



Sidhartha Sinha

Assistant Professor of Medicine (Gastroenterology and Hepatology)

Medicine - Gastroenterology & Hepatology

CLINICAL OFFICE (PRIMARY)

- **Stanford Gastroenterology and Digestive Health Clinic**

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ACADEMIC CONTACT INFORMATION

- **Alternate Contact**

Cynthia Cruise - Administrative Associate

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Tel 650.497.6216

Bio

BIO

As a practicing gastroenterologist and researcher specializing in inflammatory bowel disease (IBD), a disease without medical cure and whose pathogenesis is incompletely understood, I am keenly aware of the resultant limitations and risks of existing IBD therapies. It is precisely this need—the need to offer patients improved treatment options by better understanding the underlying causes of IBD and its impact on patients—that motivates me and is a focus of my research. With a unique background with formal training in Biodesign (medical technology assessment and development) and postdoctoral training in translational immunology, I am particularly interested in developing and applying novel solutions to alleviate intestinal inflammatory conditions.

There are two primary and overlapping emphases of my research, both of which are driven and united by needs-based innovation and translational potential:

(1) Understanding the microenvironment of the inflamed versus normal gut in order to identify better therapeutic targets for people with immune-mediated GI disorders. Here, our investigations include understanding the influence and interactions of pharmacologic and dietary interventions on gut microbiome/metabolomic changes and the host immune response. In the context of providing patients with new understanding and solutions for their disease, I have led and advised on the design of both pilot and large clinical trials (including new FDA approved therapies) for anti-inflammatory therapies;

(2) Applying novel approaches and technologies (including natural language processing, computer vision, and reinforcement learning) to identify and address unmet clinical needs. In this area we have ongoing and published efforts in my lab to validate and develop solutions to pressing clinical needs. We have developed/led new drug delivery technologies with a multidisciplinary team that have shown strong potential in ongoing human IBD clinical trials. My lab has utilized both supervised and unsupervised approaches to analyze social media discourse and unstructured data sets for identifying patient needs that are rarely addressed in clinical settings. We have gained insights into patient perceptions around preventative health interventions, such as health screening and diet, including the dearth of evidence-based dietary recommendations to treat IBD (despite strong patient desire for solutions in this domain).

CLINICAL FOCUS

- Gastroenterology

- Inflammatory Bowel Disease
- Ulcerative Colitis
- Crohn's Disease
- Microscopic Colitis
- Pouchitis
- Global Health
- Biodesign, Low-cost devices

ACADEMIC APPOINTMENTS

- Assistant Professor - University Medical Line, Medicine - Gastroenterology & Hepatology
- Member, Bio-X
- Member, Stanford Medicine Children's Health Center for IBD and Celiac Disease

ADMINISTRATIVE APPOINTMENTS

- Director of Digital Health and Innovation, Division of Gastroenterology & Hepatology Stanford University School of Medicine, (2019- present)

PROFESSIONAL EDUCATION

- Board Certification: Gastroenterology, American Board of Internal Medicine (2014)
- Fellowship: Stanford Hospital and Clinics (2014) CA
- Fellowship, Mayo Clinic, Rochester, MN (Crohn's & Colitis Foundation Visiting IBD Fellow Program) , Inflammatory Bowel Disease (2013)
- Fellowship: Stanford Biodesign Program (2011) CA
- Residency: Stanford University School of Medicine (2010) CA
- Medical Education: University of California San Francisco (2007) CA
- BA, Harvard University

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

There are two primary and overlapping emphases of my research, both of which are driven and united by needs-based innovation and translational potential:

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CLINICAL TRIALS

- The Influence of a Fasting Mimicking Diet on Ulcerative Colitis, Recruiting
- The Role of Secondary Bile Acids in Intestinal Inflammation, Recruiting
- Effects of an Intermittent Reduced Calorie Diet on Crohn's Disease, Not Recruiting
- Myoelectric GutPrint-Crohn's Disease, Not Recruiting

