

Dr. S. Sivakumar M. Sc., Ph. D.,
Associate Professor
School of Chemistry / Organic Chemistry
Madurai Kamaraj University
Madurai-625 021
e-mail to: shivazzen@gmail.com &
shivazzen@mkuniversity.org
Mobile: +91-9715452858



❖ **Employment**

- **Associate Professor:** Department of Organic Chemistry, School of Chemistry, Madurai Kamaraj University, Madurai-625 021. **(2020 - Present)**
- **Assistant Professor:** Department of Organic Chemistry, School of Chemistry, Madurai Kamaraj University, Madurai-625 021. **(From March 24, 2010 - 2020)**

❖ **Research/Training/Education**

- **UGC-Raman Post-Doctoral Fellow:**
Division of Translational Imaging, New York State Psychiatric Institute, Columbia University, USA. (Oct. 2013 – 14)
- **Visiting Fellow:**
(Chemical Biology), Department of Chemistry, Ben-Gurion University of Negev, Israel. **(May 2010-June 2010)**
- **Post-Doctoral Fellow:**
Chemical Biology Lab at Department of Chemistry, Ben-Gurion University of Negev, Israel. **(May 2008-March 2010)**
- **Ph.D. (Organic Chemistry) :** Department of Chemistry, Pondicherry University, Pondicherry. Guide: **Prof. H. Surya Prakash Rao (June 2002-April 2008)**
 - **Project Fellow**
(Organic Chemistry), Industrial Project, Department of Chemistry, Pondicherry University, Pondicherry. Guide: **Prof. H. Surya Prakash Rao (Dec 2002-June 2003)**
 - **Project Assistant:**
(Organic Chemistry), Bio-Organic & Applied Materials, Pvt. Ltd. Bangalore, India. **March 2002**
 - **M. Sc. (Chemistry):** Department of Chemistry, Pondicherry University. **Project**, Guide: Prof. R. Venkatesan (1998- 2000)

❖ **Awards/Honors**

- **Cover page Published in New Journal of Chemistry, 2023**
- **Indo-US UGC-Raman Postdoctoral Fellowship.** (2013-2014)
- **DST Young Scientist Project (FAST TRACK).** (2010)
- **Awarded CSIR-SRF (Senior Research Fellow in Council of Scientific and Industrial Research (CSIR)).** 2006
- **Qualified UGC-CSIR-NET 2001** (Council of Scientific and Industrial Research (CSIR)). 2001
- **Qualified GATE** (“Graduate Aptitude Test in Engineering”) (2001 & 2003)
- **Best Poster Presentation Award at CRSI Local Chapter, Madurai – 625021 (2003)**

❖ **Other Experience and Professional Memberships:**

- **Life Member**, Indian Society for Radiation and Photochemical Sciences (ISRAPS)
- **Member**, American Chemical Society, USA (2014 –2019)
- **Life Member**, Chemical Research Society of India (CRSI), Bangalore (2011 – Present)
- **Life Member - Fluorescence Society of India**
- **Convener, CRSI Local Chapter Madurai (2023-2026)**

❖ **Area of Specialization:**

- Synthetic Organic Chemistry

❖ **Field of Interest:**

- Organic Synthesis,
- Organic Photochemistry
- Organo-Boron Chemistry
- Organic Electrodes
- Organic materials,
- Sensors,
- Radiolabeling

❖ **Ph. D.s/M. Phil/M. Sc guided /on-going:**

S. No.	Name of the Degree	No. of awarded	Ongoing
1	Ph.D.,	Awarded: 10	6
2	M.Phil. Project	13	0
3	M.Sc. Project	35	
4.	Summer Research Fellows from Indian Academy of Sciences, Bangalore	15	0

❖ **Major research projects under operation/completed as Principal /Co-Investigator:**

S. No.	Title of the Research Project	Agency and Funding	Duration
1	Synthesis and Physico-Chemical studies on Rational Design Highly Active Fluorescent BODIPY Probes and their application to Bio-imaging	Major Research Project from the Department of Science and Technology (DST) (Rs.23 lakhs)	2011-14
2	Synthesis and characterization of novel ent probe from 2-(5-chloro-4- phenyl- 1H -3-yl)-3-heteroaryls	Major Research Project (Completed), University Grants Commission (UGC), New Delhi (Rs.11.05 lakhs)	2012-15
3	One-Pot Synthesis of Novel Indenophenaridine Fluorescent Probes and Their Bio-Chemical Application	Major Research Project from (Ongoing), Science and Engineering Research Board (SERB), New Delhi (Rs. 42.83 lakhs)	2017-20

