

BIOGRAPHICAL SKETCH

Name: Yoram Rudy

Affiliation: Washington University in St Louis

Title: The Fred Saigh Distinguished Professor of Engineering,
Professor of Biomedical Engineering, Medicine,
Cell Biology & Physiology, Radiology, and Pediatrics

Director, Cardiac Bioelectricity and Arrhythmia Center (CBAC)

Address: Washington University in St Louis
Cardiac Bioelectricity Center
290 Whitaker Hall,
Campus Box 1097
One Brookings Drive
St Louis, MO 63130-4899, USA

Phone: (314) 935-8160
FAX: (314) 935-8168
Email: rudy@wustl.edu
<http://rudylab.wustl.edu>
<http://cbac.wustl.edu>

Education:

Technion, Haifa, Israel, B.Sc., 1971, Physics

Technion, Haifa, Israel, M.Sc., 1973, Physics

Case Western Reserve University, School of Medicine, 1 year, 1976

Case Western Reserve University, Ph.D., 1978, Biomedical Engineering

Professional (Research/Teaching) Experience:

- 2004 - Director, Cardiac Bioelectricity and Arrhythmia Center (CBAC)
Washington University in St Louis
- 2004 - The Fred Saigh Distinguished Professor of Engineering,
Professor of Biomedical Engineering, Medicine,
Cell Biology & Physiology, Radiology, and Pediatrics
Washington University in St Louis
- 1994 - 2004 Director, Cardiac Bioelectricity Research and Training Center (CBRTC)
Case Western Reserve University, Cleveland, Ohio
- 2001 - 2004 The M. Frank and Margaret C. Rudy Professor of Cardiac Bioelectricity
Case Western Reserve University
- 1989 - 2004 Professor, Department of Biomedical Engineering
Case Western Reserve University
- 1998 - 2004 Professor, Department of Physiology and Biophysics
Case Western Reserve University
- 1991 - 2004 Professor, Combined Program in Biophysics/Bioengineering
Case Western Reserve University
- 1992 - 2004 Professor, Department of Medicine, Division of Cardiology
Case Western Reserve University
- 1986-1989 Associate Professor, Department of Biomedical Engineering
Case Western Reserve University
- 1981-1986 Assistant Professor, Department of Biomedical Engineering
Case Western Reserve University

Visiting Professorships

Technion - Israel Institute of Technology, Haifa, Israel, Department of Biomedical Engineering (Dec. 1982 - Mar. 1983).

University of Parma, Italy, Institute of General Physiology (July 1986 and July 1987).

University of Berne, Switzerland, Department of Physiology (May 1990).

University of Utah, Salt Lake City, The Nora Eccles Harrison Cardiovascular Research and Training Institute (October 1990).

Tel-Aviv University, Israel, Department of Physics and Astronomy (June - July, 1991).

Columbia University, College of Physicians and Surgeons, Department of Pharmacology, New York, August 1994.

Cornell University, Department of Physiology, Ithaca, New York, October 1994.

Masonic Medical Research Laboratory, Utica, New York, December 1995.

Russian Academy of Sciences, St. Petersburg, June 1997.

University of Szeged, Department of Pharmacology and Pharmacotherapy, Szeged, Hungary, September 2004.

Reynolds Visiting Professor, The Reynolds Cardiovascular Research Center, Johns Hopkins School of Medicine, Baltimore, March 2005.

Columbia University, College of Physicians and Surgeons, Department of Pharmacology, New York, June 2005.

Nagoya University, Research Institute of Environmental Medicine, Nagoya, Japan, October 2005.

Columbia University College of Physician and Surgeons, Department of Pharmacology, New York, April 2006.

University of Berne, Switzerland, Department of Physiology, December 2006.

Stanford University Cardiovascular Institute, December 2007.

University of California, San Francisco, Department of Medicine, March 2008.

Maastricht University, The Netherlands, September 2008.

Maastricht University, The Netherlands, September 2009.

NIH Committees

Member, Cardiovascular and Pulmonary Study Section, July 1, 1984 - June 30, 1988.

Member, National Institutes of Health Reviewers (NRR), July 1, 1988 - June 20, 1992.

Ad Hoc member, Cardiovascular and Pulmonary Study Section, July 1, 1983 - June 30, 1984...

Member, Special Study Section on Dysrhythmias in the Developing and Immature Heart
June 27-29, 1983.

Member, Small Business Innovative Research Review Committee, February 14, 1984.

Member, site visit teams for various Program Project Grant applications.

Task force on developing a long-term plan for imaging research, 1994.

Ad Hoc member of various Study Sections, 1992 -

Panelist, Bioengineering - Building the Future of Biology and Medicine, February 27-28, 1998.

Panelist, Biomedical Imaging - Visualizing the Future of Biology and Medicine, June 25-16, 1999.

Review of Grants for Centers of Excellence in Computational Biology, October 25, 2002.

NIH Special Emphasis Review Panel, (November 2003).

Organizer and Chair, NIH-NHLBI Workshop on Systems Approach to Understanding
Electromechanical Activity in the Human Heart, August 20-21, 2007.

Other Review Committees:

The Whitaker Foundation

National Science Foundation

Medical Research Council of Canada

American Heart Association

The Wellcome Trust

Pittsburgh Supercomputing Center (PSC)

Fondues FCAR, Canada

FRSQ, Quebec, Canada

United States-Israel Binational Science Foundation

The Israel Science Foundation

The Israel Academy of Science

The Austrian Science Fund

Review and evaluation of research programs at the Nora Eccles Harrison Cardiovascular Research and Training Institute, University of Utah, Salt Lake City (October 18-20, 1990).