Teaching

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Daisy Ye

Publications

PUBLICATIONS

- **Artificial intelligence and machine learning technologies in ulcerative colitis.** *Therapeutic advances in gastroenterology*
Kulkarni, C., Liu, D., Fardeen, T., Dickson, E. R., Jang, H., Sinha, S. R., Gubatan, J.
2024; 17: 17562848241272001
- **Colonoscopy Prep Is Associated With Increased Risk of Flare Among Patients With Previously Inactive Inflammatory Bowel Disease**
Kulkarni, C., Talamantes, S. M., Sinha, S.
LIPPINCOTT WILLIAMS & WILKINS.2023: S840
- **Oral Vancomycin Is Associated With Less IBD Therapy Intensification in PSC-IBD**
Talamantes, S. M., Kulkarni, C., Cholankeril, G., Fardeen, T., Sinha, S.
LIPPINCOTT WILLIAMS & WILKINS.2023: S830-S831
- **Wireless Patches Reveal Differences in Gastric and Colonic Motility Between Crohn's Disease Patients in Flare and Remission**
Axelrod, L., Axelrod, S., Navalgund, A., Patel, A., Brogadir, S., Sinha, S.
LIPPINCOTT WILLIAMS & WILKINS.2023: S860-S861
- **Development and Validation of a Machine Learning System to Identify Reflux Events in Esophageal 24-hour pH/Impedance Studies.** *Clinical and translational gastroenterology*
Zhou, M. J., Zikos, T., Goel, K., Goel, K., Gu, A., Re, C., Rodriguez, D., Clarke, J. O., Garcia, P., Fernandez-Becker, N., Sonu, I., Kamal, A., Sinha, et al
2023
- **Microbiomic and Metabolomic Analyses Unveil the Protective Effect of Saffron in a Mouse Colitis Model.** *Current issues in molecular biology*
Singh, G., Brim, H., Haileselassie, Y., Varma, S., Habtezion, A., Rashid, M., Sinha, S. R., Ashktorab, H.
2023; 45 (7): 5558-5574
- **Dietary Exposures and Interventions in Inflammatory Bowel Disease: Current Evidence and Emerging Concepts.** *Nutrients*
Gubatan, J., Kulkarni, C. V., Talamantes, S. M., Temby, M., Fardeen, T., Sinha, S. R.
2023; 15 (3)
- **Gut Microbiome in Inflammatory Bowel Disease: Role in Pathogenesis, Dietary Modulation, and Colitis-Associated Colon Cancer.** *Microorganisms*
Gubatan, J., Boye, T. L., Temby, M., Sojwal, R. S., Holman, D. R., Sinha, S. R., Rogalla, S. R., Nielsen, O. H.
2022; 10 (7)
- **Anti-Integrins for the Treatment of Inflammatory Bowel Disease: Current Evidence and Perspectives.** *Clinical and experimental gastroenterology*
Gubatan, J., Keyashian, K., Rubin, S. J., Wang, J., Buckman, C. A., Sinha, S.
2021; 14: 333-342
- **Protective Effect of Saffron in Mouse Colitis Models Through Immune Modulation.** *Digestive diseases and sciences*
Singh, G., Haileselassie, Y., Ji, A. R., Maecker, H. T., Sinha, S. R., Brim, H., Habtezion, A., Ashktorab, H.

