



Dr. Joydev Kumar Laha

Assistant Professor

Department of Pharmaceutical Technology
(Process Chemistry)

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Professional Experience

- July 2011 to present: Assistant Professor, NIPER S.A.S. Nagar
- Mar 2007 to Jul 2011: Staff Chemist, The Laboratory for Drug Discovery in Neurodegeneration, Brigham & Women's Hospital and Harvard Medical School
- Feb 2006 to Mar 2007: Senior Research Fellow, Mayo Clinic, Rochester, United States

Post-doctoral and Doctoral Experience

- 1996 to 2001 : National Chemical Laboratory, Pune
(Research supervisor: Dr. Ganesh Pandey)
- 2001 to 2006 : Postdoctoral Fellow, North Carolina State University, Raleigh, United States

Teaching

- **M. Tech. courses:** Synthetic aspects of Process Chemistry (PT-560), Synthetic bulk drug technology (PT-630)
- **Ph.D. course:** Technologies for green Chemistry (PT-710)

Research Interest

- **Development of new synthetic methodology:** Domino reactions involving C-C and C-X bond formation, decarboxylative C-C and C-X bond formation, C-H bond activation, transition-metal-free reaction for the synthesis of N-fused heterocycles
- **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.
- **Novel Process Development for the synthesis of generic drugs and drug intermediates (APIs)**

Research Grant Availed

Title	Funding agency	Cost
Development of Metal-Catalyzed Domino Reactions for the Synthesis of Biaryls Containing Five to Eight Member Ring and its applications in the Synthesis of Active Pharmaceutical Ingredients (API) and Natural Products	Council of Scientific and Industrial Research (CSIR), Govt. of India, New Delhi, (Ongoing)	Rs. 20 lakhs
Development of Metal-catalyzed Domino Synthesis of Azafluorenes and its Applications in the Synthesis of Compounds Potential as Aromatase Inhibitors, Natural product, and in the Discovery of New Amine Protecting Group	Department of Science and Technology (DST), New Delhi, (Ongoing)	Rs. 50 lakhs

Our Group Activities

- Electronic Research update (Every Wednesday)
- Weekly departmental seminar (Chem-Sem) (Every Thursday)
- Group meetings (Every Wednesday)

Ph.D. Student Awarded the Degree

Dr. Neetu Dayal

Thesis: "Convergent synthesis of tricyclic fused nitrogen heterocycles via palladium-catalyzed mono C(sp²)-H/double C(sp²)-H functionalization strategies"

Current position: **Postdoctoral Associate with Prof. Herman Sintim, Purdue University, United States.**

Dr. K. Satyanarayana T.

Thesis: "Convergent synthesis of fused nitrogen heterocycles via palladium-catalyzed domino and transition metal-free oxidative reactions"

Current position: **Postdoctoral Associate with Prof. Jon Antilla, Tianjin University, China**

Ph.D. Students



Krupal P. Jethava

Joined the group with NIPER fellowship
In 2013



Rohan A. Bhimpuria

Joined the group with UGC fellowship
In 2014



Shubhra Sharma

Joined the group with NIPER fellowship
In 2014



Ketul V. Patel

Joined the group with DST project
fellowship In 2014



Bharat Dwivedee

Joined the group with NIPER fellowship
In 2013



Seema Kirar

Joined the group with DBT
fellowship in 2014



Technical Assistant
Ms. V. S. Negi

Master Student Guiding Currently : 07

Total Master Student Guided : 24

Master's Degree Students

Current - M. Tech. (Pharm.) Batch 2015-'17

Sheetal Sharma

Vanya Vashisht

Ganesh Solanke

Surabhi Panday

Aitha Manoj Kumar

Mukul Jain

Gajanan Mule

M. Tech. (Pharm.) Batch 2014-'16

Sagarkumar Patel (PhD, NIPER-Ahmedabad)

Mandeepkaur

Misha Sharma (Novartis, Hyderabad)

Ramateja (Reckitt Benckiser, Gurgoan)

