

SHAILENDRA KOIRALA

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EDUCATION

Doctor of Philosophy, Chemistry & Biochemistry

August 2025

The University of Texas at Dallas, Richardson, TX

Advisor: Prof. Jeremiah J. Gassensmith

Master of Science, Chemistry

August 2020

Southern Illinois University Edwardsville, IL

Advisor: Prof. Yun Lu

Bachelor of Pharmacy

December 2015

Kathmandu University, Nepal

SKILLS AND TECHNICAL PROFICIENCIES

- **Imaging & Biophysics:** Hands-on experience with confocal microscopy, TEM/SEM, DLS; IVIS Lumina (small animal); MRI (in vitro/in vivo) and EPR for contrast/probe studies.
 - **Microbiology & Cell Work:** Encompassing bacterial culture and quantitative imaging, mammalian cell assays, intracellular bacteria quantification.
 - **Murine Model:** Proficient in handling rodents *in vivo*, including various techniques for multimodal drug administration such as intravenous, subcutaneous, intraperitoneal, intravesical, intranasal, oral, and intratracheal injections.
 - **Analytical Chemistry:** Extensive experience in HPLC, LC-MS, dissolution studies, UV-Vis, FT-IR, and spectroscopy techniques.
 - **Purification & Isolation:** Prep/flash/CombiFlash chromatography, chiral separations, mass-triggered fraction collection; mg→gram scale clean-up; impurity isolation for characterization.
 - **Structural Characterization:** ¹H/¹³C/2D NMR (MestreNova/TopSpin), LC-MS data interpretation; NMR-guided pooling.
 - **Virology & Nanobiotechnology:** Experienced in TMV infection of Nicotiana plants, virus purification, small molecule conjugation, and development of TMV-based MRI contrast agents.
 - **Organic Synthesis:** Skilled in organic synthesis techniques, focusing on designing and developing molecular probes for diverse applications.
 - **Software & Data:** Excel, Word, PowerPoint; GraphPad Prism, ImageJ, FlowJo, Origin; ChemDraw, CAS SciFindern; PyMOL/Chimera; Adobe Illustrator.
 - **Documentation & Collaboration:** SOPs, protocols, technical reports; cross-functional work with QA/QC/Process teams; mentoring and presentations.
 - **Peer Reviewing:** Official reviewer for Chemical Engineering Journal.
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RESEARCH AND PROFESSIONAL EXPERIENCE

Postdoctoral Scholar

Nov 2025 – Present

Stanford University Department of Radiology (Lucas Center for Imaging)

- **Performing large-animal (pig) MRI for clinical lymphangiography**, optimizing MRI workflows including scanner setup, pulse sequences, and protocol development.
- **Integrating preclinical and clinical MRI pipelines** by collaborating with radiologists, surgeons, and imaging scientists, contributing to ARPA-H-aligned translational imaging initiatives.
- **Analyzing MRI datasets (T1/T2, relaxivity)**, preparing imaging documentation, and supporting manuscripts, grant development, and operational readiness through Lucas Center MRI and large-animal training.

Graduate Research Assistant

The University of Texas at Dallas, Department of Chemistry and Biochemistry

Aug 2024 – Aug 2025

- **Developed a fluorescent molecular probe** for detecting intracellular and extracellular bacteria, leading to successful validation in animal models and mammalian cells, improving detection accuracy.
- **Created a Gd-based MRI molecular probe** and an organic radical-based MRI probe, successfully validating animal models and mammalian cells, and advancing bacterial detection methods.
- **Developed TMV-based nanomaterials** by infecting plants, purifying virus particles, and conjugating small molecules for applications like MRI contrast agents.
- **Mentored** graduate and undergraduate students, fostering their professional growth and enhancing laboratory productivity by supervising experiments and research projects.

Graduate Teaching Assistant

The University of Texas at Dallas, Department of Chemistry and Biochemistry

Aug 2020 – July 2024

- **Facilitated learning in Advanced Organic Synthesis and Advanced Physical Chemistry** by leading review sessions and clarifying complex concepts, enhancing student comprehension and analytical skills.
- **Assisted professors with grading and evaluations**, ensuring fair assessment of student progress, and developed supplemental materials to foster deeper engagement with the subject matter.

