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# Cholera Strain Evolves New Mechanism for Causing Disease

***New clinical strains of cholera appear to have evolved a distinctly different mechanism to cause the same disease, according to research published in the current issue of the online journal mBio®.***

Vibrio cholerae is the causative agent for the diarrheal disease cholera. While there are more than 200 different serogroups only the O1 and the O139 strains have been known to cause epidemic and pandemic outbreaks of disease, using a toxin-coregulated pilus (TCP) and cholera toxin (CT), which other strains lack.

"While non-O1, non-O139 strains have caused sporadic disease globally, the virulence mechanisms are not fully understood, since most of these strains lack TCP and CT," say the researchers from Harvard Medical School and the International Center for Diarrhoeal Research in Dhaka, Bangladesh.

The researchers studied a newly identified non-O1, non-O139 strain of the bacteria called AM-19226. Using comparative genomics, they investigated how this new strain causes diarrhea.

Many pathogenic bacteria require something called a type III secretion system (T3SS) in order to cause disease. In previous studies, the researchers discovered a T3SS and identified a protein (vopF) that they believe could be involved in causing disease.

In the current study they identified an additional protein (vopE) and using mouse models show that AM-19226 requires T3SS to cause diarrhea and that both vopE and vopF contribute to the disease.

"With the discovery of the T3SS in V. cholerae and its role in the virulence of non-O1 and non-O139 strains, it is astonishing to observe how this bacterium has evolved two independent pathogenic mechanisms to cause similar disease," say the researchers.

V. C. Tam, M. Suzuki, M. Coughlin, D. Saslowsky, K. Biswas, W. I. Lencer, S. M. Faruque, J. J. Mekalanos. Functional Analysis of VopF Activity Required for Colonization in Vibrio cholerae. mBio, 2010; 1 (5): e00289-10 DOI: 10.1128/mBio.00289-10