



Steven Higginbottom

Director of Gnotobiotics, Microbiology and Immunology

Bio

CURRENT ROLE AT STANFORD

Maintain and operate Gnotobiotic research facility.

HONORS AND AWARDS

- Marcia J. Cohen Inspiring Change Leadership Award, Stanford University (2023)

Publications

PUBLICATIONS

- **Indole-3-acetic acid production is rare among gut bacteria and reflects OFOR-driven amino acid oxidation in acetogens.** *bioRxiv : the preprint server for biology*
DeFeo, M. E., Liu, Y., Zhou, Z., Higginbottom, S. K., Dodd, D.
2026
- **Gut microbiota gate host exposure to cholinesterase inhibitors from dietary Solanums.** *bioRxiv : the preprint server for biology*
Liou, C. S., Louwies, T., Iakiviak, M., Rajniak, J., Murugkar, P. P., Higginbottom, S. K., Weakley, A., Meng, X., Htet, P., Cabrera, A. V., Jasper, M., Dimas, A., Schulman, et al
2025
- **Genome-scale resources in the infant gut symbiont *Bifidobacterium breve* reveal genetic determinants of colonization and host-microbe interactions.** *Cell*
Shiver, A. L., Sun, J., Culver, R., Violette, A., Wynter, C., Nieckarz, M., Mattiello, S. P., Sekhon, P. K., Bottacini, F., Friess, L., Carlson, H. K., Wong, D. P., Higginbottom, et al
2025
- **A gut pathobiont regulates circulating glycine and host metabolism in a twin study comparing vegan and omnivorous diets.** *medRxiv : the preprint server for health sciences*
Carter, M. M., Zeng, X., Ward, C. P., Landry, M., Perelman, D., Hennings, T., Meng, X., Weakley, A. M., Cabrera, A. V., Robinson, J. L., Nguyen, T., Higginbottom, S., Maecker, et al
2025
- **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
- **Metabolic diversity in commensal protists regulates intestinal immunity and trans-kingdom competition.** *Cell*
Gerrick, E. R., Zlitni, S., West, P. T., Carter, M. M., Mechler, C. M., Olm, M. R., Caffrey, E. B., Li, J. A., Higginbottom, S. K., Severyn, C. J., Kracke, F., Spormann, A. M., Sonnenburg, et al
2023

- **Hadza Prevotella require diet-derived microbiota-accessible carbohydrates to persist in mice.** *Cell reports*
Gellman, R. H., Olm, M. R., Terrapon, N., Enam, F., Higginbottom, S. K., Sonnenburg, J. L., Sonnenburg, E. D.
2023; 42 (11)
- **Hadza Prevotella require diet-derived microbiota-accessible carbohydrates to persist in mice** *CELL REPORTS*
Gellman, R. H., Olm, M. R., Terrapon, N., Enam, F., Higginbottom, S. K., Sonnenburg, J. L., Sonnenburg, E. D.
2023; 42 (11)
- **A mutant fitness compendium in Bifidobacteria reveals molecular determinants of colonization and host-microbe interactions.** *bioRxiv : the preprint server for biology*
Shiver, A. L., Sun, J., Culver, R., Violette, A., Wynter, C., Nieckarz, M., Mattiello, S. P., Sekhon, P. K., Friess, L., Carlson, H. K., Wong, D., Higginbottom, S., Weglarz, et al
2023
- **Mapping the T cell repertoire to a complex gut bacterial community.** *Nature*
Nagashima, K., Zhao, A., Atabakhsh, K., Bae, M., Blum, J. E., Weakley, A., Jain, S., Meng, X., Cheng, A. G., Wang, M., Higginbottom, S., Dimas, A., Murugkar, et al
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- **Region-specific sampling from humans improves mouse models of the small intestine microbiota**
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WILEY.2023
- **Strain dropouts reveal interactions that govern the metabolic output of the gut microbiome.** *Cell*
Wang, M., Osborn, L. J., Jain, S., Meng, X., Weakley, A., Yan, J., Massey, W. J., Varadharajan, V., Horak, A., Banerjee, R., Allende, D. S., Chan, E. R., Hajjar, et al
2023; 186 (13): 2839-2852.e21
- **Hadza Prevotella Require Diet-derived Microbiota Accessible Carbohydrates to Persist in Mice.** *bioRxiv : the preprint server for biology*
Gellman, R. H., Olm, M. R., Terrapon, N., Enam, F., Higginbottom, S. K., Sonnenburg, J. L., Sonnenburg, E. D.
2023
- **Host-microbe co-metabolism via MCAD generates circulating metabolites including hippuric acid.** *Nature communications*
Pruss, K. M., Chen, H., Liu, Y., Van Treuren, W., Higginbottom, S. K., Jarman, J. B., Fischer, C. R., Mak, J., Wong, B., Cowan, T. M., Fischbach, M. A., Sonnenburg, J. L., Dodd, et al
2023; 14 (1): 512
- **Butyrate Differentiates Permissiveness to Clostridioides difficile Infection and Influences Growth of Diverse C. difficile Isolates.** *Infection and immunity*
Pensing, D. A., Fisher, A. T., Dobrila, H. A., Van Treuren, W., Gardner, J. O., Higginbottom, S. K., Carter, M. M., Schumann, B., Bertozzi, C. R., Anikst, V., Martin, C., Robiloti, E. V., Chow, et al
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- **Design, construction, and in vivo augmentation of a complex gut microbiome.** *Cell*
Cheng, A. G., Ho, P., Aranda-Diaz, A., Jain, S., Yu, F. B., Meng, X., Wang, M., Iakiviak, M., Nagashima, K., Zhao, A., Murugkar, P., Patil, A., Atabakhsh, et al
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- **Clostridium sporogenes uses reductive Stickland metabolism in the gut to generate ATP and produce circulating metabolites.** *Nature microbiology*
Liu, Y., Chen, H., Van Treuren, W., Hou, B., Higginbottom, S. K., Dodd, D.
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- **Oxidative ornithine metabolism supports non-inflammatory C.difficile colonization.** *Nature metabolism*
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1800
- **Establishment and characterization of stable, diverse, fecal-derived in vitro microbial communities that model the intestinal microbiota.** *Cell host & microbe*

