Research Newsletter

Volume 2, April 2023

Department of Chemistry
CHRIST (Deemed to be University)
Hosur Road, Bangalore 560029

Message from Head of the Department

Dr. Anitha Varghese

Greetings to all! I am delighted to present the annual research newsletter for the Department of Chemistry for the year 2022-2023. Despite facing challenges, we have continued to strive towards our mission of advancing the field of chemistry through education and research. Our faculty members have been engaged in research across a wide range of areas, including organic synthesis, materials chemistry, nano chemistry, catalysis, electrochemical synthesis, and energy devices. Our research endeavors have been supported by numerous grants from funding agencies. Our scholars have made significant contributions to our research efforts, publishing their work in high-impact journals, and presenting their findings at national and international conferences. Additionally, our M.Sc. and B.Sc. students have gained valuable experience in laboratory techniques and scientific communication through their participation in research projects during their internships. Along with our research activities, we have also maintained our commitment to excellence in teaching. We have introduced new courses and teaching methodologies to enhance our students' learning experiences and collaborated with industry partners to provide practical training and research opportunities. In the upcoming year, we look forward to expanding our research efforts and strengthening collaborations with other departments and institutions. We will continue to provide a supportive and stimulating environment for our faculty and students to conduct innovative research. I am proud of the accomplishments of our department, and I am excited to share more news with you in the future.

Editorial and message from Research Coordinator

Editorial: The second volume of yearly research newsletter highlights the diverse research activities that are being conducted at Department of Chemistry, Christ University, central campus, Bangalore. The department scans through multidimensional chemical science research covering wide range of topics like electrospinning of polymeric and composite fiber, electro catalysis, designing of carbon spheres etc. In this volume the glimpse of developments in the research, faculty achievements, research scholars awards are covered. In a nutshell, here we hope to give reader a brief idea about current status of research groups, their research activities and long term research goals.

Message from Research Coordinator: In the capacity of research coordinator I look forward to uplift the outcome and fine tune the research policies related to the departmental research activities. Here, we all as a research faculty team strive to give best of us to the research scholars. Our aim is to smoothen the process of experimentation and entire research life of scholars. I personally believe in updating ourselves every day and every moment, no matter how perfect we are or can be. This clearly signifies the open space for research scholars for suggestions on improving the system. The new infrastructure of R&D block and instrumentation facilities can definitely help scholars to bring out better research results not in terms of just number of research articles but also high impact factor articles in internationally reputed journals. Finally the message from me is we long for not just the quantity but the quality research and this will help to change the face of Chemistry Department of Christ University in bringing more research accolades in near future.

Dr. Abhijeet K Chaudhari

Message from PhD Coordinator

Dr Sunaja Devi K R

As a PhD coordinator, I got the opportunity to oversee and manage the academic program for students pursuing their Doctor of Philosophy degree. The coordinator serves as a liaison between the students, faculty members, and administration, ensuring that the program operates smoothly and efficiently. The PhD coordinator is responsible for providing academic guidance and support to students and overseeing the RAC meetings and dissertation process. Additionally, the PhD coordinator must communicate with faculty members to ensure that they are providing the necessary resources and support to their students and to ensure that the program is meeting the needs of both students and faculty.

During my tenure as a coordinator, I got the opportunity to interact with and establish a good relationship with highly motivated young researchers, understand their problems, and provide support services for the success of their research journey. The usage of various software, academic databases, and funding opportunities was discussed with the scholars and created a healthy research atmosphere in our department. The HOD, supervisor, and research advisory committee help the scholars to refine their research questions, design their research methodology, and analyze their data. Regular feedback and communication between the scholars and their advisors ensure that the research is progressing as planned. Acknowledging and celebrating each other's achievements in research is an important aspect of building a positive and supportive academic community that helps to foster a sense of camaraderie and collaboration among scholars and serves as motivation for others to strive for excellence in their own research. The pursuit of a doctorate degree requires a tremendous amount of hard work, perseverance, and passion, and it is inspiring to see our scholar’s growth; who are determined to overcome challenges, help each other and achieve their goals. It is an exciting time to be part of such a community, and I look forward to seeing the incredible work.

Major Research Grants

1. K-FIST-L1 from VGST: This grant is given to establish the niche research area to strengthen the science and technology, 20 lakhs received for this grant.
2. Onion Grand Challenge grant from Ministry of Consumer affairs: This grant is to uplift the onion growing farmers in the country through high tech innovations. It has several steps before it commercializes. Amount received in step 1 is 75000.
3. MSME Startup grant from Govt of INDIA. This grant is given to create cost effective catalysts for the pharmacy industries, amount sanctioned: 37 lakhs
4. RKVY AGRI Grant: This grant is given to create cost effective floor cleaners from arecanut nano. Amount sanctioned is 15 lakhs.

Dr. Gurumurthy Hegde

In the year 2022, September 23rd Dr. Abhijeet K Chaudhari received the major research grant from Department of Science and Technology (DST) under the scheme of startup research grant (SRG) offered via Science and Engineering Research Board (SERB). The grant amount offered to Dr. Abhijeet K Chaudhari is 30 lakh INR for the tenure of 2 years. The title of his project is "Next-Generation SupraMOFs Materials: En-route to Designed Functionalities onto Nano-Porous MOFs for Advanced Optoelectronic and Sensing Applications". Under this grant he aims to advance the field of MOF for the purpose of in-field applications in the regime of biosensors and devices.

Dr. Abhijeet K Chaudhari

Dr. Avijit Kumar Das has received an external research grant of 30 lakhs for 3 years on the project topic entitled “Photochemical and chemical synthesis of fluorescent multifunctional chemosensors for selective detection of DNA and biologically relevant analytes through various environment remediation tools” funded by Science and Engineering Research Board - State University Research Excellence (SERB-SURE), Department of Science and Technology, Government of India.

Dr. Avijit K Das

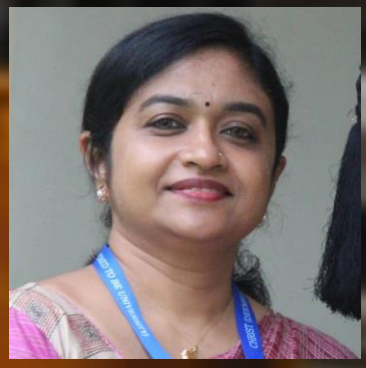
Recognitions & Achievements

1 Recipient of Top 2% Scientist from Stanford University List
2.Recipient of Prajavani Achievers Award, Karnataka
3.Recipient of Best Innovator Award from KSTA, Govt of Karnataka
4.Recipient of Onion Grand Challenge winner, Govt of India
5.Appointed as the Adjunct Professor, PPISR, Bengaluru
6.Recipient of Silver medal at National Conference on Liquid Crystals 2022
7.Appointed as the Guest Editor, Current Organic Synthesis
8.Appointed as the Editorial Board member: Frontiers in Physics

Dr. Gurumurthy Hegde

Research Award

Dr. Anitha Varghese, has received the award for best research publication in the area of Chemistry for the year 2022-23. This award is given by the Vision Group on Science and Technology (VGST), Government of Karnataka, to outstanding researchers and faculty who have published their research in reputed peer-reviewed scientific journals. This carries a cash prize of Rs 25,000. Dr. Anitha Varghese and her team were honoured for their work utilizing green functionalized carbon quantum dots to identify pollutants such as picric acid.



Dr. Anitha Varghese

Deccan Herald Highlights our Research!

DH DECCAN HERALD | Home | Bengaluru | Karnataka | National | Sports | Business | Opinion | Features | Videos | Brandspot | Specials

Home / City / Now, monitor milk freshness with petals, paper & an app

Researchers monitor milk freshness with petals, paper and an app

The use-by date on the milk sachets, a standard indicator, is not always effective in real-time assessment of the milk's freshness

The researchers — Chaithra K P and Vinod T P — rub-coated hibiscus flower petals on paper, which was then used to sample the milk (fresh, packaged and powdered) droplets on. The change in colour of the paper treated with milk, from green to purple to pink, indicated the nature of the samples — fresh, spoiling, and spoiled, respectively.

The pH of fresh milk is estimated at 6.5 to 6.7, which decreases with spoilage. Milk samples adjusted with lactic acid to attain different pH levels (6.68, 6.5, 6.0, 5.5, 5.0 and 4.4) were added to the indicator to confirm distinction among fresh, spoiling and spoiled milk. A real-time sampling of spoilage was also done with milk that was stored in refrigerators and kept at room temperature, for different durations.

After the sampling, the researchers photographed the colour changes, and using an android app, Color Grab, analysed their RGB (red, green and blue) indices. They used the red chromatic shift to quantify these changes, with greater proximity to red indicating higher acidity (and lower pH).

Dr. Vinod T P

Ms. Chaitra K P

For more information visit:
https://www.deccanherald.com/city/hc-dismisses-pil-to-implement-moving-garden-scheme-1164887.html

Achievements of Research Scholars

The best poster award received for the poster entitled "Exploring the Performance of the Oxygen Evolution Reaction in Ni-Cu MOF Bimetal Organic Framework System" by Sruthi Rajasekaran at Indo-South Korea–Thailand 2nd International e-Conference on Nanoscience and Nanotechnology for Energy, Environment and Biomedical Applications (iNEEBA-2022) organised by Vinayaka Mission's Kirupananda Variyar Arts and Science College, Salem, India, on 24-25th November 2022.

Sruthi Rajasekaran

Apoorva participated in three day International Conference on "Advances in Materials Science and Chemistry (AMSC-23)", from 2nd to 4th March 2023 organized by Department of Chemistry, GOGTE INSTITUTE OF TECHNOLOGY at Belagavi. The paper presented here was titled "Cost-effective Samanea Saman pod derived carbonaceous nanomaterial supported palladium catalyst for Suzuki-Miyaura Coupling" This paper highlighted the importance of the synthesis of a sustainable heterogeneous catalyst derived from biowaste. For this work, she was awarded first place in the oral presentation category.

Apoorva Shetty

Aman participated in the three-day International Conference on Advances in Materials, Ceramics and Engineering Sciences (AMCES-2023) from 13-15 March, 2023. The conference was organized by the Dayanand Sagar College of Engineering jointly with the Indian Ceramic Society, Karnataka Chapter and the Department of Applied Sciences, VTU, Belagavi. He received Best Paper Award for the Oral Presentation for the paper titled "Bio-waste derived Carbon Nanospheres towards Water Purification". The paper highlights the need for the waste water treatment since water pollution caused by the industrial sector is a major issue that impedes the achievement of sustainable development goals.

Aman Sharma

Faculty Research Profile

Dr Aatika Nizam

Our research activities are focused on the various aspects of organic synthesis with the major emphasis on the development of new methodologies and molecules and their applications. Some of the recent investigations include synthesis of fused tetrazolo scaffolds their biological and photoluminescence applications.

