

CURRICULUM VITAE

LAWRENCE K. FUNG, M.D., PH.D.

DEPARTMENT OF PSYCHIATRY & BEHAVIORAL SCIENCES
STANFORD UNIVERSITY SCHOOL OF MEDICINE
401 Quarry Road
Stanford, CA 94301

CERTIFICATION and LICENSURE

SPECIALTY CERTIFICATION

Diplomate, Child & Adolescent Psychiatry, American Board of Psychiatry and Neurology 2015 to present
Diplomate, Psychiatry, American Board of Psychiatry and Neurology 2013 to present

MEDICAL OR OTHER PROFESSIONAL LICENSURE

MD licensure, California 2010 to present
DEA Licensure, Practitioner 2010 to present

EDUCATION AND TRAINING

UNDERGRADUATE

Jun 1990 – University of California B.S. (Honors) Chemical Engineering
May 1993 Berkeley, CA May 1993

GRADUATE

Sep 1993 – Johns Hopkins University M.S.E. Chemical Engineering
May 1996 Baltimore, MD May 1996 Advisor: W.M. Saltzman, Ph.D.

Jun 1996 – Cornell University Ph.D. Chemical Engineering (Major)
Jan 1998 Ithaca, NY Jan 1998 Neurobiology & Behavior (Minor)
Advisor: W.M. Saltzman, Ph.D.

Aug 2005 – George Washington University M.D. Medicine
May 2009 Washington, DC May 2009

POSTGRADUATE

Jun 2009 – Stanford University Medical Center Internship in Psychiatry
Jun 2010 Department of Psychiatry & Behavioral Sciences Program Director: C. Barr
Stanford, CA Taylor, M.D.

Jun 2010 – Stanford University Medical Center Residency in Psychiatry
Jun 2012 Department of Psychiatry & Behavioral Sciences Program Director: Chris
Stanford, CA Hayward, M.D., M.P.H.

Jul 2013 – Stanford University School of Medicine Postdoctoral Research
Jun 2014 Center for Interdisciplinary Brain Sciences Research Fellowship in Child Psychiatry
Department of Psychiatry & Behavioral Sciences & Development
Stanford, CA Director: Allan L. Reiss, M.D.

Jul 2012 – Stanford University Medical Center Fellowship in Child &
Dec 2014 Division of Child & Adolescent Psychiatry Adolescent Psychiatry

Department of Psychiatry & Behavioral Sciences
Stanford, CA

Program Director: Shashank
Joshi, M.D.

Additional Training:

Jul-Dec 2014 Medical Genetics, Stanford University School of Medicine

APPOINTMENTS and POSITIONS

ACADEMIC

Jun – Dec 1992	University of California, Berkeley Department of Chemistry	Teaching Assistant (General Chemistry)
Jan – May 1993	University of California, Berkeley Department of Chemical Engineering	Teaching Assistant (Chemical Engineering Unit Operations Laboratory)
Sep 1993 – May 1996	Johns Hopkins University Department of Chemical Engineering Baltimore, MD	Graduate Research Assistant to W. Mark Saltzman, Ph.D.
Jun 1996 – Jan 1998	Cornell University Department of Chemical Engineering Ithaca, NY	Research Assistant to W. Mark Saltzman, Ph.D.
Jun 2009 – Dec 2014	Stanford University School of Medicine Department of Psychiatry & Behavioral Sciences, Stanford, CA	Intern (2009-2010); Resident (2010- 2012); Child & Adolescent Psychiatry Fellow (2012-2014); Postdoctoral Research Scholar (2013-14)
Jan 2015 – May 2018	Stanford University School of Medicine Department of Psychiatry & Behavioral Sciences, Stanford, CA	Instructor
Jan 2015 – Jun 2018	Stanford University School of Medicine Department of Psychiatry & Behavioral Sciences, Stanford, CA	Staff Psychiatrist, Pediatric Neuropsychopharmacology Clinic
Jan 2015 – present	Stanford University School of Medicine Department of Psychiatry & Behavioral Sciences, Stanford, CA	Staff Psychiatrist, Autism & Developmental Disabilities Clinic
Aug 2017 – present	Stanford University School of Medicine Department of Psychiatry & Behavioral Sciences, Stanford, CA	Staff Psychiatrist, In-patient Unit
Jun 2018 – present	Stanford University School of Medicine Department of Psychiatry & Behavioral Sciences, Stanford, CA	Clinical Assistant Professor
Jun 2018 – present	Stanford University School of Medicine Department of Psychiatry & Behavioral Sciences, Stanford, CA	Director, Stanford Neurodiversity Project

Jul 2018 – Stanford University School of Medicine Director, Neurodiversity Wellness Clinic
 Department of Psychiatry & Behavioral
 Sciences, Stanford, CA

NON-ACADEMIC

Jun 1998 – Bristol-Myers Squibb Company Research Investigator II (2000 – 2001);
 Oct 2001 Pharmaceutical Research Institute Research Investigator I (1998 – 2000)
 Discovery Metabolism and
 Pharmacokinetics, Wallingford, CT

Oct 2001 – Neurogen Corporation (acquired by Associate Director of Pharmacokinetics
 Jun 2005 Ligand Pharmaceuticals in 2009) (2004-05);
 Department of Drug Metabolism Research Fellow II/Group Leader (2003-04);
 Branford, CT Research Fellow I/Group Leader (2001-02)

Aug 2005 – Advanced Pharmacokinetic Consulting Consultant
 Apr 2009 Oakton, VA

HONORS

2000-2001 Spot Awards, Bristol-Myers Squibb Pharmaceutical Research Institute
 2006 General Clinical Research Center Medical Student Scholar, Children's National
 Medical Center, Washington, DC

2010 American Psychiatric Institute on Research and Education (APIRE) / Janssen
 Resident Psychiatric Research Scholar

2010 American Academy of Child & Adolescent Psychiatry (AACAP) Outstanding General
 Psychiatry Resident Award – previously Educational Outreach Program Award

2010 Elected to Stanford Society of Physician Scholars

2011 NIMH-sponsored Brain Camp III participant

2011 National Institute of Mental Health (NIMH) Outstanding Resident Award

2011 Academy of Psychosomatic Medicine Trainee Travel Award

2012 Miller Award for the Best Paper By a Psychiatric Resident, Stanford University

2012 Nominee, National Institutes of Health Director's Early Independence Award
 (selected from Stanford University-wide search)

2013 Scholar, Career Development Institute for Psychiatry

2013 Runner-up in Resident Poster Competition, Session on "Community Service,
 Curriculum Development and Educational, Psychosocial and/or Biomedical
 Research", Annual Meeting of the American Psychiatric Association

2013 Finalist, National Institutes of Health Director's Early Independence Award (project
 title: *GABAergic Cytoarchitectonics, Neuroanatomy, and Structural Connectivity in
 Autism Spectrum Disorder and Fragile X Syndrome*)

2013 Ruth L. Kirschstein Individual Postdoctoral National Research Service Award (T-32),
 National Institute of Mental Health

2013 AACAP Pilot Research Award

2013 Nominee, Burroughs Wellcome Fund Career Awards for Medical Scientists (selected
 from Stanford University-wide search)

2015 American College of Neuropsychopharmacology (ACNP) Travel Award

2016 Young Investigator Award, International Symposium on Functional NeuroReceptor
 Mapping of the Living Brain

2016 Clinical Investigator Award / Mentored Clinical Scientist Research Career

2017	Development Award (K08), National Institute of Mental Health
	Society of Biological Psychiatry (SOBP) Travel Fellowship Award
2018	Elected to associate membership of ACNP

PROFESSIONAL MEMBERSHIPS AND AFFILIATION

2002 – 2015	Member, American Society of Clinical Pharmacology and Therapeutics
2008 – present	Member, American Psychiatric Association
2008 – present	Member, American Academy of Child & Adolescent Psychiatry
2009 – present	Member, International Society for Autism Research
2010 – present	Member, Northern California Psychiatric Society
2012 – present	Member, Society of Biological Psychiatry
2014 – present	Member, Bay Area Autism Consortium
2015 – present	Member, Stanford Neuroscience Institute
2017 – present	Member, International Society for Cerebral Blood Flow & Metabolism
2018 – present	Associate Member, American College of Neuropsychopharmacology
2018 – present	Member, Child Health Research Institute, Stanford University

