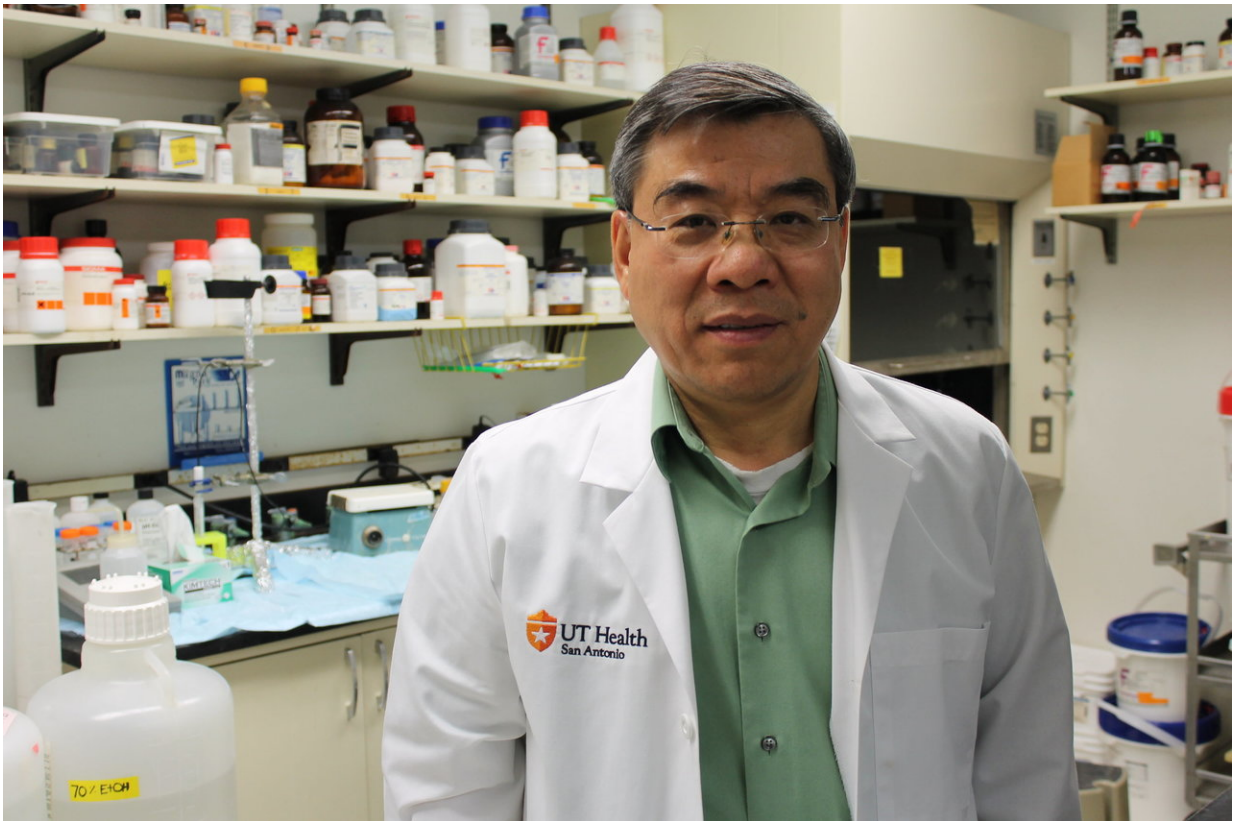


Study: Site of first chlamydia exposure makes big difference

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Guangming Zhong, M.D., Ph.D., of The University of Texas Health Science Center at San Antonio, now called UT Health San Antonio, and his team reported evidence that if the site of first chlamydia infection is the gut, there is a better disease prognosis than if the first site of infection is the genital tract. Chlamydia is the nation's most common sexually transmitted disease. Pre-exposing the gut to chlamydia may be an effective vaccine, the research suggests. Credit: UT Health San Antonio

Exposing the gut to chlamydia protects against subsequent infection in the genital tract and other tissues, researchers from UT Health San Antonio discovered. Chlamydia is the nation's most common sexually transmitted disease and causes infertility, ectopic pregnancy and pelvic inflammatory disease if left untreated.

"This research emphasizes the pre-exposure of chlamydia to the gastrointestinal (GI) tract as a vaccine," said Guangming Zhong, M.D., Ph.D., professor in the Joe R. & Teresa Lozano Long School of Medicine at UT Health San Antonio.

The protection is very robust and is across tissues, which is called transmucosal immunity. Protected sites include the genital tract and the lungs, said Dr. Zhong, whose faculty appointment is in the Department of Microbiology, Immunology & Molecular Genetics.

The discovery, reported Nov. 13, 2017, in [*Infection and Immunity*](#), indicates that exposing the gut first to chlamydia is a novel avenue to explore in preventing the genital infection. However, when the genital tract is the site of initial chlamydia exposure, a different outcome may result. In this scenario, genital chlamydia spreads to the gut and induces responses that promote further disease in the genital tract. Dr. Zhong hypothesized this disease pattern in a review article published Dec. 27, 2017, in [*Trends in Microbiology*](#).

Controlled transmission

Human exposure to chlamydia is unpredictable, perhaps coming through genital or non-genital sexual contact with an infected partner and perhaps via contact with contaminated materials. The UT Health San Antonio scientists are utilizing a mouse model that is a controlled way to study chlamydia transmission.

The team found that if the gut is the first site to be colonized by chlamydia bacteria, then the mice are immunized against further disease. The gut infection is benign. But if the genital tract is the first to be infected, the resulting disease is harmful. This results in a worse disease prognosis, including the possibility of infertility because the disease is advanced before symptoms are evident.

"If you are exposed to chlamydia in the GI tract first, it's a vaccine, but if you are exposed in the [genital tract](#) first, you may have enhanced [disease](#)," Dr. Zhong said.

A probiotic for the gut

Dr. Zhong is exploring the possibility that *Chlamydia trachomatis*, the bacterium that causes chlamydia, could be delivered orally as a vaccine.

"We take probiotics for our GI health," Dr. Zhong said. "In the future, we may add chlamydia as a probiotic for the gut. Once the bacteria are established in the GI tract, they don't spread."

About 1.6 million cases of [chlamydia](#) were reported to the U.S. Centers for Disease Control and Prevention in 2016. Because many individuals have no symptoms and don't get tested, the number of annual cases is estimated to be as high as 2.8 million.

Chlamydia is especially common among young people, and the CDC estimates 1 in 20 sexually active young women age 14-24 have the STD.

More information: Luying Wang et al, Nonpathogenic Colonization with *Chlamydia* in the Gastrointestinal Tract as Oral Vaccination for Inducing Transmucosal Protection, *Infection and Immunity* (2017). [DOI: 10.1128/IAI.00630-17](https://doi.org/10.1128/IAI.00630-17)

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