micronuclei in betel quid chewers and non-chewers was 26.80+/- 11.96 and 7.76+/- 4.73. The frequency of total micronuclei per 250 cells in cases was 9.3+/- 5.37 in right buccal mucosa, 9.43+/-5.66 in left buccal mucosa, 9.43+/- 5.66 in hard palate and 3.33+/- 2.88 in right buccal mucosa, 2.96+/-3.31 in left buccal mucosa, and 2.96+/-3.31 in hard palate in controls.

Conclusion: The mean number of micronuclei in buccal mucosal cells of female municipal sweepers with betel quid chewing practice was significantly higher compared to controls reaffirming their carcinogenic potential and highlighting the need of early screening for oral cancer in susceptible groups.

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CDNJ-11

Awareness about the concept of Activity Based Costing (ABC) among Medical laboratory professionals

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Medica Innovatica,
Jan - Jun 2021, Volume 10, Issue 1

ABSTRACT

Background: Medical laboratories are an integral and essential component of the healthcare system. Information about costing and resource management is of paramount importance for providing services at a reasonable price and without quality compromise. Awareness of a scientific method of cost accounting Activity Based Costing (ABC), may contribute significantly to enhance the laboratories capacity to manage its resources efficiently.

Objective: This study was done to know the awareness of Activity based costing.

Materials & Methods: A preformed validated questionnaire was sent to various laboratory professionals affiliated to private and teaching hospital laboratories. 121 responses were recorded, percentages of which were entered in EXCEL sheets, graphically represented and analysed.

Results: Majority of our participants were from medium sized laboratories (40%), working in private sectors, using a combination of automated & semi-automated technologies & not being accredited by regulating bodies. Activity based costing was being implemented in only 14 labs, with more than 70% of respondents not having an adequate knowledge about the same. Inadequate training (44.6%), not being involved in costing (46.3%) and assumed practical difficulties in implementing (9.1%) were some of the reasons cited.

Conclusion: Healthcare providers from the laboratory had limited awareness on costing methods like ABC. Efforts to implement and create awareness about the same if made can upscale quality, and sustainable service delivery in lab services at reasonable costs especially in developing country like ours.

Key words: costing, traditional costing, activity based costing, direct costs, indirect costs, laboratory.

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CDNJ-12

Serous borderline tumour of the peritoneum- A rare entity

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Indian Journal of Pathology and Oncology,
Volume : 8, Issue : 4, Year : 2021: 522-525.
DOI: https://doi.org/10.18231/j.ijpo.2021.109

ABSTRACT:
Serous borderline tumor is a rare entity of peritoneum which can lead to diagnostic dilemma due to its resemblance with reactive lesions of peritoneum and ovarian borderline and malignant neoplasms. Complete clinical details, histopathological evaluation and immunohistochemistry aid in arriving at correct diagnosis. Recognizing this entity is important as it carries good prognosis.
Keywords: Mesothelium hyperplasia, Primary peritoneal carcinoma, serous borderline tumor.

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CDNJ-13

Xanthoma of Fallopian Tube in Young Female- An Uncommon Entity

EDUPUGANTI, HIMA SREE; NIKHIL, P. V.; MINAL, JESSICA; SHETTY, ARCHANA; SANDHYARANI, KANNA

Journal of Clinical & Diagnostic Research. **Apr2022, Vol. 16 Issue 4, p1-2. 2p.**

ABSTRACT
Xanthomas or xanthelasmas are rare benign tumours characterized by localized lipid deposits within an organ system which can be an important sign of systemic disease. These tumours have a predilection for skin and subcutaneous tissue, the most common visceral site being the Gastrointestinal (GI) tract. Xanthoma in female genital tract is a rare finding and should be considered as a differential diagnosis for abdominal pain in a reproductive age group. This is an unusual case of Xanthoma of fallopian tube in a 27-year-old female presenting with lower abdominal pain. Ultrasonography (USG) revealed right hydrosalpinx. The histopathological examination of fallopian tube showed sheets of foamy macrophages with peripherally placed nucleus and abundant vacuolated cytoplasm in the lamina propria which was positive for Cluster of Differentiation 68 (CD68) and negative for Cytokeratins (CK). A final diagnosis of Xanthoma of right fallopian tube was made. Fallopian tube Xanthomas must be distinguished from xanthogranulomatous salpingitis, which is associated with an inflammatory cell infiltrate, often including giant cells and plasma cells.

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CDNJ-14

Mesenteric mucinous cystadenoma: a diagnostic conundrum

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The New Indian Journal of OBGYN. **2023; 9(2): 394 -97.** DOI - 10.21276/obgyn.2023.9.2.40

ABSTRACT

Mucinous cystic neoplasms (MCNs) can be of ovarian or extra-ovarian origin. They share a common pathway of development, but pathogenesis remains controversial. Case reports involving the mesentery as a primary tumour site are few in literature. We report a case of a 48 year old female who presented with abdominal pain. Ultrasound revealed an intraabdominal cystic mass probably of adnexal in origin under radiology. On laparotomy, the mass was seen arising from the mesentery and was suspected to be a mesenteric cyst. On histopathological examination, the cyst was diagnosed to be of neoplastic nature (Mesenteric mucinous cystadenoma). MCNs of the mesentery remain asymptomatic until they attain a very large size. The awareness of this entity helps in considering this lesion in the differential diagnosis of mesenteric cysts. Complete surgical removal of the tumour without spillage is recommended,

Due to higher risk of recurrence and malignant transformation. The definitive diagnosis is based on histopathological examination which can exclude a borderline or malignant component, thereby helping in better patient management.

Keywords: Mucinous, cystadenoma, mesenteric, ultrasound.

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CDNJ-15

Idiopathic calcinosis cutis of the right iliac region: Common Lesion at uncommon

Gaffoor, N. ., Edupuganti, H. S. ., Minal, J. ., Shetty, A. ., T R, S. ., & Muralidhar, A.

Indian Journal of Case Reports,
Volume 7(12), 541–543. (2021).
https://doi.org/10.32677/ijcr.v7i12.3231

ABSTRACT
Calcinosis cutis is an uncommon soft tissue lesion characterized by the deposition of calcium salts in the skin or subcutaneous tissue attributed to a wide variety of causes. We present a case of idiopathic calcinosis cutis in an adult male, who presented with a swelling in the right iliac region. Chalky white aspirate and amorphous basophilic granular material on microscopy suggestive of calcium deposits were noted. Histopathological examination of the excised mass coupled with appropriate clinical background led to the final diagnosis of idiopathic calcinosis cutis. We present this case with a complete diagnostic workup to undermine the importance of considering this lesion in the differential diagnoses of a subcutaneous hard lump in an otherwise healthy patient.
Keywords: Calcinosis, Calcium, Fine-needle aspiration, Skin.

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CDNJ-16

Adverse Drug Reaction Monitoring Through Active Surveillance in the Inpatients of General Medicine Ward of a Tertiary Care Hospital

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APIK Journal of Internal Medicine.
10(1): p 22-27, Jan–Mar 2022. | DOI: 10.4103/ajim.ajim_7_21

ABSTRACT
Objective: To monitor and analyze the adverse drug reactions (ADRs) by active surveillance in the inpatients of the department of general medicine of a tertiary care hospital.

Materials and Methods: This was a cross-sectional study on the patients aged 18–70 years conducted for a period of 6 months. Patients' medical history, any new symptoms after commencing treatment, and their details were obtained after direct interviews. The case report forms were also reviewed. Suspected ADRs were documented in consultation with the attending physicians. Descriptive statistics was used to analyze the data for the occurrence, relatedness to the drug, seriousness, preventability, severity, intensity, and predictability of

ADRs.

Results: Fifty-three women and 47 men consented to participate, the majority of whom were between the ages of 20 and 30 years. Thirty suspected ADRs were detected in 24 out of 100 patients. The most common indications for which the drugs were prescribed were depression, psychosis, bipolar disorder, atopic dermatitis, and cervical spondylitis. Of the 30 ADRs, 28 were probably related, and 2 were possibly due to the prescribed drugs. Seven ADRs were serious in nature. Four ADRs were definitely preventable, seven were probably preventable, and nineteen were not preventable. Maximum ADRs were caused by immunosuppressant's including steroids. Dermatological reactions were the most common manifestations of ADRs followed by that of central nervous system. There were four rare ADRs, namely, escitalopram-induced duodenitis, phenobarbitone-induced pancytopenia, quetiapine-induced thrombocytopenia, and aripiprazole-induced ocular gyrus syndrome. ADRs were mostly mild to moderate in intensity.

Conclusion: Monitoring the ADRs through active surveillance is helpful to get a detailed information and to detect rare ADRs.

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CDNJ-17

A Study on Physicians' Adherence to Joint National Committee Guidelines for Hypertension

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APIK Journal of Internal Medicine,
10(2): p 73-77, Apr–Jun 2022. | DOI: 10.4103/ajim.ajim_12_21

ABSTRACT

Background: Increased blood pressure (BP) is the second leading risk factor for death and disability globally according to the Global Burden of Disease Study. Therefore, various guidelines have been issued. The American College of Cardiology/American Heart Association issued guidelines and Joint National Committee (JNC) 7 and JNC 8 guidelines, which were laid down by the JNC are a few guidelines for hypertension (HTN) management. Many countries have not implemented effective public policies to prevent and control HTN.

Objective: The objective of this study was to assess the number of physicians' adherent to JNC 7, JNC 8, and AHA guidelines when prescribing medications to patients. In addition, the efficacy of the medications, trends in prescribing medications, and adverse drug reactions that a few patients presented with were assessed.

Materials and Methods: A cross-sectional, questionnaire-based observational study was conducted on hospitalized hypertensive patients in a tertiary care hospital in South India. Data were collected on a detailed interview basis after receiving an informed consent based on a specific set of preformulated questions. The sample size was met, and the obtained data were analyzed appropriately using the SPSS software version 21. Results: Seventy two patients had diabetes and/or CKD along with hypertension out of 198 patients who participated in the study. Maximum number of prescriptions were adherent to JNC 8 and the least were observed with AHA guidelines. The blood pressure was more controlled in those patients where physicians were adherent to guidelines. The most commonly prescribed drugs were Calcium channel blockers followed by Angiotensin receptor blockers, beta blockers and ACE inhibitors. Adverse drug reactions were seen in only 5 patients

Conclusion: The overall adherence to antihypertensive medications guidelines by physicians in India is only modest and much lesser when comorbidities are associated. There is a need to build awareness. Further the antihypertensive classes of medications currently recommended appear to be efficacious and safe.

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CDNJ-18

COVID-19 Associated Stroke-A Single Centre Experience

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Journal of the Association of Physicians of India. **2021 Jun;69(6):11-12.**
https://pubmed.ncbi.nlm.nih.gov/34472782/

ABSTRACT

Background and purpose: Various neurological complications have been reported in association with COVID-19. We report our experience of COVID-19 with stroke at a single center over a period of eight months spanning 1 March to 31 October 2020.

Methods: We recruited all patients admitted to Internal Medicine with an acute stroke, who also tested positive for COVID-19 on RTPCR. We included all stroke cases in our analysis for prediction of in-hospital mortality, and separately analyzed arterial infarcts for vascular territory of ischemic strokes.

Results: There were 62 stroke cases among 3923 COVID-19 admissions (incidence 1.6%). Data was available for 58 patients {mean age 52.6 years; age range 17-91; F/M=20/38; 24% (14/58) aged ≤40; 51% (30/58) hypertensive; 36% (21/58) diabetic; 41% (24/58) with O2 saturation <95% at admission; 32/58 (55.17 %) in-hospital mortality}. Among 58 strokes, there were 44 arterial infarcts, seven bleeds, three arterial infarcts with associated cerebral venous sinus thrombosis, two combined infarct and bleed, and two of indeterminate type. Among the total 49 infarcts, Carotid territory was the commonest affected (36/49; 73.5%), followed by vertebrobasilar (7/49; 14.3%) and both (6/49; 12.2%). Concordant arterial block was seen in 61% (19 of 31 infarcts with angiography done). 'Early stroke' (within 48 hours of respiratory symptoms) was seen in 82.7% (48/58) patients. Patients with poor saturation at admission were older (58 vs 49 years) and had more comorbidities and higher mortality (79% vs 38%). Mortality was similar in young strokes and older patients, although the latter required more intense respiratory support. Logistic regression analysis showed that low Glasgow coma score (GCS) and requirement for increasing intensity of respiratory support predicted in-hospital mortality.

Conclusions: We had a 1.6% incidence of COVID-19 related stroke of which the majority were carotid territory infarcts. In-hospital mortality was 55.17%, predicted by low GCS at admission.

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CDNJ-19

A Community-Based Study of Milk Adulteration and Childhood Malnutrition in Bangalore Rural District, India

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Epidemiology and Society Health Review,
Vol. 4, No. 1, 2021, pp. 1-11, DOI: 10.26555/eshr.v4i1.4641

ABSTRACT

Background: Milk promotes child growth; however, adulterated milk reduces nutritional value and exposes children to harmful chemicals. Therefore, this study aimed to assess the nutritional status of children aged 1–5 years living in the selected study area and test milk samples from the children's households for common adulterants. The study further aimed to explore the association between malnutrition and milk adulteration.

Methods: We used a community-based cross-sectional study design conducted in the service Area of a tertiary healthcare institute in Bangalore Rural District, Karnataka state, India. Systematic random sampling was used to recruit 180 children aged 1–5 years. Primary data Was collected through interviews, anthropometry, and strip tests for milk adulteration. Statistical analysis consisted of descriptive analysis, Chi-square tests, odds ratios, and 95% confidence intervals.

Results: Prevalence of underweight, stunting, wasting, and low Body Mass Index (BMI) was 13.33%, 38.33%, 15.0%, and 26.7%, respectively. General adulterants detected were Neutralizers in 97 (53.9%) and malt dextrin in 90 (50%) samples. Higher proportions of stunting, underweight and low BMI were found in children drinking adulterated milk. Low BMI was significantly associated with joint family and lower maternal education.

Conclusion: Our study found a high prevalence of malnutrition in children, particularly stunting. The study also detected widespread adulterants in milk and a potential association with malnutrition. The authors recommend further studies with a larger sample size to accurately delineate the relationship between milk adulteration and malnutrition.

Keywords: Malnutrition; Milk adulteration; Under-five; Stunting; Underweight; Wasting

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CDNJ-20

Voices of Those Who Bear the Brunt - Experiences of Programme Personnel Concerning Private Sector Tuberculosis Notifications in Bengaluru City, India

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Social Work in Public Health. 2021
Nov 17; 36(7-8):759-769.
DOI: 10.1080/19371918.2021.1953665.

