Dr. NARENDRA NATH PATI
Institute of Chemical Reaction Design and Discovery (ICReDD)
Hokkaido University, Japan
e-mail: narendranathpati@icredd.hokudai.ac.jp
Mobile: (+91)-6305706394
Google Scholar:
https://scholar.google.com/citations?hl=en&user=UhL5TmkAAAAJ&view_op=list_works&sortby=pubdate

Profile Summary and Key Research Area:

1. Competent professional with Ph. D. (Organic Chemistry/porphyrinoid chemistry) and more than 5 years of research associates experience in research and development of new porphyrinoids/high energy materials and one experience in pharmaceutical industry as senior scientist.

2. Sound knowledge in synthetic organic chemistry, porphyrinoid chemistry and supramolecular chemistry coupled with modern synthetic techniques.

3. Involved in development and possess optimization of advanced chemistry and design strategies of different class of porphyrinoids.

4. Diverse hands-on experience in the field of organic synthesis with special emphasis on the compounds containing aromatic, heteroaromatic and aliphatic motifs.

5. Design and synthesis of complex molecules through multi-step synthesis using modern synthetic methods, i.e. metal catalysed reactions, cryogenic reactor for low temperature reactions, various air-free techniques.

6. Strong analytical capabilities in multi-disciplinary areas aiding new product developments.

7. Sound knowledge in isolation of desired compounds with high purity by applying various techniques like column chromatography (silica-gel, alumina), preparative TLC and recrystallization.

8. Expertise in characterization and analysis of compounds using different spectroscopic analysis including e.g. NMR, UV-vis spectrometers, IR, Fluorescence and Mass techniques.

9. Good knowledge in crystal engineering and supramolecular chemistry i.e. developing a diffraction grade single crystal of small molecules to macrocycles by applying innovative techniques and analysing the crystal structures.

10. Mentoring students in different projects including design, synthesis and documentation work for achieving goals within time and budget.

11. Good knowledge in scientific literature search, scientific writing for research publication associated with projects including reviewing scientific publications.

12. Continuous modification towards the evolution of the laboratory's technology and strategy.

EDUCATION:

2005-2017 University of Hyderabad, India. **Doctor of Philosophy** (**Ph. D.**) **in Chemistry** ("**New Horizons in Porphycene Chemistry: From unsymmetrical Isomers to Supramolecular Sandwich complex**"), **Supervisor: Prof. Pradeepta K. Panda.**

2003-2005 Banaras Hindu University, Banaras, India. **Master of Science** (**M. Sc.**) **in Chemistry**– 73.67% (1st Division).

1999-2003 The University of Burdwan, Burdwan, India. **Bachelor of Science (B. Sc.)** with **chemistry Honors** - 57.37 % (2ndDivision).

RESEARCH EXPERIENCE:

01/10/2023- TILL DATE **Post-doctoral fellow, ICReDD, Hokkaido University**

01/08/2022-31/07/2022 **Senior Scientist:** Sambi Pharma PVT Ltd

05/2021-31/07/22 (Post Ph. D. research) **Research Associate (II):** At Advanced Centre of Research in High Energy Materials (ACRHEM), University of Hyderabad under mentorship of Prof. Pradeepta K. Panda, project funded by Defence Research and Development Organization (DRDO), Government of India.

***Key Projects handled*: Synthesis of TNAZ-like Molecules and Synthesis of tetranitropyrazolidines, tri/tetranitropyrazole.**

02/2021-05/2021 (Post Ph. D. research) **Project Assistant III:** At Advanced Centre of Research in High Energy Materials (ACRHEM), University of Hyderabad under mentorship of Prof. Pradeepta K. Panda, project funded by Defence Research and Development Organization (DRDO), Government of India.

***Key Projects handled*: Synthesis of TNAZ-like Molecules and Synthesis of tetranitropyrazolidines, tri/tetranitropyrazole.**

07/2017-12/2020 (Post Ph. D. research)	**Research Associate:** At School of Chemistry, University of Hyderabad under mentorship of **Prof. Pradeepta K. Panda**, project funded by Board of Research in Nuclear Sciences (BRNS) under the Department of Atomic Energy (DAE), Government of India. ***Key Projects handled*: Synthesis of Pi-extended Subchlorins: potential photosensitizers for photodynamic therapy (PDT).**
2005-2017 (Doctoral Research)	**Ph. D. in Chemistry** under mentorship of **Prof. Pradeepta K. Panda**, School of Chemistry, University of Hyderabad, India.

1. Worked in the field of porphyrinoids and supramolecular chemistry: synthesis of unsymmetrically substituted symmetry reduced porphycenes, the most stable isomers of porphyrin.
2. Multi-step organic synthesis, vigilant purification, and characterization of the novel porphycenes.
3. Structural elucidation, photophysical properties exploration, and singlet oxygen generation efficacy towards photodynamic therapy of the macrocycles and other application e.g. non-linear optical studies.
4. During doctoral programme, also involved in a University Grant Commission (UGC), India sponsored project entitled "New sapphyrin derivatives for anion discrimination".
5. Early stage of doctoral programme, worked on crystal engineering and supramolecular chemistry including crystal structure prediction.

