Health

Your skin microbiome may affect how attractive you are to mosquitoes

Mosquitoes can be drawn to your skin microbiome, suggesting that one day a spray that alters your bacteria could help ward off bites

By Carissa Wong

30 August 2023

Aedes aegypti mosquitoes, which spread infections such as dengue, may be put off by some of the odours produced by bacteria on people's skin
James Gathany/CDC/AP/Alamy

Bacteria that live on your skin produce odours that can help repel mosquitoes. This suggests that changing some people's skin microbiomes to contain more of these bacteria could work as a mosquito repellent.

Synthetic repellents, which commonly contain the ingredient DEET, can be applied to the skin to prevent mosquito bites, but tend to wear off after a few hours and, in rare cases, can cause skin irritation. DEET can also have toxic effects on aquatic life, such as slowing the growth of algae.

Now, Iliano Vieira Coutinho Abreu Gomes at the University of California, San Diego, and his colleagues have found that bacteria that commonly live on people's skin produce chemicals that help to repel *Aedes aegypti* mosquitoes, which spread infections such as dengue, chikungunya and yellow fever.

The researchers looked at 20 strains of microorganisms that belong to the bacterial group *Staphylococcus* and 19 strains of *Corynebacterium*, both of which are commonly found on human skin. They tested how a subset of chemicals – called 2-methyl butyric acid, 3-methyl butyric acid and geraniol – released by these bacteria affect mosquito behaviour.

Read more:

Your body wash may make you more attractive to mosquitoes

The team placed a plastic mesh coated with the chemical lactic acid, which is highly attractive to mosquitoes and produced by some skin bacteria, at two ends of a cage. At one end, the researchers also placed a mesh coated in either odourless water or paraffin oil, acting as the control part of the experiment. At the other end, they placed a mesh coated in 2-methyl butyric acid. They then repeated the experiment with 3-methyl butyric acid and geraniol-coated meshes at this end of the cage.

After releasing 16 female *A. aegypti* mosquitoes into the cage at a time, the team found that the insects landed and spent roughly 70 per cent less time at the end of the cage

with either 2-methyl butyric acid, 3-methyl butyric acid or geraniol, compared with the side with the control solutions.

"Bacteria such as *Staphylococci* stay on our skin even if we take a shower and the repellent chemicals they produce are naturally found on our bodies," says Gomes. Researchers could genetically engineer these bacteria in the laboratory to produce raised levels of chemicals such as 2-methyl butyric acid and then these engineered microbes could be applied to skin, he says. As these bacteria already live on people's skin, targeting the skin microbiome could result in a much longer-lasting repellent than existing sprays, he says. The team is testing this approach in mice.

However, it is unclear how easily such a repellent could be distributed to people most at risk of infections spread by mosquitoes. "Products containing microbes would usually need to be stored in the fridge, which isn't really practical," says Alicia Showering at the London School of Hygiene & Tropical Medicine.

What's more, the team only studied one type of mosquito and the experiments didn't involve using people as bait, says Perran Ross at the University of Melbourne, Australia. "It's too early to say from this study whether new repellents based on these compounds could be better than existing ones," he says.

Reference:

bioRxiv DOI: 10.1101/2023.08.19.553996

Topics:
Skin / Mosquitoes / Microbiome

Health

Malaria outbreak in Ethiopia linked to invasive mosquito from Asia

News Free

Health

Amphibian deaths in Central America led to malarial mosquito surge

News Free

Life

When cats chew catnip it releases mosquito-repelling chemicals

News Free

Health

A single vaccine could protect against many mosquito-borne diseases

News Subscriber-only

Popular articles

Trending New Scientist articles

1 **Why relaxation is as important as sleep - and six ways to do it better**

2 **Super-heavy oxygen hints at problem with the laws of physics**

3 **Iconic supernova captured by the James Webb Space Telescope**

4 **Maxwell's demon imagined by physicists really exists inside our**

cells

5 **Unravelling the secrets of the vagus nerve will revolutionise medicine**

6 **The untold story of the curiously controversial Homo floresiensis dig**

7 **Our ancestors may have come close to extinction 900,000 years ago**

8 **The 10 best science and technology podcasts right now**

9 **AI shows no sign of consciousness yet, but we know what to look for**

10 **Why is it so difficult to make an effective vaccine against dengue?**

Back to the top