

Vaccine to prevent urinary tract infections shows early promise

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University of Michigan (U-M) scientists have made an important step toward what could become the first vaccine in the U.S. to prevent urinary tract infections, if the robust immunity achieved in mice can be reproduced in humans. The findings are published September 18 in the open-access journal *PLoS Pathogens*.

Urinary tract infections (UTIs) affect 53 percent of women and 14 percent of men at least once in their lives. These infections lead to lost work time and 6.8 million medical provider's office visits, 1.3 million emergency room visits and 245,000 hospitalizations a year, with an annual cost of \$2.4 billion in the United States.

To help combat this common health issue, the U-M scientists used a novel systematic approach, combining bioinformatics, genomics and [proteomics](#), to look for key parts of the bacterium, *Escherichia coli*, that could be used in a vaccine to elicit an effective immune response. The team, led by Dr. Harry L.T. Mobley, Ph.D., screened 5,379 possible bacterial proteins and identified three strong candidates to use in a vaccine to prime the body to fight *E. coli*, the cause of most uncomplicated [urinary tract infections](#). The vaccine prevented infection and produced key types of immunity when tested in mice.

Scientists have attempted to develop a vaccine for UTIs over the past two decades. This latest potential vaccine has features that may better its chances of success. It alerts the immune system to iron receptors on the surface of bacteria that perform a critical function allowing infection to

spread. Administered in the nose, it induces an [immune response](#) in the body's [mucosa](#), a first line of defense against invading pathogens. The response, also produced in mucosal tissue in the urinary tract, should help the body fight infection where it starts.

Mobley's team is currently testing more strains of *E. coli* obtained from women treated at U-M. Most of the strains produce the same iron-related proteins that the vaccine targets, an encouraging sign that the vaccine could work against many urinary tract infections. Mobley is seeking partners in clinical research to move the vaccine forward into a phase 1 trial in humans. If successful, this vaccine would take several more years to reach the market.

More information: Alteri CJ, Hagan EC, Sivick KE, Smith SN, Mobley HLT (2009) Mucosal Immunization with Iron Receptor Antigens Protects against Urinary Tract Infection. *PLoS Pathog* 5(9): e1000586. [doi:10.1371/journal.ppat.1000586](https://doi.org/10.1371/journal.ppat.1000586)

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