Clark Allen Lindgren

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Professional Preparation:

1985-1989	Postdoctoral Fellowship (Neurophysiology). Duke University. Durham, North Carolina. (Advisor: John W. Moore, Ph.D.)
1982-1985	Ph.D. (Physiology). University of Wisconsin. Madison, Wisconsin. (Advisor: Dean O. Smith, Ph.D.)
1980-1982	M.S. (Physiology). University of Wisconsin. Madison, Wisconsin.
1976-1980	B.S. (Physics). Wheaton College. Wheaton, Illinois.

Professional Appointments

2012-	Patricia A. Johnson Professor of Neuroscience. Grinnell College, Grinnell, Iowa.
2006-	Professor. Department of Biology, Grinnell College. Grinnell, Iowa.
2000-2002	Chair, Department of Biology, Grinnell College, Grinnell, Iowa.
1998-1999	Visiting Scientist, Department of Zoology & Genetics, Iowa State University.
1996-1998	Chair, Department of Biology, Grinnell College, Grinnell, Iowa.
1996-2006	Associate Professor. Department of Biology. Grinnell College. Grinnell, Iowa.
1992-1996	Assistant Professor. Department of Biology. Grinnell College. Grinnell, Iowa.
1989-1992	Assistant Professor. Department of Biology. Allegheny College. Meadville, PA.
1985-1989	Research Associate. Department of Physiology/Neurobiology. Duke University.

Administrative Duties:

2022-	Chair of the Faculty, Grinnell College
2017-2019	Neuroscience Concentration, Chair
2015-2019	Health Professions Advisory Committee, Co-Chair
2014-2019	Institutional Animal Care and Use Committee (IACUC), Chair
2010-2012	Neuroscience Concentration, Chair
2010-2012	Health Professions Advisory Committee, Co-Chair
2008-2010	Chair, Science Division, Grinnell College. Grinnell, Iowa.
2008-2010	Executive Council (Faculty Advisory Committee to the President and Dean)
2007-2008	College Personnel Committee
2006-2009	Interdisciplinary Fellow, Grinnell College Expanding Knowledge Initiative
2001-2005	College Personnel Committee (Science Division Representative, 2001-3)
1993-2005	Health Professions Advisory Committee, Grinnell College (Chair: 1996-98, 99-00)
1993-1996	Institutional Review Board, Grinnell College (Chair: 1994-1995)
1993-1997	Summer Research Committee, Grinnell College
1993-1996	Bowen Hall of Science Addition & Renovation Committee, Grinnell College
1990-1992	Health Professions Advisory Committee, Allegheny College (Co-Chair, 1991-1992)

Honors and Fellowships:

2022	Award for Education in Neuroscience from the Society for Neuroscience
2022	Biology Faculty Mentor Award (advanced career) from the Council for Undergraduate Research – Biology Division.
2015	Iowa Professor of the Year (Council for the Advancement and Support of Education and the Carnegie Foundation for the Advancement of Teaching)
1995	Harris Faculty Fellowship (Grinnell College): a competitive, year-long, pre-tenure research leave
1987	Sigma Xi Travel Award (Duke University Chapter).

1986	Grass Fellowship in Neurophysiology. Marine Biological Laboratory, Woods Hole, Massachusetts.
1982	Trainee, Cellular and Molecular Biology Training Grant.
1980	Graduated *Magna Cum Laude*. Wheaton College. Wheaton, Illinois.

Publications (student authors are indicated with an asterisk):

I. Articles

Khondamir Imomnazarov*, Sarah E. Torrence*, and Clark A. Lindgren (2023). Reduced Plasma-Membrane Calcium ATPase Activity and Extracellular Acidification Trigger Presynaptic Homeostatic Potentiation at the Mouse Neuromuscular Junction. *Neuroscience* **532**: 103–112. https://doi.org/10.1016/j.neuroscience.2023.09.014

Yiyang Zhu*, Claire I.C. Warrenfelt*, Jill C. Flannery*, and Clark A. Lindgren (2021). Extracellular protons mediate presynaptic homeostatic potentiation at the mouse neuromuscular junction. *Neuroscience* **467:** 188-200. https://doi.org/10.1016/j.neuroscience.2021.01.036

Emily M. Kozik*, Elaine M. Marzluff, and Clark A. Lindgren (2021). Evidence of NAAG-family tripeptide $NAAG_2$ in the *Drosophila* nervous system. *Journal of Neurochemistry* **156**: 38-47. https://doi.org/10.1111/jnc.15173.

