

# **Gregorio Valdez, Ph.D.**

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## **EDUCATION AND EMPLOYMENT**

- 2012 – Present:       **Tenure-Track Assistant Professor**  
Virginia Tech Carilion Research Institute (VTCRI), Roanoke, VA  
Department of Biology, Blacksburg, VA  
Department of Gerontology in Medicine, Virginia Tech Carilion  
School of Medicine
- 2005 – 2012:       **Post-doctoral Fellow**  
Harvard University, Department of Molecular and Cellular  
Biology and Center for Brain Science, Cambridge, MA  
Field: Neuroscience  
Advisor: Dr. Joshua R. Sanes
- 1999-2005:       **Doctor of Philosophy**  
Stony Brook University, Department of Neurobiology and  
Behavior, Stony Brook, NY  
Field: Neurobiology and Behavior  
Advisor: Dr. Simon Halegoua
- 1993-1996:       **Undergraduate Research**  
Lehman College/CUNY, Department of Biology  
Field: Plant Genetics  
Advisor: Dr. Elli Wurtzel
- 1992-1996:       **Bachelor of Science**  
Lehman College/CUNY, Department of Biology  
Major: Biochemistry

## **HONORS AND AWARDS**

- 2015:               **March of Dimes – Distinguished Honoree**  
Signature Chefs Auction, Roanoke, VA
- 2011-2012:       **Finalist for “Earl Stadtman Investigators” Search**  
NIH, Bethesda, MD.
- February 2010:   **Underrepresented Minority Scholarship**  
Keystone Symposia

- 2007-2010: **Post-Doctoral Fellowship**; F32 (Ruth L. Kirschstein National Research Service Awards, NIH/NINDS) to examine the Molecular basis of age-related synaptic alterations.
- May 2006: **Carl Storm URM Fellowship**  
Gordon Research Conference
- 1993-1996: **Undergraduate Fellowships**; Minority Biomedical Research Support (MBRS) (NIH/NIGMS).

## TEACHING, ADVISING AND MENTORING

- Present: **Advisory Committee**  
Sunseok Lee, Graduate Thesis, Virginia Tech  
Aboozar Monavarfeshani, Graduate Thesis, Virginia Tech  
Alicia Kerr, Graduate Thesis, Virginia Tech  
Arbour Danielle, Graduate Thesis, University of Montreal, Canada
- 2014:  
**Tech** **Committee Member for New Graduate Program, Virginia**  
Planning Committee for Development, Aging and Repair Track
- 2005-2012: **Board of Tutors in Biochemical Sciences**  
Harvard University, Cambridge, MA
- 2009-2012: **Mentor for the Neuroscience Scholars Program**  
Society for Neuroscience
- 2000-2001: **Teaching assistant in Human Physiology**  
Stony Brook University, Stony Brook, NY
- 1999-200: **Teaching Assistant in Animal Physiology**  
Stony Brook University, Stony Brook, NY

## SCIENTIFIC MEMBERSHIP AND SERVICE

Editorial Board for the Gerontology Journal: Biological Sciences

Ad hoc reviewer for the following journals:

PLoS ONE  
Journal of Experimental Biology and Medicine  
PNAS  
JoVE  
Gerontology Journal: Biological Sciences

Early Career Reviewer on Aging Systems and Geriatrics Study Section, NIH

Faculty Search Committee, Virginia Tech Carilion Research Institute

Member of Society for Neuroscience (Current)

