

# Discovery paves way for salmonella vaccine

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(Medical Xpress) -- An international research team led by a University of California, Davis, immunologist has taken an important step toward an effective vaccine against salmonella, a group of increasingly antibiotic-resistant foodborne bacteria that kills hundreds of thousands of people worldwide each year.

The researchers' discovery will be published the week of Feb. 13 in the early edition of the *Proceedings of the National Academy of Sciences*.

The research team has identified a set of [antigens](#) — molecules in the invading [bacteria](#) that trigger an immune response — that is common to both mice and humans.

“These antigens will provide the research community with a foundation for developing a protective [salmonella](#) vaccine,” said Stephen McSorley, an immunologist and associate professor in the UC Davis Center for Comparative Medicine, which investigates diseases that afflict both humans and animals.

Salmonella bacteria cause foodborne illness in industrialized nations. More than 1.4 million cases occur annually in the United States alone, according to the World Health Organization, at an estimated cost of \$3 billion and the loss of 580 lives.

There are currently no vaccines for the strains of salmonella that cause these type of illnesses.

Furthermore, salmonella bacteria increasingly are becoming resistant to existing antibiotic treatments. And no new, effective antibiotics are on the horizon.

“Although salmonella infections are extremely important to human and animal health around the world, up until this time, the target antigens that are so key to developing a vaccine had not been clearly defined,” McSorley said.

In an effort to identify those antigens, the research team created an array, or collection, of 2,700 proteins, representing approximately 60 percent of all proteins produced by salmonella bacteria. The researchers found that 117 of those proteins behaved as antigens when mixed with blood serum from salmonella-infected mice, triggering an immune response to defend against the bacterial infection. Fourteen of those proteins were common to all four strains of mice involved in the study.

The researchers also identified 14 proteins that served as antigens in the blood serum from Malawian children infected with salmonella. Eight of those 14 proteins, or 57 percent, were among the 117 antigens identified in the mice.

“Discovery of the eight antigens in both mouse and human infections suggests that some of these antigens might be successfully used in developing a vaccine to protect against salmonella and that the mouse model of salmonella will be useful before [vaccine](#) research moves into clinical trials,” McSorley said.

Provided by UC Davis

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