Shruti Sharma

Gurudatt Dubey (PhD, NIPER-S.A.S. Nagar)

M. Tech. (Pharm.) Batch 2013-'15

Akshay Nair (PhD, IIT-Bombay)

Atithi Arya (Novartis, Hyderabad)

Dilip Prajapati (entiss Pharma, Gurgoan)

Nidhi Patel (Torrent Pharma. Ahmedabad)

Urvashi Jawharani

M. Tech. (Pharm.) Batch 2012-'14

Ketul Patel (PhD, JKL group, NIPER-S.A.S. Nagar)

Anuja Jain (Assistant Professor, Jabalpur)

Kartavya Balat (Intas Pharmaceuticals, Ahmedabad)

Roli Jain (Emcure Pharma. Ltd. Pune)

Bhaskar Singh Rathore (Drug Inspector)

Gitanjali Madan

Manoj Kadam (Panacea Biotech, Mumbai)

Lekshmi Vijay

Sumant Kumar Bhaskar

M. Tech. (Pharm.) Batch 2011-'13

Pooja Shah (Lupin Pharma)

Shivanand Kaurav (Stellarix Consultancy Services)

Rohan Bhimpuria (PhD, JKL group, NIPER)

Swati Singh (Parexel, Chandigarh)

Peer-Reviewed Publications

(As an independent faculty member)

16. Laha, J. K.; Patel, K. V.; Tummalapalli, K. S. S.; Dayal, N., "Formation of Amides, their Intramolecular Reactions to the Synthesis of N-heterocycles, and Preparation of a Marketed Drug, Sildenafil: A Comprehensive Coverage" *Chem. Comm.*, 2016, 52, 10245-10248. [Impact factor: 6.56]
15. Laha, J. K.; Bhimpuria, R. A.; Prajapati, D. V.; Dayal, N.; Sharma, S., "Palladium-catalyzed regioselective C-2 arylation of 7-azaindoles, indoles and pyrroles with arenes" *Chem. Commun.*, 2016, 52, 4329-4332. [Impact factor: 6.56]
14. Laha, J. K.; Tummalapalli, K. S. S.; Jethava, K. P. "Implications of dynamic imine chemistry to the sustainable synthesis of nitrogen heterocycles via transimination followed by intramolecular cyclisation" *Org. Biomol. Chem.*, 2016, 14, 2473-2479. [Impact factor: 3.56]
13. Bhaumik, J.; Gitanjali, G.; Kirar, S.; Vijay L.; Thakur S. N.; Banerjee, U. C.; Laha, J. K., "Bioinspired Nanophotosensitizers: Sythesis and Characterization of Porphyrin-Noble Metal Nanoparticle Conjugates" *New J. Chem.*, 2016, 724-731. [Impact factor: 3.27]
12. Laha, J. K.; Jethava, K. P.; Patel, S. "Scope of Successive C-H Functionalizations of the Methyl Group in 3-Picolines: Intramolecular Carbonylation of Arenes to the Metal-free Synthesis of 4-Azafluorenones" *Org. Lett.*, 2015, 17, 5890–5893 [Impact factor: 6.36]
11. Laha, J. K.; Sharma, S.; Dayal, N. "Palladium-Catalyzed Regio- and Chemoselective Reactions of 2-Bromobenzyl Bromides: Expanding the Scope for the Synthesis of Biaryls Fused to a Seven-Membered Sultam" *Eur. J. Org. Chem.* 2015, 36, 7885–7891 [Impact factor: 3.06]
10. Laha, J. K.; Tummalapalli, K. S. S.; Nair, A.; Patel, N. "Sulfate Radical Anion ($SO_4^{\cdot-}$) Mediated C(sp³)-H Nitrogenation/Oxygenation in N-Aryl Benzylic Amines Expanded the Scope for the Synthesis of Benzamidine/oxazine Heterocycles" *J. Org. Chem.* 2015, 80, 11351–11359 [Impact factor: 4.72]
9. Laha, J. K.; Dayal, N.; "A Tandem Approach to Functionalized Carbazoles from Indoles via Two Successive Regioselective Oxidative Heck Reactions Followed by Thermal Electrocyclization" *Org. Lett.* 2015, 17, 4742–4745. [Impact factor: 6.36]

