SHAILENDRA KOIRALA

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PROFESSIONAL SUMMARY

Stanford Postdoctoral Scholar in Radiology specializing in clinical MRI, large-animal imaging (pig), lymphatic imaging, and translational research. Experienced in designing and optimizing MRI workflows, conducting clinical-style lymphangiography, and bridging preclinical and clinical imaging pipelines. Strong background in MRI data analysis (T1/T2, relaxivity), large-animal procedure preparation, and imaging protocol development under. Previously trained in chemistry, microbiology, and rodent models, now transitioning fully into clinical imaging science and radiology-driven research. A collaborative researcher with a growing focus on clinical translation, imaging workflow improvement, and radiologic innovation.

EDUCATION

Postdoctoral Scholar, Radiology (Imaging Sciences) November 2025 –Present
Stanford University School of Medicine, Stanford, CA
Research Focus: Development of advanced MRI lymphangiography methods for quantitative assessment of the lymphatic system in large-animal and clinical settings
Advisor: Prof. Andreas Loening

Doctor of Philosophy, Chemistry & Biochemistry August 2025
The University of Texas at Dallas, Richardson, TX
Dissertation: Targeted imaging of uropathogens via Zn-OXY-DPA-based fluorescent and MRI probes
Advisor: Prof. Jeremiah J. Gassensmith

Master of Science, Chemistry August 2020
Southern Illinois University Edwardsville, IL
Dissertation: A Test of a New Model for the Origin of Primary Kinetic Hydrogen Isotope Effect
Advisor: Prof. Yun Lu

Bachelor of Pharmacy December 2015
Kathmandu University, Nepal
Thesis Advisor: Prof. Aswani Kumar Shrestha
Thesis Title: "Formulation optimization and solubility enhancement of Griseofulvin using β-CD and PVPK30 as ternary complex.

TECHNICAL SKILLS

- **MRI & Imaging:** Large-animal (pig) MRI, 3T MRI operations, clinical lymphangiography, relaxivity studies, IVIS Lumina, confocal microscopy, TEM/SEM, DLS
- **Organic Synthesis:** Skilled in organic synthesis techniques, focusing on designing and developing molecular probes for diverse applications.

- **Analytical Chemistry:** Extensive experience in HPLC, LC-MS, dissolution studies, UV-Vis, FT-IR, and spectroscopy techniques.
- **Method Development & Validation:** Proficient in method validations, method transfers, and analytical testing.
- **Virology & Nanobiotechnology:** Experienced in TMV infection of Nicotiana plants, virus purification, small molecule conjugation, and development of TMV-based MRI contrast agents.
- **Microbiology:** Encompassing bacterial culture, advanced bacterial imaging techniques, precise quantification, comprehensive studies on bacterial behavior, and *In Vitro* mammalian cell work with 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.
- **Medical Device Prototyping & Optics:** Custom fiber-optic laser catheter design, benchtop validation, animal-safe deployment, documentation.
- **Photonics & Laser Systems:** Fiber coupling/alignment, output-power calibration, beam profiling, laser safety, procedure standardization.
- **Imaging:** In vivo fluorescence/MRI for probe evaluation and treatment monitoring; laser-assisted intravesical illumination.
- **Biodistribution Studies:** Conducted and analyzed biodistribution studies, involving the collection of blood and tissue samples to assess drug distribution within murine models.
- **Imaging Techniques:** Hands-on experience with in vivo and in vitro MRI imaging in murine models, bacterial samples, and phantom models; proficient in EPR spectroscopy for analyzing free radicals and contrast agents
- **Instrumentation:** HPLC, ESI-MS, 1H, 13C and 2D NMR, TLC, CombiFlash Chromatography, Confocal microscopy, transmission electron microscopy (TEM), scanning electron microscopy (SEM), dynamic light scattering (DLS), FT-IR, UV-Vis, IVIS Lumina live animal imaging system, and LC-MS.
- **Software:** PowerPoint, MS Word, Excel, Adobe Illustrator, FlowJo, ImageJ, GraphPad Prism, Chimera, Chemdraw, PyMOL, Origin, Mestrenova, Topspin, MicroDicom, ChemDraw, CAS SciFindern
- **Project & Team Leadership:** Strong ability to lead projects, mentor junior scientists, and coordinate laboratory activities.

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.

EMPLOYMENT HISTORY

Postdoctoral Researcher November 2025 – Present
Stanford University School of Medicine Department of Radiology

• Lead large-animal MRI studies focused on clinical lymphangiography, including MRI system operation, protocol design, and optimization of clinical-inspired imaging workflows.
• Collaborate with radiologists, imaging scientists, and surgeons to integrate preclinical MRI pipelines into clinical practice, supporting translational radiology initiatives.
• Perform quantitative MRI analysis, prepare study documentation, and contribute to clinical-research manuscripts and grants.

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) July 2015 – November 2015
Deurali-Janata Pharmaceuticals Pvt. Ltd, Kathmandu Nepal

- **Assisted in production** by monitoring batch formulations and ensuring compliance with standard operating procedures, contributing to efficient manufacturing practices.
- **Provided quality-control tests and supported R&D** efforts by participating in formulation development and stability studies, ensuring product safety and efficacy.

SCHOLARLY ACTIVITIES OR RESEARCH EXPERIENCE

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.
- **Engineered a laser catheter system:** Designed, fabricated, and tested a fiber-optic laser catheter for non-invasive, survival intravesical delivery in mice; established SOPs, sterilization workflow, and reproducible illumination/dosing.
- **Dual-function Zn-Oxy-DPA probes:** Created probes that selectively stain and kill intracellular bacteria in mammalian cells; optimized structure–activity, quantified intracellular kill (gentamicin-protection & CFU/viability imaging), and correlated outcomes with in vivo imaging.

