Healthy Outlook Blog

Smelly Socks' Allure for Mosquitoes May Help Swat Malaria

By Sue Russell | Posted March 29 2012

Global Health, malaria, Mosquitoes, Research

In 2008, most of the nearly one million who died from malaria were children living in Africa. Now, promising research shows that improbable-sounding "sock science" could play an important role in ending malaria's reign of terror.

Malaria is one of the globe's most intransigent killer diseases. And when Dutch scientist Dr. Bart Knols discovered mosquitoes favored legs and feet by standing naked in a darkened room and observing where he

ABOUT OUR BLOG

Our blog is a collection of thoughts and stories that serve as inspiration for what healthymagination is—a shared commitment to creating better health for more people. It's written by the people behind healthymagination, as well as members of our advisory board and guest contributors from around the web.

YOU MIGHT LIKE

First Bedside Genetic Test Identifies Right Drug for Stent Patients

Now, Canadian biotech firm Spartan Bioscience has developed the first bedside genetic test for heart patients, the Spartan Rx. The device tests DNA from a simple swab of cheek saliva to identify star-2 allele carriers, allowing patients to be treated with the right anti-clotting medication.

was bitten, it seemed important. Knols learned that feet are four times more attractive than other human body parts to the pesky insects, but that when feet are washed, their allure quickly fades.

However, Knols' intriguing discovery languished for fifteen years without practical application. That's when he put his faith in Fredros Okumu, a young Tanzanian keen to utilize this odiferous intelligence in his own malaria research. Okumu is the Principal Investigator of the Outdoor Mosquito Control Project at the Ifakara Health Institute, an international research organization in Tanzania. Currently a Ph.D. candidate at the London School of Hygiene and Tropical Medicine, he has masters' degrees in Medical Parasitology and Geographical Information Systems.

He is only 29 years old but Okumu works with a sense of urgency. "Given that the life expectancy of my country is just about 55," he says, "you can see I have just about 20 years left to serve my society in any meaningful way."

$100,000 in funding from the Bill and Melinda Gates Foundation got Okumu and his colleagues started on "sock science" and smell experiments back in 2009. "We purchased synthetic versions of chemicals that we knew human beings naturally emit in sweat, breath, or from their skin surfaces," he says. "What we did first was to constitute a mix of attractants that is more attractive (to mosquitoes) than humans at long range. And this was in itself a very beautiful thing to find."

Okumu also was intent on moving beyond what he calls the "fancy sock science affair" to developing actual public health products. The team hit upon the right blend of eight chemical attractants, then began testing them at varying concentrations. Finally, they found the optimal combination to lure the most malaria mosquitoes into traps where

StickK: Wagering Cash on Achieving Healthy Goals

Despite the best of intentions, most of us find it incredibly difficult to adhere to diets, exercise regimens and attempts to quit smoking. That's where StickK enters the picture. The service, available on the web as well as through the iPhone and Android smartphones, literally lets you put a contract out on yourself.

Olympic Hopefuls Test Pioneering Vibrating Suit for Peak Performance

Imagine wearing a sensor-laden electric training suit whose vibrations prompt you to move in just the right way as you work to perfect your gymnastics routine…or golf swing or back stroke or tennis moves?

POPULAR TOPICS

- Health
- Healthy Behaviors
- Health Tips
- Wellness
- Lifestyle
- Everyday Health
- Innovation
- Research
- Health Information
- Technology

OUR AUTHORS

they could be killed.

“But, instead of sticking to the lab,” says Okumu, “we went out to the village to do what our Research Group at Ifakara Health Institute does best. We tested this thing against wild, free flying, disease-transmitting mosquitoes. “We constructed and tested physical devices baited with this synthetic mix or dirty socks to check whether we could mimic humans sitting outside houses and whether we could lure and kill these potentially dangerous creatures.”

The researchers also tested the attraction of a human volunteer sleeping beneath a net directly against the stinky synthetic mixture. “And this is when we showed four times more mosquitoes were entering the huts with the synthetic bait than the hut with the human volunteer,” says Okumu.

So far, the results of the team’s research have been positive. And the focus on outdoor mosquito control strategies is important because, says Okumu, “We now have unequivocal evidence than an increasingly high proportion of malaria transmission is taking place outdoors.”

Recently, the team was awarded $775,000 by the Bill and Melinda Gates Foundation (BMGF) and Grand Challenges Canada (GCC) to fund two more years study. “We are extremely happy that we have the ongoing partnership,” says Okumu.

Moving forward, Okumu anticipates the placement of devices around 30m away from the nearest houses, or near identified mosquito-breeding sites. At least 20 devices would be required per 1,000 people, he estimates. And maintenance costs for each device must be at $4-30 per year to be viable.

Chemicals seem to work better at long range, dirty socks at closer quarters. However, smelly socks and “sock science” might yet win out for all too practical reasons.


Lisa Collier Cool


Sam Greengard


Jane Langille


Britta Barrett


Linda Melone


Dan Ferber


Paula Dranov


Sue Russell

BLOGROLL

- New York Times Well
- John Barban
- The Healthcare IT Guy
- The Health Care Blog
- KevinMD
- Cooking Light Eating Smart

“We must realize,” Okumu explains, “that our aim is not only to end up with a super-attractive lure, but also a cost-effective one. So if we have a moderately attractive sock that we can obtain easily and fairly cheaply, then that will be the winner.”

Okumu hopes that his team’s devices will become a mainstay in the outdoor mosquito control arsenal. There is much to learn, he admits. “It’s still more like shooting a space-borne missile using a handheld gun,” he says. “Nevertheless, we believe that for the first time we have an opportunity to start actively working on outdoor mosquito control as a complementary method alongside nets and insecticide sprays. And with the BMGF and GCC support, the hurdles are a lot fewer and a lot lower.”

Encouragingly, Okumu says computer modeling also suggests that combining insecticide-treated nets with his team’s devices “can indeed drive malaria transmission lower than the thresholds that we will need to reach in order to consider malaria elimination a real possibility in many areas. And this is true for most epidemiological scenarios representative of Africa.”

CONNECT THE DOTS

For information about malaria, visit the World Health Organization and the Centers for Disease Control and Prevention. To learn about insecticide-treated mosquito nets, visit USAID. Follow Fredros Okumu’s research blog.

- Think Simple Now
- Good Magazine
- Diets In Review
- The Next Level

CONTACT US

Share your ideas at:
contact.healthymagination@ge.com.

PREVIOUS POST

NEXT POST

About Healthymagination

What is Healthymagination?
Leadership
Advisory Board
Press
GE Healthcare
GE Reports
2009 Annual Report
2010 Annual Report

Projects

All Faces
Game Changers Summit
Better Health Evaluator
Health of Nations
Healthy How-To's
Visualizing Data
Healthy Innovation
Better Health Study
Sharing Healthy Ideas

Stories

GOOD Guide to Living Better
Healthy School Days
Meet mobilegs
Morsel Summer Survival Guide
The Art of Therapy
Healthy Alterations
Decoding Data
Pediatric Adventures
Hip-Hop Health

From the Better Health Blog

Tasty Farmer's Market Recipes
The Anti-Diet: Winning the War on Obesity
Tiny Tots in the Dentist's Chair Among Changes in Pediatric Dentistry – MedicineNet

Applications

HealthyShare
Fit Friendzy
Stats of the Union
Morsel
I'm Expecting
Sleep on It
Moody Me
Patient Shuffle
My Diet Diary

Social Presence

Blog
Facebook
Twitter
YouTube