

# KIMBERLY MULLIGAN, PhD

Associate Professor of Biological Sciences

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## Education

PhD            **Stanford University**, Stanford, CA  
2008            Developmental Biology

BS             **University of California at San Diego**, La Jolla, CA  
1999            Biochemistry and Cell Biology

## Positions & Training

Jan 2015 - current    **Assistant Professor of Biological Sciences:** California State University, Sacramento  
Courses: BIO227 Developmental Biology & Regenerative Medicine, BIO 220 Introduction to Scientific Inquiry, BIO 294A Seminar in Molecular and Cellular Biology, BIO 127 Developmental Biology, BIO121 Molecular Cell Biology, BIO2 (Laboratory) Introduction to Cells, Molecules and Genes

2014                 **Adjunct Professor of Biological Sciences:** California State University, Sacramento  
Courses: BIO186A Cell and Molecular Biology Seminar, BIO 100 Introduction to Scientific Analysis, BIO 1 (Laboratory) Biodiversity, Evolution and Ecology

2011 - 2012         **Postdoctoral Research:** University of California at San Francisco Department of Psychiatry, Center for Molecular Neurodevelopment  
Project: Functional analysis of Dixdc1, a candidate risk gene for neuropsychiatric illness, in mammalian embryonic neurodevelopment  
Advisor: Benjamin Cheyette, M.D., PhD

2008 - 2011         **Postdoctoral Research:** Stanford University Department of Developmental Biology  
Project: CIRM-funded initiative to optimize the expression and purification of Wnt proteins to mediate analysis of liposome-based stem cell studies. Advisor: Roel Nusse, PhD

2001 - 2008         **Doctoral Research:** Department of Developmental Biology, Stanford University

Dissertation: Molecular characterization of Swim, a novel Wnt binding protein that promotes long-range signaling by maintaining Wingless solubility during *Drosophila* development. Advisor: Roel Nusse, PhD

## Peer-Reviewed Publications

- 2020 Murphy LN, Nguyen K, Stryder B, Welch C, Sidhu H, Ceballos A, Chu D, Penn A, Tinsley B, Ivory-Ford I, Ghenta K, and **Mulligan K** (2019) "Developmental exposure to the environmental neurotoxicant PCB 95 causes mushroom body axon outgrowth defects in *Drosophila melanogaster*" *Science Matters* (Submitted—Under Review)
- 2020 Poston RG, Murphy LN, Rejepova A, Ghaninejad-Esfahani M, Joshua Segales J, **Mulligan K**, Saha RN (2020) "Specific ortho-hydroxylated brominated ethers inhibit neuronal MEK-ERK signaling and disrupt neurodevelopmental processes" *J. Biol. Chem.* jbc.RA119.011138. doi:10.1074/jbc.RA119.011138
- 2018 Martin PM, Stanley RE, Ross AP, Freitas AE, Moyer CE, Brumback AC, lafrati J, Stapornwongkul KS, Dominguez S, Kivimae S, **Mulligan KA**, Pirooznia M, McCombie WR, Potash JB, Zandi PP, Purcell SM, Sanders SJ, Zuo Y, Sohal VS, Cheyette BNR (2018) "DIXDC1 contributes to psychiatric susceptibility by regulating dendritic spine and glutamatergic synapse density via GSK3 and Wnt/ $\beta$ -catenin signaling" *Mol Psych*, Oct 18. doi: 10.1038
- 2017 **Mulligan KA** and Cheyette B (2017) "Neurodevelopmental Perspectives on Wnt Signaling in Psychiatry" Review. *Mol Neuropsych*, Jan 13. (2) 219-246
- 2014 Dhamdhare GR, Fang MY, Jiang J, Lee K, Cheng D, Olveda RC, Liu, B, **Mulligan KA**, Carlson J, Ranson R, Weis W, Helms J. (2014) Drugging a Stem Cell Compartment Using Wnt3a Protein as a Therapeutic. *PLoS ONE* 9(1): e83650. <https://doi.org/10.1371/journal.pone.0083650>
- 2012 **Mulligan KA** and Cheyette B (2012) "Wnt signaling in vertebrate neural development and function" Review. *J NeuroImmune Pharmacol.* Dec; 7(4) 774-87
- 2012 **Mulligan KA**, Fuerer C, Ching W, Willert K, Fish M, Nusse R (2012) "Secreted-Wingless interacting molecule (Swim) promotes long-range signaling by maintaining Wingless solubility" *Proc Natl Acad Sci USA.* Jan10;109 (2):370-7

