

# Researchers discover a gene that controls the severity of colon cancer

September 7 2021, by Brittany Steff

---



Majid Kazemian and a team of scientists have discovered that the gene TCF-1 plays a key role in controlling TReg cells, affecting the severity of colon cancer. Credit: Purdue University / Rebecca McElhoe

Regulatory T cells ( $T_{\text{Reg}}$ ) are essential to regulating the immune system.

However, there are several different types of  $T_{\text{Reg}}$  cells, and scientists are only now beginning to differentiate among them and understand their functions and roles.

Researchers from Purdue University, including Majid Kazemian, an assistant professor of biochemistry and computer science, and a team of collaborators from Mayo Clinic and the University of Chicago, have discovered that the gene TCF-1 controls the functions of a specific set of  $T_{\text{Reg}}$  cells. Without TCF-1, these  $T_{\text{Reg}}$  cells keep their normal repressive function, but they gain additional properties and become inflammatory: They become more activated, increase the cancer signals, and gain a gut-homing feature, resulting in more drastic and dangerous colon cancers. Patients with colon cancer have these same  $T_{\text{Reg}}$  cells that lack TCF-1 in their [tumor](#). Before this research, scientists knew many of the main regulators, but this is the first time the link between TCF-1 and colon cancer has been explored. Future drug development could focus on this pathway to treat or ameliorate certain kinds of colon cancer.

"It's extremely important to be able to manage the degree of immune response," Kazemian said. "That's why understanding these  $T_{\text{Reg}}$  cells is so important. If you have too much of a response, you get autoimmunity. If you have too little, you get cancer. Healthy systems need to strike a balance between autoimmune disease and cancer, and proper  $T_{\text{Reg}}$  cell function plays a key role in doing that."

## Brief summary of methods

The scientists set out to study the link between TCF-1 and  $T_{\text{Reg}}$  cells. They discovered that when they removed TCF-1, the  $T_{\text{Reg}}$  cells changed their behavior, became gut-homing and more numerous. They studied  $T_{\text{Reg}}$  cell activity in mice that lacked the gene and compared the activity to  $T_{\text{Reg}}$  cells in human patients with colon cancer.

**More information:** Abu Osman et al, TCF-1 controls Treg cell functions that regulate inflammation, CD8+ T cell cytotoxicity and severity of colon cancer, *Nature Immunology* (2021). [DOI: 10.1038/s41590-021-00987-1](https://doi.org/10.1038/s41590-021-00987-1)

Provided by Purdue University

Citation: Researchers discover a gene that controls the severity of colon cancer (2021, September 7) retrieved 7 May 2024 from <https://medicalxpress.com/news/2021-09-gene-severity-colon-cancer.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--