

Meet the Fellow

Leila Wogick, PhD

Host Lab: Veterinary diagnostic laboratory, College of Veterinary Medicine, University of Minnesota

Highest Degree: PhD in parasitology

Graduation: January 2019

School: Urmia University, Iran

Tell us about your educational background?

I earned my PhD in parasitology in 2019 from Urmia University in Iran, focusing on protease characterization in *Fasciola hepatica*. My research identified key serine and cysteine proteases involved in parasite development and demonstrated how environmental factors influence enzyme activity and parasite infectivity.

During my doctoral training, I served as a Visiting Researcher at Tulane University (Department of Tropical Medicine, New Orleans, LA), where I conducted research on vector-pathogen interactions and transmission-blocking strategies for tropical diseases. This experience expanded my expertise in infectious disease models, including in-vivo mouse studies and molecular approaches to disrupt pathogen development within vectors. At Urmia University, I also led projects on enzyme profiling and protease inhibition, investigating chemical and herbal inhibitors as potential therapeutic strategies.

Following my PhD, I completed postdoctoral training at Bezmialem Vakif University (Istanbul, Turkey, 2019–2023), where I engineered *Aspergillus oryzae* as a paratransgenic platform to inhibit Plasmodium development in Anopheles mosquitoes, advancing scalable transmission-blocking strategies for malaria control (Sci Rep. 2023;13:12177).

Since August 2025 I have been a fellow at the University of Minnesota Veterinary Diagnostic Laboratory (VDL), conducting translational molecular research focused on mRNA vaccine development and diagnostic innovation in veterinary and public health systems.

What brought you into laboratory science?

What brought me to laboratory science was a desire to understand the biological mechanisms that drive infectious diseases and to contribute to practical solutions to protect human and animal health. I was initially fascinated by how molecular events within pathogens influence disease outcomes, and laboratory research provided a way to investigate those mechanisms directly. Over time, my focus expanded from studying parasite biology to working across vector-borne, zoonotic, and emerging infectious disease systems. I am motivated by the ability of laboratory science to translate mechanistic insight into diagnostics, vaccines, and surveillance tools that support public health decision-making. The laboratory allows me to move from understanding disease processes at the molecular level to developing applied interventions that impact communities.



Photo courtesy of Leila Wogick

Leila Wogick works in the lab work at the University of Minnesota Veterinary Diagnostic Laboratory.

How did you hear about the Public Health Laboratory Fellowship Program?

I learned about the Public Health Laboratory Fellowship Program while seeking opportunities to align laboratory research with real-world public health applications. The program's emphasis on diagnostic capacity, surveillance, and applied laboratory systems strongly resonated with my career goals.

How did this fellowship match or exceed your expectations?

The fellowship has exceeded my expectations by providing hands-on experience in a public health laboratory, allowing me to translate my research background into applied diagnostic and vaccine development work. I anticipated gaining exposure to laboratory operations, but the program has also deepened my understanding of how public health laboratories support surveillance, outbreak response, and zoonotic disease control. Working at the Veterinary Diagnostic Laboratory has broadened my perspective beyond academic research, showing me how molecular tools directly inform real-world decision-making. The fellowship has strengthened my technical skills and expanded my understanding of laboratory quality systems, interagency collaboration, and translational research within a public health framework.

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Tell us what you learned from your mentor.

Through my mentor, I learned how to approach laboratory science within a public health framework rather than solely from an academic perspective. I gained a deeper appreciation for how diagnostic laboratories operate under regulatory, quality assurance, and reporting systems that directly support surveillance and disease control.

My mentor also emphasized strategic thinking, designing experiments with practical applicability, considering scalability, and aligning research objectives with real-world laboratory needs. This experience strengthened my ability to translate molecular research into diagnostic and vaccine-related applications that serve veterinary and public health systems.

Tell us about your projects/laboratory roles.

During my fellowship at the University of Minnesota Veterinary Diagnostic Laboratory, I have been engaged in both diagnostic virology and translational research within a public health laboratory framework. My primary project focuses on developing mRNA vaccine strategies targeting Turkey Arthritis Reovirus (TARV), with the goal of establishing adaptable vaccine platforms for economically significant viral infections in poultry. My role includes experimental design planning, molecular workflow optimization, antigen strategy development, and strengthening core virology and molecular biology techniques relevant to vaccine development.

In addition to vaccine-focused research, I participate in routine and research-based laboratory activities, including viral propagation and titration (e.g., Avian Influenza Virus (AIV), Avian Metapneumovirus (AmPV), Phocine Distemper Virus (PEDV), Porcine Reproductive and Respiratory Syndrome (PRRSV), and reoviruses), Tissue Culture Infectious Dose (TCID₅₀) assays, RNA extraction and Polymerase Chain Reaction (PCR)-based diagnostics, primary cell culture preparation, and virus inactivation studies. These assignments have strengthened my understanding of laboratory quality systems, biosafety practices, and the role of diagnostic laboratories in surveillance and outbreak preparedness. Beyond hands-on laboratory work, I have contributed to public health scholarship by authoring and submitting review manuscripts addressing emerging and re-emerging viral threats. These include.

- Porcine epidemic diarrhea virus: a model for coronavirus persistence and immune escape in intensive livestock systems
- Highly pathogenic avian influenza A (H5N1) in mammals: host-range expansion and implications of milk-borne viral shedding
- The return of measles: how declining vaccination coverage is reversing decades of disease control

This work complements my laboratory responsibilities by situating diagnostic and vaccine development within

broader contexts of zoonotic risk and public health preparedness.

Overall, my fellowship assignments have allowed me to integrate molecular research, diagnostic practice, and public health strategy within a One Health framework.

How has your fellowship experience inspired you?

The fellowship experience has strengthened my commitment to applying laboratory science to directly support public health systems. Working in a diagnostic laboratory environment has shown me how molecular research translates into surveillance, outbreak response, and disease prevention at the interfaces of animal and human health.

It has inspired me to pursue a career that bridges mechanistic research with applied laboratory practice, particularly in zoonotic and emerging infectious diseases. Seeing how laboratory data informs real-world decision-making has reinforced my motivation to contribute to public health infrastructure and translational innovation.

How would you describe the Fellowship to other students?

I would describe the fellowship as an excellent bridge between academic research and applied public health laboratory practice. It provides hands-on experience within a real diagnostic setting, allowing fellows to understand how laboratory science directly supports surveillance, outbreak response, and disease prevention.

For students interested in infectious diseases, zoonotic systems, or translational research, the fellowship offers exposure to laboratory operations, quality systems, and interagency collaboration that are not typically encountered in traditional academic training. It is particularly valuable for those who want to see how molecular tools and research innovations function within public health infrastructure.

Aside from the laboratory and the science, did you gain any other beneficial life experiences?

Yes. Beyond laboratory skills, the fellowship provided valuable experience in professional communication, interdisciplinary collaboration, and navigating public health systems. Working in a US diagnostic laboratory strengthened my ability to collaborate across teams, understand regulatory and quality frameworks, and communicate scientific findings to support decision-making.

As an international scientist, the fellowship also helped me adapt to a new professional and cultural environment, enhancing my resilience, flexibility, and confidence. These experiences have been just as impactful as the scientific training, shaping how I approach teamwork, leadership, and problem-solving in public health settings.