Optical barrier generator prevents the spread of infectious disease by damaging mosquitoes' sensory systems with infrared light

Technology #m09-076

Malaria remains a major global public health threat, responsible for the death of ~1 million people annually. Evidence has shown that malaria-carrying mosquitoes are vulnerable to optically-induced sensory interference and damage. This technology creates an infrared optical barrier to disorient mosquitoes, damage their sensory networks, and prevent them from locating their human prey. The device’s camera spots approaching mosquitoes, and only then activates an infrared light sheet. The resulting barrier shows an abrupt change in light intensity which can damage insects’ sensory systems, but is safe for humans.

Optical device offers a safe and environmentally friendly means to repel mosquitoes

Existing chemical methods for controlling mosquito populations may pose direct environmental and health risks, and serious discomfort to users. Thus, there is a great need for environmentally friendly and complementary approaches to mosquito control. Because the power required to disorient a mosquito is small, this device implements an infrared light source that is damaging to insects but safe for humans. A low power green light provides humans visual feedback.

The light barrier can also be tuned to target specific bugs, leaving other small animals unharmed. It has been featured in the New York Times, The Economist, and has been awarded a grant for Grand Challenges in Global Health from the Bill and Melinda Gates Foundation.

Lead Inventor:

Szabolcs Marka, Ph.D.
Applications:

- Mosquito repellent in underdeveloped countries to prevent the spread of malaria and other infectious diseases
- Repellant for dangerous arthropods other than mosquitoes (e.g. kissing bug)
- Household consumer product for keeping insects away
- Can be used to build insect defense stations at campgrounds
- Protection of plants from insects in agriculture

Advantages:

- Harmless to the human eye
- Does not use chemicals or biological agents (i.e. environmentally friendly)
- Provides defense in three dimensions
- Does not require physical contact with mosquitoes
- Provides visual feedback

Patent information:

Patent Issued (US 8,810,411)

Tech Ventures Reference: IR M09-076

Inventors

Szabolcs Marka