

Emory study of syphilis bacteria yields valuable diagnostic tool

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Variations in a gene within the family of bacteria that causes syphilis may hold clinical, epidemiological and evolutionary significance, researchers at Emory University in Atlanta have found.

The researchers' study results describe how sequence variations they identified in the acidic repeat protein (ARP) gene allow straightforward differentiation of venereal syphilis from non-venereal *Treponema pallidum* subspecies. The study was published online in the journal *FEMS Immunology and Medical Microbiology* June 12 (<http://www.blackwell-synergy.com/doi/abs/10.1111/j.1574-695X.2008.00427.x>).

"This finding can lead to improved diagnoses of cases, enabling doctors to prescribe the right treatment, and public health workers to determine the best prevention strategies," says Kristin Harper, who led the research team as a Howard Hughes Medical Institute pre-doctoral fellow in Emory's Population Biology, Ecology and Evolution program.

The family of *Treponema* bacteria causes venereal syphilis and the non-venereal diseases of yaws and bejel, which are transmitted through skin-to-skin or oral contact. Public health workers in parts of Africa have reported difficulty in distinguishing yaws from syphilis in children, leaving open the question of whether the child may have contracted a venereal disease either congenitally or through sexual abuse.

"As yaws eradication efforts near their goal, and case diagnosis becomes

more difficult due to the relative rarity of yaws, a molecular means of determining whether the infection is venereal or non-venereal becomes essential," Harper says.

The analysis of the repeat region of the ARP gene in 32 strains of pathogenic *Treponema* showed that the sexually transmitted strains contained multiple types of repeat motifs, while the non-venereal subspecies contained only one type of motif.

In addition, the researchers found the presence of multiple, but distinct, repeat motifs in the two types of sexually transmitted *Treponema* examined, suggesting that a diverse repertoire of repeat motifs has evolved at least two times in association with sexual transmission.

"The kind of changes we found in the ARP gene are consistent with rapid evolution," Harper said. "This scenario lends further support to several prominent theories about the origin of syphilis, including that the pathogen arose with the return of Columbus from the New World."

Source: Emory University

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