

Researchers identify unforeseen regulation of the anti-bacterial immune response

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The Trudeau Institute is a nonprofit biomedical research center located in Saranac Lake, New York. Credit: Trudeau Institute

New research from the laboratory of Dr. Andrea Cooper at the Trudeau Institute, just published in the *European Journal of Immunology*, holds promise for the improved prevention and treatment of bacterial infections and the life-threatening complications of chronic inflammation that can result from them. The publication title is "Nitric oxide inhibits the accumulation of CD4⁺CD44^{hi}Tbet⁺CD69^{lo} T cells in mycobacterial infection".

Following a typical bacterial infection, the immune response is manifested by the accumulation of [immune cells](#) within the affected organs. In a bacterial skin infection, for example, this accumulation

results in swelling and redness. When infection occurs in [internal organs](#), a similar type of response takes place, but in this setting the immune response can actually damage the organs, resulting in their diminished function. Because of this risk, whenever the immune response acts to control bacteria, the response itself must also be regulated to prevent patient injury.

The publication defines the role of a specific component of the immune response in controlling the extent of the immune response. The authors show that cells that promote damaging inflammation are specifically regulated by the activated immune cells that are part of the inflammatory process. In this way, the immune response undergoes a [negative feedback loop](#) that regulates tissue damage but can also limit the expression of bacterial control.

Once bacteria enter the body, the disease process can occur in one of two ways: either the bacteria manipulates the immune regulatory pathways, limiting expression of an immune response (leading to too many bacteria and resulting in tissue damage), or the immune response is not well regulated, and the subsequent inflammatory response damages organs. Maintaining the balance between the killing of bacteria and regulation of the immune response is critical to the health of the patient. The better our understanding of how this balance is generated, the more easily the immune response can be manipulated to achieve an optimal outcome every time it is induced.

Provided by Trudeau Institute

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