Recent Publications

1. J. Devasia, F. Joy, and A. Nizam, "A Selective Excited-State Intramolecular-Proton-Transfer (ESIPT) Sensor for Copper(II) Based on Chelation-Enhanced Quenching and 'Off-On' Detection of Amino Acids," Chemistry-A European Journal, (2023), 1.
2. J. Devasia, A. Nizam, D. Muthukumar, R. S. Pillai, and F. Joy, "A concise route to fused tetrazolo scaffolds through 10-camphor sulfonic acid auto-tandem homogeneous catalysis and mechanistic investigation," Journal of Molecular Liquids, 376 (2023) 121510.
3. F. Joy, J. Devasia, A. Nizam, V. L Vasantha and S. B. N. Krishna, "Fungi-Templated Silver Nanoparticle Composite: Synthesis, Characterization, and Its Applications" Applied Sciences, 13 (2023) 2158.
4. M. Mishra, K. J. Jomon, S. Chinnam, J. Devasia, A. Nizam and M. B.Madhusudana Reddy, "Switchable surface activity of Bi2Al4O9 nano particles: A contemporary approach in heterocyclic synthesis"Journal of Nanoparticle Research. 25:49 (2023) 1.

Dr Abhijeet K Chaudhari

Core Area of Research: Porous Materials, Metal-Organic Frameworks, Covalent Organic Frameworks, Molecular Sensing, Organic Solids, Magnetic Materials, Solid state materials, X-Ray Crystallography, Composite materials from Porous Materials

Selected Publications

1. Chaudhari, A. K.; Tan, J. C. Dual-Guest Functionalized Zeolitic Imidazolate Framework-8 for 3D Printing White Light-Emitting Composites. Adv Opt Mater 2020, 8, 1901912.
2. Chaudhari, A. K.; Souza, B. E.; Tan, J.-C. Electrochromic thin films of Zn-based MOF-74 nanocrystals facilely grown on flexible conducting substrates at room temperature. Apl Mater 2019, 7, 081101.
3. Chaudhari, A. K.; Tan, J.-C. Mechanochromic MOF nanoplates: Spatial molecular isolation of light-emitting guests in a sodalite framework structure. Nanoscale 2018, 10, 3953-3960.
4. Chaudhari, A. K.; Tan, J.-C. A mechano-responsive supramolecular metal–organic framework (supraMOF) gel material rich in ZIF-8 nanoplates. Chemical communications 2017, 53, 8502-8505.
5. Chaudhari, A. K.; Kim, H. J.; Han, I.; Tan, J. C. Optochemically responsive 2D nanosheets of a 3D metal–organic framework material. Advanced Materials 2017, 29, 1701463.
6. Chaudhari, A. K.; Ryder, M. R.; Tan, J.-C. Photonic hybrid crystals constructed from in situ host–guest nanoconfinement of a light-emitting complex in metal–organic framework pores. Nanoscale 2016, 8, 6851-6859.
7. Chaudhari, A. K.; Han, I.; Tan, J. C. Multifunctional Supramolecular Hybrid Materials Constructed from Hierarchical Self-Ordering of In Situ Generated Metal-Organic Framework (MOF) Nanoparticles. Advanced Materials 2015, 27, 4438-4446.

Dr Ajesh Vijayan

Core Area of Research: Synthetic organic chemistry, Transition metal catalyzed reactions, C-H activation reactions, Coupling reactions, Construction of carbocyclic and heterocyclic motifs, Multicomponent reactions, Electrochemical extraction of metals from scraps.

References

1) Vishal Talukdar, Ajesh Vijayan, Naresh Kumar Katari, K. V. Radhakrishnan, & Parthasarathi Das, Recent Trends in the Synthesis and Mechanistic Implications of Phenanthridines, Adv. Synth. Catal., 2021, 363 (05), 1202-1245, https://doi.org/10.1002/adsc.202001236.

2) P. Sharathna, V. Alishaa, P. Sasikumar, Ajesh Vijayan, F. Ayisha, I. G. Shibi, V. V. Sivan, Kaustabh Kumar Maiti, Ravi S. Lankalapalli, & K. V. Radhakrishnan, Mirabijalones S-W, rotenoids from rhizomes of white Mirabilis jalapa Linn. and their cell proliferative studies, Phytochemistry Letters, 2021, 44, 178-184, https://doi.org/10.1016/j.phytol.2021.06.017.

3) Maniyamma Aswathy, Ajesh Vijayan, Uzini D. Daimary, Sosmitha Girisa, Kokkuvayil V. Radhakrishnan, Ajaikumar B. Kunnumakkara, Betulinic acid: A natural promising anticancer drug, current situation, and future perspectives, Journal of Biochemical and Molecular Toxicology, http://doi.org/10.1002/jbt.23206.

4) Handbook of CH-Functionalization (CHF), Chapter title: “Strain Release of Bicyclic/Tricyclic Olefins via C-H Functionalization Reactions”, Praveen Prakash, Ajesh Vijayan and K. V. Radhakrishnan, First Edition, WILEY-VCH GmbH 2022; ISBN: 9783527834242; DOI: https://doi.org/10.1002/9783527834242.chf0181

Dr Anitha Varghese

Dr. Anitha Varghese's Group (AV) is working in different areas of Chemistry focussing on electro-organic synthesis, development of novel electrocatalysts, mechanistic studies of the electrode-electrolyte interface, development of electrochemical and fluorescent sensors for a wide spectrum of important analytes. In addition, our research work is devoted to electrocatalytic reduction of CO2 to green fuels and useful chemicals and utilisation of CO2 for electro-carboxylation reactions a. The group has several research papers to its credit in various international refereed journals.

Jose, S., Thadathil, D. A., Ghosh, M., & Varghese, A. (2023). Enzyme immobilized conducting polymer-based biosensor for the electrochemical determination of the eco-toxic pollutant p-nonylphenol. Electrochimica Acta, 460, 142591.

Rodrigues, R. M., Thadathil, D. A., & Varghese, A. (2023). Pi-MnO2 decorated poly-3-thienylacetic acid on carbon fiber paper for electrochemical synthesis of 2-formyl-thiophene. Molecular Catalysis, 545, 113242.

Keerthana, P., George, A., Benny, L., & Varghese, A. (2023). Biomass derived carbon quantum dots embedded PEDOT/CFP electrode for the electrochemical detection of phloroglucinol. Electrochimica Acta, 448, 142184.

Keerthana, P., Das, A. K., Bharath, M., Ghosh, M., & Varghese, A. (2023). A ratiometric fluorescent sensor based on dual-emissive carbon dot for the selective detection of Cd2+. Journal of Environmental Chemical Engineering, 11(2), 109325.

George, A., Cherian, A. R., Jacob, B., Varghese, A., & Maiyalagan, T. (2023). Design optimisation and fabrication of amino acid based molecularly imprinted sensor for the selective determination of food additive tartrazine. Food Chemistry, 404, 134673.

Dr Avijit K Das

Research area: Chemosensors for analytes and bio-analytes (CAB)

My research area is mainly focused on the multistep organic synthesis to develop various fluorescent ligands and dyes for the selective detection of biologically important analytes like metal ions as cations (Zn2+, Hg2+, Cr3+, Cu2+, Ni2+, Al3+ etc), anions (F-, CN-, AcO-, Phosphate etc), reactive species (reactive oxygen and nitrogen species, hydrogen sulphide, hydrazine, nerve gas etc) and different forms of DNA (duplex and quadrupex DNA).

Recent Publications:

1. Das, G. C., Das, A.K., Das,* D., Maity, T. R., Samanta, A., Fatmah, A. A., Amani S. A., Amjad, I., Dolai, M., Ortho-Vanillin based multifunctional scaffold for selective detection of Al3+ and Zn2+ employing molecular logic with DFT study and cell imaging with live Grass pea, Journal of Photochemistry and Photobiology A: Chemistry, 440, 2023, 114663.
2. N., Karthik., Das, A. K.* (2023). Nanobiosensors for COVID-19. In: Dutta, G. (eds) Next-Generation Nanobiosensor Devices for Point-Of-Care Diagnostics. Springer, Singapore. https://doi.org/10.1007/978-981-19-7130-3_2.
3. Das, T., Jain, S., Das, A.K.* (2023). Recent Progress on the Development of Chemosensors. In: Dutta, G. (eds) Next-Generation Nanobiosensor Devices for Point-Of-Care Diagnostics. Springer, Singapore. https://doi.org/10.1007/978-981-19-7130-3_8.
4. Maity, S., Maity, A. C., Das, A. K.,* Bhattacharyya, N., Dual-mode chemosensor for the fluorescence detection of zinc and hypochlorite on a fluorescein backbone and its cell-imaging applications, Anal. Methods, 2022,14, 2739-2744.

Dr Bincy Cyriac

Solid phase microextraction for the preconcentration and separation of uranium, thorium, zirconium, hafnium and rare earth elements in nuclear and geological materials. Environmental remediation for uranium, flouride and other toxic elements using natural materials and phytoremediation.

1. A.Premadas, Bincy Cyriac ,K. Satyanarayana, Precipitative separation and ICP-AES determination of Rare earth elements, Yttrium, Scandium and Thorium in different types of geological samples including Iron and Uranium rich samples, Atomic Spectroscopy, Vol 30(2), 2009, 66-75.
2. Bincy Cyriac, B. K. Balaji, A novel method of synthesizing solid phase adsorbent silica modified with xylenol orange-Application for separation, pre-concentration and determination of uranium in calcium rich hydrogeological samples and sea water samples, Microchimica Acta 171(1-2)33-40,2010
3. Bincy cyriac, Smeer Durani, Determination of rare earth elements and yttrium in zircons by plasma emission spectrometry after solvent extraction separation of zirconium with di (2 ethyl hexyl) phosphoric acid. J. Indian. Chem. Soc., Vol 90, No.11, Nov 2013, 2099.
4. Bincy Cyriac, Mastan Vali, Nishma Ojha, Smeer Durani, Extraction of Th, Zr and Sc from rock matrix using silica modified with arsenazo-III and their determination by inductively coupled plasma atomic emission spectrometry, Journal of chemical sciences. 2020, 132:91.article id 0091

Dr Clament Sagaya Selvam. N

Research Area: Sustainable energy conversion reactions (water electrolyzer/fuel cell) for clean power generation and utilization.

