AG RESEARCH
SPOTLIGHT

Catherine Hill

"What we've done at Purdue is to recreate in academia the drug discovery pipeline that exists in industry. It's like searching for a needle in a haystack to find that one insecticide molecule that works."

—Catherine A. Hill, Professor of Entomology

The Ag Research Spotlight shines each month on an individual whose work reflects our commitment to the six strategic themes that guide Agricultural Research at Purdue. Our spotlight for November 2013 underscores the theme, "Utilizing molecular approaches to expand the frontiers of agriculture and life sciences."

THE RESEARCHER: Medical entomologist Catherine Hill is the textbook bug-collector turned bug-scientist. Growing up in suburban Adelaide on the southern coast of Australia, her "pet collecting," she recalls, "used to drive my mother mad." And butterflies didn't appeal: "I wanted the gooey, gory stuff—the insects that sucked blood or caused paralysis." After earning a bachelor's degree in Agricultural Science and Ph.D. in Entomology at the University of Adelaide, Hill was recruited to Elanco Animal Health, part of Eli Lilly and Company in Indianapolis. "I didn't understand the discipline of medical entomology until I came to the United States—that there are career opportunities that allowed me to combine two big interests, entomology and medical research for animal and human health," she says. After three years with Elanco, Hill became a postdoctoral research associate at the University of Notre Dame's Center for Tropical Disease Research and Training. Scientists there were just beginning to sequence the genome of the malaria mosquito. When Purdue offered her a position in 2003, she couldn't resist the opportunity to become a principal investigator of ticks, her "favorite medical pests," in a place "where entrepreneurship and commercialization is very much respected and supported."

THE RESEARCH: Hill's research focuses on decoding an insect's genome to design an insecticide that exploits it.

"What we work on is discovering next-generation insecticides that are safer for the environment and non-target organisms like humans and honey bees," she explains. "You're on the hunt for what might be the next blockbuster insecticide. It's exciting. We've created a multidisciplinary team, which includes researchers across campus in Pharmacy and also the Bindley Bioscience Center at Discovery Park, so every day my brain is getting stretched and challenged."

IGP COLLABORATION: Hill chairs the *Ixodes scapularis* Genome Project, the first large-scale genomic analysis of the Lyme disease tick in North America. Funded by the NIH, the partnership links members of the international tick research community, Broad Institute and J. Craig Venter Institute. The paper that describes the project has been submitted to Science with 89 co-authors.

OUTREACH: Public education is the key to the preventing the transmission of vector-borne diseases like Lyme disease and West Nile virus, Hill says. She is part of Purdue's Public Health Entomology program team, which serves Indiana citizens on public health issues related to such insects as fleas, bed bugs and mosquitoes, as well as ticks.

BACK HOME: Hill enjoys creative writing, reading, yoga and international travel, which often is part of her work. She is spending this academic year at the Monash Institute for Pharmaceutical Sciences in Melbourne, the first extended visit to her home country in 15 years. The institute's quest for ways to search for highly selective human drugs is applicable to insecticides. "I went there to learn what they do in human drug discovery work there so we can apply it to our little critters," she says.