

## Education

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- 09/2007 — 12/2012     **California Institute of Technology**     Pasadena, CA  
Doctor of Philosophy in Neurobiology
- 09/2003 — 12/2006     **University of California, Los Angeles**     Los Angeles, CA  
Bachelor of Science in Microbiology, Immunology and Molecular Genetics

## Appointments

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- 07/2015 — present     **Assistant Professor, UCLA Department of Integrative Biology & Physiology**
- 09/2015 — present     **Joint Appointment, UCLA Department of Medicine, Digestive Diseases**
- 10/2015 — present     **Member, UCLA Brain Research Institute**
- 01/2016 — present     **Member, UCLA California NanoSystems Institute (CNSI)**
- 01/2016 — present     **Member, UCLA Eli & Edyth Broad Center of Regenerative Medicine & Stem Cell Research (BRCSC)**
- 05/2016 — present     **Member, UCLA Molecular Biology Institute**
- 09/2017 — present     **Joint Appointment, UCLA Department of Microbiology, Immunology & Molecular Genetics**
- 07/2015 — present     **Visiting Faculty Member, Caltech Biology & Biological Engineering**
- 09/2014 — 07/2015     **Research Assistant Professor, Caltech Biology & Biological Engineering**
- 09/2013 — 09/2014     **Senior Research Fellow, Caltech Biology & Biological Engineering**
- 01/2013 — 09/2013     **Postdoctoral Scholar, Caltech**  
Mentors: Rustem F. Ismagilov, Chemistry & Chemical Engineering  
Sarkis K. Mazmanian, Biology & Biological Engineering
- 09/2007 — 01/2013     **Graduate Student, Caltech**  
Mentor: Paul H. Patterson; Biology & Biological Engineering
- 03/2007 — 09/2007     **Associate, Pre-Clinical Formulations, Amgen, Inc.**  
Supervisor: Karen Erickson

## Academic and Professional Honors

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- 06/2018     **New York Stem Cell Foundation Robertson Neuroscience Investigator Award**

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| 04/2018 | UCLA Life Sciences Excellence Award in Educational Innovation            |
| 11/2017 | Robert J. and Claire Pasarow Foundation Medical Research Award           |
| 10/2017 | Packard Fellow in Science and Engineering                                |
| 09/2017 | Renew Life Research Excellence Award                                     |
| 07/2017 | Klingenstein-Simons Fellow in Neuroscience                               |
| 04/2017 | UCLA Life Sciences Excellence Award for Outstanding Research Publication |
| 01/2017 | UCLA Chancellor's Post-doctoral Mentoring Award Nominee                  |
| 02/2016 | Alfred P. Sloan Research Fellow in Neuroscience                          |
| 10/2015 | UCLA De Logi Chair in Biological Sciences                                |
| 09/2015 | Member, White House Office of Science & Technology Microbiome Forum      |
| 11/2015 | Kavli Fellow of the National Academy of Sciences                         |
| 08/2015 | TEDYouth Speaker   |
| 06/2015 | National Geographic Emerging Explorer Award                              |
| 09/2014 | Caltech Environmental Microbial Interactions Career Award                |
| 08/2014 | Forbes' "30 Under 30 in Science & Healthcare"                            |
| 09/2013 | NIH Director's Early Independence Award (DP5)                            |
| 05/2013 | 2013 Caltech Everhart Lecturer   |
| 01/2013 | Global Young Scientist Summit Travel Award, Singapore                    |
| 03/2012 | Keystone Symposium Scholarship   |
| 09/2012 | TEDxCaltech Speaker  |
| 09/2011 | Gregory O. & Jennifer W. Johnson Caltech Innovation Fellowship           |
| 01/2012 | International Society for Developmental Neuroscience Travel Award, India |
| 09/2011 | NIH/NRSA Ruth L. Kirschstein Pre-doctoral Fellowship                     |
| 09/2009 | Autism Speaks Dennis Weatherstone Pre-doctoral Fellowship                |

## Publications

### *Primary Research Articles*

Olson CA, Vuong HE, Yano JM, Liang QY, Nusbaum DJ, Hsiao EY (2018) The gut microbiota mediates the anti-seizure effects of the ketogenic diet. *Cell*, 173:1728-41. PMID: 29804833.

Highlighted in *Science* 6394:1199-200, *Science Translational Medicine* 446:eaau0471, *Faculty* 1000

Fung TC, Garduno C, Vuong HE, Aleksandrova A, McGinn J, Rendon T, Forrest L, Hsiao EY (2018) Bacterial uptake of serotonin regulates host intestinal colonization. submitted.

Lee K, Vuong HE, Nusbaum DJ, Hsiao EY, Evans CJ, Taylor AMW (2018) Intermittent, but not sustained, morphine leads to changes in sensory and affective symptoms via alterations in the gut microbiome, in revision.

Osadchiy V, Labus JS, Jacobs J, Gupta A, Ashe-MacNalley C, Hsiao EY, Mayer EA (2018) Correlation of tryptophan metabolites with connectivity of extended central reward network in healthy subjects, submitted.

