Maitham Khajah et al., J Gastrointest Dig Syst 2016, 6:7(Suppl)
http://dx.doi.org/10.4172/2161-069X.C1.043

The role of Granulocyte-macrophage colony stimulating factor (GM-CSF) in colitis

Maitham Khajah[*#], and **Donna-Marie McCafferty**[*]
Faculty of Pharmacy, Kuwait University, Kuwait
University of Calgary, Canada

Background: GM-CSF is a well-established priming agent and exerts proliferative effects for hematopoietic cells. Recent evidence suggests a potent chemotactic property towards neutrophils ***in vitro***.

Aim: To examine the role of GM-CSF in neutrophil recruitment to the colon ***in vivo*** and its effect on modulating colitis severity using the 2, 4, 6-trinitrobenzene sulphonic acid (TNBS) model in mice.

Methods: Colitis was induced by a single intra rectal injection of TNBS (4mg, 20% ethanol) at day 1. Animals were treated with a single i.p injection of neutralizing anti-GM-CSF antibody (100 µg/mouse) on day 1, or multiple injections on day 1,2,3, and 4, and sacrificed on day 5 post-induction of colitis. Control mice were injected with i.p saline (vehicle) plus TNBS. On another experimental setup, colitis was induced in GMCSFRβ$^{-/-}$ and compared to wild type (WT) mice. Results: enhanced GM-CSF expression (at both gene and protein levels) was observed in colonic tissues at day 3 and 7 post colitis induction. A single injection of GM-CSF antibody did not modulate colitis severity, while multiple injections significantly reduced colonic MPO activity and colitis severity. In the GMCSFRβ$^{-/-}$ mice, colonic MPO activity was significantly reduced post colitis induction but no improvement in colitis severity was observed compared to WT mice.

Conclusion: Anti-GM-CSF therapy significantly reduced neutrophil recruitment to the colon leading to reduced colitis severity.

Biography

Maitham Khajah has completed his B. Pharm degree from Faculty of Pharmacy, Kuwait University and obtained his Ph.D. degree from the University of Calgary, Canada. He is currently an Assistant Professor in Kuwait University, Faculty of Pharmacy, Department of Pharmacology & Therapeutics since January 2010. His research interest focuses on studying new targets for the treatment of inflammatory bowel disease. He published various abstracts and peer reviewed manuscripts in international journals. He co-supervised many students for the M.sc Molecular Biology Program. Since he joined Kuwait University, he got various grants as PI and Co-I. He was awarded the Best young researcher award by Kuwait University for the year 2013 – 2014.

maitham@HSC.EDU.KW

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