PUBLICATIONS

Peer-Reviewed Original Articles

1. Strasser JF, **Fung LK**, Eller S, Grossman SA, Saltzman WM. Distribution of 1,3-bis(2-chloroethyl)-1-nitrosourea and tracers in the rabbit brain after interstitial delivery by biodegradable polymer implants. *Journal of Pharmacology and Experimental Therapeutics*. 1995 Dec; 275(3): 1647-1655. PMID: 8531140.
2. **Fung LK**, Shin M, Tyler B, Brem H, Saltzman WM. Chemotherapeutic drugs released from polymers: distribution of 1,3-bis(2-chloroethyl)-1-nitrosourea in the rat brain. *Pharmaceutical Research*. 1996 May; 13(5): 671-678. PMID: 8860421.
3. **Fung LK**, Ewend MG, Sills A, Sipos EP, Thompson R, Watts M, Colvin OM, Brem H, Saltzman WM. Pharmacokinetics of interstitial delivery of carmustine, 4-hydroperoxycyclophosphamide, and paclitaxel from a biodegradable polymer implant in the monkey brain. *Cancer Research*. 1998 Feb; 58(4): 672-684. PMID: 9485020.
4. Fura A, Harper TW, Zhang H, **Fung L**, Shyu WC. Shift in pH of biological fluids during storage and processing: effect on bioanalysis. *Journal of Pharmaceutical and Biomedical Analysis*. 2003 Jul; 32(3): 513-522. PMID: 14565556.
5. Dubowchik GM, Michne JA, Zuev D, Schwartz W, Scola PM, James CA, Ruediger EH, Pin SS, Burris KD, Balanda LA, Gao Q, Wu D, **Fung L**, Fiedler T, Browman KE, Taber MT, Zhang J. 2-arylaminothiazoles as high-affinity corticotropin-releasing factor 1 receptor (CRF1R) antagonists: synthesis, binding studies and behavioral efficacy. *Bioorganic and Medicinal Chemistry Letters*. 2003 Nov; 13(22): 3997-4000. PMID: 14592493.
6. Han X, Michne JA, Pin SS, Burris K, Balanda LA, **Fung LK**, Fiedler T, Browman KE, Taber MT, Zhang J, Dubowchik GM. Synthesis, structure-activity relationships, and anxiolytic activity of 7-aryl-6,7-dihydroimidazoimidazole corticotropin-releasing factor 1 receptor antagonists. *Bioorganic and Medicinal Chemistry Letters*. 2005 Sep; 15(17): 3870-3873. PMID: 15982881.
7. Han X, Pin SS, Burris K, **Fung LK**, Huang S, Taber MT, Zhang J, Dubowchik GM. Synthesis and structure-activity relationship of imidazo[1,2-a]benzimidazoles as corticotropin-releasing factor 1 receptor antagonists. *Bioorganic and Medicinal Chemistry Letters*. 2005 Sep; 15(18): 4029-4032. PMID: 15990298.
8. Blum CA, Zheng X, Briellmann H, Hodgetts KJ, Bakthavatchalam R, Chandrasekhar J, Krause JE, Cortright D, Matson D, Crandall M, Ngo CK, **Fung L**, Day M, Kershaw M, De Lombaert S, Chenard BL. Aminoquinazolines as TRPV1 antagonists: modulation of drug-like properties through the

- exploration of 2-position substitution. *Bioorganic and Medicinal Chemistry Letters*. 2008 Aug 15;18(16):4573-7. PMID: 18662872.
9. Mattai A, **Fung L**, Bakalar J, Overman G, Tossell J, Miller R, Rapoport J, Gogtay N. Adjunctive use of lithium carbonate for the management of neutropenia in clozapine-treated children. *Human Psychopharmacology*. 2009 Oct; 24(7):584-9. PMID: 19743394.
 10. Vrudhula VM, Dasgupta B, Pin SS, Burris KD, Balanda LA, **Fung LK**, Fiedler T, Browman KE, Taber MT, Zhang J, Macor JE, Dubowchik GM. Design, synthesis and evaluation of constrained tetrahydroimidazopyrimidine derivatives as antagonists of corticotropin-releasing factor type 1 receptor (CRF1R). *Bioorganic and Medicinal Chemistry Letters*. 2010 Mar 15;20(6):1905-9. PMID: 20185312.
 11. Hardan AY, **Fung LK**, Amin H. Risperidone: Switching from brand-name to generic. *Journal of Child and Adolescent Psychopharmacology* 2010. 20(5):457-458. PMID: 20973719.
 12. Hodgetts KJ, Ge P, Yoon T, Lombaert SD, Brodbeck R, Gulianello M, Kieltyka A, Horvath RF, Kehne JH, Krause JE, Maynard GD, Hoffman D, Lee Y, **Fung L**, Doller D. Discovery of N-(1-Ethylpropyl)-[3-methoxy-5-(2-methoxy-4-trifluoromethoxyphenyl)-6-methyl-pyrazin-2-yl]amine 59 (NGD 98-2): An Orally Active Corticotropin Releasing Factor-1 (CRF-1) Receptor Antagonist. *Journal of Medicinal Chemistry*. 2011 Jun 23;54(12):4187-4206. PMID: 21618986.
 13. Hardan AY, **Fung LK**, Libove R, Obukhanych TV, Nair S, Herzenberg LA, Frazier TW, Tirouvanziam R. A randomized, placebo-controlled, double-blind trial of N-Acetylcysteine in children with autism. *Biological Psychiatry*. 2012 Jun 1;71(11):956-61. PMID: 22342106.
 14. **Fung LK**, Chahal L, Libove R, Bivas R, Hardan AY. A retrospective review of the effectiveness of aripiprazole in the treatment of sensory abnormalities in autism. *Journal of Child and Adolescent Psychopharmacology*. 2012 Jun;22(3):245-8. PMID: 22537360.
 15. **Fung LK**, Akil M, Widge A, Roberts LW, Etkin A. Attitudes toward neuroscience education among psychiatry residents and fellows. *Academic Psychiatry*. 2014 Apr;38(2):127-34. PMID: 24493359.
 16. **Fung LK**, Libove R, Phillips J, Haddad F, Hardan AY. Brief Report: An open-label study of the neurosteroid pregnenolone in adults with autism spectrum disorder. *Journal of Autism & Developmental Disabilities*. 2014 Nov;44(11):2971-7. PMID: 24849255.
 17. **Fung LK**, Akil M, Widge A, Roberts LW, Etkin A. Attitudes towards neuroscience education in psychiatry: a national multi-stakeholder survey. *Academic Psychiatry*. 2015 Apr;39(2):139-46. PMID: 25001432.
 18. Hardan AY, **Fung LK**, Frazier T, Berquist SW, Minshew NJ, Keshavan MS, Stanley JA. A proton spectroscopy study of white matter in children with autism. *Progress in Neuro-Psychopharmacology & Biological Psychiatry*. 2015 Nov 16;66:48-53. PMID: 26593330.
 19. **Fung LK**, Mahajan R, Nozzolillo A, Bernal P, Krasner A, Jo B, Coury D, Whitaker A, Veenstra-Vanderweele J, Hardan AY. Pharmacologic treatment of severe irritability and problem behaviors in autism: a systematic review and meta-analysis. *Pediatrics*. 137(s2) February 2016:e20152851. PMID: 26908468.
 20. Palner M, Beinat C, Banister S, Zanderigo F, Park J, Shen B, Hjoernevik T, **Fung L**, Chin FT. Effects of common anesthetic agents on [¹⁸F]flumazenil binding to the GABA_A receptor. *European Journal of Nuclear Medicine and Molecular Imaging Research*. 2016 Dec;6(1):80. PMID: 27826950.