Labus JS, Osadchiy V, Hsiao EY, Tap J, Derrien M, Gupta A, LeNeve B, Brazeilles R, Grinsvall G, Ohman L, Tornblom H, Tillisch K, Simren M, Mayer EA. (2018) Association of gut microbial Clostridia with brain functional connectivity and evoked symptoms in irritable bowel syndrome: a tripartite network analysis, submitted.

Labus JS, Hollister EB, Jacobs J, Kirbach K, Oezguen N, Gupta A, Acosta J, Luna R, Aagaard K, Versalovic J, Savidge T, Hsiao E, Tillisch K, Mayer EA (2017) Differences in gut microbial composition correlate with regional brain volumes in irritable bowel syndrome. *Microbiome* 5:49. PMID: 28457228. PMCID: PMC5410709.

Labus JS, Hsiao EY, Tap J, Derrien M, Gupta A, Le Neve B, Brazeilles R, Grinsvall C, Ohman L, Tornblom H, Tillisch K, Simren M, Mayer EA (2017) Clostridia from the gut microbiome are associated with brain functional connectivity and evoked symptoms in IBS. *Gastroenterology* 152:S40.

Wu W, Hsiao EY, Yan Z, Mazmanian SK, Patterson PH (2016) Placental interleukin-6 signaling controls fetal brain development and behavior. *Brain, Behav Immun.* 62:11-23. PMID: 27838335.

Yano JM, Yu K, Donaldson G, Shastri G, Ma L, Ann P, Nagler C, Ismagilov RF, Mazmanian SK, Hsiao EY (2015) Indigenous bacteria from the gut microbiota regulate host serotonin biosynthesis. *Cell*, 161:264-76. PMID:25860609. PMCID: PMC4393509.

Highlighted in *Cell* 161:193-4, *Science Signaling* 373:ec101, *Nature Reviews Gastroenterology & Hepatology* 12:311, *ACS Chemical Biology* 10:1157-1159, *Faculty 1000*

Hsiao EY, McBride SW, Hsien S, Sharon G, Hyde ER, McCue T, Codelli JA, Chow J, Reisman SE, Petrosino JF, Patterson PH\*, Mazmanian SK\* (2013) The microbiota modulates behavioral and physiological abnormalities associated with neurodevelopmental disorders. *Cell*, 155:1451-1463. PMID: 24315484. PMCID: PMC3897394. \*Authors contributed equally

Highlighted in *Cell* 155:1446-8, *PNAS* 111:2051-3, *Nature Reviews Neuroscience* 15:65, *Nature Reviews Neurology* 10:60, *Nature Reviews Microbiology* 12:76-7, *Nature Reviews Drug Discovery* 13:104, *CNS & Neurological Disorders Drug Targets* 13:733-5, *Faculty 1000*, and by Dr. Tom Insel, NIMH, Top 10 Autism Research Achievement of 2013 by Autism Speaks

Garay PA, Hsiao EY, Patterson PH, McAllister AK (2012) Maternal immune activation causes age- and region-specific changes in brain cytokines in offspring throughout development. *Brain Behav Immun*, 31:54-68. PMID: 22841693. PMCID: PMC3529133.

Hsiao EY, McBride SW, Chow J, Mazmanian SK, Patterson PH (2012) Modeling an autism risk factor in mice leads to permanent immune dysregulation. *PNAS* 109:12776-81. PMID: 22802640. PMCID: PMC3411999.

Garbett, KA\*, Hsiao EY\*, Kalman S, Patterson PH, Mirnics K (2012) Effects of maternal immune activation on gene expression patterns in the fetal brain. *Transl Psychiatry* 2:e98. PMID: 22832908. PMCID: PMC3337077. \*Authors contributed equally

Malkova NV, Yu CZ, Hsiao EY, Patterson PH (2012) Maternal immune activation yields offspring displaying the three core symptoms of autism. *Brain Behav Immun* 26:607-16. PMID: 2210922. PMCID: PMC3322300.

Hsiao EY, Patterson PH (2011) Activation of the maternal immune system induces endocrine changes in the placenta via IL-6. *Brain Behav Immun* 25:604-15. PMID: 21195166. PMCID: PMC3081363.

Highlighted in *Brain Behav Immun* 25:602-3

Ito HT, Smith SE, Hsiao E, Patterson PH (2010) Maternal immune activation alters nonspatial information processing in the hippocampus of the adult offspring. *Brain Behav Immun* 24:930-41. PMID: 20227486. PMCID: PMC2897971,

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Publications

*Invited Review Articles*

Pronovost GP and Hsiao EY (2018) Microbiome regulation of early life immunity and neurodevelopment. *Immunity*. in preparation

Hsiao EY (2018) Voices Highlighting 30 Years of Neuron: Decoding states and contexts. *Neuron*. in press.

Kentner A, Bilbo S, Brown A, Hsiao EY, McAllister K, Meyer U, Pearce B, Pletnikov M, Yolken R, Bauman M (2018). Maternal Immune Activation: Reporting guidelines to improve the rigor, reproducibility and transparency of the model. *Neuropsychopharmacology*, in revision.

Jameson KG and Hsiao EY (2018) Seminal papers in neuroscience 1978-2017: Links between the gut microbiome and a brain neurotransmitter. *Trends in Neuroscience*. 41:413-4.

Pronovost GP and Hsiao EY (2017) Microbes REV up host metabolism around the clock. *Immunity*. 47:618-20. PMID: 29045896.

Mayer EA and Hsiao EY (2017) The gut and its microbiome as related to central nervous system function and psychological wellbeing. *Psychosomatic Medicine*. 79: 844-6. PMID:

28976454.

Vuong HE, Yano JM, Fung TC, Hsiao EY (2017) The microbiome and host behavior. *Annual Reviews of Neuroscience*. 40: 21-49. PMID: 28301775.

Fung TC, Olson CA, Hsiao EY (2017) Interactions between the microbiota, immune and nervous systems in health and disease. *Nature Neuroscience*. 20:145-55. PMID: 28092661.

Olson CA, Vuong HE, Hsiao EY (2016) Microbial modulators of host behavior. In 'The Microbial Olympics 2016'. *Nature Microbiology*. 1:16122. PMID: 27573121.

Vuong HE, Hsiao EY (2016) Emerging roles for the gut microbiome in autism spectrum disorder. *Biological Psychiatry*. 81: 411-23. PMID: 27773355. PMCID: PMC5285286.

Hsiao EY (2014) Gastrointestinal issues in autism spectrum disorder. *Harv Rev Psychiatry* 22:104-111. PMID: 24614765.

Hsiao EY (2013) Immune dysregulation in autism spectrum disorder. In Konopka G, Harris A, Jenner P (Eds). *Neurobiology of Autism, Int Rev Neurobiol* 113:269-302. PMID: 24290389.

Hsiao EY, Patterson PH (2012) Placental regulation of maternal-fetal interactions and brain development. *Dev Neurobiol* 72:1317-26. PMID: 22753006.

Hsiao EY, Patterson PH (2012) Immune involvement in autism. *Autism*, S1.

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## Publications

## Invited Books and Book Chapters

Hsiao EY, Braun J, Powell N (2018) The commensal microbiota and its relationship to homeostasis and disease. In Smith PD, MacDonald T, Blumberg R (Eds.). *Principles of Mucosal Immunology*. Garland Science, in revision.

Hsiao EY, as a member of: National Academies of Sciences, Engineering and Medicine; Committee on Advancing Understanding of the Implications of Environmental-Chemical Interactions with the Human Microbiome (2018) Environmental Chemicals, the Human Microbiome and Health Risk: A Research Strategy. *The National Academies Collection: Reports funded by the National Institutes of Health*. National Academies Press. Washington DC. PMID: 29431953.

Yano J, Hsiao EY (2016) A role for the microbiota in neurodevelopmental disorders. In Hyland N, Stanton C (Eds.). *The Gut-Brain Axis: Dietary, Prebiotic and Probiotic Interventions on the Microbiota*. Academic Press. pp. 305-18.

Malkova N, Hsiao EY (2016) Non-genetic causes of autism spectrum disorders: the role of the immune system. In Sala C, Verpelli C (Eds). *Neuronal and Synaptic Dysfunction in Autism Spectrum Disorder and Intellectual Disability*. Academic Press, pp. 65-76.

Malkova N, Wu W, Hsiao EY (2015) Modeling the maternal immune activation risk factor for schizophrenia. In Pletnikov M, Waddington J (Eds). *Modeling the Psychopathological Dimensions of Schizophrenia and Related Psychoses*. Academic Press, pp. 175-193.

Hsiao EY, Bregere C, Malkova N, Patterson PH (2011) Modeling features of autism in rodents. In Amaral DG, Dawson G, Geschwind DH (Eds.), *Autism Spectrum Disorders*. New York: Oxford University Press, pp. 935-62.

Smith SE, Hsiao E, Patterson PH (2010) Activation of the maternal immune system as a risk factor for neuropsychiatric disorders. In Zimmerman, AW; Connors, SL (Eds.), *Maternal Influences on Fetal Neurodevelopment*. New York: Humana Press, pp. 289-307.

## Research Patents

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Needham B, Hsiao EY, Fishbach M, Patterson PH, Mazmanian SK. (2017) Manipulation of 4EP(S) Levels for Treatment of Anxiety and Disease. Caltech. Provisional Application Number: CIT-7706-P. [licensed]

Olson CA, Vuong HE, Yano JM, Hsiao EY (2016) Compositions and Methods for Inhibiting Seizures. UCLA. Provisional Application Number: US 2017/67548. [licensed]

Hsiao EY, Yano JM (2015) Microbe-based Regulation of Serotonin, Colonic Motility and Hemostasis. Caltech/UCLA. Publication Number: US 2016/0058808.