Selective publication:

1. **Clament Sagaya Selvam**, N.; Kwak, S. J.; Choi, G. H.; Oh, M. J.; Kim, H.; Yoon, W.-S.; Lee, W. B.; Yoo, P. J., Unveiling the Impact of Fe Incorporation on Intrinsic Performance of Reconstructed Water Oxidation Electrocatalyst. ***ACS Energy Letters*** 2021, 6, 4345-4354. *Impact Factor:24.05 & Quartile: Q1*
2. **Clament Sagaya Selvam, N.**; Du, L.; Xia, B. Y.; Yoo, P. J.; You, B., Reconstructed Water Oxidation Electrocatalysts: The Impact of Surface Dynamics on Intrinsic Activities. ***Advanced Functional Materials*** 2021, 31, 2008190. *Impact Factor: 19.97 & Quartile: Q1*
3. **Clament Sagaya Selvam, N.**; Lee, J.; Choi, G. H.; Oh, M. J.; Xu, S.; Lim, B.; Yoo, P. J., MXene supported Co_xA_y (A = OH, P, Se) electrocatalysts for overall water splitting: unveiling the role of anions in intrinsic activity and stability. ***Journal of Materials Chemistry A*** 2019, 7, 27383-27393. *Impact Factor: 14.51 & Quartile: Q1*
4. Cho, J.; Kim, M.; Seok, H.; Choi, G. H.; Yoo, S. S.; **Clament Sagaya Selvam, N.**; Yoo, P. J.; Kim, T., Patchwork-Structured Heterointerface of 1T-WS_2/a-WO_3 with Sustained Hydrogen Spillover as a Highly Efficient Hydrogen Evolution Reaction Electrocatalyst. ACS ***Applied Materials & Interfaces*** 2022, 14, 24008-24019. *Impact Factor: 10.38 & Quartile: Q1*

Dr Dephan Pinheiro

Dr Dephan is driven by the curiosity to understand the physical and chemical processes at work in heterogeneous catalytic systems and use this knowledge for designing optimal catalysts. He is interested in developing functional nanostructured materials for catalytic, electrocatalytic, photocatalytic, organic, and energy applications through unique tools, including chemical synthesis, and surface functionalization. His work is focused on the fundamental and applied aspects of synthesis, characterization, and application of various carbon based catalytic materials such as graphene, RGO, g-C3N4, nanoporous carbon, 2D materials including MoS2, MXenes, MOFs, polymer-based composites with well-controlled overall size, composition, 3D arrangement, porosity, and surface properties.

Relevant publications

1. A. Varghese, S.D. K.R., D. Pinheiro, Adsorptive removal studies of Rhodamine B by PEG capped polyaniline/TiO2/CuO composite, Mater. Today Commun. 35 (2023) 105739. https://doi.org/10.1016/j.mtcomm.2023.105739.
2. S. Rajasekaran, B.S. Reghunath, S.D. K. R., B. Saravanakumar, J. Johnson William, D. Pinheiro, M.K. Arumugam, Facile synthesis of Mn-Ni bimetal organic framework decorated with amine as an electrode for a high-performance supercapacitor, J. Solid State Electrochem. 27 (2023) 911–925. https://doi.org/10.1007/s10008-023-05382-4.
3. Madhushree. R, Jadan.R.J. UC, D. Pinheiro, S. Devi K R, The catalytic reduction of 4-nitrophenol using MoS2/ZnO nanocomposite, Appl. Surf. Sci. Adv. 10 (2022) 100265. https://doi.org/10.1016/j.apsadv.2022.100265.

Dr Gurumurthy Hegde

Dr. Gurumurthy Hegde Ph.D., is currently working as a Director at Centre for Advanced Research and Development and also as Professor in the Department of Chemistry, CHRIST University, Bengaluru India. He obtained his Ph.D. degree from Centre for Nano and Soft Matter Sciences in 2007 and then did his post-doctoral work at Gothenburg University, Sweden, and HKUST, Hong Kong. Later he worked as Assistant Professor in UMP, Malaysia. From 2014 onwards he is in India. He worked as Prof CNR Rao Chair Professor at BMS College of Engineering from 2014 to 2020. From 2021 onwards, he joined CHRIST University, Bengaluru. He has guided 6 Ph.D. students & 6 MSc students for their respective degrees and also guided 4 post-doctoral fellows. He has published over 220 research papers in national/international journals & holds 20 patents. His papers are well cited with an h-index of 35. He has delivered more than 200 invited talk, guest lectures, plenary talks, keynote address at various conferences at different parts of the world. He got more than 60 International awards for his research from USA, South Korea, Japan, Germany, UK, Malaysia, India etc. He has written more than 10 books and book chapters. His areas of interest include Nano Science & Technology, Materials Science, liquid crystal displays, waste to wealth technologies. He is also the founder of start-up company named Adindistech Pvt Ltd.

Publication from 2022-2023:

1.Pore size matters!—a critical review on the supercapacitive charge storage enhancement of biocarbonaceous materials. Critical Reviews in Solid State and Materials Sciences (2022): 1-56. Impact Factor 11.178, Q1 ranked journal.

2.Designing of a Free-Standing Flexible Symmetric Electrode Material for Capacitive Deionization and Solid-State Supercapacitors, ACS Sustainable Chem. Eng. 2023, 11, 9, 3750–3759, Impact Factor 9.224, Q1 ranked journal

Dr S.J.Hepziba Magie Jessima

The area of my interest in the field of research is corrosion studies. The corrosion inhibitors serve as a frontline defense against attack of corrosion in chemical and oil industries. The simplicity, flexibility compatibility and employability in aqueous environment make the corrosion inhibitors, though ancient, yet in market demand. The need for green corrosion inhibitors and the use of biopolymers in the field of corrosion inhibition make this field of research still more interesting. The synthesis of corrosion inhibitors, modification of biopolymers, evaluating the efficiency of the inhibitors synthesized or modified and the theoretical support to study the corrosion inhibition mechanism and extending the studies in corrosion protective coating and environmental sustainability are the areas sought to explore in future.

Publication details

1. Preparation, characterization, and evaluation of corrosion inhibition efficiency of sodium lauryl sulfate modified chitosan for mild steel in the acid pickling process

S.J.Hepziba Magie Jessima , Avni Berisha , Subramanian Sathy Srikandan , Subhashini S.

Journal of Molecular Liquids, Volume 320, Part A, 15 December 2020, 114382

2.Corrosion mitigation performance of disodium EDTA functionalized chitosan biomacromolecule - Experimental and theoretical approach

S.J.HepzibaMagie Jessima , Subhashini S. , Avni Berisha , Ayhan Oral , Subramanian Sathy Srikandan

International Journal of Biological Macromolecules, Volume 178, 1 May 2021, Pages 477-491

Dr James Arulraj

As a researchers group our aim to conduct world class research which assures the sustainable development of the scientific community. All members of this group possess a high end passion towards research and would like to carry it forward to achieve a successful and worthy outcome for the wellbeing of the society.

- Nanocatalysis (Green chemical approach)
- Synthesis and application studies of different carbonaceous materials like carbon quantum dots, carbon nanospheres, carbon nanofibers etc.
- Layered solids synthesis and application studies in the field of catalysis and environmental remediation
- Optical sensing of heavy metal ions
- Biodegradation studies of plastics
- Kinetic and mechanistic investigation of catalysis

Dr Louis George

Dr. Louis George's Group is working in analytical sensing of environmental pollutants and food adulterants. The group is involved in organic synthesis and study of its stability conditions as well as its application in the sensing of different analytes. Professor has several research papers to his credit in various international referred journals.

1. Bincy Sam, Louis George, Sudhakar Y N, Anitha Varghese, Fluorescein based fluorescence sensors for the selective sensing of various analytes, Journal of Fluorescence (2021), 1251-1276.
2. Nishitha Prakash, Rijo Rajeev, Anjali John, Ajesh Vijayan, Louis George, Anitha Varghese, 2, 2, 6, 6-Tetramethylpiperidinyloxyl (TEMPO) Radical Mediated Electro-Oxidation Reactions: A Review, ChemistrySelect (2021), 7691-7710.
3. Sherin Rison, KB Akshaya, Agnus T Mathew, EK Joice, Anitha Varghese, Louis George, β-Cyclodextrin-PANI decorated pencil graphite electrode for the electrochemical sensing of morin in almonds and mulberry leaves, SN Applied Sciences (2020), 1-10.
4. Meghana, M. C., Nandhini, C., Benny, L., George, L., & Varghese, A. (2022). A road map on synthetic strategies and applications of biodegradable polymers. Polymer Bulletin, 1-50.
5. Benny Mattam, L., Bijoy, A., Abraham Thadathil, D., George, L., & Varghese, A. (2022). Conducting Polymers: A Versatile Material for Biomedical Applications. ChemistrySelect, 7(42), e202201765.

Dr Nidhin M

- Dr Nidhin M, Assistant professor, Dept of chemistry, is working on green synthesis of nanomaterials, characterization and their application in biomedical and electrochemical sensors. His expertise is on shape selective synthesis of nanomaterials and its various biomedical and industrial applications. He is a recipient of VGST Project (3 Lakhs) & Major research Project (36 Lakhs) and published more than 35 publications, 3 book chapters and recently bagged a patent also in his domain. He bridges the gap between different synthesis and biomedical applications focused on facile, low-cost, ecofriendly synthesis pathway.

Selected List of Publications

- Research paper: Ion-imprinted chitosan-stabilized biogenic silver nanoparticles for the electrochemical detection of arsenic (iii) in water samples, Ann Maria C G, Ananya S Agnihotri, A Varghese, M Nidhin, New Journal of Chemistry 47 (11), 5179-5192, 2023
- Research paper: Agnihotri AS, Ann Maria. C. G, Varghese A, Mane P, Chakraborty B, Nidhin M. CoFe2O4-APTES nanocomposite for the selective determination of tacrolimus in dosage forms: Perspectives from computational studies. Surfaces and Interfaces. 2022 Dec 1;35:102406.
- Review paper: Aswathi VP, Meera S, Ann Maria. C. G, Nidhin M. Green synthesis of nanoparticles from biodegradable waste extracts and their applications: a critical review. Nanotechnology for Environmental Engineering. 2022 Aug 24:1-21.
- Patent: Ann Maria. C. G, Nidhin M, 202241014988, Ion Imprinted Chitosan stabilized biogenic silver nanoparticles for the electrochemical detection of arsenic in water samples, Published on April 4 2022.

Dr.Prasad Pralhad Pujar

Dr. Prasad Pralhad Pujar's Group conducts research in the area of synthesis of heterocyclic compounds by novel routes using easily available reagents following green chemistry protocols. The designed heterocycles containing nitrogen, oxygen and sulphur scaffolds are common and exhibit interesting biological properties, therapeutic value and medicinal applications like anti-viral, anti-bacterial, anti-fungal, anti-cancer, anticonvulsant, anti-diabetic, antioxidant, anti-malarial and analgesic.