Other Peer-Reviewed Articles

21. Mak M, **Fung L**, Strasser JF, Saltzman WM. Distribution of drugs following controlled delivery to the brain interstitium. *Journal of Neuro-Oncology*. 1995 Nov; 26(2): 91-102. PMID: 8787851.
22. **Fung LK**, Saltzman WM. Polymeric implants for cancer chemotherapy. *Advanced Drug Delivery Reviews*. 1997 Jul; 26(2-3): 209-230. PMID: 10837544.
23. **Fung LK**, Quintin E, Haas BW, and Reiss AL. Conceptualizing neurodevelopmental disorders through a mechanistic understanding of fragile X syndrome and Williams syndrome. *Current Opinion in Neurology*. 2012 Apr; 25(2): 112–124. PMID: 22395002. [*LKF is awarded the Miller Award for writing this paper.*]
24. **Fung LK** and Hardan AY. Autism and DSM-5: implications to patients, families, clinicians, and researchers. *Journal of Asian Psychiatry*. 2014 Oct;11:93-7. PMID: 25219947.

25. **Fung LK** and Hardan AY. Developing medications targeting glutamatergic dysfunction in autism: progress to date. *CNS Drugs*. 2015 Jun; 29(6):453-63. PMID: 26104862.
26. McGuire K, **Fung LK**, Hagopian L, Vasa RA, Mahajan R, Bernal P, Silberman AE, Wolfe A, Coury D, Veenstra-Vanderweele J, Hardan AY, Whitaker A. Irritability and problem behavior in autism spectrum disorder: a practice pathway for pediatric primary care. *Pediatrics*. 137(S2), February 2016:e20152851. PMID: 26908469.
27. **Fung LK** and Reiss AL. Moving towards integrative, multi-dimensional research in modern psychiatry: lessons learned from fragile X syndrome. *Biological Psychiatry*. 2016 Jul 15;80(2):100-11. PMID: 26868443.

Editorial

28. **Fung LK**. One step closer to shining light in humans? *Science Translational Medicine*. 23 Mar 2016: Vol. 8, Issue 331, pp. 331ec48.
29. **Fung LK**. New neural measures signal autism. *Science Translational Medicine*. 04 May 2016: Vol. 8, Issue 337, pp. 337ec73.
30. **Fung LK**. Does a mother's voice influence a child's social communication abilities? *Science Translational Medicine*. 15 Jun 2016: Vol. 8, Issue 343, pp. 343ec95.
31. **Fung LK**. A sneak peek at personalized medicine in autism? *Science Translational Medicine*. 27 Jul 2016: Vol. 8, Issue 349, pp. 349ec119.
32. **Fung LK**. Can imaging predict future suicidal behavior? *Science Translational Medicine*. 7 Sep 2016: Vol. 8, Issue 355, pp. 355ec143.
33. **Fung LK**. New genetic insights into brain size. *Science Translational Medicine*. 19 Oct 2016: Vol. 8, Issue 361, pp. 361ec166.
34. **Fung LK**. Imaging serotonin reuptake in the living brain. *Science Translational Medicine*. 30 Nov 2016: Vol. 8, Issue 367, pp. 367ec191. PMID: 27903859
35. **Fung LK**. A sterile animal model for neuroinflammation? *Science Translational Medicine*. 18 Jan 2017: Vol. 9, Issue 373, DOI: 10.1126/scitranslmed.aal4994. PMID: 28100836

Non-Peer Reviewed Journal Articles

36. Froehlich W and **Fung LK**. Autism spectrum and neurodevelopmental disorders: clinical update for psychiatrists. *Psychiatric Times*. 2012 Dec; 29(11).

Book Chapters

37. **Fung LK** and Reiss AL. Chapter 8. Genetic disorders associated with the autism spectrum disorder phenotype. In McDougle C: *Primer on Autism Spectrum Disorder*. (2016) Oxford University Press, New York, NY.
38. **Fung LK** and Hardan AY. Corpus Callosum and Autism. In Casanova M: *Autism Imaging and Devices*. CRC Press, Boca Raton, FL. *In press*.
39. **Fung LK** and Hardan AY. Chapter II.4. Oxidative Stress and the Role of N-acetylcysteine in Psychiatric Disorders. In Frye R and Berk M: *The Therapeutic Use of NAC in Medicine*. Adis Publications, Springer Healthcare, Auckland, New Zealand. *In press*.
40. **Fung LK**. Chapter 19. Autism Spectrum Disorder. In Roberts LW: *University Student Mental Health: A Guide for Psychiatrists, Psychologists, and Leaders Serving Higher Education*. American Psychiatric Association Publishing, Arlington, VA. *In press*.

Thesis and Dissertation

1. **Fung LK** (1996). *Theoretical and Experimental Pharmacokinetics of Polymer Delivery of 1,3-bis(2-chloroethyl)-1-nitrosourea (BCNU) in a Rat Brain Model*. Master's thesis, Johns Hopkins University, Baltimore, MD.
2. **Fung LK** (1998). *Pharmacokinetics and Pharmacodynamics of Chemotherapeutic Agents Released from Biodegradable Polymers in the Brain*. PhD dissertation, Cornell University, Ithaca, NY.

PRESENTATIONS

Invited lectures

1. "Carmustine distribution following Gliadel polymer implantation and interstitial release in the primate brain." Guilford Pharmaceuticals, Baltimore, Maryland. October 1996.
2. "Pharmacokinetics and pharmacodynamics of chemotherapeutic agents released from biodegradable polymers in the brain." Direct Therapeutics, White Plains, New York. November 1997.
3. "Role of biomedical engineer in drug discovery and development – an industrial perspective." Presented in Frontiers in Biomedical Engineering, Yale University, New Haven, Connecticut. March 27, 2003.
4. "Clozapine's pharmacologic uniqueness and its implications to potential adjunctive therapy for childhood onset schizophrenia." Presented in the Branch Meeting for the Child Psychiatry Branch, National Institute of Mental Health, Bethesda, Maryland. January 22, 2009.
5. "DSM-5: What does it say, what differences will it make." Presented with C. Feinstein and J. Phillips in the 6th Annual Autism Update, Stanford Autism Center at Lucile Packard Children's Hospital. June 1, 2013.
6. "Introduction to Central Nervous System Drug Discovery and Development." Presented in Biochemistry I (Chemistry 181), Stanford University, Stanford, California. November 20, 2013.
7. "The Changes in the DSM-5." Presented in the 19th Annual Autism Awareness Conference, Bakersfield, California. March 14, 2014.
8. "Neurosteroids in Neurodevelopmental Disorders." Presented in Stanford Autism Center Working Group, Stanford University, California, April 3, 2014.
9. "Mapping the 'Traffic Lights' in the Brains of Children with Autism: Clues to Better Treatment." Presented in the 8th Annual Autism Update, Stanford Autism Center at Lucile Packard Children's Hospital. April 18, 2015.
10. "Advancing Pharmacologic Treatments in Autism Spectrum Disorder." Presented in Grand Rounds, Department of Psychiatry & Behavioral Sciences, Stanford University School of Medicine. February 25, 2016.
11. "Pregnenolone Trial in Autism—a Neurosteroid Approach." Presented in the 9th Annual Autism Update, Stanford Autism Center at Lucile Packard Children's Hospital. May 7, 2016.
12. "Myths and Facts of Medication Treatments in Autism Spectrum Disorder." Presented in the "Severe Behaviors Panel" of 2016 Annual Meeting of the Autism Society of America (San Francisco Chapter), Stanford, CA. December 3, 2016.
13. "Psychiatric and Medical Challenges in Adults with Autism Spectrum Disorder." Presented in the "Accessing Health Care for Adults with Autism Panel" of the 2016 Annual Meeting of the Autism Society of America (San Francisco Chapter), Stanford, CA. December 3, 2016.
14. **Fung LK** and Lesko A. "Biology vs. Experience: The Two Sides of Autism." Podcast recorded on June 14, 2017. <https://howtoraiseamaverick.com/podcast/015-dr-fung/>
15. "Pharmacologic treatments of severe disruptive behaviors in autism." Presented in the 2017 Annual Meeting of the Autism Society of America (San Francisco Chapter), Stanford, CA. December 2, 2017.
16. "Cannabis in the treatment of autism: Are we ready?" Presented with Dr. Deb Karhson in the 2017 Annual Meeting of the Autism Society of America (San Francisco Chapter), Stanford, CA. December 2, 2017.
17. "GABAergic Neurophysiology and Socio-communicative Abilities in High-functioning Adults with Autism Spectrum Disorder". Presented in Grand Rounds, Department of Psychiatry and Behavioral Sciences, Duke University School of Medicine, Durham, North Carolina. February 22, 2018.
18. "Introduction to Neurodiversity - A prelude to the Neurodiversity at Work Program". Presented at the University Information Technology department, Stanford University, Palo Alto, CA. March 1, 2018.
19. **Fung LK**. The Stanford Neurodiversity Project. Research Workshop, 3rd Autism at Work Summit, Seattle, WA. April 24, 2018.
20. **Fung LK**. The Stanford Neurodiversity Project. NSF Convergence Workshop, Nashville, TN. June 14, 2018.
21. "GABAergic Neurophysiology and Socio-communicative Abilities in High-functioning Adults with Autism Spectrum Disorder". To be presented in the Symposium titled "Emerging Therapeutic Targets

