

CURRICULUM VITAE

TRINE KROGH-MADSEN, Ph.D.

Research Assistant Professor
Department of Medicine, Division of Cardiology
Weill Cornell Medical College
520 E. 70th St., Starr 463
New York, NY 10021, USA
Phone: 212-746-6271
Fax: 212-746-8451
E-mail: trk2002@med.cornell.edu
www: <http://icb.med.cornell.edu/people/krogh-madsen>

APPOINTMENTS

- 2009 – **Research Assistant Professor of Physiology in Medicine**
Department of Medicine, Division of Cardiology
Weill Cornell Medical College, New York
- 2007 – **Instructor in Computational Biomedicine**
Institute for Computational Biomedicine
Weill Cornell Medical College, New York
- 2006 – 2009 **Instructor of Physiology in Medicine**
Department of Medicine, Division of Cardiology
Weill Cornell Medical College, New York
- 2004 – 2006 **Postdoctoral fellow**
Department of Medicine, Division of Cardiology
Weill Cornell Medical College, New York.
Research area: cardiac electrodynamics.
Advisor: David J. Christini, PhD.

EDUCATION

- 2000 – 2004 **Ph.D., physiology**
Department of Physiology and Centre for Nonlinear Dynamics in
Physiology and Medicine, McGill University, Montreal, Canada.
Research area: computational cardiac electrophysiology.
Thesis title: “Effects of single-channel noise on spontaneous beating
and the phase-resetting response of cardiac oscillators”.
Advisor: Michael R. Guevara, PhD.
- 1993 – 1999 **M.Sc., engineering (applied physics)**
Technical University of Denmark, Lyngby, Denmark.
Includes undergraduate training (the M.Sc. was the first degree given).
Training topics: applied physics, non-linear dynamics, applied
mathematics.
Thesis title: “Spiral waves in the FitzHugh-Nagumo equations”.
Advisor: Erik Mosekilde, PhD.

SCHOLARSHIPS

2000 – 2003 Danish Research Agency
2000 – 2003 Otto Mønsted's foundation

AWARDS

2005 Best presentation prize at postdoctoral research day, Weill Cornell Medical College
2004 Ph.D. thesis selected for Dean's Honour List

PUBLICATIONS

Peer-reviewed articles

Krogh-Madsen, T. and Christini, D.J. "Pacing-induced spatiotemporal dynamics can be exploited to improve reentry termination efficacy". *Phys. Rev. E* 80:021924-1--021924-12, 2009.

Maoz, A., Krogh-Madsen, T., and Christini, D.J. "Instability in action potential morphology underlies phase 2 reentry: A mathematical modeling study". *Heart Rhythm J.* 6:813–822, 2009.

Krogh-Madsen, T. and Christini, D.J. "Resetting and termination of reentry in a loop-and-tail cardiac model". *Phys. Rev. E* 77:011916-1--011916-5, 2008.

Gordon, E., Panaghie, G., Deng, L., Bee, K.J., Roepke, T.K., Krogh-Madsen, T., Christini, D.J., Ostrer, H., Basson, C.T., Chung, W., Abbott, G.W. "A KCNE2 mutation in a patient with cardiac arrhythmia induced by auditory stimuli and serum electrolyte imbalance". *Cardiovasc. Res.* 77:98-106, 2008.

Lerma, C., Krogh-Madsen, T., Guevara, M.R., Glass, L. "Stochastic aspects of cardiac arrhythmias". *J. Stat. Phys.* 128:347-374, 2007.

Krogh-Madsen, T. and Christini, D.J. "Action potential duration dispersion and alternans in simulated heterogeneous cardiac tissue with a structural barrier". *Biophys. J.* 92:1138-1149, 2007.

Krogh-Madsen, T., Schaffer, P., Skriver, A.D., Taylor, L.K., Pelzmann, B., Koidl, B., Guevara, M.R. "An ionic model for rhythmic activity in small clusters of embryonic chick ventricular cells". *Am. J. Physiol. (Heart & Circ)* 289: H398-H413, 2005.

Krogh-Madsen, T., Glass, L., Doedel, E.J., Guevara, M.R. "Discontinuities in the phase-resetting response of cardiac pacemakers". *J. Theor. Biol.* 230:499-519, 2004.

Conference proceedings

Krogh-Madsen, T. and Christini, D.J. "Termination of Cardiac Reentry". Proceedings of the 2008 Conference on Frontiers of Applied and Computational Mathematics, 2009.

Book chapter

Krogh-Madsen, T., Jordan, P.N., Christini, D.J. “Control of Cardiac Electrical Nonlinear Dynamics”. In *Handbook of Chaos Control*, 2nd ed., 2007.

Selected, recent peer-reviewed abstracts

Abbott, G.W., Panaghie, G., Dai, J., Krogh-Madsen, T., Christini, D.J., Lerman, B.B. “A constitutively activating mutation of $G\alpha_s$ in outflow tract tachycardia increases L-type Ca^{2+} channel activity”. *J. Am. Coll. Cardiol.* 49 (9) Supplement A:38A, 2007.

INVITED TALKS

“Pacing-induced termination of cardiac reentry and alternans”. Centre for Nonlinear Dynamics in Physiology and Medicine, McGill University, Montreal, June 2009.

“Termination of reentrant cardiac activity”. SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, May 2009.

“Termination and resetting of reentrant cardiac activity”. Frontiers in Applied and Computational Mathematics conference, New Jersey Institute of Technology, May 2008.

“Termination and resetting of reentrant cardiac activity”. MathBio Seminar, New Jersey Institute of Technology, March 2008.

“Stochastic aspects of cardiac arrhythmias”. KITP Miniprogram: Cardiac Dynamics, Santa Barbara, CA, July-Aug 2006.

“Slow-fast time scales and the phase-resetting response of cardiac pacemakers”. SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, May 2005.

“Discontinuities and canards in the phase-resetting response of cardiac pacemakers”. SIAM Conference on the Life Sciences, Portland, OR, July 2004.

TEACHING

Course director and lecturer

Advanced Topics in Electrophysiology (with D. J. Christini). Weill Cornell Medical College, fall 2006.

Guest lecturer

“Cardiac Modeling” in *Graduate Course in Bioinformatics and Computational Biomedicine*. Weill Cornell Medical College, summer 2008.

“Basic Engineering Concepts in the Cardiovascular System” in the course *Introduction to Bioengineering*. Weill Cornell Medical College, winter 2007.

“Diffusion and Electrodiffusion” in the course *Cell Physiology*. Weill Cornell Medical College, fall 2006.

“Electrophysiology of the Embryonic Chick Heart” in the course *Advanced Cardiovascular Physiology*. McGill University, spring 2003.

Lab tutor/Small group facilitator (for 1st year medical students)

ECG and blood pressure lab. Weill Cornell Medical College, winter 2007, 2008.

Molecules, Genes, Cells (electrophysiology parts). Weill Cornell Medical College, fall 2008.

Lab coordinator and tutor

Computer exercises for *Nonlinear Dynamics in Physiology and Medicine* Summer School. McGill University, spring 2004.

Teaching assistant

Various labs for physiology students. McGill University, 2002-2004.
Mathematical Models in Biology. McGill University, fall 2001.

REVIEWER

Physical Review Letters, Physical Review E, Chaos, Heart Rhythm Journal