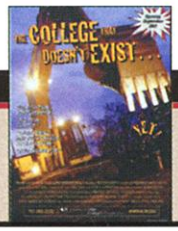

MALARIA RESEARCH

Sequencing Set for Dreaded Mosquito

PARIS—Scientists have agreed to terms on a long-awaited effort to sequence the genome of the mosquito *Anopheles gambiae*, the main vector for the malaria parasite in sub-Saharan Africa. Meeting at the Pasteur Institute here on 3 March, representatives from 20 research centers in 12 countries started laying plans for the project. Like the rat sequencing project (see previous story), it will include Celera Genomics of Rockville, Maryland, and feature unrestricted public access to data.

SWATTING THE MOSQUITO GENOME
The Key Players

- Genoscope (France)
- Celera Genomics (U.S.)
- Pasteur Institute (France)
- European Molecular Biology Laboratory (Germany)
- University of Notre Dame (U.S.)
- The Institute for Genomic Research (U.S.)
- Institute of Molecular Biology and Biotechnology (Greece)
- ONSA Network (Brazil)
- United Nations/World Health Organization (Switzerland)
- FlyBase Consortium (U.K. and U.S.)
- European Bioinformatics Institute (U.K.)

Sequencing of the *Anopheles* genome is expected to begin in the next 6 months. Because some of the partners—including the Pasteur and the French gene-sequencing center Genoscope—have already begun preliminary gene mapping and sequencing, a "rough draft" of the full sequence could be completed by year's end. Revealing the mosquito's 260 million DNA base pair sequence—together with those of the human genome and the malaria parasite *Plasmodium falciparum* now nearing completion—should open up new strategies for controlling the deadly disease, which kills some 1.5 million people each year, mostly African children. This genetic treasure trove will allow researchers "to get to the parasite at every possible level," says Fotis Kafatos, director of the European Molecular Biology Laboratory in Heidelberg, Germany.

The initial sequencing and genome assembly should run "significantly less than $10 million," says Kafatos, who initiated the project with *Anopheles* expert Frank Collins of the University of Notre Dame in Indiana (*Science*, 23 July 1999, p. 508). Additional funds will be needed to fine-tune the sequence and begin detailed analyses of the genes and their functions.

Together with Genoscope, Celera will perform the initial sequencing using the "whole-genome shotgun" approach it unleashed on the human genome. Although not all the financing is in place, the French government has pledged to cover Genoscope's participation in the initial sequencing. Celera has submitted a grant proposal to the U.S. National Institutes of Health to cover at least part of its costs.

Researchers who have campaigned for years to have the mosquito's genome sequenced are delighted that the big guns of modern gene technology will at last be brought to bear on *Anopheles*. "We are really excited," says Kafatos. "A unique global collaboration has finally crystallized." —MICHAEL BALTER

ARCHAEOLOGY

Heavy Damage Feared After Taliban Decree

Two ancient Buddhas captured the world's attention last week, as Afghanistan's Taliban leaders began to carry out a decree to demolish all carvings and statues of animals and humans. The government-sponsored destruction extends even to artifacts from its own, Islamic tradition, as well as thousands of lesser known items that experts say combine Western and Eastern traditions in unique and irreplaceable ways. The Taliban, which few governments recognize as legitimate rulers, believes animal and human representations are antithetical to Islamic teaching.

Archaeologists are stunned by the decree's breadth. "It is a most enormous tragedy," says Norman Hammond, a Boston University archaeologist who worked in Afghanistan in the 1970s and has written about its treasures. Afghanistan's special archaeological heritage derives from its position as the ancient crossroads of Asia. Alexander the Great left behind artisans who built Greek-styled statues at cities such as Alexandria Oxiana, now Ai Khanum, on the Oxus River. Chinese caravans crossed Afghanistan's rugged terrain heading west. Buddhist influence seeped in from India to the southeast, and Islam swept the region from the west. The result was often a rich blending of styles. A Kabul Museum collection of panels from the first century, for example, show clear Mediterranean, Chinese, and Indian influences.

The two giant Buddhas, which stand 37 and 54 meters high in the sandstone cliffs of Bamiyan and date from the third and fifth centuries, have become symbols of the new policy. But the decree apparently also would cover objects in the Kabul Museum, such as a 1000-year-old copper dish bedecked with mythical animals and a Koran quotation. Hammond also fears the worst for frescoes in Islamic-era palaces at Lashkair Bazar and at Ghazni, which includes a building decorated with a stone frieze.

How much of the Kabul collection was intact even before last week's decree is unclear, however. The museum, closed to Westerners for years, already has been severely damaged and at least partly looted.

The Taliban leaders so far have rejected pleas by the United Nations to rescind the decree and have mocked offers by museums such as New York's Metropolitan Museum of Art to rescue smaller objects in danger. "I

Under siege. Taliban has targeted this stone Buddha and other artifacts.

CREDITS (TOP TO BOTTOM): SINCLAIR STAMMERS/WHO/TDR (MOSQUITO); UNESCO