

KAZI RUHULLAH SHAHRIAR

kazi@krshahriar.com · krshahriar.com · ORCID · Google Scholar · LinkedIn

EDUCATION

Ph.D. in Chemistry (Organic), University of Tennessee, Knoxville	Expected December 2026
M.Pharm. in Pharmaceutical Chemistry, University of Dhaka, Bangladesh	2019
B.Pharm. in Professional Pharmacy (5-year program), University of Dhaka, Bangladesh	2017

RESEARCH EXPERIENCE

Ph.D. Researcher, Best Research Group, University of Tennessee, Knoxville	Dec 2021 – Present
---	--------------------

- Developed *de novo* ROS-responsive lipids from non-phospholipid precursors to enable H₂O₂-triggered liposomal cargo release while improving synthetic accessibility, cost profile, and scalability.
- Designed and synthesized ROS-responsive molecular platforms using tandem self-immolative strategies to model signal transduction across membranes.
- Created triphenylphosphonium–boronate–fluorophore constructs for ROS-responsive, mitochondria-targeted delivery and imaging applications.
- Prepared and characterized lipid-based nanoparticles (liposomes and GUVs) by thin-film hydration and extrusion; evaluated size, polydispersity, and morphology by DLS and TEM; quantified stimulus-responsive cargo release using fluorescence-based assays (ANTS–DPX, Nile Red) and UV–Vis kinetics.
- Characterized all synthetic intermediates and final constructs by ¹H/¹³C/¹¹B NMR, HPLC, and FTIR; applied statistical design of experiments (JMP Pro) to optimize formulation variables; used OriginPro and ImageJ for quantitative data analysis.
- Mentored three undergraduate researchers in synthesis, purification, lipid assembly, liposome preparation, fluorescence assays, and data analysis; maintained detailed electronic and paper laboratory notebooks.

Master's Thesis Researcher, University of Dhaka, Bangladesh	Jan 2018 – Feb 2019
---	---------------------

- Isolated and characterized secondary metabolites, including a novel cyclohexanone derivative, from *Bridelia stipularis* and *Aporosa wallichii* using chromatographic fractionation, 1D/2D NMR, and MS-guided structure elucidation.
- Evaluated antioxidant and cytotoxic properties using standard bioactivity screening assays.

TECHNICAL SKILLS

Organic synthesis	Multistep synthesis, reaction design, lipid synthesis, boronate and carbonate chemistry, self-immolative linker systems, orthogonal protecting-group strategies, route optimization, purification
Analytical methods	¹ H/ ¹³ C/ ¹¹ B NMR, 1D/2D NMR, HPLC, FTIR, UV–Vis spectroscopy, fluorimetry, DLS, TEM, confocal microscopy, polarimetry
Formulation / assays	Liposome and GUV preparation (thin-film hydration, extrusion), ROS-triggered release assays, dye-release kinetics (ANTS–DPX, Nile Red), organelle-targeted probe, fluorescence-based characterization
Software & data	ChemDraw, MestreNova, OriginPro, JMP Pro, ImageJ, EndNote, NVivo, Microsoft Office

PUBLICATIONS

-
1. Shahriar, K.R.; Mustafa, M.B.; Kaufman, N.R.; Best, M.D. *De Novo Lipid Switch Design for Reactive Oxygen Species-Triggered Liposomal Release*. *Bioconjugate Chemistry* **2026** (accepted).
 2. Ullah, M.; Shahriar, K.R.; Mustafa, M.B.; Best, M.D. *Cysteine-Responsive Lipid Switch Development for Liposome Triggered Cargo Release*. Under review at *RSC Chemical Biology* (submitted 2026).
 3. Shahriar, K.R.; Hossain, M.E.; Rahman, K.M.; Ahsan, M.; Hasan, C.M.A. *A New Cyclohexanone Derivative from Bridelia stipularis*. *Chemistry of Natural Compounds*. 2021, 57(3), 455–458.
 4. Shahriar, K.R.; Salekin, S.; Islam, Q.S.; Ahsan, M.; Hasan, C.M.A. *Phytochemical and Biological Studies on Bark Extract of Aporosa wallichii*. *Dhaka Univ. J. Pharm. Sci.* 2020, 19(2), 139–143.
 5. Puja, S.D.; Shahriar, K.R.; Hasan, C.M.; Ahsan, M. *Flavonoids from Bridelia stipularis with in vitro Antioxidant and Cytotoxicity Activity*. *Pharmacology & Pharmacy*. 2020, 11(7), 137–146.
 6. Shahriar, K.R.; Islam, M.R. *Recent Prescribing Patterns of Cardiac Physicians in Metropolitan Dhaka City, Bangladesh*. *Bangladesh Pharmaceutical Journal*. 2018, 21(2), 123–130.