4	Molecular Design and Development of Imaging Agents and Inhibitors: A Chemical Biology Approach	One of the PI - Joint Major Research Projects from RUSA, MHRD, New Delhi (Rs.3.84cr)	2020-22
5	Design and Development of Imaging Probes and Potential Inhibitors for Neurodegenerative Disorders: A Chemical Biology Approach	Co-PI- Joint Major Research Project from TANSCHHE (Rs.47,88,000/-)	2021-23

❖ **Selected List as Invited Speaker to Prestigious Institutions:**

S. No.	Title of invited lecture	Name of the Conference
1	Strategy to Development of Organic Sensor Molecules and Their Applications	International symposium on Main-group Molecules to Materials (MMM-2018), from October, 28 - 31, 2018 at by the Department of Inorganic and Physical Chemistry, IISc, Bangalore, India
2	Strategy to Development of Highly Substituted Heterocycles and Their Biological Evaluations”	International conference on “Frontiers in Chemical Sciences 2018 (FICS 2018)' during December 6 - 8, 2018.at the Department of Chemistry, IIT Guwahati, India
3	Selective Sensing of Explosive Nitroaromatic Compounds via Aggregation Induced Emission in Aqueous Media	15th DAE-BRNS Biennial - Trombay Symposium on Radiation & Photochemistry, during January 5 - 9, 2020 at Bhabha Atomic Research Centre (BARC), Mumbai, India
4	Workshop on Recent Advances in Marine Ecotoxicological Testing- RAMETOX2015	Department of Marine and Coastal Studies, Madurai Kamaraj University at Pudumadam, Ramanathapuram District, Tamil Nadu during 5– 9 January 2017
5	Design and Synthesis of Indenophenanthridine based Donor-Acceptor Fluorophore Derivatives Enroute to Amine Sensor	Four Days International Conference on Consortium of Universal Research Erudition (iCURE), from 3-5 February, 2023 organized by Madurai Kamaraj University, Madurai - 625021

❖ **Conference / Workshops /Seminars, Symposia organized**

1. **Secretary**, Lecture Workshop on Bioinorganic Chemistry sponsored by Indian academy of Science (IASc), Bangalore, in School of Chemistry, Madurai Kamaraj University, Madurai -625 021, on 28-30 September 2012
2. **Coordinator**, Lecture Workshop on Advances of Chemistry sponsored by Indian Academy of Science (IASc) during July 26-27, 2013 at School of Chemistry, Madurai Kamaraj University, Madurai-625025.
3. **Coordinator**, CRSI Local Chapter National Seminar on “Emerging Trends in Chemistry”, February 18-20, 2016, School of Chemistry, Madurai Kamaraj University, Madurai-625025.
4. **Convener**, Lecture Workshop on Entrepreneurship Skill Development in Chemistry sponsored by National Academy of Sciences India (NASI), Allahabad, March10-11, 2017, School of

- Chemistry, Madurai Kamaraj University, Madurai -625021.
5. **Coordinator**, RSC Symposium Bioinorganic and Chemical Sciences sponsored by Indian Academics of Sciences (IASC), India during March17-18, 2017, School of Chemistry, Madurai Kamaraj University, Madurai-625021.
 6. **Convener**, SERB-NPDF Committee Meeting, School of Chemistry, Madurai Kamaraj University, Madurai-625021. 2017
 7. **Co-coordinator – Organized, Two Days National workshop, MKU in 2022**
 8. **Organizing Member – Fours Days International Conference iCURE, MKU in 2023**
 9. **Convener**, CRSI Local Chapter National Conference on “Current Trends in Chemistry”, February 21-23, 2024, School of Chemistry, Madurai Kamaraj University, Madurai-625025.

❖ **List of Publications (*Corresponding Author)**

2024

42. Development of Pyrene Embedded Luminophore via π -linker: Room Temperature Phosphorescence (RTP) and Sensing towards Nitroaromatics (NACs)". Kannan Jamuna^[a,b], Prasannamani Govindharaj^c, Aravind Krishnan^d, Natarajan Savitha Devi^e, Amal Tom Sebastian^b, Narayanan Selvapalam^a, Moubani Mugargee^b, Przemyslaw Data^{c*}, Santhalingum Gayathri^e, Shanmugam Sivakumar^{b*}, Balasubramaniam Ashokkumar^e
ChemPhotoChem. 2024 (accepted) DOI: 10.1002/cptc.202400046
41. Phenanthridium-based conjugated probe for selective detection of anionic surfactant.
Kannan Jamuna, Amal Tom Sebastian, Senthilmurugan Subbiah, Narayanan Selvapalam*, **Shanmugam Sivakumar***
Journal Of Surfactants and Detergents (Accepted) **2024**. DOI: 10.1002/JSDE.12785
40. Synthesis and Characterization of Spirooxindole β-Ketothiolester and their Fluorescence Imaging on PC3 Cells. Seenivasagaperumal Sriram Babu^a, Natarajan Savitha Devi^c, Ramamoorthy Manjula Devi^b Narayanan Dhiraviam Kannan^b, and **Shanmugam Sivakumar^{a*}** *ChemistrySelect*, **2024**. 9 (10), e202303884.
<https://doi.org/10.1002/slct.202303884>

