Reviewer's report

Title: Mitochondria-targeted antioxidant MitoQ ameliorates experimental mouse colitis by suppressing NLRP3 inflammasome-mediated inflammatory cytokines

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Reviewer: Holger K Eltzschig

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The present studies show that ROS originated from mitochondria play a causative role in the pathogenesis of IBD. ROS levels, oxidative injury and inflammatory cytokines IL-1β and IL-18 were increased in colon tissue of DSS-induced colitis mice and significantly decreased by treating with MitoQ. Also, excessive activation of NLRP3 inflammasome which is responsible for those cytokines was suppressed by MitoQ. Based on these findings the authors conclude that mtROS play a critical role in the pathogenesis of IBD and MitoQ is a possible therapeutic molecule for the treatment of IBD. These are novel and important findings. The conclusions are well supported by the data presented.

Major comments:

1.) The authors should expand their discussion on the interdependent role of hypoxia and inflammation (see for example Eltzschig et al. Hypoxia and Inflammation; NEJM 2011 and Eltzschig et al. Purinergic signaling during inflammation; NEJM 2012). How does the hypoxic environment of the inflammed mucosa impact their findings?

2.) What role do regulatory T-cells play in this context (see for example Clambey et al. Hypoxia-inducible factor-1 alpha-dependent induction of FoxP3 drives regulatory T-cell abundance and function during inflammatory hypoxia of the mucosa; PNAS 2012)?

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
I have no competing interest in relation to this manuscript.