Hsiao EY, Wu W, Mazmanian SK, Patterson PH (2015) Compositions and Methods Comprising Bacteria for Improving Behavior in Neurodevelopmental Disorders. Caltech. Publication Number: US 2016/0120916, US 2016/0120920. [licensed]

Hsiao EY, McBride S, Patterson PH, Mazmanian SK (2013) Diagnosis and Treatment of Autism Spectrum Disorder. Caltech. Publication Number: US 2014/0065132. [licensed]

Hsiao EY, McBride S, Chow J, Patterson PH, Mazmanian SK (2011) Probiotic Therapies for Autism. Caltech. Issued Patent Number: US 2012/0087895. [licensed]

## Funding

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|-------------------|---|
| 01/2019— 01/2024  | <b>New York Stem Cell Foundation Robertson Neuroscience Investigator Award</b>  |
| 10/2017 — 10/2022 | <b>Packard Fellowship for Science and Engineering</b>   |
| 10/2017 — 10/2020 | <b>Edward Mallinckrodt Foundation Grant</b>   |
| 09/2017           | <b>Pasarow Foundation Research Award</b>  |
| 09/2017           | <b>Renew Life Research Excellence Award</b>   |
| 08/2017 — 08/2019 | <b>Brain Research Foundation Frank Fay Seed Grant</b>   |
| 07/2017 — 07/2020 | <b>Klingenstein-Simons Fellowship Award in Neuroscience</b>   |
| 07/2017 — 07/2022 | <b>Office of Naval Research, Army Research Office, Multidisciplinary University Research Initiative (MURI) Topic: Nutritional and Environmental Effects on the Gut Microbiome and Cognition</b><br>PI: Hsiao EY, Dissecting microbiome-gut-brain circuits for microbial modulation of host cognition in response to diet and stress |
| 03/2017           | <b>UCLA CURE Digestive Diseases Research Center Pilot and Feasibility Grant</b><br>PI: Hsiao EY, Molecular and cellular mechanisms for communication across the microbiota-gut-brain axis   |
| 02/2017           | <b>UCLA Office of Instructional Development, Instructional Improvement Grant</b><br>PI: Hsiao EY, Integrating human microbiome research into undergraduate education  |
| 08/2016 — 08/2017 | <b>NIH/NIDDK P50 Center Grant (1P50 DK64539)</b><br>PI: Mayer E (UCLA), Co-I: Hsiao EY; Center for Neurovisceral Sciences and Women's Health  |
| 07/2016 — 07/2017 | <b>UCLA Clinical and Translational Science Institute Core Award</b>   |
| 02/2016 — 02/2018 | <b>Alfred P. Sloan Neuroscience Fellowship</b>  |
| 07/2015 — 07/2020 | <b>UCLA De Logi Chair in Biological Sciences</b>  |
| 09/2013 — 09/2018 | <b>NIH Director's Early Independence Award (DP5)</b><br>PI: Hsiao EY, Uncovering microbial modulators of neuroactive molecules as novel therapeutics  |
| 06/2015 — 06/2016 | <b>National Geographic Emerging Explorer Award</b>  |
| 09/2014 — 09/2015 | <b>Caltech Environmental Microbial Interactions Career Award</b>  |

Extramural Service and Entrepreneurship

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|-------------------|---|
| 04/2018 — 05/2018 | <b>Group Lead and Member, Milken Institute Aligning Science Across Parkinson's (ASAP) Scientific Workshop</b>                     |
| 04/2018           | <b>Member, Paul G. Allen Frontiers Group Neuroimmunology Workshop</b>   |
| 04/2018           | <b>Ad hoc Member, NIH Special Emphasis Panel ZRG1 BDCN-G (03) S</b>   |
| 03/2018 — present | <b>Co-Founder, Bloom Science; CEO: Anthony Colasin; CSO: Christopher Reyes, Ph.D.</b>   |
| 03/2018           | <b>Member, Office of Naval Research Microbiome, Synthetic Biology and Microbial Electrochemical Systems External Review Panel</b> |

03/2018 **Ad hoc Member, NIH Special Emphasis Panel ZDA1 GMX-A (01) S; NIDA Research Center of Excellence Grant Program**

03/2018 **Ad hoc Member, NIH Special Emphasis Panel ZDA1 GMX-A (02) S; NIDA Core Center of Excellence Grant Program**

01/2018 — present **Scientific Advisor, Holobiome**

12/2017 — present **Scientific Advisor, uBiome**

12/2017 — present **Member, Medical Advisory Panel, Renew Life**

11/2017 — 05/2018 **Guest Editor, Special Issue of *eLife* on the Microbiome**

10/2017 **Ad hoc Member, NIH Developmental Brain Disorders (DBD) Study Section**

08/2017 **Scientific Teaching Fellow, Yale Institute for Teaching and Learning/HHMI Summer Institutes on Scientific Teaching**

03/2017 **Member, NIH Special Emphasis Panel ZRG1 BBBP-L (40) P; Autism Centers of Excellence (ACE) Programs (P50) Review Group**

02/2017 **Ad hoc Member, NIMH CNN- Clinical Neuroscience and Neurodegeneration Study Section; Center for Scientific Review**

01/2017 **Member, Microbiome Gut and Brain-Neurovascular Unit Review Panel; Department of Defense Parkinson's Research Program**