Stephen X. Zhang*, Elaine M. Marzluff, and Clark A. Lindgren (2021). Quantitative determination of nitric oxide from tissue samples using liquid chromatography – mass spectrometry. *MethodsX* **8**: 101412. https://doi.org/10.1016/j.mex.2021.101412

John S. Wang*, Danica Bojovic*, Yang Chen* and Clark A. Lindgren (2018). Homocysteine sensitizes the mouse neuromuscular junction to oxidative stress via nitric oxide. *NeuroReport* **29:** 1030-1035. doi: 10.1097/WNR.0000000000001073

Clark A. Lindgren, Zachary Newman*, Jamie J. Morford*, Steven B. Ryan, Kathryn A. Battani*, and Zheng Su* (2013). Cyclooxygenase-2, PGE_2-glycerol, and nitric oxide are involved in muscarine-induced presynaptic enhancement at the vertebrate neuromuscular junction. *Journal of Physiology* **591**: 4749-4764.

Clark A. Lindgren and David Lopatto (2013). An Introductory Biology Course that involves every student in authentic research. *CUR Quarterly on the Web*, Summer 2013 edition.

Kathryn K. Walder*, Steve B. Ryan, Tomasz Bzdega, Rafal T. Olszewski, Joseph H. Neale, and Clark A. Lindgren (2013). Immunohistological and electrophysiological evidence that N-acetylaspartylglutamate (NAAG) is a co-transmitter at the vertebrate neuromuscular junction. *European Journal of Neuroscience* **37**: 118-129.

Clark A. Lindgren (2010). Teaching Matters: Turning Biology Education Upside Down. *Chronicle of Higher Education*, **56** (35), A27.

Clark A. Lindgren (2010). Teaching by Doing: Turning a Biology Curriculum Upside Down. *Skeptic Magazine* **15** (4), 35-37.

Zachary Newman*, Priya Malik*, Tse-Yu Wu*, Christopher Ochoa*, Nayantara Watsa* and Clark A. Lindgren (2007). Endocannabinoids mediate muscarine-induced synaptic depression at the vertebrate neuromuscular junction. *European Journal of Neuroscience* **25**, 1619-1630.

Austin R. Graves*, Katherine A. Lewin*, and Clark A. Lindgren (2004). Nitric oxide, cAMP and the biphasic muscarinic modulation of ACh release at the lizard neuromuscular junction. *Journal of Physiology* **559**, 423-432.

Clark A. Lindgren, Dennis G. Emery, & Philip G. Haydon (1997). Intracellular acidification reversibly reduces endocytosis at the neuromuscular junction. *Journal of Neuroscience* **17**: 3074-3084.

Clark A. Lindgren & Melissa V. Laird* (1994). Nitroprusside inhibits neurotransmitter release at the frog neuromuscular junction. *NeuroReport* **5**. 2205-2208

Clark A. Lindgren and John W. Moore (1991). Calcium current in motor nerve endings of the lizard. In: *Calcium Entry and Action at the Presynaptic Nerve Terminal*. E.F. Stanley, D. Triggle, and M. Nowycky, Eds. Proceedings of the New York Academy of Sciences Vol. 635. Pp. 58-69.

Clark A. Lindgren& John W. Moore (1989). Ionic currents at presynaptic nerve endings of the lizard and their relationship to neurotransmitter release. *Journal of Physiology* **414**: 201-22.

Kathleen Dunlap, George G. Holz, Clark A. Lindgren, and John W. Moore (1989). Calcium channels that regulate neurosecretion. In: *Secretion and Its Control*. Clay M. Armstrong and Gerry S. Oxford, Eds. The Rockefeller University Press: New York. Pp. 239-250.

Clark A. Lindgren and Dean O. Smith (1987). Extracellular ATP modulates calcium uptake and transmitter release at the neuromuscular junction. *Journal of Neuroscience 7*: 1567-1573.

Clark A. Lindgren and Dean O. Smith (1986). Increased presynaptic ATP levels coupled to synaptic activity at the crayfish neuromuscular junction. *Journal of Neuroscience* **6**: 2644-2652.

Dean O. Smith and Clark A. Lindgren (1986). Modulation of presynaptic transmitter release by ATP derived from postsynaptic sources. In: *Calcium, Neuronal Function and Transmitter Release*, B. Katz and R. Rahamimoff, Eds. Martinus Nijhoff Publ: Boston. Pp. 357-374.