2023

39. Synthesis of Lewis adduct-based indenophenanthridine and study of its tunable optoelectronic properties toward an amine sensor[†].
Kannan Jamuna,^a Prasannamani Govindharaj,^b Rajaram Kamalakkannan,^a Aravind Krishnan,^c Amal Tom Sebastian,^a Przemyslaw Data,^b Natarajan Savitha Devi^d and **Shanmugam Sivakumar***
New J. Chem., 2023,**47**, 20723-20732, DOI: 10.1039/D3NJ03299J (Cover page)
38. Synthesis of Highly Functionalized Novel 4H-pyrano[2',3':4,5]imidazo[1,2-a]pyridine hybrid via One-pot Four-Component Domino Reaction.
Ramesh Vedyappan^{a,b}, Natarajan Savitha Devi,^c Rameshbabu Ajaydev^a and **Sivakumar Shanmugam^{a*}**. *Tetrahedron Letters* 131 (2023) 154765

37. "Synthesis of Different Nano-layer Shells (Mono-, Bi-, and Alloy Layers)-Coated Gold Spherical Nanoparticles Core for Catalysis"
Sundarapandi, Manickam, Shanmugam, **Sivakumar*** and **Ramaraj**, Ramasamy* *ChemistrySelect*, 2023, **8** (11), e202203389.
36. Design and Development of a Fluorometric and Colorimetric sensor for Toxic cyanide detection by Pyridinium scaffolds: Live cell imaging and real samples analysis.
Kannan Jamuna, Santhalingum Gayathri, **Shanmugam Sivakumar***, Balasubramaniam Ashokkumar. *Sens. & Diagn.*, 2023, **2**, 337-346.
<https://doi.org/10.1039/D2SD00163B>

2022

- 35 Amine functionalized silane assisted preparation of AgNPs deposited α -Ni(OH)₂ composite materials and its application in Hg²⁺ ions sensing" Sundarapandi, Manickam; Praveen, Raju; **Shanmugam, Sivakumar***; Ramaraj, Ramasamy* *ACS Omega* 2022, **7**, **43**, 39396-39403.
34. **Microwave-Assisted Tandem Copper-Catalyzed Three-Component Reaction for Synthesis of 2-Iminopyrans.** Kamaraj Pasumpon, Vaithyanathan Mahendran, Sivakumar Shanmugam*. *ChemistrySelect*, 2022. **7** (46), e202203659.
<https://doi.org/10.1002/slct.202203659>.
33. Synthesis of indenophenanthridine via a [4+2] annulation strategy: a ‘‘turn-off’’ Fe³⁺ ion sensor, practical application in live cell imaging and reversible acidochromism studies. Kannan Jamuna, Solaimalai Thimmarayaperumal, Manikka Kubendran Aravind, **Shanmugam Sivakumar*** and Balasubramaniam Ashokkumar. . *New J. Chem.*, 2022, **46**, 9207-9215
32. Tuning Cu₂O Shell on Gold Nanocube Core Employing AmineFunctionalized Silane for Electrocatalytic Nitrite Detection. Manickam Sundarapandi, **Sivakumar Shanmugam***, and Ramasamy Ramaraj**ACS Applied Nano Materials* 2022, **5**, 1, 1674-1682

2019

31. Biofilm-Associated Agr and Sar Quorum Sensing Systems of Methicillin-Resistant Staphylococcus Aureus are Inhibited by Fruit Extracts of Illicium Verum
P. Sankar Ganesh*†, Krishnamurthy Veena†, Koneti Iswamy, S. Suvaithenamudhan, Amudhan Murugesan, Irudhayaraj J. Vimali, Arumugam V. Ravi, **Sivakumar Shanmugam**, Dinakar Challabathula, Samuthira Nagarajan, Esaki M. Shankar*
30. Synthesis and Catalytic Activities of Metal Shells (monolayer, bilayer and alloy layer) Coated Gold Octahedra Towards Catalytic Reduction of Nitroaromatics
Manickam Sundarapandi, **Sivakumar Shanmugam*** and Ramasamy Ramaraj*
J. Phys. Chem. C, 2019, **123**, 21066-21075.
29. Catalyst free Synthesis of Highly Functionalized Indolizines from In Situ Generated Pyridinium Ylides via One-Pot Multicomponent Reaction
V. Ramesh, **Sivakumar Shanmugam*** and Natarajan Savitha Devi
ChemistrySelect 2019, **4**, 3717-3721.

