Vitamin A used in acne medicines may help autoimmune and transplant patients

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The same form of Vitamin A used by teenagers to combat acne might offer benefits that are more than skin deep. That's because an international team of researchers have found that it may also help keep the immune system under control for people with autoimmune disorders or those who have received transplants. This finding was published in the February 2014 issue of the *Journal of Leukocyte Biology*.

"The results will help us to use the different protocol of Treg induction for clinical therapy in autoimmune diseases and organ transplantation protection,'" said Song Guo Zheng, M.D., Ph.D., a Professor of Medicine and leading author involved in the work from the Department of Medicine, Autoimmunity Research Center at Penn State University Hershey College of Medicine, in Hershey, Pennsylvania.

To make this discovery, scientists used cells isolated from mice and humans to conduct a head-to-head comparison of the role of all-trans retinoid acid (ATRA) on CD4+ and CD8+ Treg cell development. While ATRA significantly promoted CD4+Foxp3+Treg development and function in mice and humans, it did not boost the differentiation and function of CD8+Foxp3+Treg. On the contrary, ATRA interfered with the differentiation and function of human CD8+Foxp3+Treg. This suggests that ATRA-treated CD4+Treg is superior to ATRA-treated CD8+Treg for the treatment of autoimmune disease and organ transplantation. This lays the groundwork for the potential development of specific Treg subsets to combat specific autoimmune diseases and complications.

"The great thing about this discovery is that we already have a strong foundation of clinical use of this form of Vitamin A and know that it is well-tolerated by people," said E. John Wherry, Ph.D., Deputy Editor of the *Journal of Leukocyte Biology*. "These findings are a great example of the ability to exploit currently used drugs and our growing molecular and cellular understanding of the immune system. Such approaches represent exactly the kind of merging of basic science and clinical medicine that defines translational research."

More information: Jilin Ma, Ya Liu, Yang Li, Jian Gu, Justin Liu, Jiayou Tang, Julie Wang, Bernhard Ryffel, Yi Shen, David Brand, Zhongmin Liu, and Song Guo Zheng. Differential role of all-trans retinoic acid in promoting the development of CD4+ and CD8+ regulatory T cells. *J Leukoc Biol.* February 2014 95:275-283; DOI: 10.1189/jlb.0513297

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