Satya Rama Krishna Boddu, Ph.D.

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PROFILE SUMMARY

- Skilled in both solid- and solution-phase peptide synthesis, with a focus on synthesizing short to medium-sized peptides, and macrocyclic compounds.
- Proven ability to develop advanced purification methods using chromatography for small molecules, glycopeptides, and synthetic peptide modalities.
- An innovator in designing and developing advanced synthetic methodologies for complex natural products, peptides, glycopeptides, and small molecules.
- Expertise in transition metal-catalyzed cross-coupling reactions, with proficiency in managing air- and moisture-sensitive organometallic reagents and transition metal complexes.
- Proven mentor, having guided and trained over 5 students toward success in scientific research.
- Experienced in developing scalable processes, leading teams, and pioneering innovative synthesis methods. Ready to drive purification process development and pharmaceutical innovation.

EXPERIENCE

Enhancing Stereoselectivity in Carbohydrate Chemistry
Wayne State University • Detroit, United States • 08/2022 — Present • Postdoctoral Fellow

- Experienced in the development of novel catalytic methodologies for the stereoselective synthesis of 1,2-cis furanosidic linkages, a key motif in biologically significant oligosaccharides and polysaccharides.
- Expertise extends to phenanthrolinium-catalyzed chemo selective glycopeptide synthesis, enabling controlled glycosylation under mild conditions.
- Strong background in reaction mechanism studies, catalyst design, and functional group compatibility to enhance stereoselectivity and efficiency.

Peptide Synthesis and Methodology Expert
Wayne State University • Detroit, United States • 09/2020 — 07/2022 • NIH Postdoctoral Fellow

- Developed a divergent approach for synthesizing Anabaenopeptin congeners via solid-phase peptide synthesis, enhancing the efficiency of purification in peptide production.
- Contributed to medicinal chemistry efforts by utilizing N-acyl urea in innovative N to C solid-phase peptide synthesis (SPPS), showcasing scientific leadership in cross-functional development projects.
- Collaborated with the Pohl group at Indiana University in optimizing the synthesis of o-amino amide derivatives using a novel flow method, supporting the purification of peptides and small molecules.

Metal-Catalyzed Reactions Expert
Indian Institute of Technology Kanpur • Kanpur, India • Graduate Student

- Developed Rh-catalyzed methodologies for selective aldehyde C-H functionalizations and decarbonylative couplings, enabling the synthesis of bioactive molecules.
- Conducted metal-catalyzed cross-coupling reactions (Rh, Pd, Cu) for C-C bond formation, facilitating heterocyclic scaffold synthesis.
- Strong expertise in transition-metal catalysis, regioselective transformations, and mechanistic studies.
- Designed and implemented convergent and divergent synthesis strategies, emphasizing green chemistry principles.
- Skilled in compound analysis, structural identification, and reaction pathway elucidation.

SKILLS

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Air and moisture sensitive reactions handling
Glove box and Schlenk line expertise
Multistep synthesis of carbohydrates
Solid Phase Peptide Synthesis (SPPS)
Solution Phase Peptide Synthesis
Managing multiple synthesis projects under tight deadlines

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Meticulous handling of instruments

Peptide synthesizers (Microwave, semi- and fully automated)
GC, GCMS, HPLC, LCMS, HRMS
Solvent purification system
Purification of small amount of liquids using Kugelrohr distillation

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Purification of organic compounds, carbohydrates, peptides and glycopeptides

Silica gel chromatography
Kugelrohr distillation
Preparative TLC
HPLC (Normal and reverse phase)

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Reaction Monitoring

Thin Layer Chromatography
Gas Chromatography (Coupled with Mass)
HPLC (Coupled with Mass)
^{1}H-NMR

**Qualitative and Quantitative
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Products and Intermediates analysis

1D and 2D NMR Techniques (Multi-nuclear)
HPLC Chirality Analysis
UV and IR analysis
Low Resolution and High-Resolution Mass Spectroscopy
Chemical Kinetics

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Handling, Training and Maintenance

GC, GCMS, HPLC and LC-MS System
Biotage Isolera+, Prelude Peptide Synthesizers
Flash Chromatography Systems
Solvent Purification System
Laboratory Safety Protocols

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<td colspan="2">Project Management: Team leadership, Project Planning, Lab Management, safety Compliance. Proven success in Delivering High-Quality results Under Tight Deadlines</td>
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EDUCATION

Doctor of Philosophy in Organic Chemistry
Indian Institute of Technology Kanpur • Kanpur, India • (GPA: 8.33)

- Rh-Catalyzed De Novo reactivity studies using salicylaldehyde motifs in organic synthesis.
- Synthesis of bioactive small molecules and the Taccabulin family of natural products.

