

"Fungi provide a very good alternative in places where resistance to the insecticides used on bed nets has already appeared," says evolutionary biologist Yannis Michalakis of the Research Institute for Development in Montpellier, France. Elsewhere, he adds, "the fungi and insecticide[-treated] bed nets could be used in combination."

Michalakis, who did not participate in either of the studies recently reported in *Science*, says that fungus-based insecticides are potentially "much more environmentally friendly" than chemical sprays.

Fungal sprays could nevertheless kill nontarget insect species, says Read, "but most of those are species people don't want anyway."

A number of obstacles remain. "We need to work on a formulation that makes spores survive longer in the field," says Bart G.J. Knols of Wageningen University, who was part of the Tanzanian study. In the current formulation, a solution mixed with a little vegetable oil, the spores appear to remain effective only for about 3 weeks, suggesting that frequent applications would be required. Most chemical treatments last for 6 months or more, Knols notes.

In time, Michalakis adds, either mosquitoes or malaria parasites could evolve ways to circumvent the new fungal tactic. The parasites might accelerate their development so that they could spread from a fungus-infected mosquito to a person before the insect carrier dies, for example. Also, mosquitoes might alter their behavior so that they become less likely to remain inside homes after feeding, thereby minimizing contact with the fungi.

Knols acknowledges those possibilities but he says that mosquitoes and the parasites are less likely to evolve resistance to an organism such as a fungus, which can evolve countermeasures in response, than they are to a chemical agent.

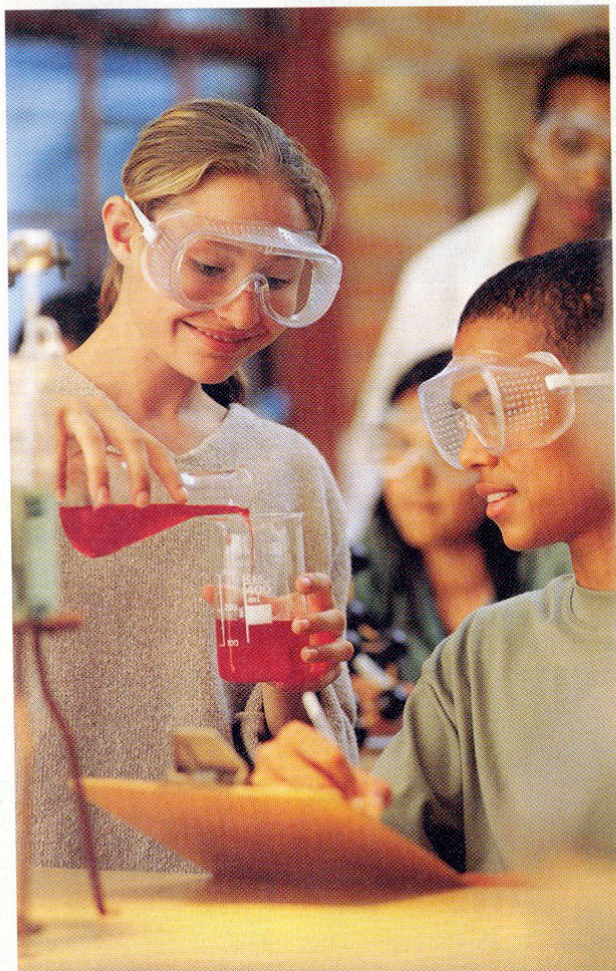
Such potential obstacles notwithstanding, Read sees good reason to pull out the stops in fighting malaria mosquitoes. "Hit these things with everything you've got," he says. ■



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