

Pioneering Neuroscience

Volume 15; December 2015



THE GRINNELL
JOURNAL OF
NEUROPHYSIOLOGY

PIONEERING NEUROSCIENCE

VOLUME 15, DECEMBER 2015

Contents

iii Introduction

ORIGINAL ARTICLES

- 1 Inhibiting cGMP and elevating NO levels do not affect post-tetanic potentiation at the crayfish neuromuscular junction
Kai Gui, Shudi Pan, and Michellie Thurman
- 7 AP5 and CNQX decrease post-tetanic potentiation at the crayfish neuromuscular junction
Charlotte Love, Amelia Cogan, and Allison Hartman
- 13 Ruthenium red does not affect paired-pulse facilitation at the crayfish neuromuscular junction
Henry Jantzen, Jimin Tan, and Juliet Torres
- 17 Argireline decreases EPSP amplitude over time, and increases paired-pulse facilitation in a dose-dependent manner
Ashley Kang, Andrew Shults, and Yuanqui Zhao
- 25 Inhibiting reverse-mode operation of the Na⁺/Ca²⁺ exchanger does not affect long-term facilitation in crayfish neuromuscular junction
Sophie Banegas, Savanna Biedermann, and Ashley Wehrenberg
- 31 Methyl-beta-cyclodextrin induced cholesterol depletion facilitates synaptic transmission at the crayfish neuromuscular junction
Maria Venneri, Kai Vorhies, and Andrew Zdechlik
- 37 Serotonin does not increase the EPSP amplitude and IP₃ does not decrease the EPSP amplitude in *Orconectes* neuromuscular junction
Yufei Wang, Danica Bojovic, and Lysimachos Papoutsis
- 41 Group II and III mGluR-linked paired-pulse facilitation is unaffected by agonist NAAG but possibly increased by LY-341,495 block
Katie McDonald, Mira Lamb, and Yijun Xiong

Information on this journal can be accessed at:

<http://www.grinnell.edu/neuroscience/>

Typeset, printed and bound by Grinnell College, Grinnell, IA 50112, USA.

© 2015, Grinnell College

It is my pleasure to present the fifteenth volume of *Pioneering Neuroscience: The Grinnell Journal of Neurophysiology*. The articles collected in this volume represent original contributions to the field of neuroscience offered by students of Biology 150: Introduction to Biological Inquiry - The Language of Neurons. As has been true for the fourteen previous classes of The Language of Neurons, most of these students were in their first semester in college. For all of the students, this was their first college-level biology course!

The articles in this volume explore several themes in neural communication: the involvement of the several glutamate receptors in the production of EPSPs, the roles of SNARE proteins in paired-pulse facilitation, and a variety of means through which intracellular calcium concentration regulation affects synaptic plasticity. As usual, all of this was done using the wonderful model system of the crayfish neuromuscular junction. I hope you enjoy this volume and trust you will be as impressed as I am with what these students have accomplished in such a short time.

We wish to thank the students of Biology 150 for their hard work and collegiality. None of this would have been possible without the assistance of Jason Parks, lab instructor, and the excellent work of mentors Gabby Mercado '16 and Takahiro Omura '17.

The cover picture was downloaded from <http://voices.nationalgeographic.com/files/2014/02/weird-state-symbols-1-s2048x1365-p.jpg>.

Nancy Rempel-Clower, Editor
December, 2015
Grinnell, Iowa