



**Dr. Saravanan Peruncheralathan Ph. D**  
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**Nationality:** Indian

**Born:** 23<sup>rd</sup> January 1976 in Salem (India)

**Marital Status:** Married

**Academic Record:**

Associate Professor, School of Chemical Sciences, NISER Bhubaneswar	2019-
Reader – F, School of Chemical Sciences, NISER Bhubaneswar	2012 - 2019
Assistant Professor, School of Chemical Sciences, NISER Bhubaneswar	2010 - 2012
Postdoctoral Research with Prof. C. Schneider, Institute für Organische Chemie, Universität Leipzig (Germany)	2006 - 2009
Research Associate with Prof. H. Ila, Department of Chemistry, Indian Institute of Technology Kanpur	2005 - 2006
Ph. D with Prof. H. Ila, Department of Chemistry, Indian Institute of Technology Kanpur	1998 - 2004
M. Sc (Chemistry) Madras University, Chennai	1997
B. Sc (Chemistry) Bharathiar University, Coimbatore	1995

**Award:**

Alexander von Humboldt fellowship	2007 - 2008
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**Professional Society:**

American Chemical Society

**Teaching Experiences:**

16 Courses offered (3 New courses introduced)

**Main Research Area:**

- Functionalisation of C—X and C—H Bonds
- Asymmetric Synthesis
- Domino Reactions
- Small molecules for Therapeutic Applications

**Research Grants:**

- *Catalytic, Enantioselective Desymmetrization of Prochiral and meso-Compounds with Quaternary Carbon Centers*, DST-SERB, 2018 – 2021, (42.2 Lakhs) **Principal Investigator**
- *Synthesis and Bioactivity Screening of Marine Indole Alkaloids and Related Analogues*, Development of Potential Drugs From Ocean Programme, Ministry of Earth Sciences, Government of India, 2012-2017 (75 Lakhs) **Principal Investigator**
- *New Strategies for Chemical Synthesis: Bifunctional Organocatalysts and their Reactions*, Alexander von Humboldt Equipment Grant, 2013 (Euro 18,000) **Principal Investigator**

**Publications:** 33*Selected Publications*

- ❖ “2,3-Difunctionalized Benzo[b]thiophene Scaffolds Possessing Potent Antiangiogenic Properties” H. Singh, A. Thirupathi, B. Das, M. Janni, R. Kumari, S. Singh, M. Rashid, M. Wahajuddin, M. M. Balamurali, K. Jagavelu, and S. Peruncheralathan, *J. Med. Chem.* **65**, 120 - 135 (2022).
- ❖ “Nickel Catalyzed Site Selective C–H Functionalization of  $\alpha$ -Aryl-thioamides” D. Bandyopadhyay, A. Tirupathi, N. Dhage, N. Mohanta, and S. Peruncheralathan, *Org. Biomol. Chem.* **16**, 6405 - 6408 (2018).
- ❖ “Copper Catalyzed Intramolecular N-Arylation of Ketene Aminals at Room Temperature: Synthesis of 2-Amino-3-Cyano indoles”, A. Thirupathi, M. Janni and S. Peruncheralathan, *J. Org. Chem.*, **83**, 8668 - 8678 (2018).
- ❖ “Chemoselective Ullmann Coupling at Room Temperature: A Facile Access to 2-Aminobenzo[b]thiophenes”, M. Janni, A. Thirupathi, S. Arora and S. Peruncheralathan, *Chem. Commun.*, **53**, 8439 - 8442 (2017).
- ❖ “Double Heteroannulation of S,N-acetals: a Facile Access to Quinolone ”, M. Janni, S. Arora and S. Peruncheralathan, *Org. Biomol. Chem.*, **14**, 8781 - 8788 (2016).
- ❖ “Catalytic Selective Deuteration of Halo(Hetero)Arene, M. Janni and S. Peruncheralathan, *Org. Biomol. Chem.*, **14**, 3091-3097 (2016).
- ❖ “AIEE Phenomenon: Tetraaryl vs. Triaryl Pyrazoles ”, Sayani Mukherjee, P. S. Salini, A. Srinivasan and S. Peruncheralathan, *Chem. Commun.*, **51**, 17148-17151 (2015).
- ❖ “Trideuteromethoxylation of Aryl and Heteroaryl Halides” P. Dash, M. Janni and S. Peruncheralathan *Eur. J. Org. Chem.*, 4914-4917 (2012).

