Stanford



Sean Paul Spencer, MD,PhD

Assistant Professor of Medicine (Gastroenterology and Hepatology)

Medicine - Gastroenterology & Hepatology

Curriculum Vitae available Online

CLINICAL OFFICE (PRIMARY)

- **Stanford Digestive Health Clinic**

  420 Broadway St

  Pavilion D 2nd Fl

  Redwood City, CA 94063

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ACADEMIC CONTACT INFORMATION

- **Alternate Contact**

  Rosalie Pham - Administrative Associate

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Bio

BIO

Sean Spencer, MD,PhD is a Gastroenterologist and Physician Scientist at Stanford University working to uncover the role of dietary intake on the gut microbiome and mucosal immune system. Sean obtained his medical degree University of Pennsylvania, earning his PhD studying nutritional immunology with Yasmine Belkaid,PhD at the National Institutes of Health (NIH), after which he moved to Boston for residency training at Massachusetts General Hospital and completed his Gastroenterology training at Stanford University. Sean's career goal is to study mechanisms by which dietary intake influences our microbiome and immune system to better understand and treat gastrointestinal disease. Sean has launched a microbiome-focused clinical practice at Stanford where he is working to develop novel microbiome diagnostics and microbial medicines.

CLINICAL FOCUS

- Gastroenterology
- Neurogastroenterology & Motility
- Gastrointestinal Microbiota
- Diet

ACADEMIC APPOINTMENTS

- Assistant Professor-Univ Med Line, Medicine - Gastroenterology & Hepatology
- Member, Bio-X
- Member, Maternal & Child Health Research Institute (MCHRI)

ADMINISTRATIVE APPOINTMENTS

- Medical Director of Microbiome Diagnostics and Therapeutics, Department of Medicine, (2025- present)

HONORS AND AWARDS

- K08 Clinical Scientist Research Career Development Award, NIH/NIDDK (2023-2028)
- A.P. Giannini Postdoctoral Fellow, AP Giannini Foundation (2021-2023)

- Training Grant in Academic Gastroenterology (T32), National Institute of Diabetes and Digestive and Kidney Diseases (2019-2021)
- Ruth L. Kirschstein NRSA Individual Predoctoral MD/PhD fellowship (F30), National Institute of Diabetes and Digestive and Kidney Disease (2011-2014)
- Medical Scientist Training Program (T32), National Institute of General Medical Sciences (2007-2009)

PROGRAM AFFILIATIONS

- SPARK at Stanford

PROFESSIONAL EDUCATION

- Fellowship: Stanford University Division of Gastroenterology and Hepatology (2020) CA
- Residency: Massachusetts General Hospital Internal Medicine Residency (2017) MA
- MD/PhD, University of Pennsylvania , Immunology (2015)
- Board Certification: Internal Medicine, American Board of Internal Medicine (2018)
- Board Certification: Gastroenterology, American Board of Gastroenterology (2022)

LINKS

- Lab Website: https://spencerlab.stanford.edu/
- Clinical Profile: https://stanfordhealthcare.org/doctors/s/sean-spencer.html

Research & Scholarship

CLINICAL TRIALS

- Capsule Microbiota Sampling in IBS/Functional Gastrointestinal Disease, Recruiting
- Use of A Complex Gut Bacterial Consortium (MITI 001) for the Treatment of Irritable Bowel Syndrome With Diarrhea, Recruiting
- Ecosystem Nourishment for Gut Restoration After Fecal Transplantation, Not Specified
- High-Resolution Measurements of Diet-Microbiome Interactions, Not Specified

Teaching

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Siddu Shivanagoudra, Jiawei Sun, Annika Weber

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Gastroenterology & Hepatology (Fellowship Program)

