

## **Researchers look for smaller, cheaper, onedose vaccines**

January 15 2008

A team of Iowa State University researchers is examining a new vaccine method that may change the way we get vaccinations.

Michael Wannemuehler and his team of researchers is hoping to find a way to produce vaccines that work better, use smaller doses and require only one trip to the doctor's office.

Traditionally, injectable vaccines have often been prepared from killed bacteria. The vaccinated person's immune system then learns to recognize the bacteria as a threat and consequently builds up defenses against it. Then, if the individual is exposed to the live version of the infectious agent, his or her body is already prepared to defend itself.

Wannemuehler's research is focused on the use of just a part of the bacteria -- a protein -- as a vaccine, instead of the entire bacteria, coupled with novel polymers that will be used to deliver these vaccines. This combination of new approaches will allow vaccines doses to be smaller, safer and induce fewer side effects.

"As we move away from using whole bacteria, we're going to more molecular approaches with purified proteins or portions of proteins," said Wannemuehler, a professor of veterinary microbiology and preventative medicine. "What these technologies should allow us to do is, instead of injecting 100 units to get protection, we can inject one unit, for example."



Wannemuchler's research targets the bacteria that causes plague, a disease that's rare in the United States, but is still found in other parts of the world.

Using select proteins of the bacteria coupled with unique polymers can reduce the amount of vaccine needed as well as costs for shipping and storage. That makes the vaccine economically feasible for areas at a great distance, such as Africa, where vaccines can be difficult to obtain.

Also, vaccinating a large population can be difficult if more than one dose or injection is required. In places where doctors are scarce, locating and vaccinating patients can be difficult. In addition, having the same patients return for their booster vaccinations can be even more complicated.

"Another aspect is the hope that this would be single dose," said Wannemuehler. "We hope we can get a robust response with one dose."

And there will likely be uses beyond the plague.

"If this technology works here," said Wannemuehler, "it's completely transferable to any protein, with minor changes."

Wannemuchler is working with BioProtection Systems Corp. of Ames on this research. BPSC hopes to supply lower-cost vaccines to government agencies for use where the plague is still a threat.

"We are thankful that the Iowa Values Fund supports our collaboration with Iowa State University and allows us to combine our broadly applicable vaccine technology with theirs for the development of more effective vaccines," said Joe Lucas of BPSC, located at the Iowa State University Research Park.



## Source: Iowa State University

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