M.Sc. in Organic Chemistry
Ideal College of Arts & Sciences (Andhra University) • Kakinada, India • (GPA: 7.9)

- Learned Basics of Practical Synthetic Organic Chemistry.

AWARDS

- NIH Postdoctoral Fellowship (2020-2022)
- Senior Research Fellowship (SRF) of CSIR, INDIA
- National Eligibility Test (NET) in Chemical Sciences for Junior Research Fellowship of CSIR, INDIA

VOLUNTEERING

- Peer Reviewer for the *Journal of Heterocyclic Chemistry* (2023−Present)
- Judge for the Graduate Research Symposium – 2024 & 2025 at Wayne State University

PUBLICATIONS

1. Shi, J. H.; Birbeck, J. A.; Olson, N. E.; Parham, R. L.; Holen, A. L.; Ledsky, I. R.; **Ramakrishna, B. S.**; Bilyeu, L.; Jacquemin, S. J.; Schmale, D. G.; Stockdill, J. L.; Westrick, J. A.*; Ault, A. P.* Detection of Aerosolized Anabaenopeptins from Cyanobacterial Harmful Algal Blooms in Atmospheric Particulate Matter. *ACS Earth Space Chem.* **2025**, *9*, 603–616.

2. Venneti, N. M.; **Ramakrishna, B. S.**; Harris, Z. K.; Kasmer, S. C.; Anderson, D. P.; Perino, N. J.; Westrick, J. A.; Stockdill, J. L.* Synthesis of Anabaenopeptins with a Strategic Eye Toward N-Terminal Sequence Diversity. *J. Pept. Sci.* **2025**, *31,* e70003.

3. **Ramakrishna, B. S.**; Rani, N.; Xu, H.; Alan-Lee, C.; Schlegel, H. B.; Nguyen, H.* Why Is Thiol Unexpectedly Less Reactive but More Selective Than Alcohol in Phenanthroline-Catalyzed 1,2-cis O- and S-Furanosylations?. *Org. Biomol. Chem.* **2025**, *23*, 328–342.

4. Zastepa, A.;* Westrick, J. A.; Liang, A.; Birbeck, J. A.; Furr, E.; Watson, C. L.; Stockdill, J. L.; **Ramakrishna, B. S.**; Crevecoeur, S. Broad Screening of Toxic and Bioactive Metabolites in Cyanobacterial and Harmful Algal Blooms in Lake of the Woods (Canada-USA), 2016-2019. *J. Great Lakes Res.* **2023***, 49,* 134–146.

5. Rao, M. L. N.*; **Ramakrishna, B. S.** Rh−Catalyzed Aldehydic C-H Alkynylation and Annulation. *Org. Biomol. Chem.* **2020**, *18*, 1402−1411.

6. Rao, M. L. N.*; **Ramakrishna, B. S.** Rh−Catalyzed Decarbonylative Addition of Salicylaldehydes with Vinyl Ketones: Synthesis of Taccabulins A−E. *Eur. J. Org. Chem.* **2019**, 7545−7554.

7. Rao, M. L. N.*; **Ramakrishna, B. S.**; Nand, S. Rh-Catalyzed Domino Synthesis of 4-Hydroxy-3-methylcoumarins via Branch-Selective Hydroacylation. *Org. Biomol. Chem.* **2019**, *17*, 9275−9279.

8. Rao, M. L. N.*; **Ramakrishna, B. S.** Rh−Catalyzed Deformylative Coupling of Salicylaldehydes with Acrylates and Acrylamides. *J. Org. Chem.* **2019**, *84*, 5677−5683.

9. Rao, M. L. N.*; **Ramakrishna, B. S.** Rhodium−Catalyzed Directing-Group-Assisted Aldehydic C-H Arylations with Aryl Halides. *Eur. J. Org. Chem.* **2017**, 5080−5093.

10. Rao, M. L. N.*; **Ramakrishna, B. S.** Rh-Catalyzed Direct Synthesis of 2,2'–Dihydroxybenzophenones and Xanthones. *RSC Adv.* **2016**, *6*, 75505–75511.

11. Rao, M. L. N.*; Dasgupta, P.; **Ramakrishna, B. S.** Murty, V. N. Domino Synthesis of 1,3-diynes from 1,1-Dibromoalkenes: A Pd-Catalyzed Copper-Free Coupling Method. *Tetrahedron Lett.* **2014**, *55*, 3529–3533.

Note: *Represents the Principal Investigator (PI)