

# How excess alcohol depresses immune function

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Alcoholism suppresses the immune system, resulting in a high risk of serious, and even life-threatening infections. A new study shows that this effect stems largely from alcohol's toxicity to immune system cells called dendritic cells. These cells play a critical role in immune function, responding to danger signals by searching for unfamiliar antigens within the body that would be coming from invading microbes, and presenting such antigens to T cells, thus activating them to seek and destroy cells containing these antigens. The research is published in the July 2011 issue of the journal *Clinical and Vaccine Immunology*.

Earlier studies in mice had shown that excessive drinking of [alcohol](#) impaired T cell function, and subsequently that this impairment could be reversed by exposure to dendritic [cells](#) (so named for their shape) from non-alcoholic mice, and that poor function in CD4 and CD8 T cells could be improved through exposure to cytokines produced by non-alcoholic dendritic cells. (Cytokines are immune regulatory cells.) In this study, Jack R. Wands and colleagues of Brown University, Providence, RI, compared dendritic cells produced by alcoholic and non-alcoholic mice, which they first removed from the mice.

The result: dendritic cells from the alcoholic mice had a poor ability to activate T cells, while the dendritic cells from mice on isocaloric diets containing no alcohol functioned normally. The researchers found further that the dendritic cells from alcohol-fed mice showed reduced antigen presentation compared to those from control mice, as well as less production of the regulatory cytokines. This research also confirmed

earlier results showing that alcohol inhibits cytokine secretion by dendritic cells.

“This research helps us understand why alcoholics are predisposed to bacterial and viral infections, and why they do not respond well to vaccines,” says Wands. Understanding this, he says, will help in the development of ways to improve dendritic cell function in people with [alcohol](#) syndromes.

**More information:** A. Eden, et al., 2011. Ethanol inhibits antigen presentation by dendritic cells. *Clin. Vaccine Immunol.* 18:1157-1166.)

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