**Invited Talks:** 10**Book:** 1

“Domino Reactions Initiated by Nucleophilic Substitution”, H. Ila, A. Acharya, S. Peruncheralathan in *Domino Reactions - Concepts for Efficient Organic Synthesis*, Edited by L. F. Tietze; 2014 Wiley-VCH

### Research Students Guided:

Ph. D – 8 Students (4- Completed)

M. Sc – 25 Students (17 – Completed)

### Research Expertise:

Our group interest is the selective functionalisation of C—X and C—H bonds of aromatic compounds. We use catalysis as a tool to achieve selective functionalisation of arenes and haloarenes. We developed a simple, efficient, and ligand-controlled deturation of haloarenes (*Eur. J. Org. Chem.*, **2012**, 4914 & *Org. Biomol. Chem.*, **2016**, *14*, 3091). The researcher used our approach for the late-stage modification of natural products and functional materials (See: Toste *J. Am. Chem. Soc.* **2016**, *138*, 9775 & Abe, *J. Am. Chem. Soc.* **2017**, *139*, 13429). We also demonstrated a regioselective intramolecular *N*-arylation of ketene amins at ambient temperature (*J. Org. Chem.*, **2018**, *83*, 8668). In continuation, we examined a chemoselective intramolecular Ullmann reaction of thioamides. We extended to an enantiospecific Ullmann coupling reaction (*Chem. Commun.* **2017**, *53*, 4914). Recently, we demonstrated that NiBr<sub>2</sub> catalysed a site-selective C—H thiolation of thioamides to synthesise 2-aminothiophenes (*Org. Biomol. Chem.* **2018**, *16*, 6405). In 2016, we applied a double heteroannulation protocol for the synthesis of quinolo-fused heterocycles from haloarenes (*Org. Biomol. Chem.* **2016**, *14*, 8781). Now, we developed a metal-free sequential double C—H functionalisation strategy for the synthesis of indolo fused quinolines & quinolones (Submitted). We studied all newly synthesised heterocycles for potential applications in biomedical (Antiangiogenic activity, *J. Med. Chem.* **2022**, *65*, 120) and material science (*Chem. Commun.* **2015**, *51*, 17148 & *Polym. Chem.*, **2015**, *6*, 7764).

Our current research interest is the synthesis and biological activity of unexplored indolo fused heterocycles such as pyrazolo and triazolo fused indoles. Further, the desymmetrisation of all-carbon quaternary centres is undergoing in our laboratory.

### List of Publications:

1. 2,3-Difunctionalized Benzo[b]thiophene Scaffolds Possessing Potent Antiangiogenic Properties, H. Singh, A. Thirupathi, B. Das, M. Janni, R. Kumari, S. Singh, M. Rashid, M. Wahajuddin, M. M. Balamurali, K. Jagavelu,\* and **S. Peruncheralathan**,\* *J. Med. Chem.* **2022**, *65*, 120 - 135.
2. Metal-free ring-opening of 5-amino-1,4-diaryl-1H-pyrazoles: A facile access to 2-aryl-3-aryloxy acrylonitriles, Arpita Chatterjee, Divya Radhakrishnan, Debashruti Bandyopadhyay, Selvaraj Kanchithalaivan and **S. Peruncheralathan**,\* *J. Heterocycl. Chem.*, **2022**, *59*, 1016-1024.
3. Shalini Pandey, Keerthana Anil C., **S. Peruncheralathan**, Swati Madhulika, Punit Prasad, Arindam Ghosh\*, Hydrothermal treatment as a means to improve solubility and enhance diaCEST MRI contrast efficiency. *New J. Chem.*, 2022, *46*, 14888-14893
4. Shalini Pandey, Subhayan Chakraborty, Rimilmandrita Ghosh, **S. Peruncheralathan**,\* Arindam Ghosh\*, The role of hydrogen bonding in tuning CEST contrast efficiency: A

comparative study of intra and intermolecular hydrogen bonding *New J. Chem.*, 2022, 46, 1260-1266