2018

28. Catalytic Activities of Mono- and Bimetallic (Gold/Silver) Nanoshell Coated Gold Nanocubes toward Catalytic Reduction of Nitroaromatics
Manickam Sundarapandi, Perumal Viswanathan, **Sivakumar Shanmugam*** and Ramasamy Ramaraj*
Langmuir **2018**, *34*, 13897-13904.
27. Metal-Free γ,δ -Unsaturated β -Ketothiolester: Solvatochromism, AIEE, and Detection of Picric Acid. S.S. Babu and **Sivakumar Shanmugam*** **ChemistrySelect** **2018**, *13*, 4075-4081.
26. Ultrasound-assisted one-pot multicomponent 1,3-dipolar cycloaddition strategy: Combinatorial synthesis of spiro-acenaphthylene-S,S-acetal and 2H-pyranone derivatives
Sivakumar Shanmugam* and S. Thimmarayaperumal
New Journal of Chemistry, **2018**, *42*, 4061 – 4066.
25. Fluorescent β -ketothiolester boron complex: substitution based “turn-off” or “ratiometric” sensor for diamine
S.S. Babu and **Sivakumar Shanmugam***
New Journal of Chemistry, **2018**, *42*, 3394 – 3400.
24. A Simple and Direct Synthesis of Penta substituted Pyrroles via [3+4] Annulation and Their In Vitro Evaluation as Thrombolytic agents and Cytotoxicity Studies on L929 Cells"
Sivakumar Shanmugam* and Biguvu Balachandra.
ChemistrySelect **2018**, *3*, 2037–2044.
23. Er(OTf)₃-Catalyzed Multicomponent Synthesis of 3,4-Dihydro-2H-pyran via Hetero- Diels-Alder Reaction under Ambient Temperature has been built and requires approval
V. Ramesh, **Sivakumar Shanmugam** and Natarajan Savitha Devi*
ChemistrySelect **2018**, *3*, 3652–3658.

2017

22. CAN-Supported Chemoselective Oxidative Conversion of α -Aroylketene-(S,S)-acetals to Aryl Carboxylic Acids
S. Sriram Babu and **Sivakumar Shanmugam*** **ChemistrySelect**, **2017**, *2*, 2330-2334.
21. Live Cell Imaging of Bacterial Cells: Pyrenoylpyrrole based Fluorescence Labelling
M.A. Divakar and **Sivakumar Shanmugam***
Chemical Biology and Drug Design, **2017**, *90*, 554–560.
20. An Easy Access to Bipyrazoles and Unusual Demethylation of Methyl Phosphorous Ester: Exploring the Synthetic Utility of Bestmann-Ohira Reagent
Mahendran, K. Pasumpon and **Sivakumar Shanmugam*** **ChemistrySelect**, **2017**, *2*, 2866-2869.
19. One-pot synthesis of boron diketonate complexes: photophysical properties and sensor for picric acid
S.S. Babu and **Sivakumar Shanmugam***
Journal of Materials Chemistry C, **2017**, *5*, 4788-4796.
18. Synthesis of chiral α -carbonyl- δ -nitro-ketenedithioacetals via L-proline catalyzed Michael addition reaction
Arun Divakar Mathiyazhagan and **Sivakumar Shanmugam*** **Research on Chemical Intermediates** **2017**, *43*, 6863–6873.
17. Base Promoted Selective Synthesis of 2H-Pyrone and Tetrahydronaphthalenes via Domino Reactions
Sivakumar Shanmugam * and S. Thimmarayaperumal
ACS Omega **2017**, *2*, 4900–4910.

