

# Scientists identify missing link between smoking and inflammation

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It's no secret that using tobacco is bad for you, but what has been a mystery until now is how tobacco causes increased inflammation throughout the body. Now, a team of researchers from the United States and Sweden have learned why. In a new report appearing in the November 2016 issue of the *Journal of Leukocyte Biology*, scientists show that nicotine activates certain white blood cells, called neutrophils, which in turn release molecules that lead to increased inflammation.

"Our study reveals an explanation how nicotine contributes to induction of inflammation and in doing so shows new possibilities for future therapies to treat tobacco-related diseases which each year lead to premature deaths of several million people worldwide," said Constantin Urban, a researcher involved in the work from the Umeå Centre for Microbial Research in Sweden.

To make this discovery, the researchers stimulated isolated neutrophils from humans and mice with nicotine and could measure a dose-dependent release of inflammatory molecules. By using pharmacological small molecule inhibitors as well as neutrophils from genetically modified mouse strains the team could identify essential receptor and signaling pathways involved in the nicotine-mediated activation of neutrophils.

"The cancer-causing effects of smoking have been known for decades, but how smoking is related to immune changes has been less clear," said E. John Wherry, Ph.D., Deputy Editor of the *Journal of Leukocyte*

*Biology*. "Because of the direct link between nicotine itself and [inflammation](#), this study has important implications including that alternative forms of nicotine inhalation, such as vaping that lacks other chemicals from cigarette smoke, may nonetheless still have detrimental immunological effects."

**More information:** A. Hosseinzadeh et al, Nicotine induces neutrophil extracellular traps, *Journal of Leukocyte Biology* (2016). [DOI: 10.1189/jlb.3AB0815-379RR](#)

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