Recent Publications:

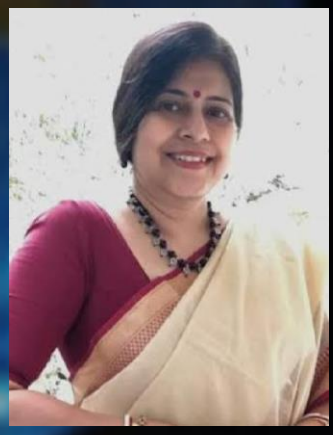
1) The facile and efficient organocatalytic platform for accessing1,2,4-selenadiazoles and thiadiazoles under aerobic conditions" V.P. Rama Kishore Putta, Raghuram Gujjarappa,,Nagaraju Vodnala ,Richa Gupta,, Prasad P.Pujar *, Chandi C.Malakar* Tetrahedron Letters, Volume 59, Issue 10, 7 March 2018, Pages 904-908

2) Studies on Photophysical Properties of Mono-carbonyl Curcumin Analogues: Experimental and Theoretical approach. Manjula Rayanal, Prasad Pralhad Pujar* and Sridhar D Oriental Journal of Chemistry, volume 34, 2018, issue no 4, pp 2170-2179

3) Metal- and Base-Free Domino Protocol for the Synthesis of 1,3-Benzoselenazines, 1,3- Benzothiazines and Related Scaffolds V. P. Rama Kishore Putta, Raghuram Gujjarappa, Ujjawal Tyagi, Prasad P. Pujar,* Chandi C. Malakar* Org. Biomol. Chem., 2019, 17, 2516–2528

4) Reagent-Controlled Divergent Synthesis of 2-Amino-1,3-Benzoxazines and 2-Amino-1,3- Benzothiazines. Venkata Pattabhi Rama Kishore; Vodnala, Nagaraju; Gujjarappa, Raghuram; Tyagi, Ujjawal; Garg, Aakriti ; Roy, Kuldeep; Gupta, Sreya; Pujar, Prasad*; Malakar, Chandi* Journal of Organic Chemistry, 2019,85(2),380-396.

Dr Riya Datta



Dr. Riya Datta is working on the area of Computational Chemistry. The work comprises of computational studies of organic molecules, particularly their structural and electronic properties, and the way these properties can contribute to their potential bioactivity. Other studies include pharmacological evaluation using online tools to study the ADMET properties of the molecules. A significant part of the work is dedicated to docking the molecules with popular anticancer targets using AutoDock Tools software.

Recent Publications:

1. Recent advances in bimetallic based nanostructures: Synthesis and electrochemical sensing applications, R Rajeev, R Datta, A Varghese, YN Sudhakar, L George, Microchemical Journal 2021, 163, 105910
2. Efficient lipophilicity prediction of molecules employing deep-learning models, R Datta, D Das, S Das, Chemometrics and Intelligent Laboratory Systems, 2021, 213, 104309
3. DeepBBBP: High Accuracy Blood-brain-barrier Permeability Prediction with a Mixed Deep Learning Model, S Cherian Parakkal, R Datta, D Das, Molecular Informatics 2022, 41 (10), 2100315
4. Computational investigation into structural, topological, electronic properties, and biological evaluation of spiro [1H-indole-3, 2′-3H-1, 3-benzothiazole]-2-one, SC Parakkal, R Datta, S Muthu, A Irfan, A Jeelani, Journal of Molecular Liquids, 2022, 359, 119234
5. Solvent polarity, structural and electronic properties with different solvents and biological studies of 3, 3, 5-triphenylfuran-2 (3H)-one-cancers of the blood cells, SC Parakkal, R Datta, A Saral, S Muthu, A Irfan, A Jeelani, Journal of Molecular Liquids, 2022, 368, 120674

Dr Sreeja Puthenveetil Balakrishnan

Dr. Sreeja obtained her doctorate in chemistry from Cochin University of Science and Technology India in 2005. She was associated with the Université de Lille, France and the Université de Rennes, France with CNRS fellowship for her Post doctoral research. She was awarded a Centenary Fellowship from the Indian Institute of Science, Bangalore, India in 2007. She joined the department as Assistant Professor in 2009.

Recent Publications

1. Photoresponse and electrochemical behaviour of azobenzene anchored graphene oxide for energy storage application, material chemistry and physics, 2023
2. Photoresponsive Carbon-Azobenzene Hybrids: A Promising Material for Energy Devices, Chemphyschem, 2022
3. Conducting Polymers and their composites for supercapacitor applications, Springer nature, 2022

Dr Sunaja Devi K R

- Synthesis of environmentally benign nanocatalysts, including modified transition metal and rare-earth metal oxides for organic transformations, adsorption, and photocatalytic processes.
- Development of new methodologies that encapsulate functionalized species into the nano space of materials for catalysis, organic reactions, and energy storage applications.
- Polymer-based composites that are industrially useful and energy efficient for photocatalytic applications, HER and OER reactions.
- Studies on 2D materials like MoS2, MOFs, and MXenes for photocatalytic, organic reactions, dye adsorption/degradation, and water splitting applications.

Relevant publications

1. Sruthi Rajasekaran, B. Shalini Reghunath, Sunaja Devi K. R., B. Saravanakumar, J. Johnson William, Dephan Pinheiro, Bi Functional Manganese-Pyridine 2,6 Dicarboxylic Acid Metal Organic Frameworks with Reduced Graphene Oxide as an Electroactive Material for Energy Storage and Water Splitting Applications, J. Electrochem. Soc. 170 (2023) 036505. 10.1149/1945-7111/acbfe3
2. A. Varghese, S. Devi K R, F. Kausar, D. Pinheiro, Evaluative study on supercapacitance behavior of polyaniline/polypyrrole – metal oxide based composites electrodes: a review, Mater. Today Chem. 29 (2023) 101424. https://doi.org/10.1016/j.mtchem.2023.101424.
3. B.S. Reghunath, S. Rajasekaran, S. Devi K R, D. Pinheiro, J.R. Jaleel UC, N-doped graphene quantum dots incorporated cobalt ferrite/graphitic carbon nitride ternary composite for electrochemical overall water splitting, Int. J. Hydrogen Energy. 48 (2023) 2906–2919. https://doi.org/10.1016/j.ijhydene.2022.10.169.

Dr Suvardhan Kanchi

- Electrochemical Nanodevices for food and point-of care applications
- Separation sciences for cosmetics, environmental and food applications

Selected Publications:

1. Kwanele Kunene, Syreina Sayegh, Matthieu Weber, Myalowenkosi Sabela, Damien Voiry, Igor Iatsunskyi, Emerson Coy, Suvardhan Kanchi, Krishna Bisetty, Mikhael Bechelany. “Smart Electrochemical Immunosensing of Aflatoxin B1 Based on a Palladium Nanoparticle-Boron Nitride-Coated Carbon Felt Electrode for the Wine Industry”. Talanta (2023):253, 124000 [SCI & ISI, IF2021: 6.556] https://doi.org/10.1080/24701556.2022.2034010.
2. Naidoo, Lyndon, Suvardhan Kanchi, Roland Drexel, Florian Meier, and Krishna Bisetty. "Measurement of TiO2 Nanoscale Ingredients in Sunscreens by Multidetector AF4, TEM, and spICP-MS Supported by Computational Modeling." ACS Applied Nano Materials 4, no. 5 (2021): 4665-4675. [SCI & ISI, IF2021: 6.140] https://doi.org/10.1021/acsanm.1c00290
3. Mthembu, Christian L., Myalowenkosi I. Sabela, Mbuso Mlambo, Lawrence M. Madikizela, Suvardhan Kanchi, Halalisani Gumede, and Phumlane S. Mdluli. "Google Analytics and quick response for advancement of gold nanoparticle-based dual lateral flow immunoassay for malaria–Plasmodium lactate dehydrogenase (pLDH)†." Analytical Methods 9, no. 41 (2017): 5943-5951. [SCI & ISI, IF2016: 1.90] https://doi.org/10.1039/C7AY01645J
4. Bathinapatla, Ayyappa, Suvardhan Kanchi, Parvesh Singh, Myalowenkosi I. Sabela, and Krishna Bisetty. "An ultrasensitive performance enhanced novel cytochrome c biosensor for the detection of rebaudioside A." Biosensors and Bioelectronics 77 (2016): 116-123. [SCI & ISI, IF2016: 7.780] http://dx.doi.org/10.1016/j.bios. 2015.09. 004

Dr Vinod T P

Our group is exploring novel functionalities and applications of various classes of materials and interfaces. The materials we study include nanoparticles, nanofibers, quantum dots, soft surfaces, and hydrogels. We study the application of these materials in environmental sensing, biosensing, food quality monitoring, water collection, anti-counterfeiting, etc.

Selected Publications:

1. Compositionally Homogeneous Soft Wrinkles on Elastomeric Substrates: Novel Fabrication Method, Water Collection from Fog, and Triboelectric Charge Generation.
Soorya S. Raj, Deljo Davis, Pramila Viswanathan, Arunkumar Chandrasekhar, Vinod T. P*
Macromolecular Materials and Engineering 307.9 (2022): 2200247.
DOI: 10.1002/mame.202200247

2. Amine functionalized carbon quantum dots from paper precursors for selective binding and fluorescent labelling applications.
Varsha Lisa John, F Joy, Amy Jose Kollannoor, Kuruvilla Joseph, Yamuna Nair, Vinod T. P.*
Journal of Colloid and Interface Science 617 (2022): 730-744.
DOI: 10.1016/j.jcis.2022.03.070

3. Carbon dots derived from frankincense soot for ratiometric and colorimetric detection of lead (II).
Varsha Lisa John, Fasila P M, Chaithra K P and Vinod T P*
Nanotechnology 33.49 (2022): 495706.
DOI: 10.1088/1361-6528/ac8e76

4. A Smartphone Coupled Freshness Indicator Prepared by Rub-coating of Hibiscus Flowers on Paper substrates for Visual Monitoring of the Spoilage of Milk
Chaithra K P and Vinod T P*
ChemistrySelect 7.41 (2022): e202201839
DOI: 10.1002/slct.202201839

Dr Yamuna Nair

The research activities of our group focus on the synthesis of fluorescent molecules/materials for various applications. We take advantage of molecular structures to incorporate the desired properties and explore their potential use in DNA binding studies, optical sensing, and cell imaging.

The group at present is actively engaged in developing:

- Fluorescent organic/inorganic molecules exhibiting solid-state fluorescence.
- Fluorescent nanomaterials
- Post synthetic modifications of MOFs.