2021

- **Development and Validation of an Artificial Intelligence System to Optimize Clinician Review of Patient Records.** *JAMA network open*
 Chi, E. A., Chi, G., Tsui, C. T., Jiang, Y., Jarr, K., Kulkarni, C. V., Zhang, M., Long, J., Ng, A. Y., Rajpurkar, P., Sinha, S. R.
 2021; 4 (7): e2117391
- **Saffron Pre-Treatment Promotes Reduction in Tissue Inflammatory Profiles and Alters Microbiome Composition in Experimental Colitis Mice.** *Molecules (Basel, Switzerland)*
 Banskota, S., Brim, H., Kwon, Y. H., Singh, G., Sinha, S. R., Wang, H., Khan, W. I., Ashktorab, H.
 2021; 26 (11)
- **Saffron Pre-Treatment Promotes Reduction in Tissue Inflammatory Profiles and Alters Microbiome Composition in Experimental Colitis Mice** *MOLECULES*
 Banskota, S., Brim, H., Kwon, Y., Singh, G., Sinha, S. R., Wang, H., Khan, W. I., Ashktorab, H.
 2021; 26 (11)
- **Therapeutic Implications of Diet in Inflammatory Bowel Disease and Related Immune-Mediated Inflammatory Diseases.** *Nutrients*
 Jiang, Y., Jarr, K., Layton, C., Gardner, C. D., Ashouri, J. F., Abreu, M. T., Sinha, S. R.
 2021; 13 (3)
- **Reply to Letter to the Editor: What is the incidence of COVID-19 in patients with IBD in western countries?** *Gastroenterology*
 Gubatan, J. n., Sinha, S. R., Habtezion, A. n.
 2021
- **Artificial intelligence applications in inflammatory bowel disease: Emerging technologies and future directions.** *World journal of gastroenterology*
 Gubatan, J. n., Levitte, S. n., Patel, A. n., Balabanis, T. n., Wei, M. T., Sinha, S. R.
 2021; 27 (17): 1920-1935
- **Vitamin D is Associated with #4#7+ Immunophenotypes and Predicts Vedolizumab Therapy Failure in Patients with Inflammatory Bowel Disease.** *Journal of Crohn's & colitis*
 Gubatan, J., Rubin, S. J., Bai, L., Haileselassie, Y., Levitte, S., Balabanis, T., Patel, A., Sharma, A., Sinha, S. R., Habtezion, A.
 2021
- **Anti-Integrins for the Treatment of Inflammatory Bowel Disease: Current Evidence and Perspectives** *CLINICAL AND EXPERIMENTAL GASTROENTEROLOGY*
 Gubatan, J., Keyashian, K., Rubin, S. S., Wang, J., Buckman, C. A., Sinha, S.
 2021; 14: 333-342
- **Association of Anti-TNF Therapy With Increased Risk of Acute Cholangitis in Patients With Primary Sclerosing Cholangitis.** *Inflammatory bowel diseases*
 Kulkarni, C., Murag, S., Cholaneril, G., Fardeen, T., Mannalithara, A., Lerrigo, R., Kamal, A., Ahmed, A., Goel, A., Sinha, S. R.
 2020
- **Efficacy of Dietary Supplements in Inflammatory Bowel Disease and Related Autoimmune Diseases.** *Nutrients*
 Jadhav, P., Jiang, Y., Jarr, K., Layton, C., Ashouri, J. F., Sinha, S. R.
 2020; 12 (7)
- **Dysbiosis-Induced Secondary Bile Acid Deficiency Promotes Intestinal Inflammation.** *Cell host & microbe*
 Sinha, S. R., Haileselassie, Y., Nguyen, L. P., Tropini, C., Wang, M., Becker, L. S., Sim, D., Jarr, K., Spear, E. T., Singh, G., Namkoong, H., Bittinger, K., Fischbach, et al
 2020
- **Mass cytometry reveals systemic and local immune signatures that distinguish inflammatory bowel diseases.** *Nature communications*
 Rubin, S. J., Bai, L., Haileselassie, Y., Garay, G., Yun, C., Becker, L., Streett, S. E., Sinha, S. R., Habtezion, A.
 2019; 10 (1): 2686
- **Age-Related Changes in Gut Microbiota Alter Phenotype of Muscularis Macrophages and Disrupt Gastrointestinal Motility.** *Cellular and molecular gastroenterology and hepatology*
 Becker, L., Spear, E. T., Sinha, S. R., Haileselassie, Y., Habtezion, A.
 2019; 7 (1): 243
- **The high resource impact of reformatting requirements for scientific papers.** *PloS one*

