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BIOGRAPHY

Dr. Joydev Laha started his independent research career at NIPER S.A.S. Nagar since July 2011. Prior to joining the NIPER, Dr. Laha was employed on a permanent position in the Laboratory for Drug Discovery in Neurodegeneration (LDDN) at Harvard Medical School. Dr. Laha obtained a Ph.D. degree in organic chemistry from the National Chemical Laboratory at Pune under the mentorship of Dr. Ganesh Pandey. He acquired a total of about five years of postdoctoral research experiences in synthetic organic chemistry and medicinal chemistry at the North Carolina State University and Mayo Clinic in the United States. Dr. Laha has versatile research experiences including target-driven methodology development in organic synthesis, natural product synthesis, and medicinal chemistry research directed to structure-based drug discovery. He is author or co-author of twenty-two papers published in peer-reviewed

international journals and has two US Patents to his credit. He has been serving referee to the *Royal Society of Chemistry* journals since 2008. He has delivered lectures in national American Chemical Society meetings.

RESEARCH INTEREST

- **Development of new synthetic methodology:** Metal-catalyzed decarboxylative intramolecular C-C bond formation, Domino reactions involving C-C and C-N bond formation, Asymmetric organo-catalysis, Green chemistry, Click chemistry, Implementation of laboratory methods to large-scale synthesis
- **Target-driven convergent synthesis:** Design and synthesis of novel fluorescent probes and photosensitizers for applications in photodynamic therapy (PDT) and photodynamic anti-bacterial chemotherapy (PACT), ligands for use as nicotinic acetylcholine receptors, small molecule inhibitors of HIV
- **Natural product synthesis:** Agesamides A & B, Mescengricin and other biologically active compounds.

POSITIONS AVAILABLE

The lab is looking for highly motivated students with a desire to pursue Ph.D. program at NIPER S.A.S. Nagar. Please contact me at jlaha@niper.ac.in for consideration.

CURRICULUM VITAE

EDUCATION

- Doctor of Philosophy (Ph.D.) in Chemistry (February 1995-September 2001): University of Pune, India (conducted research at the National Chemical Laboratory, Pune); Mentor: Dr. Ganesh Pandey
- Master of Science (M. Sc.) in Chemistry (September 1991-December 1993): Visva-Bharati University, Santiniketan, West Bengal, India
- Bachelor of Science (B. Sc.) in Chemistry (September 1987-December 1990): Vidyasagar University, West Midnapur, West Bengal, India

PROFESSIONAL EXPERIENCE

Staff Chemist (March 2007-July 2011): Laboratory for Drug Discovery in Neurodegeneration, Harvard NeuroDiscovery Center, Brigham & Women's Hospital and Harvard Medical School, Cambridge, MA

- Lead-optimization of Cdk5/p25 kinase inhibitor
- Lead-discovery for short-acting general anesthesia

- Discovery of an alternate lead for the inhibition of bone morphogenetic protein (BMP) signaling pathway
- Synthesis of nitrogen-containing fused heterocycles with defined stereochemistry by Mitsunobu alkylation followed by palladium-mediated intramolecular cyclization
- One-pot synthesis of α -carboline (pyrido[2,3-*b*]indoles) by sequential palladium-catalyzed aryl amination and intramolecular arylation
- A general route to the synthesis of carboline by photostimulated cyclization of anilinothalopyridines
- Tetrabutyl ammonium fluoride assisted high yielding synthesis of tetrazolo[1,5-*a*]pyridines

Senior Research Fellow (February 2006-March 2007): Mayo Clinic, Rochester, MN

- Working experience with small molecule inhibitors of the zinc endopeptidase of *Botulinum* neurotoxin serotype A
- Synthesis of 1,9-pyrazoloanthrone derivatives as c-Jun N-terminal kinase (JNK) inhibitors