against Autism Spectrum Disorder” in the 18th World Congress of Basic and Clinical Pharmacology, Kyoto, Japan. July 4, 2018.

Presentations with Published Abstracts

1. Strasser, J, **Fung LK**, Eller S, Grossman GA, Saltzman WM. (1995, October). Distribution of 1,3-bis(2-chloroethyl)-1-nitrosourea and tracers in the rabbit brain after interstitial delivery by biodegradable polymer implants. Oral Presentation presented at: 1995 Annual fall meeting of the Biomedical Engineering Society; Boston, MA.
2. **Fung LK**, Shin M, Strasser J, Caviston T, Sipos EP, Tyler B, Brem H, Saltzman WM. (1995, July). Transport of 1,3-bis(2-chloroethyl)-1-nitrosourea in the brain following release by a polymer. Oral Presentation presented at: International Symposium on Controlled Release of Bioactive Materials; Seattle, WA.
3. **Fung LK**, Ewend M, Sills A, Sipos E, Thompson R, Brem H, Saltzman WM. (1996, April). Polymer delivery of carmustine, 4- hydroperoxycyclophosphamide, and taxol in the monkey brain. Poster presented at: 87th Annual Meeting of the American Association for Cancer Research; Washington, DC.
4. **Fung LK**, Ewend M, Sills A, Sipos E, Thompson R, Watts M, Colvin OM, Brem H, Saltzman WM. (1996, November). Carmustine distribution following Gliadel polymer implantation and interstitial release in the primate brain. Oral Presentation presented at: First Scientific Meeting of the Society for Neuro-Oncology; Santa Fe, NM.
5. Saltzman WM, **Fung LK**. Controlled-release polymers for delivery of chemotherapy to brain tumors. *Annals of Biomedical Engineering*. 1996 Oct; 24(Suppl 1): S-23. PMID: 8954193.
6. **Fung LK**, Hilton J, Colvin OM, Saltzman WM. (1997, November). Cytotoxic effects of low-dose exposure of BCNU in human glioma cells in culture. Poster presented at: Second Scientific Meeting of the Society for Neuro-Oncology; Charlottesville, VA.
7. Saltzman WM, Belcheva N, Mahoney MJ, **Fung LK**, Haller MF. (1998, August). Polymeric delivery systems for growth factor delivery to the central nervous system. Oral Presentation presented at: American Chemical Society Annual National Meeting; Boston, MA.
8. Zuev D, Michne JA, Huang H, Schwartz W, Scola PM, James CA, Ruediger EH, Pin S, Burris KD, Balanda LA, Gao Q, Wu D, **Fung L**, Fiedler T, Browman KE, Taber MT, Zhang J, Dubowchik G. (2003, September). 2-Arylamino-4-trifluoromethyl-5-aminomethylthiazoles are high affinity corticotropin-releasing factor type 1 receptor antagonists: Parallel synthesis, binding studies and behavioral efficacy. Poster presented at: 226th ACS National Meeting; New York, NY.
9. Rajachandran L, Beretta E, Doller D, Brodbeck RM, Kinrade MB, Cheng CS, **Fung LK**, Shaw KR, Cassella JV, Krause JE. (2004, November). Efficacy of a Novel MCHR1 Antagonist in Preventing Weight Gain in Dog. Poster presented at: Annual Meeting of the North American Association for the Study of Obesity; Las Vegas, NV.
10. Han X, Michne JA, Pin SS, Ruediger E, Civiello R, Pin S, Burris K, Balanda LA, **Fung L**, Knipe J, Ren S, Wu DD, Gao Q, Huang S, Fiedler T, Browman KE, Macci R, Taber MT, Zhang J, Dubowchik GM. (2005, August). Design and synthesis of constrained imidazole as CRF1R antagonists. Poster presented at: Annual Meeting of the American Chemical Society; San Diego, CA.
11. Sprenger KJ, Aneiro L, **Fung L**, Liu Y, Changchit A, Rajachandran L, Kehne JH, Xie L. (2007, November). Clinical Trial Data Demonstrating Sedative-Hypnotic Efficacy of the $\alpha 3$ -Subunit Preferring GABA_A Receptor Partial Allosteric Activator, NG2-73 (Adiplon): Translational Validity of PK/PD Relationships Derived From Preclinical Studies. Poster presented at: Annual Meeting of Society for Neuroscience; San Diego, CA.
12. Mattai A, **Fung L**, Bakalar J, Tossell J, Miller R, Rapoport J, Gogtay N. (2009, May). Use of Lithium Carbonate in the Management of Clozapine-Induced Neutropenia in Childhood-Onset Schizophrenia. Presented at 64th Annual Scientific Convention & Meeting of the Society of Biological Psychiatry; Vancouver, BC, Canada.
13. **Fung LK**, Libove R, Hornbeak K, Chahal L, Obukhanych TV, Nair S, Goswami A, Frazier TW, Tirouvanziam R, Hardan AY. (2010, October) A Randomized, Placebo-Controlled, Double-Blind Trial of N-Acetylcysteine In Children with Autism. Presented at 57th Annual Meeting of the American

Academy of Child & Adolescent Psychiatry; New York, NY. [A news article written by Karla Gale entitled "N-Acetylcysteine Reduces Irritability in Autistic Kids: Phase II Study" covering this poster presentation was published by Reuters Health Information in www.medscape.com]