- Jiang, Y. n., Lerrigo, R. n., Ullah, A. n., Alagappan, M. n., Asch, S. M., Goodman, S. N., Sinha, S. R.
2019; 14 (10): e0223976
- **Using Social Media to Characterize Public Sentiment Toward Medical Interventions Commonly Used for Cancer Screening: An Observational Study.** *Journal of medical Internet research*
Metwally, O., Blumberg, S., Ladabaum, U., Sinha, S. R.
2017; 19 (6)
 - **Using Social Media to Characterize Public Sentiment Toward Medical Interventions Commonly Used for Cancer Screening: An Observational Study.** *Journal of medical Internet research*
Metwally, O., Blumberg, S., Ladabaum, U., Sinha, S. R.
2017; 19 (6)
 - **Use of Tumor Necrosis Factor Alpha Inhibitors for Inflammatory Bowel Disease Patients with Concurrent Heart Failure.** *Digestive diseases and sciences*
Jiang, Y., Lin, O., Sinha, S. R.
2017; 62 (6): 1597-1606
 - **Use of Tumor Necrosis Factor Alpha Inhibitors for Inflammatory Bowel Disease Patients with Concurrent Heart Failure.** *Digestive diseases and sciences*
Jiang, Y., Lin, O., Sinha, S. R.
2017; 62 (6): 1597-1606
 - **A Thermo-Sensitive Delivery Platform for Topical Administration of Inflammatory Bowel Disease Therapies.** *Gastroenterology*
Sinha, S. R., Nguyen, L. P., Inayathullah, M., Malkovskiy, A., Habte, F., Rajadas, J., Habtezion, A.
2015; 149 (1): 52-55 e2
 - **Effect of Intratonsillar Injection of Steroids on the Palatine Tonsils of Rabbits** *LARYNGOSCOPE*
Cho, D., Sinha, S. R., Gardner, J. M., Schaller, M. P., Pamnani, R. D., Felt, S. A., Barral, J. K., Messner, A. H.
2014; 124 (12): 2811-2817
 - **Effect of intratonsillar injection of steroids on the palatine tonsils of rabbits.** *Laryngoscope*
Cho, D., Sinha, S. R., Gardner, J. M., Schaller, M. P., Pamnani, R. D., Felt, S. A., Barral, J. K., Messner, A. H.
2014; 124 (12): 2811-2817
 - **Strategies for last mile implementation of global health technologies.** *The Lancet. Global health*
Chao, T. E., Lo, N. C., Mody, G. N., Sinha, S. R.
2014; 2 (9): e497-8
 - **Ethnic Disparities in the Association of Body Mass Index with the Risk of Hypertension and Diabetes** *JOURNAL OF COMMUNITY HEALTH*
Wong, R. J., Chou, C., Sinha, S. R., Kamal, A., Ahmed, A.
2014; 39 (3): 437-445
 - **Severe Iron Deficiency: Rare Etiology, Easy Treatment** *DIGESTIVE DISEASES AND SCIENCES*
Sinha, S. R., Triadafilopoulos, G., Shah, N.
2014; 59 (3): 538-542
 - **Effect of intra-tonsillar injection of Steroids on the palatine tonsils of rabbits.** *Laryngoscope*
Cho, D., Sinha, S. R., et al
2013
 - **Severe Iron Deficiency: Rare Etiology, Easy Treatment.** *Digestive Diseases and Sciences*
Sinha, S. R., Triadafilopoulos, G., Shah, N.
2013
 - **Enhanced imaging technologies in detecting dysplasia in IBD: narrowing or widening our options?** *Gastroenterology*
Sinha, S. R., Shah, S. B.
2012; 143 (4): 1108-1110
 - **Health Technologies and Innovation in the Global Health Arena** *NEW ENGLAND JOURNAL OF MEDICINE*
Sinha, S. R., Barry, M.
2011; 365 (9): 779-782

- **Protecting health: thinking small** *BULLETIN OF THE WORLD HEALTH ORGANIZATION*
Sinha, S. R., Batniji, R.
2010; 88 (9): 713-715
- **Shaping National Health Financing Systems: How Can Micro-banking Contribute?** *World Health Organization Technical Brief*
Durairaj V, Sinha SR, et al.
2009