## PUBLICATIONS

1. Vaughan S, Kemp Z, Hatzipetros T, Vieira F, **Valdez G.**, (2015). Degeneration of proprioceptive sensory nerve endings in mice harboring amyotrophic lateral sclerosis-causing mutations. *J Comp Neurol.* 2015 Jul 2. doi: 10.1002/cne.23848.
2. Dittmar W.J., McIver L., Michalak P., Garner H.R., **Valdez, G.**, (2014), EvoCor: a platform for predicting functionally related genes using phylogenetic and expression profiles. *Nucleic Acid Research.*
3. **Valdez, G.**, Hayer, M.P., Feng, G., Sanes, J. R., (2014). The role of muscle microRNAs in repairing the neuromuscular junction. *PLOS ONE.* \*  
Corresponding Author.
- 4.
5. Samuel MA, **Valdez G**, Tapia JC, Lichtman JW, Sanes JR. Agrin and synaptic laminin are required to maintain adult neuromuscular junctions. *PLoS One.* 2012;7(10):e46663. doi: 10.1371/journal.pone.0046663. Epub 2012 Oct 3.
6. **Valdez G**, Tapia JC, Lichtman JW, Fox MA, Sanes JR. Shared resistance to aging and ALS in neuromuscular junctions of specific muscles. *PLoS One.* 2012;7(4):e34640. Epub 2012 Apr 2.
7. Philippidou P, **Valdez G**, Akmentin W, Bowers WJ, Federoff HJ, Halegoua S. Trk retrograde signaling requires persistent, Pincher-directed endosomes. *Proc Natl Acad Sci U S A.* 2010 Dec 27.
8. Carlson SS, **Valdez G**, Sanes JR. Presynaptic calcium channels and alpha3-integrins are complexed with synaptic cleft laminins, cytoskeletal elements and active zone components. *J Neurochem.* 2010 Aug 21.
9. **Valdez G**,\* Tapia JC\*, Kang H\*, Clemenson GD Jr, Gage FH, Lichtman JW, Sanes JR. Attenuation of age-related changes in mouse neuromuscular synapses by caloric restriction and exercise. *Proc Natl Acad Sci U S A.* 2010 Aug 17;107(33):14863-8. (\* Contributed equally to this work)
10. Williams AH\*, **Valdez G\***, Moresi V, Qi X, Richardson JA, Elliott JL, Bassel-Duby R, Sanes JR, Olson EN. Regulation of Neuromuscular Synapse

- Regeneration by microRNA 206. *Science*. 2009 Dec 11;326(5959):1549-54. (\* Contributed equally to this work)
11. Proszynski TJ, Gingras J, **Valdez G**, Krzewski K, Sanes JR. Podosomes are present in a postsynaptic apparatus and participate in its maturation. *Proc Natl Acad Sci U S A*. 2009 106:18373-8.
  12. Bonanomi D, Fornasiero EF, **Valdez G**, Halegoua S, Benfenati F, Menegon A, Valtorta F. Identification of a developmentally-regulated pathway of membrane retrieval in neuronal growth cones. *J Cell Sci*. 2008 121:3757-69.
  13. Nishimune H, **Valdez G**, Miner JH, Sanes JR. Laminins promote postsynaptic maturation by an autocrine mechanism at the neuromuscular junction. *J Cell Biol*. 2008 182:1201-15.
  14. **Valdez G**, Philippidou P, Rosenbaum J, Akmentin W, Shao Y., Halegoua S. Trk-signaling endosomes are generated by Rac-dependent macroendocytosis. *Proc Natl Acad Sci U S A*. 2007 104:12270-5.
  15. **Valdez G.**, Akmentin W., Kuruvila R., Ginty D. D., Halegoua S. Trk macroendocytosis mediates retrograde axonal signaling. *J Neurosci*. 2005 25:5236-47.
  16. Kuruvilla R, Zweifel LS, Glebova NO, Lonze BE, **Valdez G**, Ye H, Ginty DD. A neurotrophin signaling cascade coordinates sympathetic neuron development through differential control of TrkA trafficking and retrograde signaling. *Cell*. 2004 118:243-55.
  17. Wang S, Liu Y, Adamson CL, **Valdez G**, Guo W, Hsu SC. The mammalian exocyst, a complex required for exocytosis, inhibits tubulin polymerization. *J Biol Chem*. 2004 279:35958-66.
  18. Shao Y, Akmentin W, Toledo-Aral JJ, Rosenbaum J, **Valdez G.**, Cabot JB, Hilbush BS, Halegoua S. Pincher, a pinocytic chaperone for nerve growth factor/TrkA signaling endosomes. *J Cell Biol*. 2002 157:679-91.
  19. Wurtzel, E.T., **Valdez, G.**, and Matthews, P.D. (1997) Variation in expression of carotenoid genes in transformed E. coli strains. *Bioresearch Journal* 1: 1-11.
  20. Wurtzel ET, Li Z-h, Luo R, Matias D, Mozoub D, Matthews PD, Upasani VN, **Valdez G**, Yoganathan A, Yu J.1996. Research towards improvement of the provitamin A (carotenoid) content of rice endosperm. *International Rice Research Notes* 21, 43-44.