- 2008 Nusse R, Fuerer C, Ching W, **Harnish K\***, Logan C, Zeng A, ten Berge D, Kalani Y. (2008) "Wnt signaling and stem cell control" Cold Spring Harb Symp Quant Biol. Nov (73) 59-66. Review
- 2007 **Harnish K\***, Willert K, Nusse R (2007) "Analysis of *Drosophila* Lipocalin, a putative Wnt carrier protein" Wnt Meeting  
Presentation type: Platform
- 2004 Johnson ML, **Harnish K\***, Nusse R, Van Hul W (2004) "LRP5 and Wnt signaling: a union made for bone." J Bone Mineral Research. Nov;19(11):1749-57. Review

\* Kimberly Harnish is my maiden name

## Book Chapter

- 2016 **Mulligan K** and Cheyette B (2016) "Introduction to Wnt signaling" *Inborn Errors of Development*, 3<sup>rd</sup> Edition, Oxford University Press

## Recent Selected Posters

- 2019 Welch C, Ardon-Castro A, Hu A, Lew A, Murphy L, Nguyen D, and **Mulligan K**. "The Autism-Associated Chromatin Modifier, *kismet/Chromodomain Helicase DNA Binding Protein 8*, Affects Axon Guidance and Behavioral Phenotypes in *Drosophila melanogaster*" West Coast Regional Society for Developmental Biology Meeting
- 2019 Murphy L, Chu D, Penn A, Hindi Z, Ghenta K, and **Mulligan K**. "Exposure to the Environmental Neurotoxicant Polychlorinated Biphenyl-95 Phenocopies a Common Autism Risk Gene in *Drosophila melanogaster*" West Coast Regional Society for Developmental Biology Meeting
- 2019 Tinsley B, Nguyen U, Casiquin J, Ceballos A, Chu D, Palacios Y, Sen Y, Welch C, and **Mulligan K**. "Developmental Exposure to Bisphenol-A Causes Neurodevelopmental Defects in *Drosophila melanogaster*" 32<sup>nd</sup> CSUPERB Annual Biotechnology Symposium
- 2018 Tinsley B, Palacios Y, Welch C, and **Mulligan K**. "Developmental Exposure to Bisphenol A Causes Axon Outgrowth Defects in *Drosophila melanogaster*" 77<sup>th</sup> Annual Society for Developmental Biology Meeting
- 2018 Welch C, Ardon-Castro A, Hu A, Lew A, Murphy L, Nguyen D, and **Mulligan K**. "The Autism-Associated Chromatin Modifier, *kismet/Chromodomain Helicase DNA Binding Protein 8*, Affects Axon Guidance and Behavioral Phenotypes in *Drosophila melanogaster*" 77<sup>th</sup> Annual Society for Developmental Biology Meeting

- 2018                      Nguyen D, Lew A, Hu A, Murphy L, Welch C, Crawford R, and **Mulligan K.**  
 “The Autism-Associated Chromatin Modifier, Chromodomain Helicase  
 DNA Binding Protein 8, Affects Axon Guidance and Behavioral  
 Phenotypes in *Drosophila*” CSUPERB Annual Biotechnology Symposium
- 2018                      Hindi Z, Murphy L, Ghenta K, Nguyen D, and Mulligan K **Mulligan K.**  
 “Exposure to the Environmental Neurotoxicant Polychlorinated Biphenyl-  
 95 Phenocopies a Common Autism Risk Gene in *Drosophila*  
*melanogaster*” CSUPERB Annual Biotechnology Symposium

## Awards and Fellowships

### *Teaching/Pedagogy Awards*

- 2018 – 2019            Outstanding Teaching Award (CSUS, College of Natural Sciences and  
 Mathematics)
- 2018 – 2019            Pedagogy Enhancement Award (3 unit release time; CSUS, Center for  
 Teaching and Learning)
- 2017 – 2018            Pedagogy Enhancement Award (3 unit release time; CSUS, Center for  
 Teaching and Learning)
- 2016 – 2017            Promising Practices Course Redesign with Technology Award (3 unit  
 release time; CSU Chancellor’s Office)