PRESENTATIONS

- **Invited Oral** Shahriar, K.R. *Master Key vs Smart Key: A New Generation of Stimuli-Responsive Lipids*. UTK College of Arts & Sciences Spring Dean's Advisory Board (DAB) Meeting, 2026.
- **Oral — 3rd Place, 3MT®** Shahriar, K.R. *Master Key vs Smart Key: A New Generation of Stimuli-Responsive Lipids*. UTK Three-Minute Thesis Finals, 2025.
- **Oral** Shahriar, K.R. *Reactive Oxygen Species (ROS)-Responsive Synthetic Systems for Biomedical Applications*. UTK Chemistry Graduate Seminar, 2024.
- **Poster** Shahriar, K.R.; Mustafa, M.B.; Best, M.D. *De Novo Lipid Switch Design for ROS-Triggered Liposomal Release*. UTK Biomembranes Symposium, 2026.
- **Poster** Shahriar, K.R.; Qualls, M.P.; Best, M.D. *Development of ROS-Triggered Molecular Platforms for Signal Transduction Modeling via a Tandem Self-Immolative Strategy*. ACS Spring 2026, Atlanta, GA.
- **Poster — Best Award** Shahriar, K.R.; Mouree, T.Z.; Zaman, S.U.; Islam, M.R. *Current Prescription Patterns for Management of Cardiovascular Diseases at Major Hospitals in Dhaka*. ISE SFEC National Conference, University of Dhaka, 2017.

AWARDS & FELLOWSHIPS

- Graduate Student Senate (GSS) Travel Award, University of Tennessee, Knoxville — ACS Spring 2026 (2026)
- ACGS Travel Award, ACS Spring 2026, Atlanta, GA (2026)
- Third Place, UTK Three-Minute Thesis (3MT®) Competition (2025)
- Graduate School Fellowship, University of Tennessee, Knoxville (2021–2024)
- National Science and Technology (NST) Fellowship, Ministry of Science and Technology, Bangladesh (2019)
- Best Poster Award, ISE SFEC National Conference, University of Dhaka (2017)

TEACHING EXPERIENCE

Graduate Teaching Assistant, University of Tennessee, Knoxville Aug 2021 – Present

- Taught nine semesters of chemistry laboratories — Foundations of Organic Chemistry Laboratory (CHEM 269), In-depth Organic Chemistry Laboratory (CHEM 359), and General Chemistry I Laboratory (CHEM 123).
 - CHEM 359: Spring 2023, Spring 2024, Spring 2025, Fall 2025, Spring 2026
 - CHEM 269: Spring 2022, Fall 2022, Fall 2024
 - CHEM 123: Fall 2021
- Earned an average instructor rating of 4.6/5.0 across nine evaluated semesters.
- Recognized in student evaluations for connecting abstract concepts to practical lab techniques and for providing clear, constructive feedback.
- Tutored students in the Organic Learning Center; graded lecture exams in Organic Chemistry.

Lecturer, Department of Pharmacy, State University of Bangladesh, Dhaka Feb 2019 – Jul 2021

- Taught seven undergraduate courses, three graduate courses, and twelve laboratory courses spanning medicinal chemistry, pharmaceutical analysis, quality control, natural products, pharmacology, and physical chemistry.
- Major courses: Advanced Medicinal Chemistry & Drug Discovery; Advanced Pharmacology & Clinical Toxicology; Pharmaceutical Analysis; Pharmacognosy & Natural Product Chemistry Lab; QC & Analytical Method Validation Lab.
- Coordinated multi-section instruction and served on examination committees to support consistent learning outcomes and student assessment.
- Supervised three M.Pharm. theses and twelve undergraduate research projects focused on phytochemical isolation, characterization, and biological screening.

PROFESSIONAL SERVICE & AFFILIATIONS

- Student Member, American Chemical Society (ACS), 2022–Present
- Vice President, Bangladesh Students Association, University of Tennessee, Knoxville (2023–2024)
- Volunteer, UTK Forensic Chemistry Summer Camp (2024)