Parasite research participant advances the understanding of vaccine targets in cattle

By Jordan Stidham

U.S. Department of Agriculture Agricultural Research Services research participant Mariam Bakshi, Ph.D., applied her immunology, biomedical parasitology and entomology knowledge to studying parasites in farm animals. (Credit: Lindsay Porter/Texas A&M University)

Parasites damage the U.S. cattle industry significantly, so it is imperative to find effective control measures. Mariam Bakshi, Ph.D., contributed to research focused on parasites that deteriorate farm animal health while she was an Oak Ridge Institute for Science and Education (ORISE) participant.

Bakshi heard about the U.S. Department of Agriculture (USDA) Agricultural Research Services (ARS) Research Participation Program from Dante Zarlenga, Ph.D., who became her mentor during her appointment. Bakshi applied to the program because she wanted to gain postdoctoral experience by conducting research.

The USDA ARS Research Participation Program provides opportunities for students, postgraduates, established scientists and faculty to participate in programs, projects and activities at ARS-designated facilities to help ARS solve agricultural problems of high national priority.

For her appointment, Bakshi was stationed at the Animal Parasitic Diseases Laboratory in Beltsville, Maryland, where she investigated vaccine targets against harmful gastrointestinal nematodes of cattle.

“The parasites *Ostertagia ostertagi* and *Haemonchus contortus* cost the U.S. cattle industry billions of dollars annually,” Bakshi explained. “Preventive measures are drugs; but, due to drug resistance, we focused on finding alterative preventive measures such as vaccination. I was part of a project that focused on finding parasitic immune modulators that are secreted into the host and could be used as vaccine targets.”

Born in New Delhi, India, Bakshi received her doctoral degree in veterinary pathobiology from Texas A&M University. She has a background in immunology, biomedical parasitology and entomology.

“It is interesting that the parasites are so diverse. Yet, at some level they have a commonality to infect something else in nature, to survive. It is interesting that these parasites suppress the host immune system to complete their life cycles and that’s what fascinates me,” Bakshi said.

“One of my passions is to serve the community through teaching and research, which one can obtain through careers in STEM,” said Bakshi, referencing science, technology, engineering and math. Her career goals include becoming an independent researcher and developing a teaching program for young investigators.

Bakshi gained memberships in the American Association of Immunology and the American Association of Veterinary Parasitologists. She attended three conferences, including one international conference, during her time in the program.

“I really enjoyed this experience,” Bakshi said. “It has given me the chance to do what I really love, and this itself is a reward.”

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