

Education

- 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

- 07/2015 — present **Assistant Professor, UCLA Department of Integrative Biology & Physiology**
- 09/2017 — present **Joint Appointment, UCLA Department of Microbiology, Immunology & Molecular Genetics**
- 05/2016 — present **Member, UCLA Molecular Biology 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)**
- 10/2015 — present **Member, UCLA Brain Research Institute**
- 09/2015 — present **Joint Appointment, UCLA Department of Medicine, Digestive Diseases**
- 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

- 12/2018 **John H. Walsh Young Investigator Research Prize**
- 10/2018 **Chan-Zuckerberg Initiative Ben Barres Career Acceleration Award**

06/2018	New York Stem Cell Foundation Robertson Neuroscience Investigator
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
11/2015	Kavli Fellow of the National Academy of Sciences
10/2015	UCLA De Logi Chair in Biological Sciences
09/2015	Member, White House Office of Science & Technology Microbiome Forum
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

2018	Fung TC, Garduno C, Vuong HE, Aleksandrova A, Vavilina A, McGinn J, Rendon T, Forrest L, Hsiao EY (2018) Intestinal serotonin and antidepressant exposure regulate bacterial colonization in the gut. in review .
2018	Lee K, Vuong HE, Nusbaum DJ, Hsiao EY, Evans CJ, Taylor AMW (2018) The gut microbiota mediates reward and sensory responses associated with regimen-selective morphine dependence. <i>Neuropsychopharmacology</i> , 43:2606-14. PMID: 30258112. Highlighted in <i>Nature Medicine</i> 24:1630-6.
2018	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. <i>Cell</i> , 173:1728-41. PMID: 29804833. Highlighted in <i>Science</i> 6394:1199-200, <i>Science Translational Medicine</i> 446:eaau0471,

- 2018 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. *PLoS One*, 13:e0201772. PMID: 30080865.
- 2017 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.
- 2017 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.
- 2016 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.
- 2015 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
- 2013 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
- 2012 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.
- 2012 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.
Top 10 Autism Research Achievement of 2012 by Autism Speaks, Notable Paper of 2012 by

- 2012 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
- 2012 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.
- 2011 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
- 2010 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.

Publications

Invited Review Articles

- 2018 Pronovost GP and Hsiao EY (2018) Perinatal interactions between the microbiome, immunity and neurodevelopment. *Immunity*, in press.
- 2018 Fields C, Sampson T, Bruce-Keller A, Kiraly D, Hsiao EY, De Vries G (2018). Defining dysbiosis in disorders of movement and motivation. *Journal of Neuroscience*, 38:9414-22. PMID: 30381433. PMCID: 6209841.
- 2018 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*. doi: 10.1038/s41386-018-0185-7. PMID: 30188509
- 2018 Hsiao EY (2018) Decoding states and contexts, in "Setting the Stage for the Next Generation of Neuroscience". *Neuron*. 99:11-12. PMID: 30001505
- 2018 Jameson KG and Hsiao EY (2018) Linking the gut microbiome to a brain neurotransmitter. *Trends in Neuroscience*. 41:413-4.
- 2017 Pronovost GP and Hsiao EY (2017) Microbes REV up host metabolism around the clock. *Immunity*. 47:618-20. PMID: 29045896.
- 2017 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.

- 2017 Vuong HE, Yano JM, Fung TC, Hsiao EY (2017) The microbiome and host behavior. *Annual Reviews of Neuroscience*. 40: 21-49. PMID: 28301775.
- 2017 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.
- 2016 Olson CA, Vuong HE, Hsiao EY (2016) Microbial modulators of host behavior. In 'The Microbial Olympics 2016'. *Nature Microbiology*. 1:16122. PMID: 27573121.
- 2016 Vuong HE, Hsiao EY (2016) Emerging roles for the gut microbiome in autism spectrum disorder. *Biological Psychiatry*. 81: 411-23. PMID: 27773355. PMCID: PMC5285286.
- 2014 Hsiao EY (2014) Gastrointestinal issues in autism spectrum disorder. *Harv Rev Psychiatry* 22:104-111. PMID: 24614765.
- 2013 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.
- 2012 Hsiao EY, Patterson PH (2012) Placental regulation of maternal-fetal interactions and brain development. *Dev Neurobiol* 72:1317-26. PMID: 22753006.
- 2012 Hsiao EY, Patterson PH (2012) Immune involvement in autism. *Autism*, S1.