Publications

PUBLICATIONS

- **Metagenomic immunoglobulin sequencing reveals IgA coating of microbial strains in the healthy human gut.** *Nature microbiology*
  Olm, M. R., Spencer, S. P., Takeuchi, T., Silva, E. L., Sonnenburg, J. L.
  2025
- **Profiling the human intestinal environment under physiological conditions.** *Nature*
  Shalon, D., Culver, R. N., Grembi, J. A., Folz, J., Treit, P. V., Shi, H., Rosenberger, F. A., Dethlefsen, L., Meng, X., Yaffe, E., Aranda-Diaz, A., Geyer, P. E., Mueller-Reif, et al
  2023

- **Impact of a 7-day homogeneous diet on interpersonal variation in human gut microbiomes and metabolomes.** *Cell host & microbe*
  Guthrie, L., Spencer, S. P., Perelman, D., Van Treuren, W., Han, S., Yu, F. B., Sonnenburg, E. D., Fischbach, M. A., Meyer, T. W., Sonnenburg, J. L.
  2022

- **Pursuing Human-Relevant Gut Microbiota-Immune Interactions.** *Immunity*
  Spencer, S. P., Fragiadakis, G. K., Sonnenburg, J. L.
  2019; 51 (2): 225–39

- **The long non-coding RNA Morrbid regulates Bim and short-lived myeloid cell lifespan.** *Nature*
  Kotzin, J. J., Spencer, S. P., McCright, S. J., Kumar, D. B., Collet, M. A., Mowel, W. K., Elliott, E. N., Uyar, A., Makiya, M. A., Dunagin, M. C., Harman, C. C., Virtue, A. T., Zhu, et al
  2016; 537 (7619): 239-243

- **Adaptation of innate lymphoid cells to a micronutrient deficiency promotes type 2 barrier immunity.** *Science (New York, N.Y.)*
  Spencer, S. P., Wilhelm, C., Yang, Q., Hall, J. A., Bouladoux, N., Boyd, A., Nutman, T. B., Urban, J. F., Wang, J., Ramalingam, T. R., Bhandoola, A., Wynn, T. A., Belkaid, et al
  2014; 343 (6169): 432-7

- **Dietary and commensal derived nutrients: shaping mucosal and systemic immunity.** *Current opinion in immunology*
  Spencer, S. P., Belkaid, Y.
  2012; 24 (4): 379-84

- **Fermentation-Derived Metabolites Shape Host Biology to Attenuate Severity of Inflammatory and Metabolic Disease.** *bioRxiv : the preprint server for biology*
  Caffrey, E. B., Robinson, E. K., Fessler, J. L., Reddy, A., Hernandez, S. G., Gao, Y., Guiberson, E. R., Spencer, S. P., Sonnenburg, E. D., Sonnenburg, J. L.
  2026

- **Methane Trajectory Phenotypes on Glucose Breath Testing Are Associated With Slow Colonic Transit: A Group-Based Trajectory Modeling Analysis.** *Neurogastroenterology and motility*
  Sirimongkolkasem, J., Valencia, B., Becker, L., Spencer, S., Sonu, I., Nguyen, L., Neshatian, L.
  2026; 38 (7): e70409

- **Multi-region sampling of the human small intestine using an ingestible device.** *medRxiv : the preprint server for health sciences*
  Fu, B., DeSchepper, L. B., Sun, J., McKeithen-Mead, S. A., Kapili, B., Ochoa-Andersen, P., Spencer, S. P., Fardeen, T., Ricardo, M., El Kamari, V., Sinha, S., Relman, D. A., Grembi, et al
  2026

- **Multi-omics reveal vitamin D regulation of immune-gut microbiome interactions and tolerogenic pathways in inflammatory bowel disease.** *Cell reports. Medicine*
  Gubatan, J., Sojwal, R. S., Ye, J., Boye, T. L., Hoang, J. N., Fardeen, T., Temby, M., Rubin, S. J., Spencer, S. P., Kotagiri, P., Rogalla, S., Rosen, M. J., Nielsen, et al
  2026: 102703

