

WesternU Faculty Member Publishes Breakthrough Study on Schistosome Resistance Genes

WesternU's Dr. Michelle Steinauer identifies genetic resistance to schistosome infection in African snails, offering new hope for disease control.

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Michelle Steinauer, PhD, Assistant Vice
President for Research and Professor

of Microbiology at Western University of Health Sciences College of Osteopathic Medicine of the Pacific-Northwest, which is in the process of transitioning to its new name, the Heatherington College of Osteopathic Medicine, has published new findings in Nature Communications that shed light on genetic resistance to schistosome infection.



The [study](#), titled “Genes linked to schistosome resistance identified in a genome-wide association study of African snail vectors,” identifies two distinct regions in the genome of African freshwater snails associated with resistance to *Schistosoma mansoni*, the parasite responsible for schistosomiasis. This discovery offers promising direction for developing strategies to interrupt disease transmission at its source.

Addressing a Global Health Challenge

Schistosomiasis affects more than 200 million people worldwide. While mass drug administration programs, most often using praziquantel, have improved health outcomes in many endemic regions, reinfection remains a persistent problem. Because the parasite is carried by freshwater snails, populations remain vulnerable even after treatment. Interrupting transmission in the snail host is therefore critical to breaking the cycle.

“Despite large-scale drug distribution programs, schistosomiasis continues to thrive in many endemic regions,” Dr. Steinauer explained. “Snails carrying the parasite are abundant in surface waters, which serve as the main water source for many communities. As a result, reinfection occurs rapidly. Even rodents and other mammals can act as reservoirs, sustaining the cycle of infection.”

Key Genetic Insights

To investigate how certain snails resist infection, researchers conducted a genome-wide association study (GWAS) of *Biomphalaria sudanica*, a primary snail vector in Africa. The team identified two genomic regions, labeled SudRes1 and SudRes2, strongly tied to resistance.

- SudRes1 contains genes for receptor-like protein tyrosine phosphatases.
- SudRes2 houses G-protein coupled receptors with leucine-rich repeats.

Both sets of genes are critical to how organisms recognize and respond to pathogens. Interestingly, these resistance genes differ from those found in other snail species, suggesting that African snails have evolved unique genetic defenses against the parasite.

The study also revealed that genetic lineages within snail populations correspond to their ability to resist infection, indicating that natural variation among populations could play a significant role in shaping disease transmission patterns.

Broader Implications

These findings deepen scientific understanding of host-parasite interactions and highlight new pathways for disease control. By targeting the snail vectors themselves, researchers hope to design more sustainable solutions to reduce human infection rates.

“Infectious diseases continue to cause significant illness and death worldwide while also affecting agriculture and economies,” Dr. Steinauer said. “The immune system is a product of long evolutionary battles between hosts and pathogens. To grasp its full complexity, we must study a wide range of species to uncover the diverse strategies they use to fight infection.”

About Western University of Health Sciences

Western University of Health Sciences (www.westernu.edu), located in Lebanon, Oregon and Pomona, Calif., is an independent nonprofit health professions university, conferring degrees in osteopathic medicine, physical therapy, biotechnology and pharmaceutical sciences, dental medicine, medical sciences, nursing, optometry, pharmacy, physician assistant studies, podiatric medicine and veterinary medicine. WesternU is home to WesternU Health, where the best in collaborative health care services is offered.

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