ABSTRACT

This study aims to assess private and public sector contributions to Tuberculosis (TB) notification in Bengaluru city (2011 to 2016) and identify challenges of program personnel in their interaction with private practitioners and procedural barriers for TB notification from the private sector as perceived by them. A mixed methods study was carried out in Bengaluru city, India with TB notification data obtained from TB Units in addition to in-depth interviews with key program implementers. Results showed the contribution of private practitioners to TB notification to be about 20%. Barriers and challenges were: the private practitioners' hesitancy to refer the patients to public sector due to their fear of losing patience and dishonoring of diagnosis from private practitioners, lack of awareness about TB notification, lack of legal punitive measures and constant glitches on the notification website. These need to be resolved on priority to achieve the national target of TB elimination by 2025.

Keywords: Bengaluru city; Nikshay; TB notification; private practitioners.

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CDNJ-21

Prevalence and predictors of prehypertension and hypertension in Adult population of rural Southern India-An epidemiological study

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Journal of Family Medicine and Primary Care. 2021
Jul; 10(7):2558-2565. DOI: 10.4103/jfmpc.jfmpc_2415_20

ABSTRACT

Introduction: Hypertension is considered as one of the major health problem worldwide and the most important risk factor for non-communicable diseases.

Aims: To estimate the prevalence and the risk factors of prehypertension and hypertension

Methods and material: A community-based cross-sectional study was conducted among adult population of rural area of Chittoor District. WHO STEPS was applied for data collection from 1,742 study participants aged 18 years and above. Chi-square test, Fisher exact, and ANOVA test applied to find out the intragroup and intergroup variable association with raised blood pressure.

Results: The overall prevalence of hypertension and prehypertension in our study was 21.5% [95% CI: (19.6-23.5)] and 42.8% [95% CI: (39.5-46.3)], respectively. Males had higher prevalence when compared to females. The mean systolic and diastolic blood pressure was 118.7 ± 17.6 mmHg and 77.1 ± 9.7 mmHg, respectively. The odds of being hypertensive was higher among older age group (OR: 3.83), male study participants (OR: 1.83), either widowed or separated (OR: 2.03), unemployed (OR: 1.51), and those who belonged to upper socioeconomic status (OR: 2.01). Those who were overweight (OR: 3.15), obese (OR: 2.55) and having central obesity (OR: 1.74), and also tobacco smokers (OR: 1.53) were having higher odds of hypertension. Significant association was found between hypertension and age, gender, marital status, body mass index, abdominal obesity, tobacco smoking, and physical inactivity.

Conclusion: The prevalence of prehypertension and hypertension in this study was found to be high in rural area of Andhra Pradesh. There is a need to develop a community-based program, which would aim at minimizing the risk factors of hypertension.

Keywords: Hypertension; India; predictors; prehypertension; rural.

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CDNJ-22

Comparing knowledge, attitude, practice and stigma associated with SARS- COV-2 Infection among Healthcare students of Bangalore city: A cross sectional study

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Indian Journal of Community Health, **Vol. 33 No. 4 (2021).**
DOI: https://doi.org/10.47203/IJCH.2021.v33i04.020

ABSTRACT

Background: In 2020, a new global pandemic has emerged, caused by a new strain of Corona virus called SARS-CoV-2. A poor understanding of the disease among healthcare students may implicate in delayed treatment and rapid spread of infection and development of complications.

Objectives: 1) To estimate the knowledge, attitude, practice and stigma associated with SARS- CoV-2 infection among healthcare students. 2) To estimate the association between socio-demographic determinants with knowledge, attitude, practice and stigma of SARS- CoV-2 infection among healthcare students.

Methods: A web-based cross-sectional study was undertaken among 493 healthcare i.e., medical, nursing and allied sciences students, during 1st May to 20th May 2020, using a pre-designed and semi-structured questionnaire. Data was analyzed using Chi square test, t-test, one way Anova and Bonferroni test was used for assessing the association among the study variables

Results: The study revealed that, there were about 225(45.64%) medical, 165(33.46%) nursing and 103(20.89%) allied sciences students. Majority were females 349(70.79%), majority were Hindus 333(67.54%). Mean knowledge score of medical, nursing and allied sciences students were 15.66 (2.518), 14.16 (2.92) and 14.46 (3.11) respectively Practice score was good among nursing than allied sciences students at 'p' (0.003).

Conclusion: Even though the overall knowledge was less in our study participants, majority of them had followed good practices for preventing SARS- CoV-2 infection.

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CDNJ-23
Vitamin D and glycated hemoglobin levels in non-diabetic anemic patients

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National Journal of Physiology, Pharmacy and Pharmacology,
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ABSTRACT

Background: Glycated hemoglobin (HbA1c) is a form of hemoglobin that indicates average plasma glucose concentration over months formed due to non-enzymatic glycation. According to the previous studies, HbA1c levels have been found to be increased in anemic patients despite the shortened life span of the erythrocytes. Decreased Vitamin D may be an independent risk factor for type 2 diabetes mellitus (T2DM) with higher HbA1c levels. Studies have also demonstrated that in children, decreased Vitamin D levels are associated with increased risk for anemia.

Aim and Objective: The aim of this study is to estimate and analyze HbA1c, Hb, and Vitamin D among non-diabetic anemic patients and age- and sex-matched normal subjects.

Materials and Method: A case–control study was carried out with inclusion of 50 anemic patients as cases and 50 normal subjects as controls. The patients, who had diabetes, hemolytic anemia, worm infestation, chronic alcohol ingestion, and renal disease, were excluded from the study. Routine blood investigations, the fasting and postprandial glucose and HbA1c, Hb, and Vitamin D levels were measured in all the subjects. Vitamin D was estimated by ELISA. Fasting and postprandial blood glucose levels were determined by GOD-POD method. Hemoglobin (Hb) was estimated by Drabkin's method. HbA1c was determined by immunoturbidimetry.

Results: The mean HbA1c (7.4 ± 0.5%) level in the patients with iron deficiency anemia (IDA) was higher than that in the control group (5.2% ± 0.8) ($P < 0.05$). There was no difference in the levels of FBS and PPBS between the two groups ($P > 0.05$). The Hb, serum ferritin, FBS, PPBS, and the HbA1c levels were normal in the control group ($P > 0.05$). The study found negative correlation between Vitamin D and HbA1c in both males and females ($r = –0.4$, $r = –0.3$ $P \leq 0.001$), HbA1c and hemoglobin ($r = –0.4$, $r = –0.3$ $P \leq 0.002$). Furthermore, there was a significant positive correlation between the Vitamin D and hemoglobin ($r = 0.5$, $r = 0.3$ $P \leq 0.001$) values in the study population.

Conclusion: HbA1c is not affected by the blood sugar levels alone, and there are many factors to be considered when HbA1c is measured, especially that of presence of iron deficiency. It is essential to rule out IDA before making any decision, based on the HbA1c levels.

KEY WORDS: Anemia; Glycated Hemoglobin; Non-diabetic; Vitamin D

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CDNJ-24

Faster reading techniques - A method to ameliorate performance among first MBBS students

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National Journal of Physiology, Pharmacy and Pharmacology,
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ABSTRACT

Background: The reading speed depends on the level at which these organs are trained to help the reader use them earnestly. Research related to fast reading courses affirms that the reading speed can be greatly increased without sacrificing comprehension by learning to make use of visual information at a single glance and by ignoring the inner speech. With the change in curriculum by National Medical Commission, adopting faster reading techniques would help in holistic development of future physicians of first contact.

Aim and Objectives: The objectives of the study were to study the effects of faster reading techniques on reading and comprehending capabilities among students.

Materials and Methods: Students were instructed to read the material given to them within a time limit of 2 minutes and answer the questions at the end of 2 minutes before and after employing fast reading techniques.

Results: The results of the present study showed a statistically significant increase in reading speed and performance of the individuals after delivering instructions pertaining to fast reading techniques. Conclusion: In the light of our findings, it is recommended that faculty members in medical education need to train and encourage students extensively on the use of faster reading strategies such as skimming and scanning for better academic performance.

KEY WORDS: Faster Reading Techniques; First Bachelor of Medicine and Bachelor of Surgery Students; Reading Speed; Comprehension; Performance

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CDNJ-25

Glutamic Acid Decarboxylase and Islet Cell Cytoplasmic Autoantibodies

Positivity in Latent Autoimmune Diabetes of Adults: Need for Early Insulinisation

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Journal of Clinical and Diagnostic Research,
2021, May, Volume: 15, Issue: 05
DOI: 10.7860/JCDR/2021/47396.14869

ABSTRACT

Introduction: Latent Autoimmune Diabetes of Adults (LADA) remains a poorly understood disease at both the clinical and research level and usually misdiagnosed as Type 2 Diabetes Mellitus (T2DM) and treated with Oral Hypoglycemic Agents (OHA). This might lead to accelerated β-cell destruction leading to early insulin-dependency in these patients. Screening of T2DM and determination of C-peptide and insulin antibodies helps to differentiate this disease from LADA. Early insulinisation of these patients prevents β-cell destruction and preserves residual β cell function.

Aim: To screen type 2 diabetic patients for potential LADA subjects based on LADA clinical risk score and to confirm them as LADA based on Glutamic Acid Decarboxylase (GADA) positivity and Islet Cell Cytoplasmic Autoantibodies (ICA) positivity.

Materials and Methods: The hospital based cross-devotional study was done on 945 T2DM patients attending Out Patient Department (OPD) of Rajarajeswari Medical College and Hospital, Bengaluru, Karnataka, India from March 2017 to May 2019. Patients were screened using LADA clinical risk score and potential LADA subjects were identified and tested for C-peptide, GAD and IC Antibodies to confirm LADA. C-Peptide and GAD antibodies were measured by ELISA method. IC antibodies were observed using immunofluorescence microscopy. Inferential Statistics (Chi-square test, Z test, t-test) by using SPSS V20 and MS Excel was used.

Results: Out of 945 T2DM patients, 188 patients (20%) were considered as potential LADA subjects based on LADA clinical risk score. All 188 subjects were tested for C-peptide, GAD and IC antibodies. 36% (68 subjects) of them had low C-peptide levels. Among them four subjects (6%) had high GADA titer confirming them as LADA subjects. Three (4%) of the subjects had low GADA titer, remaining 61 subjects did not show antibody positivity. Only one of them had both IC antibody positivity out of four subjects with high GADA titer. Remaining 64% (120 subjects) had normal C-peptide levels and antibody negative.

Conclusion: Using 5-point LADA clinical risk score 20% were identified as potential LADA subjects out of 945 T2DM subjects. 6% of the potential LADA subjects had high GADA titer confirming them as LADA, who may be benefited by early insulinisation.

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CDNJ-26

Effect of abacus training on critical flicker fusion Frequency threshold among primary schoolchildren

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Indian Journal of Physiology and Pharmacology,
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ABSTRACT

Objectives: The concept of neuronal plasticity has been considerably studied to know how long-lasting changes are associated with brain's capacity to be shaped or sculptured by experience. Potential cognitive benefits of abacus training have been proved by various studies indicating it to be a promising tool in improving cognitive abilities including arithmetic abilities, visuospatial and working memory. Critical flicker fusion happens when the individual can no longer differentiate between changing visual stimuli. It can be modulated by behavioural or psychophysical techniques. The objectives of the study were to evaluate the effects of abacus training on critical flicker fusion frequency (CFFF) threshold.

Materials and Methods: CFFF threshold (CFFFT) was measured in 60 school students studying third and fourth standard (30 trained in abacus and 30 not trained in abacus) using portable software-based apparatus.

Results: The mean scores of abacus trained individuals were significantly higher compared to those who were not trained.

Conclusion: Since higher CFFFTs can absorb more visual information, increasing their threshold might lead to cognitive improvement and better academic performance. Abacus trained individuals showed significantly higher critical fusion frequency threshold.

Keywords: Abacus trained, Primary school students, Critical flicker fusion frequency threshold, Sweep gen

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CDNJ-27

A study on effective use of technology in training first MBBS students for Foundation course during pandemic era

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National Journal of Physiology, Pharmacy and Pharmacology,
2022 | Vol 12 | Issue 05, pp: 581-587.
DOI: 10.5455/njppp.2022.12.10383202125102021

ABSTRACT

Background: Medical education in India is being revolutionized with the introduction of "Competency-based undergraduate curriculum" for an Indian Medical Graduate. It demands great commitment, flexibility to adopt to changes, and lifelong learning. For this, 1 month foundation course was introduced across the country. Unfortunately, the pandemic had cast its shadow on a conduct of this very pertinent foundation course at a classical offline mode and made a shift to online learning inevitable.

Aim and Objectives: The aim of the study was to study how the use of technology can result in effective delivery of course content through feedback analysis and online objective assessment.

Materials and Methods: Feedback from the students was obtained employing a predesigned questionnaire mailed to them using Google forms and online objective assessment was also conducted after the end of the course.

Results: The majority of the students felt that the topics selected were absolutely essential for the medical profession and scored fairly well in the assessment. Conclusion: The results of the present indicate that there was not much difference in students perception about the foundation course whether covered through online or offline mode suggesting a blended learning format to be a useful teaching learning method during the post-pandemic phase.

KEY WORDS: National Medical Council; First MBBS; Foundation Course; Online Mode; Feedback; Assessment

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CDNJ-28

A STUDY ON VISUAL MEMORY AMONG CONGENITALLY DEAF CHILDREN

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INDIAN JOURNAL OF APPLIED RESEARCH,
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ABSTRACT

During early stages of development, the loss of a sensory system can lead to profound neural reorganization, specially leading to an enhancement of the remaining modalities, a phenomenon termed as cross-modal plasticity. Thus in the absence of hearing, the vision is put under great demand, resulting in use-dependent plasticity pertaining to visual functions. The objective of the current study is to assess visual memory among congenitally deaf children and compare the results with those obtained from normal hearing individuals. The study included 60 congenitally deaf children and 50 normally hearing subjects. 30 subjects from each group with intelligence scores between 25-75 percentiles were tested for visual memory. The results of the present study disclosed that deaf individuals were superior to normally hearing subjects with respect to immediate recall and delayed recall. Since deaf individuals demonstrate increased sensitivity to visual stimuli, their visual strengths can be utilized for better communication and academic achievement.

KEYWORDS: Congenitally deaf, Neuronal plasticity, Intelligence, Visual memory, Rey-Osterrieth Complex figure

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CDNJ-29

An unusual presentation of Chronic Lymphocytic Leukaemia as delirium

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Archives of Mental Health,
Volume: 18 Issue: 2 Page: 144-145, 2022

ABSTRACT

Delirium is a state of impairment in the level of consciousness, cognition, psychomotor activity, sleep-wake cycle and emotions. It is one of the most common neuropsychiatric complication in terminally ill cancer patients. People with Chronic Lymphocytic Leukaemia (CLL) are usually asymptomatic, and presenting to psychiatry outpatient as delirium is a rare scenario. Through our extensive literature search, delirium in CLL was noted only when hematopoietic stem cell transplant was initiated, although we did not get any data on CLL presenting as delirium. We are hereby describing the case of a 65 year old male who presented with delirium as the initial manifestation of CLL. He was started on chlorambucil and prednisolone with conservative management of delirium and was found to be doing well on follow up. This case illustrates the need for thorough evaluation and treatment of the underlying cause for delirium.