Clark A. Lindgren, Dennis J. Paulson, and Michael F. Shanahan (1982). Isolated cardiac myocytes. A new cellular model for studying insulin modulation of monosaccharide transport. *Biochimica et Biophysica Acta* **721***:* 385-393.

II. Recent Abstracts of Presentations:

Sarah Torrence*, Khondamir Imomnazarov* & Clark A. Lindgren (2022). Evidence that protons mediate presynaptic homeostatic potentiation at the mouse neuromuscular junction. *Society for Neuroscience Abstracts* **48***,* 609.08.

John Wang* & Clark A. Lindgren (2018). Homocysteine sensitizes the mouse neuromuscular junction to oxidative stress via nitric oxide. *Society for Neuroscience Abstracts* **44***,* 52.05.

Yang Chen* & Clark A. Lindgren (2017). Homocysteine suppresses evoked neurotransmission and sensitizes the mouse neuromuscular junction to mild oxidative stress, as observed by a decrease in spontaneous neurotransmitter release, by activating NMDA receptors. *Society for Neuroscience Abstracts* **43**, 135.22.

Michael Fitzpatrick*, Allexandra Byrne * & Clark Lindgren (2015). Using complement-mediated cell ablation to characterize the role of perisynaptic Schwann cells at the vertebrate neuromuscular junction. *Society for Neuroscience Abstracts* **41***,* 394.08.

Clark Lindgren, Chris Kaiser-Nyman* & Jay Dreier* (2013). Perisynaptic glia mediate muscarine-induced enhancement of neurotransmitter release at the vertebrate neuromuscular junction. *Society for Neuroscience Abstracts* **39***,* 427.15.

Xingjie Zhang*, Elaine Marzluff & Clark A. Lindgren (2012). A simple and highly sensitive technique to quantitatively measure nitric oxide released from biological samples using liquid chromatography-mass spectrometry (LCMS). *Society for Neuroscience Abstracts* **38***,* 299.13.

Jamie Morford*, Steve Ryan & Clark Lindgren (2012). The calcium-sensing receptor (CaSR) is present at the vertebrate neuromuscular junction and may play a role in homeostatic control of neurotransmitter release. *Society for Neuroscience Abstracts* **38***,* 46.18.

Kathryn Walder*, Steve Ryan, Tomasz Bzdega, Rafal Olszewski, Joseph Neale & Clark Lindgren (2011). Localization and utilization of N-acetylaspartylglutamate as a neurotransmitter at the lizard neuromuscular junction. *Society for Neuroscience Abstracts* **37***,* 345.17.

Xingjie Zhang*, Kathryn Walder*, Elaine Marzluff & Clark A. Lindgren (2011). N-Acetylaspartylglutamate (NAAG) induces a biphasic effect on nitric oxide levels at the neuromuscular junction of the lizard. *Society for Neuroscience Abstracts* **37***,* 40.20.

Clark A. Lindgren, Zheng Su* & Kathryn A. Battani* (2010). PGE_2-glycerol, a metabolite of the endocannabinoid 2-arachidonyl glycerol, enhances neurotransmitter release at the vertebrate neuromuscular junction via activation of the TRPV1 receptor. *Society for Neuroscience Abstracts* **36***,* 549.14.

Katie Battani*, Zheng Su*, and Clark Lindgren (2009). The role of cyclooxygenase-2 (COX-2) in synaptic modulation at the vertebrate neuromuscular junction. *Society for Neuroscience Abstracts* **35***,* 422.15.

Zachary Newman* and Clark A. Lindgren (2006). Endocannabinoid signaling mechanisms at the vertebrate neuromuscular junction. *Society for Neuroscience Abstracts* **32***,* 631.12.

Clark A. Lindgren, Charles H. Sullivan, and D. E. Lopatto (2005). Total Immersion Biology: A course that engages first-year undergraduate students in cell biology research. *The Molecular Biology of the Cell* **16**, 1652.

Katherine A. Lewin*, Austin R. Graves*, and Clark A. Lindgren (2005). The distribution of M1 and M3 muscarinic receptors and CB1 cannabinoid receptors at the lizard neuromuscular junction. *The Molecular Biology of the Cell* **16**, 562.

