

Karina Vargas, PhD

The Eugene Bell Center for Regenerative Biology and Tissue Engineering
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EDUCATION AND TRAINING

2010-2014. Postdoctoral Fellow. Department of Cell Biology, School of Medicine, Yale University, New Haven. Mentors: Dr Sreeganga Chandra and Prof. Pietro De Camilli.

2005-2009: PhD in Sciences, Molecular and Cellular Biology Program, School of Medicine, Austral University of Chile. Mentor: Dr Andres Couve Correa.

1998-2004: Biology and Biochemistry B.S, Department of Science, Austral University of Chile. Mentor: Dr Carlos Gonzalez Fritz.

RESEARCH EXPERIENCE

2018-Present. Research Scientist. Eugene Bell Center for Regenerative Biology and Tissue Engineering, Marine Biological Laboratory, Woods Hole, MA.

2014-2018. Associate Research Scientist. Department of Neuroscience, School of Medicine, Yale University, New Haven.

2010-2014. Postdoctoral Fellow. Department of Cell Biology, School of Medicine, Yale University, New Haven.

PUBLICATIONS

Vargas KJ, Colosi PL*, Girardi E*, and SS Chandra. (2020) α -Synuclein facilitates clathrin assembly in synaptic vesicle endocytosis. BioRxiv, DOI: 10.1101/2020.04.29.069344. *Dr. Vargas' undergraduate mentees.

Soll LG, Eisen J, **Vargas KJ**, Medeiros AT, Hammar KM, and JR Morgan. (2020) α -Synuclein-112 impairs synaptic vesicle recycling consistent with its enhanced membrane binding properties. *Frontiers in Cell and Developmental Biology, section Molecular Medicine*. 8:405.

Vargas KJ. (2019) Kinetic measurements of endocytosis and exocytosis in cultured neurons. *Methods in Molecular Biology.* 1948:23-33.

Vargas KJ, Schrod N, Davis T*, Fernandez-Busnadiego R, Taguchi YV*, Laugks U, Lucic V and SS Chandra. (2017) Synucleins have multiple effects on presynaptic architecture. *Cell Reports.* 18:161-173. ***Dr. Vargas' undergraduate and graduate mentees.**

Vargas KJ, Makhani S, Davis T*, Whestphal C, Castillo PE and SS Chandra. (2014) Synucleins regulate the kinetics of synaptic vesicle endocytosis. *Journal of Neuroscience.* 34:9364-76. **Featured on the journal's cover. *Dr. Vargas' undergraduate mentees.**

Vargas KJ, Terenuma M, Wilkins ME, Ramirez OA, Jarauguiberry-Bravo M*, Pangalos MN, Smart TG, Moss SJ and A Couve. (2010) Prolonged activation of NMDA receptors promotes dephosphorylation and alters post-endocytic sorting of GABA_B receptors. *Proceedings of the National Academy of Sciences.* 107:13918-23. ***Dr. Vargas' undergraduate mentees.**

Ramirez OA, Vidal RL, Tello JA, **Vargas KJ,** Kindler S, Hartel S and A Couve. (2009) Dendritic assembly of heterotrimeric GABA_B receptor subunits in hippocampal neurons. *Journal of Biological Chemistry.* 284:13077-13085.

Vargas KJ, Sarmiento JM, Ehrenfeld P, Añazco CC, Villanueva CI, Carmona PL, Brenet M, Navarro J, Muller-Esterl W and CB Gonzalez. (2009) Postnatal expression of V2 vasopressin receptor splice variants in the rat cerebellum. *Differentiation.* 77:377-385.

Vargas KJ, Terenuma M, Tello JA, Pangalos MN, Moss SJ and A Couve. (2008) The availability of surface GABA_B receptors is independent of γ -aminobutyric acid but controlled by glutamate in central neurons. *Journal of Biological Chemistry.* 283:24641-24648.

MANUSCRIPTS IN PREPARATION

Vargas KJ and JR Morgan. α -Synuclein mediates AP2 recruitment to synaptic membranes. Anticipated submission, winter 2021. **Dr. Vargas is a co-corresponding author in this manuscript.**

GRANTS

2020-2022: NIH/NINDS-R03 (1R03NS116646-01A1)

Title. Roles for alpha-Synuclein in Clathrin-Mediated Synaptic Vesicle Recycling.

Role: Principal Investigator.

(Total Award \$166,000).

2007-2008: CONICYT PhD Student Grant.