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CDNJ-30

A FATAL CASE OF SUICIDAL CUT THROAT INJURY- CASE REPORT

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Journal of South India Medicolegal Association,
14(1):61-64, March 2022

ABSTRACT

BACKGROUND: Cut throat injury is a type incised wound over the neck. It may be suicidal, homicidal or even accidental in manner. The wound can lead to death due to hemorrhage, shock, air embolism or even aspiration of the blood. Suicidal cut throat injury is rare and is most commonly seen in men and those having previous psychiatric illnesses.

Case presentation: A 28 year old man was found on the verge of death in his room, by his mother. He was lying on the floor supine, in a pool of blood with a wound over the neck. Autopsy revealed three incised wounds merged into one present over front of the neck at the level of cricoid cartilage.

Conclusion: Cases of cut throat injuries presents as a challenge of forensic pathologist in determining the manner of the death as these cases present quite similarly when subjected to post-mortem examination. The furnishing of an opinion requires careful examination of circumstantial evidence, history, and crime scene and autopsy findings.

Keywords: Cut throat injury, Suicidal incised wound, self-inflicted wound

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DEPARTMENT OF COMMERCE AND MANAGEMENT
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Publication Summary

International Journal	**02**	**(CAMIJ-01 – CAMIJ-02)**
National Journal	**01**	**(CAMNJ-01)**
International Conference	**02**	**(CAMIC-01 – CAMIC-02)**
Book Chapters	**02**	**(CAMBC-01 – CAMBC-02)**

DEPARTMENT OF COMMERCE AND MANAGEMENT
SCHOOL OF COMMERCE AND MANAGEMENT
INTERNATIONAL JOURNAL PUBLICATIONS

CAMIJ-01

IMPACT ANALYSIS OF MACRO- ECONOMIC FACTORS ON NON-LIFE INSURANCE SECTOR IN INDIA

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International Journal of Financial Engineering
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DOI: 10.1142/S2424786322500116
June 2022

Abstract

The development of global economy has pushed up the importance of insurance industry in the growth of an economy. This paper intends to study the non-life insurance sector with an objective to identify the macro-economic factors that influence its growth. Time series data of 37 years is considered using Johansen & Engle Granger Cointegration and Ordinary Least Square method. It was found that Final Consumption Expenditure plays a negatively significant role in influencing non-life insurance sector in India. The practical implication of this study lies in controlling the responsible factors through appropriate policy measures to ensure a sustainable growth of the non-life Insurance sector.

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CAMIJ-02

Impact of Competency Management on Employee Self-development For Retention in large scale industries

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Webology,
ISSN - 1735-188X, Volume 19, Pages - 3971-3988, January 2022

Abstract

An organization which grows with the employees of long-time existing will create a historical success story. The creation of emotional bonding between employee and employer is the significant role of HR in a company. The automobile industry is India's one of the largest sectors and placing a fourth largest market globally. Employee retention is very mandatory in the automobile industry because of competitors, day-to-day innovations, and migrant employees. This study is specially focused on the influence of competency assessment and employee self-development for workplace happiness among 72 Managers and 95 Engineers of various automobile companies & ancillary companies in India. Statistical analysis is carried using the statistical tool IBM SPSS 20. The outcome of the study insists that reward programs, promotions, and self-development programs must be organized regularly. The study concludes that competency assessments and self-development have a strong positive impact on workplace happiness, leading to employee retention.

Keywords

Competency Assessment, Employee Self-development, Workplace Happiness, Employee Retention, Employee Recognition.

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NATIONAL JOURNAL PUBLICATION

CAMNJ-01

Do the Macroeconomic factors Influence the volatility of Gold Price? An empirical study

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Journal of Commerce & Accounting Research,
ISSN - 2277-2146, Volume 11, Issue 2, Pages - 37-44,
April 2022

Abstract

The price of gold changes every day due to several reasons, such as economic factors, political factors, festival season, and the demand and supply needs of the consumers across the world. Among these factors, the change in gold price is majorly influenced by macroeconomic variables in India. With this backdrop, the study focuses on the influence of macroeconomic factors on the fluctuations in gold price in India. The study has chosen select macroeconomic variables on the basis of existing studies, namely wholesale price index (WPI), exchange rate (ER), unemployment rate (UR), long-term interest rate (LTIR), and S&P BSE SENSEX. This study takes monthly observations over a period of five years, from 1 January 2015 to 31 December 2019. Descriptive statistics is used to check accuracy and reliability of the data. Correlation analysis is used to find the relationship, and ordinary least square (OLS) method is applied to check the cause and effect of the macroeconomic variables on the gold price. The study empirically found that ER, WPI, UR, and S&P BSE SENSEX have a positive influence on the gold price, while LTIR has a negative influence.

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CAMIC-01

Analysis of skill enhancement program introduced by government of India to up skill the human capital

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Social Science Research Network,
ISSN - 3841886, 2021

Abstract

Human abilities and education is an important asset. These constituents to the capital make the human capital. This can be invested to produce value in every business scenario. The concept though originally applied in the analysis of a nation's ability to utilize the skill set of people. It gradually became a key part of understanding corporate productivity. This parameter increasingly became essential in understanding how businesses succeed. The United Nations (2009) expands on this definition as productive wealth embodied in labor in the form of skill and education. This expertise integrated with humans as a result of formal and informal education. For this study human capital is defined as productive wealth embodied in labor, skills and knowledge (UN 2016 and 2020). Further, for this study human capital is defined as education and training, either in the form of formal education or in the form of informal education and cultural studies. Due consideration is given to Knowledge, labor, skills in general, as well as industry and firm jobs and also task specific experience . This study aims at exclusive analysis of recent programs introduced by the government of India to enhance the skill. The study focuses on critical success of program depending on real time skill enhancement. Further analysis of different schemes is done on the ground level implementation. Each category is analyzed against the various reformatory Acts and statutes introduced by Government of India under skill enhancement effort further effectiveness of implementation is studied in the new skill Development programs announced by the government of India. This study is more critical in the light of most developing nations liberalizing their economies to attract foreign direct investment. The competition is steep with the advent of liberal and open trade policies. Solution to strive for this global competition is skill enhancement.

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CAMIC-02

Artificial intelligence for mitigating patent process hurdles

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[2] Student of Dept of AIML, Dayananda Sagar Academy of Technology and Management.

International Journal of Engineering Research in Computer Science and Engineering,
ISSN - 2394-2320, Volume 09, Issue 10,
October 2022

Abstract

New thrust by the government to develop skill sets and entrepreneurship has resulted in massive inventions and rapid advancement of science and technology. Complexity in monitoring, managing adapting, and registering innovations is becoming increasingly difficult due to a massive number of inventions. Maintaining standards for new innovations along with increased time for their scrutiny is causing delays in the adaptation of new inventions. The Intellectual property rights scrutiny towards judging the uniqueness of a particular innovation and prior art search has been made considerably easy by using artificial intelligence and machine learning. This latest technology can help to overcome the cumbersome processes for the allotment of intellectual property rights. This technology eases the burden of managing a large number of innovations filed as patent applications. Data mitigation becomes easy in the area of prior art searches. The world trade organization has announced certain stipulations in the form of law to avoid overlapping of the inventions and grant patents in line with the geographical restrictions. This article makes a concrete proposal to understand the complex interrelationship between trade law, jurisprudence, and the application of artificial intelligence in overcoming the hurdles concerning the patent grant process. The paper also proposes the use of artificial intelligence for patent-related dispute settlement in line with Trade-related aspects of intellectual property rights agreements. The paper advocates the use of artificial intelligence in the area of application and grant of patents

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Books & Book Chapters

CAMBC-01

Fluctuations of West Texas Intermediate (WTI) Oil Price pre and during Covid -19 times: An Event Study"

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Bhumi Publishing, ISBN: 978-81-953600-9-3
COVID 19: Impact and Response volume III
Pages 170-177, 2021

Abstract
The Novel Corona virus pandemic or COVID-19 pandemic is an ongoing disease caused by severe acute respiratory syndrome. As the virus continues to spread across the world, led most of the powerful economies on the brim of collapse and forced to go into a state of lockdown by shutting down all of its major operations, which affected various sectors and created shocks in the stock market. Due to pandemic, it is observed that there is lesser demand for crude oil though huge supply persists. Based on this backdrop, the study has examined the fluctuations of West Texas intermediate oil price during pre and during Covid-19. Further, the study has considered COVID-19 as an "Event" in which daily observations on West Texas intermediate oil prices over a period of total ten months was considered from 1st June 2019 to 30th March 2020 and classified time period from June 1st 2019 to October 30th 2019 (Pre COVID) and 1st November 2019 to March 30th 2020 (During COVID) . This empirical study has found using paired t test that there is statistically significant difference in West Texas intermediate oil price during pre and during Covid-19. JEL Classification: C1, C12, F1, F6 Keywords: Covid-19, WTI oil price, Paired t test, Oil Price fluctuation.

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CAMBC-02

Digital Business

[1] Dr. Jyoti Mishra

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Himalaya Publishing House
ISBN: ISO 9001:2015 CERTIFIE, Pages - 1-347
2021

Abstract

To highlight this interrelation between "business" and "digital", this book focuses on examining the concept of digitalization which is related, according to Gartner (2017), to the use of digital technologies to improve businesses, and create new revenues and value-producing opportunities. Thus, digitalization allows organizations to change their business model and value chains with the use of disruptive technologies and digital data in the digital economy (Skilton, 2016). Such business transformations should be understood and mastered by providing practical tools and frameworks to assist managers in dealing with digitalization challenges. In this book, a special focus will be on transitional economies facing big concerns and challenges linked to unexpected events and additional global pressures. Digitalization and digital transformation can be, at the time, sources of opportunities and risks for such economies when dealing with globalization challenges. To organize this process, the text is divided into five chapters: Chapter 1 – Electronic Commerce Chapter 2 – Mobile Commerce, Social Commerce and IoT Chapter 3 – Digital Business Ecosystem Chapter 4 – Digital Business Applications - I Chapter 5 – Digital Business Applications - II In the context of the above backdrop, it is heartening to note that the subject "106 – Digital Business" is included by Pune University in its MBA curriculum in its new 2019 syllabus.

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DEPARTMENT OF MANAGEMENT STUDIES (MBA)
SCHOOL OF COMMERCE & MANAGEMENT

Publication Summary

International Journals	**01**	**(MGSIJ-01)**
Book Chapters	**03**	**(MGSBC-01-03)**

DEPARTMENT OF MANAGEMENT STUDIES (MBA)
SCHOOL OF COMMERCE AND MANAGEMENT
INTERNATIONAL JOURNAL PUBLICATIONS

MGSIJ-01

Journal of Behavioral and Experimental Finance: A Bibliometric overview

[1] Satish Kumar, [2] Sandeep Rao, [3] Kirti Goyal, [4] Nisha Goyal

[1, 3] Department of Management Studies, Malaviya National Institute of Technology Jaipur, Jaipur 302017, Rajasthan, India
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Journal of Behavioral and Experimental Finance
DOI: 10.1016/j.jbef.2022.100652
VOL. 34 June 2022

Abstract

Behavioral science has made a considerable contribution to finance. To gain an understanding of the scientific contributions emerging from all fields of finance with a behavioral perspective, this paper reviews the content of the major journal dedicated to behavioral finance, the *Journal of Behavioral and Experimental Finance* (*JBEF*), since its foundation 8 years ago. For this purpose, we employ Bibliometric and content analysis to shed light on the publication trends and intellectual structure of the *JBEF*, obtaining numerous intriguing findings. First, the *JBEF* is still a young journal, and its numbers of publications and citations have grown significantly since its inception. Second, though there are contributions from all parts of the world, the United States is acknowledged as contributing the most to the *JBEF*. Diverse authors have contributed to the journal, but those affiliated with the University of Innsbruck and Macquarie University lead the list. Third, most of the studies have used the theoretical underpinnings of behavioral theory and prospect theory. Methodologically, most of the studies are empirical and primarily based on quantitative research designs, archival data and regression analysis. Fourth, the *JBEF*'s contributions concern eight intellectual clusters—namely *personal characteristics and national cultures*; *psychological factors, financial literacy and robo-advising*; *investor sentiment and stock market volatility*; *asset market experiments*; overconfidence *and the disposition effects in the stock market*; *externalities (COVID-19) and financial markets*; *socially responsible investing*; and *herding behavior in financial markets*. Finally, "behavioral finance" is the most prominently used author keyword in the *JBEF*'s publications, followed by "financial literacy" All in all, these findings should offer readers a retrospection of scholarly contributions from the *JBEF*.

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BOOK & BOOK CHAPTERS

MGSBC-01

A Marketing Handbook- Book of Marketing Jargons for Students

[1] Prof. Capt. A. Nagaraj Subbarao, [2]Dr. Shweta Tewari, [3] Prof. V.V. Rajan

[1, 2, 3] School of Commerce and Management Studies, Dayananda SagarUniversity, Bangalore, Karnataka

Bluerose publishers
ISSN: 978-935-62-8122-6, 2022

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MGSBC-02

20 days of self-management

[1] Prof. Capt. A. Nagaraj Subbarao, [2]Dr. Shweta Tewari, [3] Prof. V.V. Rajan

[1, 2, 3] School of Commerce and Management Studies, Dayananda SagarUniversity, Bangalore, Karnataka

Bluerose publishers
ISSN: 978-935-47-2727-6, 2022

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MGSBC-03

Financial Inclusion in Emerging Markets" - A Roadmap to sustainable growth

[1] Dr. H.N. Shylaja

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Business Correspondents' Perspective on Financial Inclusion Initiatives: An Empirical Analysis

DOI: 10.1007/978-981-16-2652-4_4

ISSN: 978-981-16-2652-4, 2021

Abstract

With inclusive growth at the center of policy initiatives, multiple financial inclusion schemes have been introduced by the Government of India. Primafacie it appears that the concerted efforts have borne positive results in terms of access and usage of banking service. Business correspondents being the link between the last mile customer and the banks have played a pivot role in expanding the banking services to the hitherto excluded. This study aims to find out the perspective of the BCs about the FI initiatives. The study aims to analyze the progress made in terms of the banking access post the Pradhan Mantri Jan Dhan Yojna. The data collected for the purpose is both primary and secondary in nature. While the secondary data is collected from the government Web site, the secondary data has been collected from the business correspondents. The data with reference to outreach is analyzed by finding compound annual growth rate while the primary data is analyzed through two-sample paired t-test. It is observed that there is a significant increase in the expansion of banking services and a considerable improvement in the number of people who are forthcoming in availing the banking services.

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PATENTS

Summary

Patents	**03**	**(DSUIP-01 – DSUIP-03)**

PATENT PUBLICATION

DSUP-01

Ai Based Automatic Health Care System to Recognize Fruits, Vegetables Estimation For Healthy Life Using Deep Leaning Algorithm

M.Gokilavani, **Anita. A** Dayananda Sagar University, Bangalore, India
Kumaran M, Dr.Karthikeyan Palaniappan, Dr. Savitha C K
Dr.K.Shashidhar, Subhash Yalavarthy, Shaik Asha Begum
Dr. Pradeep Yadav, Dr. Brijesh Sathian, Dr. S Kalaiselvan Bengaluru, India.