14. **Fung LK**, Lolak, S, Maldonado, JR. Upper Extremity Self-amputation and Replantation – A Case Illustrating the Traumagenic Neurodevelopmental Model of Psychotic Behavior. (2011, November 17). Presented at the Academy of Psychosomatic Medicine 2011 Annual Meeting; Phoenix, AZ.
15. **Fung L**, Akil M, Widge A, Roberts L, Etkin A. (2013, May 17) Investigating Attitudes toward Neuroscience Education in Psychiatry – The Stanford Education in Neuroscience Study (SENS). Presented at Society of Biological Psychiatry's 68th Annual Meeting, San Francisco, CA.
16. **Fung L**, Akil M, Widge A, Roberts L, Etkin A. (2013, May 18) Investigating Attitudes toward Neuroscience Education in Psychiatry – The Stanford Education in Neuroscience Study (SENS). Presented at American Psychiatry Association's 166th Annual Meeting, San Francisco, CA. [*LKF was awarded the Runner-up ribbon in Resident Poster Competition, Session on "Community Service, Curriculum Development and Educational, Psychosocial and/or Biomedical Research", for presenting this poster.*]
17. **Fung LK**, Libove R, Hardan AY. A Pilot, Open-label Study of Pregnenolone in the Treatment of Irritability in Autism Spectrum Disorder. Presented on May 14, 2014 at the International Meeting for Autism Research (IMFAR) in Atlanta, GA.
18. **Fung LK**, Pisani L, Reiss AL. Developmental Pathodynamics of Connectional Neuroanatomy in a Mouse Model of Autism Spectrum Disorder. Presented on October 25, 2014 at the Annual Meeting of the American Academy of Child & Adolescent Psychiatry in San Diego, CA.
19. **Fung LK**, Mahajan R, Nozzolillo A, Bernal P, Denton DG, Krasner A, Jo B, Coury D, Whitaker A, Veenstra-Vanderweele J, Hardan AY. Systematic Review and Meta-Analysis of Pharmacotherapies of Irritability-Aggression in Autism Spectrum Disorder. Presented on October 24, 2014 at the Annual Meeting of the American Academy of Child & Adolescent Psychiatry in San Diego, CA.
20. **Fung LK**, Whitaker A, Morton, K, Mahajan R, Bernal P, Denton DG, Coury D, Veenstra-Vanderweele J, Hardan AY. Draft Guidelines for Treating Irritability in ASD: Pharmacotherapy. Presented on October 24, 2014 at the Annual Meeting of the American Academy of Child & Adolescent Psychiatry in San Diego, CA.
21. **Fung LK**, Mahajan R, Nozzolillo A, Bernal P, Denton DG, Krasner A, Jo B, Coury D, Whitaker A, Veenstra-Vanderweele J, Hardan AY. Systematic Review and Meta-Analysis of Pharmacotherapies of Irritability-Aggression in Autism Spectrum Disorder. Presented on May 15, 2015 at the International Meeting for Autism Research (INSAR) in Salt Lake City, Utah.
22. Kwa L, Sun W, Libove R, Phillips J, Haddad F, Tanaka S, Hardan AY, **Fung LK**. Assessing the Role of Neurosteroids in the Pathophysiology and Treatment of in Autism Spectrum Disorder. August 26, 2015 at the Bio-X Interdisciplinary Initiatives Seed Grants Program Symposium.
23. **Fung LK**. Translational Neuroscience of Social Impairment: What Do Animal Models of Neurogenetic Disorders Teach Us About Autism Spectrum Disorder? Presented on October 31, 2015 at the Annual Meeting of the American Academy of Child & Adolescent Psychiatry in San Antonio, TX.
24. **Fung LK**, Sun W, Libove R, Tanaka S, Phillips J, Haddad F, Rajadas J, Hardan AY. Open-Label Study of Pregnenolone in the Treatment of Irritability in Autism Spectrum Disorder – a Post-Hoc Metabolomic Analysis. Presented on November 7, 2015 at the 1st Regional Asia Pacific IMFAR Regional Meeting in Shanghai, China.
25. **Fung LK**, Sun W, Libove R, Tanaka S, Kwa L, Phillips J, Haddad F, Rajadas J, Hardan AY. Pregnenolone in the Treatment of Irritability in Autism Spectrum Disorder – a Post-Hoc Metabolomic Analysis. December 7, 2015 at the 54th Annual Meeting of the American College of Neuropsychopharmacology in Hollywood, Florida.
26. Derar N, Alexander S, Bass D, Alcorn D, **Fung LK**, Watkins D, Rosenblatt DS, Cowan TM, Enns GM. Renal Complications in Longitudinal Evaluation of a Patient with Cobalamin G Disease. 2016 ACMG Annual Clinical Genetics Meeting. March 8-12, 2016, Tampa Convention Center, Tampa, Florida.
27. **Fung LK**, Sun W, Libove R, Tanaka S, Phillips J, Rajadas J, Hardan AY. Predicting Response to Pregnenolone Treatment of Irritability in Autism Spectrum Disorder – Preliminary Neurosteroid

- Metabolomic Analysis. Presented on May 14, 2016 at the International Meeting for Autism Research (INSAR) in Baltimore, Maryland.
28. **Fung LK**, Gu M, Leuze C, Hjoernevik T, Shen B, Park JH, Levine S, Holley D, Jung JH, Lee BC, Kim SE, Khaligi M, Gulaka P, Zaharchuk G, McNab J, Quon A, Spielman D, Chin FT. Simultaneous Acquisition of GABA_A Receptor Binding Potential by [¹⁸F]Flumazenil-PET and GABA by Magnetic Resonance Spectroscopy. Presented on July 15, 2016 at the International Symposium on Functional NeuroReceptor Mapping of the Living Brain in Boston, Massachusetts.
 29. **Fung LK**. Cortisol in Individuals with Autism Spectrum Disorder: Meta-Analysis and Systematic Review. Presented on October 29, 2016 at the Annual Meeting of the American Academy of Child & Adolescent Psychiatry in New York, NY.
 30. **Fung LK**, Gu M, Leuze C, Hjoernevik T, Shen B, Park JH, Flores R, Levine S, Holley D, Gandhi H, Park JH, Lee BC, Kim SE, Khaligi M, Gulaka P, Zaharchuk G, McNab J, Quon A, Spielman D, Chin FT. Studying GABA Neurophysiology by Simultaneous [¹⁸F]Flumazenil-Positron Emission Tomography and Magnetic Resonance Spectroscopy. Presented on December 5, 2016 at the 55th Annual Meeting of the American College of Neuropsychopharmacology in Hollywood, Florida.
 31. Parker K, Oztan O, Libove R, Sumiyoshi R, Summers J, Hinman K, **Fung L**, Motonaga K, Carson D, Phillips J, Garner J, Hardan A. Intranasal Vasopressin Treatment Improves Social Abilities in Children With Autism. Presented on December 6, 2016 at the 55th Annual Meeting of the American College of Neuropsychopharmacology in Hollywood, Florida.
 32. **Fung LK**, Flores R, Gu M, Leuze C, Hjoernevik T, Shen B, Park JH, Jung JH, Lee BC, Kim SE, McNab J, Spielman D, Chin FT. Interrogating the GABAergic System with Simultaneous [¹⁸F]Flumazenil-Positron Emission Tomography and GABA-Magnetic Resonance Spectroscopy in Healthy Volunteers. Presented on April 2, 2017 in the 13th Conference on Quantification of Brain Function with PET in Berlin, Germany.
 33. **Fung LK**, Siebert J, Hardan AY. Immune Response to Pregnenolone Treatment in Adults with Autism Spectrum Disorder – Preliminary Analysis from an Open-Label Study. Presented on May 12, 2017 at the International Meeting for Autism Research (INSAR) in San Francisco, CA.
 34. **Fung LK**, Flores R, Gu M, Hjoernevik T, Spielman D, Chin FT. Simultaneous [¹⁸F]Flumazenil-Positron Emission Tomography and GABA-Magnetic Resonance Spectroscopy in Adults with Autism and Healthy Volunteers. Presented on May 18, 2017 at the Society of Biological Psychiatry's 72nd Annual Scientific Program and Convention in San Diego, California.
 35. **Fung LK**, Flores R, Liu K, Gu M, Spielman D, Chin FT, Hardan A. Comprehensive Examination of the GABAergic System in Adults with Autism by Simultaneous [¹⁸F]Flumazenil-Positron Emission Tomography and Magnetic Resonance Spectroscopy. Presented on December 4, 2017 at the 56th Annual Meeting of the American College of Neuropsychopharmacology in Palm Springs, California.

