

Christian Zemlin

Department of Pharmacology
SUNY Upstate Medical University
750 East Adams St
Syracuse, NY 13210
USA

Tel: +1-315-464-7988
Fax: +1-315-464-8014
Email: zemlinc@upstate.edu



CURRICULUM VITAE

Education

- Oct 1998 – Jun 2002 **PhD. Physics**
Institute for Theoretical Biology
Humboldt-University Berlin, Berlin, Germany
Supervisors: Profs. Alexander Panfilov and Hanspeter Herzel
- Oct 1995 – Oct 1998 **M. Sc. Physics (Diplom)**
Department of Physics
Technical University Berlin, Berlin, Germany
Supervisor: Prof. Hanspeter Herzel.
- Oct 1994 – Aug 1995 Graduate Studies in Mathematics/Physics
Department of Physics and Department of Mathematics
ETH Zurich, Zurich, Switzerland
- Oct 1992 – Aug 1994 **B. Sc. Mathematics (Vordiplom)**
Department of Mathematics
Technical University Berlin, Berlin, Germany
- Oct 1992 – Aug 1994 **B. Sc. Physics (Vordiplom)**
Department of Physics
Technical University Berlin, Berlin, Germany

Grants/Honors

- Jul 2003 – Jun 2005 Postdoctoral Fellowship from the American Heart Association
(\$78,000 total)
- Jan 1998 Heraeus-Award for successful and fast completion of M.Sc.
- Mar 1991-Oct 1998 Study grant from the German Study Foundation (Studienstiftung)
- Jan 1991 First prize in German National Mathematics Competition
(Bundeswettbewerb Mathematik, ca. 8 first prizes per year
awarded)

Positions

- May 2006 – Research Assistant Professor, SUNY Upstate Medical University, Syracuse, NY.
- Jul 2005 – Apr 2006 Research Scientist, SUNY Upstate Medical University, Syracuse, NY.
- Jul 2003 – Jun 2005 Postdoctoral Research Fellow of the American Heart Association, SUNY Upstate Medical University, Syracuse, NY.
- Jul 2002 – Jun 2003 Postdoctoral Research Associate, SUNY Upstate Medical University, Syracuse, NY.
- Mar 2002 – Jun 2002 Instruction Support Assistant, SUNY Upstate Medical University, Syracuse, NY.
- Oct 1998 – Feb 2002 Junior Researcher, Humboldt University Berlin, Germany
- Oct 1997 – Oct 1998 Tutor for theoretical physics at the Technical University Berlin
- Oct 1995 – Oct 1997 Tutor for experimental physics at the Technical University Berlin

Editorial Boards

- 2002- Reviewer, CHAOS
- 2003 - Reviewer, Journal of Cardiovascular Electrophysiology
- 2003- Reviewer, American Journal of Physiology
- 2005- Reviewer, Physical Review Letters
- 2006- Reviewer, Physical Review E

Publications

Peer reviewed

C. W. Zemlin, K. Mukund, V. Biktashev, and A. M. Pertsov. "Dynamics of Bound States of Same-Chirality Spiral Waves." *Physical Review E*, in press (2006).

O. Bernus, C.W. Zemlin, A. Matiukas, C. J. Hyatt, and A. M. Pertsov. "Intra-myocardial Cusp waves and Their Manifestation in Optical Mapping Signals." *IEEE Engineering in Medicine and Biology*, in press (2006).

C. W. Zemlin, S. F. Mironov, and A. M. Pertsov. "Near-threshold Field Stimulation: Intramural Versus Surface Activation" *Cardiovasc Res* **69**, pp. 98-106 (2006).

C. J. Hyatt, S. F. Mironov, F. J. Vetter, C. W. Zemlin, and A. M. Pertsov. "Optical action potential upstroke morphology reveals near-surface transmural propagation direction." *Circ Res* **97**, pp. 277-84 (2005).

C. W. Zemlin, K. Mukund, M. Wellner, R. Zaritski, and A. M. Pertsov. "Asymmetric Bound States of Spiral Pairs in Excitable Media." *Phys Rev Lett* **95**, 098302 (2005).

O. Bernus, C. W. Zemlin, R. Zaritski, S. F. Mironov, and A. M. Pertsov. "Alternating conduction in the ischemic border zone as a precursor of reentrant arrhythmias: a simulation study." *Europace* **7**, Suppl.2, pp. 93-104 (2005).

C. W. Zemlin, S. Mironov, and A. M. Pertsov. "Delayed success in termination of three-dimensional reentry: role of surface polarization." *J Cardiovasc Electrophysiol* **14**, pp. S257-S263 (2003).

A. V. Panfilov and C.W. Zemlin. "Wave propagation in an excitable medium with a negatively sloped restitution curve." *Chaos* **12**, pp. 800-807, (2002).

O. Bernus, R. Wilders, C. W. Zemlin, H. Vershelde, and A.V. Panfilov. "An efficient electrophysiological model of human ventricular cells." *Am J Physiol* **282**, pp. H2296-2308 (2002).

C. W. Zemlin, E. Storch, and H. Herzel. "Alternans and 2:1 rhythms in an ionic model of heart cells." *Biosystems* **66**, pp. 1-10 (2002).

C. W. Zemlin and A.V. Panfilov. "Spiral waves in excitable media with negative restitution." *Phys Rev E* **63**:041912 (2001).

Submitted to peer reviewed journals

C. W. Zemlin and A. M. Pertsov. "Using Absorptive Transillumination to Assess the Net Polarization Caused by Shock-Induced Intramural Virtual Electrodes" (2006).