Role: Principal Investigator

(Total Award ~\$14,000)

FELLOWSHIPS AND AWARDS

- 2011-2012:** Pew Latin-American Fellow in the Biological Sciences.
- 2010:** Best PhD Graduate Award, Austral University of Chile.
- 2009:** CONICYT PhD Fellowship. Stipend.
- 2008:** DID-UACH Scholarship, 48th ASCB Annual Meeting, United States.
- 2008:** Puelma-UCH Scholarship, 48th ASCB Annual Meeting, United States.
- 2008:** MECESUP Short Term Fellowship, Tufts University, United States.
- 2008:** CONICYT Scholarship, Gordon Research Conference, United States.
- 2008:** MECESUP Short Term Fellowship, University of Concepción, Chile.
- 2005-2008:** CONICYT PhD Fellowship. Graduate School tuition and stipend.
- 1998-2004:** “Presidente de la República” Undergraduate Scholarship, Chile. Stipend.
- 1998-2002:** MINEDUC Undergraduate Scholarship, Chile. Undergraduate tuition.

INVITED TALKS AND PRESENTATIONS

- 2020:** Alpha-Synuclein regulates synaptic vesicle endocytosis in health and disease. Arvinas: New Haven, United States. **Oral presentation.**
- 2017:** Synuclein modulates synaptic vesicle recycling. Symposium at DZNE: Berlin, Germany. **Oral presentation.**
- 2017:** Synuclein modulates synaptic vesicle recycling. Symposium at ENI: Gottingen, Germany. **Oral presentation.**
- 2015:** Pathological and physiological function of α -synuclein. School of Medicine, University of Chile, Santiago, Chile. **Oral presentation.**
- 2013:** Synucleins regulate the kinetics of synaptic vesicle endocytosis by acting at early steps. Department of Molecular Pharmacology and Cell Biology, Free University of Berlin, Berlin, Germany. **Oral presentation.**

CONFERENCE OR MEETING PRESENTATIONS

- 2019:** **Vargas KJ, and JR Morgan.** Synuclein regulates AP2-recruitment to the membrane. American Society for Cell Biology Annual Meeting: Washington DC, United States.

- 2019: Vargas KJ.** α -Synuclein Affects Synaptic Viability by Disturbing Synaptic Vesicle Endocytosis. MBL Flash Talk: Woods Hole, United States. **Oral presentation.**
- 2018: Vargas KJ,** Girardi E, Colosi P and SS Chandra. Synuclein modulates synaptic vesicle recycling. Society for Neuroscience Annual Meeting: San Diego, United States. **Serve as Chair of Nanosymposium “Neurotransmitter Release”. Nanosymposium talk.**
- 2018:** PL Colosi, **KJ Vargas,** EM Girardi, SS Chandra. Examining the role, localization, and dynamics of alpha-Synuclein at the synapse during endocytosis. American Society for Cell Biology Annual Meeting: San Diego, United States.
- 2018: Vargas KJ.** α -Synuclein Affects Synaptic Viability by Disturbing Synaptic Vesicle Endocytosis. MBL Flash Talk: Woods Hole, United States. **Oral presentation.**
- 2017:** Chandra SS and **KJ Vargas.** Molecular investigations into the presynaptic functions of synucleins. Society for Neuroscience Annual Meeting: Washington, United States. **Nanosymposium “Alpha-Synuclein: Models and Mechanisms”.**
- 2016: Vargas KJ,** Schrod N, Davis T, Fernandez-Busnadiego R, Taguchi YV, Laugks U, Lucic V and SS Chandra. Molecular Investigations into the Presynaptic Functions of Synucleins. American Society for Cell Biology Annual Meeting: San Francisco, United States. **Microsymposium “Regulation of the Trafficking Machinery”. Poster and Microsymposium talk.**
- 2015:** Cao X, Vargas KJ and SS Chandra. Defining the α -synuclein interactome in situ. Society for Neuroscience Annual Meeting: Chicago, United States. **Nanosymposium “Alpha-Synuclein, LRRK2 and Other Molecular Mechanisms in Parkinson’s disease”.**
- 2015: Vargas KJ,** Makhani S, Davis T, Castillo PE and SS Chandra. Pathological and physiological function of α -synuclein. Janelia Conference: The long and winding road: Neuronal trafficking in physiology and disease: Virginia, United States. **Oral presentation.**
- 2014: Vargas KJ,** Makhani S, Davis T, Castillo PE and SS Chandra. Synucleins regulate the kinetics of synaptic vesicle endocytosis by acting at early steps. Pew Annual Meeting: Costa Rica. **Oral presentation.**
- 2013: Vargas KJ,** Makhani S, Davis T, Westphal CA, Castillo PE and SS Chandra. Synucleins regulate the kinetics of synaptic vesicle endocytosis by acting at early steps. EMBO Annual Meeting: Amsterdam, Netherlands. **Poster and Flash talk.**
- 2013: Vargas KJ,** Makhani S, Davis T, Castillo PE, De Camilli P and SS Chandra. Absence of synucleins impairs synaptic vesicle endocytosis. Pew Annual Meeting: Puerto Rico.
- 2012: Vargas KJ,** Greten-Harrison B, De Camilli P and SS Chandra. Synaptic functions of

synucleins. Society for Neuroscience Annual Meeting: New Orleans, United States.