Selected Publications:

1. A Multi-Stimuli responsive organic luminogen with aggregation induced emission for the selective detection of Zn2+ ions in solution and solid state
Journal: Chemical Engineering Journal, 2023
2. Amine functionalized carbon quantum dots from paper precursors for selective binding and fluorescent labelling applications
Journal: Journal of Colloid and Interface Science, 2022
3. Novel dioxidomolybdenum complexes containing ONO chelators: Synthesis, physicochemical properties, crystal `structures, Hirshfeld surface analysis, DNA binding/cleavage studies, docking, and in vitro cytotoxicity.
Journal: Applied Organometallic Chemistry, 2021

Publications April 2022-May 2023

1. Dual-mode chemosensor for the fluorescence detection of zinc and hypochlorite on a fluorescein backbone and its cell-imaging applications. Sibaprasad Maity, Annada C. Maity, Avijit kumar Das*, Nandan Bhattacharyya. Anal. Methods Advance Article.2022
2. Colorimetric and theoretical investigation of coumarin based chemosensor for selective detection of fluoride. Sibaprasad Maity, Annada C Maity, Avijit kumar Das*, Gourisankar Roymahapatra, Shyamaprosad Goswami, Tarun Kanti Mandal. Journal of Molecular Structure, 2022
3. Carbon Dots from Natural Sources for Biomedical Applications. Gopika A. R,Varsha Lisa John, Aiswarya P. S, Athira Krishnan K. A, Vinod T. P. Particle and Particle Systems Characterization.2022
4. Compositionally Homogeneous Soft Wrinkles on Elastomeric Substrates: Novel Fabrication Method, Water Collection from Fog, and Triboelectric Charge Generation. Soorya S. Raj, Deljo Davis, Pramila Viswanathan, Arunkumar Chandrasekhar,Vinod T. P. Macromolecular Materials and Engineering 2022
5. Photosensitizer Anchored Nanoparticles: A Potential Material for Photodynamic Therapy. B Nisha, R Shaik Abdul, MJ Athira, PB Sreeja. ChemistrySelect, Medicinal Chemistry & Drug Discovery.2022
6. Conducting polymers and their composites for supercapacitors. Anjana Baby, Vigneshwaran J , Sreeja P B, Sujin P Jose. Handbook of Energy Materials.2022.
7. Fluorescent Photosensitizers: A Promising Tool for Biomedicine. Athira Maria John, Anjana Baby and Sreeja P.B. Photosensitizers and Their Applications.2022.
8. Structural and morphological characterization of hydrothermally synthesized N-Carbon Dot @ Fe3O4 composites for heavy metal ion detection. S Abinaya, Anjana Baby, K Gurunathan PB Sreeja, Sujin P JoseMaterials Today: Proceedings2022
9. composites for heavy metal ion detection Theoretical and experimental validation of thermal and heat transfer performance of novel ethylene glycol - Cr2AlC nanofluids. Deepak Davis, Joby Mackolil, B. Mahantesh, Sunaja Devi K R. International Communications in Heat and Mass Transfer.2022
10. Recent trends in photocatalytic water splitting using titania based ternary photocatalysts-A review. Fathima Kausar, Arun Varghese, Dephan Pinheiro, Sunaja Devi K R. International Journal of Hydrogen Energy.2022
11. Modelling and optimization of Rhodamine B degradation over Bi2WO6–Bi2O3 heterojunction using response surface methodology. Sunaja Devi K R, Karthik, K., Mackolil, B. Mahantesh, B Shalini Reghunath, Dephan Pinheiro. Applied nanoscience.2022.
12. The catalytic reduction of 4-nitrophenol using MoS2/ZnO nanocomposite. Madhushree R, Jadan Resnik Jaleel UC, Dephan Pinheiro, Sunaja Devi K R. Environmental Research.2022.
13. Architecture of visible-light induced Z-scheme MoS2/g-C3N4/ZnO ternary photocatalysts for malachite green dye degradation. Madhushree R, Jadan Resnik Jaleel UC, Dephan Pinheiro, Renuka NK, Sunaja Devi K R, Juhyeon Park, Sivakumar Manickam, Myong Yong Choi. Environmental Research.2022.
14. Synthetic Approaches to Diospongins: A Two Decade Journey. Krishnaji Tadiparthi , Sourav Chatterjee. SynOpen.2022.
15. Carbon-Based Nanomaterials for Cancer Treatment and Diagnosis: A Review. Dieney Thresia Thomas, Anjana Baby, Vidya Raman, Sreeja P B. Chemistry select 2022.
16. Carbon Dots Derived from Frankincense Soot for Ratiometric and Colorimetric Detection of Lead (II). Varsha Lisa John, Fasila P. M., Chaithra K P, and Vinod T. P. Nanotechnology.2022.
17. Influence of electrochemical co-deposition of bimetallic Pt–Pd nanoclusters on polypyrrole modified ITO for enhanced oxidation of 4-(hydroxymethyl) pyridine. M Bharath, Agnus T Mathew, KB Akshaya, Uraiwan Sirimahachai, Anitha Varghese, Gurumurthy Hegde. RSC Advances.2022.
18. Recent Advances in Electrochemical Synthesis of Nitriles: A Sustainable Approach. Roopa Margaret Rodrigues, Ditto Abraham Thadathil, Keerthana Ponmudi, Ashlay George, Anitha Varghese. ChemistrySelect.2022.

19. A road map on nanostructured surface tuning strategies of carbon fiber paper electrode: Enhanced electrocatalytic applications. Sandra Jose, Rijo Rajeev, Ditto Abraham Thadathil, Anitha Varghese, Gurumurthy Hegde. Journal of Science: Advanced Materials and Devices.2022
20. An efficient inclusion complex based fluorescent sensor for mercury (II) and its application in live-cell imaging. Keerthana P,Hanna Abbo, Anila Rose Cherian, Salam Titinchi, Anitha Varghese. Journal of Fluorescence.2022.
21. Enzyme based bioelectrocatalysis over laccase immobilized poly-thiophene supported carbon fiber paper for the oxidation of D-ribofuranose to D-ribonolactone. Ditto Abraham Thadathil, Anitha Varghese, Chekrain Valappil Shihas Ahamed, KA Krishnakumar, Sanjay Suresh Varma, Ravi S Lankalapalli, Kokkuvayil Vasu Radhakrishnan. Molecular Catalysis.2022.
22. New horizons in surface topography modulation of MXenes for electrochemical sensing toward potential biomarkers of chronic disorders. Rijo Rajeev, Ditto Abraham Thadathil, Anitha Varghese. Critical Reviews in Solid State and Materials Sciences.2022.
23. Enzyme immobilization on biomass-derived carbon materials as a sustainable approach towards environmental applications. Geethanjali Bijoy, Rijo Rajeev, Libina Benny, Sandra Jose, Anitha Varghese. Chemosphere.2022.
24. Surface adsorption and anticorrosive behavior of benzimidazolium inhibitor in acid medium for carbon steel corrosion. Perumal Kannan, Rijo Rajeev, Anitha Varghese, Nallaiyan Rajendran. Journal of Applied Electrochemistry.2022.
25. β-cyclodextrin functionalized graphitic carbon nitride as a promising electrocatalyst for the selective oxidation of Tetrahydrofurfuryl alcohol. Libina Benny, Anitha Varghese, Uraiwan Sirimahachai, Gurumurthy Hegde. Electrochimica Acta 2022.
26. Fabrication of bismuth ferrite/graphitic carbon nitride/N-doped graphene quantum dots composite for high performance supercapacitors. B. Shalini Reghunath, Sruthi rajasekaran, Sunaja Devi K R, B. Saravanakumar, J.J. William, Dephan Pinheiro, Durai Govindaraj, Soorathep Kheawhom. Journal of physics and chemistry of solids 2022.
27. PANI/Bi2O3 polymeric nanocomposite for the reduction od 4-nitrophenol. George Joseph, Dephan Pinheiro, Mothi Krishna Mohan, Sunaja Devi K R. Polymer Bulletin 2022
28. Structural, Morphological and Optical Properties of MoS2-Based Materials for Photocatalytic Degradation of Organic Dye. Jadan Resnik Jaleel UC, Madhushree R, Dephan Pinheiro, Sunaja Devi KR, Mothi Krishna Mohan. Photochem2022.
29. Betulinic acid: A natural promising anticancer drug, current situation, and future perspectives. Maniyamma Aswathy, Ajesh Vijayan, Uzini D. Daimary, Sosmitha Girisa, Kokkuvayil V. Radhakrishnan, Ajaikumar B. Kunnumakkara. Journal Of Biochemical And Molecular Toxicology 2022.
30. Evaluation of Wound Healing Effect of Curcumin Loaded OPL Carbon Nanospheres Embedded Chitosan Membranes. Roopesh M, Jyothi M. S Rajendran Velmurugan Gurumurthy Hegde, Khantong Soontarapa Rangappa S. Ker. Journal of Polymers and the Environment 2022.
31. Polymer Nanocomposite Graphene Quantum Dots for High-Efficiency Ultraviolet Photodetector. Vandana Molahalli, Devendrappa Hundekal, Paola De Padova, Gurumurthy Hegde. Nanomaterials 2022.
32. Capacitive dominated charge storage in supermicropores of self-activated carbon electrodes for symmetric supercapacitors. Rajender S.Varma Vinay S.Bhat, Arafat Toghan, Gurumurthy Hegde. Journal of Energy Storage 2022.
33. Fast and Effective Removal of Textile Dyes from the Wastewater using Reusable Porous Nano Carbons: A Study on Adsorptive Parameters and Isotherms. Bhavya Krishnappa, Supriya Saravu, Jyothi Mannekote Shivanna, Maya Naik, Gurumurthy Hegde. Environmental Science and Pollution Research 2022.

