Activation of Pro-Inflammatory Genes Suggests Pathogen-Associated Molecular Pattern (PAMP) Component in Giardia lamblia Recognized by the Murine Innate Immune System

Lewis, Samuel

Preventable and treatable diarrheal disease is the second leading cause of death in children under five years old in the world, killing approximately 760,000 children each year. Diarrheal disease caused by protozoan parasites such as Plasmodium falciparum (malaria), Toxoplasma gondii, and Giardia lamblia is notoriously widespread in impoverished areas of developing countries in Africa, Asia, and Latin America. Developments of vaccines against eukaryotic parasites have been largely unsuccessful, partially because of the lack of commercial incentive but also because of the general lack of knowledge about protein sensing of parasites by the innate immune system and the ability of parasites to immunosuppress and evade immunity. This study characterizes the innate immune response to Giardia lamblia in mice by examining the expression of pro-inflammatory genes in murine macrophages upon stimulation by Giardia lysates, ultimately discovering that there is a pathogen-associated molecular pattern (PAMP) in Giardia recognized by the innate immune system. This study also attempts to identify the pattern recognition receptor (PRR) responsible for sensing the PAMP in Giardia, which previous literature had not done. Innate immune response was found to be independent of the suspected receptors, Toll-like receptors (TLRs) 11 and 12, but an immunosuppressive component of Giardia was suggested to be a protein.

Awards Won: