KANAGAVALLI P

Email: *kanagapandi1992@gmail.com*
kanagavalli.cecri18a@acsir.res.in
Phone: +91-(8508281957)
LinkedIn
Google Scholar Webpage

Education

- **01/2022 – Till now** : Assistant Professor (Biochemistry) – Sethu Bhaskara Agricultural College & Research Foundation, Karaikudi, India.
- **08/2018 – 10/2022** : Ph.D. in Chemical Sciences– Academy of Scientific and Innovative Research, CSIR-Central Electrochemical Research (CECRI), Karaikudi, India.
- **07/2014 - 05/2015** : M.Phil. in Chemistry (81.7%) –Madurai Kamaraj University (MKU), Madurai, India.
- **06/2014 - 06/2012** : M.Sc. in Chemistry (75.6%) –MKU, Madurai, India.
- **06/2012 - 06/2009** : B.Sc. in Chemistry (79.1%) –MKU, Madurai, India.

Research Interests

Electrochemical biosensors (Immunoassay and genosensing), Electrodeposition, Carbon-based materials, and Electrocatalytic water splitting.

Professional Experience

- **04/2019 – 04/2022**: Senior Research Fellow, CSIR-CECRI, Karaikudi
  Ph.D. Thesis Title: **Chemically Interplayed Graphene based Label-Free Sensor Platform for Dengue Diagnosis and Therapeutics.**
  Supervisor: Dr. Murugan Veerapandian (Scientist) – *vmurugan@cecri.res.in*

  Project Assistant (Electrochemistry) in CSIR-CECRI, Karaikudi, India.
- **02/2018-04/2019:***Electrochemical Immunosensor for Hand Held Rapid Detection of Dengue Virus Infection.*
  Project Investigator:Dr. Murugan Veerapandian (Scientist).
  Project Description: Fabrication of redox-active electrodes for fast acute detection of dengue viral antigen, NS1 protein. Quantitatively detect the biomarker with support of electrochemical immunoassay platform.
- **04/2017-11/2017:***Electrochemiluminescence of Metal Clusters: Synthesis, Characterization, and suitable for Environmental Applications.*
  Project Investigator:Dr. S. Senthil Kumar (Principal Scientist).
  Project Description:Development of novel metal clusters having fluorescent behavior suitable for electrochemiluminescence studies.
- **06/2015 – 03/2017:***Multifunctional Electrode and Electrolytes for Future Technologies.*
  Project Investigator:Dr. S. Senthil Kumar (Principal Scientist).

  Project Description: Establishing the protocol for the fabrication of cost-efficient electrode materials utilized as an electrocatalyst for OER/ORR applications.
- **04/2014 – 05/2015:** M.Phil. Project, Research Supervisor: Dr. E. Jayabharathi (Associate Professor)
  Project Title: *Eco-friendly Synthesis of Molybdenum Trioxide Nanorods and their Catalytic Activity in Biginelli Reaction*

Project Description: Synthesize of MoO_3 nanorods with the support of β-cyclodextrin, and used as an eco-friendly catalyst for biginelli reaction.

Publications

1. **P. Kanagavalli**, M.N. Karuppasamy, V.S. Ganesan, H.P. Saravanan, T. Palanisamy*, and M. Veerapandian*, Electropolymerized Melamine on Electrochemically Reduced Graphene Oxide: Growth Mechanistics, Electrode Processing, and Amperometric Sensing of Acyclovir, *Langmuir*, **2023**, 39 (9), 3512-3525 (*I.F: 4.33*) (Q1).

2. V. Krishnan, E. Gunasekaran, C. Prabhakaran, **P. Kanagavalli**, V. Ananth, M. Veerapandian*, Electropolymerized methylene blue on graphene oxide framework for the direct voltammetric detection of gallic acid, *Materials Chemistry and Physics*, **2023**, 295, 127071-127081 (***I.F: 4.7***) (Q1).

3. **P. Kanagavalli**, G.R. Pandey, P. Murugan, M. Veerapandian*, Electrochemical and DFT studies of andrographolide on electrochemically reduced graphene oxide for anti-viral herbaceutical sensor, *Analytica Chimica Acta*, **2022**, 1209, 339877-339887 (***I.F: 6.9***) Cited by 3(Q1).

4. G.R. Pandey, **P. Kanagavalli**, K. Karnam, K. Thanigai Arul, P. Monisha, C.L. Dong, J.L. Chen, M. Veerapandian*, J. Nirmal*, Molybdenum trioxide hybridized kaempferol: double-powered nanosystem for salvaging oxidative stress and electrochemical immunoprobing of interleukin-6, *Materials Today Chemistry*, **2022**, 24, 100809-100822 (***I.F: 7.6***) Cited by 1 (Q1).

5. **P. Kanagavalli**, C. Andrew, M. Veerapandian*, M. Jayakumar*, *In-situ* redox-active hybrid graphene platform for label-free electrochemical biosensor: Insights from electrodeposition and electroless deposition, *Trends in Analytical Chemistry*, **2021**, 143, 116413-116426 (***I.F: 14.9***) Cited by 12 (Q1).

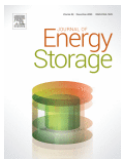
6. **P. Kanagavalli**, S. Senthil Kumar*, Synthesis of nanocubicshape controlled Gold-Prussian blue nanocomposite for enhanced electrocatalytic hydrazine oxidation, *Journal of Electroanalytical Chemistry*, **2021**, 897, 115566-115575 (***I.F: 4.5***) Cited by 3(Q2).

7. S. Arumugasamy, **P. Kanagavalli**, M. Veerapandian, M. Jayaraman*, K. Yun*, Electrochemical properties of Rubpy-reduced graphene oxide synergized by ultrasonication for label-free quercetin sensing, *Applied Surface Science*, **2021**, 537, 147777-147787 (***I.F: 7.3***) Cited by 7(Q1).

8. **P. Kanagavalli**, G.R. Pandey, V.S. Bhat, M. Veerapandian*, G. Hegde*, Nitrogenated carbon nanoelectrocatalyst advertently processed from bio-waste of Allium sativum for oxygen reduction reaction, *Journal of Nanostructure in Chemistry*, **2021**, 11, 343-352 (***I.F: 8.0***) Cited by 11(Q3).

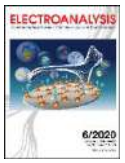
9. P. Kurinjinathan, **P. Kanagavalli**, P-R. Li, M. Veerapandian, H-W. Chang, P-H. Yeh, K. Asokan, K. Thanigai Arul*, C-L Dong**, Role of partial amorphous and disordered stannous ions incorporated hydroxyapatite nanosphere for enhanced electrochemical energy storage application, *Journal of Alloys and Compounds*, **2021**, 851,156710-156721 (***I.F: 6.3***) Cited by 2(Q1).

10. V.S. Bhat, **P. Kanagavalli**, G. Sriram, R. Prabhu B, N.S. John, M. Veerapandian, M. Kurkuri, G. Hegde*, Low cost, catalyst free, high performance supercapacitors based on porous nano carbon derived from agriculture waste, *Journal of Energy Storage*, **2020**, 32, 101829-101840 (***I.F: 8.9***) Cited by 58 (Q1).



11. R. Rajaram*, **P. Kanagavalli**, S. Senthil Kumar, J. Mathiyarasu, Au nanoparticle-decorated nanoporous PEDOT modified glassy carbon electrode: a new electrochemical sensing platform for the detection of glutathione, *Biotechnology and Bioprocess Engineering*, **2020**, 25, 715-723 (***I.F: 3.3***) Cited by 12 (Q2).

12. **P. Kanagavalli**, S. Radhakrishnan, G. Pandey, V. Ravichandiran*, G.P. Pazhani, M. Veerapandian*, G. Hegde*, Electrochemical tracing of butein using carbon nanoparticles interfaced electrode processed from biowaste, *Electroanalysis*, **2020**, 32(6), 1220-1225 (***I.F: 3.0***) Cited by 11 (Q3).