## SELECT PRESENTATIONS

1. Valdez, G., The role of synaptic molecules in motor neuron and muscle diseases. Barcelona, Spain 2014.

2. Valdez, G., Cellular and molecular changes associated with aging neuromuscular synapses. American Society for Neurochemistry, Long Beach, CA 2014
3. Valdez, G., Discovering molecules that protect synapses from the ravages of aging. Virginia local SFN chapter meeting in Richmond, 2014.
4. **Valdez G.,** Lifestyle and molecular factors that maintain and repair peripheral synapses. Georgia Regents University, Georgia, 2013.
5. **Valdez G.,** Combating neurological diseases and aging by targeting synapses. Department of Statistics, Virginia Tech, 2013.
6. **Valdez G.,** The role of synaptic molecules in diseases of the nerve and muscle. UFMG, Brazil, 2013.
7. **Valdez G.,** Influence of peripheral connections on the initiation and progression of ALS. Brazilian Society for Neuroscience, Brazil, 2013.
8. **Valdez G.,** Structural and Molecular Neuromuscular Changes Induced by Aging and Age-related Diseases NIA Workshop: Age-related Changes in Neuromuscular Junction. Bethesda, DC, 2013.
9. **Valdez, G.,** Molecular mechanisms that maintain and repair neuromuscular junctions. Children's National Medical Center, 2013.
10. **Valdez G.,** The role of synaptic molecules in motor neuron and muscle diseases. Virginia Tech/Dept. of HNFE, Blacksburg VA, 2013.
11. **Valdez G.,** Brain School: How brains grow and age. VTCRI, 2013.
12. **Valdez G.,** Brain Power: The role of exercise and diet in maintaining healthy synapses. Jefferson College of Health Sciences, 2013.
13. **Valdez G.,** Using sensory neurons to screen for therapeutics for ALS. Virginia Tech/Center for Drug Discovery, Blacksburg VA, 2013.
14. **Valdez G.,** Evidence from Animal Models: Effects of Aging and Lifestyle Factors on Motor Synapses. GSA meeting 2012; the Central Nervous System, and Mobility in Older Adults workshop, Evidence on Changes in the Central Nervous System, Control of Movement Across the Lifespan and in Aging.
15. **Valdez G.,** Protecting neuromuscular synapses from the ravages of aging and Lou Gehrig's disease. Neurolunch, Harvard University, 2010.
16. **Valdez G.,** Molecular and structural changes in aging and ALS-afflicted neuromuscular junctions. Harvard NeuroDiscovery Center Journal Club, Massachusetts General Hospital, 2010.

17. **Valdez G**, Tapia JC, Kang H, Clemenson GD Jr, Gage FH, Lichtman JW, Sanes JR. Attenuation of age-related changes in mouse neuromuscular synapses by caloric restriction and exercise. Keystone Symposia, 2010.
18. **Valdez G.**, Williams A., Olson E., Sanes JR. Regulation of Neuromuscular Synaptic Maturation and Reinnervation by microRNA-206. Society for Neuroscience, 2008.
19. Proszynski T., Gingras J., **Valdez G.**, McCann C., Krzewski K., Sanes JR. A podosome-like organelle implicated in synaptic maturation at the neuromuscular junction. Society for Neuroscience, 2008.
20. Halegoua S., Philippidou P., **Valdez G.**, Shao Y., Akmentin W., Rosenbaum J., Neurotrophin Endosomes: Signaling in Time and Space. Amer Soc. for Neurochem, 2008.
21. **Valdez, G.** Pincher-mediated macroendocytosis underlies retrograde signaling by neurotrophin receptors. Herbert H. Lehman College, Bronx, NY, 2005.
22. **Valdez, G.** Pincher mediates formation and trafficking of Trk signaling endosomes in neurons. Neuroscience meeting, New Orleans, 2004.
23. **Valdez G.**, A novel endocytic mechanism regulates neurotrophin endocytosis and signaling. Graduate presentation, Stony Brook University, 2003.
24. Nyame V., Akmentin W., **Valdez G.**, Halegoua S. Pincher Mediates Internalization and Transport of Neurotrophin Signaling Endosomes. AGEP meeting, Stony Brook University, 2003.
25. **Valdez, G.**, Matthews, P.D., Wurtzel, E.T. Variation in the accumulation of carotenoids in E. coli strains. Maize Genetics Conference, Chicago, Illinois, 1996.
26. Wurtzel, E.T. Li, Z., Luo, R.\*, Matias, D., Mozoub, D., Matthews, P.D., Upasani, V., **Valdez, G.**, Yoganathan, A., Yu, J. (1995) Research towards improvement of the pro-vitamin A (carotenoid) content of rice endosperm. Second Annual Science Poster Session, The Graduate School and University Center, The City University of New York. Nov. 1, 1995. (poster presenter)
27. Wurtzel, E.T., Matthews, P.D., Yoganathan, A., Yu, J., Li, Z., Luo, R., Upasani, V., Matias, D., Mozoub, D., and **Valdez, G.** (1995) Regulation of carotenoid biosynthesis in maize endosperm. Maize Genetics Conference, March 16-19, 1995, Asilomar, California. (talk)
28. Matthews, P. D., Yu, J., Li, Z., Yoganathan, A., **Valdez, G.**, Basile, M., and Wurtzel, E. T. (1995) Higher plant homologs of bacterial phytoene desaturase. Maize Genetics Conference, March 16-19, 1995, Asilomar, California. (poster)

