

# Stanford

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## Dylan Dodd

Associate Professor of Pathology and of Microbiology and Immunology

### CLINICAL OFFICE (PRIMARY)

- **Stanford Clinical Laboratories**

3375 Hillview Ave Room 1805

Palo Alto, CA 94304

Tel (650) 724-0112      Fax (650) 724-8280

### Bio

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#### CLINICAL FOCUS

- Clinical Chemistry
- Anatomic and Clinical Pathology

#### ACADEMIC APPOINTMENTS

- Associate Professor, Pathology
- Associate Professor, Microbiology and Immunology
- Member, Maternal & Child Health Research Institute (MCHRI)
- Member, Stanford Medicine Children's Health Center for IBD and Celiac Disease

#### PROFESSIONAL EDUCATION

- Residency: Stanford University Pathology Residency (2016) CA
- Board Certification: Clinical Pathology, American Board of Pathology (2016)
- M.D., Ph.D., University of Illinois at Urbana-Champaign , Medicine, Microbiology (2013)
- B.S., University of California, Davis , Biochemistry (2005)

#### LINKS

- Dodd Lab Website: <https://www.doddlab.org/>

### Research & Scholarship

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#### CURRENT RESEARCH AND SCHOLARLY INTERESTS

Harnessing the gut microbiome to treat human disease.

## Teaching

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### STANFORD ADVISEES

#### Postdoctoral Faculty Sponsor

Zhiwei Zhou

## Publications

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### PUBLICATIONS

- **gutSMASH 2.0: extended identification of primary metabolic gene clusters from the human gut microbiota.** *Journal of molecular biology*  
Zhu, Y., Augustijn, H. E., Andreu, V. P., Draisma, A., van Wezel, G. P., Dodd, D., Fischbach, M. A., Medema, M. H.  
2025: 169567
- **Gut bacteria degrade purines via the 2,8-dioxopurine pathway.** *Nature microbiology*  
Liu, Y., Zhou, Z., Jarman, J. B., Chen, H., Miranda-Velez, M., Terkeltaub, R., Dodd, D.  
2025
- **Microbiota and kidney disease: the road ahead.** *Nature reviews. Nephrology*  
Bloom, P. P., Garrett, W. S., Penniston, K. L., Winkler, M. H., Hazen, S. L., Agudelo, J., Suryavanshi, M., Babiker, A., Dodd, D., Fischbach, M. A., Huang, K. C., Huttenhower, C., Joe, et al  
2025
- **The Gut Microbiome in Hyperuricemia and Gout.** *Arthritis & rheumatology (Hoboken, N.J.)*  
Terkeltaub, R., Dodd, D.  
2025
- **$\gamma\delta$  T cell antigen receptor polyspecificity enables T cell responses to a broad range of immune challenges.** *Proceedings of the National Academy of Sciences of the United States of America*  
Guo, J., Chowdhury, R. R., Mallajosyula, V., Xie, J., Dubey, M., Liu, Y., Li, J., Wei, Y. L., Palanski, B. A., Wang, C., Qiu, L., Ohanyan, M., Kask, et al  
2024; 121 (4): e2315592121
- **A widely distributed gene cluster compensates for uricase loss in hominids.** *Cell*  
Liu, Y., Jarman, J. B., Low, Y. S., Augustijn, H. E., Huang, S., Chen, H., DeFeo, M. E., Sekiba, K., Hou, B. H., Meng, X., Weakley, A. M., Cabrera, A. V., Zhou, et al  
2023; 186 (16): 3400-3413.e20
- **Targeted Quantification of Amino Acids by Dansylation.** *Methods in molecular biology (Clifton, N.J.)*  
Liu, Y., Chen, H., Dodd, D.  
2023; 2675: 65-76
- **Systems biology elucidates the distinctive metabolic niche filled by the human gut microbe *Eggerthella lenta*.** *PLoS biology*  
Noecker, C., Sanchez, J., Bisanz, J. E., Escalante, V., Alexander, M., Trepka, K., Heinken, A., Liu, Y., Dodd, D., Thiele, I., DeFelice, B. C., Turnbaugh, P. J.  
2023; 21 (5): e3002125
- **gutSMASH predicts specialized primary metabolic pathways from the human gut microbiota.** *Nature biotechnology*  
Pascal Andreu, V., Augustijn, H. E., Chen, L., Zhernakova, A., Fu, J., Fischbach, M. A., Dodd, D., Medema, M. H.  
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
- **Tutorial: Microbiome Studies in Drug Metabolism.** *Clinical and translational science*  
Dodd, D., Cann, I.  
2022