Charles H. Sullivan, Clark A. Lindgren, Jonathan M. Brown, and David E. Lopatto (2002). The student as scientist: a first course in biology at Grinnell College. *9th National Conferrence of the Council on Undergraduate Research, Connecticut College, New London, CT* .

Clark A. Lindgren and Kendra M. Young* (2002). The inhibition of ACh release by muscarinic agonists at the neuromuscular junction requires nitric oxide synthesis. *Society for Neuroscience Abstracts 28.*

Fred H. Bahls and Clark A. Lindgren (2000). Introducing students to bioethics: a self-contained module in three sessions. *Society for Neuroscience Abstracts 26,* 44.

Grants:

Currently under review – "Investigating the role of pH in presynaptic homeostatic potentiation at the vertebrate neuromuscular junction." Academic Research Enhancement Award (AREA grant) from the National Institutes of Health (R15NS139201-01). Total Project Period: 5/1/2025 – 4/30/2028. Total Project Award (Direct Costs): $375,000.

Principal Investigator – "Acquisition of a laser scanning confocal microscope for use in research and teaching in the Biology, Chemistry and Physics Departments at Grinnell College." Major Research Instrumentation – National Science foundation (Award # 2216359). Start Date: 10/1/2022. Total Project Award: $499,553.00.

Co-Principal Investigator – "FaCE-ing the challenges of neuroscience education at primarily undergraduate institutions." FACE grant – Associated Colleges of the Midwest. Total Project Period: 6/1/18 - 6/1/20. Total Project Award: $ 19,402.

Co-Principal Investigator – "MRI: Acquisition of an Infrared (IR) Fluorescence Imager." Major Research Instrumentation – National Science foundation (Award # DBI-1428384). Total Project Period: 8/1/14 - 7/31/17. Total Project Award: $ 61,815.

Principal Investigator – "Unconventional Synaptic Modulation at the Vertebrate Neuromuscular Junction." Academic Research Enhancement Award (AREA grant) from the National Institutes of Health (R15NS072735-02). Total Project Period: 4/1/2014 – 3/31/2018. Total Project Award (Direct Costs): $300,000.

Principal Investigator – "Unconventional Synaptic Modulation at the Vertebrate Neuromuscular Junction." Academic Research Enhancement Award (AREA grant) from the National Institutes of Health (R15NS072735-01). Total Project Period: 9/1/2010 – 3/31/2014. Total Project Award (Direct Costs): $250,000.

Co-Principal Investigator – MRI: "Acquisition of Mass Spectrometry Instrumentation for Chemistry and Biology Research." Major Research Instrumentation – National Science foundation (Award # 0923422). Total Project Period: 8/01/09 – 7/31/2012. Total Project Award: $428,295

Project Director – Howard Hughes Medical Institute Undergraduate Science Education Grant. Total Project Period: 9/1/04 – 8/31/09. Total Project Award: $1,400,000.

Co-Principal Investigator – MRI: "Acquisition of a Quantitative Microscopy Workstation for Neuroscience and Developmental Biology Research." Major Research Instrumentation – National Science Foundation (Award # 0521031). Total Project Period: 8/15/05 – 7/31/08. Total Project Award: $158,878.

Co-Principal Investigator – "Reform of Undergraduate Biology Education: Biological Inquiry and Integrative Biology." Course, Curriculum, and Laboratory Improvement-National Science Foundation (DUE-9950289). Total Project Period: 6/1/99-5/31/03. Total Project Award: $75,000.

Co-Principal Investigator – "The New Science Project: A Division-Wide Introductory Science Reform Effort." Institution-Wide Reform of Undergraduate Education – National Science Foundation (DUE-9652147). Total Project Period: 8/1/96 – 7/31/99. Total Project Award: $196,883.

Principal Investigator – "Computer-Based Laboratory Exercises and Research Experience in Physiology." Instrumentation and Laboratory Improvement Grant – National Science Foundation (DUE-9352901). Total Project Period: 7/15/93 – 12/31/95. Total Project Award: $43,677 (plus 100 % matching funds).

Principal Investigator – "Presynaptic Mechanisms of Neurotransmitter Release." Academic Research Enhancement Award (AREA grant) from the National Institutes of Health (R15 NS29520-01). Total Project Period: 3/1/91 – 12/31/94. Total Project Award (Direct Costs): $75,000.

Co-Principal Investigator – "Physiology of Excitable Membranes." National Institutes of Health (NS 03427-28). Total Project Period: 9/25/88 – 8/31/92. Total Project Award: $495,024.