5. Triflic acid-mediated *N*-heteroannulation of  $\beta$ -anilino- $\beta$ -(methylthio)acrylonitriles: a facile synthesis of 4-amino-2-(methylthio)quinolines, D. Bandyopadhyay, A. Thirupathi, D. Radhakrishnan, A. Panigrahi, and **S. Peruncheralathan**,\* *Org. Biomol. Chem.*, **2021**, *19*, 8544 - 8553.
6. Chemoselective Ullmann reaction of alpha-trisubstituted thioamides: Synthesis of novel 2-iminobenzothiolanes, A. Bhattacharya, A. Thirupathi, P. Natarajan, and **S. Peruncheralathan**,\* *ACS Omega*, **2021**, 2021, 6, 32, 21169 - 21180.
7. Paracetamol and other Acetanilide analogs as inter-molecular hydrogen bonding assisted diamagnetic CEST MRI contrast agents, S. Chakraborty, **S. Peruncheralathan**\* and A. Ghosh,\* *RSC Advances*, **2021**, *11*, 6526 - 6534.
8. PtCl<sub>2</sub> mediated peripheral transformation of carbatriphyrin(3.1.1) into a meso-fused  $\beta$ - $\beta'$  dimer and its monomer analogue, M. Murugavel, B. Adinarayana, M. Das, **S. Peruncheralathan**, N. R. Palepu, and A. Srinivasan,\* *Chem. Commun.*, **2020**, *56*, 12809 - 12812.
9. Copper-catalysed *N*-arylation of 5-aminopyrazoles: a simple route to pyrazolo[3,4-*b*]indoles, A. Chatterjee, C. Murmu, and **S. Peruncheralathan**,\* *Org. Biomol. Chem.*, **2020**, *18*, 6571-6581.
10. Core-modified 48 $\pi$  and 42 $\pi$  decaphyrins: syntheses, properties and structures, A. Ghosh, S. Dash, A. Srinivasan, C. H. Suresh, **S. Peruncheralathan**, and T. K. Chandrashekar,\* *Org. Chem. Front.*, **2019**, *6*, 3746 – 3753.
11. “Nickel Catalyzed Site Selective C–H Functionalization of  $\alpha$ -Aryl-thioamides” D. Bandyopadhyay, A. Tirupathi, N. Dhage, N. Mohanta, and **S. Peruncheralathan**,\* *Org. Biomol. Chem*, **2018**, *16*, 6405 – 6408.
12. “Copper Catalyzed Intramolecular *N*-Arylation of Ketene Aminals at Room Temperature: Synthesis of 2-Amino-3-Cyano indoles” A. Thirupathi, M. Janni and **S. Peruncheralathan**,\* *J. Org. Chem.*, **2018**, *83*, 8668-8678.
13. “Chemoselective Ullmann Coupling at Room Temperature: A Facile Access to 2-Aminobenzo[*b*]thiophenes” M. Janni, A. Thirupathi, S. Arora and **S. Peruncheralathan**,\* *Chem. Commun.*, **2017**, *53*, 8439 – 8442.
14. “Double Heteroannulation of *S,N*-acetals: a Facile Access to Quinolone ” M. Janni, S. Arora and **S. Peruncheralathan**,\* *Org. Biomol. Chem.*, **2016**, *14*, 8781-8788.
15. “Catalytic selective deuteration of halo(hetero)arene, M. Janni and **S. Peruncheralathan**,\* *Org. Biomol. Chem.*, **2016**, *14*, 3091-3097. “
16. AIEE phenomenon: tetraaryl vs. triaryl pyrazoles” S. Mukherjee, P. S. Salini, A. Srinivasan and **S. Peruncheralathan**,\* *Chem. Commun.*, **2015**, *51*, 17148-17151.
17. “Tetraaryl Pyrazole Polymers: Versatile synthesis, aggregation induced emission enhancement and detection of explosives” V. Mukundam, A. Kumar, K. Dhanunjayarao,