12/2016 **Member, NIH Special Emphasis Panel ZDA1 GMX-A (15) R; SBIR Laboratory and Diagnostic Tools to Advance Microbiome-Brain Research Review Group**

10/2016 **Ad hoc Member, NIMH CNNT- Clinical Neuroplasticity and Neurotransmitters Study Section; Brain Disorders and Clinical Neuroscience Integrated Review Group**

07/2016 — 02/2018 **Member, National Academy of Sciences Committee on Advancing Understanding of the Implications of Environmental-Chemical Interactions with the Human Microbiome**

07/2016 — 12/2016 **Member, NIMH Interagency Autism Coordinating Committee (IACC): Strategic Plan Update for ASD Research**

06/2016 **Ad hoc Member, NIH Study Section, Biobehavioral Mechanisms of Emotion, Stress & Health (MESH); Biobehavioral and Behavioral Processes Integrated Review Group**

12/2016, 06/2016 **Member, NIMH Special Emphasis Panel ZMH1 ERB-B (07) S; Fellowship and Dissertation Grants Review**

06/2016 **Session Chair, American Society for Microbiology Microbe 2016**

05/2016 **External Reviewer, National Health and Medical Research Council of Australia**

04/2016 — present **Organizing Committee Member, International Mind, Mood & Microbes Symposium**

03/2016 — 09/2016 **Scientific Consultant, Kaleido Biosciences**

01/2016 **Reviewer, US-Israel Binational Science Foundation**

11/2015 **Session Chair, National Academy/ Kavli Foundation Frontiers in Science Meeting**

10/2015 — 2/2017 **Co-editor, Special Issue of Psychosomatic Medicine (Journal of Biobehavioral Medicine) on the Microbiome**

01/2015 — present **Ad hoc reviewer**  
 Nature; Science; Cell; Nature Immunology; Nature Medicine; Nature Neuroscience; Journal of Neuroscience; Cell Host and Microbe; Nature Microbiology; ACS Chemical Neuroscience,



Scientific Reports; EBioMedicine; Brain, Behavior, and Immunity; Molecular Psychiatry; Biological Psychiatry; Neuropharmacology; Psychoneuroendocrinology; Molecular Autism, Journal of Autism and Developmental Disorders; Behavioural Brain Research; Neuroscience Letters; Brain Research; Neuroscience; Biology of Sex Differences.

- 03/2015 — 12/2015 **Member, American Society for Microbiology Microbiome Outreach Taskforce**
- 09/2014 — 09/2015 **Faculty Advisor, Caltech Women Mentoring Women Program**
- 10/2014 **Section Chair, Forbes' Under 30 Summit- Science & Healthcare**
- 05/2014 **Member, NIMH Pushing Translational Boundaries: Neuroimmunology & Mental Health Workshop**
- 04/2014 **Session Chair, Keystone Symposium: Understanding Biochemical Transformations in the Human Microbiome**
- 03/2014 **Member, NIMH R21/R33 Special Emphasis Panel, ZMH1 ERB-M (04)**
- 12/2013 — 12/2016 **Co-founder, Axial Biotherapeutics (formerly Neurobiotix Health); Co-founders: Sarkis Mazmanian and Paul H. Patterson; CEO: Michael Glemmbourt (2013-2016), David Donabedian (2016-present); Investors: Longwood Fund, Domain Ventures**

#### UCLA Intramural Service

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- 10/2017— 02/2018 **Chair, UCLA Microbiology, Immunology & Molecular Genetics Search Committee**
- 09/2017— 02/2018 **Member, UCLA Neuroscience Search Committee**
- 09/2017— 02/2018 **Member, UCLA Physiology Search Committee**
- 03/2017 **Faculty Judge, University of California Leadership Excellence through Advanced Degrees (UC LEADS) Research and Leadership Symposium**  
Promoting advancement to STEM graduate programs for underrepresented UC students
- 02/2017 **Participant, UCLA Faculty Technology Commercialization Panel**  
Helping to prioritize initiatives and focus efforts for UCLA's Technology Development Office
- 01/2017 — present **Faculty Mentor, UCLA Microbiome Trainee Club**
- 12/2016 **Speaker, UCLA David Geffen School of Medicine Board of Visitors Meeting, Organizer: Dean Kelsey Martin**
- 11/2016 **Faculty Reviewer, UCLA MSD Scholars, MARC, Beckman and UC Leads Programs: Applying to Graduate School; Instructor: Tama Hasson**
- 10/2016 — present **Member, UCLA Depression Grand Challenge Basic Sciences Group**
- 10/2016 — present **Co-Director, UCLA Undergraduate Neuroscience Scholars Summer Program**
- 10/2016 — present **Graduate Thesis Committee Member, UCLA Life Sciences Division**  
Daniel Whittaker (MCIP, Laboratory of Chris Colwell; 12/2016-present); Taylor Brown (IMMP, Laboratory of Elissa Hallem; 10/2016-present); Christine Olson (MCIP; 10/2016-present); Allison Fisher (MCIP; 07/2017-present)
- 10/2016 **Panel Speaker, UCLA Women & Philanthropy Business Meeting, Organizer: Dean Victoria Sork**