Undergraduate Student Research Collaborators: (90)

Joseph Lissanti. 1990. A study of ATP release and its possible neuromodulator effect at the neuromuscular junction (NMJ) of the lizard, *Anolis carolinensis*.

Theresa K. Foster. 1990. Computer simulation of the lizard nerve terminal at the *ceratomandibularis* muscle.

R. Daniel Mellon. 1990. The effects of Lambert-Eaton Myasthenic Syndrome antibodies on the NMJ of *Anolis carolinensis*.

Richard Houghtling. 1991. Onset of Lambert-Eaton Myasthenic Syndrome (LEMS) and synaptic facilitation in the NMJ of *Anolis carolinensis*.

Jody R. Brumagin. 1991. Levels of nerve growth factor (NGF) in the ceratomandibularis muscle and its motor nerve in the male and female *Anolis carolinensis*.

Shernaaz Kapadia. 1991. Sexual dimorphism in the presynaptic nerve terminal of the lizard, *Anolis carolinensis*."

Vicki R. Kopf. 1991. Lambert-Eaton Myasthenic Syndrome: its site of attack at the NMJ of *Anolis carolinensis*.

Gregory R. Murray. 1991. An investigation of the neuromodulator effects of catecholamines at the NMJ of the lizard, *Anolis carolinensis*..

Eric Jason Eross. 1991. An experimental investigation of the role of membrane depolarization in neurotransmitter release at the NMJ of the lizard, *Anolis carolinensis*.

Darin S. Gogstetter. 1991. The effect of quinolinic acid on glutamate mediated signal transmission within the crayfish NMJ.

J. Josh Lawrence. 1991. The role of high-affinity choline uptake in synaptic potentiation.

Gerald Orban. 1991. Effects on synaptic plasticity of the opener muscle preparation of *Procambarus clarkii* as a result of pericardial organ and sinus gland neuromodulatory agents.

Brian M. Sullivan. 1991. Synaptic facilitation in *Anolis* lizards.

Terry Buckwalter. 1991. The effects of nitric oxide on the frog NMJ.

Melissa Laird. 1992, 1993. Sodium nitroprusside inhibits neurotransmitter release at the frog NMJ.

Anne Yesley. 1993. Are the inhibitory effects of sodium nitroprusside, nitroglycerin and hydroxylamine on end-plate potentials concentration -dependent?

Joe Mattern. 1993. Determination of a physiological role for nitric oxide at the frog NMJ.

Heidi Picken. 1993. Characterization of the effects of SNP on the End-plate potentials of the ceratomandibularis muscle in *Anolis carolinensis*.

Jeff Lahti. 1994. The effects of arachidonic acid on the frog NMJ.

Jeff Wirtz. 1994. Effects of nitric oxide on the glutamatergic synapse of the crayfish.

Evan Fertig. 1995. Neuraminidase further resolves dual effects of calcium on miniature end-plate potential frequency at frog NMJs.

Kathleen Eagan. 1995. Synaptic depression at the frog NMJ.

Maithelee Menezes. 1995. Characterization of Ca-activated potassium currents in the lizard NMJ.

Mary Johnson. 1997. The effect of ruthenium red on spontaneous neurotransmitter release at the frog neuromuscular junction is ambiguous.

JunSeok Lee. 1997. Ruthenium red induces a reversible, positive shift of negative surface potential at the frog NMJ.

Dhruv Mallick. 1997. A delay in recovery of synaptic vesicle recycling upon application of bisindolylmalemide suggests protein kinase C involvement in endocytosis.

Craig Alpha. 1997. An electron microscopic study of synaptic vesicle depletion and recovery following intracellular acidification at the lizard NMJ.

Rick Heineman. 1999. Modulation of post-tetanic depression by perisynaptic Schwann cells at the frog NMJ.

Amy Bailey. 1999. Muscarinic acetylcholine receptor agonists and ATP decrease Ca^{2+} concentration in the lizard motor nerve terminal.

Elizabeth Paesch. 2001. Low and High Concentrations of Oxotremorine Similarly Depress End Plate Potentials at the *Cutaneous Pectoris* Neuromuscular Junction of *Rana pipiens*

Kendra Young Harris. 2000 & 2001. Glial Cells: chaperoning the synapse?

Gerald Walther. 2001 & 2002. A synaptic rundown in low Ca^{2+} solution questions the interpretation of oxotremorine-M's and DEANO's effect at the lizard NMJ.