- A. Ravi, **S. Peruncheralathan** and K. Venkatasubbaiah,\* *Polym. Chem.*, **2015**, *6*, 7764-7770.
18. "Domino Reactions Initiated by Nucleophilic Substitution, H. Ila,\* A. Acharya, **S. Peruncheralathan** in *Domino Reactions - Concepts for Efficient Organic Synthesis*, Edited by L. F. Tietze; 2014 Wiley-VCH.
  19. "Trideuteromethoxylation of Aryl and Heteroaryl Halides" P. Dash, M. Janni and **S. Peruncheralathan**,\* *Eur. J. Org. Chem.*, **2012**, 4914-4917.
  20. "The Ti-BINOLate-Catalyzed, Enantioselective Ring-Opening of meso-Aziridines with Amines" **S. Peruncheralathan**, S. Aurich, H. Teller, C. Schneider, *Org. Biomol. Chem.* **2013**, *11*, 2787-2803.
  21. "Cationic Late-Transition-Metal Complexes Catalyse the Ring Opening of Aziridines with Amines" A. Marti, **S. Peruncheralathan**, C. Schneider, *Synthesis* **2012**, 27-36. (Feature Article)
  22. "Titanium-BINOLate-Catalyzed Aminolysis of meso-Aziridines – a Highly Enantioselective and Direct Access to 1,2-Diamines", **S. Peruncheralathan**, H. Teller, C. Schneider, *Angew. Chem. Int. Ed.* **2009**, *48*, 4849-4853.
  23. "A New One-Pot, Three-Component Synthesis of 2,3,5-Substituted or Annulated 6-(Methylthio)pyridines" K. Yadav, S. K. S. Yadav, I. Siddiqui, S. Peruncheralathan, H. Ila, H. Junjappa, *Synlett* **2008**, 2674-2680.
  24. "A Novel Anionic Domino Process for the Synthesis of o-Cyanoaryl-Methylthio/Alkyl/Aryl/Heteroaryl Acetylenes" S. Kumar, **S. Peruncheralathan**, H. Ila, H. Junjappa, *Org. Lett.* **2008**, *10*, 965-968.
  25. "Indium(III) Chloride-Catalyzed Thiolytic of meso-Aziridines" **S. Peruncheralathan**, M. Henze, C. Schneider, *Tetrahedron Lett.* **2007**, *48*, 6743-6746.
  26. "Sc(OTf)<sub>3</sub>-Catalyzed Aminolysis of meso-Aziridines" **S. Peruncheralathan**, M. Henze, C. Schneider, *Synlett* **2007**, 2289-2291.
  27. "Domino Carbocationic Rearrangement of  $\alpha$ -[Bis(methylthio)methylene]alkyl-2-(3/2-indolyl) Cyclopropyl Ketones" A. K. Yadav, **S. Peruncheralathan**, H. Ila, H. Junjappa *J. Org. Chem.* **2007**, *72*, 1388-1394.
  28. "Regioselective Synthesis of 1-Aryl-3,4-Substituted/annulated-5-(methylthio)pyrazoles and 1-Aryl-3-(methylthio)-4,5-Substituted/Annulated Pyrazoles" **S. Peruncheralathan**, T. A. Khan, H. Ila, H. Junjappa, *J. Org. Chem.* **2005**, *70*, 10030-10035.
  29. "Highly Regioselective Synthesis of 1-Aryl-3 (or 5)-alkyl/aryl-5(or 3)-(N-cycloamino)pyrazoles" **S. Peruncheralathan**, A. K. Yadav, H. Ila, H. Junjappa, *J. Org. Chem.* **2005**, *70*, 9644-9647.
  30. "S,S-Dimethyl Dithiocarbonate: A Useful Reagent for Efficient Conversion of Aldoximes to Nitriles" T. A. Khan, S. Peruncheralathan, H. Ila, H. Junjappa, *Synlett* **2004**, 2019-2021.
  31. "Domino Carbocationic Rearrangements of  $\alpha$ -[Bis(methylthio)methylene]alkyl-2-(2-heteroaryl)cyclopropyl Ketones" **S. Peruncheralathan**, V. Sriram, H. Ila, H. Junjappa *Tetrahedron* **2004**, *60*, 5603-5612.

32. “ $\alpha$ -Oxoketene Dithioacetals Mediated Heteroaromatic Annulation Protocol for Benzoheterocycles: An Efficient Regiocontrolled Synthesis of Highly Substituted and Annulated Indazoles” **S. Peruncheralathan**, T. A. Khan, H. Ila, H. Junjappa *Tetrahedron* **2004**, *60*, 3457-3464.
33. “Domino Carbocationic Rearrangement of  $\alpha$ -[Bis(methylthio)methylene]alkyl-2-aryl-cyclopropyl Carbinols: Facile Access to 1-Arylindanes” P. K. Mahanta, **S. Peruncheralathan**, H. Ila, H. Junjappa, *J. Org. Chem.* **2001**, *66*, 1503-1508.