Europeans brought new strains of ulcer-causing bacterium to pre-Columbian Americas

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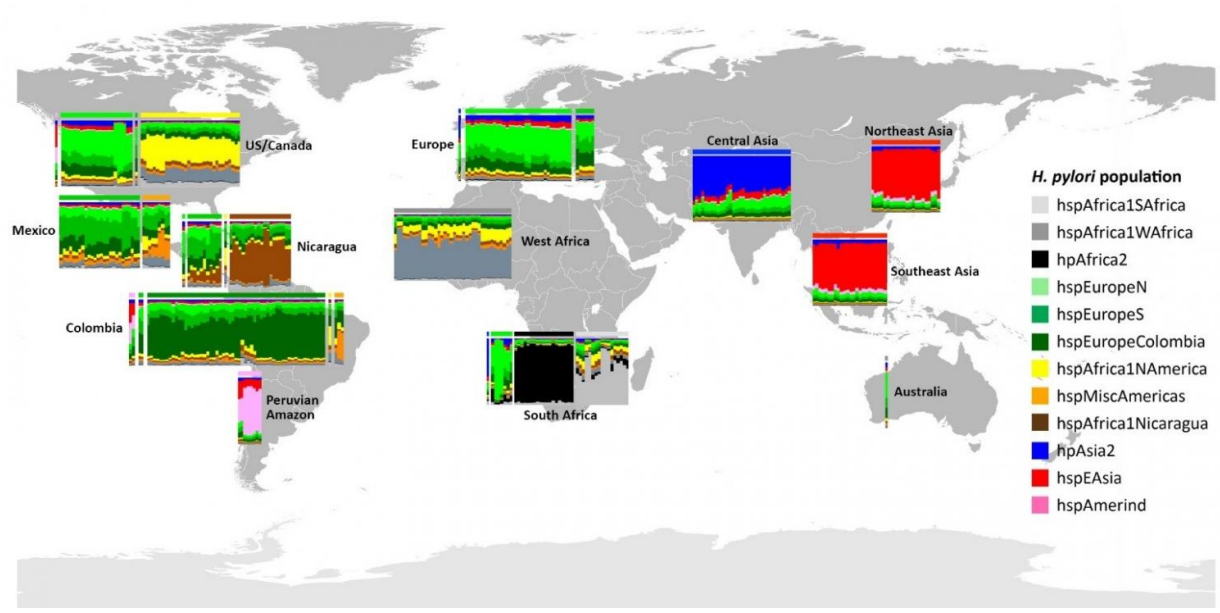

Distinct new sub-populations of *Helicobacter pylori* have evolved in North, Central and South America. Credit: Kaisa Thorell, Koji Yahara and colleagues

A genomic study of a harmful stomach bacterium finds that foreign strains intermingled with and replaced local strains after the arrival of Europeans and African slaves across the Americas. The study by Kaisa Thorell at the Karolinska Institutet in Sweden, Koji Yahara at the National Institute of Infectious Diseases in Japan and colleagues is

published February 23rd, 2017 in *PLOS Genetics*.

The Americas have been a melting pot, not only for diverse humans for the past 500 years, but also for strains of the microbe *Helicobacter pylori* carried along in the humans' stomachs. The bacterium persists for decades and commonly spreads from parent to child, but can also colonize new hosts and exchange DNA with local strains. Scientists analyzed 401 *H. pylori* genome sequences from strains collected in North, Central and South America. They found that European and African strains mixed together across the Americas, with little input from local strains, suggesting that the bacterial populations evolved quickly and spread rapidly to people of different ethnicities. Further analysis finds that the ability of a strain to adapt to a different ethnic group relies on a handful of human immune system genes.

This study of *H. pylori* populations in the Americas sheds new light on the relationship between human migration and bacterial diversity, but also has implications for human health. *H. pylori* is a major health issue in Latin America where it contributes to ulcers and high rates of stomach cancer. Previous studies have identified a link between cancer risk and a mismatch between the ethnicity of the patient and the origin of the bacterial strain. The current findings may be useful for future explorations of the connection between individual bacterial strains and their associated risk of causing stomach cancer in different human populations.

According to coauthor Daniel Falush "*Helicobacter pylori* has often beendescribed as a pathogen which is mostly passed from parent to child. Ourstudy shows that in the Americas its evolution has been much more dynamic.Native American strains have been largely outcompeted. Bacteria of Africanorigin seem to have done particularly well, hybridizing with strains ofEuropean origin and forming distinct new sub-populations, adapted to localconditions, in North, Central and South

America."

More information: Thorell K, Yahara K, Berthenet E, Lawson DJ, Mikhail J, Kato I, et al. (2017) Rapid evolution of distinct Helicobacter pylori subpopulations in the Americas. *PLoS Genet* 13(2): e1006546. DOI: 10.1371/journal.pgen.1006546

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