LIST OFPUBLICATIONS:

1. 3,6,13,16-Tetrapropylporphycene: Rational Synthesis, Complexation and Halogenation, Jodukathula Nagamaiah, Arnab Dutta, **Narendra Nath Pati**, Sameeta Sahoo, Rahul Soman and Pradeepta K. Panda, ***J. Org. Chem. 2022, 87, 5, 2721–2729*** (https://doi.org/10.1021/acs.joc.1c02652).

2. Chromatographically separable ruffled non-planar isomeric octaalkylporphycenes: consequences of unsymmetrical substitution upon structure and photophysical properties, **Narendra N. Pati,** Sameeta Sahoo, Sipra S. Sahoo, Dipanjan Banerjee, S. Venugopal Rao and Pradeepta K. Panda, ***New J. Chem.***, **2020**, *44,* 9616-9620 (https://doi.org/10.1039/D0NJ01744B).

3. Synthetic access to calix[3]pyrroles *via meso*-expansion: hosts with diverse guest chemistry, B. Sathish Kumar, **Narendra N. Pati,** K. V. Jovan Jose and Pradeepta K. Panda, ***Chem. Commun.***, **2020**, *56*, 5637-5640 (https://doi.org/10.1039/D0CC01447H).

4. Unsymmetrical bipyrrole derived highly soluble and emissive β-dialkylporphycenes with good singlet oxygen generation ability, **Narendra N. Pati,** B. Satish Kumar, Dharani Sivadasan, Sipra Sucharita Sahoo, Pradeepta K. Panda, ***Journal of Porphyrins and Phthalocyanines*****, 2020,** *24*, 121-128 (https://doi.org/10.1142/S1088424619500950).

5. *β*-Hexaalkylporphycenes: Positional Effect of Alkyl Groups toward Design and Control of Structural and Photophysical Properties in Isomeric Hexaethylporphycenes, **Pati, N. N.,** Kumar, B. S., Panda, P. K. ***Org. Lett.*****, 2016,** *19*, 134-137 (https://doi.org/10.1021/acs.orglett.6b03428).

6. Unsymmetrical Bipyrrole derived *β*-Tetraalkylporphycenes and C-H…Br-C Interaction Induced 2D Arrays of 2:1 Supramolecular Sandwich Complex of their *cis-/trans*-Dibromo Isomers, **Pati, N. N.;** Kumar, B. S.; Chandra, B.; Panda, P. K. ***Eur. J. Org. Chem.,*** **2016,** 741-745 (https://doi.org/10.1002/ejoc.201601584).

7. Calix[2]bispyrrolylarenes: New Expanded Calix[4]pyrroles for Fluorometric Sensing of Anions via Extended π-Conjugation, Brijesh Chandra, Sanjeev P. Mahanta, **Narendra N. Pati,** Sambath Baskaran, Ravi K. Kanaparthi, Chinnappan Sivasankar and Pradeepta K. Panda, ***Org. Lett.*** **2013**, **15**, 2, 306–309 (https://doi.org/10.1021/ol3032158).

8. Crystal structure prediction with the supramolecular synthon approach: Experimental structures of 2-amino-4-ethylphenol and 3-amino-2-naphthol and comparison with prediction, Archan Dey, **Narendra Nath Pati** and Gautam R. Desiraju, ***CrystEngComm,*** **2006**, *8*, 751-755 (https://doi.org/10.1039/B609101F).

RESEARCH WORK PRESENTATIONS:

1. Poster presentation on "**calix[4]phycene: An efficient host for dihydrogen phosphate anions**", 12thCRSINational symposium in Chemistry, February 5-7th **2010**, Indian Institute of Chemical Technology (IICT), Hyderabad, India.
2. Oral presentation on **"Unsymmetrically Substituted Porphycene- A New Direction"**, 13th Annual In-House Symposium of the School of Chemistry, ChemFest, 18-19th March, **2016**, University of Hyderabad, India.
3. Poster presentation on "**β-Hexaalkylporphycenes: Positional effect of alkyl groups towards design and control of structural and photophysical properties in isomeric**

hexaethylporphycenes", 20th CRSI National symposium in Chemistry, February 2-5th **2017**, Gauhati University, India.

4. Oral and poster presentation on "**non-planar chromatographically isolated octaalkylporphycene isomers with distinct structural and electronic properties including two photon absorption",** 17th Annual In-House Symposium of the School of Chemistry, ChemFest2020, 27-28th February **2020**, University of Hyderabad, India.
5. Oral presentation on **"Positional effect, unsymmetrical substitution and alteration of symmetry: a nature influenced avenue to understanding the porphycene system towards better applications**", 11th International Conference on Porphyrins and Phthalocyanines, 28th June -3rd July, **2021**, ICPP-SPP, USA.

AWARDS AND HONORS:

1. Qualified **CSIR**-Junior Research Fellowship (**JRF-2005)** and Senior Research Fellowship (**SRF-2007**) and secure place among the **top 20%** and invited for **Shyama Prasad Mukherjee Fellowship (SPM)** test on 2005 test conducted by Joint Council of Scientific and Industrial Research (CSIR)-University Grants Commission (UGC) National Eligibility Test (NET), India in **December 2004**.
2. Qualified Graduate Aptitude Test Engineering (**GATE)-2004** with all India **rank 186**, conducted by Indian Institute of Technology, Delhi, on behalf of the Department of Secondary and Higher Education, Ministry of Human Resource Development (MHRD), Government of India.