

CURRICULUM VITAE

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CURRENT POSITION

Post-doctoral researcher and Sloan-Swartz Fellow in the laboratory of Eve Marder, Brandeis University

EDUCATION

- 2000 Doctor of Natural Sciences (Dr. rer. nat.), Munich Technical University, Munich, Germany (grade: 1.0 with honors on a scale from 1 to 6)
Dissertation: "Towards defined networks: guided growth, cable transmission and electrical synapses of cultured snail neurons"
- 1996 Diplom (comparable to a master's degree) in physics, University of Ulm, Germany (grade: 1.0 with honors on a scale from 1 to 6)
- 1991 Vor-Diplom (comparable to a bachelor's degree) in physics, University of Ulm, Germany (grade: 2.0 on a scale from 1 to 6)

RESEARCH EXPERIENCE

- 2000 – Postdoctoral Fellowship with Dr. Eve Marder, Department of Biology, Brandeis University:
- Theoretical, experimental, and dynamic clamp studies on neuromodulation and homeostasis in small neural networks
 - Large scale numerical simulations of conductance-based neurons and networks
- 1996 – 2000 Doctoral research with Dr. Peter Fromherz, Max-Planck-Institute for Biochemistry, Munich, Germany:
- Design and characterization of defined networks of molluscan nerve cells
 - Construction and analysis of analytical models of electrical

synapses in small networks

- Numerical simulations of electrical activity in hippocampal neurons

1995 – 1996 Diploma thesis with Dr. Peter Fromherz, Max-Planck-Institute for Biochemistry, Munich, Germany:

- Optical detection and computational modeling of electrical signal propagation in neurons

TEACHING EXPERIENCE

2000 – Student projects supervised at Brandeis University:

- David Markowitz (technician and future neuroscience graduate student): Construction of a database of pacemaker models
- Alice Robie (undergraduate): Cell culture of crustacean stomatogastric ganglion neurons
- Feng Wang (biophysics graduate student): Programming of a model neuron with activity-dependent conductance regulation

1998 – 1999 Co-taught a practical course in biophysics, Munich Technical University, Munich, Germany

FELLOWSHIPS AND SCHOLARSHIPS

2001 – Postdoctoral Fellowship, Sloan-Swartz Center for Theoretical Neurobiology at Brandeis University

2000 – 2001 Research Scholarship, Deutsche Forschungsgemeinschaft (German Research Foundation)

2000 Research Scholarship, Max-Planck-Society, Germany

1993 – 1994 Scholarship for graduate studies at the University of Oregon, Eugene, Oregon, Konrad-Adenauer-Foundation, Germany

1989 – 1996 Scholarship, Konrad-Adenauer-Foundation, Germany

PROFESSIONAL AFFILIATIONS

2001 – Society for Neuroscience

1992 – 1998 German Physical Society

PROFESSIONAL SERVICE

- Served as an external reviewer for the Journal of Neurophysiology, the Journal of Neuroscience Methods and the Journal of Neuroscience Research
- Staff member involved in the organization of the 3rd European Biophysics Congress, Munich, Germany, summer 2000

PARTICIPATION IN SCIENTIFIC CONFERENCES

- 2003 Annual East Coast Nerve Net Meeting, Woods Hole, Massachusetts
 Goettingen Neurobiology Conference, Goettingen, Germany
 World Congress of the International Brain Research Organization, Prague,
 Czech Republic
 Annual Society for Neuroscience Meeting, New Orleans, Louisiana
- 2002 Annual East Coast Nerve Net Meeting, Woods Hole, Massachusetts
 Annual Summer Meeting of the Sloan-Swartz Centers for Theoretical
 Neurobiology, Boston, Massachusetts
 Federation of European Neuroscience Societies Forum, Paris, France
 Annual Society for Neuroscience Meeting, Orlando, Florida
- 2001 Meeting of the Biophysical Society, Boston, Massachusetts
 Annual East Coast Nerve Net Meeting, Woods Hole, Massachusetts
 Annual Summer Meeting of the Sloan-Swartz Centers for Theoretical
 Neurobiology, Lake Tahoe, Nevada
 International Congress of Neuroethology, Bonn, Germany
 Annual Society for Neuroscience Meeting, San Diego, California
- 2000 Federation of European Neuroscience Societies Forum, Brighton, France
 Annual Society for Neuroscience Meeting, New Orleans, Louisiana
- 1999 Goettingen Neurobiology Conference, Goettingen, Germany
 Meeting of the German Society for Biophysics, Ulm, Germany
 World Congress of the International Brain Research Organization,
 Jerusalem, Israel
 Annual Society for Neuroscience Meeting, Miami, Florida
- 1998 Meeting of the German Society for Biophysics, Frankfurt, Germany
- 1997 Goettingen Neurobiology Conference, Goettingen, Germany
 European Biophysical Societies Association Congress, Orleans, France
- 1996 Meeting of the German Society for Biophysics, Leipzig, Germany
- 1995 Meeting of the German Society for Biophysics, Wuerzburg, Germany

PUBLICATIONS (as of December 2003)**Refereed Articles**

Prinz AA, Fromherz P (2000). Electrical synapses by guided growth of cultured neurons from the snail *Lymnaea stagnalis*. *Biol Cybern* 82 (4): L1-L5.

