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SCIENTISTS DISCOVER ORIGIN OF MALARIA

Discovery Could Lead to Development of New Treatments, Prevent Future Plagues

SAN FRANCISCO — Today scientists reported that they have discovered the origin of malaria, one of the deadliest diseases of humanity. Chimpanzees, native to equatorial Africa, have been identified as the original source of the parasite that likely moved from them to humans via mosquitoes.

An international group of researchers, including senior author Nathan Wolfe, Ph.D., of the Global Viral Forecasting Initiative and Stanford University, made the discovery, published in the Aug. 3 2009 *Proceedings of the National Academy of Sciences*, by identifying several new parasites from chimpanzees. The newly discovered parasites show that malaria jumped from animals to humans, much the way that HIV, SARS and swine flu originated.

“This discovery shows that ancient diseases, such as malaria, can originate in the same way that modern pandemics do, namely by jumping from animals to humans” Wolfe said. “We now know that malaria, while at least thousands of years old, did not originate in humans but rather was introduced into our species, presumably by the bite of a mosquito that had previously fed on a chimpanzee.”

Until now, malaria’s origin had been unclear. Although chimpanzees were known to harbor a parasite, called *Plasmodium reichenowi*, that is closely related to the dominant human malaria parasite, *Plasmodium falciparum*, most scientists assumed incorrectly that these parasites had co-existed separately in human and chimpanzee ancestors for the last 5 million years.

The newly discovered parasites not only demonstrate how malaria originated, but represent potentially powerful tools for developing vaccines and treatments against this deadly scourge. Discovery of these parasites indicates that there is a much broader range of close relatives to the human parasite than were previously recognized, some of which might provide key insights in drug development or act as vaccines that could prevent human malaria.

“Dr. Wolfe’s discovery of the origin of human malaria is a perfect example of the kind of research supported by the NIH Director’s Pioneer Award program, which gives outstanding investigators a chance to test exceptionally innovative and potentially paradigm-shifting ideas,” said Raynard S. Kington, M.D., Ph.D., acting director of the National Institutes of Health.

Wolfe and his colleagues sampled wild and wild-born captive chimpanzees in Cameroon and Ivory Coast. In Cameroon researchers collected samples from chimpanzees during routine health exams in three different wildlife sanctuaries. They were primarily wild-born animals brought to the sanctuaries after being confiscated by authorities or abandoned by human owners. In Ivory Coast scientists from the Robert Koch Institute and Max Planck Institute for Evolutionary Anthropology collected tissue and blood samples from 10 chimps that had died due to anthrax, respiratory disease or other reasons in the Tai National Park. Samples were analyzed in the laboratory of Stephen Rich, Ph.D., at the University of Massachusetts, Amherst.

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Scientists Discover Origin of Malaria/add one

“It is now clear that a new disease that successfully jumps from an animal to a human can last not just for decades, but millennia or more,” Wolfe said. “This makes the task of stopping future disease spillovers from animals to humans vital, not only for saving lives today, but for the health of people for many generations to come.”

Every year malaria:

- Accounts for 500 million cases per year.
- Results in more than one million deaths—mostly children.
- Includes 1,300 cases in the United States.
- Cuts economic growth by as much as 1.3 percent in countries with high disease rates.
- Occurs primarily in tropical and subtropical regions such as Central and South America, Southeast Asia, sub-Saharan Africa, the Caribbean and the South Pacific Islands.

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The Global Viral Forecasting Initiative has spent the last ten years developing a global system to prevent pandemics. By coupling innovative surveillance in field sites throughout the world with a consortium of top laboratories, GVFI is able to characterize the diversity of viruses and other agents as they move from animals to humans. GVFI virus hunter Nathan Wolfe, Ph.D., has studied how this happens—and how frequently it happens—and has identified a number of new infectious diseases. The group’s work provides basic insights into how pandemics are born and employs cutting-edge strategies to prevent the next major pandemic.