

# Adolescent exposure to the may cause immune systems to go up in smoke

## New research published in the *Journal of Leukocyte Biology* suggests that early exposure to marijuana can affect immune system development, leading to immune-related diseases in adulthood

Eurekalert.org | 9/30/14

When it comes to using marijuana, new research, involving mice and published in the October 2014 issue of the *Journal of Leukocyte Biology*, suggests that just because you can do it, doesn't mean that you should. That's because a team of Italian scientists have found that using marijuana in adolescence may do serious long-term damage to the immune system. This damage may result in autoimmune diseases and chronic inflammatory diseases, such as multiple sclerosis, inflammatory bowel disease and rheumatoid arthritis in adulthood.

"I hope that the knowledge that early exposure to marijuana is associated with immediate and long-term deleterious effects on the immune system may reach adolescents and their families," said Paola Sacerdote, Ph.D., a researcher involved in the work from the Università degli Studi di Milano in Milano, Italy. "The increased risk of getting sick in adulthood may hopefully be a deterrent for marijuana abuse among young individuals."

To make this discovery, scientists injected "adolescent" mice with THC, the main active component of marijuana, for 10 days. This period in the mouse lifecycle corresponded to the adolescence period in humans (approximately ages 12-18). A second group of adolescent mice received only a placebo. At the end of treatments, both groups of animals were left undisturbed for approximately two months, until they reached full adulthood. The activity of the immune system was then evaluated, taking into consideration several important measurements, such as the ability of leukocytes to produce cytokines to mount an antibody response to vaccination or the capacity of macrophage to phagocyte particles. The group of mice treated with THC in adolescence had severe alterations of immune responses in adulthood, characterized by a clear switch toward a pro-inflammatory and cytotoxic phenotype.

"The immune system is characterized by an impressive ability to 'remember' previous exposures and changes during the period of immune system development especially early in life can have important long-term consequences," said John Wherry, Ph.D., Deputy Editor of the *Journal of Leukocyte Biology*. "These studies not only point to adolescence as a key phase of immune system sensitivity, but also highly the dramatic and long-lasting negative effects that a common recreational drug abused by teenagers may have on immune function."

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The *Journal of Leukocyte Biology* publishes peer-reviewed manuscripts on original investigations focusing on the cellular and molecular biology of leukocytes and on the origins, the developmental biology, biochemistry and functions of granulocytes, lymphocytes, mononuclear phagocytes and other cells involved in host defense and inflammation. The Journal of Leukocyte Biology is published by the Society for Leukocyte Biology.

Details: Sarah Moretti, Mara Castelli, Silvia Franchi, Maria Augusta Raggi, Laura Mercolini, Michele Protti, Lorenzo Somaini, Alberto E. Panerai, and Paola Sacerdote.  $\Delta^9$ -Tetrahydrocannabinol-induced anti-inflammatory responses in adolescent mice switch to proinflammatory in adulthood. *J. Leukoc. Biol.* jlb.3HI0713-406RR; doi:10.1189/jlb.3HI0713-406RR ; <http://www.jleukbio.org/content/96/4/523.abstract>