

# Binge drinkers let down guard against infection

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As if a bad hangover wasn't enough of a deterrent, new research has shown how binge drinking weakens the body's ability to fight off infection for at least 24 hours afterwards. The study, published today in the open access journal *BMC Immunology*, focused on the effect of heavy drinking on toll-like receptor 4 (TLR4), a protein that has an important role in immune system activation.

Previous mouse experiments indicate that binge drinking - consuming large quantities of alcohol over a short time to deliberately get drunk - inhibits the body's production of pro-inflammatory cytokines. These are signalling molecules that launch the inflammatory response to infection.

Stephen Pruett, currently at the College of Veterinary Medicine at Mississippi State University, USA and Ruping Fan of Louisiana State University Health Sciences Center, USA, set out to compare the in vivo and in vitro effects of alcohol on cytokines and TLR4, using a mouse model. Their results confirm that acute [alcohol exposure](#) prevents the body from producing certain key pro-inflammatory cytokines. Ethanol molecules suppress TLR4's usual ability to send signals that would normally trigger the production of inflammatory cytokines, the authors suggest.

The in vivo and in vitro results were similar, although using the mouse model the authors were able to pick up more detail on alcohol's [inhibitory effect](#) on NF- $\kappa$ B, a protein complex that controls DNA transcription and which is known to control expression of some of the

cytokines that are inhibited by alcohol.

Alcohol's effects continue long after the party is over: some cytokines were still not on full duty guarding against infection 24 hours after the binge. "The time frame during which the risk of infection is increased might be at least 24 hours," said Pruett. "A persistent effect of ethanol on cells is indicated, such that inhibition of the response of some cytokines occurs even after the ethanol is cleared."

More information: Ethanol inhibits LPS-induced signaling and modulates cytokine production in peritoneal macrophages in vivo in a model for [binge drinking](#); Stephen B Pruett and Ruping Fan; *BMC Immunology* (in press); [www.biomedcentral.com/bmcimmunol/](http://www.biomedcentral.com/bmcimmunol/)

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