Publications

Invited Books and Book Chapters

- 2018 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.
- 2016 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.
- 2016 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.

- 2015 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.
- 2011 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.
- 2010 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

- 2018 Fung TC, Hsiao EY (2018) Regulating Colonization of Select Bacteria of the Microbiome. UCLA. Provisional Application. In legal preparation.
- 2018 Fung TC, Hsiao EY (2018) Microbe-Based Modulation of Lipid and Steroid Metabolism. UCLA. Provisional Application. In legal preparation.
- 2017 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]
- 2016 Olson CA, Vuong HE, Yano JM, Hsiao EY (2016) Compositions and Methods for Inhibiting Seizures. UCLA. Provisional Application Number: US 2017/67548. [licensed]
- 2015 Hsiao EY, Yano JM (2015) Microbe-based Regulation of Serotonin, Colonic Motility and Hemostasis. Caltech/UCLA. Publication Number: US 2016/0058808. [licensed]
- 2015 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]
- 2013 Hsiao EY, McBride S, Patterson PH, Mazmanian SK (2013) Diagnosis and Treatment of Autism Spectrum Disorder. Caltech. Publication Number: US 2014/0065132. [licensed]
- 2011 Hsiao EY, McBride S, Chow J, Patterson PH, Mazmanian SK (2011) Probiotic Therapies for Autism. Caltech. Issued Patent Number: US 2012/0087895. [licensed]

Funding

01/2019 — 01/2024	Chan-Zuckerberg Initiative Neurodegeneration Challenge
01/2019 — 01/2024	New York Stem Cell Foundation Robertson Neuroscience Investigator Award
10/2017 — 10/2022	Packard Fellowship in Science and Engineering
10/2017 — 10/2020	Edward Mallinckrodt Foundation Grant
09/2017	Robert J. and Claire Pasarow Foundation Medical Research Award
09/2017	Renew Life Research Excellence Award
08/2017 — 08/2019	Brain Research Foundation Frank Fay Seed Grant
07/2017 — 07/2020	Klingenstein-Simons Fellowship Award in Neuroscience
07/2017 — 07/2022	Office of Naval Research, Army Research Office, Multidisciplinary University Research Initiative (MURI) Topic: Nutritional and Environmental Effects on the Gut Microbiome and Cognition
03/2017	UCLA CURE Digestive Diseases Research Center Pilot and Feasibility Grant
02/2017	UCLA Office of Instructional Development, Instructional Improvement Grant
08/2016 — 08/2017	NIH/NIDDK P50 Center Grant (1P50 DK64539)
07/2016 — 07/2017	UCLA Clinical and Translational Science Institute Core Award
02/2016 — 02/2018	Alfred P. Sloan Neuroscience Fellowship
07/2015 — 07/2020	UCLA De Logi Chair in Biological Sciences
09/2013 — 09/2018	NIH Director's Early Independence Award (DP5)
06/2015 — 06/2016	National Geographic Emerging Explorer Award
09/2014 — 09/2015	Caltech Environmental Microbial Interactions Career Award

Invited Lectures (2015-present)

2020 (accepted)	TBD <ul style="list-style-type: none">— Keystone Symposium, A Gut-Systemic Perspective for Metabolic Disease. Santa Fe, NM.
2019 (accepted)	TBD <ul style="list-style-type: none">— International Mind, Mood & Microbes Symposium. Amsterdam, Netherlands.— UCSD Quantitative Biology, Center for Microbiome Innovation Seminar Series. La Jolla, CA.— 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. Orlando, FL.— Harvard Medical School Microbiology and Immunology Seminar Series. Cambridge, MA.— Caltech Center for Environmental Microbial Interactions Annual Meeting. Pasadena, CA.— Cell Symposium on the Neuroimmune Axis. Long Beach, CA.— International Conference of Childhood Disability. Anaheim, CA. <i>Keynote Speaker.</i>

- 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.*
 - UCLA Depression Grand Challenge Symposium. Los Angeles, CA.
 - Packard Foundation Annual Meeting. San Diego, CA.
 - Columbia University Neuroscience Seminar Series. New York City, NY.
 - UCLA Neurology Grand Rounds. Los Angeles, 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.
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- 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.
- NIH High Risk High Reward Symposium. Bethesda, MD