SAROJ KHADKA

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Biomedical Science PhD candidate with strong research experience in bacterial virulence mechanisms, host-pathogen interactions, and microbial gene regulation. Skilled in molecular biology and microbiological techniques, mentoring and science communication. Motivated to build an independent career in biomedical research.

EDUCATION

PhD in Microbiology and Immunology **Aug 2024* – Jul 2026 (expected)**
University of Pittsburgh, School of Medicine, *Pittsburgh, Pennsylvania, USA*
* *Transferred from the University of Toledo (see below)*

PhD in Medical Microbiology and Immunology **Aug 2021 – Jul 2024 (*transferred*†)**
University of Toledo, College of Medicine and Life Sciences, *Toledo, Ohio, USA*
Selective Courses: Advanced Immunology | Advanced Microbiology | Current Problems and Approaches in Proteins | Methods in Biomedical Science | Current Problems and Approaches in Cell Biology and Signaling | Methods in Biomedical Sciences
† *Transferred to the University of Pittsburgh (see above)*

MS in Medical Microbiology **Aug 2015 – Jul 2017**
Tribhuvan University, *Kathmandu, Nepal*
Selective Courses: Systematic and Diagnostic Bacteriology | Systematic and Diagnostic Virology | Systematic and Diagnostic Mycology | Systematic and Diagnostic Parasitology | Human Anatomy & Physiology | Microbial Genetics and Molecular Biology

BS in Microbiology **Dec 2011 – Nov 2014**
Tribhuvan University, *Kathmandu, Nepal*,
Selective Courses: Medical and Environmental Microbiology | Agricultural and Food Microbiology | Biochemistry and Biotechnology | Organic, Inorganic and Physical Chemistry | Zoology | Botany | Biostatistics

EXPERIENCES

Graduate Student Researcher **May 2022 – Present**
Dr. Laura A. Mike's Lab, Department of Medicine/Division of Infectious Diseases, *Pittsburgh, Pennsylvania, USA*
- Investigate the mechanisms and regulation of *Klebsiella pneumoniae* capsular polysaccharide attachment and chain length.
- Develop and optimize techniques pertinent to *Klebsiella pneumoniae* exopolysaccharides research.
- Present research findings at departmental, regional and national conferences.
- Mentor undergraduate, graduate and medical students on lab techniques and project design.
  - Supervised three graduate students on various projects related to *K. pneumoniae* capsular polysaccharide regulation during lab rotations.
  - Mentored a Medical Summer Research Program (MSRP) student during their summer research project titled 'Construction of *Klebsiella pneumoniae* reported plasmid using *xylE'.*
  - Mentored two undergraduate students on various projects related to *K. pneumoniae* capsular polysaccharide attachment and chain length regulation.

Molecular Biologist **Nov 2020 – Jun 2021**
B-Sure Path Lab and Diagnostic Center, *Biratnagar, Nepal*
- Performed routine qRT-PCR for COVID-19 diagnosis in clinical specimens.
- Trained newly recruited lab technicians in molecular diagnostics.
- Managed patient data, diagnostic reporting and laboratory quality control as required by National Public Health Laboratory, Nepal.
- Coordinated regularly with the Ministry of Health's COVID-19 Crisis Management Center for central reporting of diagnosis .

Secondary School Teacher **Nov 2018 – Mar 2019**
Newton Higher Secondary School, *Kathmandu, Nepal*
- Taught Science and Mathematics to Grade 8 students.
- Designed and administered tests, and prepared test score reports to track student progress.
- Facilitated parent-teacher meetings to discuss student development and address concerns.
- Proctored final examinations and National Education Board exams for Grade 8 and Grade 10 students.

Intern Medical Microbiologist **Apr – Sept 2018**
Kathmandu Model Hospital, *Kathmandu, Nepal*

- Conducted routine clinical microbiological tests for pathogen isolation and identification in clinical specimens.
- Maintained culture collection and surveillance records of multidrug-resistant bacterial isolates for national reporting.
- Performed monthly and quarterly quality assurance assays as required by National Public Health Laboratory.
- Performed hospital environmental pathogen monitoring.

Educational Consultant and Tutor **Jan 2015 – Dec 2018**
St. Xavier Institute, *Kathmandu, Nepal*

- Guided secondary school graduates on academic planning and admissions.
- Tutored students for competitive higher secondary and nursing entrance examinations.
- Developed and administered mock tests to improve student performance.