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|------------------------------------|---|
| 05/2016, 06/2017                   | <b>Faculty Evaluator, UCLA IBP Undergraduate Research Poster Session</b>  |
| 03/2016 — present                  | <b>Member, UCLA Vice Chancellor for Research and David Geffen School of Medicine Animal Research Advisory Committee</b> |
| 02/2016 — present                  | <b>Interviewer, UCLA Biosciences Graduate Program, IMMP, MCIP, and Neuroscience Home Areas</b>                          |
| 01/2016                            | <b>Reviewer, UCLA CURE/CTSI Research Center Program Grants</b>  |
| 01/2016 — present                  | <b>Member, UCLA Integrative Biology &amp; Physiology Graduate Advisory Committee</b>                                    |
| 11/2015 — 06/2016                  | <b>Participant, UCLA Big "C" Creativity Study; Principal Investigator: Robert Bilder</b>                                |
| 10/2015                            | <b>Member, UCLA California NanoSystems Institute, Microbiome Applications Committee</b>                                 |
| 10/2015 — 10/2017                  | <b>Member, UCLA Neuroscience Graduate Program Student Advisory Committee</b>  |
| 10/2016, 01/2016, 10/2015, 01/2017 | <b>Interviewer, UCLA-Caltech MD/Ph.D. Program</b>   |
| 08/2015 — present                  | <b>Associate Director/Steering Committee Member, UCLA Microbiome Center</b>   |
| 08/2015 — 08/2017                  | <b>Member, UCLA Specialized Center of Research (SCOR) Executive Committee</b>   |
| 08/2015                            | <b>Interviewer, UCLA David Geffen School of Medicine Star/GI Fellows Program</b>  |

#### Teaching Experience and Training (2015-present)

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|-----------------------|---|
| 11/2018 (anticipated) | <b>Instructor, Society for Neuroscience: Neurobiology of Disease Workshop</b>   |
| 09/2018 (anticipated) | <b>Instructor, UCLA Life Science 7C: Physiology</b>   |
| 10/2017 — present     | <b>Faculty Mentor, UCLA Regents Scholar Society</b><br>Meet quarterly with Regent Scholar students to provide mentorship on undergraduate education, career development, graduate and health professions. |
| 10/2017               | <b>Participant, UCLA Faculty Training Workshop on Development; UCLA Academic Senate Committee on Development</b>  |
| 09/2017               | <b>Participant, UCLA Workshop for Advancing Faculty Mentoring Practices; Wisconsin Program for Scientific Teaching; NIH National Research Mentoring Network (NRMN)</b>                                    |
| 07/2017               | <b>Faculty Facilitator, Amgen Scholars U.S. Symposium</b><br>Discussant for student roundtable on science, research and career development  |
| 07/2017               | <b>Participant, UCLA Summer Institute on Scientific Teaching; UCLA Center for Education Innovation &amp; Learning in the Sciences</b>   |
| 07/2017               | <b>Guest Lecturer, UCLA Food Science</b><br><b>FS 187: Moral Ecology of Food, Instructor: Evan Kleiman</b>  |
| 04/2017 — present     | <b>Developer and Instructor, UCLA Physiological Sciences 128: The Microbiome in Health and Disease</b><br>Develop and teach course on host-microbiome interactions in health and disease, which           |

includes discussion of basic properties for microbial communities, intersections with immunology, metabolism and neurobiology, and applications in medicine and technology

04/2017 **Lecturer, UCLA Life Science 7C: Physiology and Human Biology**  
Recorded “flipped” course lectures for sections on the human microbiome.

03/2017 **Participant, UCLA Enhancing Student Success in Science Workshop**  
Training in the best practices for building inclusive classrooms and intergroup dialogue

02/2016, 2017, 2018 **Guest Lecturer, UCLA Microbiology Immunology and Molecular Genetics**  
**MIMG 185: Molecular Genetics**, Instructor: Jeffrey H. Miller

11/2016 **Member, UCLA Undergraduate Research Fellow Program Review Committee**  
Advised underrepresented minority students on writing graduate and medical school application essays

10/2016 **Participant, UCLA FacTech**  
Promoting new tools and technologies to enhance productivity in science and education

09/2016 **Instructor, Neuroscience School of Advanced Studies: Microbiota and the Brain Course; Microbial Modulation of Neurochemical**; Organizer: Pierre-Marie Lledo

09/2016, 09/2015 **Participant, Faculty Workshop on Best Practices in Teaching**;  
**UCLA Center for Education Innovation & Learning in the Sciences**

05/2016, 05/2015, 05/2014 **Guest Lecturer, Caltech Biology & Biological Engineering Division**  
**Bi1 Principles of Biology**; Instructor: Dianne Newman

04/2016 **Guest Speaker, UCLA-Program for Excellence in Education and Research in the Sciences (PEERS)**; Instructor: Paul Barber  
Promoting success of underrepresented minorities in STEM fields

03/2016 **Guest Speaker, UCLA-HHMI Pathways to Success Program**;  
Instructor: Tracy Johnson  
Promoting scientific research for underrepresented minorities in STEM fields