PRESENTATIONS

- Medical Devices in Developing Countries - Stanford University (2011)
- A Non-surgical Treatment for Hypertrophic Tonsils - Stanford Medical Center, Grand Rounds (5/2011)
- Non-invasive Monitoring of Heart Failure / A Novel Treatment for Hypertrophic Tonsils - Stanford Biodesign Research Presentations (5/2011)
- Narrow-band Imaging as an Alternative to Chromoendoscopy for the Detection of Dysplasia in Long-Standing Inflammatory Bowel Disease - Santa Clara Valley Medical Center, Division of Gastroenterology (10/2011)
- Colon Cancer Risk, Surveillance, and Management in Inflammatory Bowel Disease - Joint GI, Surgery, Interventional Radiology Conference (10/2011)
- Management of Dysplasia Associated Lesions or Masses in IBD - Stanford Digestive Disease Conference (10/2011)
- Gastric Cancer in the Young, Disturbing Trends - Joint GI, Surgery, Interventional Radiology Conference (11/2011)
- Use of Nasogastric Lavage in Upper GI Bleeds - Santa Clara Valley Medical Center, Division of Gastroenterology (11/2011)
- Case Presentation: 28-year-old Man with Unresectable Gastric Cancer - Stanford Digestive Disease Conference (11/2011)
- Use of NSAIDs and Statins in Barrett's Esophagus - Stanford Digestive Disease Conference (1/2012)
- GI Manifestations of Tuberculosis - Stanford Digestive Disease Conference, Case Presentation and Review (2/2012)
- Gallbladder Perforation: Case Presentation and Management - Joint GI, Surgery, Interventional Radiology Conference (4/2012)
- Gallbladder Perforation - Stanford Digestive Disease Conference, Clinical Case Presentation (4/2012)
- Rare Cause of Iron Deficiency Anemia - Stanford Digestive Disease Conference, Case Presentation (5/2012)
- Rare Cause of Iron Deficiency Anemia - Joint GI, Surgery, Interventional Radiology Conference (2012)
- Factors Influencing Adenoma Detection Rate - Santa Clara Valley Medical Center, Division of Gastroenterology (5/2012)
- Nonalcoholic Fatty Liver Disease - Santa Clara Valley Medical Center, Department of Medicine Conference (5/2012)
- Endoscopic Drainage of Pancreatic Pseudocyst...in Pregnancy - Stanford Digestive Disease Conference, Case Presentation (10/2012)
- Prevention of PostERCP Pancreatitis - Stanford Digestive Disease Conference, Case Presentation (10/2012)
- HIV-HBV Coinfection - Stanford Digestive Disease Conference, Case Presentation for Hack Lecture Series (2/2013)
- Utilization of Anesthesia Assistance in GI Procedures - Stanford Digestive Disease Conference (5/2013)
- "Outcomes and Patient Satisfaction: A Review of the Evidence - Stanford Digestive Disease Conference (3/2014)
- Introduction to Gastroenterology - Stanford Pre-Collegiate Science Conference (3/2014)
- Targeted Therapeutics for Treatment of Inflammatory Bowel Disease - Stanford Gastroenterology Research Conference (6/2014)
- Introduction to Gastroenterology - Stanford Pre-Collegiate Science Conference (8/2014)
- Evaluation of a Novel Thermosensitive Delivery Platform to Administer Topical Therapeutics - Stanford Spectrum Program (3/2015)
- IBD Research Update - Stanford IBD Group Meeting (5/2016)
- Targeted Topical Therapy to Treat IBD Using a Novel Thermosensitive Delivery Platform - Spectrum Innovation Symposium (1/2017)
- Novel Therapies and Investigations to Reduce Inflammatory Bowel Disease Burden - Stanford Digestive Disease Conference (2/2017)
- Perspectives of a Biodesign Fellow - American Gastroenterological Association Tech Summit (4/2013)
- Physician Innovator Track - American Gastroenterological Association Tech Summit (4/2013)
- What the Physician Innovator Needs to Know - AGA Digestive Disease Week Session (5/2014)

- Developing an Innovation Curriculum - AGA/DDW Session (5/2014)
- Targeted Therapy to Treat Colitis - IBD Working Group Presentation (12/2014)
- Practical Guidelines for the Physician Innovator - AGA/Digestive Disease Week Session (5/2015)
- Practical Guidelines for the Physician Innovator - AGA/Digestive Disease Week Session (5/2016)
- How to Innovate in Digestive Health - AGA CGIT Course (4/2016)
- Practical Guidelines for the Physician Innovator - Digestive Disease Week Session (5/2017)
- The Use of Microfinance to Finance Healthcare - World Health Organization, Division of Health Financing and Policy (3/2007)
- Innovation in Gastroenterology - National University of Ireland, BioInnovate Program (11/2013)
- Needs Assessment in the Development of Medical Technologies - National University of Ireland, BioInnovate Program (8/2014)