Other Presentations

1. **Fung LK**, Arora V, Tweedie DJ. Building structure-metabolism relationships in the Neuroimmunophilin program. Poster presented at: Bristol-Myers Squibb Pharmaceutical Research Institute Annual Wallingford Scientific Symposium; Wallingford, CT. (1999, May)
2. **Fung LK**, Alberts J, Arora V, Knipe J. Serum protein binding in the HIV Integrase program. Poster presented at: Bristol-Myers Squibb Pharmaceutical Research Institute Annual Princeton Scientific Symposium; Princeton, NJ. (2000, September)
3. Alberts JJ, **Fung LK**, Curneal T, Santone K, Knipe J. A fluorescence HPLC method for measuring metabolites produced in the CYP inhibition screen. Poster presented at: Bristol-Myers Squibb Pharmaceutical Research Institute Annual Wallingford Scientific Symposium; Wallingford, CT. (2001, May)
4. **Fung LK**, Kadiyala P, Alberts JJ, Wang-Iverson D, Hansel S, Knipe J, Ball S, Sorenson M, Naidu M, Ueda Y, Bronson J. Pharmacokinetic equivalence of the diastereomers of a thiazolyl peptide. Poster presented at: Bristol-Myers Squibb Pharmaceutical Research Institute Annual Wallingford Scientific Symposium; Wallingford, CT. (2001, May)
5. **Fung LK**, Libove R, Hornbeak K, Chahal L, Obukhanych TV, Nair S, Goswami A, Frazier TW, Tirouvanziam R, Hardan AY. A Randomized, Placebo-Controlled, Double-Blind Trial of N-

Acetylcysteine In Children with Autism. Presented at Autism Research Update of the Bay Area Autism Consortium, San Francisco, CA. (2012, March 13)

6. Hardan AY and **Fung LK**. Evidence-Based Therapeutic Approaches for Treating Emotion Dysregulation and Irritability in ASD. Bi-Annual Conference of the International Society for Research on Emotion. (2015, July 8-10)
7. Panelist, "Conversations on Caretaking: A Panel Discussion with Caretakers of Individuals on the Autism Spectrum", Autism Speaks U (Stanford Chapter). Stanford, California, November 17, 2016.

RESEARCH

Active

1. Source: National Institute of Mental Health (NIMH) - K08MH111750
 Title: GABAergic Neurophysiology in Autism Spectrum Disorder
 Role: Principal Investigator
 Period covered: 09/2016 - 05/2020
 Goals: (a) Characterize the distribution of GABA_A receptors in adults with ASD using PET. (b) Determine the abnormalities in GABA levels in thalamocortical networks in adults with ASD using MRS. (c) Examine the independent and interactive effects of GABA_A receptor densities and GABA levels in the thalamus and DLPFC, on socio-communicative abilities.
2. Source: NICHD - 1R01HD091972
 Title: Intranasal Vasopressin (AVP) Treatment in Children with Autism
 Role: Co-Investigator (MPIs: Karen Parker, Ph.D.; Antonio Hardan, M.D.)
 Period covered: 07/01/2017 – 03/31/2022
 Goals: Our primary outcome measure is improvement in child social abilities as assessed by parent ratings on the social responsiveness scale (SRS-2). We will also test the safety and tolerability of AVP treatment, and whether pre-treatment blood AVP levels are a personalized predictor of treatment efficacy. Finally, we will test whether AVP treatment improves ASD symptoms as assessed by clinician impression, additional parent report measures, and child performance on laboratory tests of social cognition and communication.
3. Source: National Institute of Mental Health (NIMH) - 1R01MH110683
 Title: Robust ¹H MRSI of GABA, Glutamate, Glutamine, and Glutathione
 Role: Co-Investigator (PI: Daniel Spielman, Ph.D.)
 Period covered: 06/15/2017 - 04/30/2021
 Goals: This project aims at overcoming current methodological limitations of MRS via the systematic design, implementation, and testing of robust MM-suppressed J-edited single-voxel and multi-voxel sequences to measure GABA, glutamate, glutamine and glutathione, yielding time-efficient measurements from multiple brain regions.
4. Source: Eunice Kennedy Shriver National Institute of Child Health & Human Development (NICHD)
 Title: Cross-Species Multi-Modal Neuroimaging to Investigate GABA Physiology in Fragile X Syndrome (FXS)
 Role: Co-Investigator (PI: Frederick Chin, Ph.D.)
 Period covered: 06/2014 - 05/2019
 Goals: (a) Chart the developmental trajectories of GABA_A receptors, GABA levels, structural neuroanatomy and connective anatomy in novel mouse models of FXS. (b) Examine the effects of oxytocin on GABA levels and GABA_A receptor distribution in *Fmr1* knock-out (KO) mice and wild-type (WT) mice by multi-

modal neuroimaging (including positron emission tomography (PET) using [^{18}F]flumazenil as radiotracer, magnetic resonance spectroscopy (MRS), and structural MRI), and *ex vivo* autoradiography. (c) Compare the brain distribution of GABA_A receptors and GABA levels in young adult humans with FXS and idiopathic intellectual disability by utilizing hybrid [^{18}F]flumazenil-PET-MRS.

5. Source: Mosbacher Family Fund for Autism Research and Fung Start-up Package
 Title: Neurosteroid Metabolomics in Neurodevelopmental Disorders
 Role: Protocol Director
 Period covered: 04/01/14 – present
 Goal: Compare metabolic signatures of neurosteroids among adolescents and young adult males with autism spectrum disorder (ASD), other neurodevelopmental disorders, and typically developing controls using a metabolomic approach.

6. Source: Simons Foundation – Pilot Grant (No cost extension)
 Title: Randomized Controlled Pilot Trial of Pregnenolone in Autism
 Role: Co-Investigator; Protocol Co-director (PI: Antonio Hardan, M.D.)
 Period covered: 09/01/2015 – 08/31/2017
 Goals: (a) Demonstrate that Pregnenolone results in reduction in irritability.
 (b) Establish safety in the use of Pregnenolone in ASD.
 (c) Examine whether Pregnenolone will result in improvement in social communication and reduction of sensory abnormalities.

7. Source: National Institute of Neurological Disorders and Stroke (NINDS)
 Title: Developmental Synaptopathies Associated with TSC, PTEN and SHANK3 Mutations
 Role: Co-Investigator (PI: Mustafa Sahin, M.D., Ph.D.; PL: Antonio Hardan, M.D.)

8. Source: Stanford Center for Cognitive and Neurobiological Imaging (CNI)
 Title: Investigating the role of GABA and glutamate on dorsal anterior cingulate activity associated with hypnosis
 Role: Co-Investigator (PI: David Spiegel, M.D.; other collaborators: Danielle DeSouza, Ph.D., Nolan Williams, M.D.)

Pending

1. Source: National Institute of Mental Health (NIMH) – R01 (Application Submitted in Jun 2018)
 Title: Gender Differences in Behavioral Phenotypes And GABAergic Neurophysiology of High-Functioning Adults with Autism Spectrum Disorder
 Role: Principal Investigator
 Period covered: 04/2019 - 03/2024

Completed

1. Source: General Clinical Research Center Medical Student Scholar Program
 Role: Medical Student Scholar (Mentor: Dr. Roger Packer, Department of Neurology, Children's National Medical Center, Washington, DC)
 Period covered: Jun 2006 – Jul 2008
 Goals: (a) Created a searchable brain cancer registry with over 1000 patients seen in Children's National Medical Center between 1990 and 2006. (b) Chart review

for treatment outcomes for NF-1 associated optic glioma in children.

2. Source: National Institute of Mental Health, Bethesda, MD
 Title: Advanced Pediatric Neuropsychopharmacology
 Role: Special volunteer / medical student (Mentors: Dr. Judith Rapoport & Dr. Nitin Gogtay, Child Psychiatry Branch)
 Period covered: Nov 2008 – Apr 2009
 Goals: (a) Studied lithium treatment for clozapine-induced neutropenia. (b) Studied augmentation strategies for the treatment of childhood onset schizophrenia. (c) Literature review on drug-drug interactions in pediatric psychopharmacology, and clozapine's unique pharmacologic properties.

3. Source: Escher Family Fund at the Silicon Valley Community Foundation
 Title: A retrospective review of the effectiveness of aripiprazole in the treatment of sensory abnormalities in autism
 Role: Psychiatry resident (Mentor: Dr. Antonio Hardan, Division of Child & Adolescent Psychiatry, Stanford University)
 Period covered: Aug 2009 – Aug 2012
 Goal: Assess the effectiveness of aripiprazole in targeting sensory deficits in children and adolescents with autism.