Intellectual Property India, Application Number: 202241042198; Application Type: Ordinary; Date of Publication: 22-07-2022

Abstract

This project is used to identify the automatic fruits detection using Artificial Intelligence (AI). The main objective of this project is to detection of fruits and estimate calories using the image acquired by camera. It is used to study human diet and lifestyle, large sets of egocentric images were acquired using a wearable device like camera. It can also be detect shape, size, color etc. The identifying the fruits and calories from an image is quite an interesting field with various applications. Since fruit monitoring plays an important role in health-related problems, it is becoming more essential in our day-to-day life. For this purpose a recognition for fruit is presented by considering its shape, color, and size and texture characteristics. In this paper our approach has been presented to recognize the image of fruit using convolution neural networks (CNN) based on fruit image recognition algorithms. The main goal of our research is to enhance and improve the accuracy of dietary assessment by analyzing the fruit images captured by using mobile devices (e.g. smartphone). It requires mobile application to have the internet connection, but it's independent from your programming language choice and resources limitations which is important for mobile device. Keywords- Artificial Intelligence, Convolutional Neural Networks (CNN), Calorie measurement, Fruit image recognition.

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DSUP-02

Selective Intracellular Targeting of Cancer cells and methods Of use there of

Prof Dr.K. Muthuchelian, **Dr. Farhan Zameer,** Dayananda Sagar University, Bangalore, India
Dr.Sinjitha S Mambiar, **Dr.M.Gnana Ruba Priya,** Dayananda Sagar University, Bangalore, India
Dr.Saravanan, Dr.C.Suganya, Dr.R.Ganesan, Dr.Asha Kannan AP Bengaluru, India.

Intellectual Property India, Application Number: 202241008869; Application Type: Ordinary; Date of Publication: 21.02.2022

Abstract

Human cancer may be treated using the compositions and techniques of this invention. 5 Stimulating tumor microenvironment stromal cell proliferative activity is an object of innovation. At least one inorganic and optionally one or more organic compounds are included in the nucleus of the innovative particles, which may be triggered in vivo to label or modify cells and tissues. The invention likewise covers methods for making these particles and pharmacological and diagnostic formulations incorporating them.

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DSUP-03

Novel Pharmaceutical formulation Exhibits Anti-Tumor activity And tissue Necrosis

Dr.Farhan Zameer, Dr.M.Gnana Ruba Priya, Dayananda Sagar University, Bangalore, India
Dr. Soorangkattan Saravanan, Dr. Sethuraj Geetha, Dr.Suganya Chinnasamy
Dr. Muthuchelian, Bangalore, India.

Intellectual Property India, Application Number: 1191508; Application Type: Ordinary; Date of Publication: 07.01.2022

Abstract

New anticancer and necrotizing cancer characteristics, as well as other desired pharmacological qualities, are provided by this innovation. It combines a particular solution containing polyethylene glycol, 2, 3-hexanediol (e.g., para toluene sulfonamide), propanediol and decanedioic acid, dimethyl, sulfoxide, and ethanol. Preliminary human clinical testing shows the mixture to be therapeutically active, and there are few unwanted side effects.

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Ph.D THESIS

Summary

Thesis Abstracts	**19**	**(DSUT-01 – DSUT-19)**

DSUT-01

Nagaraj A.M.
(ENG16PPEC05)

**Dept of Electronics and Communication Engineering,
School of Engineering**

Under the Supervision of

Dr.Puttamadappa C & Dr.R.Prakash

Title: Computation of Induced Voltages and currents in the Aircraft Wiring Due to Lightning Strike

Abstract

Avionics adopts sophisticated interconnected equipment comprising of intense communication, control and computational capability. Considering the importance of data Communicated in avionics equipment, the communication cables need protection from different external disturbances. Lightning is considered as one of the prime disturbances on the aircraft causing both mechanical and EMI disturbances. Electromagnetic Interference is one such disturbance that degrades or malfunction the avionic equipment. Signal processing Techniques are adopted in order to develop the transient analysis on the cable affected by the Lightning problem. The frequency domain analysis of the cable current and voltage infers the Transient conditions occurring due to the current surge in the cables. Flight control panel uses both the braided and non-braided cables for communication inside the aircraft. The investigation of the transient effect on both the braided and the non-braided cables are carried out with lightning effect on the cables. Considering the characteristic impedance on both the sides of the cable the transient analysis is carried out with both the current and the voltage responses for analysis using differential equations. Fourier Transform based analysis of the transients occurring due to the lightning on the cable is carried out and its response is analysed. The ground impedance and the characteristics impedance variation in the shielded cable due to the lightning transient is analysed to test the shielding effectiveness. The electromagnetic transient fields due to indirect lightning effect that are produced at various heights from the cable and the effects on the shielded cables are analysed. Finally, factors influencing the transfer impedance, including simulation of length of cable, angle of incidence, cable height above the ground were investigated for shielded, braided and non-braided coaxial cables. This research investigates the different effects of the lightning on the cables used in avionic equipment communication. MATLAB based simulation is carried out to simulate voltage and current responses on the coaxial cable.

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DSUT-02

Shwetha V
(BAS16PPAS01)

Basic and Applied Sciences, School of Basic and Applied Sciences
Under the Supervision of

Dr. Sunil S More & Dr. Gautham S.A.

Title: Preparation and cocktails of extracts from medicinal plants as first aid formulation for snakebites

Abstract
Snake envenomation is an acute medical emergency and WHO has characterized it as neglected tropical disease under category A. In India, medical emergency and mortality by snake envenomation is said to be due to krait, cobra, Russells viper and saw scaled viper commonly referred to as "BIG FOUR". Polyvalent antisnake venom, is the only available treatment for snake envenomation. However due to its limitations, scientific community is trying address this issue by either improving treatment strategies like identifying therapeutic molecules that when administered along with antisnake venom would improve treatment efficiency or finding an alternative treatment. In this perspective, we have focused on obtaining cocktail of phytochemicals from medicinal plants that can delay the effects of snake venom of BIG FOUR. Thus, the obtained cocktail can be used as first aid formulation. In present study, 12 medicinal plants were evaluated for anti-venom properties by performing enzyme inhibitions of phospholipase A2, protease, hyaluronidase and acetylcholine esterase along with antifibrinogenolytic and anti-hemorrhagic activity. Plant extracts with significant inhibitions were later selected for preparing cocktail. Thus, two cocktails obtained were Clerodendrum serratum: Butea monsperma: Azadirachata indica: Citrus Limon fruit peel: Areca catechu (1:1:1:1:1) of aqueous ethanolic (C1) and Clerodendrum serratum: Butea monosperma: Azadirachata indica: Citrus Limon fruit peel- methanolic extracts: with aqueous ethanolic Areca catechu (1:1:1:1:1) extract (C2). Both these cocktails were evaluated by ex vivo and in vivo experiments by performing hemorrhagic, myotoxic, edema and lethal toxicity neutralization studies. It was observed that both the cocktails have shown significant neutralizations at varying degrees proving venom delaying effects. With challenging dose (3*LD50) of venom in pre-incubation neutralization studies, venoms of krait and sawscaled viper was completely neutralized by both cocktails and delay in effect of cobra venom by half an hour was seen in C1. In independent injection studies, venom neutralizations were not observed. Thus, from the study it can be concluded that, cocktail possess active phytochemicals that are effective against venom components. However, to further evaluate the efficiency in independent injection method, mode of cocktail administration has to be standardized.
Keywords: Big four, snake venom, cocktail, neutralization, antisnake venom

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DSUT-03

Spoorthi B.C.
(BAS16PPAS02)

Basic and Applied Sciences, School of Basic and Applied Sciences

Under the Supervision of

Dr. Sunil S More & Dr.Arpan Maity

Title: Investigations on intestinal neuropeptides as anti-Colitogenic agents in ulcerative colitis: implications on mitochondrial function for the maintenance of colon epithelial tract.

Abstract

Ulcerative colitis is an inflammatory bowel disease (IBD) that affects the innermost colon epithelial lining resulting in disruption of the mucosal tract. As current medications have their own limitations, there is a need for newer and safer anticolitogenic agents. Mitochondrial dysfunction is known player in the onset and recurrences of UC affecting most cellular functions and epithelial barrier maintenance in UC. But no study has been carried out targeting mitochondria as a novel target for treating UC. In this regard, we have used intestinal neuropeptides such as vasoactive intestinal peptide (VIP) and substance P (SP) to reverse mitochondrial dysfunction and to maintain colonic mucosal lining in experimental colitis. The study involved two working models: in vivo and in vitro. In vivo: DSS was administered in C57BL/6J mice at a dose of 3.5%/gm body weight for 3 cycles of 5 days each followed by an i.p. Dose of 0.5nmol VIP per mouse per day for next 10 days and 5nmol SP per kg body weight through i.e. for 7 consecutive days respectively. Later the mice were sacrificed and isolated mitochondria were utilized for mitochondrial functional assays and oxidative stress parameters. In vitro: The study was performed for ascertaining the in vivo findings in terms of mitochondrial dysfunction and for accurate identification of reactive species that might be involved in the process. For this, Caco-2 cell line model was subjected to DSS (5%) treatment for 6 days followed by 10nM of VIP and SP treatment for 4 days in the presence and absence of an array of free radical scavengers/antioxidants. Both in in vivo and in vitro studies, VIP was found to be an potent neuropeptide to combat mitochondrial dysfunction by scavenging free radicals O2 •- and •OH as when compared to standard antioxidants while treatment with SP failed to restore mitochondrial functions and its efficacy proved below par compared to SOD and DMSO indicating involvement of O2 •- and •OH and non-involvement of H2O2, NO and ONOO- in UC in the progression of UC. Thus, VIP can be recommended as a potent anti-Colitogenic agent and SP may not be a potent anticolitogenic agent targeting colonic mitochondrial dysfunction for maintenance of colon epithelial tract as it lacks free radical scavenging property.

Keywords: Ulcerative colitis, mitochondrial dysfunction, DSS, vasoactive intestinal peptide, Substance P, free radical scavenger, ROS, colon.

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DSUT-04

Shreenivasa L.
(ENG16PPBS01)

Dept of Chemistry, School of Engineering

Under the Supervision of

Dr.Ashok S

Title: Synthesis and Characterization of Nanostructured Metal Vanadates and Their Application as Cathode Materials for Lithium Ion Battery

Abstract

Currently, the lithium-ion battery is the exceptional choice of energy source for cell phones, laptops and other portable electronic devices. However, limited power density and energy density is the major setback to further use in electric vehicles or hybrid electric vehicles. The best way to enhance the power density or energy density by downsizing the electrochemically active materials, which could replace the traditional bulk materials. Vanadium based materials are considered as good cathode materials for lithium- ion batteries owing to their layered structure, flexible interlayer distance, multiple valence states, high abundance and possess the high specific capacity. However, the major problem lies with the vanadium based cathode materials is the lack of efficient and simple synthetic protocol for the large scale production. Further, structural degradation and poor electrical conductivity significantly impede the charge and mass transfer. The present work focuses mainly on the development of high- performance nanostructured vanadium based cathode materials for lithium- ion battery where the emphasis has been given on the development of facile synthetic protocol, electrode fabrication and electrochemical characterization. In this connection, a simple sucrose/glycine-nitrate based wet chemical method has been successfully developed for the large scale production of vanadium based cathode materials, namely, Fe2V4O13, ZrV2O7, AlV3O9, Zn0.29V2O5, CrVO4 and Mn2V2O7. The proposed synthetic protocol involves nano-engineering/nano-structuring, which enriches the properties like surface to volume ratio, electrical conductivity, and porosity and ample of active sites. The proposed materials exhibit a small crystallite size (less than 100 nm) and enhanced conductivity. The developed Fe2V4O13, ZrV2O7, AlV3O9, Zn0.29V2O5, CrVO4 and Mn2V2O7 were successfully tested as cathode materials for lithium- ion batteries where materials exhibit superior electrochemical performance in terms of specific capacity, cycling performance and long term stability.

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DSUT-05

Tambrallimath Vijay
(ENG16PPME03)

Dept of Mechanical Engineering, School of Engineering

Under the Supervision of

Dr.Saravanan Bavan & Dr. R. Keshava Murthy

Title: Synthesis and Characterization of Graphene Filled PC-ABS Based Nanocomposite Developed by Fused Deposition Modelling

Abstract

In the present work, a novel composite nanomaterial was developed by using Polycarbonate (PC) and Acrylonitrile Butadiene Styrene (ABS) as the matrix material. The ratio of these polymers were taken in the ratio 70:30 so as to establish better flow-ability and processing abilities to be drawn out as a wire of given diameter. Graphene as a nano material was used as reinforcement. 0.2 to 0.8wt% in incremental addition of 0.2wt% were added to PC-ABS matrix and a novel nanocomposite material was developed. Comparative study was carried out to understand the effect of reinforcement on polymer matrix. The mixture of PC-ABS was developed by pre drying and compounding. Addition of graphene reinforcement was done after compounding and the compounded mixture was extruded using twin screw filament extrusion of 1.75mm diameter to be used for feed material for Fused Deposition Modelling (FDM). The process of development of parts by FDM was carried out optimizing the process parameter with respect to fill density, angle of fill, thickness, bed temperature and nozzle temperature. The studies were broadly categorized into three segments viz microstructure and physical studies, mechanical studies and thermal studies. Microstructure and physical studies included dispersion studies, elemental mapping, dimensional accuracy measurements, surface roughness and density. Dispersion of reinforcement was seen to be well dispersed without any notable agglomeration. Dimensional stability enhanced with addition of reinforcement and surface roughness reduced with increased addition of graphene. Density of the developed parts was measured with Archimedes principle and the increment in density was observed with addition of reinforcement. Under the class of mechanical properties ultimate tensile strength, young's modulus and impact strength were carried out. With addition of graphene at 0.8wt% the enhanced value of ultimate tensile strength enhanced by 33.33% in comparison to pure PC-ABS. Young's modulus has seen an increment from 2.53 to 4.038 GPA. All the testing's were carried out according to ASTM standards. Addition of 0.2wt% of graphene to PC-ABS has increased impact energy by 50% in comparison to PC-ABS and addition of 0.8wt% graphene has led to increment of 87.5%. Thermal studies included thermogravimetric analysis, differential scanning calorimetry and thermal conductivity studies. The analysis of glass transition temperature was carried out by thermogravimetric analysis. Increment in glass transition temperature was seen with addition of graphene from 0.2 to 0.8wt%. Reduction xvii in mass of the sample with increased temperature was studied with differential scanning calorimetry. Reduction in mass with increased temperature was noted with addition of reinforcement. The studies of thermal conductivity were done to analyse the ability of

the polymers to act as conductive materials. Addition f graphene has paved the way in enhancement of thermal conductive property of the developed polymer nanocomposite. The developed polymer nanocomposite in this study has a greater ability of thermal conductive properties, increased glass transition temperature, greater mechanical strength, decreased surface roughness and enhanced dimensional accuracy when compared with pure PC-ABS. PC-ABS+Graphene based polymer nano composite heat sinks were successfully developed using fused deposition modelling technique with improved thermo-mechanical properties.

