

Vaccine candidate for gonorrhea shows preclinical effectiveness

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Gonorrhea has become resistant to almost every antibiotic in clinical use; thus, there is an urgent need for a safe and effective vaccine. Credit: University of Massachusetts Medical School

A report in the journal *mBio*, published by the American Society for Microbiology, describes a prototype vaccine candidate for *Neisseria gonorrhoeae*, the bacterium that causes gonorrhea, a sexually transmitted infection that affects men and women. Untreated, gonorrhea can cause infertility in women.

"The global spread of multidrug-resistant strains of *N. gonorrhoeae* constitutes a public health emergency. With antibiotic treatment options becoming limited, there is an urgent need for development of a safe and effective vaccine against [gonorrhea](#)," said Peter A. Rice, MD, professor of medicine in the Division of Infectious Diseases and Immunology, and senior author of the report.

"The UMMS team has developed a gonococcal vaccine candidate, a complex peptide that is both scalable and economically produced to a high degree of purity. The candidate elicits bactericidal (killing) antibodies and is efficacious in a preclinical experimental infection model."

Currently, there is no gonococcal vaccine that effectively prevents or curtails gonorrhea in humans.

Gonorrhea has become resistant to almost every antibiotic in clinical use, even as the number of cases reported is increasing rapidly—almost 600,000 cases were reported in the United States in 2018, a 63 percent increase in the past five years. Worldwide, there were an estimated 87 million cases in 2016. An economical and effective vaccine would help the global spread of a dangerous, multi-drug resistant, organism.

The [vaccine candidate](#), a synthetic compound, represents a mimic of a highly represented molecule on the surface of gonococcal organisms that is replicated many times on its surface and is shared by almost all gonococci, while also serving as the target of vaccine elicited antibody. The vaccine formulation also includes an adjuvant to increase the [immune response](#) against the organism. The vaccine was tested over a range of doses and administration intervals in an animal model. The vaccine elicited a durable and robust immune response, one that significantly reduced both the duration of infection and the level of gonococcal colonization.

"This vaccine is the most promising candidate developed in 40 years," said Dr. Rice, one that he and his colleagues are poised to navigate through in additional preclinical studies toward FDA approval and a clinical trial. "From a public health perspective, even a decrease in burden and duration of infection can have profound effects on disease pathology and transmission. In addition, prevention represents an important goal in the development of a safe, economical and effective gonococcal [vaccine](#) that can be used in resource limited areas where rates of gonorrhoea are high."

More information: Sunita Gulati et al. Preclinical Efficacy of a Lipooligosaccharide Peptide Mimic Candidate Gonococcal Vaccine, *mBio* (2019). [DOI: 10.1128/mBio.02552-19](https://doi.org/10.1128/mBio.02552-19)

Provided by University of Massachusetts Medical School

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