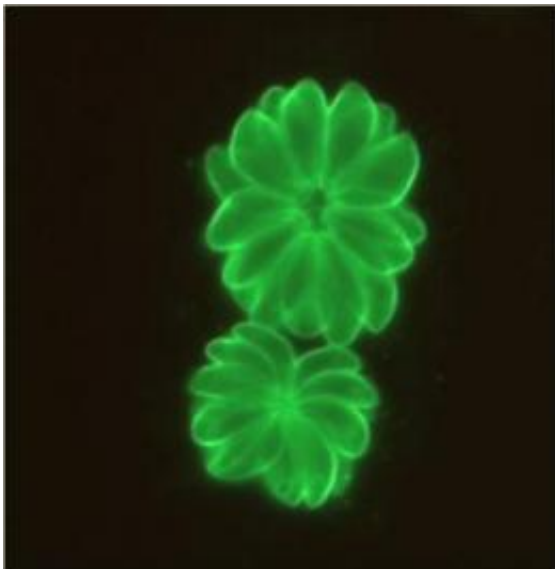


New study brings long-sought vaccines for deadly parasite closer to reality

December 13 2012



This is an image of *T. gondii*. Credit: Sankar Ghosh

One major cause of illness from food-borne diseases is the parasite *Toxoplasma gondii* (*T. gondii*). New insights into how the immune system combats *T. gondii* are provided in a study published by Cell Press December 13th in the journal *Immunity*. The findings could lead to the development of long-sought vaccines to protect against *T. gondii* and related parasites.

To fight off pathogens, the immune system relies on Toll-like receptors (TLRs)—a class of proteins that recognize [microbes](#) and activate

immune responses. The important role of TLR11 in recognizing the *T. gondii* infection was previously demonstrated by a team led by Sankar Ghosh of Columbia University and Alan Sher of the National Institute of Allergy and [Infectious Diseases](#). But scientists had not yet identified any TLRs—including TLR11—that could promote survival in infected animals.

In the new study, Ghosh, Sher, and their collaborators focused on the previously uncharacterized TLR12 because it is closely related to TLR11 and physically interacts with that receptor, suggesting that the two might work together to mount immune responses. When they genetically engineered mice to lack TLR12, they found that [immune cells](#) could not recognize or protect against *T. gondii*, and these mice quickly succumbed to infection. Although both TLR11 and TLR12 activate overlapping immune responses to *T. gondii* in certain types of cells, TLR12 also triggers responses in a distinct set of immune cells to promote survival.

"Prior to this study, TLR12 had no known function in the immune system, and it was not known what pathogen this receptor recognized," Ghosh says. "We have demonstrated that TLR12 is essential for resistance to *T. gondii* in mice."

Because TLR12 also recognized another related parasite, the findings could have broad [clinical implications](#). "By investigating how immune cells expressing TLR12 organize the [immune response](#) against *T. gondii* infection, we hope to identify new means of promoting protective immune responses against *T. gondii* and potentially other important parasite pathogens," Ghosh says.

More information: Koblansky et al.: "Recognition of profilin by toll-like receptor 12 is critical for host resistance to *Toxoplasma gondii*."
[DOI: 10.1016/j.immuni.2012.09.016](https://doi.org/10.1016/j.immuni.2012.09.016)

Provided by Cell Press

Citation: New study brings long-sought vaccines for deadly parasite closer to reality (2012, December 13) retrieved 8 May 2024 from <https://medicalxpress.com/news/2012-12-long-sought-vaccines-deadly-parasite-closer.html>

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