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DSUT-06

Murgayya Basavankattimath
(ENG16PPME02)

Dept of Mechanical Engineering, School of Engineering

Under the Supervision of

Dr.Saravanan Bavan & Dr. H.N. Suresh

Title: Design and Optimization of a Reliable Rotor System Using Axisymmetric Model

Abstract

The work is focused on analyzing the rotor system in rotating machines using vibration signature analysis in order to predict the failure and to evaluate the reliability of selected rotors. Imbalance due to various factors like stress concentration, rub, friction etc. is most common failure observed a_ecting its performance of rotors. The imbalance in rotor system is major concern that arises with time and Causes rotor misalignment, looseness, bent shaft and bearing failures. In order to avoid resonance the critical speeds could be shifted or bypassed which enhances the reliability of rotor and can be achieved through XLrotor tool. The results obtained in XLrotor align with Analytical, Experimental and Finite Element Method (FEM) results. It is observed from results, the disk onset has a maximum impact on performance of rotor system. Sensitivity analysis is carried out on selected rotor to identify the critical factors a_ecting its performance. Through sensitivity analysis it is seen, unbalanced load on disk leads to unreliable conditions and disk conguration results a reliable rotor model. The vibrations are controlled by converting narrow to wide band amplitudes by changing bearing sti_ness and damping properties for high speed rotor system. The rotors are also analysed for combined modes (lateral & torsional) to predict the failures. And the balance correction masses with locations are calculated from measured vibration signature and balancing is carried out for rotor models as part of corrective measures.

Key words: Condition Monitoring, Vibration Signature Analysis, Rotor dynamic Analysis and Reliability Analysis

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font sizes, broken lines or characters, quality of the image, and the exposure of the image to the light problems in segmentation that influence recognition process and also extracting the text from the complex background images.

DSUT-07

Ramachandra Reddy Aasodi
(HSC16PPPH01)

College of Pharmaceutical Sciences, School of Health Sciences

Under the Supervision of
Dr. V. Murugan

Title: Separation and quantification of amino acids and its related compounds by advanced Chromatographic techniques

Abstract

Congenital errors of metabolism alone lead to a diverse group of rare diseases, which accounts for 10% of the genetic diseases described. All of these occur due to enzymatic defects that inhibit specific metabolic pathways. Amongst them, amino acid disorders are distinctive as serious disease, since the cause of their manifestation being an acute or chronic poisoning, which enfolds accumulation of amino acids and other toxic metabolites, resulting functional damages of the organs such as brain, kidney and liver. Amino acids are physiologically significant as they are involved in various life-processes such as being an essential building block of proteins and as precursor in the bio-synthesis of various hormones and neurotransmitters. Amino acids are prescribed either as nutritional supplements or as medicines or as pharmaceutical dosage forms containing AAs as active ingredient or in the form of biological reparations, for the healthiness and well-being of humans. Therefore, pharmaceutical industries are developing a reliable, sensitive, robust and precise analytical methods for the separation and quantification of AAs and their related substances that can authenticate and endorse the quality of the pharmaceutical or biological products to meet the standards purported for regulatory submissions. As a result, several new analytical methods were developed incorporating advanced technologies, with reverse phase high performance liquid chromatography being prominent amongst the analyst / researchers for the quantitative estimation of total and individual amino acids. However, depending on the complexity of the pharmaceutical product and regulatory requirements, it is always necessary to develop a recent and more efficient methods to determine and quantify the amino acids precisely. The process of quality control and quality assurance implemented on the analysis of pharmaceutical chemicals and their formulations, marketed as pharmaceutical products should enunciate that such products are safe, clinically efficacious for intended purpose and must ensure freedom from any substandard drugs. Pharmaceutical analysis, being an integral aspect in the quality assessment of the pharmaceutical product, enables the pharmaceutical industry to acquire valid documents, required for regulatory submissions in endorsing the drugs and their formulations. Therefore, a progress in tune to the contemporary changes is always necessitated, in the development of novel and improved analytical methods for accurate determination and quantification of amino acids that are available either as raw materials or as pharmaceutical dosage forms, with an emphasis for a reliable

outcome that can substantiate various studies involving Quality assessment, Pharmacokinetics, Bio-equivalence and Toxicology. The developed analytical method should produce a precise data that corroborates on the quality of the raw materials / bulk drugs / active constituents incorporated in pharmaceutical formulations with due consideration on to their possible degradation products / impurities. Development of novel analytical methods is warranted as the existing analytical methods were time consuming, expensive as to cost factors and has an outcome that are either irregular or unreliable, i.e. of being low accuracy and nonspecific. A more sensitive, precise and accurate analytical method development is feasible by adopting the advanced techniques and better instrumentation that blooms in the field of analytical sciences. The analyst sets out certain goals to succeed in the development of novel or improved analytical method, propitiously that the developed method should yield data proving for method precision and be capable of determining the analyte even at traceable amounts. Developing novel analytical method and optimization of the developed method using pure standard drugs will not fulfil the regulatory requirements, but these developed methods should be properly validated, and the data obtained on method validation should confide assurance in achieving the intended purpose of the method. With due consideration to the above cited goals, the author preferred to develop HPLC and UPLC methods for the determination of amino acids and their related compounds. The research study aimed to develop a more efficient selective analytical method; successful validation of those new methods developed, for testing 20 amino acids (chapters 2 and 3), the degradation products of 6 amino acids (chapter 4 and 5) and the analysis of 10 essential amino acids (chapter 6). The study design entails the development of new HPLC / UPLC methods with pre-column and post-column derivatization techniques; the validation of those developed methods and investigate their suitability in the estimation of pharmaceutical dosage forms according to the ICH, USP, and ISO regulatory guidelines. The concept of total error approach was considered for validating the developed method. The thesis is divided into 7 chapters; Chapter 1 depicts introductory background information, content, aim of the studies, introduction of amino acids, introduction of the concept of total error, summary of the topics, need and importance of this work, statement of the research problem. Chapter 2 to Chapter 6 of the thesis portrays details on the author's experimentation and the experimental data obtained on developing HPLC / UPLC methods, the method validation of those developed methods, in the determination and quantification of AAs and their related substances. The data pertinent of Chapter 2 to Chapter 6 have been segmented to 9 parts with their contents being entitled as follows: 1. Objective 2. Background 3. Drug profile 4. Mechanism of Chemistry 5. Literature review 6. Methodology (materials, method of analysis, method development and method validation) 7. Summary and discussion 8. Conclusion 9. References Chapter-7 dealt with the summary of research work, which deliver in detail the summary of the research performed in each chapter and the achievements.

Keywords: Amino acids; Essential amino acids; Derivatization; Pre-column derivatization; Post-column derivatization; Total error; Risk profile; Ninhydrin; Fluorenylmethyloxycarbonyl chloride (FMOC-Cl); 6-aminoquinolyl-N-hydroxysuccinimidyl carbamate (AccQ)

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DSUT-08

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School of Commerce and Management Studies

Under the Supervision of

Dr.Asha Nadig

Title: An Exploratory Study of the Development of an HR Analytics Competency Model and its Impact on the Organization's Decision-Making Process

Abstract

The application of data in the organizations has changed its mode and concentrated on fulfilling the legal wants of the employment. This change in the use of data gradually changed dynamics of Human Resource Management (HRM) role and the organizations expect good analysis quality from Human Resource (HR) professions. Various studies suggested that the use of Human Resource Analytics (HRA) would assist HR professionals to develop diverse viewpoints on their contribution to the financial targets of the organizations through the creation of suitable measurements. Still, not many researchers explored the role of HRA in increasing the business out come in the context of Indian organizations. In this context, the present study analyses the role of HRA competencies in determining the business outcomes. Moreover, the study also examines the gap existing in the expected and existing competencies of HR analysts in Indian organizations. In the wake of findings from an in-depth literature review, the present study prepares a conceptual framework based on Capability Motivation and Opportunity (CMO) model to test the hypotheses, which were formulated to analyse the relationship among the study variables. A quantitative methodology was adopted to gather the data as it integrates the components of HRA competency and measures their impact on business outcomes. A structured questionnaire was designed and distributed to a sample population, which consisted of 230 HR professionals, including HRA users as Well as HR managers who work in different organizations in the city of Bengaluru. The data were analysed using various statistical tools to find out the role of HRA in business outcomes and analyse the gap between the existing and expected competencies of HRA. The findings demonstrated that business outcomes can be improved by providing motivation and opportunities to employees, who possess HR analytical skills. A structural model was developed by the study to assess the compatibility of the Proposed CMO framework in explaining the relationships among the study variables. The analysis of the model revealed that motivation and opportunities encouraged employees to utilize their skills in their jobs. Furthermore, it was found that utilization of analytical skills for implementing various HR strategies and for improving the performance of various HR processes like competency analysis and recruitment Analysis plays an important role in enhancing business outcomes. It was found that motivation and opportunities provided to capable employees act as crucial aspects in encouraging them to develop analytical skills. The possession of such analytical skills has a significant impact on business outcomes. Overall, the study provided a significant depiction of the role played by HRA in determining the business outcomes and the gap existing in the competencies exhibited by HR analysts, with respect to the competency levels expected from them.

Keywords: Human Resource Management, Human Resource Analytics, Decision-making, LAMP, COM, HRA, Competency Model, BASP, HR Analytics.

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DSUT-09

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Under the Supervision of
Dr. Shaila S G

Title: Human Facial Expression Recognition and Classification using the Properties of Geometrical Features of Various Facial Regions

Abstract

Facial expression plays vital role in representing an emotional state and mental state of a human. Psychologist says that 7% of the total information is conveyed by language, 38% by language auxiliary such as speech rhythm, tone, etc. and 55% by facial expression. Hence, Facial Expression Recognition (FER) is considered as an important research topic in terms of theoretical and practical research and the life application values. An emotional feelings, say happy, sad, fear, anger, depression, etc. are expressed in terms facial expression. This can be caused by the events which are expressed during communication. FER is an important research problem and has attracted a large number of researchers in the last few years. It plays major role in computer vision, robotics, medical treatment, driver fatigue surveillance and many other Human Computer Interaction (HCI) applications. Ekman and Friesen, (1978) determined 6 basic emotions from the human facial images such as anger, happiness, surprise, sad, disgust and fear that are expressed frequently through facial expressions. The traditional approaches may not handle the real-time application requirement effectively. Apart from this, illumination conditions, noise, occlusion and variations in head posture are some of the factors that affect the expression recognition systems resulting in uncertainty and ambiguity. Many techniques use handcrafted features for facial expression recognition and thus require increased efforts in terms of programming and computation cost. In this thesis, an architecture specification is proposed to handle the above mentioned research issues. As a first work, an approach is proposed to build the facial expression recognition model by considering facial components such as eyes, eyebrows, nose and mouth features. The approach considers six basic emotions such as sad, happy, anger, surprise, fear and disgust. The cropped facial images are pre-processed by face identification and segmentation, feature extraction, etc. The feature is extracted from various facial components or landmarks for facial expression such as eyes, eyebrows, nose, and mouth recognition. The approach builds geometric model of neutral face considering it as reference image. The geometric structure is analysed for other expressions of same facial image. The similarity between the reference (Neutral face) and deformed facial images are calculated to capture the degree of deformation for any facial expressions. Various machine learning algorithms such as Support Vector Machine (SVM), ANN, etc. are used for classifying the emotion, after a suitable training phase. Well-known data sets such as JAFFEE, CK+ is used for evaluating the performance of the proposed approach and is compared with contemporary approaches and found that classification accuracy is good in recognizing the emotions. Among the facial components, lip feature contribute to greater extent in recognizing all facial expressions. The expression from lips such as dropped jaw, Open Mouth, One side of the mouth raised, Corners raised, Corners drawn down represents various emotions. In this work the geometrical feature of lips is extracted. The lips are considered as parabola and its properties are applied for extracting the features. The deformation of points on the lip/parabola defines the type of emotion and is considered as salient points and Action Units (AUs). The properties such as Latus Rectum, Focal Point, Directrix, Vertex, etc. are considered to identify the feature points of the lower lips and upper lips. The Support Vector Machine (SVM), Multi-Layer Perceptron (MLP) and Random Forest (RF) are used as classifiers. The

proposed approach is evaluated on benchmark Datasets such as JAFFEE and Cohn–Kanade Dataset and is found that the performance is encouraging. The results are compared with contemporary methods and found that this approach has given good classification accuracy in recognizing facial expressions. It is noticed that the nose of the human face is also important component in recognizing the facial expression of human. The tetrahedron geometric structure is used to extract the important feature vectors. As it plays important role in representing the key expressions such as happy, surprise and anger. The proposed model maps the nose to geometrical property of tetrahedron. The tetrahedron /pyramid structure has a common property that their sides are in triangular shape. While all the triangle are equilateral, the pyramid is termed as a regular tetrahedron. In contrast, if the edges of the triangle have different length, the pyramid is termed as an irregular tetrahedron. In the proposed approach, the properties of the triangular base pyramid are exploited to estimate emotion on human face. The model use deformation points as AUs for recognizing expressions. The degree of deformation at various points on nose are considered as feature vector. Tetrahedron t is superimposed on reference nose and compared with the deformed nose. Well-known data sets such as JAFE, YALE, and CK+ are used for evaluating the performance of the proposed approach. The experimental results are compared with some of the well-known approaches. The proposed tetrahedron model has performed well. Similar to all the above work mentioned, the expression from the whole face is also extracted for estimating the emotion and extracts scale, orientation and translation invariant feature using the Interval Graph. This approach has various stages. The first stage is the pre-Processing stage, where the noise is removed, face is localized, face boundary is processed, four regions of face are segmented, etc. The second stage is Feature Vector Extraction stage and the common intersecting salient points of facial regions are considered for measuring the expressions. The face region is divided into four sub regions and the Interval graph is extracted for each region. The salient points for each region is calculated which helps to find the relationship between all the deformed salient points on the human face. The Degree of deformation and Degree of direction is proposed to measure the deformation in vertical, horizontal, and diagonal directions. The Degree of deformation represents the pixel difference between reference and deformed vertices and the Degree of direction represents the number of vertices contributing to the deformation in horizontal, vertical and diagonal directions. These values are considered as feature vectors for measuring emotions. Third stage is classification where in the data is n-fold cross validated, Support Vector Machine (SVM), Multi-Layer Perceptron (MLP) and Random Forest (RF) classification algorithms are used. The experiments are conducted on well-known benchmark Datasets such as JAFEE and CK+ and classification accuracy is calculated. The performance of the reposed approach is found to be good in estimating the expression of the Dataset images. The results are compared with contemporary methods.

Keywords: Facial Expression; Human Emotions; Parabola; Tetrahedron; Salient points; Geometrical Structures; Deformation; Interval Graph; Classification; Support Vector Machine, Multi-Layer Perceptron, Random Forest.