- **A fasting-mimicking diet in patients with mild-to-moderate Crohn's disease: a randomized controlled trial.** *Nature medicine*
  Kulkarni, C., Fardeen, T., Gubatan, J., Ye, J., Jarr, K., Dickson, E., Jang, H., Temby, M., Patel, A., Jiang, Y., Singh, G., Keyashian, K., Streett, et al
  2026

- **Evacuation Dysfunction Does Not Impact Breath Test Results.** *Neurogastroenterology and motility*
  Soetaert, C., Itani, M., Triadafilopoulos, G., Spencer, S., Nguyen, L., Neshatian, L.
  2025: e70211

- **Intestinal Methanogen Overgrowth (IMO) Is Associated with Delayed Small Bowel and Colonic Transit Time (TT) on the Wireless Motility Capsule (WMC).** *Digestive diseases and sciences*
  Talamantes, S., Steiner, F., Spencer, S., Neshatian, L., Sonu, I.
  2024

- **Improved mouse models of the small intestine microbiota using region-specific sampling from humans.** *bioRxiv : the preprint server for biology*
  Culver, R. N., Spencer, S. P., Violette, A., Lemus Silva, E. G., Takeuchi, T., Nafarzadegan, C., Higginbottom, S. K., Shalon, D., Sonnenburg, J., Huang, K. C.

2024

- **Resisting weight gain with prebiotic fibre.** *Nature metabolism*
  Carter, M. M., Spencer, S. P.
  2024

- **CH4, H2S, and H2O: How Do They Relate to Microbiome-Driven IBS Pathogenesis?** *Digestive diseases and sciences*
  Spencer, S.
  2023

- **Metagenomic Immunoglobulin Sequencing (MIG-Seq) Exposes Patterns of IgA Antibody Binding in the Healthy Human Gut Microbiome.** *bioRxiv : the preprint server for biology*
  Olm, M. R., Spencer, S. P., Silva, E. L., Sonnenburg, J. L.
  2023

- **Cromolyn Reduces Symptoms in Patients With Irritable Bowel Syndrome, Functional Dyspepsia, or Gastroparesis**
  Karhu, E., Linda Anh Nguyen, Sonu, I., Neshatian, L., Gottfried-Blackmore, A., Fernandez-Becker, N., Spencer, S.
  LIPPINCOTT WILLIAMS & WILKINS.2023: S492

- **Cromolyn Reduces Symptoms in Patients With Irritable Bowel Syndrome, Functional Dyspepsia, or Gastroparesis**
  Karhu, E., Nguyen, L., Sonu, I., Neshatian, L., Gottfried-Blackmore, A., Fernandez-Becker, N., Spencer, S.
  LIPPINCOTT WILLIAMS & WILKINS.2023: S492

- **Ultra-deep sequencing of Hadza hunter-gatherers recovers vanishing gut microbes.** *Cell*
  Carter, M. M., Olm, M. R., Merrill, B. D., Dahan, D., Tripathi, S., Spencer, S. P., Yu, F. B., Jain, S., Neff, N., Jha, A. R., Sonnenburg, E. D., Sonnenburg, J. L.
  2023

- **Ultra-deep Sequencing of Hadza Hunter-Gatherers Recovers Vanishing Gut Microbes.** *bioRxiv : the preprint server for biology*
  Merrill, B. D., Carter, M. M., Olm, M. R., Dahan, D., Tripathi, S., Spencer, S. P., Yu, B., Jain, S., Neff, N., Jha, A. R., Sonnenburg, E. D., Sonnenburg, J. L.
  2022

- **The Tabula Sapiens: A multiple-organ, single-cell transcriptomic atlas of humans.** *Science (New York, N.Y.)*
  Jones, R. C., Karkanias, J., Krasnow, M. A., Pisco, A. O., Quake, S. R., Salzman, J., Yosef, N., Bulthaup, B., Brown, P., Harper, W., Hemenez, M., Ponnusamy, R., Salehi, et al
  2022; 376 (6594): eabl4896