10/2015 **Guest Lecturer, UCLA Biomedical Science**  
**BR5HA Biomedical Research: Concepts and Strategies**, Instructor: Rafael Romero

10/2015 **Participant, UCLA Ecology and Evolutionary Biology**  
**Communicating Science**, Instructor: Paul Barber

07/2015 — present **Research Mentor, UCLA Integrative Biology & Physiology**  
*Staff*: Jessica Yano (07/2015-07/2016), Julianne McGinn (10/2015-11/2017), Tomiko Rendon (09/2017-present); *Postdoctoral fellows*: Helen Vuong (11/2015-present; UCLA UPLIFT Postdoctoral Fellowship), Thomas Fung (07/2016-present); *Graduate students*: Christine Olson (MCIP; 01/2016-present; NIH T32 Physiology Training Grant recipient; UCLA Hyde Pre-doctoral Fellowship); Alex Sercel (IMMP; rotation 01/2016-03/2016); John Muroski (Biochemistry; rotation 03/2016-06/2016); Jenna Harrigan (Molecular Toxicology; rotation 03/2016-06/2016); Maria Kazantsev (Physiological Sciences; 09/2016-present); Geoffrey Pronovost (IMMP; 01/2017-present; NIH T32 Microbial Pathogenesis Training Grant); Anastasia Vavilina (IMMP; rotation 01/2017-04/2017); Kelly Jameson (Neuroscience; 03/2017-present); Alonso Iniguez (Physiological Sciences; 09/2017-present), Matthew Miller (IMMP; rotation 01/2018-03/2018). *Post-Baccalaureate student*: David Nusbaum (01/2016-07/2016); *Undergraduate students*: QingXing Liang (09/2015-present), Austin Qiu (11/2015-

present), Gina Young (09/2015-06/2016), Emily Siegler (11/2015-present), Charisse Yeh (10/2015-06/2016); Elaine Cheung (03/2016-06/2016); Cristopher Garduno (06/2016-07/2017; UCLA CARE Program, URSP Fellowship recipient); Chantel Wilson (06/2017-08/2017; UCLA SPUR-LABS program); Sahil Telang (09/2017-present).

## Invited Lectures (2015-present)

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2019 (accepted)

### **Microbial Modulation of Seizure Susceptibility in Refractory Epilepsy**

- International Mind, Mood & Microbes Symposium. Amsterdam, Netherlands.
- Keystone Symposium, Microbiome: Chemical Mechanisms and Biological Consequences. Montreal, Quebec.
- Experimental Biology; American Physiological Society Joint Presidential Symposia and Workshop on The Microbiome in Physiology and Pharmacology

2018

### **Microbial Modulation of Seizure Susceptibility in Refractory Epilepsy/ Bacterial Responses to Host Serotonin**

- Transformations of the Human Microbiome, Berggruen Institute. Los Angeles, CA.
- Department of Psychology, Mount Holyoke College. MA. *2018 Hastorf Lecturer.*
- Department of Defense, Army Research Office, Multidisciplinary University Research Initiative Meeting. Pasadena, CA. *Organizer.*
- UCSF Microbial Pathogenesis and Host Defense Seminar Series. San Francisco, CA.
- Novartis Invited Speaker. San Francisco, CA.
- Vollum Institute Seminar Series, Oregon Health and Science University. Portland, OR.
- USC Neurobiology Seminar Series. Los Angeles, CA.
- Office for Science and Technology of the Embassy of France Symposium on The Human Microbiome- Time for Effective Translation. Los Angeles, CA.
- Department of Defense Tri-Service Microbiome Consortium. Bethesda, MD. *Keynote Speaker.*
- Simons Foundation Annual Meeting. New York City, NY.
- Society of Biological Psychiatry Annual Meeting. New York City, NY. *Plenary Speaker.*
- FASEB Translational Neuroimmunology. Snowmass, CO. *Session Chair.*
- Packard Foundation Annual Meeting. San Diego, CA.

2017

### **Gut microbes and serotonin biology / Neuroimmune contributions to neurodevelopmental disease**

- Gordon Research Conference on Neuroimmunology. Ventura, CA.
- NIH NHLBI Cell Biology & Physiology Center Seminar Series. Bethesda, MD.
- UCLA Molecular Biology Institute Seminar Series. Los Angeles, CA
- UCLA Synapse to Circuits Seminar Series. Los Angeles, CA.
- Stanford Immunology Graduate Student Seminar Series. Palo Alto, CA.
- Tufts Neuroscience Symposium. Boston, MA.
- Karolinska Institutet Nobel Conference on the Microbiome. Stockholm, Sweden.

- International Society of Nutrigenetics and Nutrigenomics Annual Congress. Los Angeles, CA.
- Washington University School of Medicine, St. Louis; Center for Neuroimmunology and Neuroinfectious Diseases Mini-Symposium. St. Louis, MO.
- University of California, Riverside Microbiology Seminar Series. Riverside, CA.
- Neuron/Cell Satellite Symposium on Big Questions in Neuroscience. Washington DC.
- Society for Neuroscience Annual Meeting, Symposium on Neuroimmune Interactions. Washington DC.
- Keystone Symposia Frontiers of Serotonin Beyond the Brain. Park City, UT
- American College of Neuropsychopharmacology Annual Meeting, Palm Springs, CA.