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DSUT-10

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Under the Supervision of

Dr. Rajesh T M

Title: A Novel Approach for Grading of Human Emotions using Data Analytics

Abstract

Emotion analysis is a field that has seen widespread use in forensic crime detection, as a technique for mentoring depressed students, and in the treatment of emotionally disturbed individuals. Despite the fact that significant research has been done in this area, the current system only aids in the detection of emotions, not in evaluating the intensity of emotions, such as whether a person is genuinely happy or is just pretending to be happy. This study focuses on grading two emotions (happy and sad) and establishing the degrees of emotions, such as grade 1, grade 2, and grade 3, to gain a better understanding of the emotions exhibited on a person's face. Prior study has mostly focused on identifying prototypic expressions of six basic emotions. This approach can be in grading of human emotions, instead of categorizing a face image into one of the facial expression categories. The problem of determining the depth of facial expression in order to further rate emotions necessitates additional focus. The multimodal approach with combination of different domains helps us in predicting the depth of emotions. When used together, emotional analytics and data analytics may help with accurate emotional identification and verification, as well as anticipating the amount of emotion in a particular emotion. Proposed new approach for reconstructing the traditional local binary pattern (LBP) feature operator to an image of the expression in this research work, which combines abstract facial expression characteristics obtained from a deep neural network with updated texture properties of the LBP feature operator. To categories the level of emotions, 19 retrieved characteristics were fed into different machine learning algorithms, KNN, Fuzzy Logic, Decision Tree and also deep learning algorithms. Different architectures were utilized for verification of our approach like CNN Alex Net, VGG, Google Net, and Resnet utilizing a fusion of algorithm method. The data from this phase were used in a confusion matrix for study of emotion grading, yielding an accuracy of 87.58% utilizing CNN Alex net in the comparative analysis. In addition, for validation, multiple databases and standard networks are compared.

Keywords: Facial Emotion Detection, Human Computer Interactions. Grading of Emotions, Deep Neural Networks, Data Analytics, LBP, Euclidean distance, KNN, Decision Tree, Fuzzy logic, CNN Alex net, VGG, Google Net, and Resnet.

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DSUT-11

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Under the Supervision of

Dr. Bondu Venkateswarlu & Dr. Arbind Gupta

Title: Leveraging Machine Learning Techniques for Improving Healthcare Opportunities in India

Abstract

Efficient healthcare in terms of affordability, accessibility and quality is still far from being within reach of many people in India. Shortage of facilities in rural areas hampers medical diagnostic and therapeutic help in the initial stage of disease leading to delayed treatment and increase in morbidity and mortality. There has been an alarming increase in the mortality rate due to non- communicable diseases in India during the past two decades. The numbers of deaths due to cardiovascular diseases (CVDs) have increased significantly from 15.2% to 28.1% in this period of time. In addition to CVDs, mortality due to other chronic diseases like cancer, hepatitis, diabetes and chronic kidney diseases etc. has also increased substantially during past two decades. In the present scenario, it is essential to leverage machine learning techniques to provide affordable and easily accessible healthcare facilities in India. The main objective of this research work is to leverage machine learning techniques for improving healthcare opportunities. All the experiments were carried out on benchmark datasets of chronic diseases collected from UCI machine learning repository. Cardiac dataset collected from Sagar hospitals, Bengaluru, India was also used for experimental purposes. This research work aims to build a cost effective, high-performance heart disease prediction system. To achieve this objective, this research work first proposes a sliding window technique for feature selection to identify the most significant non-invasive clinical attributes for heart disease prediction. The key strategy is to identify the best combinations of input attributes which provide excellent performance in terms of accuracy, specificity and sensitivity. Machine learning based heart disease prediction system developed using these significant attributes achieved an accuracy of 93.8%. It is accessible via internet at http://das.southeastasia.cloudapp.azure.com/predict/.Cost effectiveness, excellent performance, and easy accessibility of the prediction system via internet defend the use of machine learning based prediction system as a screening tool for CVD detection in India. Second, this research work proposes a novel hybrid feature selection technique using Chi-square, information gain and principal component analysis for removal of redundant and irrelevant features. The study provides remarkable results. The results have been validated by comparing the results with various existing feature selection techniques. Third, the role of ensembling techniques in enhancing the performance of prediction systems has also been discussed. A novel ensembling technique has been proposed for building high performance prediction systems for chronic diseases like diabetes, hepatitis, breast cancer and chronic kidney disease. A noteworthy enhancement in performance has been observed with datasets in large dimensions as well as low-dimensions validating the power of proposed technique over well-known existing approaches in the literature. This research also focuses on identification of various hurdles in smooth integration of machine learning techniques in Indian healthcare sector. Delphi technique was adopted to take feedback from software engineers, data scientists, doctors and academicians from Bengaluru region. A questionnaire was circulated to seek their opinion regarding relevance of Health 4.0 in India. Twelve obstacles which create strong

hinderance for implementation of Health 4.0 in India were identified. A clear understanding of these obstacles enables the concerned authorities to take timely due actions for better amalgamation of machine learning in Indian healthcare sector. Satisfactory results obtained in this study indicate that the techniques discussed in this study shall potentially be used to meet the challenges being currently faced by Indian healthcare sector.
Keywords: Affordable healthcare, machine learning, feature selection, ensembling, Delphi technique, Indian healthcare

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DSUT-12

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Under the Supervision of

Dr. V. Murugan

Title: Validated Chromatographic Methods for Quantification of New Related Compounds in Drug Substances by RP-HPLC Technique

Abstract

Analytical method development and validation commensurate to be a pioneer research arena in the domain of pharmaceutical analysis, as they, ultimately accounts for the purity and the amount of any known or unknown substances present in the drug substances or any other pharmaceutical products. Today's pharmaceutical industries are highly sophisticated and modernized, that are evinced with the adoption of advanced chromatographic techniques like HPLC, GC methods in the pharmaceutical analysis domain to deliver a highly accurate, sensitive and reliable quantification of related substances in drug substances / pharmaceutical products. Advancements in Technology have rapidly replaced the older methods like TLC, Microbiological assay with versatile liquid chromatographic techniques. These versatile advanced technique results in reliable outcomes that implicit the quality, safety and efficacy of the drug substances. As the pharmaceutical industries are besieged with an increased necessity for unbiased analytical outcomes, we attempted a research study emphasizing a goal, to develop a simple and suitable analytical method for the quantification of related substance or related compounds present in the chemical entity. Scientific Literature study authenticated the necessity to develop new simple, specific and reliable analytical methods for the quantification of related substances / related compounds present in anticancer and amino glycosides drug substances. The study design entails the development of new HPLC method using UV and ELSD detector technique; the validation of those developed, methods and investigate their suitability in the estimation of various dosage form according to various guidelines. Concept of total error approach was considered for validating the developed method. The present research study expatiates on the analytical procedures involved towards the successful development and validation of the novel analytical method.

Keywords: Quantification, Related substances, Liquid chromatographic, Analytical, Total error

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Under the Supervision of

Dr. Farhan Zameer & Dr. Sunil S More

Title: Phytobioactive Intervention on Diabetic Neuropathy and Microbiome Dysfunction In Drosophila

Abstract

Lifestyledisordersareshowingitspresenceinthebusyworkingculture.Further,improveddiagnosishasfacilitatedinidentifyingalargenumberofdisorders.OneamongthemisDiabeteswhichiswidespreadintheworld,andIndiaranksinthirdposition.Diabetesbeingadiseaseofprimeimportanceaffectingmorethan15%ofthepopulationofIndianeedsmoreattention.Diabetesalsobringsacascadeofco-orbiditieswithitlikehypertension,obesity,dyslipidemia,chronickidneydiseaseandcardiovasculardisease.Themajordiseaseaffectingmorethan50%ofthepopulationisdiabeticneuropathy(DN).Though,thetypesofDNaremany,butthemostprevalentoneistheperipheralneuropathy.Withanaimtoexplorephytobioactivesinamelioratingdiabeticneuropathy(DN)usingflyasamodelsystem.Inspectingtheresearchgapsfromareviewoftheliteraturewestudyinsilico,biochemical,gutmicrobiota,mRNAandbehaviouralchangesindrosophila. ResearchgapstostudyDrosophilaasatherapeuticmodelwereidentifiedbyathoroughreviewofReviewingofliterature.Further,researchgapshelpedinstudyingdrosophilaasatherapeuticmodelforDN.OurstudywasinitiatedbyinsilicoevaluationforaneffectivephytobioactiveagainstourtargetImdandDuoxwhichfunctionsasanimmunityregulatorinmidgutofdrosophilawherethemicrobiotaisaffected.Theligandswhichwechosewerefrom Bananaplantflowersand Pseudostem.ThestudyrevealedUmbelliferoneasthebestligandforthetargets.Thisfollowsthemodelstandardization by Streptozotocinandfollowedbytreatmentwith Umbelliferone. Thisexperimentalgroupsweresubjectedtobiochemicalevaluationfortheparametersof AChE,BChE,Dopamine,PCs,ROSandETCenzymes.Further,thechangesinmicrobiotaphylaofFirmicutes,Bacteroidetesandβ-Proteoacteriawasevaluatedusingdosimetricstudies.ThenthemRNAchangesforAKt1(AKTserine/threoninekinase),relish,AChE,Cat(Catalase),Sod(Superoxidedismutase),Nmnat(Nicotinamidemononucleotideadenylyltransferease),Sir2(sirtuin),Imd(Immunodeficiencypathway)andDuox(Dualoxidase)wasobservedwhenevaluatedusingqRT-PCRmethod.Finallythebehaviouratrealtimewasmonitoredandthechangesweredocumented.OurstudyrevealedDrosophilaasaneffectivemodeltotreatDNbyusingphytobioactives

Keywords: Gutmicrobiota, immunity, metabolism, diabetes, Drosophila, inSilico, Invivo.

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Under the Supervision of

Dr.Ashok S

Title: Synthesis and Characterization of Nanostructured Materials for Energy Conversion System

Abstract

Hydrogen is one of the most promising clean and sustainable alternative energy carriers to meet the world's constantly growing energy demand. Water electrolysis in alkaline medium is considered as a clean and long-term strategy for the production of high quality H2. Consequently, the development of rapid and generic synthetic protocol to prepare highly active electrocatalysts on a large scale with good structural stability, chemical stability, and fast electron transport properties for water splitting reaction still remains a challenge. The focus of the thesis is on the development of a rapid and generic synthetic protocol to synthesize earth abundant and first-row transition metal-based electrocatalysts for alkaline OER. In this regard, the rapid and generic wet chemical based synthetic protocol has been proposed to tune the morphology, surface to volume ratio, crystallite size and electron transport properties of nickel, cobalt and titanium based electrocatalysts. The proposed synthetic protocol involves the in situ addition of conducting graphitic carbon into NiCo2O4/CoO and Co3O4 nanostructured materials during the course of the reaction. This in situ addition of conducting graphitic carbon with nano-engineering significantly improves the properties such as surface to volume ratio, electron transport properties and accessible active sites for enhanced OER kinetics. A simple citrate-nitrate decomposition method has been successfully demonstrated to prepare NiO nanoparticles with varied amount of metallic nickel. The content of metallic Ni within NiO is regulated by altering the annealing period from 4 minutes to 8 hours where the sample prepared up to 4 hours exhibits Ni/NiO nanocomposite with varied amount of metallic nickel while the sample prepared at 8 hours exhibits pure NiO. The Ni/NiO nanocomposite immobilized on SPE's exhibits enhanced electrochemical activity towards OER. A new and novel titanium based Mesoporous LiTiPO4F has been identified as an electrocatalyst for OER. The identified LiTiPO4F electrocatalyst displayed extremely high electrocatalytic activity and stability towards OER.

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Under the Supervision of

Dr. Sunil S More & Dr. Narasimha Rao

Title: Crystal Structure Determination and Biophysical Characterization of Cyclin Dependent Kinase 2 with Small Molecule Inhibitors for Structure Guided Drug Design

Abstract

Cyclin dependent kinases (CDKs) are the key therapeutic targets among the kinase class for diverse type of cancers. Among all the CDKs, CDK2 is an attractive target for the design of new therapeutic antitumor agents. Several CDK2 inhibitors have been discovered and their crystallographic binding structure have been published. To date, many inhibitors with adequate cell-based and biochemical data know are still in pre-clinical stage due to lack of clarity in understanding binding potency and selectivity with CDK2. Availability of crystallographic information of such inhibitors would enhance their drug like properties to move to clinical stage. In our study we have selected a moderately potent inhibitor, CVT-313 and NU6140 with CDK2 (≥ 0.5 μM) to determine crystal structure and to aid structure guided drug design with improved properties. In addition to structural data, we have performed cell-based, biophysical, and binding studies using thermal shift and surface plasmon resonance assays to provide depth of knowledge in binding interaction of these inhibitors with CDK2. We have elucidated the X-ray crystal structure of CDK2 with CVT-313 and NU6140 to understand the binding mode and interactions that stabilize the complex. The crystal structures were determined to a resolution of 1.7 and 2.3 Å, and the data demonstrated that both CVT-313 and NU6140 binds in the ATP binding pocket. CVT-313 showed the interactions with Leu83, Asp86, and Asp145 directly and the binding was further stabilized by water-mediated interaction with Asn132 of CDK2. And NU6140 interact with Leu83 and Glu81 directly, and the binding was further stabilized by water-mediated interaction with Asp 145 of CDK2. Based on this data, we proposed structural modifications for both the inhibitors to improve their potency while retaining the selectivity. In parallel, we have demonstrated molecular docking experiments for newly designed structure guided inhibitors that predicted to have stable CDK2-inhibitor complex. Further potential of our studies on CVT-313 and NU6140 will facilitate new ideas and to design of more potent and selective CDK2 inhibitors to treat cancer.

Keywords: CDK2, CVT-313, NU6140, crystal structure, X-ray crystallography, surface plasmon resonance and molecular docking.

