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KINGSTON, R.I. -- In a basement laboratory at the University of Rhode Island, adult deer ticks are taped onto their backs, legs flailing. For about an hour, the watermelon-seed-sized ticks continuously drool into a miniature glass tube.

If research assistant Megan Dyer is lucky, she may get the equivalent of a tiny raindrop in tick saliva by the time she is finished with the three-dozen ticks.

Bizarre as the work seems, it's part of a serious two-decade effort by URI professor and tick expert Tom Mather to develop a vaccine against tick-borne diseases that would make people itch as soon as a deer tick bites.

"It's noticing them before they have time to transmit disease," said Mather, who is funded by the National Institutes of Health.

Vaccines are one strategy for protecting the public against the growing threat of tick-borne diseases. But technical challenges and public skepticism stand in the way.

An earlier human Lyme vaccine, Lymerix, was pulled off the market in 2002 because of poor sales, attributed in part to public concerns that it made people sick and tepid endorsements by the federal government. No subsequent study found the vaccine to be unsafe, but it was also inconvenient, requiring three initial shots and, likely, yearly boosters.

In May, Baxter International, Inc. released promising results for a new Lyme vaccine being developed with Stony Brook University and Brookhaven National Laboratory researchers. It uses the same novel approach the first vaccine did -- killing the corkscrew-shaped Lyme bacteria in the tick's gut before it is transmitted to humans -- but it would work against all strains of the bacteria in Europe and the United States; Lymerix targeted only the Northeast US species. It is not known how many initial shots, or how frequently boosters, would be needed.

Any vaccine maker will have to work hard to persuade the public it is effective -- and safe. That's partly because a growing and vocal community of Lyme activists is highly suspicious of the medical establishment, with which it has battled over who has Lyme disease, how to treat it, and researchers' consulting arrangements with vaccine makers.

"I'm cautious about vaccines," Lorraine Johnson, chief executive of the advocacy group LymeDisease.org, said in an e-mail. "Everyone wants a good vaccine, but no one wants a vaccine that enriches researchers and harms patients like the last one."

Vaccine researchers say that they are guided by the medical data and that independent scientists review their results.

"My advice to Baxter is to be proactive" with the public, said Stanley Plotkin, emeritus professor of pediatrics at the University of Pennsylvania and a vaccine expert. "Go to meetings and explain what is being done."

Brian Kyhos, a Baxter spokesman, said in an e-mail, "We are mindful of the previous experience in this treatment category, and that is a consideration in our planning." He had no timetable when a vaccine might be ready.

Mather is pursuing his own vaccine. Using proteins in tick saliva, Mather hopes to provoke an itching sensation in people if any tick bites them; later he wants to trigger the body's immune system to attack any pathogens the tick may deliver.

It has not been easy: Several years ago, after collecting saliva for a year from about 2,500 ticks -- less than a teaspoon's worth -- his team lost all of it in the purification process.

"We changed the approach after that," Mather said.

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