

Studying illnesses caused by worms: Scientists are learning how immune cells communicate

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A billion people living in underdeveloped areas around the world are infected with parasitic helminthes, worms that survive by residing in and feeding on their hosts. These infestations can cause chronic intestinal (and occasionally systemic) illnesses leading to long-term disability. Irah King and Markus Mohrs, biomedical researchers at the Trudeau Institute, are investigating illnesses caused by these gut-dwelling worms in an effort to decipher how immune cells send and receive signals that determine the specific immune response to mount.

In a study reported in the current issue of the [Journal of Immunology](#), Dr. King and his colleagues demonstrate that a soluble factor released by CD4+ T cells (a subset of cells that aid B cells in generating an immune response) called interleukin-21 (IL-21) instructs B cells to produce antibodies that bind helminth-derived products and inhibit their ability to mature into adult worms in the host.

Using genetically modified mice that lack the receptor for IL-21, they found that B cells directly require IL-21 signals in order to differentiate into [plasma cells](#), the major antibody-producing B cell subset. The role of IL-21 signaling in this context seems to be specific because it does not impact other forms of B cell activation or CD4+ T cell differentiation, another leukocyte subset critical for protective immunity to helminthes.

"It is already established that B cells must produce antibodies to protect

us from gut-dwelling worms and other parasitic infections," said Dr. King. "However, the signals that [B cells](#) need to receive in order to produce antibodies following infection are not yet completely understood."

Scientists who study anti-parasite immunity understand that immune responses generated by worm infections are in many ways similar to responses generated by diseases more common in the developed world like asthma, allergies, and [ulcerative colitis](#). By identifying these similarities, Dr. King and other researchers hope to point to new treatments and therapies for a host of diseases associated with problems in immune system regulation.

Provided by Trudeau Institute

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