

Self-motivated Scientist and Ph.D. candidate in Pharmacology with 11+ years of combined research and practical experience. I am a dedicated and goal-oriented Ph.D. candidate in Pharmacology with over eleven years of research experience spanning in-vivo and in-vitro platforms. My expertise lies at the intersection of translational science, biopharmaceutics, clinical pharmacology, and pharmacometrics, where I focus on generating impactful insights to drive innovation in drug discovery and personalized medicine. Proficient in advanced modeling and simulation platforms, including GastroPlus, Simcyp, PK-sim and Phoenix WinNonlin, with a strong understanding of drug-excipient interactions and translational biopharmaceutics. Equipped with strong analytical skills, meticulous attention to detail, and a collaborative mindset, I thrive in multidisciplinary environments and excel at tackling complex scientific challenges.

EDUCATION

Ph.D.: Pharmacology; **University of Houston**, Houston, TX **[Expecting May 2025]**
Thesis: Impact of Inflammation Activation on Cardiovascular Disease Pathogenesis and Progression.

M.Sc.: Pharmaceutical Science, **Rowan University**, Glassboro, NJ
Thesis: Searching for new analgesics without addiction risks.

Bachelor of Pharmacy (Hon's), Stamford University Bangladesh, Dhaka, Bangladesh
Thesis: Phytochemical and pharmacological screening of the medicinal plant *Anisomeles indica* (L.).

SKILLS

Laboratory Techniques

- Mammalian Cell Culture
- Immunofluorescence
- Quantitative PCR (qPCR)
- Western Blotting
- ELISA
- Flow Cytometry
- Cell Transfection & Cloning
- Confocal Microscopy
- HPLC

Pharmacokinetic Analysis

- Non-compartmental Analysis (NCA)
- Nonlinear Mixed-Effects Modeling (NLME)
- Population Pharmacokinetics (PK) Modeling
- PBPK Modeling & ADME Prediction
- Drug-drug interaction (DDI) modeling
- Quantitative systems pharmacology (QSP)

Computer Skills

- Microsoft Office Suite (Word, Excel, PowerPoint, Outlook)

Software Skills

- Phoenix WinNonlin
- Phoenix NLME
- GastroPlus
- PK-sim, Simcyp
- R, Python
- GraphPad Prism
- FlowJo
- ImageJ
- Image-Pro Plus

PROFESSIONAL EXPERIENCES

University of Houston, Houston, TX (August 2020 – Present)

Cardiovascular Research (Dr. Krishna Boini's Lab)

- Demonstrated expertise in mastering and adapting a variety of molecular and biochemical techniques to enhance cell-based assays, including mammalian cell culture, quantitative PCR (qPCR), western blotting, ELISA, cell transfection, immunofluorescence, protein purification, cloning, flow cytometry, and confocal microscopy.
- Investigated the molecular mechanisms of nicotine-induced glomerular damage, identifying two critical pathways and proposing therapeutic options validated through *in-vivo* and *in-vitro* models.
- Executed nephrectomy procedures with precision, showcasing proficiency in anesthetic administration, surgical intervention, and post-operative care to optimize recovery outcomes.
- Demonstrated expertise in PBPK modeling using advanced platforms such as PK-Sim, Simcyp, and GastroPlus to predict drug absorption, distribution, metabolism, and excretion, enhancing translational research and drug development strategies.
- Authored manuscripts by conducting data analysis, statistical processing, and figure generation, while maintaining meticulous laboratory records for accurate reporting. Communicated research findings effectively through poster and oral presentations at conferences and seminars.

University of Florida, Orlando, FL (January 2025)

Florida Winter School on Modeling and Simulation in PK/PD

- Managed Conducted guided PBPK model development and verification using PK-Sim, with real-world case studies.
- Modeled drug-drug interactions and mechanism-based inhibition using sensitivity and uncertainty analysis tools.
- Applied PBPK concepts to simulate drug behavior in special populations, including pediatrics and patients with renal or hepatic impairment.
- Developed PBPK models for IV and oral administration to evaluate absorption, distribution, and clearance.
- Collaborated with experts to integrate QSP approaches into drug development pipelines.

Rowan University, Glassboro, NJ (August 2018 – May 2020)

Behavioral Neuroscience Research (Dr. Thomas Keck's Lab)

- Managed and executed research on the behavioral and pharmacological aspects of the novel molecule μ -opioid analgesic IBNtxA, assessing its potential abuse liability and discriminative stimulus effects.
- Led a significant project that uncovered important interactions between $\alpha 2GABA_A$, $\alpha 3GABA_A$, and μ -opioid receptor-mediated signals, highlighting the potential of combination therapy for treating pain-related disorders.
- My research findings established a strong foundation and were fundamental in securing approximately \$2M in NIH grant funding, reflecting my commitment to advancing innovative and impactful research in the field of pharmacotherapy.

Globe Pharmaceuticals Ltd., Dhaka, Bangladesh (February 2013 – July 2017)

Product Management Specialist

- Led the development and optimization of pharmaceutical products, applying scientific principles to ensure quality, safety, and efficacy throughout the product lifecycle.
- Analyzed pharmacological data and performed preclinical research to support the development and innovation of new pharmaceutical products.

Healthcare Pharmaceuticals Ltd., Gazipur, Bangladesh (May 2011 – August 2011)

Student Internship

- Successfully managed inventory, contributed to product development, and optimized manufacturing processes, ensuring quality control, regulatory compliance, and enhanced production efficiency in a pharmaceutical setting.

PUBLICATIONS

1. **Rahman, Mohammad A.**, Harini Lakkakula, Datta, Sayantap., Koka, Saisudha., Boini, Krishna M. (2025), Acid sphingomyelinase and ceramide signaling pathway mediates nicotine-induced NLRP3 inflammasome activation and podocyte injury. *Biomedicines*.
2. Datta, S., **Rahman, M. A.**, Koka, S., & Boini, K. M. (2025). High mobility group box 1 (HMGB1) mediates nicotine-induced podocyte injury. *Frontiers in pharmacology*, 15, 1540639. <https://doi.org/10.3389/fphar.2024.1540639>
3. Datta, S., **Rahman, M. A.**, Koka, S., & Boini, K. M. (2024). High Mobility Group Box 1 (HMGB1): Molecular Signaling and Potential Therapeutic Strategies. *Cells*, 13(23), 1946. <https://doi.org/10.3390/cells13231946>
4. **Rahman, M. A.**, Keck, T. M., Poe, M. M., Sharmin, D., Cook, J. M., & Fischer, B. D. (2021). Synergistic antihyperalgesic and antinociceptive effects of morphine and methyl 8-ethynyl-6-(pyridin-2-yl)-4H-benzof[*f*]imidazo[1,5-*a*][1,4]diazepine-3-carboxylate (MP-III-024): a positive allosteric modulator at $\alpha 2GABA_A$ and $\alpha 3GABA_A$ receptors. *Psychopharmacology*, 10.1007/s00213-021-05791-1.
5. Islam, A., **Rahman, M. A.**, Brenner, M. B., Moore, A., Kellmyer, A., Buechler, H. M., DiGiorgio, F., Verchio, V. R., McCracken, L., Sumi, M., Hartley, R., Lizza, J. R., Moura-Letts, G., Fischer, B. D., & Keck, T. M. (2020). Abuse Liability, Anti-Nociceptive, and Discriminative Stimulus Properties of IBNtxA. *ACS pharmacology & translational science*, 3(5), 907–920.

CONFERENCE ABSTRACTS

1. **Rahman, Mohammad A.**, Datta, Sayantap., Koka, Saisudha., Boini, Krishna M., Membrane raft redox signaling pathway mediates gut microbial metabolite TMAO-induced NLRP3 inflammasome activation and cardiovascular dysfunction. American Association of Pharmaceutical Scientists meeting 2024, Salt Lake City, UT.
2. **Rahman, Mohammad A.**, Datta, Sayantap., Koka, Saisudha., Boini, Krishna M., (2024) Membrane raft redox signaling pathway in nicotine-Induced NLRP3 inflammasome activation and renal injury. *Journal of Pharmacology and Experimental Therapeutics* June 2024, 389 (S3) 462; DOI: <https://doi.org/10.1124/jpet.462.906960>
3. **Rahman, Atiqur.**, Koka, Saisudha., Boini, Krishna M., (2023) Role of acid sphingomyelinase in nicotine-induced podocyte injury. *Journal of Pharmacology and Experimental Therapeutics* June 2023, 385 (S3) 101; DOI: <https://doi.org/10.1124/jpet.122.286380>

PUBLICATIONS IN-PREPARATION

1. **Rahman, Mohammad A.**, Datta, Sayantap., Koka, Saisudha., Boini, Krishna M., Membrane raft redox signaling pathway mediates gut microbial metabolite TMAO-induced NLRP3 inflammasome activation and cardiovascular dysfunction.
2. **Rahman, Mohammad A.**, Datta, Sayantap., Koka, Saisudha., Boini, Krishna M., Membrane raft redox signaling pathway in nicotine-Induced NLRP3 inflammasome activation and renal injury.
3. **Rahman, Mohammad A.**, Koka, Saisudha., Boini, Krishna M., Effects of Membrane Raft Redox Signaling in Gut Microbial Metabolite TMAO-Induced NLRP3 Inflammasome Activation and Podocyte Injury.

CERTIFICATION & TRAINING

1. **Pharmacokinetic Data Analysis:** Expert in using Phoenix WinNonlin and Phoenix NLME for Non-compartmental Analysis (NCA), Nonlinear Mixed-Effects Modeling (NLME), Population Pharmacokinetics (popPK) Modeling, and PKPD Modeling, Certified by Certara University, with specialized training in advanced pharmacokinetic analysis.
2. **Physiologically Based Pharmacokinetic (PBPK) Modeling:** Skilled in using GastroPlus for PBPK modeling to predict drug absorption, distribution, metabolism, and excretion (ADME), and optimize dosage forms in drug development, certified by Simulation Plus.
3. **Clinical Research Training:** Completed two NIH courses, *Principles of Clinical Pharmacology* and *Principles and Practice of Clinical Research*, gaining deep expertise in drug development and clinical trial methodologies.