13. **P. Kanagavalli**, and M. Veerapandian*, Opto-electrochemical functionality of Ru(II)-reinforced graphene oxide nanosheets for immunosensing of dengue virus non-structural 1 protein, *Biosensors and Bioelectronics*, **2020,** 150, 111878-111887 (***I.F: 12.5***) Cited by 17 (Q1).

14. G. Pandey, M. Marimuthu, **P. Kanagavalli**, V. Ravichandiran*, K. Balamurugan*, M. Veerapandian*, Chitosanylated MoO_3–ruthenium(II) nanocomposite as biocompatible probe for bioimaging and herbaceutical detection, *ACS Biomaterials Science & Engineering*, **2019,** 5(7), 3606-3617 (***I.F: 5.3***) Cited by 7 (Q1).

15. V. Premkumar, N. Chandrasekaran*, K. Madasamy, M. Kathiresan*, **P. Kanagavalli**, S. Senthil Kumar*, Iron oxide decorated N-doped carbon derived from poly(ferrocene-urethane) interconnects for the oxygen reduction reaction, *New Journal of Chemistry*, **2018**, 42, 15629-15638 (***I.F: 3.9***) Cited by 6 (Q1).

16. **P. Kanagavalli**, and S. Senthil Kumar*, Stable and sensitive amperometric determination of endocrine disruptor bisphenol A at residual metal impurities within SWCNT, *Electroanalysis*, **2018**, 30, 445 –452 (***I.F: 3.0***) Cited by 27 (Q3).

17. **P. Kanagavalli**, R. Sudha, S. Boopathi, S. Senthil Kumar*, Electrochemical synthesis of Au-$Ni(OH)_2$-nanocomposite on glassy carbon electrode as highly active bifunctional electrocatalyst for oxygen evolution and oxygen reduction reactions, *Electrochemistry Communications*, **2017**, 82, 61–65 (***I.F: 5.4***) Cited by 15 (Q1).

Patent File

1. M. Veerapandian, M. Jayakumar, **P. Kanagavalli**, C. Andrew, "*Electrodeposited Sensor for Dengue Variant Detection and Method Thereof*" IP Application No: 202211048496 dated 25.08.2022.

Personal Achievement

- ✓ Secured merit rank in UG and PG studies.
- ✓ Awarded CSIR-Senior Research Fellowship (April 2019)
- ✓ Won **second** prize in chem speed competition in National level conference at VHNSN College 2012
- ✓ **Best poster award** in India-UK international conference (ANEH-2019) at Bishop Heber College, Trichy, India
- ✓ Won **first** prize in CECRI intraleague Chess competition.

Expertise

- (Bio)sensor design and application
- Fundamental and Applied Electrochemistry

- Electrocatalysis OER/ORR
- Health care diagnosis based on Optical and Electrochemical approach
- Electrochemical Immunoassay and Nucleic acid sensing
- Nanomaterial Science and Technology
- Electrochemistry of Synthetic and Natural Products of Antiviral Function
- Bioelectrochemistry
- Electrodeposition

Instruments Handled

- Electrochemical Workstations (BAS100$_B$, Autolab (PGSTAT30), CH Instrument (1000A, 600B), IVIUM, OrigaLys (OGF01A), PalmSens (BV), and miniaturized potentiostat (EmStat-blue & Rodeostat).
- Electrochemical quartz crystal microbalance (CH Instrument 440A with oscillator)
- Rotating Disk Electrodes (RDE, and RRDE) from Pine Research Instrumentation
- UV-Visible Spectrometer (Thermo Fisher Scientific Company)
- Fluorescence Spectrophotometer (Cary Eclipse, Varian)
- FT-IR Spectrometer (Bruker TENSOR 27)
- Scanning Electron Microscope (Tescan, Bruker)
- Laser Raman Spectroscopy (LabRAM HR Evolution, Horiba)

Research Skills

- Developing *in-situ* redox-active disposable electrode for (bio)sensor application
- Label-free electrochemical immunosensor/genosensor platform for viral biomarker detection
- Spectroscopic analysis, data curation and processing/interpretation
- Maintain laboratory cleanliness/safety and standard
- Interpersonal skills on interdisciplinary research activities and joint mentorship
- Proficient in undergraduate/postgraduate level teaching of inorganic chemistry, nanoscience and nanotechnology and biosensor for allied health science
- Dissertation mentorship at B.Tech., and M.Sc., level
- Proficient in drafting research report and presentation for research grant raising
- Published research/review articles in peer-reviewed international journals.

