

Dr. Ravi Kumar

Assistant Professor,

Department of Medicinal Chemistry,

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**Education:**

Ph.D., Central Drug Research Institute, Lucknow, 2013 - 2017

Master of Science, University of Delhi, Delhi, 2010 - 2012 (Organic Chemistry as Major)

Bachelor of Science, University of Delhi, Delhi, 2006 – 2009 (Industrial Chemistry as Major)

Profession Experience:

January 2025- Assistant Professor, NIPER Mohali, SAS Nagar,

February 2022-Decemeber 2024, University of Bern, Switzerland

Worked for photoredox catalysis, radical chemistry, sustainable chemistry and synthetic method development.

November 2019-November 2021, Harbin Institute of Technology (HIT) Shenzhen, China

Worked in asymmetric allylic alkylation reaction under continuous flow chemistry (remotely from Jan 2020-due to COVID-19)

March 2018- Jun-2019, Scripps Research Institute, California, USA

Worked in the prebiotic aspects of origin of life.

Research Interest:

Development of the novel, improved, and practical synthetic methodologies for drug molecules development.

Synthesis of small to complex organic molecules of medicinal importance particularly for antibacterial and antitubercular diseases.

Development of new innovative, robust, and catalytic strategies promoted by light, electricity, and mechanical energy for promoting sustainable development.

Asymmetric synthesis, organometallic chemistry, organoboron chemistry and C-H activation approach to develop diverse library of small molecules for high throughput screening.

Publications:

1. A plausible prebiotic one-pot synthesis of orotate and pyruvate suggestive of common protometabolic pathways. Alyssa P Clay, Rachel E Cooke, **Ravi Kumar**, Mahipal Yadav, Ramanarayanan Krishnamurthy, Greg Springsteen. *Angew. Chem. Int. Ed.*, **2022**, 1-5 e202112572.
2. Transition-metal catalyzed asymmetric reactions under continuous flow from 2015 to early 2020. Jingyuan Liao, Shilong Zhang, Zesheng Wang, Xiao Song, Dongliang Zhang, **Ravi Kumar**, Jian Jin, Peng Ren, Hengzhi You, Fen-Er Chen. *Green Synthesis and Catalysis*, **1** (2), **121-133**.
3. Lewis Acid Catalyzed Decarboxylative Annulation of 2-Aminoindole-3-Carboxylate with Ynals Involving [3+2] Spirocycloaddition and 2,3-Aza Migration. **Ravi Kumar**, Manda Rajesh, Surendra Puri, Jagadeesh Babu Nanubolu and Maddi Sridhar Reddy. *Organic Letters*, **2020**, **22**, **3**, **1117-1123**.
4. The Chemistry of Abiotic Nucleotide Synthesis. Mahipal Yadav, **Ravi Kumar**, Ramanarayanan Krishnamurthy. *Chem. Rev.*, **2020**, **120**, **11**, **4766-4805**.
5. Synthesis of 2-Thioorotidine and Comparison of its Unusual Instability with its Canonical Pyrimidine Counterparts. **Ravi Kumar**, Greg Springsteen and Ramanarayanan Krishnamurthy. *J. Org. Chem.* **2019**, **84**, **22**, **14427-14435**.
6. Rh(III)-Catalyzed Intramolecular Oxidative Annulation of Propargyl Amino Phenyl Benzamides to Access Pyrido/ Isoquinolino Quinoxalinones. **Ravi Kumar**, Gurram Ravi Kumar, , Manda Rajesh, B. Sridhar and Maddi Sridhar Reddy. *Advance Synthesis and Catalysis*, **2019**, **361**, **4825**.
7. A Nickel-Catalysed anti-Carbometallative cyclization of alkyne-azide with organoboronic acids: Construction of 2,3-diaryl Quinolines. **Ravi Kumar**, Gadi Ranjit Kumar, Manda Rajesh and Maddi Sridhar Reddy. *Chemical Communication*, **2018**, **54**, **759-762**.
8. Silver-Mediated Direct C–H Cyanation of Terminal Alkynes with N-Isocyanoinotriphenylphosphorane. Hannan Wang, Pengbing Mi, Wanjun Zhao, **Ravi Kumar** and Xihe Bi. *Organic Letters*, **2017**, **19**, **5613-5616**.
9. A stereoselective thiocyanate conjugate addition to electron deficient alkynes and concomitant cyclization to N,S-heterocycles. Vikas Dwivedi, Manda Rajesh, **Ravi Kumar**, Ruchir Kant and Maddi Sridhar Reddy. *Chemical Communication*, **2017**, **53**, **11060-11063**.
10. Copper Promoted Regioselective Intermolecular Diamination of Ynamides: Synthesis of Imidazo[1,2-a]pyridines. Vikas Dwivedi, **Ravi Kumar**, Kavita Sharma and Maddi Sridhar Reddy. *ACS Omega*, **2017**, **2**, **2770-2777**.
11. Metal-Free Iodosulfonylation of Internal Alkynes: Stereodefined Access to Tetrasubstituted Olefins. **Ravi Kumar**, Vikas Dwivedi and Maddi Sridhar Reddy. *Advance Synthesis and Catalysis*, **2017**, **359**, **2847-2856**.
12. Cu-Catalyzed Iminative Hydroolefination of Unactivated Alkynes En route to 4-Imino-Tetrahydropyridines and 4-Aminopyridines. **Ravi Kumar**, Rajesh G. Gonnade and Maddi Sridhar Reddy. *Chemical Communication*, **2016**, **52**, **13475-13478**.
13. Diversity Oriented Synthesis of Indoloazepinobenzimidazole and Benzimidazotriazolo-benzodiazepine from N1-Alkyne-1,2-diamines. **Ravi Kumar**, Rajesh K. Arigela, Srinivas Samala and Bijoy Kundu. *Chem. Euro. J.*, **2015**, **21**, **18828-18833**.