2016

16. Tetraphenylethene-2-Pyrone Conjugate: Aggregation-Induced Emission Study and Explosives Sensor
V. Mahendran, K. Pasumpon, S. Thimmarayaperumal, P. Thilagar, and Sivakumar

Shanmugam *

J. Org. Chem., **2016**, *81*, 3597-3602.

15. An efficient five-component synthesis of thioether containing dihydropyrano[2,3c]pyrazoles: a green domino strategy
V. Ramesh, **Sivakumar Shanmugam** and Natarajan Savitha Devi*
New Journal of Chemistry, **2016**, *40*, 9993-10001.
14. Regioselective synthesis of pyrrolylpyrazole as a multifunctional compound: Potential antibacterial as well as anticancer agent
A. Divakar Mathiyazhagan and **Sivakumar Shanmugam***
ChemistrySelect, **2016**, *1*, 6151-6155.

2015

13. Copper(ii) bromide-catalyzed C-C/C-N bond forming reactions: synthesis of pyrrole-incorporated triarylmethane
H. Surya Prakash Rao, A. Veera Bhadra Rao and **Sivakumar Shanmugam***
Synthetic Communications, **2015**, *45*, 2712-2717.
12. One-pot chemo/regio/stereoselective generation of a library of functionalized spiro- oxindoles/ pyrrolizines/pyrrolidines from α -aroylidineketene dithioacetals
Pandi Dhanalakshmi, S.S. Babu, S. Thimmarayaperumal and **Sivakumar Shanmugam ***
RSC Adv., **2015**, *5*, 33705-33719.
11. α -Aroylidineketene dithioacetal chemistry: CuI catalyzed synthesis of 2-styryl benzimidazoles enroute to regioselective hydrothiolation
P. Dhanalakshmi, and **Sivakumar Shanmugam *** **Tetrahedron** **2015**, *71*, 6300- 6314.
10. Facile synthesis and characterization of bioorganometallic compounds and their biological activity contour against human pathogens
M.A. Divakar, V. Sudhamani, **Sivakumar Shanmugam*** T. Muneeswaran, S. T amilzhalagan, M. Ramakritinan and K. Ganesan
RSC Adv., **2015**, *5*, 8362-8370.
9. Iodine catalyzed one-pot synthesis of highly substituted N-methyl pyrroles via [3 + 2] annulations and their in vitro evaluation as antibacterial agents
B. Balachandra, **Sivakumar Shanmugam, *** T. Muneeswaran and M. Ramakritinan
RSC Adv., **2015**, *5*, 64781-64789.
8. One-pot synthesis of hydrazono-sulfonamide adducts using Cu(BTC) MOF catalyst and their remarkable AIEE properties: unprecedented copper(II)-catalyzed generation of ketenimine
Mahendran and **Sivakumar Shanmugam ***
RSC. Adv., **2015**, *5*, 20003-20010.
7. Aggregates of a hydrazono-sulfonamide adduct as picric acid sensors Mahendran and **Sivakumar Shanmugam***
RSC Adv., **2015**, *5*, 92473-92479.

2014

6. Convenient one-pot multicomponent strategy for the synthesis of 6- pyrrolylpyrimidines, Pandi Dhanalakshmi, Solaimalai Thimmarayaperumal and **Sivakumar Shanmugam***.
RSC Adv., **2014**, *4*, 29493-29501.
5. Metal catalyst free one-pot synthesis of 2-arylbenzimidazoles from α - aroylketene dithioacetals
Pandi Dhanalakshmi and **Sivakumar Shanmugam ***
RSC Adv., **2014**, *4*, 12028-12036.

2003-2007

4. Aroylketene Dithioacetal Chemistry: Facile Synthesis of 4-Aroyl-3- methylsulfanyl-2-tosylpyrroles from Aroylketene Dithioacetals and TosMIC
H.S.P. Rao and **S. Sivakumar**
Beilstein J. Org. Chem., **2007**, *3*:31.
3. Condensation of α -Aroylketene Dithioacetals and 2-Hydroxyarylaldehydes Results in Facile

Synthesis of a Combinatorial Library of 3-Aroylcoumarins

H.S.P. Rao and **Sivakumar Shanmugam** **J. Org. Chem.**, **2006**, 71, 8715-8723.

2. Nitroketene Acetal Chemistry – 3: Facile Synthesis of Nitroacetic Acid Triarylmethyl Orthoesters from 1,1-Di(methylsulfanyl)-2-nitroethylene

H.S.P. Rao and **Sivakumar Shanmugam**

J. Org. Chem., **2005**, 70, 4524-4527.

1. Nitromethylidene]-1,3-dithioles from the Dipotassium Salt of 2-Nitro-1,1-ethylenedithiol

H.S.P. Rao.; Sakthikumar, L.; Vanitha, S.; **Sivakumar Shanmugam**

Tetrahedron Lett. **2003**, 44, 4701-4704.