

Curriculum Vitae

January, 2012

| NAME | POSITION TITLE |
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| Bjoern Ch. Ludwar, Ph.D. | Assistant Professor of Neuroscience |

| INSTITUTION AND LOCATION | DEGREE | YEAR(s) | FIELD OF STUDY |
|---------------------------------|--------------|---------|------------------------|
| University of Erlangen, Germany | | 1992-93 | Electrical Engineering |
| University of Erlangen, Germany | (BS) | 1994-96 | Biology |
| University of Erlangen, Germany | Diploma (MS) | 1996-99 | Zoology |
| University of Cologne, Germany | Doctorate | 1999-03 | Neurophysiology |
| University of Ohio | Postdoctoral | 2003-05 | Neurophysiology |
| Mt. Sinai School of Medicine | Postdoctoral | 2005-10 | Neurophysiology |

Positions and Employment

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| 1999 - 2003 | University of Cologne, Zoological Institute Laboratory of Dr. A. Büschges Research Assistant and Teaching Assistant for Animal Physiology |
| 2003 - 2005 | University of Ohio, Department of Biological Sciences Laboratory of Dr. R.A. DiCaprio Postdoctoral Fellow |
| 2005 - 2010 | Mt. Sinai School of Medicine, Department of Neurobiology Laboratories of Dr. E.C. Cropper and Dr. K.R. Weiss Postdoctoral Fellow |
| 2009 – 2010 | Phase V Communications Scientific Supervisor |
| 2010 – present | Mt. Sinai School of Medicine, Department of Neurobiology Assistant Professor of Neuroscience Course Coordinator in the Graduate Program |

Teaching

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| 2011 – | Chemical Senses in course <i>Principles of Neurobiology: Systems Neuroscience</i> |
| 2011 – | Introduction to Imaging Techniques to Study Cell Physiology in course <i>Cellular Physiology and Ion Channels</i> |
| 2011 – | small group leader Cardiovascular System and Respiration in the <i>Medical Physiology Lab</i> |

Professional Memberships

- 2000 – Deutsche Neurowissenschaftliche Gesellschaft e.V.
- 2007 – Member Society for Neuroscience

Fellowships

- 1998 Fulbright Travel Grant
- 1998 Fellowship of the University of Kansas
- 2001 Fellowship of the Boehringer Ingelheim Fonds
- 2001 Fellowship of the Marine Biological Laboratory
- 2008 Molluscan Neuroscience Travel Award

Publications (peer-reviewed articles)

- Jing J., Sasaki K., Perkins M.H., Siniscalchi M.J., Ludwar B.C., Cropper E.C., Weiss K.R. (2011) Coordination of distinct motor structures through remote axonal coupling of projection interneurons. *J. Neurosci.* 31(43):15438-49.
- Evans C. G., Ludwar B. C., Askanas J., Cropper E. C. (2011) Effect of holding potential on the dynamics of homosynaptic facilitation. *J Neurosci.* 31(30):11039-43.
- Evans C. G., Ludwar B. C., Kang T., Cropper E. C. (2011) Effect of presynaptic membrane potential on electrical vs. chemical synaptic transmission. *J Neurophysiol.* 106(2):680-9.
- Jing J., Sweedler J. V., Cropper E. C., Alexeeva V., Park J.-H., Romanova E. V., Xie F., Dembrow N. C., Ludwar B. C., Weiss K. R., Vilim F. S. (2010) Feedforward compensation mediated by the central and peripheral actions of a single neuropeptide discovered using representational difference analysis. *J Neurosci* 30: 16545-58.
- Friedman A. K., Zhurov Y., Ludwar B. Ch., Weiss K. R. (2009) Motor outputs in a multitasking network: relative contributions of inputs and experience-dependent network states. *J Neurophysiol* 102 (6): 3711-27.
- Ludwar B. Ch., Evans C. G., Jing J., Cropper E. C. (2009) Two distinct mechanisms mediate potentiating effects of depolarization on synaptic transmission. *J Neurophysiol* 102 (3): 1976-83.
- DiCaprio R. A., Billimoria C. P., and Ludwar B. Ch. (2007) Information rate and spike-timing precision of proprioceptive afferents. *J Neurophysiol* 98(3): 1706-17.
- Akay T., Ludwar B. Ch., Göritz M. L., Schmitz J. and Büschges A. (2007) Segment Specificity of Load Signal Processing Depends on Walking Direction in the Stick Insect Leg Muscle Control System. *J Neurosci* 27: 3285-3294.
- Evans C. G., Ludwar B. Ch., and Cropper E. C. (2007) A mechanoafferent neuron with an inexcitable somatic region: Consequences for the regulation of spike propagation and afferent transmission. *J Neurophysiol* 97: 3126-3130.

