

Genomic warfare to counter malaria drug resistance

16 February 2010

Scientists battling malaria have earned a major victory. According to a *Nature Genetics* study, an international group of researchers has used genomics to decode the blueprint of *Plasmodium falciparum* - a strain of malaria most resistant to drugs that causes the most deaths around the world. The discovery may lead to advanced pharmaceuticals to fight the disease and prevent drug resistance among the 250 million people infected by malaria each year.

"Combating [malaria](#) resistance is nothing short of an arms race," says lead author Dr. Philip Awadalla, a pediatrics professor at the Université de Montréal, a scientist at the Sainte-Justine University Hospital Research Center and scientific director of CARTaGENE. "As the malaria pathogen evolves, researchers must evolve with it to find ways to counter the disease."

The team decoded 200 malaria samples from Asia, Africa, Central America, South America and Papua New Guinea. Their goal was to identify how [Plasmodium falciparum](#) strains were becoming resistant to the eight anti-malaria drugs currently available.

"There are substantial genetic differences in malaria around the world," stresses Dr. Awadalla, noting African strains differ from Asia strains. "What has occurred is a combination of genetic drift, where genes segregated over space and time from differential environments, immune pressures and exposures to drugs."

As part of their genomic mapping, the research team found that *Plasmodium falciparum* recombined fastest in Africa. Dr. Awadalla compares malaria genomes to human genomes. In malaria, however, variation among some genetic material is so high and evolves so rapidly that the parasite can develop [drug resistance](#).

New clues garnered by this study, he says, "will

allow pharmaceutical companies to create treatments that target the evolving malaria genome."

More information: The article "Plasmodium falciparum genome-wide scans for positive selection, recombination hot spots and resistance to antimalarial drugs" is published in the journal *Nature*. www.nature.com/ng/journal/vaop...ent/full/ng.528.html

Provided by University of Montreal

APA citation: Genomic warfare to counter malaria drug resistance (2010, February 16) retrieved 11 September 2022 from <https://medicalxpress.com/news/2010-02-genomic-warfare-counter-malaria-drug.html>

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