Kupper J, **Prinz AA**, Fromherz P (2002). Recombinant Kv1.3 potassium channels stabilize tonic firing of cultured rat hippocampal neurons. *Eur J Physiol* 443: 541-547.

Prinz AA, Fromherz P (2003). Effect of neuritic cables on conductance estimates for remote electrical synapses. *J Neurophysiol* 89: 2215-2224.

Prinz AA, Thirumalai V, Marder E (2003). The functional consequences of changes in the strength and duration of synaptic inputs to oscillatory neurons. *J Neurosci* 23: 943-954. Rated "must read" by the Faculty of 1000.

Prinz AA, Billimoria CP, Marder E (2003). Alternative to hand-tuning conductance-based models: construction and analysis of databases of model neurons. *J Neurophysiol* 90: 3998-4015. Rated "exceptional" by the Faculty of 1000.

Prinz AA, Bucher D, Marder E (in preparation). Similar output patterns from different network architectures.

Thirumalai V, **Prinz AA**, Marder E (in preparation). Functional consequences of modulation of the feedback synapse to an oscillator: the effects of RPCH on the pyloric rhythm of the lobster *Homarus americanus*.

Oprisan SA, **Prinz AA**, Canavier CC (in preparation). Prediction of the phasic relationships in and stability of 1:1 entrainment of a reciprocally inhibitory hybrid circuit of two bursting neurons.

Chapters

Abbott LF, Thoroughman K, **Prinz A**, Thirumalai V, Marder E (2003). Activity-dependent modification of intrinsic and synaptic conductances in neurons and rhythmic networks. In: Van Ooyen A, ed. *Modeling Neural Development*. MIT Press, Cambridge MA: 151-166.

Marder E, **Prinz AA**, Abbott LF (2003). Dynamic clamp: modeling with biological neurons. In: Adelman G, Smith BH, eds. *Encyclopedia of Neuroscience*, 3rd ed. Elsevier.

Reviews

Marder E, **Prinz AA** (2002). Modeling stability in neuron and network function: the role of activity in homeostasis. *BioEssays* 24: 1145-1154.

Marder E, **Prinz AA** (2003). Current compensation in neuronal homeostasis. *Neuron* 37 (1): 2-4.

Prinz AA, Abbott LF, Marder E (in press). The dynamic clamp comes of age. *TINS*.

Prinz AA (submitted). The dynamic clamp a decade after its invention.

Selected Abstracts

Prinz A, Müller C, Fromherz P (1997). Signal propagation in leech neurite observed by optical recording. *Eur Biophys J* 26 (1): 111.

Prinz A, Fromherz P (1999). Towards defined in vitro networks: guided outgrowth and determination of membrane and synaptic parameters of molluscan neurons in cell culture. *Soc Neurosci Abstr* 25: 1307.

Prinz AA, Kupper J, Fromherz P (2000). Expression of recombinant Kv1.3 channels maintains sustained firing in rat hippocampal neurons. *Eur J Neurosci* 12 (Suppl 11): 24.

Prinz AA, Thirumalai V, Marder E (2002). Changes in synaptic strength don't always change functional synaptic efficacy: dynamic clamp and modeling show that the phase response curve (PRC) of pacemaker neurons in the stomatogastric ganglion is more sensitive to input duration than strength. *FENS Abstr. vol 1*, A146.19.

Marder E, **Prinz AA**, Thirumalai V (2002). Biological and model bursting pacemaker neurons are more sensitive to the duration than the strength of synaptic input. Program No. 67.3. *2002 Abstract Viewer and Itinerary Planner*. Washington, DC: Society for Neuroscience. CD-ROM.

Thirumalai V, **Prinz AA**, Marder E (2002). RPCH-mediated strengthening of the LP to PD synapse does not play a role in the decrease in pyloric cycle frequency. Program No. 67.4. *2002 Abstract Viewer and Itinerary Planner*. Washington, DC: Society for Neuroscience. CD-ROM.

Oprisan SA, **Prinz A**, Marder E, Canavier CC (2002). Predicting phase-locked modes in a hybrid circuit from the phase resetting curve. Program No. 67.10. *2002 Abstract Viewer and Itinerary Planner*. Washington, DC: Society for Neuroscience. CD-ROM.

Prinz AA, Billimoria CP, Marder E (2002). Studying Hodgkin-Huxley type neurons by screening a library of computational models. Program No. 312.9. *2002 Abstract Viewer and Itinerary Planner*. Washington, DC: Society for Neuroscience. CD-ROM.

Prinz AA, Marder E (2003). Using a database of 20 million model networks to study a pacemaker circuit. Program No. 605.3. *2003 Abstract Viewer and Itinerary Planner*. Washington, DC: Society for Neuroscience. CD-ROM.