- Ludwar B. Ch., Westmark S., Büschges A., and Schmidt J. (2005) Modulation of membrane potential in mesothoracic moto- and interneurons during stick insect front leg walking. *J Neurophysiol* 94: 2772-2784.
- Brandt L. S. E., Ludwar B. Ch., and Greenfield M. D. (2005) Co-Occurrence of Preference Functions and Acceptance Thresholds in Female Choice: Mate Discrimination in the Lesser Wax Moth. *Ethology* 111: 609-625.
- Ludwar B. Ch., Göritz M. L., Schmidt J. (2005) Intersegmental coordination of walking movements in stick insects. *J. Neurophysiol.* 93(3): 1255-65.
- Büschges A., Ludwar B. Ch., Bucher D., Schmidt J., DiCaprio R. A. (2004) Synaptic drive contributing to rhythmic activation of motoneurons in the deafferented stick insect walking system. *Eur J. Neurosci.* 19(7): 1856-62.

Publications (thesis)

- Ludwar B. (2003) Neural mechanisms for intersegmental coordination of walking movements in the stick insect. Online: <http://kups.ub.uni-koeln.de/volltexte/2003/923/> (Ph.D. Dissertation)
- Ludwar B. (1999) Behavioral studies on the sexual preferences in the lesser waxmoth (*Achroia grisella*). Online: <http://www.opus.ub.uni-erlangen.de/opus/volltexte/2006/372/pdf/Ludwar99.pdf> (Diploma Dissertation)

Publications (conference abstracts, posters, and talks)

- B. C. Ludwar & E. C Cropper (2011) Optical imaging of intracellular calcium during homosynaptic facilitation. Society for Neuroscience 41th Annual Meeting, Washington, DC.
- C. G. Evans, B. C. Ludwar, J. Askanas, E. C. Cropper (2011) Effect of holding potential on homosynaptic facilitation. Society for Neuroscience 41th Annual Meeting, Washington, DC.
- J. Jing, K. Sasaki, M. Perkins, M. Siniscalchi, B. C. Ludwar, E. C. Cropper, K. R. Weiss Coordination of distinct motor structures through remote axonal coupling of projection interneurons. Society for Neuroscience 41th Annual Meeting, Washington, DC.
- B. C. Ludwar & E. C. Cropper (2010) Enhancement of sensorimotor transmission following a burst of afferent activity. Society for Neuroscience 40th Annual Meeting, San Diego.
- C. G. Evans, B. C. Ludwar, E. C. Cropper (2010) Multiple forms of short term synaptic plasticity determine synaptic transmission between a mechanosensory afferent and a motor neuron. Society for Neuroscience 40th Annual Meeting, San Diego.

- J. Jing, J. V. Sweedler, E. C. Cropper, V. Alexeeva, J.-H. Park, E. V. Romanova, F. Xie, N. C. Dembrow, B. C. Ludwar, K. R. Weiss, F. S. Vilim (2010) Feedforward compensation mediated by the central and peripheral actions of a single neuropeptide discovered using representational difference analysis. Society for Neuroscience 40th Annual Meeting, San Diego.
- B. C. Ludwar (2009) Two Distinct Mechanisms That Regulate Stimulus Detection in a Model Organism. Invited talk at the "Microelectrode and Multielectrode Recording Techniques" Satellite Event at the Society for Neuroscience 39th Annual Meeting, Chicago.
- B. C. Ludwar, C. G. Evans, E. C. Cropper (2009) Single spike induced alterations of intracellular calcium in a sensory neuron. Society for Neuroscience 39th Annual Meeting, Chicago.
- C. G. Evans, B. C. Ludwar, T. Kang, E. C. Cropper (2009) Characteristics of peripherally applied stimuli determine spike propagation in the Aplysia mechanoafferent B21. Society for Neuroscience 39th Annual Meeting, Chicago.
- B. Ch. Ludwar, C.G. Evans, J. Jing, E.C. Cropper (2009) Simulated motorprogram induced depolarizations increase the intracellular calcium concentration of Aplysia mechano afferent B21. Molluscan Neuroscience Meeting, San Juan, PR.
- B. C. Ludwar, C. G. Evans, J. Jing, E.C. Cropper (2008) Simulated motor program induced depolarizations increase the intracellular calcium concentration of an afferent neuron. Society for Neuroscience 38th Annual Meeting, Washington DC
- M. R. Due, B. C. Ludwar, E. C. Cropper, K. R. Weiss (2008) Synaptic depression and the loss of the program-generating ability of interneuron B65 in Aplysia. Society for Neuroscience 38th Annual Meeting, Washington DC
- B. Ch. Ludwar, C. G. Evans, E. C. Cropper (2008) 'All or none' and graded mechanisms regulate sensorimotor transmission in the same afferent neuron. Talk at the 34th East Coast Nerve Net Meeting, Woodshole, Massachusetts.
- C. G. Evans, B. C. Ludwar, T. Kang, E. C. Cropper (2007) Effect of variable spike propagation on peripheral encoding in an experimentally advantageous invertebrate mechanoafferent. Society for Neuroscience 37th Annual Meeting, San Diego
- B. C. Ludwar, C. G. Evans, E. C. Cropper (2007) 'All or none' and graded mechanisms regulate sensory signals in the same afferent neuron. Society for Neuroscience 37th Annual Meeting, San Diego
- A. Friedman, Y. Zhurov, B. Ludwar, K. R. Weiss (2007) Peptidergic contributions to the state dependant outputs of the *Aplysia* feeding CPG. Society for Neuroscience 37th Annual Meeting, San Diego
- T. Akay, B. C. Ludwar, M. Goeritz, A. Bueschges, J. Schmitz (2006) Segment specificity of load signal processing depends on walking direction in the stick insect leg muscle control system. Society for Neuroscience 36th Annual Meeting, Atlanta