RESEARCH PROJECTS (Full-time effort)

- **Systems controlling *Klebsiella pneumoniae* capsular polysaccharide chain length and attachment** (Jan 2022 – Present)
  Advisor: Dr. Laura A. Mike, University of Pittsburgh
  Currently investigating the mechanisms and regulatory pathways governing *Klebsiella pneumoniae* capsule attachment and chain length using various molecular biology and biochemical analytical tools. The ongoing projects aim to unravel the bacterial factors and signaling pathways involved in *K. pneumoniae* capsular polysaccharide attachment and chain length regulation and their impact on bacterial pathogenesis.
- **Susceptibility to Fluoroquinolones and *gyrA* ser83 mutation in *Salmonella enterica* Serovar Typhi at a Referral Hospital of Kathmandu Valley** (MS Thesis Project; Jan 2018 – Dec 2019):
  Advisor: Dr. Megharaj Banjara, Tribhuvan University and Dr. Basudha Shrestha, Kathmandu Model Hospital, Nepal
  Conducted a hospital-based study on the prevalence of *Salmonella* Typhi in febrile patients visiting the Kathmandu Model Hospital and evaluated resistance to fluoroquinolones associated with *gyrA* ser83 mutation in *Salmonella* Typhi and Paratyphi isolated from the patients.

AWARDS AND SCHOLARSHIPS

- **MMI Research Scholar Award** **2024**
  Awarded by the Department of Medical Microbiology and Immunology, University of Toledo to graduate students with a first-author research manuscript accepted or published before thesis defense.
- **MMI Research Fellowship Award** **2024**
  Awarded by the Department of Medical Microbiology and Immunology, University of Toledo to graduate students who have received a pre-doctoral fellowship before thesis defense.
- **AHA Pre-Doctoral Fellowship** **2023**
  Two-year fellowship awarded by the American Heart Association (AHA) in the form of stipend support to PhD students pursuing research aimed at advancing human health and well-being.
- **Graduate Research Award** **2022**
  Awarded by University of Toledo, Graduate Student Association as a financial support for a PhD thesis research project.
- **Tribhuvan University Undergraduate Scholarship** **2013**
  Tutition support awarded by Tri-Chandra Multiple Campus, Tribhuvan University to high-performing undergraduate tuition.

VOLUNTEERING

- **Language Interpreter –** Community Care Clinic, University of Toledo Medical Center **2022 – 2024**
  Assisted Nepali-speaking patients to facilitate effective communication with healthcare providers and ensure appropriate care delivery.
- **Science Fair Judge –** Ottawa Hills Science Fair, U. of Toledo District 2 Science Day, Ohio State Science Day **2023, 2024**
  Evaluated and scored middle and high school science projects, providing constructive feedback to students.
- **Registered Volunteer, Tri-Chandra Multiple Campus Red Cross Society** **2012 – 2014**
  Supported campus-led social initiatives, including blood donation campaigns and community outreach programs.

COLLEGIATE ACTIVITIES, ASSOCIATIONS AND PROFESSIONAL MEMBERSHIPS

Member – Pitt Graduate Workers Union	2025 – Present
Member – Biomedical Graduate Students Association	2024 – Present
Global Outreach Member – American Society for Microbiology	2018 – Present
Student Member – Society for Glycobiology	2024 – 2025
Member – American Heart Association (AHA)	2023 – 2025
Student Track Representative – Council of Biomedical Graduate Students (CBGS), UToledo	2023 – 2024
Member – Urinary Tract Infection Global Alliance	2022 – 2024
Vice President – Nepali Student Organization, UToledo	2022 – 2023
Member – Graduate Student Association, UToledo	2021 – 2024
Secretary – Nepali Microbiological Student's Association	2017 – 2019

ALL PUBLICATIONS (Excluding preprints)

