protected by bed nets or domicile spraying (Roberts DR and Andre RG. *Am J Trop Med Hyg*. 1994;50:21-34). Even such strategies as using insecticide-treated bed nets, which has proven to be effective at reducing infant deaths in several large studies, has been limited because many countries cannot afford widespread distribution of the nets (Nchinda TC. *Emerg Infect Dis*. 1998; 4:398-403).

DECISION MAKING TOOLS

The consortium will use a 2-pronged approach to address these challenges. The first involves targeting the mosquito and its defenses by creating a portfolio of new and improved insecticides through collaborations with insecticide producers. The second will provide tools to aid community-level decisions about vector control.

To make participation in the project attractive to manufacturers, the consortium will partially fund the research and development process. Insecticide producers who wish to participate will submit a proposal for development of a product to an external scientific advisory committee. The committee will select projects to include in the consortium's portfolio based on criteria designed to identify those that will provide the greatest public health benefits. For instance, the committee will select products that are improvements on existing products, that are safe, that are likely to be accepted and used by countries in need, and for which the infrastructure for production is available.

"We're interested in new active ingredients and also better formulations of the pesticides we already have," said Janet Hemingway, PhD, director of the Liverpool School of Tropical Health.

Providing local communities with the tools they need to make educated decisions about vector control will be another priority of the consortium's efforts. Hemingway explained that in many areas, price may be the only factor used to determine if and when to use a particular insecticide.

"We want to give communities an assessment of the situation in their area, and help them understand what will work and what are the optimal times to use the pesticides," she said. "That way you should be able to reduce the costs of the pesticides and make sure what you put out there really works."

The consortium has already piloted such an assessment system in Mozambique. Rather than sending entomologists out to collect and identify mosquitoes and determine if they are resistant, local individuals will collect the insects and drop them off at a central analysis point. There, scientists will use microarray technology to rapidly analyze the samples. This information, as well as data on human infections, will be entered into a Web-based system (using geographic information system technology to indicate locations) and provide nearly real-time information about the spread of the disease. □

Nature's Glue May Have Medical Uses

Tracy Hampton, PhD

RESEARCHERS HAVE DISCOVERED that a unique adhesive made by the water-dwelling *Caulobacter crescentus* bacterium can withstand the stress of about 70 N/mm^2, the equivalent of 5 tons per square inch, making it the strongest biological adhesive ever measured (Tsang PH et al. *Proc Natl Acad Sci U S A*. 2006;103: 5764-5768). A number of potential medical and engineering applications for such a natural glue can be envisioned, particularly because its effectiveness in wet environments may make it a promising adhesive for procedures such as surgeries.

To get their results, the investigators first allowed individual *C crescentus* cells to attach to a thin flexible pipette, then used a suction pipette to grab and pull at each cell, measuring the force needed for detachment. More than twice as strong as commercial "super glue," which breaks when a shear force of 18 to 28 N/mm^2 is applied, the bacterial adhesive's tenacity comes from a group of polysaccharides called N-acetylglucosamine (GlcNAc). When the scientists degraded the GlcNac polysaccharides by treatment with lysozyme, the bacterial cells lost much of their stickiness. At concentrations of 2.3, 0.1, and 0.01 mg/ml of lysozyme, all cells were readily pulled off of pipettes by syringe suction.

C crescentus affixes itself to rocks and the insides of water pipes via a long, slender stalk that is held fast by GlcNac polysaccharides located at the stalk's end. Because the bacterium is common in tap water and produces no human toxins, it poses no threat to human health.

The researchers, who are from Brown University, in Providence, RI, and Indiana University, in Bloomington, next plan to study the chemical and biophysical basis for the impressive force of this bacterial adhesive. "Because polymers of GlcNac play a critical role . . . and because such polymers are important adhesins in many systems, including biofilms, understanding the basis for the adhesive properties of the holdfast will serve as a useful model system," they wrote.

However, a significant challenge in applying this adhesive to medical purposes may be in generating large quantities of the glue without it sticking to everything that is used to produce it. □