14. Unprecedented Transformation of a Directing Group Generated In Situ and Its Application in the One-Pot Synthesis of 2-Alkenyl Benzonitriles. Ravi Kumar, Rajesh K. Arigela and Bijoy Kundu. *Chem. Euro. J.*, **2015**, **21**, 11807-11812. (Selected in Wiley's Hot Topics).
 15. Metal-Free Decarboxylative Cyclization/Ring Expansion: Construction of Five-, Six-, and Seven-Membered Heterocycles from 2-Alkynyl Benzaldehydes and Cyclic Amino Acids. Srinivas Samala, Gajendra Singh, Ravi Kumar, Ravi Sankar Ampapathi, and Bijoy Kundu, *Angew, Chem. Int. Ed.*, 2015, 54, 9564-9567.
 16. Synthetic modified pyrrolo[1,4] benzodiazepine molecules demonstrate selective anticancer activity by targeting the human ligase-1 enzyme: An in silico and in vitro mechanistic study. Mohammad Shameem, Ravi Kumar, Shagun Krishna, Chandan Kumar, Mohammad Imran Siddiqi, Bijoy Kundu and Dibyendu Banerjee. *Chemico-Biological Interactions*, **2015**, **237**, 115-124.
 17. One-Pot Synthesis of Highly Fluorescent Pyrido[1,2-a]indole Derivatives through C-H/N-H Activation: Photophysical Investigations and Application in Cell Imaging. Srinivas Samala, Pragyan Pallavi, Ravi Kumar, Rajesh K Arigela, Gajendra Singh, Ravi Sankar Ampapathi, Amulya Priya, Sunando Datta, Abhijit Patra, and Bijoy Kundu. *Chem. Euro. J.*, **2014**, **20**, 14344-14350.
 18. Ruthenium(II)-Catalyzed C-H Activation/C-N Bond Formation via in situ Generated Iminophosphorane as the Directing Group: Construction of Annulated Pyridin-2(1H)-ones. Rajesh K. Arigela, Ravi Kumar, Trapti Joshi, Rohit Mahar, and Bijoy Kundu. *RSC Advances* **2014**, **4**, 57749-57753.
 19. Diversity-Oriented Synthesis of Polycyclic Indoles: Brønsted or Lewis Acid Catalyzed Three-Component Reaction for the Synthesis of α -Carbolines and Pymidoindoles. Rajesh K. Arigela, Ravi Kumar, Srinivas Samala, Sahaj Gupta, and Bijoy Kundu. *Eur. J. Org. Chem.* **2014**, 6057–6066.
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Conferences and Symposia Attended

Participated in SCS Fall meetings for 2022 (University of Zurich), 2023 (University of Bern) and 2024 (University of Freiburg).

Participated in Bern Symposium on Radical Chemistry 2024, University of Bern, Switzerland.

Participated in Swiss Summer School on Organic Synthesis 2023.

Attended “Mini-Symposium on Organic Photocatalysis and Electrochemistry” December 2020.

Attended Online Symposium “Earth Abundant 3d Metal Catalysis” Beilstein Journal of Organic Chemistry Symposium 2020. Organized by Prof. Lutz Ackermann.

Attended Virtual Symposium on “Innovation in synthetic methodology through use of flow” by Prof. Timothy Noel in July 2020.

Participation and Poster presented in “Current Trends in Drug Discovery & Research” held at CSIR-Central Drug Research Institute 2016, Lucknow, India.

Participated and Poster Presented in “18th CRSI National Symposium in Chemistry” (CRSI-2016) held at Punjab University, 2016, Punjab, India.

Participated and Poster Presented in One Day Symposium on “Drug Discovery in India: Past, Present and Future” held at CSIR-Central Drug Research Institute 2015, Lucknow, India.