Graduate Research Assistant

Southern Illinois University Edwardsville, Department of Chemistry

August 2019 – July 2020

- **Investigated biomimetic hydride tunneling reactions in solution**, uncovering insights through primary and secondary kinetic isotope effects, advancing understanding of reaction mechanisms.
- **Analyzed steric effects on the temperature dependence of primary kinetic isotope effects** in hydride transfer reactions, replicating enzymatic observations to elucidate the role of enzyme motions in catalysis.

Graduate Teaching Assistant

Southern Illinois University Edwardsville, Department of Chemistry

August 2018- July 2019

- **Delivered lectures, mentored students, and instructed lab exercises** in General Chemistry, simplifying fundamental concepts and promoting hands-on learning.

Product Manager

Genetica Laboratory Pvt. Ltd, Birgunj, Nepal

December 2015 – July 2018

- **Trained medical representatives** on pharmaceutical products, enabling effective communication with doctors and boosting product sales.
- **Conducted market research** on pharmaceutical products, leading to informed decisions on product design and manufacturing strategies.
- **Collaborated with the R&D department**, gathering feedback to improve drug formulations, and enhance product superiority over competitors.

Pharmaceutical Intern (Production, R&D, QC, QA)

Deurali-Janata Pharmaceuticals Pvt. Ltd, Kathmandu Nepal

July 2015-November 2015

- Assisted in production by monitoring batch formulations and ensuring SOP compliance, while performing quality-control tests and supporting R&D through formulation development and stability studies to ensure product safety and efficacy.

PUBLICATIONS *(Selected – full list available upon request)*

- **Koirala, Shailendra**, et al. "Fluorescent molecular probe for *in vivo* and *in vitro* targeting and imaging of an intracellular bacterial infection." *Chemical Science* (2025).
- Kumari, Sneha, Thomas S. Howlett, Ryanne N. Ehrman, **Shailendra Koirala**, Orikeda Trashi, Ikeda Trashi, Yalini H. Wijesundara, and Jeremiah J. Gassensmith. "In vivo biocompatibility of ZIF-8 for slow release via intranasal administration." *Chemical Science* 14, no. 21 (2023): 5774-5782.
- Lumata, Jenica L., Laurel M. Hage, Miguel A. Gaspar, Ikeda Trashi, Ryanne N. Ehrman, **Shailendra Koirala**, Alyssa C. Chiev et al. "TEMPO-conjugated tobacco mosaic virus as a magnetic resonance imaging contrast agent for detection of superoxide production in the inflamed liver." *Journal of Materials Chemistry B* 12, no. 13 (2024): 3273-3281.

CONFERENCE

- Delivered an invited oral presentation as a Guest Speaker at Southern Illinois University Edwardsville, July 2024.
- Presented an invited oral presentation at the 2024 ACS Meeting in Miniature, April 2023.
- Presented a poster at UT Dallas and UT Southwestern Workshop on Imaging and Data Science, October 2023.
- Presented an invited oral presentation at North American Supramolecular Chemistry meeting, December 2022.
- Delivered an oral presentation at the 54th ACS DFW Meeting in Miniature, April 2022.

HONORS AND AWARDS

- **Received the Betty and Gifford Johnson Travel Award** in 2022 from the Office of Graduate Education, University of Texas at Dallas, in recognition of exceptional graduate-level academic achievements.
 - **Awarded the Mei Lein Fellowship** in 2022 by the Office of Graduate Education, University of Texas at Dallas, based on outstanding graduate-level academic performance.
 - **Honored as the Best International Student** in 2019 at Southern Illinois University Edwardsville, highlighting academic excellence and contributions to the university community.
 - **Granted the Research Grant for Graduate Student Award** in 2018 at Southern Illinois University Edwardsville, supporting innovative research initiatives.
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