- Aranda-Díaz, A., Ng, K. M., Thomsen, T., Real-Ramírez, I., Dahan, D., Dittmar, S., Gonzalez, C. G., Chavez, T., Vasquez, K. S., Nguyen, T. H., Yu, F. B., Higginbottom, S. K., Neff, et al
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- **Quantifying rapid bacterial evolution and transmission within the mouse intestine.** *Cell host & microbe*
Vasquez, K. S., Willis, L., Ciria, N. J., Ng, K. M., Pedro, M. F., Aranda-Diaz, A., Rajendram, M., Yu, F. B., Higginbottom, S. K., Neff, N., Sherlock, G., Xavier, K. B., Quake, et al
2021
 - **A metabolomics pipeline for the mechanistic interrogation of the gut microbiome.** *Nature*
Han, S., Van Treuren, W., Fischer, C. R., Merrill, B. D., DeFelice, B. C., Sanchez, J. M., Higginbottom, S. K., Guthrie, L., Fall, L. A., Dodd, D., Fischbach, M. A., Sonnenburg, J. L.
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 - **Mucin-derived O-glycans supplemented to diet mitigate diverse microbiota perturbations.** *The ISME journal*
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 - **A Metabolic Pathway for Activation of Dietary Glucosinolates by a Human Gut Symbiont.** *Cell*
Liou, C. S., Sirk, S. J., Diaz, C. A., Klein, A. P., Fischer, C. R., Higginbottom, S. K., Erez, A., Donia, M. S., Sonnenburg, J. L., Sattely, E. S.
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 - **A metabolic pathway for bile acid dehydroxylation by the gut microbiome.** *Nature*
Funabashi, M. n., Grove, T. L., Wang, M. n., Varma, Y. n., McFadden, M. E., Brown, L. C., Guo, C. n., Higginbottom, S. n., Almo, S. C., Fischbach, M. A.
2020
 - **Depletion of microbiome-derived molecules in the host using Clostridium genetics.** *Science (New York, N.Y.)*
Guo, C., Allen, B. M., Hiam, K. J., Dodd, D., Van Treuren, W., Higginbottom, S., Nagashima, K., Fischer, C. R., Sonnenburg, J. L., Spitzer, M. H., Fischbach, M. A.
2019; 366 (6471)
 - **Western diet regulates immune status and the response to LPS-driven sepsis independent of diet-associated microbiome.** *Proceedings of the National Academy of Sciences of the United States of America*
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 - **Recovery of the Gut Microbiota after Antibiotics Depends on Host Diet, Community Context, and Environmental Reservoirs.** *Cell host & microbe*
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 - **Transient Osmotic Perturbation Causes Long-Term Alteration to the Gut Microbiota.** *Cell*
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2018; 173 (7): 1742
 - **Genetic Variation of the SusC/SusD Homologs from a Polysaccharide Utilization Locus Underlies Divergent Fructan Specificities and Functional Adaptation in Bacteroides thetaiotaomicron Strains.** *mSphere*
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 - **A gut bacterial pathway metabolizes aromatic amino acids into nine circulating metabolites.** *Nature*
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2017; 551 (7682): 648–52
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- **Molecular Analysis of Model Gut Microbiotas by Imaging Mass Spectrometry and Nanodesorption Electrospray Ionization Reveals Dietary Metabolite Transformations** *ANALYTICAL CHEMISTRY*
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