Postdoctoral Research Fellow (November 2001-September 2004) and Postdoctoral Research Associate (October 2004-February 2006): North Carolina State University, Raleigh, NC

- Design, synthesis and study of spectroscopic properties of chlorins (tetra-pyrrolic macrocycles) as photosensitizers for applications in photodynamic therapy
- Study of the reaction kinetics of acid-catalyzed condensation of pyrroles and aldehydes, and subsequent development of a robust and cost-effective scalable synthesis of dipyrromethanes
- Synthesis of various novel pyrrole intermediates including BODIPY dyes
- Creative solutions to the synthetic problems including tin-complexation strategy in the formylation and acylation of pyrroles, Michael addition of nitroethyl pyrroles using CsF, selective deprotection of tosyl group in the presence of TIPS group
- Functionalization of chlorins using various palladium-coupling reactions including a novel intramolecular α -arylation of a ketone on chlorin and measurement of their fluorescence quantum yields

Junior Research Fellow (February 1995-January 1997), Senior Research Fellow (February 1997-January 2000) and Sr. Project Assistant (February 2000-September 2001): National Chemical Laboratory, Pune, India

- A general approach to the asymmetric synthesis of bridge-head azabicyclic compounds containing a pyrrolidine ring that have strong binding affinity towards the nicotinic acetylcholine receptors
- Synthesis of conformationally constrained azabicyclic amino acids for application in peptidomimetics research

- Natural product synthesis: Epibatidine (enantioselective formal synthesis) and Tropinone
- Stereospecific synthesis of tropane compounds by 1,3-dipolar cycloaddition of cyclic azomethine ylides with a chiral or racemic dipolarophile: Facial route to cocaine antagonists
- Camphorsultam auxiliary controlled asymmetric 1,3-dipolar cycloaddition of cyclic azomethine ylides leading to indolizidine and pyrrolizidine skeletons

Research Assistant (January 1994-January 1995), Indian School of Mines, Dhanbad, India

- Carried out undergraduate research on clay-catalyzed organic synthesis

Bachelor of Education (B. Ed.) (February 1991-August 1991): Vidyasagar University, Midnapur, West Bengal, India

- Teaching experience with high school students

AWARDS & FELLOWSHIPS

- Best composition award: “Large-Scale Synthesis of a Meso-Substituted Dipyrromethane; 5-Phenyldipyrromethane” SyntheticPages, 2006: 248 (<http://www.syntheticpages.org/pages/248>)
- Awarded CSIR (Council of Scientific & Industrial Research, New Delhi, India) research fellowship for graduate studies from February 1995-January 2000
- Qualified GATE (Graduate Aptitude Test in Engineering, a National Level Test for graduate research fellowship) in December 1993 with 91.77 percentile
- Awarded National Scholarship in class 10th standard
- Prize for ranking 2nd in Madhyamik Examination within the school

HONORS & ACHIEVEMENTS

- Delivered lectures (oral presentations) in national American Chemical Society meetings
- Serving referee to the *Royal Society of Chemistry Journals*
- Biography listed in Marquis Who’s Who in the World 27th Edition 2010

PROFESSIONAL AFFILIATIONS

- Visiting Scientist, LDDN, Harvard Medical School since August 2011
- Member, American Chemical Society
- Member, International Union of Pure and Applied Chemistry (IUPAC)

THESIS

- **Laha, J. K.** “Asymmetric [3+2]-Cycloaddition of Azomethine Ylides: Application to the Synthesis of Natural Products”, Ph.D. Thesis. University of Pune, India, 2001 (dspace.ncl.res.in/dspace/bitstream/2048/71/1/th1282.pdf)

