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Popular Article

The Invisible Trail: How mosquitoes Track their Human hosts?

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Why Do Mosquitoes Bite Some People More Than Others?

Have you ever noticed that mosquitoes seem to go after one person more than the others? I have noticed this myself, and it can be really irritating. At first it may seem random, but mosquitoes actually respond to several signals from our bodies when they are looking for a person to bite. Mosquitoes are also important because they can spread diseases such as malaria, dengue, yellow fever and Zika. When they search for a person, they can pick up carbon dioxide from our breath, body heat and chemicals released by the skin. Since these signals can be different from one person to another, some people may end up getting bitten more often.

How Mosquitoes Find a Person?

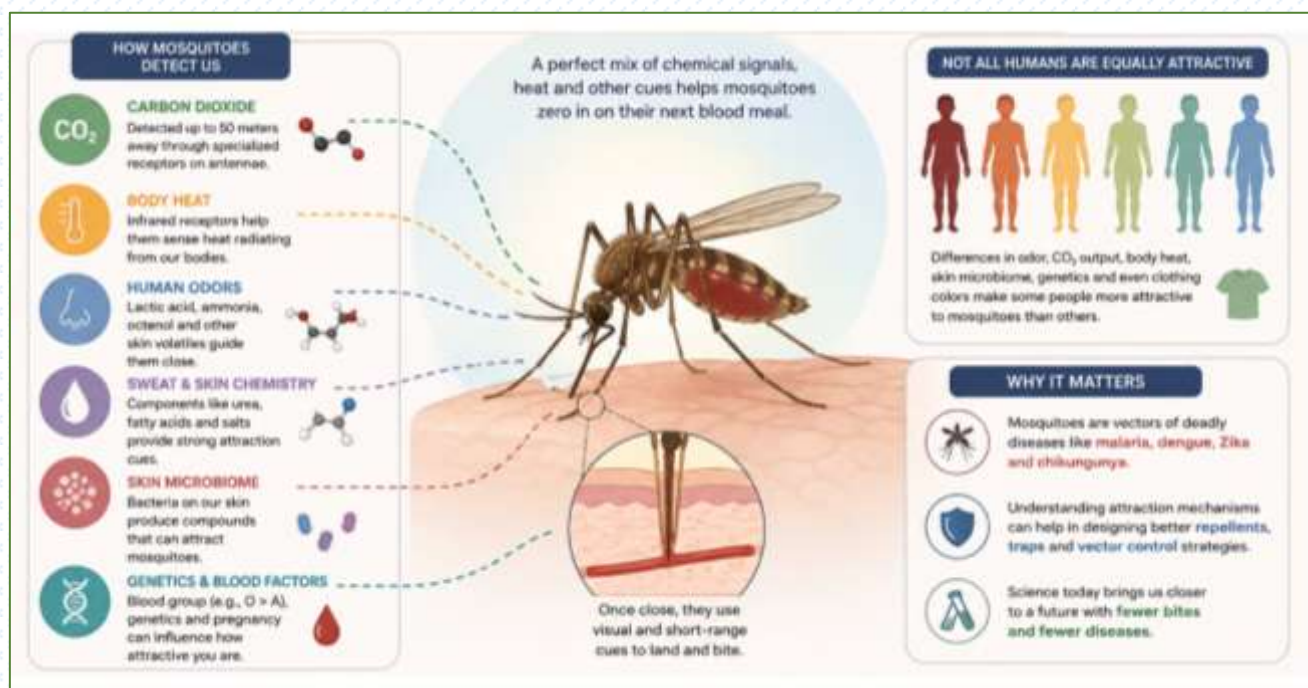


Figure 1: Diagrammatic demonstration of reasons behind affinity of mosquitoes towards certain individuals in comparison to others.

Mosquitoes do not use just one signal to find us. From a distance, the carbon dioxide in our breath can tell them that a possible host is nearby. Once they get closer, other signals become more useful for finding the person.

When they are closer, body smell becomes more important. Our skin gives off chemicals such as carboxylic acids, lactic acid, ketones and aldehydes. Mosquitoes can sense these chemicals, and the mixture is not exactly the same for everybody. This could be one reason why one person seems more attractive to mosquitoes than another.

The Skin Microbiome:

The bacteria that naturally live on our skin may also play a part. They interact with sweat and sebum and can produce chemicals that become part of our normal body smell.

The skin microbiome is a little different for everyone, so the chemicals produced on the skin can vary too. Genetics may also have some influence because it can affect sweating, metabolism and the conditions that skin bacteria live in.

Other Factors:

There are a few other things that can change the signals mosquitoes pick up. After exercise, for example, we breathe faster, our body temperature goes up and we usually sweat more. Pregnancy can also bring changes in body temperature and metabolism.

It seems to happen in stages. First, carbon dioxide helps the mosquito notice that a person is nearby. As it gets closer, it can use body heat, humidity, visual contrast and skin smell to get a better idea of where the person is.

Ways to Reduce Mosquito Bites:

There are some simple ways to lower the chance of getting bitten. Repellents such as DEET, picaridin and oil of lemon eucalyptus (PMD) can make it harder for mosquitoes to find us. Wearing suitable clothing can also help. At home, window screens, bed nets and fans can make it more difficult for mosquitoes to reach people.

After exercise, washing can remove sweat and some of the substances that contribute to body odour. However, changing the skin microbiome on purpose to prevent mosquito bites is still being studied, so it should not replace methods that are already known to help.

Mosquito Traps and Control:

Another approach is to attract mosquitoes away from people. Some traps use carbon dioxide and other chemicals associated with humans. Depending on the situation, these traps may help reduce mosquito activity around a home or living area.

Discussion:

The phrase “mosquito magnet” makes it sound like there is one clear reason why someone gets

bitten more. It is probably not that simple. Genetics can affect body chemistry, and the skin microbiome can change some of the chemicals released from the skin. Things like breathing, body heat, exercise and the surrounding environment can matter as well.

Overall, there is probably no single reason that explains why one person gets bitten more than another. Mosquitoes are reacting to several signals at the same time.

Conclusion:

Mosquitoes are very good at finding people. They use carbon dioxide, body heat, skin chemicals and other signals from the environment to locate a host. Differences in metabolism, genetics and the skin microbiome may help explain why some people seem to attract more mosquitoes.

Understanding these signals better could help scientists find improved ways to control mosquitoes in the future. For now, repellents, protective clothing, screens, bed nets and other mosquito-control methods remain useful ways to reduce bites and the risk of mosquito-borne diseases.