2016

#### **Microbiome interactions with the nervous system**

- UCSD Changing Microbiomes for Health Symposium, San Diego, CA.
- UCLA Arrowhead Microbial Genomics Meeting. Arrowhead, CA.
- American Society of Microbiology Annual Meeting. Boston, MA. *Session Chair.*
- Harvard Symposium on Probiotics. Cambridge, MA.
- Karolinska Institutet Nobel Forum Gut-Brain Axis Symposium. Stockholm, Sweden. *Keynote Speaker.*
- Experimental Biology (EB) Annual Meeting. San Diego, CA. *Session Keynote Speaker.*
- MIT-Harvard Symposium on Health & Ventures in the Microbiome. Cambridge, MA. *Keynote Speaker.*
- Neurobiology of Stress Workshop. Newport Beach, CA.
- American Association for the Advancement of Science (AAAS) Annual Meeting. Chicago, IL
- UCLA Molecular, Cellular, Integrative Physiology Annual Retreat. *Plenary Speaker.*
- UCLA Center for Neurobiology of Stress Annual Symposium. *Keynote Speaker.*
- International Nanobiotechnology Annual Symposium. Los Angeles, CA.
- UCLA Cousins Center for Psychoneuroimmunology Seminar Series. Los Angeles, CA
- UCLA Microbiome Center Seminar Series. Los Angeles, CA.

2015

#### **Neurochemicals and the microbiome**

- Harvard Neuroscience Graduate Program Spring Symposium. Cambridge, MA.
- Canadian College of Neuropsychopharmacology Annual Meeting. Ottawa.
- Columbia University/New York Psychiatric Institute Grand Rounds. New York City.
- European College of Neuropsychopharmacology Annual Meeting. Amsterdam.
- National Academy of Sciences/Kavli Foundation Frontiers in Science Meeting; Newport Beach, CA. *Session Chair.*
- World Psychiatric Association International Conference. Taipei, Taiwan.
- UCLA Broad Stem Cell Center Research Center. Los Angeles, CA.
- UCLA Medical Fellows Seminar Series. Los Angeles, CA.
- UCLA California NanoSystems Institute Microbiome Seminar Series. Los Angeles, CA.
- UCLA Synapse to Circuits Seminar Series. Los Angeles, CA.
- UCLA Microbiome Center Seminar Series. Los Angeles, CA.
- Keystone Symposium: Understanding Biochemical Transformations in the Human Microbiome. Big Sky, MT. *Session Chair*
- International Human Microbiome Consortium Annual Meeting. Luxembourg.

Public Outreach (2015-present)

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- 06/2018 **Panel Speaker, Cell Press Webinar on The Human Microbiome: from Sequencing to Therapeutics**  
Discussed advancements in microbiome research toward integrating sequencing approaches with physiology and developing microbe-based therapeutics. Additional panel speakers: Rob Knight (UCSD) and Michael Fishbach (Stanford).
- 03/2018 **Discussant, BBC**  
Discussed the current state and potential promise for microbiota-gut-brain research, as an interview to be included in a three-part series on the gut microbiota called “Second Genome”
- 01/2018 **Faculty Mentor, The Synapse Project**  
Discussed research and careers in science to empower girls in neuroscience; highlighted as an “Inspirational Woman in Neuroscience”
- 02/2017 **Panel Speaker, Natural History Museum First Fridays: The Human Body and Food**  
Discussed roles for the gut microbiome in diet and nutrition
- 01/2017 **Keynote Speaker, Los Angeles/Irvine Brain Bee**  
Discussed recent advances in neurobiology research for program that stimulates high school students to learn neuroscience
- 05/2016 **Panel Speaker, UCLA Science & Food Public Lecture Series on Microbes: From Your Food to Your Brain**  
Discussed interactions between the gut microbiota, diet and host physiology
- 03/2016 **Collaborator, Jorge Cham, Ph.D. and the Kavli Foundation**  
Co-created an animated video for Ph.D. Comics on “Microbiomes Explained”
- 11/2015 **Speaker, National Taiwan University Autism Outreach**  
Discussed recent advances in autism research with ~30 autism families, with follow-up question and answer panel
- 10/2015 **Speaker, TEDYouth New York City**  
Presented microbiome research to ~300 middle-high school students with interactive session
- 10/2015 **Discussant, San Francisco State University Neurological Diseases Course**  
Presented research and participated in panel discussion with Master’s students
- 09/2015 **Contributor, National Geographic Learning/Cengage Learning**  
Directed a team to create an animation and lesson plan to introduce the microbiome to K-12 and adult learners
- 09/2015 **Speaker, UCLA Department of Digestive Diseases Wisdom from Within Fundraiser**  
Presented research to select donors at event hosted by Drs. Eric Esrailian and Gary Gitnick
- 09/2015 **Discussant, UCLA Bruin Daily Radio Show**  
Discussed microbiome research for UCLA radio program run by undergraduates