Barbara Lake. 2002. Glial cells play an active role in the regulation of Acetylcholine release from neurons in the vertebrate peripheral nervous system: should we rethink the role of glial cells in vertebrate central nervous system functions?

Kristen Kessler & Courteney McKuen. 2003. KB-R7943, an inhibitor of Na^{+}-Ca^{2+} exchange in reverse mode, reduces paired-pulse facilitation at the crayfish NMJ.

Austin Graves. 2002&2003. Nitric Oxide is Necessary but not sufficient for Biphasic Muscarinic Effects at the Lizard NMJ.

Erin Conboy. 2002&2003. Detecting Nitric Oxide at the Lizard Neuromuscular Junction.

Priya Malik. 2003&2004. Pre-application of muscarine prevents the delayed enhancement but not the muscarine-induced reduction in synaptic transmission at the lizard NMJ.

Katie Lewin Tschida 2003&2004. Localization of m1,m2, and m3 muscarinic acetylcholine receptors, m2/m3 metabotropic glutamate receptors, and nitric oxide synthase at the lizard NMJ.

Tse-Yu "Eric" Wu. 2004. Localization of CB1 (cannabinoid) receptors at the lizard NMJ.

Laura Dobbs. 2004. The effects of muscarine and the cannabinoid agonist, ACPA, on the evoked Ca increase in lizard motor nerve terminals.

Chrisopher Ochoa, 2005**.** 2-arachidonoylglycerol is a ligand of the CB_1 receptor at the lizard NMJ.

Nayantara Watsa, 2005, Involvement of the nitric oxide – cGMP – PKG pathway in the modulation of neurotransmitter release by endocannabinoids.

Zach Newman, 2005&2006. Endocannabinoid signaling mechanisms at the vertebrate NMJ.

Katie Battani, 2007-2009**.** Localization of M1-M3 Muscarinic Acetylcholine Receptors at the Lizard NMJ. Is COX-2 required for M1-mediated synaptic enhancement?

Will Olson, 2007-2009. M2 and M3 receptors mediate muscarine-induced inhibition at the frog NMJ. Does the muscle action potential modify synaptic plasticity?

Adam Dorzweiler, 2007. Seasonal variations may influence the muscarine-induced biphasic modulation of neurotransmitter release at the lizard NMJ.

Xingni Xie, 2008. N-acetylaspartylglutamate (NAAG) at the lizard NMJ.

Courtney Smith, 2008&2009. The physiological relevance of endocannabinoid-mediated synaptic modulation at the lizard NMJ.

Zheng Su, 2009-2010. PGE_2-G, a product of the cyclooxygenation of 2-AG, enhances neurotransmitter release at the lizard neuromuscular junction.

Sarah Evans, 2009. The role of NO in neuromuscular fatigue in the *Ceratomandibularis* muscle of *Anolis carolinensis*.

Zhaoying Xu, 2009. Developing an ATP luminescence assay to measure synaptic vesicle exocytosis at the vertebrate neuromuscular junction.

Kathryn Walder, 2010, 2011. The role of glial cells and N-Acetylaspartylglutamate (NAAG) in automodulation at the vertebrate neuromuscular junction.

Stephen Zhang, 2010. The prevalence and role of kiss-and-run at the lizard neuromuscular junction. 2011, 2012. N-Acetylaspartylglutamate modulates nicotine induced nitric oxide release at the lizard neuromuscular junction.

Christopher Barbey, 2010. The role of perisynaptic Schwann cells in short-term synaptic modulation.

Jamie Morford, 2011, 2012. Localization of the Calcium-Sensing Receptor (CaSR) at the Vertebrate neuromuscular Junction.

John "Jay" Dreier, 2012, 2013. Complement-mediated ablation of PSCs at the lizard NMJ

Chris Kaiser-Nyman, 2012. Glial cells are necessary for the muscarine-induced delayed enhancement of neurotransmitter release at the neuromuscular junction.

Kaya Matson, 2014. Gliobiology Research: measuring cyclooxygenase expression in lizard and mouse perisynaptic Schwann cells.

Erica Kwiatkowski, 2014. An immunohistological study of endocannabinoids at the mouse NMJ.

Alexandra Byrne, 2014. The function of PSCs in synaptic depression at the lizard NMJ.

Michael Fitzpatrick, 2014, 2015. A comparison of the efficacy of antibodies HNK-1 and 2A12 in complement-mediated ablation of PSCs at the lizard NMJ. 2016. The effect of PSC ablation on synaptic depression.