- **Role of insulin resistance and the gut microbiome on urine oxalate excretion in ob/ob mice.** *Physiological reports*  
Xiang, H., Chen, H., Liu, Y., Dodd, D., Pao, A. C.  
2022; 10 (14): e15357
- **The gut metabolite indole-3 propionate promotes nerve regeneration and repair.** *Nature*  
Sergey, E., Luengo-Gutierrez, L., Chadwick, J. S., Kong, G., Zhou, L., Crawford, G., Danzi, M. C., Myridakis, A., Brandis, A., Bello, A. T., Muller, F., Sanchez-Vassopoulos, A., De Virgiliis, et al  
2022
- **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*  
Pruss, K. M., Enam, F., Battaglioli, E., DeFeo, M., Diaz, O. R., Higginbottom, S. K., Fischer, C. R., Hryckowian, A. J., Van Treuren, W., Dodd, D., Kashyap, P., Sonnenburg, J. L.  
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- **The gutSMASH web server:automated identification of primary metabolic gene clusters from the gut microbiota.** *Nucleic acids research*  
Pascal Andreu, V., Roel-Touris, J., Dodd, D., Fischbach, M. A., Medema, M. H.  
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.  
2021; 595 (7867): 415-420
- **Metabolic Foundations of Microbiota-Host Interactions**  
Dodd, D.  
OXFORD UNIV PRESS INC.2020: 69
- **Bifidobacterium alters the gut microbiota and modulates the functional metabolism of T regulatory cells in the context of immune checkpoint blockade.** *Proceedings of the National Academy of Sciences of the United States of America*  
Sun, S., Luo, L., Liang, W., Yin, Q., Guo, J., Rush, A. M., Lv, Z., Liang, Q., Fischbach, M. A., Sonnenburg, J. L., Dodd, D., Davis, M. M., Wang, et al  
2020
- **An oral bacterial cocktail for kidney protection.** *Nature biomedical engineering*  
Jarman, J. n., Dodd, D. n.  
2020; 4 (9): 847-48
- **Comparison of Japanese and Indian intestinal microbiota shows diet-dependent interaction between bacteria and fungi.** *NPJ biofilms and microbiomes*  
Pareek, S., Kurakawa, T., Das, B., Motooka, D., Nakaya, S., Rongsen-Chandola, T., Goyal, N., Kayama, H., Dodd, D., Okumura, R., Maeda, Y., Fujimoto, K., Nii, et al  
2019; 5 (1): 37
- **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)
- **Microbial Contribution to the Human Metabolome: Implications for Health and Disease.** *Annual review of pathology*  
Van Treuren, W., Dodd, D.  
2019
- **Perspective: Dietary markers of Intake and Exposure-Exploration with Omics Approaches.** *Advances in nutrition (Bethesda, Md.)*  
Maruvada, P., Lampe, J. W., Wishart, D. S., Barupal, D., Chester, D. N., Dodd, D., Djoumbou-Feunang, Y., Dorrestein, P. C., Dragsted, L. O., Draper, J., Duffy, L. C., Dwyer, J. T., Emenaker, et al  
2019

