GRADUATE
AG RESEARCH
SPOTLIGHT

Rishi Drolia

"My interest lies in understanding how microorganisms target hosts. It was not necessarily my intention to be in food safety, but I try to understand how bugs cause infectious disease."
Rishi Drolia, PhD candidate, Food Science

THE STUDENT: Rishi Drolia's mom used to tell him it was often the smallest things in life that created problems. He took that to heart: "Indeed, these small things that I study — bacteria and viruses — are responsible for causing fatal infections," he says. Drolia grew up in Shimla in northern India. He earned a bachelor's degree in microbiology at Bharati Vidyapeeth University and a master's degree in biochemistry at Fergusson College, both in Pune, India. He then looked beyond his country's boundaries: "The U.S. offered extensive diversity that I believe teaches you more," he says. "I wanted more exposure." He came to Kansas State University in 2009 for master's study in biology and taught each of the six semesters he was there. He also explored advanced research programs relevant to his interest in intracellular pathogens. The work being done at Purdue in Professor of Food Science Arun Bhunia's molecular food microbiology research lab was of particular interest. The two became acquainted by phone, which led to Drolia's arrival at Purdue in fall 2012.

THE RESEARCH: Drolia uses basic and applied science tools to study the foodborne bacterial pathogen *Listeria monocytogenes*, which impacts human health worldwide. It infects the gastrointestinal tract by first crossing a wall of cells in the gut that generally protects the bloodstream from harmful pathogens. "Pathogens have this incredible ability to cross host barriers," Drolia says. "My interest lies in how this one crosses the gut barrier — the first line of defense."

NEW THINKING: His research showed the pathogen could cross the gut barrier by multiple routes. "In terms of food safety, this is important," Drolia explains. "The U.S. has zero tolerance for *Listeria monocytogenes*, but in Europe, a few cells in ready-to-eat products including deli meats are still accepted. Other countries have no regulation, and outbreaks are on the rise. My research says that in designing policy, it should not be tolerated." His findings were published in April 2018 in Cell Host Microbe. "Publishing the article puts your science out there for people to read and makes it global," he says. "The peer-review process gives you constructive criticism about your work and allows you to improve science."

LEARNING PATIENCE: Such research takes time, and Drolia credits his advisor with teaching him patience: "He keeps me motivated and gives me very good insight at the right time," he says of Bhunia. "The most compelling thing is, you've got to solve the problem. The long hours you spend in the lab will never appear long if you enjoy doing it." He plans to graduate in December and continue in a postdoctoral position in the lab before looking for a faculty position that balances research with teaching. His favorite stress-buster is running, but he also enjoys cooking with his wife — everything from Asian to Mexican to Indian cuisine.