Talora Martin, 2014. The effect of endocannabinoid receptor agonists and antagonists on synaptic transmission at the mouse NMJ.

Gabrielle Mercado, 2014. The localization of the endocannabinoid CB_1 receptor and synthetic enzyme diacylglyceral lipase-α at the mouse NMJ.

Samantha McConnell, 2015. Electrochemical detection of nitric oxide at the lizard NMJ.

Lacy Murray, 2015. Observing perisynaptic Schwann cell morphology as a function of muscle fiber type at the mouse NMJ.

Yang Chen, 2015, 2016. The facilitating effect of TrkB receptor activation on endocannabinoid actions at the mouse NMJ. Homocysteine sensitizes the mouse NMJ to mild oxidative stress.

Shanaz Daneshdoost, 2015. Quantifying the expression of COX-2 at the mouse NMJ in response to the activation of muscarinic acetylcholine receptors.

Andrea Baumgartel, 2016. Exploring the role of endocannabinoids at the soleus muscle of the mouse.

Fraol Galan, 2016. Exploring a role for nitric oxide in synaptic homeostasis at the *Drosophila* larval neuromuscular junction.

Noah Mozell, 2016. Using immunofluorescence to localize nitric oxide synthase at the *Drosophila* larval neuromuscular junction

Jamie Schafroth, 2016. Examining the role of carbon monoxide at the *Drosophila* larval neuromuscular junction.

Ryan Betters, 2017. Determining the cellular source of nitric oxide synthase (NOS) at the Drosophila larval neuromuscular junction using the GAL4-UAS system to knock down NOS expression in specific cell types using RNAi.

Danica Bojovic, 2017. Using immunofluorescence to localize the NMDA receptor at the mouse NMJ.

John Wang, 2017, 2018. Determining whether nitric oxide synthase is required for the effects of long-term homocysteine exposure at the mouse NMJ. Seeking the retrograde signal responsible for synaptic homeostasis at the mouse NMJ.

Sam Dahlke, 2018. Examining the role of Nitric Oxide on presynaptic homeostasis at the Drosophila larval neuromuscular junction.

Andrew Moy, 2018. Examining presynaptic homeostasis at the frog neuromuscular junction.

Emily Kozik, 2019. Using immunohistochemistry and tandem LC-MS spectroscopy to detect N-acetylaspartylglutamate (NAAG) in the nervous system of *Drosophila melanogaster*.

Jill Flannery, 2019. Localizing N-acetylaspartylglutamate (NAAG) in the mouse neuromuscular junction using immunofluorescence.

Yiyang ("Reus") Zhu, 2019. Extracellular protons play a role in presynaptic homeostatic potentiation at the mouse neuromuscular junction.

Claire Warrenfelt, 2019, 2020. Acid-sensing ion channel is essential for presynaptic homeostasis at the mouse neuromuscular junction.

Avery Cardeiro, 2021. The subtype composition and localization of ASICs at the mouse neuromuscular junction.

Neil Israni, 2021. Expressing super ecliptic pHluorin fused to α-bungarotoxin in yeast.

Khondamir Imomnazarov, 2021, 2022. The effect of strong pH buffers on presynaptic homeostatic potentiation at the mouse neuromuscular junction.

Sarah Torrence, 2021, 2022. The effect of extracellular pH on synaptic transmission at the mouse neuromuscular junction.

Erin Hernandez, 2022. Measuring the sensitivity of FP-NO to nitric oxide donors using fluorimetry.

Jamie Lee, 2022. Using FP-NO to investigate the kinetics and stoichiometry of NO release from commonly used NO-donors.

Samikshya Pokharel, 2023. Uncovering the mechanism of presynaptic homeostatic potentiation (PHP) at the vertebrate neuromuscular junction: exploring the role of the PMCA.

Nora O'Prey, 2023. Measuring pH in the synaptic cleft of mouse neuromuscular junctions using the fusion protein SEP-BTX.

Madeline Fialkov, 2023. Identification and localization of proteins involved in presynaptic homeostatic potentiation at the mouse neuromuscular junction.

Essi Adokou, 2024. Investigating succinylcholine's unique blocking action at the vertebrate neuromuscular junction.

Mahiro Noda, 2024. Examining the effect of transient acidification on neurotransmitter release at the mouse neuromuscular junction.