- **Clinical utility of an ultrasensitive urinary free cortisol assay by tandem mass spectrometry** *STERIODS*  
Luo, A., El Gierari, E. M., Nally, L. M., Sturmer, L. R., Dodd, D., Shi, R.  
2019; 146: 65–69
- **Comparison of Japanese and Indian intestinal microbiota shows diet-dependent interaction between bacteria and fungi.** *NPJ biofilms and microbiomes*  
Pareek, S., Kurakawa, T., Das, B., Motoooka, D., Nakaya, S., Rongsen-Chandola, T., Goyal, N., Kayama, H., Dodd, D., Okumura, R., Maeda, Y., Fujimoto, K., Nii, et al  
2019; 5: 37
- **Enzymatic mechanism for arabinan degradation and transport in the thermophilic bacterium *Caldanaerobius polysaccharolyticus*.** *Applied and environmental microbiology*  
Wefers, D. n., Dong, J. n., Abdel-Hamid, A. M., Müller Paul, H. n., Pereira, G. V., Han, Y. n., Dodd, D. n., Baskaran, R. n., Mayer, B. n., Mackie, R. I., Cann, I. n.  
2017
- **A gut bacterial pathway metabolizes aromatic amino acids into nine circulating metabolites.** *Nature*  
Dodd, D. n., Spitzer, M. H., Van Treuren, W. n., Merrill, B. D., Hryckowian, A. J., Higginbottom, S. K., Le, A. n., Cowan, T. M., Nolan, G. P., Fischbach, M. A., Sonnenburg, J. L.  
2017; 551 (7682): 648–52
- **Clinical Utility of an Ultrasensitive Late Night Salivary Cortisol Assay by Tandem Mass Spectrometry.** *Steroids*  
Sturmer, L. R., Dodd, D. n., Chao, C. S., Shi, R. Z.  
2017
- **Modulation of a Circulating Uremic Solute via Rational Genetic Manipulation of the Gut Microbiota** *CELL HOST & MICROBE*  
Devlin, A. S., Marcobal, A., Dodd, D., Nayfach, S., Plummer, N., Meyer, T., Pollard, K. S., Sonnenburg, J. L., Fischbach, M. A.  
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- **Your gut microbiome, deconstructed.** *Nature biotechnology*  
Dodd, D., Tropini, C., Sonnenburg, J. L.  
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- **Structural and Biochemical Basis for Mannan Utilization by *Caldanaerobius polysaccharolyticus* Strain ATCC BAA-17** *JOURNAL OF BIOLOGICAL CHEMISTRY*  
Chekan, J. R., Kwon, I. H., Agarwal, V., Dodd, D., Revindran, V., Mackie, R. I., Cann, I., Nair, S. K.  
2014; 289 (50): 34965-34977
- **Xylan utilization in human gut commensal bacteria is orchestrated by unique modular organization of polysaccharide-degrading enzymes** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*  
Zhang, M., Chekan, J. R., Dodd, D., Hong, P., Radlinski, L., Revindran, V., Nair, S. K., Mackie, R. I., Cann, I.  
2014; 111 (35): E3708-E3717
- **Two New Xylanases with Different Substrate Specificities from the Human Gut Bacterium *Bacteroides intestinalis* DSM 17393** *APPLIED AND ENVIRONMENTAL MICROBIOLOGY*  
Hong, P., Iakiviak, M., Dodd, D., Zhang, M., Mackie, R. I., Cann, I.  
2014; 80 (7): 2084-2093
- **Mutational and Structural Analyses of *Caldanaerobius polysaccharolyticus* Man5B Reveal Novel Active Site Residues for Family 5 Glycoside Hydrolases** *PLOS ONE*  
Oyama, T., Schmitz, G. E., Dodd, D., Han, Y., Burnett, A., Nagasawa, N., Mackie, R. I., Nakamura, H., Morikawa, K., Cann, I.  
2013; 8 (11)
- **Reconstitution of a Thermostable Xylan-Degrading Enzyme Mixture from the Bacterium *Caldicellulosiruptor bescii*** *APPLIED AND ENVIRONMENTAL MICROBIOLOGY*  
Su, X., Han, Y., Dodd, D., Moon, Y. H., Yoshida, S., Mackie, R. I., Cann, I. K.  
2013; 79 (5): 1481-1490
- **Biochemical and Structural Insights into Xylan Utilization by the Thermophilic Bacterium *Caldanaerobius polysaccharolyticus*** *JOURNAL OF BIOLOGICAL CHEMISTRY*  
Han, Y., Agarwal, V., Dodd, D., Kim, J., Bae, B., Mackie, R. I., Nair, S. K., Cann, I. K.

