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NEWS

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*****Genetic structures responsible for antibiotic resistance reported in syphilis organism.

DALLAS--Penicillin-resistant gonorrhea has stymied the medical profession for several years. But so far there has been little concern about a penicillin-resistant syphilis bacterium.

The genetic structures responsible for resistances to antibiotics found in other bacteria have not been observed in the syphilis bacterium until now. But plasmid DNA in Treponema pallidum (the organism that causes syphilis) has been reported for the first time by Dr. Michael Norgard, assistant professor of Microbiology at The University of Texas Health Science Center at Dallas. Norgard's report appears in the July 31 issue of "Science."

A bacterium has one chromosome that contains all genes that codes for processes necessary for the cell's survival. Plasmid DNA is a "free-floating" DNA component that carries genes not necessary to survival but often helpful to the bacterium. Some genes found in plasmid DNA in bacteria are responsible for toxin production, the ability to detoxify chemicals or the ability to grow in an environment in which the bacterium could not normally grow. Plasmid DNA is also responsible for the ability developed in some bacteria to break down hydrocarbons, in effect enabling them to devour oil spills.

"I don't want to create alarm, but our results lend more credibility to the possibility that T. pallidum may develop resistance to antibiotics," says Norgard. He stresses that no antibiotic-resistant strain of the syphilis organism has been found. But plasmid DNA has caused antibiotic resistance in other bacteria, such as Salmonella, E. coli and Neisseria gonorrhea.

A bacterium can acquire plasmid DNA in two ways, either through natural selection, developing its own "helpful" genes, or from another bacteria. Moreover, plasmid DNA can often transfer itself from one organism to another when one bacterial cell comes in contact with another.

Plasmid DNA is most common in intestinal bacteria: Salmonella, E. coli and Shigellae. It is thought that penicillin-resistant N. gonorrhea acquired plasmid DNA from E. coli or Hemophilus.

The syphilis organism containing the newly reported plasmid DNA is the Nichols strain, which has been kept alive in rabbits for about 70 years. The next step, Norgard says, is to check for plasmid DNA in "wild-type strains," that is, in bacteria cultured from patients with syphilis. He has undertaken this study with Dr. Kevin Murphy, assistant professor of Internal Medicine, to see if this extraneous genetic material occurs naturally in T. pallidum in humans

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The article in "Science" was intended merely to alert medical professionals to T. pallidum's genetic capability of potential antibiotic resistance. "If somebody runs across an antibiotic-resistant syphilis organism, we would hope they would bring it to our attention so we could look at this organism more closely," says Norgard.

Co-author on the article is Dr. James N. Miller, renowned syphilis researcher, of the Department of Microbiology and Immunology at the University of California Los Angeles School of Medicine. Miller originally furnished Norgard with organisms and training in the complex area of T. pallidum research.

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