Stanford

Michael Schumacher

Assistant Professor of Pediatrics (Gastroenterology)

Pediatrics - Gastroenterology

Bio

BIO

I am a gastrointestinal physiologist focused on discovering new therapeutic targets for inflammatory bowel disease (IBD) including ulcerative colitis and Crohn’s disease. My lab studies how intestinal tissues interpret, respond to, and recover from inflammation, with a particular emphasis on how immune signals shape epithelial function, tissue remodeling, and mucosal healing.

We combine large-scale transcriptomic analysis with organoid and physiological approaches to identify fundamental regulators of intestinal health and disease. Our work spans both epithelial and immune biology, with the goal of defining mechanisms that can be leveraged for future therapies.

ACADEMIC APPOINTMENTS

- Assistant Professor, Pediatrics - Gastroenterology
- Member, Bio-X

HONORS AND AWARDS

- New Investigator Award, American Physiological Society – GI & Liver Section (2026)
- Endowed Faculty Scholar for Pediatric IBD and Celiac Disease, Stanford School of Medicine (2026-current)
- K01 Career Development Award, NIH (2022-2026)
- Ellison Career Development Award, The Saban Research Institute (2022-2024)
- Early Career Author Award, American Journal of Physiology – GI & Liver (2022)
- Career Development Award, Crohn's and Colitis Foundation (2018-2021)
- Research Fellowship Award, Crohn's and Colitis Foundation (2015-2018)
- Ryan Fellowship, Albert J. Ryan Foundation (2012-2014)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Associate Editor, AGA Gastro Hep Advances (2026 - present)
- Editorial Board, American Journal of Physiology - GI & Liver (2020 - present)
- Member, Society for Mucosal Immunology (2023 - present)
- Member, American Gastroenterological Association (2013 - present)
- Member, American Physiological Society (2012 - present)

PROFESSIONAL EDUCATION

- Fellowship, Children's Hospital Los Angeles
- PhD, University of Cincinnati College of Medicine
- BS, The Ohio State University

PATENTS

- "United States Patent 10702586 Methods for treating diseases mediated by ErbB4-positive pro-inflammatory macrophages"

LINKS

- Schumacher Gut Science Lab: https://www.gutsciencelab.com
- Google Scholar: https://scholar.google.com/citations?user=uHRB_64AAAAJ

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

We study immune and epithelial drivers of tissue remodeling, function, and regeneration in the gut with an overarching goal of discovering ways to promote mucosal healing in GI disease.

The function and composition of the gastrointestinal tract is dynamically regulated to maintain homeostasis and appropriately respond to injury, inflammation and infection. Inadequate responses to insult can lead to acute and long-term disease. As these responses are often impaired in chronic injury and inflammation, we aim to understand and harness key protective tissue responses to limit intestinal diseases like inflammatory bowel disease (IBD). In particular, we seek to address fundamental questions of how immune and tissue signals in the intestinal tract regulate stem and secretory cells to promote intestinal health. Despite demonstrations of altered secretory cell populations in intestinal disease, the mechanisms regulating these cells and their function are poorly understood. We focus on understanding the basic biology and regulatory mechanisms controlling these cells with the goal of translating this fundamental knowledge into new ways to improve GI health.

Our early studies uncovered an epithelial-stromal signaling circuit that controls secretory cell differentiation in the colon and becomes disrupted in IBD (Nature Communications, 2021). We later identified IL-13 as a potent inducer of deep crypt secretory (DCS) cells, a specialized epithelial population important for mucosal homeostasis (CMGH, 2023). More recently, we demonstrated that Wnt/β-catenin signaling in colonic stem cells regulates epithelial IL-33 expression, the upstream driver of the IL-13/DCS cell axis, thus defining an immunological role for the intestinal stem cell niche (Mucosal Immunology, 2021). Together, our work defines a novel framework for understanding how immune and epithelial cells communicate to shape intestinal tissues in inflammation and highlights pathways with therapeutic potential for driving mucosal healing in IBD.