

Frontline Science: ATF3 is responsible for the inhibition of TNF - α release and the impaired migration of acute ethanol - exposed monocytes and macrophages

Chaojie Hu, Xiaoming Meng, Cheng Huang, Chenlin Shen, Jun Li 

First published: 3 June 2016

<https://doi.org/10.1189/jlb.2H1115-491R>

Cited by:2

 About  Access PDF  Tools  Share

Abstract

Binge drinking represses host innate immunity and leads to a high risk of infection. Acute EtOH - pretreated macrophages exhibit a decreased production of proinflammatory mediators in response to LPS. ATF3 is induced and counter - regulates the LPS/TLR4 inflammatory cascade. Here, we investigated the potential role of ATF3 in LPS tolerance in acute ethanol - pretreated macrophages. We found that there was an inverse correlation between ATF3 and LPS - induced TNF - α production in acute ethanol - pretreated murine monocytes and macrophages. The knockdown of ATF3 attenuated the inhibitory effects of acute ethanol treatment on LPS - induced TNF - α production. Furthermore, ChIP assays and co - IP demonstrated that ATF3, together with HDAC1, negatively modulated the transcription of TNF - α . In binge - drinking mice challenged with LPS, an up - regulation of ATF3 and HDAC1 and a concomitant decrease in TNF - α were observed. Given that HDAC1 was concomitantly induced in acute ethanol - exposed monocytes and macrophages, we used the HDACi TSA or silenced HDAC1 to explore the role of HDAC1 in acute ethanol - treated macrophages. Our results revealed that TSA treatment and HDAC1 knockdown prevented acute ethanol - induced ATF3 expression and the inhibition of TNF - α transcription. These data indicated a dual role for HDAC1 in acute ethanol - induced LPS tolerance. Furthermore, we showed that the induction of ATF3 led to the impaired migration of BM monocytes and macrophages. Overall, we present a novel role for ATF3 in the inhibition of LPS - induced TNF - α and in the impairment of monocyte and macrophage migration.

Citing Literature

Number of times cited: 2

Banishree Saha, Editorial: Binge drinking: lessons from ATF3 and HDAC1 collaboration, *Journal of Leukocyte Biology*, **101**, 3, (620-621), (2017).

Tatyana Veremeyko, Amanda W. Y. Yung, Marina Dukhinova, Inna S. Kuznetsova, Igor Pomytkin, Alexey Lyundup, Tatyana Strekalova, Natasha S. Barteneva and Eugene D. Ponomarev, Cyclic AMP Pathway Suppress Autoimmune Neuroinflammation by Inhibiting Functions of Encephalitogenic CD4 T Cells and Enhancing M2 Macrophage Polarization at the Site of Inflammation, *Frontiers in Immunology*, 10.3389/fimmu.2018.00050, **9**, (2018).

[Crossref](#)



© 2018 by the Society for Leukocyte Biology

About Wiley Online Library 

Help & Support 

Opportunities 

Connect with Wiley 

Copyright © 1999-2018 John Wiley & Sons, Inc. All rights reserved

WILEY