

# NISHA MITTAL

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## Summary

I am a highly motivated life science researcher with more than 8 years of experience in organic chemistry and multi-step small molecule synthesis. I have an active portfolio in many research projects and have a proven track record of problem solving, project management and strong communication and leadership skills.

## Professional Experience

**Postdoctoral Research:** Department of Pharmacology & Physiology, Rutgers University – New Jersey Medical School (July 2014–present) Advisor: **Professor Joel S. Freundlich**

- Design, synthesis, and biological assay of non- $\beta$ -lactam inhibitors of L,D- and D,D-transpeptidases in *Mtb*
- Plan and execute hit evolution of *Mtb* inhibitors of respiratory pathways
- Structure activity relationship study of various other antibacterial targets
- Synthesized and optimized synthetic route for a variety of prodrugs on several grams scale.

**Doctoral Research:** Department of Chemistry & Chemical Biology, Rutgers University, Piscataway, NJ (August, 2008–December, 2013) Advisor: **Professor Daniel Seidel**

- Developed new methods for **asymmetric organocatalysis**
- Utilized a novel dual catalysis/anion binding approach in the kinetic resolution of various classes of amines
- Designed highly effective nucleophilic and chiral hydrogen bonding catalysts
- Designed Brønsted acids with internally stabilized conjugate bases and applied them in catalytic enantioselective Povarov and Pictet-Spengler reactions

**Undergraduate Research:** Department of Metallurgy, IIT, Bombay (2005), Advisor: Professor A.S. Khanna

- Conducted research in corrosion control with practical training in corrosion rate measurement, oxidation rate measurement at higher temperatures, and determination of inhibitor efficiency

**Teaching Experience (TA):** Department of Chemistry & Chemical Biology, Rutgers University, Piscataway, NJ (2008– June 2014)

- Head TA for Honors Organic Chemistry (2012)
- Organic Chemistry Recitation Instructor (2010–2011)
- Organic Chemistry Lab (2008–2010)

**Leadership and Mentoring Experience:** Department of Chemistry & Chemical Biology, Rutgers University, Piscataway, NJ (2008–2013)

- Supervised and trained 5 high school and undergraduate students: Students were mainly from the **Aresty Research Program for Undergraduates** and **Research in Science and Engineering (RiSE)** for undergraduates

## Education

- **Ph.D.** Organic Chemistry (2013); Department of Chemistry & Chemical Biology, Rutgers University
- **M. Sc** Chemistry (2007); Department of Chemistry, *Delhi University, India*
- **MBA**, specialization (Marketing Management, 2007), *SCDL, Pune, India*
- **B.S.** Chemistry Major, Physics and Mathematics Minor (2005), *Delhi University, India*

## Skills

- **Laboratory:** Small molecule synthesis and isolation; structural identification of organic compounds, Enzyme Assays, SDS-PAGE, compound pull down assay, protein extraction from bacteria, MIC determination, High performance liquid chromatography (HPLC); Infrared spectroscopy (IR); Microwave chemistry; Liquid chromatography-mass spectroscopy (LCMS); Gas chromatography-mass spectroscopy (GCMS); 1D and 2D Nuclear magnetic resonance (NMR) spectroscopy; UV-Vis; Polarimetry

- **Computer:** Chem BioDraw, Electronic Notebook, SciFinder, Reaxys, Spinworks, Mestre nova, Adobe Photoshop, Microsoft Office

### Awards & Honors

- Nominated for Blavatnik award for young scientists, **2015**
- Reid Award for outstanding performance in doctoral research (**2012**)
- William Rieman Prize for outstanding performance as a teaching assistant (**2011**)
- Certificate of merit for securing highest grade in all three years in B.Sc (**2004–2005**)
- Shakuntala Chadha Memorial Prize for securing highest score in first and second year for B.Sc (Honors) in chemistry (**2003–2004**)

### Selected Publications (4 of 10)

- **Nisha Mittal**,<sup>‡</sup> Katharina M. Lippert,<sup>#</sup> Chandra Kanta De,<sup>‡</sup> Eric G. Klauber,<sup>‡</sup> Thomas J. Emge,<sup>‡</sup> Peter R. Schreiner\*<sup>#</sup> and Daniel Seidel\*<sup>‡</sup> "A Dual-Catalysis Approach to the Kinetic Resolution of Amines: Insights into the Mechanism via a Combined Computational and Experimental Study" *J. Am. Chem. Soc.*, **2015**, *137*, 5748.
- **Nisha Mittal**, Diana X. Sun and Daniel Seidel, "Conjugate-Base-Stabilized Chiral Brønsted Acids: Catalytic Enantioselective Pictet-Spengler Reactions with Unmodified Tryptamine" *Org. Lett.*, **2014**, *16*, 1012.
- Chang Min\*, **Nisha Mittal**\*, Diana X. Sun and Daniel Seidel, "Conjugate-Base-Stabilized Brønsted Acids as Asymmetric Catalysts: Enantioselective Povarov Reactions with Secondary Aromatic Amines" *Angew. Chem. Int. Ed.*, **2013**, *52*, 14084. ((Highlighted in SYNFACTS, January 2014), (\* Joint first-authors)
- **Nisha Mittal**, Diana X. Sun and Daniel Seidel, "Kinetic Resolution of Amines via Dual Catalysis: Remarkable Dependence of Selectivity on the Achiral Co-Catalyst" *Org. Lett.* **2012**, *14*, 3084.

### Patents

- "Antibacterial Agents: Arylpropenyl, Arylproprenoyl and Arylcyclopropionyl Phloroglucinols", Richard H. Ebright, Joel S. Freundlich, **Nisha Mittal** and Mark Jaskowski, U.S. provisional patent application no.: 62/265,881.

### Selected Presentations (2 of 4)

- "Conjugate-Base-Stabilized Chiral Brønsted Acids as Powerful Asymmetric Catalysts" **Nisha Mittal**, Chang Min, Diana X. Sun and Daniel Seidel. 247<sup>th</sup> ACS National Meeting, March **2014**, Dallas, TX. Poster Presentation
- "Catalytic Enantioselective Acyl Transfer Reactions." **Nisha Mittal**. Graduate award ceremony, Rutgers University, December **2012**