



Jefferson and Molecular Targeting Technologies, Inc. Scientists Create New Vaccine for Wildlife Rabies

While the raccoon that raids your trash at night may look cute and mischievous, think again. Its claws can be nasty. Even worse, it might carry rabies.

Now, scientists at Jefferson Medical College in Philadelphia and at Molecular Targeting Technologies, Inc. (MTTI) in West Chester, Pa., are taking steps to prevent the disease. They have created a more powerful, safer vaccine than currently is available to combat rabies in wildlife.

Wildlife rabies is no small matter in this country. It's particularly prevalent along the East Coast, and more than 90 percent of reported cases of rabies in all are in wildlife. Raccoons are the most affected, with skunk a close second. Worldwide, and especially in underdeveloped nations, rabies takes a large human toll: More than 60,000 human deaths a year.

In work published December 9 in the journal *Vaccine*, researchers led by Bernhard Dietzschold, DVM, professor of microbiology and immunology, at Jefferson Medical College of Thomas Jefferson University, created a new live rabies vaccine by manipulating the virus itself, making it much weaker than before. The scientists also made the vaccine much more immunogenic, meaning it aroused a much more robust response from the immune system.

"The advantages of our vaccine are its lack of pathogenicity and the fact that it's much more immunogenic," he says. Live virus vaccines always carry the potential to actually cause the disease they are designed to prevent.

"We have developed a very specific rabies vaccine which displays high titers and the lack of pathogenicity for immunocompetent mice even after many passages," says Dr. Dietzschold, meaning that the vaccine retained its potency over time. "This novel rabies vaccine will be an excellent candidate for immunization of stray dogs and wildlife."

"We have found a key to turn off the pathogenicity of the virus," says Chris Pak, Ph.D., MTTI president and CEO. "We are extremely pleased with these preliminary positive results. Rabies is not only a public health problem that causes more than 60,000 human deaths per year worldwide but also caused a tremendous economic burden. In the United States alone, more than \$1 billion are spent annually for control, treatment and prevention of rabies."

Using "bioreactor technology," a sophisticated cell culture system, scientists at MTTI produced large amounts of vaccine easily and inexpensively - a key, says Dr. Dietzschold, to mass production.

One of the problems with current vaccines is that fact that several varieties are used, depending on the particular species of animal. Jefferson and MTTI scientists hope their vaccine will prove useful for rabies prevention in several species. The Centers for Disease Control and Prevention in Atlanta currently is testing the effectiveness of the vaccine in raccoons, dogs, skunks and mongoose over the next six months.

The next step, Dr. Dietzschold says, is field trials of the vaccine. In such trials, animals would be given food baits with vaccine, then later captured and tested for rabies antibodies. He notes that 70 percent of an animal population in an area needs to have sufficient antibodies to control the spread of the disease.

As scientists continue to better understand the specific ways the vaccine confers immunity, it will be possible to improve the vaccine's potency, obtaining immunity with a minimal dose, he says.

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