2012; 287 (42): 34946-34960

- **Biochemical Characterization and Relative Expression Levels of Multiple Carbohydrate Esterases of the Xylanolytic Rumen Bacterium *Prevotella ruminicola* 23 Grown on an Ester-Enriched Substrate** *APPLIED AND ENVIRONMENTAL MICROBIOLOGY*  
Kabel, M. A., Yeoman, C. J., Han, Y., Dodd, D., Abbas, C. A., de Bont, J. A., Morrison, M., Cann, I. K., Mackie, R. I.  
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- **Xylan degradation, a metabolic property shared by rumen and human colonic Bacteroidetes** *MOLECULAR MICROBIOLOGY*  
Dodd, D., Mackie, R. I., Cann, I. K.  
2011; 79 (2): 292-304
- **Mutational Insights into the Roles of Amino Acid Residues in Ligand Binding for Two Closely Related Family 16 Carbohydrate Binding Modules** *JOURNAL OF BIOLOGICAL CHEMISTRY*  
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- **Transcriptomic Analyses of Xylan Degradation by *Prevotella bryantii* and Insights into Energy Acquisition by Xylanolytic Bacteroidetes** *JOURNAL OF BIOLOGICAL CHEMISTRY*  
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- **Comparative Analyses of Two Thermophilic Enzymes Exhibiting both beta-1,4 Mannosidic and beta-1,4 Glucosidic Cleavage Activities from *Caldanaerobius polysaccharolyticus*** *JOURNAL OF BACTERIOLOGY*  
Han, Y., Dodd, D., Hespden, C. W., Ohene-Adjei, S., Schroeder, C. M., Mackie, R. I., Cann, I. K.  
2010; 192 (16): 4111-4121
- **Functional Diversity of Four Glycoside Hydrolase Family 3 Enzymes from the Rumen Bacterium *Prevotella bryantii* B(1)4** *JOURNAL OF BACTERIOLOGY*  
Dodd, D., Kiyonari, S., Mackie, R. I., Cann, I. K.  
2010; 192 (9): 2335-2345
- **Thermostable Enzymes as Biocatalysts in the Biofuel Industry** *ADVANCES IN APPLIED MICROBIOLOGY, VOL 70*  
Yeoman, C. J., Han, Y., Dodd, D., Schroeder, C. M., Mackie, R. I., Cann, I. K.  
2010; 70: 1-55
- **Biochemical Analysis of a beta-D-Xylosidase and a Bifunctional Xylanase-Ferulic Acid Esterase from a Xylanolytic Gene Cluster in *Prevotella ruminicola* 23** *JOURNAL OF BACTERIOLOGY*  
Dodd, D., Kocherginskaya, S. A., Spies, M. A., Beery, K. E., Abbas, C. A., Mackie, R. I., Cann, I. K.  
2009; 191 (10): 3328-3338
- **Determinants of Catalytic Power and Ligand Binding in Glutamate Racemase** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*  
Spies, M. A., Reese, J. G., Dodd, D., Pankow, K. L., Blanke, S. R., Baudry, J.  
2009; 131 (14): 5274-5284
- **Enzymatic deconstruction of xylan for biofuel production.** *Global change biology. Bioenergy*  
Dodd, D., Cann, I. K.  
2009; 1 (1): 2-17
- **Functional comparison of the two *Bacillus anthracis* glutamate racemases** *JOURNAL OF BACTERIOLOGY*  
Dodd, D., Reese, J. G., Louer, C. R., Ballard, J. D., Spies, M. A., Blanke, S. R.  
2007; 189 (14): 5265-5275