- **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.
- **Collaborated** with cross-functional teams, contributing to a cohesive work environment and driving the successful completion of shared research goals.

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.

PUBLICATIONS

- **Koirala, Shailendra**, Miguel A. Gaspar, Yalini H. Wijesundara, Dong-Hao Li, Jashkaran G. Gadhvi, Ryanne N. Ehrman, Samuel A. Cornelius et al. "Fluorescent molecular probe for in vivo and in vitro targeting and imaging of an intracellular bacterial infection." *Chemical Science* 16, no. 18 (**2025**): 7902-7911.

- Maness, Peter, **Shailendra Koirala**, Pratichhya Adhikari, Nasim Salimraftar, and Yun Lu. "Substituent Effects on Temperature Dependence of Kinetic Isotope Effects in Hydride-Transfer Reactions of NADH/NAD+ Analogues in Solution: Reaction Center Rigidity Is the Key." *Organic Letters 22*, no. 15 (**2020**): 5963-5967.

- Bai, Mingxuan, **Shailendra Koirala**, and Yun Lu. "Direct Correlation between Donor-Acceptor Distance and Temperature Dependence of Kinetic Isotope Effects in Hydride-Tunneling Reactions of NADH/NAD+ Analogues." *The Journal of Organic Chemistry* 86, no. 11 (**2021**): 7500-7507.

- 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. Hagge, 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.

- Wijesundara, Yalini H., Fabian C. Herbert, Sneha Kumari, Thomas Howlett, **Shailendra Koirala**, Orikeda Trashi, Ikeda Trashi, Noora M. Al-Kharji, and Jeremiah J. Gassensmith. "Rip it, stitch it, click it: A Chemist's guide to VLP manipulation." *Virology* 577 (**2022**): 105-123.

- Ehrman, Ryanne N., Olivia R. Brohlin, Yalini H. Wijesundara, Sneha Kumari, Orikeda Trashi, Thomas S. Howlett, **Shailendra Koirala** et al. "A scalable synthesis of adjuvanting antigen depots based on metal–organic frameworks." *Chemical Science* 15, no. 8 (**2024**): 2731-2744.

- Odeyemi, Isaiah, Teri A. Douglas, Nosakhare F. Igie, James A. Hargrove, Grace Hamilton, Brianna B. Bradley, Cathy Thai, **Shailendra Koirala** et al. "An optimized purification protocol for enzymatically synthesized S-adenosyl-L-methionine (SAM) for applications in solution state infrared spectroscopic studies." Spectrochimica Acta Part A: *Molecular and Biomolecular Spectroscopy* 309 (**2024**): 123816.

PEER REVIEW

- Official reviewer for **Chemical Engineering Journal**, ISSN: 1385-8947
- Review identifier SOURCE-WORK-ID: 502c03cf-ec0b-4d80-8aba-fc1cb15e45a4
- Review identifier SOURCE-WORK-ID: c0cc2567-8551-4843-b270-3a1e22505b23
- Review identifier SOURCE-WORK-ID: 64bfe131-a89f-4c72-9a2d-c087ac2fc7ec
- Review identifier SOURCE-WORK-ID: aa72902b-8c2e-4647-b989-9fe58a629146
- Review identifier SOURCE-WORK-ID: df792160-3c85-4838-8e21-035af0c97f85
- Review identifier SOURCE-WORK-ID: 99d09ad6-7452-488a-a048-1eecf1ba77d5
- Review identifier SOURCE-WORK-ID: f9bd6642-d569-4ec4-9a8f-af4cd35a0b69

PRESENTATIONS AND INVITED LECTURES

- Delivered an invited oral presentation as a Guest Speaker at Southern Illinois University Edwardsville, in 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, in December 2022.
- Delivered an oral presentation at the 54th ACS DFW Meeting in Miniature, April 2022.

TEACHING EXPERIENCE

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 Teaching Assistant
Southern Illinois University, Edwardsville August 2018- July 2019

- **Delivered lectures, mentored students, and instructed lab exercises** in General Chemistry, simplifying fundamental concepts and promoting hands-on learning.
- **Maintained lab equipment and graded lab reports**, ensuring smooth lab operations and accurate assessment of student work.

MENTORING

Tyler, Wilson Carter (BS Chemistry) August 2024 – Present
TQ Nicholas Nguyen (BS Chemistry) August 2022 – May 2024
Miguel Angel Gaspar (MS Chemistry & Biochemistry) September 2023 – Present

LEADERSHIP

- Secretary, Nepali Graduate Student Association at UTD August 2022- Present
- Executive member, Forum of Pharmacy, Kathmandu University, Nepal
- Class coordinator, Kathmandu University Youth Red Cross Society, Kathmandu University, Nepal September- October 2015

REFERENCES

Prof. Andreas Loening (Postdoctoral Advisor)
Associate Professor of Radiology (Body MRI), Stanford University
loening@stanford.edu

Prof. Jeremiah J. Gassensmith, FRSC (Doctoral Advisor)
Professor The University of Texas at Dallas, Department of Chemistry and Biochemistry
gassensmith@utdallas.edu

Prof. Yun Lu (Masters Advisor)
Professor Southern Illinois University, Edwardsville Department of Chemistry
yulu@siue.edu