- **Environmental enteric dysfunction induces regulatory T cells that inhibit local CD4+T cell responses and impair oral vaccine efficacy** *IMMUNITY*
  Bhattacharjee, A., Burr, A. H. P., Overacre-Delgoffe, A. E., Tometich, J. T., Yang, D., Huckestein, B. R., Linehan, J. L., Spencer, S. P., Hall, J. A., Harrison, O. J., da Fonseca, D., Norton, E. B., Belkaid, et al
  2021; 54 (8): 1745-+

- **When Gut Microbiota Creep into Fat, the Fat Creeps Back.** *Cell*
  Spencer, S. P., Sonnenburg, J. L.
  2020; 183 (3): 589–91

- **Colons or semi-colons: punctuating the regional variation of intestinal microbial-immune interactions.** *Nature reviews. Gastroenterology & hepatology*
  Culver, R. N., Spencer, S. P., Huang, K. C.
  2020

- **High Prevalence of Concurrent Gastrointestinal Manifestations in Patients with SARS-CoV-2: Early Experience from California.** *Gastroenterology*
  Cholankeril, G., Podboy, A., Aivaliotis, V. I., Tarlow, B., Pham, E. A., Spencer, S., Kim, D., Hsing, A., Ahmed, A.
  2020

- **Association of Digestive Symptoms and Hospitalization in Patients With SARS-CoV-2 Infection.** *The American journal of gastroenterology*
  Cholankeril, G. n., Podboy, A. n., Aivaliotis, V. I., Pham, E. A., Spencer, S. P., Kim, D. n., Ahmed, A. n.
  2020; 115 (7): 1129–32

- **The gut microbiota regulates white adipose tissue inflammation and obesity via a family of microRNAs** *SCIENCE TRANSLATIONAL MEDICINE*

  Virtue, A. T., McCright, S. J., Wright, J. M., Jimenez, M. T., Mowel, W. K., Kotzin, J. J., Joannas, L., Basavappa, M. G., Spencer, S. P., Clark, M. L., Eisennagel, S. H., Williams, A., Levy, et al

  2019; 11 (496)

- **The long noncoding RNA Morrbid regulates CD8 T cells in response to viral infection** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*

  Kotzin, J. J., Iseka, F., Wright, J., Basavappa, M. G., Clark, M. L., Ali, M., Abdel-Hakeem, M. S., Robertson, T. F., Mowel, W. K., Joannas, L., Neal, V. D., Spencer, S. P., Syrett, et al

  2019; 116 (24): 11916–25

- **Critical role of fatty acid metabolism in ILC2-mediated barrier protection during malnutrition and helminth infection** *JOURNAL OF EXPERIMENTAL MEDICINE*

  Wilhelm, C., Harrison, O. J., Schmitt, V., Pelletier, M., Spencer, S. P., Urban, J. F., Ploch, M., Ramalingam, T. R., Siegel, R. M., Belkaid, Y.

  2016; 213 (8): 1409-1418

- **The Transcription Factor GATA3 Is Critical for the Development of All IL-7Rα-Expressing Innate Lymphoid Cells** *IMMUNITY*

  Yagi, R., Zhong, C., Northrup, D. L., Yu, F., Bouladoux, N., Spencer, S., Hu, G., Barron, L., Sharma, S., Nakayama, T., Belkaid, Y., Zhao, K., Zhu, et al

  2014; 40 (3): 378-388

- **Retinoic acid controls the homeostasis of pre-cDC-derived splenic and intestinal dendritic cells** *JOURNAL OF EXPERIMENTAL MEDICINE*

  Klebanoff, C. A., Spencer, S. P., Torabi-Parizi, P., Grainger, J. R., Roychoudhuri, R., Ji, Y., Sukumar, M., Muranski, P., Scott, C. D., Hall, J. A., Ferreyra, G. A., Leonardi, A. J., Borman, et al

  2013; 210 (10): 1961-1976