

Research sheds light on the inner workings of the inflammatory response to Leishmaniasis

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The secret world of inflammation is slowly being revealed by the application of advanced techniques in microscopy, as shown in a study published March 12 in the open-access journal *PLoS Pathogens*.

Researchers at the Hull York Medical School and the University of York used 2-photon microscopy to identify how killer T lymphocytes behaved when they enter sites of inflammation caused by the parasite *Leishmania donovani*, and which infected cells they were able to recognise.

Leishmaniasis is a globally important but neglected disease, affecting approximately two million people every year. For most people, infection results in a slow-to-heal skin ulcer. In others, however, the parasite targets the liver, spleen and [bone marrow](#), leading to over 70,000 deaths annually.

The *Leishmania* parasite is eventually contained by a characteristic type of inflammatory response that forms cellular structures called 'granulomas'. Little is known about the inner workings of these granulomas, in spite of their occurrence in other human diseases, from tuberculosis to [rheumatoid arthritis](#).

The York-based research team used an advanced laser-based microscopy technique, called '2-photon imaging', to view the inner workings of the granuloma in mice infected with *Leishmania*. This enabled them to study how killer lymphocytes, such as those that can be induced by vaccination, are able to enter into the granulomas, penetrate deep into the core of the structure and seek out specific types of parasite-infected

cells.

Although this technique can not be used currently for the study of inflammatory disease in humans, the insights provided into the biology of granulomas and the hidden world of [inflammation](#) should help to improve vaccines and drugs, and allow researchers to now construct in silico models for this type of inflammatory process.

More information: Beattie L, Peltan A, Maroof A, Kirby A, Brown N, et al. (2010) Dynamic Imaging of Experimental *Leishmania donovani*-Induced Hepatic Granulomas Detects Kupffer Cell-Restricted Antigen Presentation to Antigen-Specific CD8+ T Cells. *PLoS Pathog* 6(3): e1000805. [doi:10.1371/journal.ppat.1000805](https://doi.org/10.1371/journal.ppat.1000805)

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