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First TB vaccine booster unveiled by Seattle scientists

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Seattle scientists have developed a tuberculosis vaccine that may boost the effectiveness of the only existing vaccine, extending immunity against the disease.

So far, the new vaccine has been tested only in laboratory animals. But if results are similar in people, it could prove a powerful tool to reduce the toll of a disease that kills nearly 2 million people a year -- most of them in poor countries.

"The thing that got me excited is that this is the first example I know of where a boost strategy really made a substantial difference in outcome," said David Sherman, a tuberculosis expert at Seattle BioMed who was not involved in the project.

The new vaccine was developed at the Infectious Disease Research Institute, a nonprofit bioscience laboratory.

Researchers hope to begin human trials early next year, said Steven Reed, IDRI founder and research director. If the vaccine's effectiveness is borne out, he estimates it would be five to 10 years before it reaches the market.

The existing tuberculosis vaccine, called BCG (bacillus Calmette-Guerin), isn't well known in the United States. But 120 million infants a year get the shot in Africa and much of the developing world. It provides partial protection against a virulent form of the disease, but the

immunity wears off around the age of 10.

Scientists have been searching decades for a way to boost the vaccine.

The IDRI vaccine was able to confer lifelong immunity to guinea pigs that had received a BCG shot, Reed said.

"The real hope we have now is that we know immunity to tuberculosis can be enhanced over that provided by BCG, and it can be enhanced with an approach that is highly scalable, inexpensive and safe."

The IDRI vaccine contains four key proteins from the bacterium that causes tuberculosis.

In mice, the vaccine protected against several strains of TB -- including a strain that is resistant to drugs used to treat the disease. The vaccine also induced an immune response in monkeys and pigs.

Even if it proves equally effective in humans, the new vaccine is unlikely to replace BCG as a stand-alone shot, Sherman said. "Something would have to be dramatically better before the public health infrastructure all over the world changes what it does."

But as a booster shot, the new vaccine might be able to protect people well into adulthood.

Tuberculosis can be treated, but the regimen includes multiple drugs and takes six months. Drug-resistant strains of the disease are becoming more common, including some that defy every weapon in the modern arsenal. With nearly a third of the world's population harboring latent or active tuberculosis infections, the disease can also spread rapidly as people travel.

"If we think about making a dramatic reduction in tuberculosis death and transmission, a vaccine will be a very important component," Reed said.

The research was funded by grants from the National Institutes of Health.

As a nonprofit, IDRI's goal would be to license the vaccine to a manufacturer, probably in India, that would produce it at low cost and get it into the hands of those who need it.