### *Mentorship Awards*

- 2018 - 2019            SEE Outstanding Faculty Mentor Award (CSUS, Science Educational  
 Equity Program Award)
- 2017 – 2018            Exceptional Assigned Time Committee Award (3 unit release time; CSUS,  
 Faculty Senate Subcommittee Award)

### *Research Awards*

- 2019 – 2022            NIH SCORE (SC2) Pilot Award (\$300,000; NIH Award)
- 2019 – 2020            Goethe Research Award (\$5,000; CSUS Award)
- 2019 – 2020            Instructionally Related Activities Award (\$7,500; CSUS, Associated  
 Students Incorporated Award)
- 2019 – 2020            Sac State Retirees Faculty Development Award (\$500; CSUS Award)
- 2019- 2020            Research and Creative Activities Award (\$7,500; CSUS Award)
- 2018 – 2019            Instructionally Related Activities Award (\$7,000; CSUS, Associated  
 Students Incorporated Award)
- 2018 – 2019            Research and Creative Activities Award (\$7,500; CSUS Award)
- 2018 – 2019            Goethe Research Award (\$2,500; CSUS Award)
- 2018                    Faculty Research Incentive Grant (\$2,500; CSUS Award)
- 2017 – 2018            CSUPERB New Investigator Research Award (\$15,000; CSU-wide award)
- 2017 – 2018            Research and Creative Activities Award (\$7,500; CSUS Award)

2017 – 2018	Instructionally Related Activities Award (\$5,759; CSUS, Associated Students Incorporated Award)
2017 – 2018	Goethe Research Award (\$2,500; CSUS Award)
2016 – 2017	CSUPERB New Investigator Research Award (\$15,000; CSU-wide award)
2016 – 2017	CSUPERB Travel Award (\$1,500; CSU-wide award)
2015 – 2016	Provost's Research Incentive Funds Award (\$5,000; CSUS Award)
2011 – 2012	Judith M. Ford T32 NIH Fellowship (UCSF postdoctoral training grant)
2002 – 2005	Stanford Graduate Fellowship (Stanford Doctoral Training Grant)

## Selected Seminars

2019	<i>Using Drosophila melanogaster to identify chemicals that confer risk of neurodevelopmental disorders.</i> West Coast Regional Society for Developmental Biology Conference
2019	<i>Using Drosophila melanogaster to identify chemicals that confer risk of neurodevelopmental disorders.</i> CSUPERB 31 <sup>st</sup> Annual Biotechnology Symposium.
2019	<i>Using Drosophila melanogaster to identify chemicals that confer risk of neurodevelopmental disorders.</i> Chico State University Seminar Series
2019	<i>Using Drosophila melanogaster to identify chemicals that confer risk of autism spectrum disorder.</i> CSUS Chemistry Department Seminar.
2018	<i>Using the Common Fruit Fly to Study Autism.</i> Sacramento Area Science Project—Science in the River City (an educational partnership between University of California, Davis and Sacramento State University)
2017	<i>Developing Drosophila melanogaster as a Tool to Identify Factors that Confer Risk of Autism.</i> San Francisco State University Seminar Series.
2017	<i>Using Online Learning Modules to Institute Elements of a Flipped Classroom.</i> CSUS Biological Sciences Department Seminar.

## Professional Learning Communities

2018 - current	STEM Education Research Collaborative (CSUS, NSM faculty)
2018 - 2019	Equity & Scholarship of Teaching and Learning: Demonstrating Success at Closing the Equity Gap (CSUS, Center for Teaching and Learning)
2016 - 2017	Innovations for STEM Success (CSUS, Center for Teaching and Learning)
2015 - 2016	Course Redesign with Technology (CSU Chancellor's Office)

## **Faculty Scholarship Communities**

2018 - 2019	The Collaborative Organization for Research Productivity and Sustainability (CSUS)
2018 - 2019	Translational Health-Related Research: Connecting Basic Science to Clinical Practice (CSUS)
2017 - 2018	The Collaborative Organization for Research Productivity and Sustainability (CSUS)

## **Professional Societies**

2017 - current	Faculty for Undergraduate Neuroscience (FUN)
2016 - current	Society for Developmental Biology (SDB)
2016 - current	American Society for Cell Biology (ASCB)
2016 - current	Genetics Society of America (GSA)