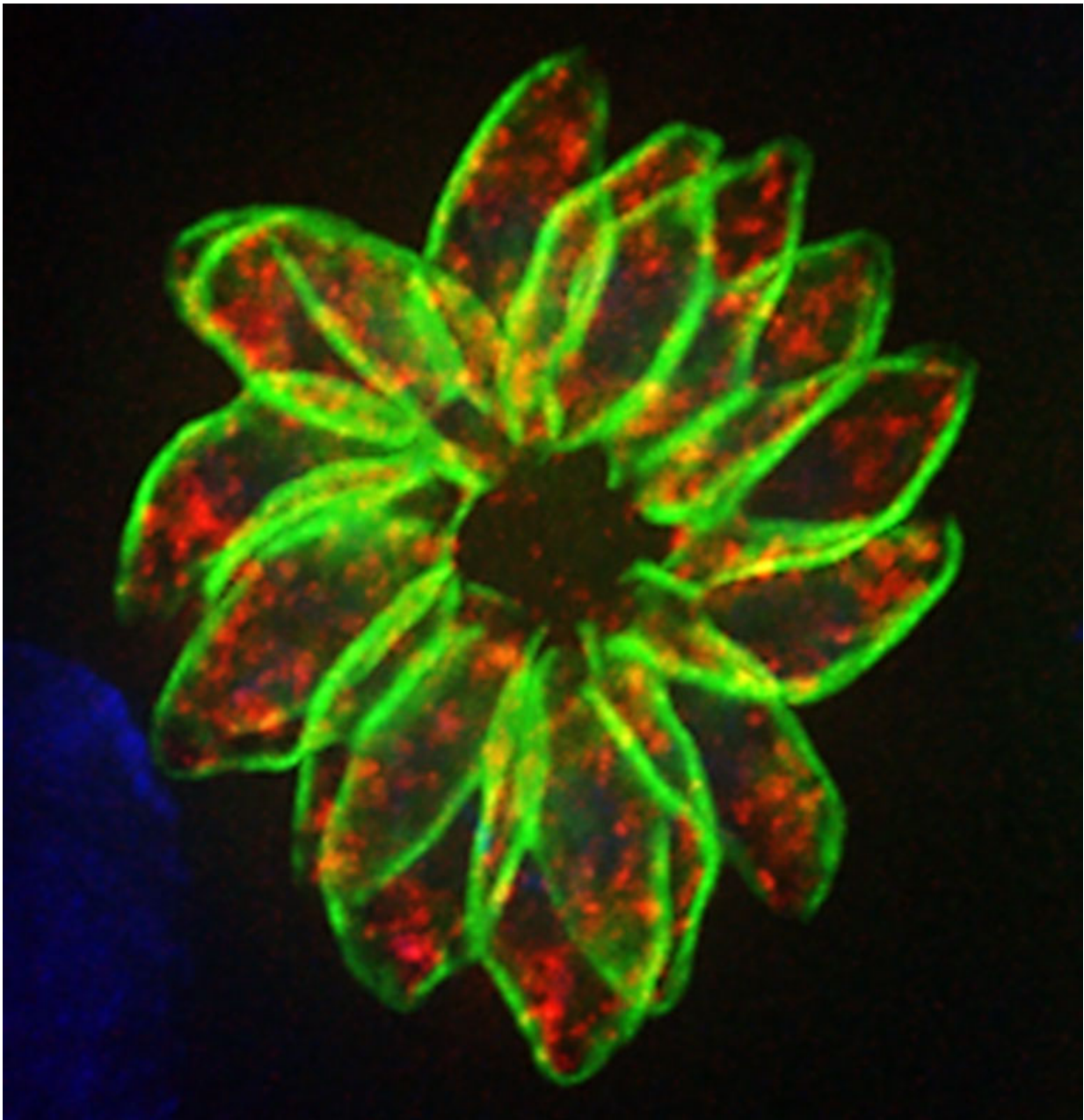


Researchers question lifelong immunity to toxoplasmosis

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Toxoplasma gondii parasite up close. Credit: University of Melbourne

Medical students are taught that once infected with *Toxoplasma gondii*—the "cat parasite"—then you're protected from reinfection for the rest of your life. This dogma should be questioned, argue researchers in an Opinion published December 8 in *Trends in Parasitology*. Their concerns stem from a handful of case studies in which expectant mothers in their late 20s and early 30s were known to have been infected by *T. gondii* at birth but were actually found to lack immunological protection during screening.

Then there's the mystery of the global decrease in the number of people who test positive for toxoplasmosis immunity. For example, in the 1960s, surveys of expectant mothers in France found that 80% or more had antibodies to the parasite. This number dropped to 30% in 2010 and is expected to continue falling. This change, also observed in the United States, could be due to improved food hygiene (particularly better preparation and quality of meat—beef, lamb, and venison are especially likely to carry the parasite) as well as fewer domestic cats consuming raw rodent meat and thus transmitting *T. gondii* to humans.

"We put forward the hypothesis that, in the past, people kept their antibodies to *T. gondii* because they were very likely to become re-infected," says lead author François Peyron, a parasitologist at the Hospital Croix-Rousse in Lyon, France. "Now that the parasitic pressure has gone down, I think people are less stimulated and they lose their immunity—it's exactly what we see for malaria."

The uncertainty around the rate of toxoplasma infection is partly due to how infrequently it is reported. Aside from the immunocompromised,

only a minority of people will experience side effects, typically flu-like symptoms, after coming into contact with the parasite. Once inside the body, the single-celled parasite travels through the blood into the brain and muscles, where it forms cysts. Researchers believe these cysts remain in an infected person for life and that their presence retriggers the immune system, but Peyron and his co-authors, Solène Rougier of Hospital Croix-Rousse and Jose Montoya of the Stanford University School of Medicine, are also challenging this idea.

Toxoplasmosis is specifically a problem when a mother is infected while pregnant. If undetected and untreated, the parasite will spread to the developing child and can terminate the pregnancy or cause the baby to develop brain or eye abnormalities. Some countries, such as France, regularly screen expectant mothers who have had no previous exposure to *T. gondii* to ensure that any infection is caught early. This standard of care might need to be revised if enough evidence shows that previous infection with *T. gondii* isn't enough to prevent reinfection of pregnant women.

"We have to be concerned by *T. gondii*, but it has been clearly demonstrated that clinical treatment is very effective at preventing fetal infection and reducing associated conditions" Peyron says. "It is our opinion that this aspect of public health has not been well investigated in many countries, especially in the United States, and that provided we keep the price of testing low, then the cost of regularly screening pregnant women for toxoplasmosis is less expensive than the cost of caring for a child that develops disabilities as a result of the infection."

The research group plans to follow up with hundreds of patients to identify when and for whom *T. gondii* immunity might be waning. In advance of evidence to support their hypothesis, they recommend that [pregnant women](#) continue to follow guidelines for avoiding infection by the parasite, such as practicing safe food habits and hand washing. The

researchers also caution those who are pregnant not to consider themselves protected and to speak with their doctor about whether and how often to screen for the parasite.

More information: *Trends in Parasitology*, Rougier et al.: "Lifelong persistence of Toxoplasma cysts: a questionable dogma?"

[www.cell.com/trends/parasitology ... 1471-4922\(16\)30190-8](http://www.cell.com/trends/parasitology/1471-4922(16)30190-8) , DOI: [10.1016/j.pt.2016.10.007](https://doi.org/10.1016/j.pt.2016.10.007)

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