C.W. Zemlin, O. Bernus, C. Hyatt, and A. M. Pertsov. "Upstroke Morphology in Whole Hearts Indicates Three-Dimensional Propagation Direction" (2006).

Conference proceedings

C. W. Zemlin, H. Herzel, and A.V. Panfilov. "Realistic modeling of cardiac arrhythmia." In W. Sulis and I. Trofimova, editors, *Nonlinear Dynamics in the Life and Social Sciences*, pages 244-253, NATO ASI workshop, 2000.

Book chapters

C. W. Zemlin, H. Herzel, S.Y. Ho, and A.V. Panfilov. "A realistic and efficient model of excitation propagation in the human atria." In N. Virag, O. Blanc, and L. Kappenberger, editors, *Computer Simulation and Experimental Assessment of Cardiac Electrophysiology*, pages 29-34, 2000.

Peer-reviewed abstracts

C. W. Zemlin and A. M. Pertsov. "Assessing the Net Polarization Caused by Shock-Induced Intramural Virtual Electrodes in Numerical Simulations and Transillumination Experiments." *Heart Rhythm* **3**:S304 (2006).

C. W. Zemlin, S. F. Mironov, and A. Pertsov. "Shock-Induced Virtual Electrodes Inside the Myocardial Wall." *Heart Rhythm* **2**: S58 (2005).

O. Bernus, C. W. Zemlin, S. F. Mironov, and A. M. Pertsov "Conduction alternans in the ischemic border zone as a precursor of reentrant arrhythmias," *Circulation* 110:III-291 (2004).

C. W. Zemlin, S. F. Mironov, and A. M. Pertsov. "Manifestations of Shock-Induced Surface Polarization and 3D Virtual Electrodes in Epifluorescence and Transillumination." *Heart Rhythm* 1 (2004).

C. W. Zemlin, S. F. Mironov, and A. M. Pertsov. "The effect of spatially uniform electrical shocks on propagating and reentrant waves in cardiac tissue." *PACE* (2003).

O. Bernus, R. Wilders, C. W. Zemlin, H. Verschelde, and A. V. Panfilov. "A realistic and efficient model of human ventricular tissue," *Proc. Physiol. Soc. New Zealand* 20: 18 (2001).

Presentations

Invited presentations

"3D Mapping of electric activity and shock response in the heart." Cardiac Electrophysiology and Arrhythmia. Mathematical Biosciences Institute, Columbus, Ohio, 2006.

"Optical Mapping." Experimental Biology. Washington, D.C., 2004.

"Delayed Success in the Termination of 3D Reentry: The Role of Surface Polarization". Computer Simulation and Experimental Assessment of Cardiac Electrophysiology. Lausanne, 2002.

"Modeling of Excitation Propagation in the Atria and the Quantification of Fibrillation." Workshop on Mapping and Control of Complex Arrhythmias. Montreal, 2000.

"Realistic Modeling of Excitation Propagation in the Human Atria." Computer Simulation and Experimental Assessment of Cardiac Electrophysiology. Lausanne, 2000.

Other presentations (selected)

"Assessing the Net Polarization Caused by Shock-Induced Intramural Virtual Electrodes in Numerical Simulations and Transillumination Experiments (Poster). Heart Rhythm Scientific Sessions. Boston, 2006.

"Field Stimulation of Heart Tissue: Intramural Versus Surface Polarization." SIAM Conference on Applications of Dynamical Systems. Snowbird, UT, 2005.

"Shock-Induced Virtual Electrodes Inside the Myocardial Wall" (Poster). Heart Rhythm Scientific Sessions. New Orleans, 2005.

"Manifestations of Shock-Induced Surface Polarization and 3D Virtual Electrodes in Epifluorescence and Transillumination" (Poster) Heart Rhythm Scientific Sessions. San Francisco, 2004

"Uniform Field Stimulation: Intramural Versus Surface Activation." Upstate New York Cardiac Electrophysiology Society. Utica, NY, 2004.

"The effect of spatially uniform electrical shocks on propagating and reentrant waves in cardiac tissue" (Poster). NASPE Scientific Sessions. Washington, D.C., 2003.

"Understanding the Mechanisms of Defibrillation." Syracuse University. Syracuse, 2003.

"3D Effects in Defibrillation." Institute for Theoretical Biology. Berlin, 2003.

"Effect of Defibrillation Shocks on Pig Right Ventricular Wall". Upstate New York Cardiac Electrophysiology Society. Rochester, 2002.

"Wave propagation in cardiac tissue" (Poster). Schloßmann Seminar on Mathematical Models in Biology, Chemistry and Physics. Bad Lausick (Germany), 2000.

"Realistic modeling of cardiac arrhythmias." Nonlinear Dynamics in the Life and Social Sciences. NATO Advanced Study Institute Workshop. Moskau, 2000.

"Realistic modeling of excitation propagation in the human atria." Theory and Mathematics in Biology and Medicine. Amsterdam, 1999.

"Realistic Modeling of the Human Atria". Vereniging Nederlandse Theoretische Biologen. Texel, 1999.

References

Dr. A. M. Pertsov

Department of Pharmacology
SUNY Upstate Medical University
750 East Adams St
Syracuse, NY 13210 (USA)
Email: pertsova@upstate.edu

Dr. Alexander Panfilov

Department of Theoretical Biology and Bioinformatics
Utrecht University
Padualaan 8
3584 CH Utrecht (The Netherlands)
Email: A.V.Panfilov@bio.uu.nl

Dr. Hanspeter Herzel

Institute for Theoretical Biology
Humboldt-University Berlin
Invalidenstr. 42
10117 Berlin (Germany)
Email: h.herzel@biologie.hu-berlin.de