PUBLICATIONS

1. Pandey, G.; **Laha J. K.**; Mohonakrishnan A. K. “[3+2]-Cycloaddition of Non-stabilized Azomethine Ylides, Part 9[#]: A General Approach for the Construction of X-Azabicyclo[m.2.1]alkanes in Optically Pure form by Asymmetric 1,3-Dipolar Cycloaddition Reactions” *Tetrahedron Lett.* **1999**; *40*: 6065–6068. Times cited: 23, Impact Factor: 2.618
2. Pandey, G.; **Laha J. K.**; Lakshmaiah G. “Stereoselective Construction of X-Azabicyclo[m.2.1]alkanes by [3+2]-Cycloaddition of Non-stabilized Cyclic Azomethine Ylides: Synthesis of Enantiopure Constrained Amino Acids and Formal Total Synthesis of Optically Active Epibatidine” *Tetrahedron* **2002**; *58*: 3525–3534. Times cited: 22, Impact Factor: 3.011
3. **Laha, J. K.**; Dhanalekshmi, S.; Taniguchi, M.; Ambroise, A.; Lindsey, J. S. “A Scalable Synthesis of Meso-Substituted Dipyrrromethanes” *Org. Process Res. Dev.* **2003**; *7*: 799–812. Times cited: 120, Impact Factor: 2.207 (**Recognized as the most cited article**)
4. Carcel, C. M.; **Laha, J. K.**; Loewe, R. S.; Thamyongkit, P.; Schweikart, K-H.; Misra, V.; Bocian, D. F.; Lindsey, J. S. “Porphyrin Architectures Tailored for Studies of Molecular Information Storage” *J. Org. Chem.* **2004**; *69*: 6739–6750. Times cited: 24, Impact Factor: 4.002
5. Yasseri, A. A.; Syomin, D.; Loewe, R. S.; **Laha, J. K.**; Lindsey, J. S.; Zaera, F.; Bocian, D. F. “Structural and Electron-Transfer Characteristics of O-, S-, and Se-Tethered Porphyrin Monolayers on Si(100)” *J. Am. Chem. Soc.* **2005**; *127*: 9308 (Addition/Correction to *J. Am. Chem. Soc.* **2004**; *126*: 15603–15612). Times cited: 34, Impact Factor: 9.019
6. **Laha, J. K.**; Muthiah, C.; Taniguchi, M.; McDowell, B. C.; Ptaszek, M.; Lindsey, J. S. “Synthetic Chlorins Bearing Auxochromes at the 3- and/or 13-Positions” *J. Org. Chem.* **2006**; *71*: 4092–4102. Times cited: 29, Impact Factor: 4.002
7. **Laha, J. K.**; Muthiah, C.; Taniguchi, M.; Lindsey, J. S. “A New Route for Installing the Isocyclic Ring on Chlorins Yielding 13¹-Oxophorbines” *J. Org. Chem.* **2006**; *71*: 7049–7052. Times cited: 18, Impact Factor: 4.002
8. Kim, H.-J.; **Laha, J. K.**; McDowell, B. E.; Muthiah, C.; Ptaszek, M.; Taniguchi, M.; Fan, D.; Lindsey, J. S. “Synthetic Routes to Stable, Tailorable hydroporphyrins” *J. Porphyrins Phthalocyanines* **2006**; *10*: 334. Times cited: none, Impact Factor: 1.189
9. Kee, L. H.; Kirmaier, C.; Tang, Q.; Diers, J. R.; Muthiah, C.; Taniguchi, M.; **Laha, J. K.**; Ptaszek, M.; Lindsey, J. S.; Bocian, D. F.; Holten, D. “Effects of Substituents on Synthetic Analogs of Chlorophylls: Synthesis, Vibrational Properties and Excited-state Decay Characteristics” *Photochem. Photobiol.* **2007**; *83*: 1110–1124. Times cited: 12, Impact Factor: 2.679
10. Kee, L. H.; Kirmaier, C.; Tang, Q.; Diers, J. R.; Muthiah, C.; Taniguchi, M.; **Laha, J. K.**; Ptaszek, M.; Lindsey, J. S.; Bocian, D. F.; Holten, D. “Effects of Substituents on Synthetic