34. Evaluation of wound healing effect of curcumin loaded OPL carbon nanospheres embedded Chitosan membranes. M Roopesh, MS Jyothi, Rajendran Velmurugan, Gurumurthy Hegde, Rangappa S Keri, Khantong Soontarapa. Research Square 2022.
35. Greenly synthesized porous carbon nanoparticle (bio-waste-based)-doped nematic liquid crystal composite with optimized electric and electro-optical properties for devices. Shivangi Tripathi, Bhupendra Pratap Singh, Gurumurthy Hegde, Atul Srivastava, Kamal Kumar Pandey, Rajiv Manohar. Journal of the Society for Information Display 2022.
36. Facile synthesis of novel SrO 0.5:MnO 0.5 bimetallic oxide nanostructure as a high-performance electrode material for supercapacitors. Vinayak Adimule, Vinay S Bhat, Basappa C Yallur, Adarsha HJ Gowda, Paola De Padova, Gurumurthy Hegde, Arafat Toghan. Nanmaterials and Nanotechnologyo 2022.
37. Garlic peel based mesoporous carbon nanospheres for an effective removal of malachite green dye from aqueous solutions: Detailed isotherms and kinetics. Dimple Pathania,Vinay S. Bhat, Jyothi Mannekote Shivanna, Ganesan Sriram, Mahaveer Kurkuri Gurumurthy Hegde. Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy 2022.
38. Toxicological Profiling of Onion-Peel-Derived Mesoporous Carbon Nanospheres Using In Vivo Drosophila melanogaster Model. Paola De Padova and Gurumurthy Hegde Vinay S. Bhat, Avinash Kundadka Kudva , Harshitha Venkatesh Naik, Reshmi G, Shamprasad Varija Raghu. Applied Sciences 2022.
39. Pore size matters!—a critical review on the supercapacitive charge storage enhancement of biocarbonaceous materials. Jagadish, Mohammad Khalid, Mahmoud , Gurumurthy Hegde Nasrollahzadeh, Ran Fen, Chun-Chen Yang Syam G Krishnan, Arunachalam Arulraj, Priyanka. Critical Reviews in Solid State and Materials Sciences 2022.
40. The influences of lateral groups on 4-cyanobiphenyl-benzonitrile- based dimers. G Shanker Srinatha M K, Ayesha Zeba, Anjali Ganjiwale, Ashwathanarayana Gowda, Gurumurthy Hegde, Mohamed Alaasar. Liquid Crystals 2022.
41. Kitchen Waste Derived Porous Nanocarbon Spheres for Metal Free Degradation of Azo Dyes: An Environmental Friendly, Cost Effective Method. Supriya S, Ananthnag GS, Maiyalagan T, Gurumurthy Hegde. Journal of Cluster Science 2022.
42. Surface engineering of silica based materials with Ni–Fe layered double hydroxide for the efficient removal of methyl orange: Isotherms, kinetics, mechanism and high selectivity studies. Ganesan Sriram, Akhilesh Bendre, Tariq Altalhi, Ho-Young Jung, Gurumurthy Hegde, Mahaveer Kurkuri. Chemosphere 2022.
43. A Smartphone Coupled Freshness Indicator Prepared by Rub-coating of Hibiscus Flowers on Paper substrates for Visual Monitoring of the Spoilage of Milk. Chaithra K. P., Vinod T. P. ChemistrySelect 2022.
44. Solvent polarity, structural and electronic properties with different solvents and biological studies of 3,3,5-triphenylfuran-2(3H)-one- cancers of the blood cells. Sheryl Cherian Parakkal, Riya Datta, A.Saral, S.Muthu, Ahmad Irfan, A.Jeelani. Journal of Molecular Liquids 2022.
45. CoFe2O4-APTES nanocomposite for the selective determination of tacrolimus in dosage forms: Perspectives from computational studies. Ananya S Agnihotri , C.G. Ann Maria , Anitha Varghese , Pratap Mane , Brahmananda Chakraborty, Nidhin M. Surfaces and Interfaces 2022.
46. Green synthesis of nanoparticles from biodegradable waste extracts and their applications: a critical review. V. P. Aswathi, S. Meera, C. G. Ann Maria & M. Nidhin. Nanotechnology for environmental Engineering 2022.
47. Biomass-Derived Carbon materials in Heterogenous Catalysis: A step towards Sustainable Future. Apoorva Shetty, Vandana Molahalli, Aman Sharma, Gurumurthy Hegde. Catalysts 2022.

48. Enhanced Electrical Properties of CuO:CoO Decorated with Sm2O3 Nanostructure for High Performance Supercapacitor. Vinayak Adimule, Vinay S. Bhat, Rajeev Joshi, Sheetal Batakurki, Gurumurthy Hegde, Basappa C. Yallur. Journal of Solid State Electrochemistry 2022.
49. SnO2QDs Deposited on GO/PPy-Modified Glassy Carbon Electrode for Efficient Electrochemical Hydrogen Peroxide Sensor. Vandana Molahalli, Aman Sharma, Apoorva Shetty, Gurumurthy Hegde.Biosensors 2022.
50. Bio-waste Derived, Highly Efficient, Reusable Carbon Nanospheres for a Speedy Removal of Organic dyes from Aqueous Solutions. Bhavya Krishnappa,Vinay S. Bhat,Vimala Ancy,Jyotsna Clemi Joshi,Jyothi M. S,Maya Naik, Gurumurthy Hegde. Molecules 2022.
51. Laccase Mediated Electrosynthesis of Heliotropin on Mango-Kernel derived Carbon Nanosphere Composite: A Sustainable Approach. Libina Benny, Anila Rose Cherian, Keerthana, Anitha Varghese, Gurumurthy Hegde. Journal of Science: Advanced Materials and Devices 2022.
52. Label free electrochemical detection of stress hormone-cortisol by chemiresistor sulphur doped graphitic carbon nitride on carbon fiber paper electrode. Anila Cherian, Keerthana P, Vinay Bhat, Uraiwan Sirimahachai, Anitha Varghese, Gurumurthy Hegde. New Journal of Chemistry 2022.
53. Fabrication and Applications of Wrinkled Soft Substrates: An Overview. Soorya S. Raj, Romina Marie Mathew, Yamuna Nair, . Aruna S. T., Vinod T. P. ChemistrySelect 2022.
54. N-doped graphene quantum dots incorporated cobalt ferrite/graphitic carbon nitride ternary composite for electrochemical overall water splitting. B Shalini Reghunath, Sruthi Rajasekaran, Sunaja Devi K R,Dephan Pinheiro, Jadan Resnik Jaleel UC. International journal of hydrogen energy 2023.
55. Design optimisation and fabrication of amino acid based molecularly imprinted sensor for the selective determination of food additive tartrazine. Ashlay George,Anila Rose Cherian,Biju Jacob,Anitha Varghese and Thandavarayan Maiyalagan. Food Chemistry 2023.
56. Biomass derived carbon quantum dots embedded PEDOT/CFP electrode for the electrochemical detection of phloroglucinol. P. Keerthana,Ashlay George,Libina Benny and Anitha Varghese. Electrochimica Acta 2023.
57. A facile, green synthesis of carbon quantum dots from Polyalthia longifolia and its application for the selective detection of cadmium. Sariga,Mrinalini Kalyani Ayilliath Kolaprath,Libina Benny and Anitha Varghese. Dyes and Pigments 2023.
58. New Horizons in the Synthesis, Properties, and Applications of MXene Quantum Dots. Ann Mariella Babu, Shashi Kumar, Rijo Rajeev, Ditto Abraham Thadathil, Anitha Varghese. Advanced Materials Interfaces 2023.
59. A ratiometric fluorescent sensor based on dual-emissive carbon dot for the selective detection of Cd2+. P. Keerthana, Avijit Kumar Das, M. Bharath, Munmun GhoshAnd Anitha Varghese. Journal of Environmental Chemical Engineering 2023.
60. Co-Electrodeposited Pi-MnO2-rGO as an Efficient Electrode for the Selective Oxidation of Piperonyl Alcohol. Roopa Margaret Rodrigues, Ditto Abraham Thadathil, G. Shanker,Uraiwan Sirimahachai,Anitha Varghese And Gurumurthy Hegde. Journal of The Electrochemical Society 2023.
61. Characteristics of chitin extracted from different growth phases of black soldier fly, Hermetia illucens, fed with different organic wastes. Subhashini Manjunatha Rampure, Krishnakumar Velayudhannair, Nidhin M. International Journal of Tropical Insect Science, 2023.
62. Ion-imprinted chitosan stabilized biogenic silver nanoparticles for the electrochemical detection of arsenic (III) in water samples. Ann Maria. C. G,Ananya S Agnihotri,Anitha Varghese and Nidhin M. New Journal of Chemistry 2023.
63. Surface-engineering of carbon fibre paper electrode through molecular imprinting technique towards electrochemical sensing of food additive in shrimps. Ashlay George,Anila Rose Cherian, Libina Benny, Anitha Varghese and Gurumurthy Hegde. Microchemical Journal, 2023.

64. Facile synthesis of Mn-Ni bimetal organic framework decorated with amine as an electrode for a high-performance supercapacitor. Sruthi Rajasekaran, B Shalini Reghunath, Sunaja Devi KR, B Saravanakumar, J Johnson William, Dephan Pinheiro, Madan Kumar Arumugam. Journal of Solid State Electrochemistry 2023.
65. Bi Functional Manganese-Pyridine 2,6 Dicarboxylic Acid Metal Organic Frameworks with Reduced Graphene Oxide as an Electroactive Material for Energy Storage and Water Splitting Applications. Sruthi Rajasekaran, B Shalini Reghunath, Sunaja Devi KR, B SaravanaKumar, J Johnson William, Dephan Pinheiro. Journal of the Electrochemical Society 2023.
66. Evaluative study on supercapacitance behavior of polyaniline/polypyrrole–metal oxide based composites electrodes: a review. Arun, Varghese, Sunaja Devi K R, Fathima Kausar, Dephan Pinheiro. Materials Today Chemistry 2023.
67. Adsorptive removal studies of Rhodamine B by PEG capped Polyaniline/TiO2/CuO composite. Arun, Varghese, Sunaja Devi K R, Dephan Pinheiro. Materials Today Communications. 2023.
68. Influence of composite mixtures between nematic liquid crystal and porous carbon nanoparticles towards photoluminescence and UV absorbance. Govind Pathak, Thitima Rujiralai, Gurumurthy Hegde, Rajiv Manohar. Applied Physics AMaterials Science & Processing 2023.
69. Sign reversal of the spontaneous and induced polarization in a mixture of achiral liquid crystal host and chiral azo dopant. Osamu Tsutsumi,Makoto Nakano, Gurumurthy Hegde,Lachezar Komitov. Liquid Crystals, Taylor & Francis Online 2023.
70. Cost effective porous areca nut carbon nanospheres for adsorptive removal of dyes and their binary mixtures. Dimple Pathania, Ankita Araballi, Fiona Fernandes, Jyothi Mannekote Shivanna, Ganesan Sriram, Mahaveer Kurkuri, Gurumurthy Hegde, Tejraj M. Aminabhavi. Environmental Research 2023.
71. Engineering a low-cost diatomite with Zn-Mg-Al Layered triple hydroxide (LTH) adsorbents for the effectual removal of Congo red: Studies on batch adsorption, mechanism, high selectivity, and desorption. K. Vishal, Kanakaraj Aruchamy, Ganesan Sriram, Yern Chee Ching, Tae Hwan Oh, Gurumurthy Hegde, Kanalli V. Ajeya, Siddharth Joshi, A.Ve Sowriraajan, Ho-Young Jung, Mahaveer Kurkuri. Colloids and Surfaces A: Physicochemical and Engineering Aspects 2023.
72. Enhanced dielectric and supercapacitive properties of spherical like Sr doped Sm2O3@ CoO triple oxide nanostructures. Vinayak Adimule, Sheetal Batakurki, Vinay S Bhat, Basappa C Yallur, Gurumurthy Hegde, Chinna Bathula. Journal of Energy Storage 2023.
73. A concise route to fused tetrazolo scaffolds through 10-camphor sulfonic acid auto-tandem homogeneous catalysis and mechanistic investigation. Jyothis Devasia, Aatika Nizam, D. Muthukumar, Renjith S. Pillai, Francis Joy. Journal of Molecular Liquids 2023.
74. Switchable surface activity of Bi2Al4O9 nano particles: A contemporary approach in heterocyclic synthesis. Manisha Mishra, K. J. Jomon, Sampath Chinnam, Jyothis Devasia, Aatika Nizam & M. B. Madhusudana Reddy. Journal of Nanoparticle Research 2023.
75. A Selective Excited-State Intramolecular-Proton-Transfer (ESIPT) Sensor for Copper(II) Based on Chelation-Enhanced Quenching and “Off-On” Detection of Amino Acids. Jyothis Devasia, Francis Joy, Aatika Nizam. Chemistry A European Journal 2023.
76. Fungi-Templated Silver Nanoparticle Composite: Synthesis, Characterization, and Its Applications. Francis Joy, Jyothis Devasia, Aatika Nizam, Vasantha Veerappa Lakshmaiah and Suresh Babu Naidu Krishna. Applied Sciences 2023.
77. Templating motifs of molecular axles in hydrogen bonding [2]rotaxanes: Synthesis and applications. Francis Joy , Aatika Nizam , Yamuna Nair, Renjith.S. Pillai , Jyothis Devasia , Praveen Nagella. European Polymer Journal 2023.
78. Ortho-Vanillin based multifunctional scaffold for selective detection of Al3+ and Zn2+ employing molecular logic with DFT study and cell imaging with live Grass pea. Gopal C Das, Avijit Kumar Das,

Debsankar Das, Tilak Raj Maity, Aveek Samanta, Fatmah Ali Alasmary, Amani Salem Almalki, Amjad Iqbal, Malay Dolai. Journal of Photochemistry and Photobiology A: Chemistry 2023.

