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CURRICULUM VITAE

Education

- Mar 2002- Apr 2006 **Postdoc Biomedical Imaging**
SUNY Upstate Medical University
Syracuse, NY
Supervisor: Dr. Arkady Pertsov
- Oct 1998 – Jun 2002 **Ph.D. Theoretical Physics**
Institute for Theoretical Biology
Humboldt-University Berlin, Berlin, Germany
Supervisors: Drs. Hanspeter Herzel and A. V. Panfilov
- Oct 1995 – Oct 1998 **M. Sc. Physics (Diplom)**
Department of Physics
Technical University Berlin, Berlin, Germany
Supervisor: Dr. 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

- May 2008 – Dec 2011 Scientist Development Grant from the American Heart Association (\$308,000 total)
- Apr 2008 – Apr 2009 Intramural support grant (\$50,000 total)
- 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. (\$2,000)
- 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.
- Feb 2009 – Research Assistant Professor, Syracuse University, Syracuse, NY.
- August 2007- Adjunct Professor, Syracuse 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, Institute for Theoretical Biology, 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

- 2010- Assistant Editor, *Frontiers in Cardiac Electrophysiology*
- 2009- Reviewer, *Physics Letters A*
- 2007- Reviewer, *Physica D*
- 2006- Reviewer, *Physical Review E*
- 2006- Reviewer, *Medical & Biological Engineering & Computing*
- 2005- Reviewer, *Physical Review Letters*
- 2003- Reviewer, *American Journal of Physiology*
- 2003 - Reviewer, *Journal of Cardiovascular Electrophysiology*
- 2002- Reviewer, *CHAOS*

Publications

Editorials

C. W. Zemlin and R. Veenstra. "What is the structural substrate for atrial fibrillation?", *Cardiology* **114**, pp. 19-21 (2009).

Peer reviewed

C. W. Zemlin and A. M. Pertsov. "Anchoring of drifting spiral and scroll waves in excitable media", *Phys Rev Lett* (2010, under review).

M. Wellner, C. Zemlin and A. M. Pertsov. "Frustrated drift of an anchored scroll wave filament and the geodesic principle", *Phys Rev E* **82**, pp. 036122 (2010).

B. Caldwell, B. Mitrea, A. M. Pertsov, and C. W. Zemlin. "Probing Field-induced Tissue Polarization Using Transillumination Fluorescent Imaging", *Biophysical Journal* **99**, pp. 2058-66 (2010).

X. Lin, J. Gemel, A. Glass, C.W. Zemlin, S. M. Taffet, E. C. Beyer, and R. Veenstra. "Connexin40 and Connexin43 Determine Gating Properties of Atrial Gap Junction Channels", *J Mol Cell Cardiol* **48**, 238-245 (2010).

C. W. Zemlin, B. G. Mitrea, and A. M. Pertsov. "Spontaneous onset of atrial fibrillation", *Physica D: Nonlinear Phenomena* **238**, 969-975 (2009).

C. J. Hyatt, C. W. Zemlin, R. M. Smith, A. M. Matiukas, A. M. Pertsov, and O. Bernus. "Reconstructing subsurface electrical wave orientation from cardiac epi-fluorescence recordings: Monte Carlo versus diffusion approximation", *Optics Express* **16**, pp. 13758-72 (2008).

X. Lin, C.W. Zemlin, J. Hennan, J. Petersen, and R. Veenstra. "Rotigaptide Reduces the Inactivation of Ventricular Gap Junctions", *Cardiovasc Res* **79**, pp. 416-426 (2008).

C. W. Zemlin, O. Bernus, A. Matiukas, and A. M. Pertsov. "Extracting Intramural Wavefront Orientation From Optical Upstroke Shapes in Whole Hearts", *Biophysical Journal* **95**, pp. 942-50 (2008).

R. Smith, A. M. Matiukas, C. W. Zemlin, and A. M. Pertsov. "Nondestructive Optical Determination of Fiber Organization in Whole Heart", *Microscope Research and Technique* **71**, pp.510-16 (2008).

C. W. Zemlin and A. M. Pertsov. "Bradycardic onset of spiral wave re-entry: structural substrates." *Europace*, **9**, pp. vi59-63 (2007).

- A. M. Pertsov, C. W. Zemlin, C. J. Hyatt, and O. Bernus. "What can we learn from the optically recorded epicardial action potential?" *Biophys J*, **91**, pp. 3959-60 (2006).
- C. W. Zemlin, K. Mukund, V. Biktashev, and A. M. Pertsov. "Dynamics of Bound States of Same-Chirality Spiral Waves." *Phys Rev E*, **74**, 016207 (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).

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

R. Smith, A. Matiukas, C.W. Zemlin, and A.M. Pertsov, "Nondestructive optical method for fiber mapping in intact heart." *Heart Rhythm* 5:S8 (2008).

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*, 28th IEEE-EMBS Proc.1564-1567 (2006).

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

"Dynamics of bound states of spiral waves." International workshop on non-linear dynamics in excitable media. Het Pand, Ghent University, Ghent, Belgium, 2007.

"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). Schloebmann 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.

Teaching Experience

“Mathematical modeling in physiology” (graduate level class, three credits), Fall 2007-2010. Department of Biomedical and Chemical Engineering, Syracuse University, Syracuse, NY.

“Cardiovascular engineering” (advanced undergraduate and beginning graduate level class, three credits), Spring 2008-2010. Department of Biomedical and Chemical Engineering, Syracuse University, Syracuse, NY.

“Foundations of Biomedical Sciences” (graduate level class, lectures on ion channels), Fall 2008, Fall 2009, Fall 2010. SUNY Upstate Medical University, Syracuse, NY.

“Cardiac Electrophysiology” (for medical students). Spring 2009, Spring 2010. SUNY Upstate Medical University, Syracuse, NY.

References

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