

Oxygen levels increase and decrease the effectiveness of anti-inflammatory therapies

2 December 2013

A new research discovery published in the December 2013 issue of the *Journal of Leukocyte Biology* yields an important clue toward helping curb runaway inflammation. Oxygen levels play a critical role in determining the severity of the inflammatory response and ultimately the effectiveness of anti-inflammatory drugs. This research could have significant future benefits for patients with severe asthma, COPD, rheumatoid arthritis, pulmonary fibrosis and coronary artery disease.

According to John Marwick from the MRC Centre for Inflammation Research at The Queen's Medical Research Institute at the University of Edinburgh Medical School in Edinburgh, Scotland, and a researcher involved in the work, "Inflammatory diseases contribute to countless deaths and suffering of people. We hope that by understanding the processes involved in inflammation we will herald the arrival of new and targeted anti-inflammatory drugs that have fewer side effects than what is currently available."

To make this discovery, researchers isolated neutrophils, the immune cells that are responsible for [acute inflammation](#), from the blood of healthy volunteers and incubated them in different levels of oxygen. They then added substances that are usually present at sites of inflammation in humans, both with and without anti-inflammatory glucocorticoid drugs and studied what effect these factors had on neutrophil lifespan. They found that the [oxygen levels](#) altered the effectiveness of the drugs, which suggests that these drugs may be less effective for some diseases than they are for others. Future areas of research include developing a deeper understanding of exactly how these drugs work under different conditions to ultimately help with development of new, better tolerated anti-inflammatory therapies.

"This report may shed light on why some people respond better to anti-inflammatory drugs than

others, and it suggests that a one size fits all strategy to anti-inflammatory drugs may be overly simplistic. This work could be a foundation to identifying ways to tailor anti-inflammatory agents to specifically treat different diseases," said John Wherry, Ph.D., Deputy Editor of the *Journal of Leukocyte Biology*.

More information: John A. Marwick, David A. Dorward, Christopher D. Lucas, Katie O. Jones, Tara A. Sheldrake, Sarah Fox, Carol Ward, Joanna Murray, Mairi Brittan, Nik Hirani, Rodger Duffin, Ian Dransfield, Christopher Haslett, and Adriano G. Rossi. Oxygen levels determine the ability of glucocorticoids to influence neutrophil survival in inflammatory environments. *J Leukoc Biol* December 2013 94:1285-1292; [DOI: 10.1189/jlb.0912462](#)

Provided by Federation of American Societies for Experimental Biology

APA citation: Oxygen levels increase and decrease the effectiveness of anti-inflammatory therapies (2013, December 2) retrieved 26 September 2020 from <https://medicalxpress.com/news/2013-12-oxygen-decrease-effectiveness-anti-inflammatory-therapies.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.