- 2012: Vargas KJ**, Greten-Harrison B, De Camilli P and SS Chandra. Synaptic functions of synucleins. Pew Annual Meeting: Panama, Panama.
- 2009: Vargas KJ**, Terenuma M, Moss S and A Couve. Glutamate changes the endocytic fate of GABA_B receptors. Chilean Society for Cell Biology Annual Meeting: Pucón, Chile.
- 2008: Vargas KJ**, Terenuma M, Tello J, Pangalos M, Moss S and A Couve. Endocytic trafficking of GABA_B receptors in central neurons. American Society for Cell Biology Annual Meeting: San Francisco, United States.
- 2008: Vargas KJ**, Terenuma M, Tello J, Pangalos M, Moss S and A Couve. The availability of surface GABA_B receptors is modulated by glutamate but not by GABA in central neurons. Chilean Society for Cell Biology Annual Meeting: Pucón, Chile.
- 2008: Vargas KJ**, Terenuma M, Tello J, Moss S and A Couve. The availability of GABA_B receptors is modulated by glutamate but not by GABA in central neurons. Gordon Research Conference: Cell Biology of the Neuron: New London, United States.
- 2007: Vargas KJ** and A Couve. Dynamin-1 is implicated in GABA_B receptor endocytosis. Chilean Society for Cell Biology Annual Meeting: Pucón, Chile.
- 2006: Vargas KJ**, Koenig-Roberts R, Ramirez O, Vidal R and A Couve. Inhibitory GABA_B receptors in Central Synapsis. III Young Scientist Meeting: Punta de Tralca, Chile.
- 2004: Vargas KJ**, Sarmiento J, Figueroa CE and CB Gonzalez. Expression of V2 Vasopressin Receptor Splice Variants in Central Nervous System. VII Research Day, Austral University of Chile: Valdivia, Chile.
- 2004: Vargas KJ**, Sarmiento J, Figueroa CE and CB Gonzalez. Expression of V2 Vasopressin Receptor Splice Variants in Central Nervous System. Chilean Society for Cell Biology Annual Meeting: Pucón, Chile.
- 2003: Vargas KJ**, Sarmiento J and CB Gonzalez. Expression of V2 Vasopressin Receptor Splice Variants in Central Nervous System. Chilean Society for Cell Biology Annual Meeting: Pucón, Chile.

TEACHING EXPERIENCE

2018: Mentor for Summer Undergraduate student in Dr. Jennifer Morgan's Laboratory, Marine Biological Laboratory, Woods Hole.

-Yohan Shane Auguste, NSF-REU student from Amherst College. Currently, Yohan is a research assistant at Cold Spring Harbor Laboratories.

2010-2017: Undergraduate and graduate student mentor in Dr. Sreeganga Chandra's Laboratory, Yale University.

-Patricia Colosi Yale NIH-Post-baccalaureate Research Education Program. Currently, Patricia is a MCB Graduate Student at University of Pennsylvania.

-Eric Girardi, Undergraduate Student at Brown University. Currently, Eric is a research assistant at Yale University.

-Beatriz Cabrera, Undergraduate Student at Yale University.

-Aurelie Nardin, Master Student at Polytech Nice Sophia Antipolis, France. Currently, Aurelie is a Preclinical Pharmacological Manager at BIOTRIAL, France.

-Kyumin Shin, Undergraduate Student UC Davis. Currently, Kyumin is a Medical Student at California Northstate University.

-Matthew Russell, Undergraduate Student. Currently, NIH Postgraduate Fellow at Yale University.

-Xiuqi Cao, Undergraduate Student at Yale University. Currently, Xiuqi is an Associate Manager at Indigo Ag.

-Yumiko Taguchi, Graduate Student at MCDB program at Yale University. Currently, Yumiko is a Medical Student at Mayo Clinic School of Medicine.

-Taylor Davis, Undergraduate Student at Yale University. Currently, Taylor is an Associate at Cravath, Swaine and Moore LLP.

2014: Teaching assistant for Biochemistry (BIOL101) and Cellular Biology (BIOL102), Yale University.

Weekly discussion session, exercise and quizzing the content of the lectures, pre-exam review session for undergrad students at Yale University.

2005: Undergraduate student mentor in Dr. Andres Couve's Laboratory, University of Chile.

-Matias Jauregui-Bravo, Undergraduate Student at University of Chile. Currently Matias is a Biomedical Sciences Graduate Student at Albert Einstein College of Medicine.

-Constanza Morales, Undergraduate Student at University of Chile. Currently, Constanza is a Biochemistry B.S. Graduate, Department of Science, University of Chile.

2000-2004: Teaching assistant for Statistic, Austral University of Chile.

Weekly discussion session, exercise and quizzing the content of the lectures, pre-exam review session for undergrad students at Austral University of Chile.

2000: Teaching assistant for Qualitative Analytical Chemistry, Austral University of Chile.
Practical class assistant.

PROFESSIONAL SOCIETIES

- Society for Neuroscience.
- American Society for Cell Biology.

LANGUAGES

- English and Spanish