4. Source: Escher Family Fund at the Silicon Valley Community Foundation
 Title: A randomized, placebo-controlled, double-blind trial of N-Acetylcysteine in children with autism
 Role: Psychiatry resident (Mentor: Dr. Antonio Hardan, Division of Child & Adolescent Psychiatry, Stanford University)
 Period covered: Aug 2009 – Aug 2012
 Goals: Assess the feasibility of using oral N-acetylcysteine (NAC), a glutamatergic modulator and an antioxidant, in the treatment of behavioral disturbance in children with autism.

5. Source: Escher Family Fund at the Silicon Valley Community Foundation; Mosbacher Family Fund for Autism Research
 Title: Open-label Study of Pregnenolone in the Treatment of Autism
 Role: Co-investigator (PI: Dr. Antonio Hardan, Division of Child & Adolescent Psychiatry, Stanford University)
 Period covered: Aug 2009 – May 2014
 Goals: Assess the tolerability and efficacy of pregnenolone in reducing irritability in adults with autism spectrum disorder in a pilot, open-label, 12-week trial.

6. Source: Department of Psychiatry and Behavioral Sciences, Stanford University
 Title: Stanford Education in Neuroscience Study
 Role: Protocol Investigator (Faculty sponsors: Dr. Amit Etkin, Dr. Laura Roberts; Collaborator: Dr. Mayada Akil, Georgetown University)
 Period covered: July 2011 – July 2014
 Goals: Assess the attitudes of chairs of psychiatry departments, psychiatrists, and psychiatry trainees toward neuroscience education in residency programs and beyond in order to inform future neuroscience education approaches.

7. Source: Ruth L. Kirschstein Individual Postdoctoral National Research Service Award (T-32), National Institute of Mental Health
 Title: (a) "Longitudinal MRI study of brain development in fragile X syndrome."
 (b) "Fragile X clinical and research consortium registry and repository."

- Role: Postdoctoral research scholar (Mentor: Dr. Allan L. Reiss, Center for Interdisciplinary Brain Sciences Research (CIBSR), Stanford University)
- Period covered: June 2013 – June 2014
- Goals: Characterize restricted, repetitive behaviors and striato-frontal/thalamo-frontal neuroanatomy (employing state-of-the-art MRI and diffusion tensor imaging) in children and adolescents with FXS and intellectual disability.
8. Source: Autism Speaks – Autism Treatment Network
- Title: Systematic review and development of practice pathway for the treatment of irritability, agitation and aggression (IAA) in ASD
- Role: Member, Workgroup for irritability and agitation practice pathway
- Period covered: 2012 – 2015
- Goal: (a) Perform systematic review and meta-analysis of randomized controlled trials for the pharmacologic treatments for IAA in individuals with ASD.
(b) Establish practice guidelines for the treatments for IAA in ASD.
9. Source: American Academy of Child and Adolescent Psychiatry (AACAP Pilot Research Award)
- Title: Developmental Pathodynamics of Structural and Connectional Neuroanatomy in a Mouse Model of Fragile X Syndrome
- Role: Principal Investigator
- Period covered: 08/01/13 – 07/30/16
- Goal: Characterize microstructural features of white matter tracts and structural connectivity in Fmr1 KO male mice and WT male mice at various stages of development.

TEACHING

Didactic teaching (Chemistry, Chemical Engineering & Biomedical Engineering):

1. General Chemistry, University of California, Berkeley, CA. Role: Teaching Assistant. Terms: Summer and Fall 1992.
2. Chemical Engineering Unit Operations Laboratory, University of California, Berkeley, CA. Role: Teaching Assistant. Term: Spring 1993.
3. Material and Energy Balance, Johns Hopkins University, Baltimore, MD. Role: Guest lecturer. Oct 1994.
4. Introduction of Biotechnology, Johns Hopkins University, Baltimore, MD. Role: Guest lecturer. Nov 1995.
5. Biomaterials for Drug Delivery and Tissue Engineering, Cornell University, Ithaca, NY. Role: Guest lecturer. Feb 1997.
6. Introduction to Biotechnology, Cornell University, Ithaca, NY. Role: Guest lecturer. Nov 1997.

Didactic teaching (Psychiatry & Behavioral Sciences):

1. Autism & Developmental Disabilities Clinic Meeting, Stanford University School of Medicine
 - a. "Pharmacologic Treatments in Autism Spectrum Disorders – Treatment Philosophy, Evidenced-based Treatments, and Investigational Treatments." March 16 and 30, 2015. March 7 and 14, 2016; July 18, 25, August 1, 8, and 22, 2016; July 17, 31, August 7, 2017.
 - b. "Introduction to Genetics and Neuroscience of Autism Spectrum Disorder." April 13, 20, and 27, 2015; April 11 and 18, 2016.
 - c. "Genetics of Autism Spectrum Disorder". February 12, 2018.
2. Child & Adolescent Psychiatry Fellowship Program didactics, Stanford University School of Medicine
 - a. "Advanced Psychopharmacology in Autism Spectrum Disorder." Dec 2014.

- b. "Introduction to Neuroscience of Autism Spectrum Disorder." May 24, 2017, May 2, 2018.
- 3. General Psychiatry Residency Program didactics, Stanford University School of Medicine
 - a. "Genetics and Neuroscience of Autism: Focusing on High-functioning Adults." July 9, 2015.
 - b. "Pharmacologic Treatments in Autism Spectrum Disorders: Focusing on High-Functioning Adults." August 6, 2015, January 23, 2017.
 - c. "Diagnostic Assessments, Differential Diagnoses, and Pharmacologic Treatments in Adults with Autism Spectrum Disorders." June 1, July 17, 2017, February 1 2018.
- 4. Neuropsychiatry Fellowship Program didactics, Stanford University School of Medicine
 - a. "Introduction to Autism Spectrum Disorder: Focusing on Adults." January 4, 2016.
 - b. "Introduction to Genetics and Neuroscience of Autism Spectrum Disorder." April 11 and 18, 2016.
 - c. "Diagnostic Assessments, Differential Diagnoses, Neuroscience, and Pharmacologic Treatments in Adults with Autism Spectrum Disorders." January 18 and 25, 2018.

Clinical supervision and teaching:

Pediatric Neuropsychopharmacology (NPP) Clinic

Jan 2015 – Jun 2015	Moira Kessler, M.D. (Current position: Clinical Assistant Professor, Stanford University School of Medicine)
Jan 2015 – Mar 2015	Steven Sust, M.D. (Current position: Clinical Instructor, Stanford University School of Medicine)
Jul 2015 – Jun 2016	Andrea Mann, D.O. (Current position: Clinical Associate of Psychiatry, University of Chicago School of Medicine)
Jul 2015 – Jun 2016	Steve Khachi, M.D. (Currently in private practice in Pasadena, CA)
Jul 2016 – Dec 2016	Julio Monterey, M.D., M.S. (3 rd year general psychiatry resident)
Jul 2016 – Jun 2017	Paula Tran, M.D. (Current position: Clinical Assistant Professor, University of Southern California School of Medicine)
Jul 2016 – Jun 2017	Jena Lee, M.D. (Current position: Medical Director of the Pediatric Psychiatric Consultation/Liaison Service, University of California Los Angeles School of Medicine)
Jan 2017 – Jun 2017	Jonathan Lee, M.D. (3 rd year general psychiatry resident)
Jul 2017 – Jun 2018	Shelley Tran, M.D. (2 nd year child & adolescent psychiatry fellow)
Jul 2017 – Oct 2017	Kerstin Asquith, M.D. (3 rd year general psychiatry resident)
Oct 2017 – Dec 2017	Adina Fischer, M.D., Ph.D. (3 rd year general psychiatry resident)
Jan 2018 – Jun 2018	Joanne Eun Kyung Lee, M.D. (3 rd year general psychiatry resident)