Prasanna M S M
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Under the Supervision of

Dr. Shaila S G

Title: Sentiment Analysis and Polarity Classification of Sarcastic and Non-Sarcastic Sentences Using Phrase and Clause Patterns

Abstract

There is an enormous amount of data available in WWW and also growing progressively. The data includes online learning, exchanging ideas and opinions, etc. People use social networking websites such as Twitter, Facebook, Instagram, and Google+ as a common platform for all these. These platforms have become very popular as they permit people to share and exchange their views about any topics/events and have considered by the researchers for sentiment analysis, opinion mining, question answering and text summarization etc. Nowadays, emotions/sentiments expressed by human are important and is a study of psychology and other related research areas. The emotional state represents mental and physical status of a person (Zhang and Li, 2008). These emotions are captured visually from facial expressions. In Contrast, emotions can also be expressed in the form of text and plays an important role in various fields such as Human Computer Interaction (HCI), Cognitive Analytics, Human intelligence, social media analysis, etc. The textual emotion gives us opinion, attitudes, question-answering, etc. and can be used for the applications such as market analysis, opinion mining on a product or debate in social media. Most of the news channel and social media invites reviews and opinions from the users to express their view. There is intensive research by Natural Language Processing (NLP) researchers to estimate the degree of emotion in text to understand the human cognitive capabilities. Twitter is one of the biggest social network platforms for people to express their opinions, share their thoughts and report on real-time Events, etc. For instance, people use Twitter and other social network sites to get opinion on products on which they are interested when they are looking for buying a product. Users use the survey, comments and reviews on the products to take a decision whether to buy the product or no. Most of the companies relied in these data for understanding the opinion of people on various topic of subjects like political events (Soler and Cuartero, 2012), popular products (Homoceanu and Loster, 2011) or movies (Hodeghatta, 2013), etc. The readers/users express their emotional quotient by voting mechanism, which has predefined emotional tags. Later, this helps in estimating the positive and negative sentiments of the user on the products/articles/topics. The sentences can be sarcastic and non-sarcastic while expressing Sentiments in social media networks. The sentiment analysis in non-sarcastic sentences is straight forward and can be easily classified in terms of their polarities. Most of the existing emotion estimation approaches detects the direct expressions using knowledge based classification schemes. In this thesis, phrase-level emotion patterns using Neuro-Fuzzy model is proposed and represented. At the initial stage, the emotional patterns at phrase level are obtained using POS Tags and EMOT_Actifiers, which results into 16 patterns. These patterns works well with the sentences having single emotion and classifies them either as Positive or Negative polarities. However, it is observed that these patterns unable to define the exact boundary

between positive and negative polarities of these sentence patterns. Thus, this issue Affects the classification accuracy due to imprecise boundary between the sentences. Mixed emotions exist in long sentences with multi phrases and thus the sentences are broken at Phrase level. The patterns are extracted at phrase-level and converted as fuzzy rules for the classification of mixed emotion patterns. Intensity grades are calculated for the patterns based on the features of phrases and their structure in the sentence. These intensity grades classify the patterns at phrase level into positive and negative emotions. Based on the intensity grades, a suitable weighing mechanism is proposed for the multi phrasal sentence structure which decides the degree of positive and negative polarities of emotion in a sentence. Higher weighted phrasal pattern decides the positive and negative polarities of emotion in a sentence. Proposed Approach performs well and achieves good F-Scores compared with other comparative approaches on benchmark datasets. On the other hand, sarcastic sentences used in social media sites hold figurative language which includes sarcasm, irony and metaphor. Sentiment analysis in sarcastic sentences is a hard Problem. In real time applications, to analyse and detect irony is completely dependent on the Social factors such as belief, intentions, and sentiments. In general, sarcasm is very common, however, difficult to recognize. In Twitter, sarcastic texts are very common. The appearance of the text might be misleading and can be considered as a compliment or sarcastic. This type of text patterns are tends to be widely used as opinions, ideas and events shared in social networks. Most of the time, People also use social media platforms to make jokes, criticize or make remarks about ideas, persons or events sarcastically. However, sarcasm is a deeper concept, highly language specific, and to the common knowledge. Also, sarcasm is considered to be common, however, it's difficult to recognize in its original form. It is well known that informal language used in tweets and limitation of characters per tweet is challenging in understanding the opinions. Further, the polarity classification in sarcastic sentence are quite difficult. The reason is that the sarcastic and irony sentences are hard to recognize either for Humans or for machines. In the context of sentiment analysis when a sarcastic sentence is detected as positive, it likely means for negative situation and vice versa. Therefore, it is Necessary to come up with an approach to automatically detect sarcastic messages/texts/patterns. In this thesis, methods are proposed for identifying and grading the sarcasm in the sentence patterns. The approach considered the sentence patterns at clause level and classifies the sentences into four categories Simple Sentences, Compound Sentences, Complex Sentences and Compound Complex Sentences. The Simple Sentences and Complex Sentences are considered for analyzing and identifying the sarcasm patterns. The decision tree and Neuro fuzzy rules are used on Sentence structures to classify them into sarcastic and non-sarcastic Patterns. The linguistic grading is used for grading the sarcastic patterns. Weighing mechanism is proposed based on the fuzzy linguistic grades for polarity classification in Sarcasm. Experimental evaluation of the proposed approach is done using Twitter dataset. The experimental results are promising with good classification accuracy.

Keywords: Sentences; Phrase; Positive emotions; Negative emotions; Classification; Fuzzy Rules; Sarcastic; Non-Sarcastic; Clause; Tweets; Decision Tree; Neuro Fuzzy; Linguistic Grades; Weight; Polarity

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KAVYA H. M.
(ENG16PPME01)

Dept of Mechanical Engineering, School of Engineering

Under the Supervision of

Dr. Saravanabavan D & Dr. B Yogesha

Title: Experimental Investigation on Effect of Coir and Inorganic Filler on Epoxy Reinforced Hybrid Composites

Abstract

In the present study, coir micro-particles, fly ash and TiC nanoparticles, Innegra fabrics are utilized as a reinforcement material to epoxy polymer for the improvement of physical, mechanical and thermal characteristics. The epoxy hybrid polymer composites were manufactured using mechanical stirring assisted wet layup technique. The microstructure of the samples was observed from a scanning electron Microscopy. It was observed that the addition of coir fibre, fly ash, and TiC nanoparticles in the epoxy polymer enhanced the mechanical and thermal characteristics of composites. It can be assigned to the better interaction and uniform distribution between the fillers and the epoxy polymer. Fillers acted a critical role in enhancing the characteristics of epoxy hybrid composites. Additionally, water absorption characteristics were also investigated for all specimens. A comparative examination was performed between various fabricated composite specimens. Results exhibited that, the water absorption of the composites improves considerably with the addition of reinforcements. Reinforcement with fly ash and TiC nanoparticles offers the most remarkable improvement in tensile, flexural, and impact strength, at approximately 2.84, 1.65, and 9.19 times compared with pure epoxy polymer. Differential scanning calorimetry and thermogravimetric analysis showed that the epoxy hybrid composites had enhanced thermal stability. The homogeneity of filler dispersion in the epoxy polymer was observed by scanning Electron microscopy.

Keywords: Coir micro-particles; Contact angle measurements; Mechanical characteristics; TiC nanoparticles; Thermal stability

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Under the Supervision of

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Title: Bandwidth Improvement Modelling and Optimization of Antenna Array for Iot Applications

Abstract

The Internet of Things (IoT) is a network of interconnected, internet-connected objects that can capture and distribute data without the need for human interaction over a wireless network. IoT is based on integrations of different processes such as identifying, sensing, networking, and computation. There are many IoT applications, such as health, transport, logistics, retail, agriculture, smart cities, smart metering, remote control, process automation, etc., that can be grouped into different fields. Antenna is a transducer designed to transmit or receive electromagnetic waves. Microstrip patch antennas (MSA) have several advantages over conventional microwave antenna and therefore they are widely used in many practical applications. In recent days the role of directional antennas in microwave imaging, remote sensing and stealth applications received great interest among researchers. These antennas must possess wide impedance bandwidth, higher gain and improved radiation characteristics. A good design of the antenna can be very useful in improving the overall system performance. With the rapid expansion of Internet of Things (IoT) application in the modern communication system, the demand for micro antennas is increasing. Antennas are used for various communication systems such as health care monitoring system due to its good omnidirectional radiation performance with stable coverage using IoT Technology. Thus, Microstrip patch antennas are generally used in IoT applications due to its compatibility. Thereby, the key benefit of the microstrip antenna is that it allows easy integration into IoT devices. In this work, one of its major applications is in the Smart health concept, allowing more convenience, efficiency (at various aspects) and safety. The main problem in smart health application is efficiency loss. This antenna system to overcome the reduce loss requirement problems. Because of use this antenna, to be small, low-power and at the same time more capable and efficient. This antenna has reduced losses and improving the gain. In this research, the optimization techniques improve the accuracy of the designed Microstrip antenna parameters. The Antenna maintains the gain while reducing the bandwidth interference. The losses are minimized, hence improving the radiation efficiency, gain, directivity, charge and current distribution, return loss, bandwidth ratio, etc. There are many techniques for solving optimization problem but Particle Swarm Optimization (PSO) technique fulfils the requirement for antenna design. For optimization of antenna, there are various optimization methods also used but Particle Swarm Optimization (PSO) is a simple and highly efficient searching technique to find the most optimal result in antenna design. Various antenna design constraints can be combined into different particles, and applied to the natural evolution to search for the fittest solution in the particular. The IGWO algorithm was solving real problems. The main aim of the thesis is optimization of MSA using PSO and Improved Grey Wolf Optimization Algorithm (IGWO) in order to satisfy the situation of huge demand, improving the gain, radiation efficiency, return loss and low cost for antenna design. PSO and IGWO have been developed to calculate the different

parameters of microstrip antenna. In the first part of the thesis, PSO enhanced Ultra Wideband Tightly Coupled Array with Frequency-Selective Surface (PSO-UTC-FSS) technique can design parameters for an antenna with a suitable frequency range and also compute the values for prototype arrays. The PSO technique improves the accuracy of the designed antenna parameters. The FSS maintains the gain while reducing the bandwidth interference. Using these concepts, the losses are reduced, hence increasing the radiation efficiency, gain, bandwidth ratio, etc. Second part of the thesis focuses on the Optimized Vivaldi antenna to enhance the gain and bandwidth performance. The main advantages of these antennas are their improved bandwidth with the acceptable performance of low return loss, good gain and radiation characteristics. The design of Vivaldi antenna has many challenges like broadband response in terms of impedance, gain, radiation pattern as well as the compact size. Primary aim of this research is the design of Vivaldi antennas with the following design goals impedance bandwidth improvement, radiation characteristics improvement, compactness, improved gain and constant group delay characteristics across the operating bandwidth. With improved radiation characteristics, the antenna can be implemented for stealth applications as low RCS antenna. Vivaldi antenna exhibits higher gain, directivity and has planar profile which makes it a potential choice for radar and imaging applications. So, second part of the research focuses on stealth implementation of Vivaldi antenna with low radar cross section. Fabricated results show that optimization of MSA have been done to achieve multi-channel and single MSA is giving better performance in term of less power, losses are decreased, hence enhancing the radiation efficiency, gain, bandwidth ratio. It requires less iteration and time to calculate parameter of MSA.

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DSUT-19

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Under the Supervision of

Dr. K Anand Solomon & Prof. Ashwini Kumar Nangia

Title : Novel Cocrystals and Salts of Drug Molecules to Improve Physicochemical Behaviour, Permeability and Tabletability

Abstract

CHAPTER ONE
Introduction to Crystal Engineering
Supramolecular chemistry defined as “chemistry beyond the molecule”, and “aims at developing highly Complex chemical systems from components interacting by non-covalent intermolecular forces”. The Development requires an understanding of molecular chemistry (the chemistry of the covalent bond) Together with noncovalent interactions for molecular self-assembly to tune the structure, properties and Functionalities of the resulting products. The understanding and design of such noncovalent intermolecular interactions in the solid state is referred to as Crystal Engineering. In crystal engineering, one uses different intermolecular interactions such as hydrogen bonding, π- stacking, halogen bonding, and van der Waals forces for the rational design of Supramolecular structures in the broadest sense with the specific aim of tailoring their properties. In recent years, the design of novel pharmaceutical solids in both academic and pharmaceutical laboratories have become a popular research activity. The majority of currently marketed drugs are as solid forms which are administrated orally (tablet, capsule, or yophilized powder forms). About 40% of drugs in the market and emerging new chemical entities (NCEs) under research and development fall in the low solubility quadrant classified under the Bio pharmaceutics Classification System (BCS) of Class II or IV. Some drugs are known to undergo degradation during the storage (ICH, International Conference Harmonization) and handling, transport even under physiological conditions. The management of these challenges along with enhanced therapeutic efficacy for active pharmaceutical ingredients (APIs) is the prime objective for pharmaceutical scientists. Possible solutions to these issues in the solid formulation space are polymorphs, salts, amorphous, solvate/hydrate, coamorphous solid blended with excipients (polymeric matrix), drug carriers, nanoparticles, etc. The US-FDA regulatory guidelines and those of the European Medical Agency (EMA) are a time for Formulation development of APIs for which the traditional routes are ineffective. By virtue of their Hydrophilic/ hydrophobic nature, formulation solids can exhibit diverse physicochemical behaviour which is possible to control with coformers, such as solubility, stability, permeability and bioavailability for improved shelf-life and drug-patient compatibility. Solids are broadly classified as crystalline (having long-range order) and amorphous (with short-range order but no long-range periodicity) depending on the internal structure, length-scale of order, and degree of periodicity. A pharmaceutical solid may exist in a single or multicomponent system, either as crystalline or amorphous state. Different crystalline arrangements of the same chemical substance are polymorphs and those with multicomponent (two or more neutral chemical species) in a single crystalline lattice is referred to as a cocrystal. The ionized salt forms and which are interacting with another organic compound in crystal lattice are known as ionic cocrystals. The Supramolecular family of multi-component solids therefore includes salts, hydrates, solvates, cocrystals, eutectics, solid solutions, alloys, etc. all of which may be assessed as pharmaceutical forms depending on the specific pharmaceutical properties required for a specific drug. The important point is that each of these solid forms can be advantageous for a specific application in different cases. Hence it is important to understand the nature and properties of diverse solid forms of drugs/ natural bioactive molecules from a pharmaceutical perspective. This thesis deals with the design and discovery of different solid forms of drug molecules and their physical behaviour and physic-chemical properties, specifically solubility, stability and permeability.

CHAPTER TWO

Naftopidil Molecular Salts with Improved Dissolution and Permeation Naftopidil (NFPD) is a phenyl piperazine derivative active pharmaceutical ingredient that exhibits high selectivity for α1- adrenoceptor antagonist. NFPD is used to treat bladder outlet obstruction in patients with benign prostatic hyperplasia (BPH) and arterial hypertension. NFPD is a bio pharmaceutics classification system (BCS) class IV drug with very low solubility (0.11 mg mL−1) and low permeability at intestinal pH (log P 3.77, Drug Bank), which results in poor oral bioavailability, that is 20% in humans because of rate limiting permeation in first pass metabolism. Because of these factors, the dosage of NFPD (brand name Flivas) is much higher (25−75 mg/d) than other pharmaceutical therapies used to treat BPH, such as tamsulosin (0.2 mg/d), terazosin (1−5 mg/d), and finasteride (5 mg/d). Thus, there is a need for finding a better approach to improve NFPD solubility and permeation properties. A Cambridge Structural Database (CSD) search of NFPD resulted in only three hits, of which one is a guest-free form and two are hydrochloride HCl salts. We report herein NFPD new binary solid form investigation via crystal engineering and solubility and permeability studies of the novel solids. NFPD was screened with GRAS (Generally Regarded as Safe by the United States Food and Drug Administration, U.S. FDA) carboxylic acid coformers via liquid-assisted grinding approach to produce molecular salts, which were crystallized from suitable organic solvents. The solubility NFPD. Our objective was to study the pharmaceutical Salts of NFPD for improving its chemical solubility and permeability. The ΔpKa of NFPD and carboxylic acid coformers, namely, SA, OA, FA, INA, and 3,5DNBA, is greater than 3, therefore a salt can be isolated in each case. The ΔpKa of NFPD and MLAs (D-MLA, L-MLA, and DLMLA) is 2.2, and at this lower-than-borderline value, therefore possibility of either cocrystal or salt can be obtained in this case. And also, we have taken NFPD-HCl salt which is commercial form to compare the physicochemical properties with the Naftopidil novel forms. We obtained six salts with Succinic Acid (SA), Oxallic acid (OA), Fumaric acid (FA), Isonicotinic Acid (INA), malic acid (MLA) and 3, 5 dinitrobenzoic acid. All the salts were characterized by X-ray diffraction (powder and single), thermal (DSC), spectroscopy (FT-IR) techniques. In the crystal structures of all these six salts, NFPD and coformer associated via ionic and charge-stabilized N−H···O, O−H···O, and C−H···O hydrogen bonds in the crystal structure. The primary objective of this work was to improve the solubility and permeability of NFPD. It was achieved via cocrystallization with MLA coformer resulted salt which is a promising candidate with higher dissolution and permeability in oral drug formulation.