- B. C. Ludwar, C. G. Evans, E. C. Cropper (2006) Regulation of spike propagation in a sensory neuron with an inexcitable somatic region: Somatic depolarization promotes conduction without disrupting the peripheral encoding of afferent information. Society for Neuroscience 36th Annual Meeting, Atlanta
- C. G. Evans, T. S. Kang, B. C. Ludwar, E. C. Cropper (2006) Coactivation of electrically coupled sensory neurons alters the active propagation of peripherally generated spikes. Society for Neuroscience 36th Annual Meeting, Atlanta
- B. Ch. Ludwar & R.A. DiCaprio (2005) Influences of Adaptation on Information Transfer by Sensory Afferents. Poster at the East Coast Nerve Net Meeting, Woodshole, Massachusetts
- B. C. Ludwar & R. A. DiCaprio (2004) Adaptation and information transfer rate in proprioceptive afferents. Society for Neuroscience 34th Annual Meeting, San Diego
- B. Ch. Ludwar & R.A. DiCaprio (2004) Transfer Functions and Information Rates of Elastic Strand Receptors. Poster at the East Coast Nerve Net Meeting, Woodshole, Massachusetts
- S. Westmark, B. C. Ludwar, J. Gabriel, J. Schmidt (2004) Tonic input to leg motoneurons during walking in stick insects. Society for Neuroscience 34th Annual Meeting, San Diego
- B. Ch. Ludwar & A. Büschges (2003) Intersegmental Influences on Middle Leg Premotor Interneuron and Motoneuron Activity during Walking of the Front Leg in an Insect. Society for Neuroscience 33rd Annual Meeting, New Orleans
- B. C. Ludwar and A. Büschges (2003) Intersegmental influences on motoneurons and interneurons for the coordination of walking movements. Proceedings of the 28th Göttingen Neurobiology Conference
- A. Büschges, B. Ludwar, R. A. DiCaprio, D. Bucher and J. Schmidt (2003) Generation of alternating motoneuron activity in the deafferented stick insect walking system. Proceedings of the 28th Göttingen Neurobiology Conference
- Ludwar B. C. & Schmidt J. (2002) Mechanisms for Intersegmental Leg Coordination in Walking Stick Insects. 3rd Forum of European Neuroscience, Paris
- Akay T., Haehn S., Ludwar B. C., Schmitz J., & Büschges A. (2002) Role of cuticular strain signals from campaniform sensilla in patterning thoraco-coxal joint motoneuron activity during active leg movements in the stick insect. 3rd Forum of European Neuroscience, Paris
- Ludwar, B. C.; Göritz, M. L.; Schmidt, J. (2002) Intersegmental coordination in walking stick insects. Zoology 105, Supplement V (05.1), Abstracts of the 95th Annual Meeting of the Deutsche Zoologische Gesellschaft Halle (Saale)
- Haehn, S.; Akay, T.; Ludwar, B. C.; Schmitz, J.; Schmidt, J.; Büschges, A. (2002) Cuticular strain signals from campaniform sensilla contribute to patterning of activity in thoraco-coxal joint motoneurons during active movements of stick insects. Zoology

105, Supplement V (05.1), Abstracts of the 95th Annual Meeting of the Deutsche Zoologische Gesellschaft Halle (Saale)

- Akay, T., Ludwar, B., Büschges, A. (2001) The role of campaniform sensilla in patterning leg motoneuron activity. Proceedings of the 28th Göttingen Neurobiology Conference
- Ludwar B., Akay, T., Schmitz J., Büschges, A. (2001) Cuticular strain signals reset centrally generated rhythmic activity in coxal leg motoneurons. Proceedings of the International Congress of Neuroethology, Bonn 2001