8. Laha, J. K.; Dayal, N.; Jethava, K. P.; Prajapati, D. V. "Access to Biaryl Sulfonamides by Palladium-Catalyzed Intramolecular Oxidative Coupling and Subsequent Nucleophilic Ring Opening of Heterobiaryl Sultams with Amines" *Org. Lett.* 2015, 17, 1296–1299. [Impact factor: 6.36]
7. Laha, J. K.; Dayal, N.; Jain, R.; Patel, K. "Palladium-Catalyzed Regiocontrolled Domino Synthesis of N-Sulfonyl Dihydrophenanthridines and Dihydrodibenzo[*c,e*]azepines: Control over the Formation of Biaryl Sultams in the Intramolecular Direct Arylation" *J. Org. Chem.* 2014, 79, 10899–10907. [Impact factor: 4.72]
6. Laha, J. K.; Jethava, K. P.; Dayal, N. "Palladium-Catalyzed Intramolecular Oxidative Coupling Involving Double C(sp²)-H Bonds for the Synthesis of Annulated Biaryl Sultams" *J. Org. Chem.* 2014, 79, 8010–8019. [Impact factor: 4.72]
5. Laha, J. K.; Tummalapalli, K. S. S.; Gupta, A. "Transition-Metal-Free Tandem Oxidative Removal of Benzylic Methylene Group by C–C and C–N Bond Cleavage Followed by Intramolecular New Aryl C–N Bond Formation under Radical Conditions" *Org. Lett.*, 2014, 16, 4392–4395. [Impact factor: 6.36]
4. Laha, J. K.; Dayal, N.; Singh, S.; Bhimpuria, R. "Dual Catalysis in Domino N-Benylation/Intramolecular C–H Arylation: Regio- and Chemoselective Synthesis of Annelated Nitrogen Heterocycles" *Eur. J. Org. Chem.* 2014, 5469–5475. [Impact factor: 3.06]
3. Laha, J. K.; Tummalapalli, K. S. S.; Gupta, A. "Mechanistic Insights into the Palladium-Catalyzed Domino Synthesis of 10,11-Dihydro-5H-dibenzo[*b,e*][1,4]diazepines" *Eur. J. Org. Chem.* 2014, 4773–4779. [Impact factor: 3.06]
2. Laha, J. K.; Tummalapalli, K. S. S.; Gupta, A. "Palladium-Catalyzed Domino Double N-Arylations (Inter- and Intramolecular) of 1,2-Diamino(hetero)arenes with *o,o'*-Dihalo(hetero)arenes for the Synthesis of Phenazines and Pyridoquinoxalines" *Eur. J. Org. Chem.* 2013, 8330–8335. [Impact factor: 3.06]
1. Laha, J. K.; Shah, P. U.; Jethava, K. P. "Palladium-Catalyzed Regio- and Chemoselective *ortho*-Benzylation of C–H Bond using a Functionalizable Primary Amide Directing Group: a Concise

Synthesis of Dibenzo[b,e]azepin-6-ones” *Chem Commun.* 2013, 49, 7623-7625. [Impact factor: 6.83].