Scientific Dissemination Activities

Poster presented in International/National level Conferences

- *International Conference on Nanoscience and Technology (ICONSAT 2016),* at Indian Institutes of Science Education and Research (IISER), Pune, Maharashtra, India, 29 February-3 March, 2016 (*Title: Gold species confined to nanocubic shaped Prussian blue: synthesis, characterization, and its application towards hydrazine electrooxidation*).

- *National Convention of Electrochemists (NCE-19),* at National Institute of Trichy (NIT), Tiruchirappalli, Tamil Nadu (TN), India, 28-29 March, 2016 (*Title: Towards tuning the electrocatalytic activity of $Ni(OH)_2$ with Au for oxygen evolution reaction*).

- *International Symposium on Electrochemical Science and Technology (iSAEST 2016),* at Hotel Kohinoor Asiana, Chennai, TN, India, 8-10 December, 2016 (*Title: Investigation of synergism between a gold and $Ni(OH)_2$ nanoparticles for selective determination of enzymeless glucose oxidation*).

- *International Conference on Electrochemical society & Technology (ICONEST-2017)*, at Indian Institute of Science, Bangalore, Karnataka, India,10th-12th August, 2017 (*Title: Investigation of Residual metal impurities within SWCNT modified on glassy carbon electrode for electro-oxidation of Endocrine disruptor Bisphenol A*).

- *National Conference on Recent Advanced Materials (NCRAM-2018)*, Thiruvalluvar University College of Arts & Science, Vandavasi, TN, India. 23-24 February, 2018 (*Title: Dye-sensitized metal oxide nanostructures as biosensor platform for healthcare diagnostics*).

- *National Convention of Electrochemists (NCE-20),*at Vellore Institute of Technology (VIT), Vellore, TN, India. 7-8 June, 2018 (*Title: Ruthenium(II)-Reinforced Carbon Nanoarchitecture for Immunosensing of Non-Structural 1 Protein*).

- *India-UK Second International Conference on Advanced Nanomaterials for Energy, Environment and Healthcare Applications (ANEH-2019),* Bishop Heber College, Tiruchirappalli, TN, India. 04-06 February, 2019 (*Title: Electrodics of Chalcone Derivative at Carbon Nanoparticles Modified Electrode*).

- **Oral presentation** given in a National level Conferences of *Frontier Areas in Chemical Technologies (FACTs-2019),*at Alagappa University, Karaikudi, TN, India. 25-26 July, 2019 (*Title: Asafetida-resin stabilized MoO_3 nanoparticles encrusted with ruthenium bipyridine an effective transducer for electrochemistry of Butein*).

- Given **oral presentation** in *National Convention of Electrochemists (NCE-22),*at PSG Institute of Technology, Coimbatore, TN, India. 26-27 August, 2022 (*Title: Ruthenium bipyridine encrusted carbon nanostructure: A double-headed probe for dengue immunoassay*).

Personal details

Software Skills	: 1-year HDCA course, GraphPad Prism, CorelDraw, Origin, and MS-Office
Nationality	: Indian
Religion	: Hindu
Address	: B4 SI quarters Police Colony, Karaikudi Tamil Nadu – 630003, India.

References

1. **Dr. Murugan Veerapandian**
   Scientist& Assistant Professor
   CSIR-CECRI, Karaikudi-630003
   Tamil Nadu, India
   *Email:*vmurugan@cecri.res.in
   Tel: 04565-241 384
   Mob: +91-7339210030

2. **Dr. S. Senthil Kumar**
   Principal Scientist
   CSIR-CECRI, Karaikudi-630003
   Tamil Nadu, India
   *Email:*ssenthilkumar@cecri.res.in
   Tel: 04565-241 563
   Mob: +91-9442224914

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