79. Spectroscopic, crystal structure and DFT-assisted studies of some nickel (II) chelates of a heterocyclic-based NNO donor aroylhydrazone: in vitro DNA binding and docking studies. Yamuna Nair, Francis Joy, T. P. Vinod, M. C. Vineetha, M. R. Prathapachandra Kurup, Savaş Kaya, Goncagül Serdaroğlu & Sultan Erkan. Molecular Diversity Mol Divers 2023.
80. A Multi-Stimuli responsive organic luminogen with aggregation induced emission for the selective detection of Zn2+ ions in solution and solid state. Francis Joy , K.P. Chaithra , Aatika Nizam, Ayswaria Deepti , P.S. Baby Chakrapani , Avijit Kumar Das , T. P. Vinod* , Yamuna Nair. Chemical Engineering Journal 2023.
81. In vitro Analytical Techniques as Screening Tools to investigate the Metal chelate-DNA interactions. Nikita Varghese, Joyna Reba Jose, P Murali Krishna, Darit Philip, Francis Joy, TP Vinod, MR Prathapachandra Kurup, Yamuna Nair. ChemistrySelect 2023.
82. Surface tuning of nanostructured graphitic carbon nitrides for enhanced electrocatalytic applications: a review. AK Mrinalini Kalyani, R Rajeev, L Benny, AR Cherian, Anitha Varghese. Materials Today Chemistry 2023.
83. One Pot Hydrothermal Synthesis and Application of Bright-yellow-emissive Carbon Quantum Dots in Hg2+ Detection. Ann Mary Chakkola Jaison, Devipriya Vasudevan, Keerthana Ponmudi, Ashlay George & Anitha Varghese. Journal of Fluorescence 2023.
84. Electrochemical Deposition for Metal Organic Frameworks: Advanced Energy, Catalysis, Sensing and Separation Applications. Ann Mariella Babu, Anitha Varghese. Journal of Electroanalytical Chemistry 2023.
85. Ion-imprinted chitosan-stabilized biogenic silver nanoparticles for the electrochemical detection of arsenic (iii) in water samples. Ann Maria. C. G, Ananya S Agnihotri,Anitha Varghese and Nidhin M. New Journal of Chemistry 2023.
86. DeepBBBP: High Accuracy Blood-Brain-Barrier Permeability Prediction with a Mixed Deep Learning Model. Sheryl Cherian Parakkal, Riya Datta, Dibyendu Das. Molecular Informatics 2023.

Book Chapters

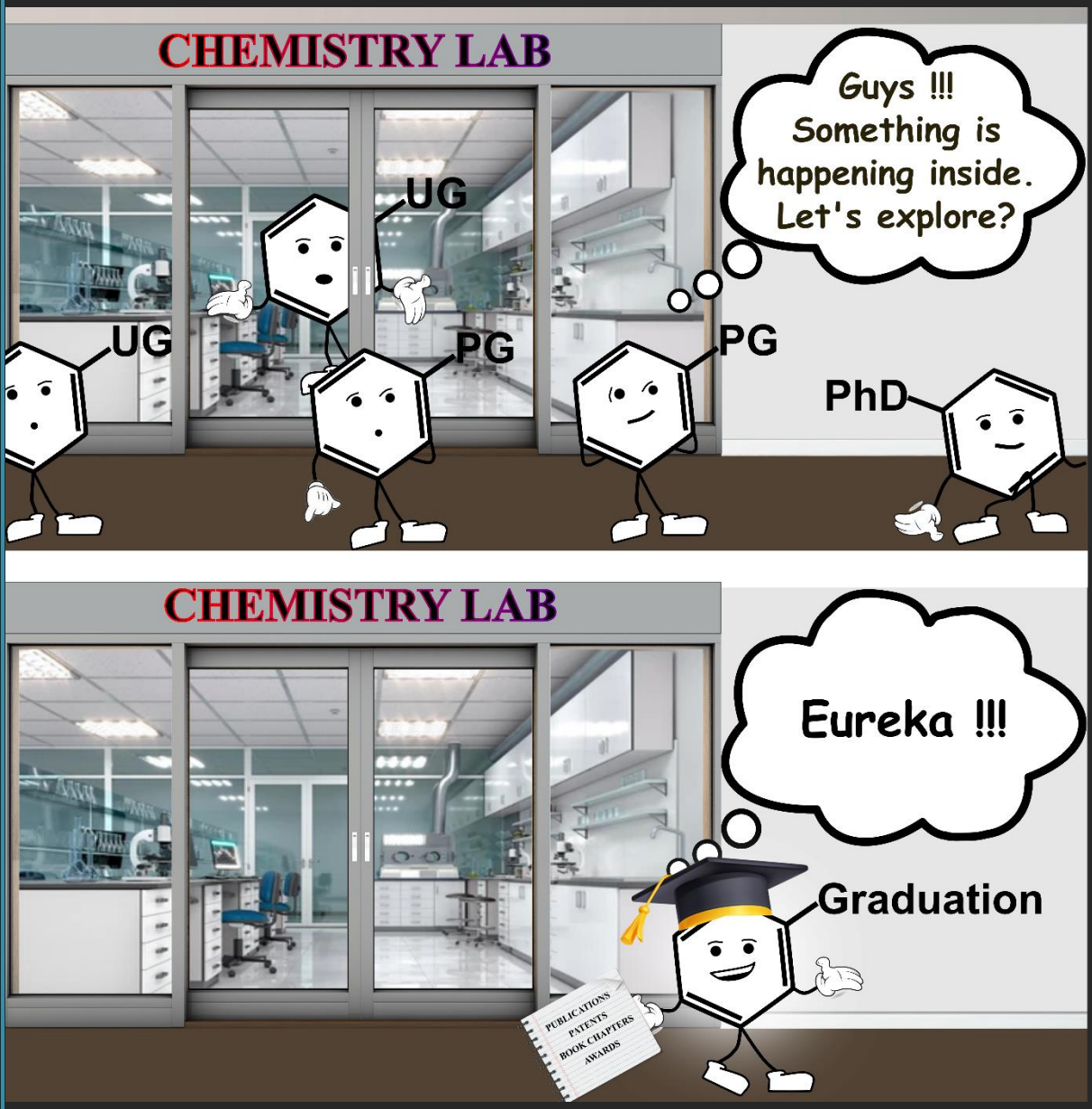
1. Biomass-Derived Carbonaceous Materials: Synthesis and Photocatalytic Applications. Kezia Sasitharan, Anitha Varghese.
2. Chapter 18 - Carbon dots as an effective material in enzyme immobilization for sensing applications. Carbon Dots in Analytical Chemistry. Keerthana Ponmudi, Anila Rose CherianAnd Anitha Varghese
3. Synthesis of 4H-3,1-Benzothiazin-4-Ones via C-N/C-S Bond Forming Reactions. Polycyclic Aromatic Compounds. V. P. Rama Kishore Putta,Saibabu Polina,Raghuram Gujjarappa,Pendyala Satya Kishore,Chandi C. Malakar &Prasad Pralhad Pujar
4. Potassium tert-Butoxide-Mediated Synthesis of 2-Aminoquinolines from Alkylnitriles and 2-Aminobenzaldehyde Derivatives. Pendyala Satya Kishore, Raghuram Gujjarappa, VP Rama Kishore Putta, Saibabu Polina, Virender Singh, Chandi C Malakar, Prasad Pralhad Pujar.
5. Nanobiosensors: A Promising Tool for the Determination of Pathogenic Bacteria. Nanotechnology for Infectious Diseases, Ananya S Agnihotri , C.G. Ann Maria, Nidhin M.
6. Metal-Based Nanoparticles for Infectious Diseases and Therapeutics. Nanotechnology for Infectious Diseases Ebin K. Baby, Catherine Reji, and Nidhin M.
7. Nanomaterial-Based Electrochemical Sensors for Vitamins and Hormones. Emerging Nanomaterials for Catalysis and Sensor Applications. Anila Rose Cherian, Rijo Rajeev, M Nidhin, Anitha Varghese, Gurumurthy Hegde

8. A concise route to fused tetrazolo scaffolds through 10-camphor sulfonic acid auto-tandem homogeneous catalysis and mechanistic investigation. Journal of Molecular Liquids. Jyothis Devasia, Aatika Nizam, D. Muthukumar, Renjith S. Pillai, Francis Joy.
9. Switchable surface activity of Bi2Al4O9 nano particles: A contemporary approach in heterocyclic synthesis. Journal of Nanoparticle Research. Manisha Mishra, K. J. Jomon, Sampath Chinnam, Jyothis Devasia, Aatika Nizam & M. B. Madhusudana Reddy.
10. A Selective Excited-State Intramolecular-Proton-Transfer (ESIPT) Sensor for Copper(II) Based on Chelation-Enhanced Quenching and “Off-On” Detection of Amino Acids. Chemistry A European Journal. Jyothis Devasia, Francis Joy, Aatika Nizam.
11. Fungi-Templated Silver Nanoparticle Composite: Synthesis, Characterization, and Its Applications. Applied Sciences. Francis Joy, Jyothis Devasia, Aatika Nizam, Vasantha Veerappa Lakshmaiah and Suresh Babu Naidu Krishna.
12. Handbook of CH-FunctionalizationStrain Release of Bicyclic/Tricyclic Olefins via C-H Functionalization Reactions. Wiley Publications. Praveen Prakash, Ajesh Vijayan, K V Radhakrishnan.
13. Nanobiosensors for COVID-19 (Next-Generation Nanobiosensor Devices for Point-Of-Care Diagnostics. Springer Nature. N. Karthik, Avijit Kumar Das.
14. Recent Progress on the Development of Chemosensors. Springer Nature. Tiasa Das, Sanskar Jain, Avijit Kumar Das
15. Economic Analysis, Environmental Impact, Future Prospects and Mechanistic Understandings of Nanosensors and Nanocatalysis. Taylor and Francis CRC press (Emerging Nanomaterials for Catalysis and Sensor Applications) Libina Benny, Vinay Bhat, Ashlay George, Anitha Varghese, Gurumurthy Hegde

