Health & Medicine

Scientists Reveal Malaria’s Method of Attack

Fall 2026

Rawpixel.com

Malaria deaths are surging in many parts of the world today, as the drugs used to fight the disease are losing their effectiveness. In sub-Saharan Africa, hundreds of thousands of children are dying of the mosquito-borne illness each year.

But a major new discovery by Columbia scientists is raising hopes that more-effective drugs could be developed. In a recent issue of the journal *Cell*, the scientists provide the first detailed description of how malaria parasites attach themselves to red blood cells, drive spiral-shaped proteins into the cells’ outer membranes, and then rip open a hole and slip inside.

According to Chi-Min Ho, a microbiologist and immunologist who oversaw the team, scientists have known for decades that malaria parasites enter blood cells by hoisting themselves in through a distinctive hatch they carve into their membranes. (These attacks occur in synchronized waves as trillions of parasites spread throughout the body, causing severe fever every forty-eight hours or so.) But the invasion occurs so quickly that until now, no one had observed exactly how an individual parasite cuts open a blood cell. The Columbia team accomplished this by freezing parasites at the moment of assault and then using cryo-electron microscopy to produce high-resolution, three-dimensional images of the crime scene. This enabled the scientists to visualize the molecular mechanics of the strike in such detail that they were able to subsequently synthesize a protein that can break a parasite's grip on a blood cell and foil the raid.

The Columbia researchers say the protective compound they've synthesized is not a drug candidate itself but that it could lead to the development of one. "That's the part we're most eager to build on," says Daphne Kaxiras, a medical student in Ho's lab who led the compound's development.

Guide to school abbreviations

All categories >