1. Emily Kinney, Drew Stark, Saroj Khadka, Christine Tin, Timothy Hand, William Bain, and Laura Mike (2025). Connections between Klebsiella pneumoniae Bloodstream Dynamics and Serotype-Independent Capsule Properties. *Infect Immun*. (Accepted for Publication)
2. **Khadka S**, Kinney EK, Ryan BE and Mike LA (2025). Mechanisms governing bacterial capsular polysaccharide attachment and chain length. *Annals of the New York Academy of Sciences*. PMID: 40369709
3. Ryan BE, Holmes CL, Stark DJ, Shepard GE, Mills EG, **Khadka S**, Van Tyne D, Bachman MA and Mike LA (2025). Arginine regulates the mucoid phenotype of hypervirulent *Klebsiella pneumoniae*. *Nat Comms*. PMID: 40595687
4. Pariseau DA, Ring BE, **Khadka S** and Mike LA (2024). Cultivation and genomic DNA extraction of *Klebsiella pneumoniae*. *Curr Protoc*. PMID: 38279957
5. [Column Article] **Khadka S** (2024). Uncovering secrets of slimy bacteria is a 'cloak' and dagger pursuit at UT. *The Blade*, Published Feb 5, 2024.
6. **Khadka S**, Ring BE, Pariseau DA and Mike LA (2023). Characterization of *Klebsiella pneumoniae* extracellular polysaccharides. *Curr Protoc*. PMID: 38010271
7. Ring BE, **Khadka S**, Pariseau DA and Mike LA (2023). Genetic Manipulation of *Klebsiella pneumoniae*. *Curr Protoc*. PMID: 37889096
8. **Khadka S***, Ring BE*, Walker RS, Krzeminski LR, Pariseau DA, Hathaway M, Mobley HLT, Mike LA (2023). Urine-Mediated Suppression of *Klebsiella pneumoniae* mucoidy is Counteracted by Spontaneous Wzc Variants Altering Capsule Chain Length. *mSphere*. PMID: 37610214. * Co-first authors
9. **Khadka S,** Shrestha B, Pokhrel A, Khadka S, Joshi RD, Banjara MR. Antimicrobial Resistance in *Salmonella* Typhi Isolated from a Referral Hospital of Kathmandu, Nepal. *Microbiology Insights*. PMID: 34916803
10. Pokhrel A, Rayamajhee B, **Khadka S**, Thapa S, Kapali S, Pun SB, Banjara MR, Joshi P, Lekhak B, Rijal KR. Seroprevalence and Clinical Features of Scrub Typhus among Febrile Patients Attending a Referral Hospital in Kathmandu, Nepal. *Trop. Med. Infect. Dis.* PMID: 34068402
11. Rayamajhee B, Pokhrel A, Syangtan G, **Khadka S**, Lama B, Rawal LB, Mehata S, Mishra SK, Pokhrel R and Yadav UN. How Well the Government of Nepal Is Responding to COVID-19? An Experience from a Resource-Limited Country to Confront Unprecedented Pandemic. *Front. Public Health*. PMID: 33681124
12. [Column Article] Pokharel A and **Khadka S** (2020). The Urgency to Develop COVID-19 Vaccine (*Title translated from Nepali*). *Nagarik Daily*, Published Sept 24, 2020

SELECTED POSTER PRESENTATIONS

1. **Khadka S**, et al. Sugar import suppresses *Klebsiella pneumoniae* mucoidy in cAMP-CRP-dependent manner (2025). Midwest Microbial Pathogenesis Conference. *Chicago, Illinois, USA.*
2. **Khadka S** and Mike LA. Sugar import diversifies *Klebsiella pneumoniae* sugar import suppresses hypermucoviscosity (2024). Society for Glycobiology Annual Meeting. *Amelia Island, Florida, USA.*
3. **Khadka S** and Mike LA. Sugar import diversifies *Klebsiella pneumoniae* sugar import suppresses hypermucoviscosity (2024). Rust Belt Microbiome Conference. *Pittsburgh, Pennsylvania, USA.*
4. **Khadka S** and Mike LA. Sugar import diversifies *Klebsiella pneumoniae* sugar import suppresses hypermucoviscosity (2024). Midwest Microbial Pathogenesis Conference. *Bloomington, Indiana, USA.*
5. **Khadka S** and Mike LA. *Klebsiella pneumoniae* sugar import suppresses hypermucoviscosity (2023). Midwest Microbial Pathogenesis Conference. *Chicago, Illinois, USA.*
6. **Khadka S** and Mike LA. Sugars suppress *Klebsiella pneumoniae* hypermucoviscosity without altering capsule abundance (2023). Midwest Graduate Research Symposium. *Ohio, USA.*
7. **Khadka S** and Mike LA. Host-derived sugars suppress *Klebsiella pneumoniae* hypermucoviscosity without altering capsule abundance or chain length. 2022. Midwest Microbial Pathogenesis Conference, *Wisconsin, USA***.**
8. **Khadka S**, Shrestha B, Pokhrel A, Khadka S, Joshi RD, Banjara MR. Susceptibility to fluoroquinolones and *gyrA* ser83 mutation in *Salmonella enterica* serovar Typhi Isolated at a referral hospital of Kathmandu valley. ASM Microbe ONLINE 2020. *USA*. (Virtual Poster)

PEER REVIEWING

- Reviewed manuscripts for **Nature Communications** and **BMC Infectious Diseases**

REFERENCES

- Dr. Laura A. Mike, University of Pittsburgh, *Pittsburgh, PA USA* | PhD Advisor | laura.mike@pitt.edu
- Dr. Kevin Pan, University of Toledo, *Ohio*, *USA* | UToledo MMI Department Chair | kevin.pan@utoledo.edu
- Dr. Megharaj Banjara, Tribhuvan University, *Kathmandu, Nepal* | MS Thesis Advisor | megha.banjara@cdmi.tu.edu
- Dr. Basudha Shrestha, Kathmandu Model Hospital, *Kathmandu, Nepal* | Internship Supervisor | basudha111@gmail.com
- Binod Rayamajhee, *Sydney, Australia* | Independent Research Collaborator | b.rayamajhee@unsw.edu.au