(In association with a group/Prior to join NIPER)

1. Zhang, X.; Hernandez, Rei, D.; Mair, W.; Laha, J. K.; Cornwell, M. E.; Cuny, G. D.; Tsai, L-H.; Steen, J. A. J.; Kosik, K. S. “Diaminothiazoles Modify Tau Phosphorylation and Improve the Tauopathy in Mouse Models” *J. Biol. Chem.* 2013, 288, 22042–22056. [Impact factor: 4.57]
2. Ervin Pejo, Cotten, J. F.; Elizabeth W. Kelly, Ri Le Ge, Cuny, G. D.; Laha, J. K.; Liu, J.; Raines, D. E. “In Vivo and In Vitro Pharmacological Studies of Methoxycarbonyl-carboetomidate” *Anesth Analg* 2012, 115, 294–304. [Impact factor: 3.47]
3. Laha, J. K.; Cuny, G. D. “Synthesis of Fused Imidazoles, Pyrroles, and Indoles with a Defined Stereocenter α to Nitrogen Utilizing Mitsunobu Alkylation followed by Palladium-Catalyzed Cyclization” *J. Org. Chem.* 2011, 76, 8477–8482. [Impact factor: 4.72]
4. Laha, J. K.; Zhang, X.; Qiao, L.; Liu, M.; Chaterjee. 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. [Impact factor: 2.42]
5. 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. [Impact factor: 4.72]
6. 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. [Impact factor: 0.50]
7. 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. [Impact factor: 5.87]
8. Laha, J. K.; Petrou, P.; Cuny, G. D. “One-pot Synthesis of α -Carbolines via Sequential Palladium-catalyzed Aryl Amination and Intramolecular Arylation” *J. Org. Chem.* 2009; 74, 3152–3155. [Impact factor: 4.72]
9. Laha, J. K.* “Improved Procedure for the Synthesis of (2*R*)-*N*-propenoylbornane-2,10-sultam” *Org. Prep. Proced. Int.* 2008, 40, 209–212. [Impact factor: 0.95]

10. 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. [Impact factor: 2.42]
11. Laha, J. K.; Cuny, G. D. "Synthesis of Tetrazolo[1,5-*a*]pyridines Utilizing Trimethylsilyl azide and Tetrabutylammonium fluoride hydrate" *Synthesis* 2008, 4002–4006. [Impact factor: 2.68]
12. 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. [Impact factor: 2.26]
13. 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. [Impact factor: 2.26]
14. 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. [Impact factor: 0.66]
15. 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. [Impact factor: 4.72]
16. 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. [Impact factor: 4.72]
17. Yasserli, 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). [Impact factor: 12.11]
18. Carcel, C. M.; Laha, J. K.; Loewe, R. S.; Thamyonkit, 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. [Impact factor: 4.72]
19. Laha, J. K.; Dhanalekshmi, S.; Taniguchi, M.; Ambroise, A.; Lindsey, J. S. "A Scalable Synthesis of Meso-Substituted Dipyrromethanes" *Org. Process Res. Dev.* 2003, 7, 799–812. [Impact factor: 2.52]
20. 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. [Impact factor: 2.64]

21. 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. [Impact factor: 2.37]

REVIEW/ COMMENTARIES/BOOK CHAPTERS

22. Bhaumik, J.; Kirar, S.; Laha, J. K. “Theranostic nanoconjugates of tetrapyrrolic macrocycles and their applications in photodynamic therapy”, Book chapter, Book Title: Redox-Active Therapeutics, 2015, Publisher: Springer.
23. Bhaumik, J. Bhimpuria, R. Shah, P. Kaurav, S., Singh, S., Laha, J. K. "Synthesis and Therapeutic Applications of 1,2,4-Triazoles" *CRIPS* 2012, 13, 22-28.
24. Laha, J. K.; Bhaumik, J. “Further Developments of the Chemistry of 1,3-Dipolar Cycloaddition Reactions Involving Porphyrins”; *Chemtracts-Organic Chemistry* 2007, 20, 9-13.
25. 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.
26. 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.

U.S. Patents approved/filed

Lindsey, J. S.; Dhanalekshmi, S.; Laha, J. K.; Taniguchi, M. “Scalable synthesis of dipyrromethanes” US Patent 7022862, April 4, 2006.

Lindsey, J. S.; Laha, J. K.; Muthiah, C.; Borbas, K. E. “Synthesis of chlorins and phorbines with enhanced red spectral features for use in photodynamic therapy or in solar cells” USPTO 60/740,924; Filed on November 30, 2005.