

# Researchers identify a possible cause and treatment for inflammatory bowel disease

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Inflammatory bowel disease (IBD) is a category of refractory inflammatory disease, of which ulcerative colitis (UC) and Crohn's disease (CD) are the main types.

Current studies suggest that IBD is a complex autoinflammatory disease determined by genetic and environmental factors, and is the major cause

of gastrointestinal cancer. Because of its complex and refractory character, researchers have focused on determining the detailed pathogenesis of IBD and finding an effective therapy for it.

In a study published online in *PNAS* on Jan. 20, Prof. Sun Bing's team from the Center for Excellence in Molecular and Cellular Science, Institute of Biochemistry and Cell Biology of the Chinese Academy of Sciences, in collaboration with Prof. Liu Jie from Huashan Hospital, Fudan University, revealed a new mechanism involved in the pathogenesis of IBD and suggested therapeutic targets for clinical trial.

Among the identified IBD-susceptibility genes (NOD2, IL-23, etc.), the extracellular matrix protein-1 (ECM1) gene was found to be strongly related to UC in 2008. Since 2011, several studies from SUN's lab have reported the disease-related functions of ECM1 in Th2, Th17 and Tfh cells. However, no available evidence suggested that ECM1 plays a direct role in IBD.

In this study, the researchers analyzed [tissue samples](#) from patients with [ulcerative colitis](#) and a DSS-induced IBD mice model.

They found that ECM1 was highly expressed in macrophages, particularly tissue-infiltrated macrophages under inflammatory conditions, and ECM1 expression was significantly induced during IBD progression. The macrophage-specific knockout of ECM1 resulted in increased arginase 1 (ARG1) expression and impaired polarization into the M1 macrophage phenotype after lipopolysaccharide (LPS) treatment.

Further study showed that ECM1 protein could regulate M1 macrophage polarization through the GM-CSF/STAT5 signaling pathway. Pathological changes in mice with dextran sodium sulfate-induced IBD were alleviated by the specific knockout of the ECM1 gene in

macrophages.

These results reveal a role for the IBD-susceptibility gene ECM1 in colitis and the possible existence of a GM-CSF/STAT5 regulatory axis in macrophages, indicating that the attenuation of ECM1 function in macrophages is a potential strategy for IBD therapy.

**More information:** Yaguang Zhang et al., "ECM1 is an essential factor for the determination of M1 macrophage polarization in IBD in response to LPS stimulation," *PNAS* (2020).

[www.pnas.org/cgi/doi/10.1073/pnas.1912774117](http://www.pnas.org/cgi/doi/10.1073/pnas.1912774117)

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