

# NIH researchers identify sequence leading to release of malaria parasites from red blood cells

*Findings could inform the development of new antimalarial drugs.*

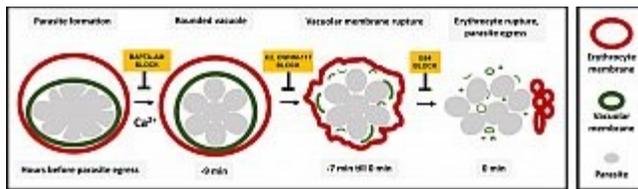


Diagram showing the sequence of events involved in rupture of the vacuole and host cell membrane leading to release of the malaria parasite. Using chemical inhibitors, the researchers showed that it's possible to block each event in the sequence. *NICHD*

## What

The vacuole, a compartment inside human red blood cells in which malaria parasites reproduce and develop, takes on a distinct spherical shape just minutes before its membrane ruptures, leading to the release of parasites into the blood stream, according to researchers at the National Institutes of Health and other institutions. Their study appears in *Cellular Microbiology*.

The researchers, working with red blood cells from healthy donors, were able to chemically block the sequence of events leading to this rounding of the vacuole. They note that targeting this sequence could inform new treatment strategies against *Plasmodium falciparum*, the species of malaria parasite that causes the most deaths worldwide and, in several areas, has become drug-resistant.

To track the rounding sequence under a microscope, researchers dyed the membrane of the vacuole with a substance that gives off green light. About 10 minutes before the membrane ruptured, the vacuole morphed from a lumpy, uneven shape to a sphere. Previous studies have shown that malaria parasites use calcium to trigger the biochemical reactions needed for their release from the cell. When the researchers treated the cells with a compound that blocks calcium's effect, the vacuoles couldn't transition to the spherical form, trapping the parasites inside the cell.

## Who

Joshua Zimmerberg, M.D., Ph.D., Section on Integrative Biophysics, *Eunice Kennedy Shriver* National Institute of Child Health and Human Development, is available for comment.

## Article

Glushakova S. Rounding precedes rupture and breakdown of vacuolar membranes before malaria parasite egress from erythrocytes. *Cellular Microbiology*. 2018;e12868. <https://doi.org/10.1111/cmi.12868>(link is external)

This press release describes a basic research finding. Basic research increases our understanding of human behavior and biology, which is foundational to advancing new and better ways to prevent, diagnose, and treat disease. Science is an unpredictable and incremental process—each research advance builds on past discoveries, often in unexpected ways. Most clinical advances would not be possible without the knowledge of fundamental basic research.

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