Department of Chemistry

Achyut Ranjan Gogoi
5th Year PhD Candidate
achyutrgogoi@tamu.edu

Dear Hiring Team,

I am a Ph.D. candidate in Chemistry at Texas A&M University with over four years of experience at the intersection of organic synthesis, high-throughput experimentation, computational modeling, and mechanistic analysis. My research philosophy integrates innovative synthetic design with quantum chemical modeling and data-driven experimentation to address complex chemical challenges; an approach that has equipped me with the skills to contribute to both process chemistry projects and small molecule discovery projects in medicinal chemistry.

In graduate school, I have developed and optimized novel transition metal-catalyzed transformations, placing strong emphasis on mechanistic understanding, reaction design, and execution of challenging multistep syntheses. I have extensive hands-on experience with air-sensitive iron complexes and I am adept at troubleshooting synthetic pathways and characterizing complex intermediates and final products. This background has prepared me to contribute meaningfully to a collaborative drug discovery team, engage in cross-disciplinary problem solving, and help advance innovative small molecule programs as well as process chemistry programs.

Currently, I am leading a project focused on developing asymmetric iron-catalyzed multicomponent cross-coupling reaction where I have achieved greater than 98% enantio- and diastereoselectivity under mild conditions. In Fall 2023, I further advanced this work through a research collaboration with Prof. Michael Neidig's group at the University of Oxford, where I gained hands-on experience with Mössbauer spectroscopy to interrogate reactive iron intermediates and elucidate stereodetermining steps. Together, these experiences sharpened my ability to use mechanistic insight to guide hypothesis-driven optimization, skills directly translatable to SAR exploration and molecule refinement in a drug discovery setting.

Throughout my Ph.D., I have built a broad collaborative network, working with leading academic groups across the U.S. and Europe on projects spanning photochemistry, transition-metal catalysis, and inorganic synthesis. These collaborations, involving Pd, Ni, Fe, Cu, and Rh systems, required frequent cross-disciplinary communication and integration of diverse technical perspectives. These experiences have strengthened my ability to communicate complex chemical ideas clearly, adapt quickly to new scientific contexts, and contribute effectively within collaborative, fast-paced research teams relevant to a pharmaceutical industry.

This summer, I joined the University of California, Los Angeles (UCLA) as a Visiting Graduate Researcher, where I am developing iron-catalyzed reductive cross-coupling strategies for asymmetric alkene dicarbofunctionalization. Leveraging UCLA's high-throughput experimentation (HTE) platform, I perform rapid chiral ligand screening and reaction optimization to accelerate reaction discovery through data-driven experimentation. This experience further strengthened my ability to combine synthesis, computation, and parallel experimentation to solve complex problems efficiently.

I have authored **18 peer-reviewed publications** (including two first-author and eight second-author papers) and presented my research at numerous international conferences, including ACS Fall 2024, GRC Physical Organic Chemistry, CIC Annual Meeting, and UCLA's Houk Conference. My work has been recognized through several honors, including the Sharon Dabney Memorial Scholarship for research excellence and departmental service, and the Third Best Poster Award at the 2023 SACNAS Diversity in Science Symposium.

Beyond research, I have demonstrated leadership and commitment to community and mentorship. I have mentored eight students, co-led the iCarbon initiative to teach computational chemistry to underrepresented

community college students. I also serve as Secretary of Phi Lambda Upsilon (PLU), contribute to STEM outreach and recruitment events, and represent the Physical Chemistry Division on the Chemistry Student Safety Committee, organizing departmental Safety Roundtable Talks.

Key Highlights:

- Developed iron-catalyzed asymmetric multicomponent and reductive cross-coupling methodologies integrating HTE and DFT for sustainable catalysis.
- Performed quantum chemical simulations to guide experimental design and elucidate mechanistic pathways of multiple organometallic transformations.
- Collaborated internationally across 10+ institutions, demonstrating adaptability and strong communication in multidisciplinary settings.
- Authored **18+** publications, presented at major conferences, and received recognition for research and leadership excellence.
- Mentored students, led outreach initiatives, and managed laboratory instrumentation including gloveboxes, HPLC systems, and spectroscopy tools.

I am particularly drawn to data-driven discovery, collaborative teamwork, and translational impact in developing sustainable and cheaper medicines for patients. I am confident that my interdisciplinary background, strong problem-solving skills, and passion for mechanism-informed chemistry would enable me to contribute meaningfully towards drug discovery projects. I would welcome the opportunity to discuss how my experience aligns with your team's needs.

Thank you for your time and consideration.

Achyut Ranjan Gogoi