Analogs of Chlorophylls: Redox Properties, Optical Spectra and Electronic Structure” *Photochem. Photobiol.* **2007**, *83*: 1125–1143. Times cited: 9, Impact Factor: 2.679

11. **Laha, J. K.*** “Excellent Exo/endo-selectivity in the 1,3-Dipolar Cycloaddition of Cyclic Azomethine Ylide: Exploring the Facile Investigation of Cocaine Antagonists” *Lett. Org. Chem.* **2007**, *4*: 550–552. Times cited: 2, Impact Factor: 0.785
12. **Laha, J. K.***; Bhaumik, J. “Further Developments of the Chemistry of 1,3-Dipolar Cycloaddition Reactions Involving Porphyrins” *Chemtracts: Org. Chem.* **2007**, *20*: 9–13. Times cited: none, Impact Factor: Not available
13. **Laha, J. K.*** “Improved Procedure for the Synthesis of (2*R*)-*N*-propenoylbornane-2,10-sultam” *Org. Prep. Proced. Int.* **2008**, *40*, 209–212. Times cited: 1, Impact Factor: 1.232
14. Cuny, G. D.; Yu, P. B.; **Laha, J. K.**; Xing, X.; Liu, J-F.; Lai, C. S.; Deng, D. Y.; Sachidanandan, C.; Bloch, K. D.; Peterson, R. T. “Structure-activity Relationship Study of Bone Morphogenetic Protein (BMP) Signaling Inhibitors” *Bioorg. Med. Chem. Lett.* **2008**, *18*, 4388–4392. Times cited: 4, Impact Factor: 2.661
15. **Laha, J. K.**; Cuny, G. D. “Synthesis of Tetrazolo[1,5-*a*]pyridines Utilizing Trimethylsilyl azide and Tetrabutylammonium fluoride hydrate” *Synthesis* **2008**, 4002–4006. Times cited: 1, Impact Factor: 2.447
16. **Laha, J. K.**; Petrou, P.; Cuny, G. D. “One-pot Synthesis of alpha-Carbolines via Sequential Palladium-catalyzed Aryl Amination and Intramolecular Arylation” *J. Org. Chem.* **2009**; *74*: 3152–3155. Times cited: 1, Impact Factor: 4.002
17. **Laha, J. K.*** "Total Synthesis of Tropinone Using 1,3-Dipolar Cycloaddition of Cyclic Azomethine Ylide and Phenyl vinyl sulfone as the Key Step" *Chem. Nat. Compd.* **2010**, *46*, 254–256. Times cited: N/A, Impact Factor: 0.468
18. Cotten, J. F.; Forman, S. A.; **Laha, J. K.**; Cuny, G. D.; Husain, S. S.; Miller, K. W.; Nguyen, H. H.; Kelly, E. W.; Stewart, D.; Liu, A.; Raines, D. E. “Carboetomidate: A Pyrrole Analogue of Etomidate Designed Not To Suppress Adrenocortical Function” *Anesthesiology* **2010**, *112*, 637–644. Times cited: N/A, Impact Factor: 5.124
19. **Laha, J. K.**; Zhang, X.; Qiao, L.; Liu, M.; Chatterjee, S.; Robinson, S.; Kenneth, S. K.; Cuny, G. D. “Structure-activity Relationship Study of 2,4-Diaminothiazoles as Cdk5/p25 Kinase Inhibitors” *Bioorg. Med. Chem. Lett.* **2011**, *21*, 2098–2011. Times cited: None, Impact Factor: 2.661
20. **Laha, J. K.**; Barolo, S. M.; Rossi, R.; Cuny, G. D. Synthesis of Carbolines by Photostimulated Cyclization of Anilinothalopyridines *J. Org. Chem.* **2011**, *76*, 6421–6425. Times cited: None, Impact Factor: 4.002
21. Ervin Pejo, Joseph F. Cotton, Elizabeth W. Kelly, Ri Le Ge, Gregory D. Cuny, Joydev K. Laha, Jifeng Liu, Douglas E. Raines In Vivo and In Vitro Pharmacological Studies of Methoxycarbonyl-carboetomidate *Anesthesia & Analgesia* **2011** (in press). Times cited: N/A, Impact Factor: 3.30