29. Yoganathan, A., Li, Z., Luo, R., Matias, D., Mozoub, D., Matthews, P.D., Upasani, V., **Valdez, G.**, Yu, J, and Wurtzel, E.T. (1995) Research towards improvement of the pro-vitamin A (carotenoid) content of rice endosperm. International Symposium on engineering plants for commercial products and applications. October 1-4, 1995, Lexington, Kentucky. (posterpresenter)
30. Wurtzel, E.T., Li, Z., Luo, R., Matias, D., Mozoub, D., Matthews, P.D., Upasani, V., **Valdez, G.**, Yoganathan, A., and Yu, J. (1995) Research towards improvement of the pro-vitamin A (carotenoid) content of rice endosperm. Third International Rice Genetics Symposium, October 16-29, 1995, Manila, Philippines. (poster)
31. **Valdez, G.**, Matthews, P.D., Yu, J., Yoganathan, A., Li, Z., Wurtzel, E.T. Localization of bacterial phytoene desaturase homologs in plants. National Institute of General Medical Sciences Minority Programs Symposium, Atlanta, Georgia, November 3-7, 1993.

## Research Support

### ACTIVE

- |   |  |
|---|--|
| <p>5K01NS085071-02 (PI: Valdez)<br/>         6.0 calendar<br/>         NIH/NINDS</p>  | <p>09/20/2013 – 08/31/2016<br/><br/>         \$209,863 Annual Direct</p> |
| <p><b>Role of Target-derived FGFs in Maintaining and Repairing Synapses</b><br/>         In this project, the goal is to investigate the function of growth factors in aging NMJs and in the initiation and progression of ALS. In addition to the training opportunities, the proposed experiments could lead to new therapeutic targets and approaches for protecting the motor system.</p> |  |
| <p>1DP7OD018428-01 (PI: M. Friedlander)<br/>         0.12 calendar<br/>         NIH/OD</p>  | <p>09/20/2013 – 08/31/2018<br/><br/>         \$225,777 Annual Direct</p> |
| <p><b>Mentorship and Development Program for Biomedical Trainees</b><br/>         The proposed program will provide early professional development and guidance, as well as networking experiences for biomedical trainees, such that they may efficiently identify and succeed along directed career paths.<br/>         Role: Faculty Collaborator</p>                                      |  |
| <p>16-6 (PI: W. Santos)<br/>         0.01 calendar<br/>         Virginia Center on Aging</p>  | <p>07/01/2015 - 06/30/2016<br/><br/>         \$20,000 Annual Direct</p>  |
| <p><b>Controlling neuronal sphingosine-1-phosphate as Alzheimer's disease therapy</b><br/>         The primary goal of this project is to determine whether inhibition of sphingosine-1-phosphate kinase is sufficient to prevent death of culture hippocampal pyramidal neurons under stress conditions, similar to that found in Alzheimer's afflicted brains.<br/>         Role: Co-I</p>  |  |
| <p>1R56AG051501-01 (PI: Valdez)<br/>         5.28 calendar</p>  | <p>09/30/2015 – 08/31/2016</p>   |

NIH/ NIA

\$234,049 Annual Direct

**Synaptic FGFs are required and sufficient to maintain and repair aged NMJs**

This proposal could lead to new molecular targets for developing therapeutic interventions to protect and repair the neuromuscular junction, and thus slow, prevent or even reverse aging of the motor system.