CHAPTER THREE

Enhanced Solubility, Permeability, and Tabletability of Nicorandil by Salt and Cocrystal Formation

Nicorandil (NCR) is a potassium channel activator induces vasodilation of coronary and systemic arteries, And has the ability to hyperpolarize smooth muscle cell membranes. NCR exhibits moderate solubility (1.19 mg/mL at 37 °C) and has short half-life (<1 h) due to rapid metabolism and systematic elimination via oral administration. NCR is formulated in tablet and liquid dosage forms for oral and intravenous routes of drug delivery. Similarly, NCR transdermal patches are used for topical drug delivery. However, during tablet manufacturing NCR undergoes chemical degradation due to the heat generated under compressive pressure exerted by the punch machine. This stability issue of NCR poses a big challenge to the formulation scientists in drug development. The marketed form tablet has to be packed in a hard tempered Aluminium foil blister stripe and each tablet inside of a blister is linked to a round disk with desiccant. And should be stored in a dry place below 25 ± 1 °C, and each tablet pack is recommended discarding in 30 days of opening. The Cambridge Structural Database (CSD) contains a guest free form of NCR and four cocrystals with 1-hydroxy-2-naphthoic acid, salicylic acid, 3-hydroxybenzoic acid and 2,5- dihydroxybenzoic acid. However, there is no published report on the solid form screen of NCR for tabletability improvement. Cocrystallization is an efficient crystal engineering approach targeted for small molecule pharmaceuticals to modify their crystal structures (without breaking/making covalent bonds) and to systematically alter physicochemical and mechanical properties. Cocrystals are synthesized by liquid assisted grinding, ball mill grinding, and slurry technique, melt, and solution crystallization methods. In case of NCR, liquid-assisted grinding followed by isothermal crystallization can afford crystals of binary solid forms. The homologous series alkane / alkene dicaroboxylic acid coformers were selected to construct cocrystals for this study. NCR has a pyridyl functional group and can form the robust carboxylic acid···pyridine (COOH···N-Py) heterosynthon in crystal structures. In this chapter, I have highlighted the NCR salt and cocrystal utility in terms of enhanced physicochemical properties exhibit phase stability and displayed enhanced solubility, dissolution rate and diffusion rate compared to the parent drug in PBS media. Among two salts and cocrystals, the NCR-OA has the

highest dissolution and diffusion behaviour among the crystal forms examined. NCR-OA is the optimal drug form for immediate release oral drug formulation with improved solubility, diffusion, and mechanical properties.

CHAPTER FOUR

Fluorobenzoic Acids as Coformers for BCS Class IV Drugs to Improve Solubility and Permeability

The fluorine atom is similar in size to H (van der Waals radius H 1.20 Å, F 1.47 Å, O 1.52 Å) and close in Electronegativity to oxygen (F 3.98, O 3.44, H 2.20). Fluorine is slightly more lipophilic than a hydrogen Atom but less than the electronegative O atom. Medicinal chemists frequently replace with reason and logic specific C–H, C–OH, and C=O groups in drug molecules with the C-F bond. Fluoro substitution at a crucial position in a key aryl or alkyl position can result in therapeutically active molecules with significant improvement in pharmacological effect and reduced biochemical transformations. This makes fluorine a unique atom that it has a profound effect when bound to the carbon in small organic molecules (organic fluorine). The hydrophobic nature of the C-F bond and high electronegativity of F make it non-polarizable which reduces interactions with the solvent molecules, and in turn reduces ligand solvation and increases ligand hydrophobicity. Hydrophobicity ascribed to deoxyfluorination significantly increases permeability, or log P, and has been associated with improvements in cell membrane permeability, referred to as polar hydrophobicity. We report in this chapter Fluoro-substitution on coformer molecules to modulate the solubility and permeability of drugs in their cocrystals/salts using naftopidil as a case study. Naftopidil, a Bio pharmaceutics Classification System (BCS) class IV drug of poor aqueous solubility and low permeability, was selected as a model drug with carboxylic acid coformers based on our earlier observations: (1) that the piperazine group of naftopidil forms salts with COOH group coformers reproducibly based on the ΔpKa rule of >3; (2) the cyclic synthon of strong, charge-assisted $N^+-H\cdots O^-$ and $O-H\cdots O^-$ and hydrogen bonds of $R_2^2(9)$ ring motif is consistently present in binary as well as higher order cocrystals/ salts; and (3) the robust heterosynthon is tolerant to a wide variety of structural changes in the COOH coformer structures. The objective was to understand the effect of graded Fluoro substitution on the coformer toward changes in solubility and permeability of the API (active pharmaceutical ingredient). The race mate form the free base in clinical practice was used in this study. In this work, all seven new solid forms of BCS-IV class drug naftopidil (NFPD), have been successfully synthesized and structurally characterized and this is the one of the first study on Fluorobenzoic acids as coformers. Both solubility and permeability of NFPD were improved after the formation of salts. Relatively, NFPD-3,4DFBA and NFPD-2, 4,5TFBA significantly increased the dissolution rate as compared with other Fluoro BA salts and especially NFPD-BA. In case of diffusion a greater number of fluorine atoms replacing hydrogen atoms in the selected benzoic acid coformers is more favourable towards permeability. It is worth noting that fluorine plays vital role in improving the permeability of the selected BCS class-IV drug naftopidil, which suggests that fluorine acts as a permeable enhancer. This study opens new avenue for the simultaneous improvement of both solubility and permeability which provides a new strategy for overcoming the handicap of drugs in BCS class-II of low permeability and class-IV having both low solubility and low permeability.

CHAPTER FIVE

Salt, Cocrystal and Hydrate Forms of Ribociclib: Drug Solubility and Diffusion Permeability Ribociclib (RBC) is an oral dosage antineoplastic agent. Due to its poor aqueous solubility (≈ 0.24 mg/mL) And permeability (log 2.38), it is classified as BCS class IV (Biopharmaceutical classification). The Succinate salt of RBC (RBC-SA) was developed by Novartis and it is reported thought it has increased Solubility, the drug concentration in the gastrointestinal (GI) tract did not improve the absorption rate as the drug molecules has to permeate across the GI membrane. Thus, the 600 mg dosage of RBC-Succinate salt form were formulated which is the high dosage strength to the cancer patients. Therefore, the balance Between the solubility and the permeability had to be optimized to achieve the maximal overall absorption of BCS class IV drug RBC. A change in crystal lattice energy and solvation energy is required to enhance the solubility. There are several cocrystal reports on enhanced solubility and dissolution profile but there are very few reports available on cocrystals ability to modulate the flux rate resulting the enhanced permeability profile of drugs that affects oral absorption. Various research groups have established and demonstrated that the cocrystals alone could alter both the solubility and the permeability of the APIs. Though it was unclear that, in a cocrystal based formulation, how the permeability of the parent drug is affected by coformer, it was speculated that the interplay

of the solubility and permeability by selecting the lipophilic coformer and a high concentration gradient across the biological membrane with high solubility improved permeability. Also, Supramolecular synthon formation, drug-coformer interaction, crystal packing, and their interplay together play a decisive role in modulating permeability for an optimized formulation. A Cambridge Structural Database (CSD) search of RBC resulted in only one hit, Ribociclib succinate (2:1) salt dehydrate (CCDC No.2067542). DMSO solvate salts and several crystalline forms of RBC were reported in patents includes polymorphs, succinate salt, and cocrystals. In the scientific articles reported with saccharine, cholic acid and orotic acid, are the cocrystals with Ribociclib whereas, citric acid formed a salt. However, the single crystal structure of RBC and its cocrystals is not published. Here I report RBC hydrate form and two new binary solid form among them, one cocrystal with resorcinol (RBC-RES, 1:1) and the other one salt hydrate with vanillic acid (RBC-VA-HYD, 1:1:1) investigated via crystal engineering and solubility and permeability studies of the novel solids. The prepared cocrystal of RBC-RES are found to be stable under stressed conditions and also has improved physicochemical properties resulted enhanced solubility, dissolution, and permeability compared to the RBC-VA-HYD salt. This improvement in the characteristics is also useful in the processing of the drug formulation to have better bioavailability.

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Funded Research Projects

SL. NO	Project Title	Funding Agency	Principal Investigators	Project Duration	Total (Estimated in lakhs)	Dept. / School
1	Telltale of Galactic Black hole X-ray binaries from AstroSat archival observations.	ISRO-SSPO	Dr. Radhika D.	2018-19 (3 years)	24.00	SOE-PHYSICS
2	Investigation of spectro-temporal variabilities of stellar mass Black Hole X-ray binaries using Astrostat.	ISRO-RESPOND	Dr. Radhika D.	2019 (3 Years)	20.82	
3	Investigations on reduced graphene oxide in the aspect of its possible application for the development of a radiation sensor.	SERB	Dr. Baishali Garai	2016-17 (3.5 Years)	35.98	
4	Design and development of a miniaturized low cost graphene based radiation detector for space applications	ISRO-RESPOND	Dr. Baishali Garai	2017-18 (3 Years)	18.94	
5	Development of a miniaturized low cost graphene doped Pd/Pdox /Sic Schottky diode gas sensor and their adaptability in Environmental control system (ECS) for Aero Space applications	DRDO-AR&DB	Dr. K. Vijaya Kumar	2021 (2 Years)	10.55	
6	Functionalized meso/microporous nanostructured metal oxides sendor for screening dispersed heavy metal ions: One-shot disposable sensor strips.	DST-SERB	Dr. Ashoka S	2017-18 (3 Years)	26.45	SOE-CHEMISTRY
7	Crystal Engineering Of Nutraceuticals As New Chemical Entities	DST-SERB	Dr.K.Anand solomon	2016-17 (3 Years)	30.98	

8	Design And Development Of Smart Robotic Based Magnetically Impelled Arc Butt Welding Equipment For Joining Ferrous And Non Ferrous Tubes	DST	S. Arungalai Vendan	2019 (3 Years)	47.88	SOE-ECE
9	Corrosion testing of fiber metal laminates using droplet cell microscopy	SERB (CRG grant)	Dr. Viswanathan R	2020 (3 Years)	20.46	SOE-MECHANICAL
10	Separation of Biobutanol via scalable approach of pervaporation: To be a "Viable Biofuel for Future"	Science and Engineering Research Board (SERB)	Dr. Santosh Choudhari/ Dr. Nataraj Sanna Kotrappanavar, Jain University	2018-19 (3 Years)	40.96	SBAS
11	Immobilized microbial consortium for pesticide bioremediation in ginger cultivated soils of Karnataka	Vision Group on Science and Technology - KFIST Level (1)	Dr. Shobha K. Jayanna	2017-18 (2 Years)	20.00	
12	Assessment of nutritional status of pulmonary TB patients who have received Nikshay Poshan Yojana scheme residing in Ramanagara district, India by using N-TB mobile application- A cross-sectional study	SAARC TB and HIV/AIDS Centre | STAC, NEPAL, Deputy Director-General, The Central TB Division, Ministry of Health & Family Welfare, Government of India	Dr. Santosh K Yatnatti	2021-2022	USD 1154 (INR 85384)	CDSIMER
	Total Funding : INR 297.87 Lakhs					

Consultancies & Trainings

Sl. No.	Name of the Faculty	Consultancy Awarded Agency	Type of work
1.	Dr. Geetha K M,	SSRVM	Sri Ravishankar Ayurvedic College
2.	Prof. Susweta Das	Coordinate and participate with VASLR to develop skill-building courses and curricula suitable for UG and PG students.	Vowels Advanced School of Learning & Research Pvt Ltd, Bangalore
3.	Dr. Suresh Nagesh	QP India as a Chief Technical Consultant	Quantum Point Pvt Ltd Global Village SEZ Bangalore 560059
4.	Dr.Sreenivasa Rao Amaraneni	Copper speciation and Zinc leaching	Eureka Forbes Ltd
5.	Dr. Rammohan Bhanumurthy, Ravitej Y P	Characterisation and Delamination studies on Banana/Baggase fibers with Platic Powder Reinforced Hybrid Epoxy components. (Ref: DSF Contract ID: 2021-71, DSF Project ID: IN-2021-2-04)	Dassault Systemes Foundation
6.	Dr. Rammohan Bhanumurthy, Sandeep M J	Partial Replacement of sand with ecofriendly sustainable material for foundry applications (Ref: DSF Contract ID: 2021-70, DSF Project ID: IN-2021-2-05)	Dassault Systemes Foundation
7.	CORPORATE TRAINING PROGRAMME ON 'AUTOCAD' held from 19 April to 30 June 2021	BUHLER INDIA, ATTIBELE, KARNATAKA-562107	CORPORATE TRAINING
8.	CORPORATE TRAINING PROGRAMME ON 'AUTOCAD' held from 2 to 13 August 2021	BUHLER INDIA, ATTIBELE, KARNATAKA-562107	CORPORATE TRAINING

Summary of Publications, Sponsored Projects & Consultancies 2021-2022

Schools	School of Engineering	School of Basic& Applied Sciences	School of Allied Health Sciences	School of Medical Education & Research (CDSIMER)	School of Commerce& Management Studies	School of Arts, Design & Humanities	TOTAL
International Journal Publications	39	21	39	23	03	0	**125**
National Journal Publications	03	01	21	30	01	0	**56**
International Conferences	14	05	21	0	02	0	**42**
National Conferences	01	07	06	0	0	0	**14**
Book Chapter(s)	17	08	09	0	05	0	**39**
Patents	0	0	3	0	0	0	**3**
Total	**74**	**42**	**99**	**53**	**11**	**0**	**279**
Sponsored Projects	**10** **Dassault Systemes: 2** **AICTE:1** **ARDB:1** **CMTI: 3** **UGC: 1** **ICMR: 2**						**10**
Consultancies Trainings	06 02						**08**