22. **Laha, J. K.**; Watkins, A. G.; Cuny, G. D. "Synthesis of Nitrogen-containing Fused Heteroaromatics with Defined Stereochemistry by Mitsunobu Alkylation and Palladium-catalyzed Intramolecular Arylation" *J. Org. Chem.* (revised manuscript submitted)
23. **Laha, J. K.**; Cuny, G. D. "Synthetic Approaches to alpha-Carbolines" *J. Heterocycl. Chem.* (invited review article)

(*As corresponding author)

PATENTS

24. Lindsey, J. S.; Dhanalekshmi, S.; **Laha, J. K.**; Taniguchi, M. "Scalable synthesis of dipyrromethanes" US Patent 7022862, April 4, 2006. Times cited: 2
25. Lindsey, J. S.; **Laha, J. K.**; Muthiah, C.; Borbas, K. E. "Synthesis of chlorins and phorbins with enhanced red spectral features for use in photodynamic therapy or in solar cells" USPTO 60/740,924; Filed on November 30, 2005. Times cited: 1

PRESENTATIONS IN NATIONAL MEETING/CONFERENCES

- **Laha, J. K.**; Lindsey, J. S. "Synthesis of 13-acetylchlorins: Simple models for chlorophylls" *Poster Presentation*, 229th ACS National Meeting, San Diego, CA, United States, March 13-17, 2005 (2005), ORGN-546.
- Chinnasamy, M.; **Laha, J. K.**; Taniguchi, M.; Lindsey, J. S. "A new synthesis of 13¹-oxophorbins, simple mimics of chlorophyll" *Poster Presentation*, 232nd ACS National Meeting, San Francisco, CA, United States, Sept. 10-14, 2006 (2006), ORGN-551.
- Kim, H.-J.; **Laha, J. K.**; McDowell, B. E.; Muthiah, C.; Ptaszek, M.; Taniguchi, M.; Fan, D.; Lindsey, J. S. "Synthetic Routes to Stable, Tailorable hydroporphyrins" *J. Porphyrins Phthalocyanines* **2006**; *10*: 334.
- Kee, L. H.; Kirmaier, C.; Tang, Q.; Diers, J. R.; Muthiah, C.; Taniguchi, M.; **Laha, J. K.**; Ptaszek, M.; Lindsey, J. S.; Bocian, D. F.; Holten, D. "Effects of substituents on synthetic analogs of chlorophylls" *Poster Presentation*, 234th ACS National Meeting, Boston, MA, United States, August 19-23, 2007 (2007), PHYS-515.
- **Laha, J. K.**; Petrou, P.; Cuny, G. D. "One-pot synthesis of alpha-carbolines via palladium-catalyzed aryl amination and intramolecular Heck reaction" *Oral Presentation*, 237th ACS National Meeting, Salt Lake City, UT, United States, March 22-26, 2009.
- **Laha, J. K.**; Cuny, G. D. "Synthesis of Nitrogen-containing Fused Heterocycles with Defined Stereochemistry by Mitsunobu Alkylation Followed by Palladium-catalyzed Cyclization" *Oral Presentation*, 36th Northeast Regional Meeting (NERM), Hartford, CT, United States, October 7-10, 2009.
- **Laha, J. K.**; Barolo, S. M.; Rossi, R.; Cuny, G. D. "General method for the synthesis of alpha-, beta-, gamma- and delta-carbolines by photo-induced intramolecular arylation of anilidopyridines" *Oral Presentation*, 241st ACS National Meeting, Anaheim, CA, United States, March 27-31, 2011.