

How nasty *Toxoplasma* parasite damages the human eye

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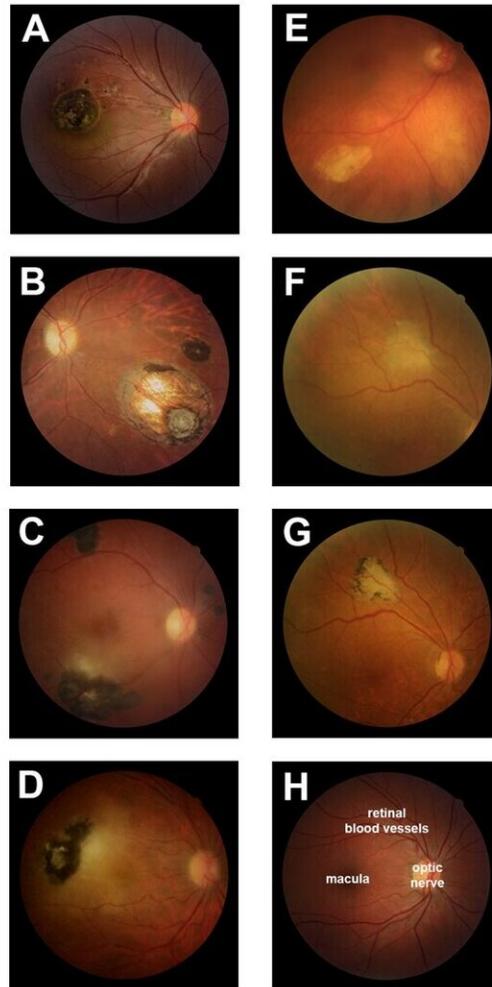
One-third of the world population is infected with *Toxoplasma*, which causes a common eye infection called ocular toxoplasmosis. Researchers have shed new light on how an infection with the parasite causes a distinctive lesion in the retina.

An international research team, from Flinders University in South Australia and University of São Paulo in Brazil, have identified proteins produced from infected retinal cells that push neighboring uninfected retinal cells to overgrow and create a distinctive lesion that doctors can use to diagnose the infection.

This study, published today in *Microorganisms*, is the first to use laboratory methods to understand how *Toxoplasma* infection leads to a characteristic eye lesion, after researchers monitored the process at a Brazilian eye clinic serving a region of 1.7 million people.

Flinders Strategic Professor in Eye & Vision Health and Superstar of STEM Justine Smith says the research demonstrates how [retinal cells](#) respond to an infection with *Toxoplasma*, and shows that the cell response may help parasites spread through the retina.

"In one of the largest groups of people with ocular toxoplasmosis studied to date, we see that infection causes a typical lesion in over 90 percent of infected eyes," says Professor Smith.



Ocular toxoplasmosis in the group of 263 human subjects, who presented consecutively over a 28 month period to Ribeirão Preto General Hospital, Brazil. Credit: Flinders University, Professor Justine Smith. University of Sao Paulo, Dr Joao M. Furtado

"Our findings show that *T. gondii*-infected human retinal pigment cells secrete VEGF and IGF1, and reduce production of TSP1, which promotes the proliferation of uninfected cells and renders those cells more susceptible to infection as a result."

Dr. Joao Furtado, co-investigator from University of São Paulo and the International Agency for Prevention of Blindness, speculates that manipulating proteins within the eye might have therapeutic applications to limit the severity of the disease.

"There is no cure for toxoplasmosis, which is most often foodborne. The World Health Organisation recommends [food safety measures](#) that include hand-washing, use of clean water in [food preparation](#), and proper cooking," advises Dr. Furtado.

More information: Shervi Lie et al. Molecular Basis of The Retinal Pigment Epithelial Changes That Characterize The Ocular Lesion in Toxoplasmosis, *Microorganisms* (2019). [DOI: 10.3390/microorganisms7100405](#)

Provided by Flinders University

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