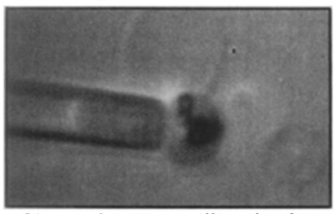
Parasitology

Patch clamp probes malaria parasite . . .



Edwin W. McCleskey/NATURE

Glass tube, one-millionth of a meter in diameter, allows monitoring of ion movement in and out of malarial parasites.

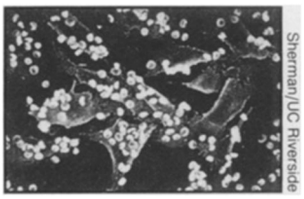
During a malarial infection, parasites transmitted by the bite of *Anopheles* mosquitoes invade red blood cells, where they multiply and then burst forth to infect even more cells. As the parasite enters a red blood cell it forms a membrane through which it draws nutrients from the cell's cytoplasm.

Using patch clamping – a technique for measuring the flow of charged particles, or ions, in and out of cells – researchers from Washington University in St. Louis have taken a close look at this parasite's feeding habits. Their observations indicate that *Plasmodium falciparum*, the microbe responsible for the greatest number of human deaths from malaria, sprouts special proteins called ion channels.

To detect the flow of ions through the channels, the researchers stuck a microscopic glass tube onto the surface of malaria parasites, electrically isolating their feeding channels. Ions flowed through the channels at a rate of 1 million per second, cell biologist Sanjay A. Desai, now at Duke University Medical Center in Durham, N.C., and his collaborators report in the April 15 NATURE.

Their data suggest that a drug that blocks these ion channels, thereby cutting off the parasite from part of its food supply, may prove useful in treating the 150 million people worldwide who contract malaria each year, says study coauthor Donald J. Krogstad, currently at the Tulane School of Public Health and Tropical Medicine in New Orleans.

. . . and peptides eliminate parasite hideouts



Sherman/UC Riverside

Infected red blood cells (white) cling to other cells.

Parasitologists have discovered that certain protein fragments, or peptides, can thwart evasive strategies practiced by the malaria parasite *P. falciparum* and may lessen malarial symptoms. When this parasite enters red blood cells, it causes a protein in the cell membrane to become sticky. The stickiness allows the cells to lodge in tiny blood vessels of the liver, heart, lung, or brain, bringing on a variety of disease symptoms, say Ian Crandall and Irwin W. Sherman of the University of California, Riverside.

The two researchers determined which of the protein's amino acids extend out of the membrane and adhere to vessel walls. Protein fragments consisting of these or similar amino acids block adhesion and prevent infected cells from "hiding out" in the vessels of monkeys with the disease, report Crandall, Sherman, and their collaborators in the May 15 PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES. "It's like putting a Teflon coating on the vessels," says Crandall.

Crandall thinks these fragments may lead to new malaria therapies, including vaccines, but are not likely to be used themselves to treat the disease.