Mosquitoes: What's Behind the Bite?

Lindy McBride

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CURRENT RESEARCH

Taking a Bite Out of Mosquito Genetics

Every few years, Lindy McBride travels to Kenya for four weeks to collect bugs. She and her team will knock on village doors and go into the forest to set traps. During their stay, the research team collects hundreds of different mosquitoes to bring back to the United States for study.

There are over 3000 kinds of mosquitoes on Earth. Most are opportunistic. They will bite whatever comes their way. But the type of mosquito that Lindy studies is a specialist. It only bites humans.

When an insect focuses on one source of food, their whole biology changes. These mosquitoes bite humans, and have evolved interesting adaptations that allow them to do that. Their ability to recognize how a human smells, for example, is uncanny. Smell is more important than vision for most insects. They recognize what they eat by how it smells.

Interestingly, these mosquitoes probably evolved to target humans relatively recently – within the past 10,000 years. They still have relatives in Africa that live in forests and bite animals. These relatives represent what the species was thousands of years ago. Lindy and her team can see how different the two varieties are in the lab. They put 100 mosquitoes in a box and given them a choice between human scent and guinea pig scent. The animal-biting variety mostly goes to the guinea pig. The human-hunting variety will choose human odor 99% of the time.

The research team is really interested in what changes in the genome and brain of a mosquito cause it to love human odor so much. First they look for the causal genes. They mate the two types of mosquitoes in the lab to create hybrids. Some hybrids like humans. Others prefer guinea pigs. The team looks for...

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AFFILIATION

Princeton University

EDUCATION

- Evolutionary Biology, Ph.D., University of California, Davis

AWARDS

- Rosalind Franklin Young Investigator Award, 2016

RESEARCH AREAS

Life Science

FUNDING REQUEST

In order to fund this potentially life-saving research, the McBride lab needs $300,000 annually.