# Scientists find method to probe genes of the most common bacterial STI

11 April 2011

In a new study from the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health, scientists describe successfully mutating specific genes of Chlamydia bacteria, which cause the most common sexually transmitted infection in the United States as well as a type of blindness common in developing nations. The procedure they used will help advance scientists' understanding of how these bacteria cause human disease and expedite the development of new strategies to prevent and control these infections.

The advance could end decades of frustration for scientists who until now have been unable to manipulate Chlamydia genes in the laboratory, inhibiting research progress in the field.

Traditionally, gene manipulation involves directly introducing foreign DNA into bacteria. But Chlamydia bacteria live inside cells where they are protected from foreign DNA by a series of cellular and bacterial membranes. Therefore, more complicated and indirect approaches were applied to mutate Chlamydia genes.

The procedure, called Targeting Induced Local Lesions in Genomes (TILLING), has been used for years in plant genetics but is new to bacterial genetics. In their study, NIAID scientists used TILLING to successfully change the function of a specific Chlamydia gene. After creating a library of chemically mutated Chlamydia bacteria, they looked for mutations in a specific target gene. The analysis yielded a mutant with a single genetic change in the target gene; that change both inactivated the gene and greatly weakened the ability of the organism to survive in laboratory-grown human cells.

According to the study authors, TILLING may now be used to reveal the unknown function of hundreds of other Chlamydia genes in an effort to better understand these infections and develop new ways to treat and prevent them.

Chlamydia diseases include both sexually transmitted infections, which can result in pelvic inflammatory disease that can cause infertility in women, and trachoma, which can cause blindness and is common in developing nations. More than 1.2 million Chlamydia infections were reported to the U.S. Centers for Disease Control and Prevention in 2009. The World Health Organization estimates that more than 140 million persons have trachoma in regions of Africa, the Middle East, Central and Southeast Asia and Latin America.

**More information:** L Kari et al. Generation of targeted Chlamydia trachomatis null mutants. *Proceedings of the National Academy of Sciences* DOI: 10.1073/PNAS.1102229108 (2011).

Provided by National Institutes of Health