Autism & Developmental Disabilities Clinic

Jan 2015 – Apr 2015	Gillian Reiersen, M.D. (Current position: 2 nd year child & adolescent psychiatry fellow at Stanford University)
Jul 2015 – Dec 2015	Steven Storage, M.D. (Current position: 2 nd year child & adolescent psychiatry fellow at University of Southern California)
Jul 2015 – Jun 2016	Steven Sust, M.D. (Current position: Clinical Instructor, Stanford University School of Medicine)
Jan 2016 – Jun 2016	Honor Hsin, M.D., Ph.D. (Current positions: Engineer, Google Inc.; Clinical Instructor, Stanford University School of Medicine)
Jul 2016 – Dec 2016	Agnieszka Kalinowski, M.D., Ph.D. (Current position: 5 th year general psychiatry resident)

Research supervision and teaching:

Spring, Summer 2015	Lauren Kwa (Stanford University undergraduate class of 2018). Awarded Bio-X undergraduate summer research program to work on neurosteroid metabolomics in Summer 2015.)
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Spring 2015 – Spring 2016	Belinda Esqueda (Stanford University undergraduate class of 2017. Awarded Undergraduate Advising and Research grant to work on neurosteroid metabolomics in Summer 2015.)
Spring 2015 – Spring 2016	Joriene Mercado (Stanford University undergraduate class of 2018)
Summer 2016 – present	Ryan Flores (University of California Berkeley undergraduate class of 2016; Research Coordinator (Jan 2017 – present))
Spring 2017 – present	Leila Chew (Stanford University undergraduate class of 2018. Awarded Undergraduate Advising and Research grant to work on neurosteroid metabolomics in Summer 2017.)
Spring 2017 – present	Neha Konakalla (Fremont High School, class of 2018. Currently competing for IBM Watson AI XPrize on Autism Buddybot.)
Summer 2017	Kevin Liu (George Washington University undergraduate class of 2018)
Summer 2017 – present	Kelsey Wu (The Harker School, class of 2019)

SERVICE

Committees

2010-2, 2013-4, 5-6	Resident Selection Advisory Committee, Department of Psychiatry & Behavioral Sciences, Stanford University School of Medicine
2011	General Psychiatry Curriculum Committee, Department of Psychiatry & Behavioral Sciences, Stanford University School of Medicine
2012 – 2015	Member, Irritability Assessment & Treatment Subgroup, Autism Speaks – Autism Treatment Network
2016	Panel discussant, Pre-med Alumni Panel and Presentation, College of Chemistry, University of California at Berkeley (Feb 5, 2016)
2016 – present	Reviewer and Interviewer, Admissions, Doctor of Medicine program, Stanford University School of Medicine
2017 – present	Founding Chair, Special Interest Group for Neurodiversity, Stanford University
2018 – present	Co-Director of Grand Rounds / Associate Chair, CME / Grand Rounds Committee, Department of Psychiatry & Behavioral Sciences, Stanford University

National, Regional and Local Meetings

2014	Symposium Co-chair, “Irritability and Aggression in Autism Spectrum Disorder: Evidence from Characterization to Treatment.” October 24, 2014 at the Annual Meeting of the American Academy of Child & Adolescent Psychiatry in San Diego, CA.
2016 – 2018	Abstract reviewer, International Meeting for Autism Research (IMFAR) meeting
2016	Symposium Co-chair, “Anxiety in Individuals With Autism Spectrum Disorder: Clinical Assessment, Biology, and Treatments.” 2016 Annual Meeting of the American Academy of Child & Adolescent Psychiatry in New York, NY.
2016	Chair, “Accessing ASD Adult Healthcare Panel.” 2016 Annual Meeting of the Autism Society (San Francisco Chapter), Stanford, CA.
2017	Member, Working Group for the James C Harris MD Developmental Neuropsychiatry Forum, Autism & Intellectual Disabilities Committee, AACAP
2017	Judge, Podium Presentations, Stanford University Postdoctoral Association Research Symposium, October 13, 2017.
2017	Organizing Committee Member, 2017 Annual Meeting of the Autism Society (San Francisco Chapter), Stanford, CA.
2017	Chair, “Hot Topics in Health: Cannabis and Stress.” 2017 Annual Meeting of the Autism Society (San Francisco Chapter), Stanford, CA.

Manuscript Review and Editorial

2012 – present	Ad hoc reviewer, <i>Academic Psychiatry</i>
2014 – present	Ad hoc reviewer, <i>Biological Psychiatry</i>
2014 – present	Ad hoc reviewer, <i>Journal of Autism & Developmental Disabilities</i>
2015 – present	Ad hoc reviewer, <i>Journal of Psychiatric Research</i>
2015 – present	Ad hoc reviewer, <i>Molecular Autism</i>
2015 – present	Ad hoc reviewer, <i>Pediatric Drugs</i>
2015 – present	Ad hoc reviewer, <i>Psychopharmacology</i>
2015 – present	Ad hoc reviewer, <i>Journal of Pediatrics</i>
2016 – 2017	Associate Scientific Advisor, <i>Science Translational Medicine</i>
2016 – present	Ad hoc reviewer, <i>JAMA Psychiatry</i>
2016 – present	Ad hoc reviewer, <i>Clinical Medicine Insights – Pediatrics</i>
2016 – present	Ad hoc reviewer, <i>CNS Drugs</i>
2016 – present	Ad hoc reviewer, <i>Autism Research</i>
2016 – present	Ad hoc reviewer, <i>Journal of the American Academy of Child and Adolescent Psychiatry</i>
2016 – present	Ad hoc reviewer, <i>Journal of Child Neurology</i>
2016 – present	Ad hoc reviewer, <i>Biological Psychiatry – Cognitive Science & Neuroimaging</i>
2016 – present	Ad hoc reviewer, <i>Journal of Child Psychiatry</i>
2017 – present	Ad hoc reviewer, <i>Research in Autism Spectrum Disorders</i>
2017 – present	Ad hoc reviewer, <i>Journal of Neurodevelopmental Disorders</i>
2018 – present	Ad hoc reviewer, <i>Brain Connectivity</i>

Grant Application Review

2017	Reviewer, <i>Building University Infrastructure Leading to Diversity Initiative (BUILD) program (funded by the NIH)</i>
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AREAS OF SPECIAL INTEREST

- Research interests:
 - Neurobiology of autism spectrum disorder and neurogenetic diseases
 - **GABAergic physiology**
 - **Neurosteroid physiology**
 - Excitation-inhibition balance
 - Critical period mechanisms
 - Hypothalamic-pituitary-adrenal (HPA) axis
 - Biomarkers for autism spectrum disorder (ASD) and neurogenetic diseases
 - Multi-modal neuroimaging in humans with ASD and neurogenetic diseases
 - Multi-modal neuroimaging in animal models of ASD (e.g. *Fmr1* knock-out mice)
 - Metabolomics
 - Bioengineering applications in psychiatry
 - Multi-modal neuroimaging, especially integrated, simultaneous positron emission tomography, magnetic resonance spectroscopy and structural/diffusion weighted magnetic resonance imaging (PET-MRS-sMRI-DWI)
 - Targeted brain stimulation in ASD (e.g., repetitive transcranial magnetic stimulation (rTMS))
 - Pharmaceutical discovery and development for ASD and neurogenetic diseases
 - Neurosteroids (e.g. pregnenolone)
 - N-acetylcysteine
 - Vasopressin
 - Novel mechanisms modulating critical period mechanisms
 - Pharmacokinetics and drug metabolism

- Teaching interests
 - **Neuroscience in psychiatry**
 - Neuropsychopharmacology
 - Interface between chemical engineering and psychiatry
- Clinical interests:
 - Neuropsychopharmacology
 - **Neurodiversity**
 - Autistic spectrum disorder
 - Transition from adolescence to adulthood
 - Adults with ASD
 - Novel employment strategies
 - Treatments for irritability and associated aggressive behaviors
 - Neurogenetic syndromes with social deficits
 - Interventional psychiatry (e.g., rTMS)