Patents Filed

1. Synthesis of amine functionalized metal organic framework using h2fipbb ligand for energy storage application, Sruthi Rajasekaran, Sunaja Devi K R, B Shalini Reghunath, B Saravanakumar, J Johnson William, Dephan Pinheiro, Applcn No. 202241023295, Patent office journal No. 19/2022 Dated 13/05/2022.
2. Bismuth Ferrite Nanoparticles decorated Cr2C MXene: A highly efficient electrocatalyst for hydrogen evolution, B Shalini Reghunath, Sruthi Rajasekaran, Sunaja Devi K R, Dephan Pinheiro, Applcn No. 202241040877, Patent office journal No. 29/22 Dated 22/07/2022.
3. Two-dimensional Cr2C MXene decorated with CoFe2O4 Nanoparticles for high performance Supercapacitor application, B Shalini Reghunath, Sunaja Devi K R, Sruthi Rajasekaran, B Saravanakumar, J Johnson William, Dephan Pinheiro, Apple No. 202241046374 A, Patent office journal No. 34/2022 Dated 26/08/2022.
4. Hierarchically porous Mn-MOFs composite with rGO as an efficient electrode material for supercapacitor application, Sruthi Rajasekaran, Sunaja Devi K R, B Shalini Reghunath, B Saravanakumar, J Johnson William, Dephan Pinheiro, Applcn No. 202241046378 A, Patent office journal No. 34/2022 Dated 26/08/2022.
5. Sruthi Rajasekaran , Sunaja Devi K R, B Shalini Reghunath, B Saravanakumar, J Johnson William, Dephan Pinheiro. “Samarium-MOF incorporated polyaniline nanocomposite as an efficient electrode for supercapattery application Indian patent published with Patent number : 202241056679 on 14th October 2022.
6. Ann Maria. C. G, Nidhin M, 'Ion Imprinted Chitosan stabilized biogenic silver nanoparticles for the electrochemical detection of arsenic in water samples'.Indian patent published with Patent number : 202241014988 on 04 April 2022.

Let us experience research - Curious to Know?



Special Rewards

- **Exposure to diverse research areas**

The department has 24 faculty members involved in research in diversified areas of chemistry. As a student you will be able to pick and choose the areas you want to explore.

- **Scientific temper**

As a budding researcher you are bound to develop a belief in cause and effect, curiosity, objectivity, critical and open mindedness, risk taking ability, intellectual honesty, humility and responsibility.

- **Recognition through paper publications and presentations**

An opportunity to be co-authoring with experienced faculty members and gaining visibility in the scientific world.

- **Team Building**

Modern scientific discoveries are results of collaborative work. As a budding researcher, you will get an opportunity to join with a scientific team working on investigations which you are interested in. In the team you will assume different roles as time progresses and situations demand.

- **Higher study opportunities**

As a researcher you get numerous opportunities to interact with great scientists, attend conferences, and share your thoughts with the contemporary scientists. The scientific rigour that you have experienced will develop and equip you to seek higher studies positions in national and international institutes of repute.

PROGRAMMES

Undergraduate Research Program

Department of Chemistry, CHRIST (Deemed to be University) provides opportunities for undergraduate students to get involved in research right from the first year of their university education. This will provide them with ample time and possibility to drive their research to greater heights.

Highlights of the Undergraduate Program

Dissertation in chemistry

Research Methodology

Courses offered:

i) Skill enhancement course on scientific writing and publications

ii) Research methodology

Research Activities

- **Poster Presentation Day**

Students get an opportunity to present their research in the form of a poster which will be displayed in the university on a selected day of scientific significance.

- **Summer Vacation Project based on UNSDGs**

The department pays utmost importance in implementing the UNSDGs. This is achieved through summer vacation projects for undergraduate students.

- **Science Exhibition**

The department takes special interest in nurturing the kinesthetics learners by providing opportunity for them to exhibit their projects in the Science exhibition organized around the National Science Day.

- **Open ended experiments**

Students are provided a platform to explore their creativity by designing chemical experiments based on sound scientific principles as part of their practical courses.

Stories/ Testimony

Madhushree R (UG)

the curriculum is designed in such a way that students are capable enough to get into research at the early age of their Bachelor's as well as Master's program. The exposure to research during my UG program (Dissertation course) developed an enthusiasm in me to step into the scientific field, which resulted in an internationally reviewed paper publications. The motivation and confidence built in me was carried out as an active researcher during my Master's. At present, I am a PhD scholar at the Dept of Chemistry, Christ University.

Gokul Krishnan (UG)

Research at Christ university has helped me gain hands-on experience in applying theoretical knowledge in real world situations, improving my thinking beyond the classroom. Presenting my project to faculties has improved my presentation, speaking and communication skills. Research skills and experience that I gained from Christ university has helped me choose my path forward in research.

Amy Jose K (UG)

The department has always tried to include research into the curriculum, thereby encouraging students to actively participate in various works that can boost the profile of the students. I believe that this early exposure to research has helped me to hone my skill sets.

Postgraduate Research Program

Department of Chemistry, CHRIST (Deemed to be University) provides opportunities for postgraduate students to get involved in research right from the first year of their university education. This will provide them with ample time and possibility to drive their research to greater heights.

Courses offered:

i) Scientific writing and communication

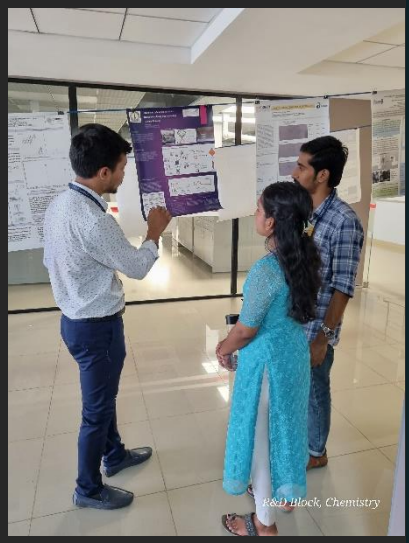
ii) General Research methodology

iii) Project

Research Activities

- **Research Seminar Series**

Students are given an opportunity to present scientific articles. This enables the students with the skills of reading, consolidating, analysing and presenting the articles in the forum of academic peers.



- **Paper Presentation**

Students are encouraged to participate in national and international conferences and present their research. This will foster development of academic network and collaborations.

- **Workshops - Hands-on-training**

The department provides workshop for handling of the scientific instruments in the university which will be useful to the students in their future research career.

- **Invited talks by Eminent expertise**

The department organizes talks by eminent scientist, entrepreneurs and researchers which provides an opportunity for the students for fruitful interactions and collaborations.

- **Visit to reputed scientific institutes and organization**

As part of experiential learning the students are taken to industries and institutes relevant to the courses which provides and up-to-date understanding of the applications of the subject.

- **Research Newsletter**

The research newsletter describes outstanding output in terms of number of research articles from the department in an academic year as combined efforts from research scholars, science students and their principal investigators. It gives reader a brief idea about current status of research groups, their research activities and long-term research goals.

Stories/ Testimony

Archana Kaliyaraj Selva Kumar (PG)

The research opportunities at the Department of Chemistry, Christ University, helped me find my passion towards research. I got exposure to various synthesis routes and instrumentation techniques. These were taught out of the regular curriculum due to my interest in research during my post-graduation, which were the stepping stones of my research career at University of Oxford, UK

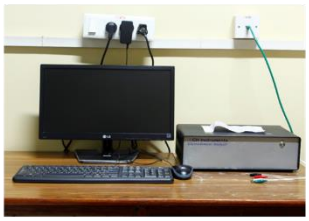
Ajay Jose (PG)

I received my primary experience in research from Christ University during my Masters in Chemistry. I was able to publish around 5-6 papers during the time I worked at Christ University as both first and co-authored which boosted my CV for PhD applications. Currently I am a doctoral candidate at University of Auckland.

Samika Sanjay Anand (PG)

The Department of Chemistry at CHRIST (Deemed to be University) ensures that a research scholar here, undergoes holistic development; academically, scientifically, socially and emotionally, making him/her confident and bold enough to face the real world. I joined Christ University as a MSc student, and was quite encouraged by my teachers to pursue research at the PG level. With their exceptional support and guidance, I published a paper in a Q2 ranked journal; which further motivated me to join for PhD. I can proudly say that the PhD programme offered here, has given me immense confidence and knowledge, making me outshine scholars of my age, elsewhere. I am currently pursuing my research, with JRF under the scheme of "Innovation in Science Pursuit for Inspired Research (INSPIRE)" by the Department of Science and Technology (DST), Government of India.

RESEARCH INSTRUMENTATION FACILITY



Electrochemical Workstation

Spectroflourophotometer

UV-Spectrophotometer

Electrospinning

Probe Sonicator

Particle Size Analyser

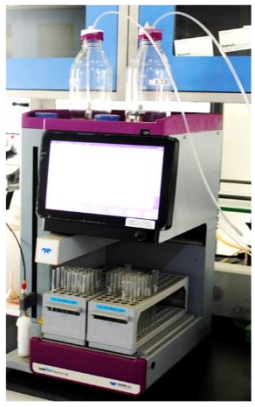
TGA/DSC

Photoreactor

Polarising Optical Microscope

XRF

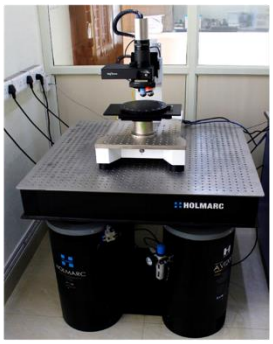
FTIR



Combiflash

Four Probe Conductivity meter

Gas Chromatography



Optical Profilometer

Tensile Tester

Rota vapour

Centrifuge

Ice flaker

LAB FACILITIES

UG LAB, BLOCK 1

PG ORGANIC LAB, BLOCK 1

PG ANALYTICAL LAB, BLOCK 1

PHARMACEUTICAL LAB, BLOCK 2

CHEMISTRY LAB, R&D BLOCK