Review of the Center for Biomedical Modeling and Simulation, University of Montreal/Ecole Polytechnique, Montreal, Canada (January 8-9, 1991).

Review of the Experimental Cardiology Program, Masonic Medical Research Laboratory, Utica, New York (September 11-12, 1997).

Review and site visit, Whitaker Foundation Leadership Award Application, Johns Hopkins University (September 15-16, 1998).

Review and site visit, The University of Oklahoma Bioengineering Center, (June 2002, June 2003).

Honors:

Member of the National Academy of Engineering (since 2003)

Citation: "For leadership in the engineering sciences of cardiac excitation at the genetic and molecular levels and for introducing new methods in clinical diagnosis and therapy"

NIH MERIT Award, September, 1998

Distinguished Alumni Award, Case Western Reserve University, October 2009.

For contributions to basic science in Biomedical Engineering.

The Hein Wellens Distinguished Professor in Cardiology, University of Maastricht, The Netherlands, 2008-2009.

The Tawara Lecture Award, 36th International Congress of Physiological Sciences (IUPS2009), Kyoto, Japan, July 2009.

President, the Cardiac Electrophysiology Society, November 2006 – November 2008

The Biomedical Engineering Society (BMES) 2001 Distinguished Lectureship Award

Fellow of the Academy of Science – St. Louis

Fellow of the American Physiological Society – Cardiovascular Section

Fellow of the Institute of Electrical and Electronics Engineers (IEEE)

Citation: "For contributions to mathematical descriptions and solutions applicable to cardiac electrophysiology"

Fellow of the American Institute of Medical and Biological Engineering (AIMBE)

Citation: "In recognition of outstanding contributions to the field of medical and biological engineering"

Fellow of the Biomedical Engineering Society (BMES)

Citation: "For research of cellular mechanisms underlying cardiac electrophysiology and arrhythmias using computational biology and mathematical modeling, and for development of Electrocardiographic Imaging (ECGI) for cardiac arrhythmias"

Fellow of the American Heart Association

Fellow of the Heart Rhythm Society

The Gordon K Moe Professorship Award, Masonic Medical Research Laboratory, 1997.

Citation: "In recognition of outstanding contributions to science and medicine in the fields of cardiac electrophysiology and arrhythmias"

The A.C. Suhren Jr. Scholar, Tulane University, 1998.

Keynote Address, Biomedical Engineering Day, Washington University in St. Louis,
March, 2001.

The Rijlant Distinguished Lecturer, International Congress on Electrocardiology, Milan,
Italy, 2000.

The Ueda Memorial Lecture Award, The Japanese Society of Electrocardiology and Japan
College of Cardiology, Nagoya, Japan, September 2002.

The Kazuo Yamada Lecture Award, The Japanese Society of Electrocardiology, Toyama,
Japan, October 2005.

Keynote Presentation, SPIE Medical Imaging, San Diego, February 2006.

Keynote Presentation, International Society for Heart Research (European Section),
Manchester, UK, June 2006.

Keynote Presentation, International Congress on Electrocardiology, Cologne, Germany,
June 2006.

Sigma Xi

Who's Who in America

Who's Who in Science and Engineering

Who's Who in the World

Nominations for Excellence in Teaching and Education:

John S. Diekhoff Award for Excellence in Graduate Teaching, 1994.

The Carl F. Wittke Award for Distinguished Undergraduate Teaching, 1999.

Excellence in Mentoring Graduate Students, 1999.

Editorial Boards:

Cardiovascular Research

Heart Rhythm (Associate Editor; Section Editor of "Viewpoints")

Journal of Cardiovascular Electrophysiology (Section Editor, "Point of View")

Journal of Electrocardiology

Cardiac Electrophysiology Review

Cardiovascular Engineering: An International Journal

Reviewer and Editorial Consultant:

Nature

Science

Proceedings of the National Academy of Sciences, U.S.A. (PNAS)

Journal of Physiology (London)

Circulation Research

Journal of the American College of Cardiology

Circulation

Biophysical Journal

Journal of General Physiology

American Journal of Physiology

Cardiovascular Research

Journal of Cardiovascular Electrophysiology

Journal of Molecular and Cellular Cardiology

IEEE Transactions on Biomedical Engineering

Annals of Biomedical Engineering

Journal of Electrocardiology

Medical and Biological Engineering and Computing

Medical Engineering and Physics

Mathematical Biosciences

Journal of Theoretical Biology

Journal on Inverse Problems

Inverse Problems in Engineering

Heart and Vessels

Professional Societies:

National Academy of Engineering (NAE)

American Institute of Medical and Biological Engineering (AIMBE), (Fellow)

American Association for the Advancement of Science

IEEE Engineering in Medicine and Biology Society, (Fellow of IEEE)

American Heart Association, Basic Science Council, (Fellow)

Biomedical Engineering Society (BMES), (Fellow)

Cardiac Electrophysiology Society, (President 2006-08; Vice President, 2005-06)

American Physiological Society, (Fellow)

Heart Rhythm Society (Fellow)

Biophysical Society

New York Academy of Science

International Society for Computerized Electrocardiology

International Society of Electrocardiology

Central Society for Clinical Research

European Cardiac Arrhythmia Society (ECAS), (Founding Member)

Publications in Refereed Journals

- Y.Rudy** and R.Plonse, "A note on the Brody-Effect" *J Electrocardiology* 1978; 11: 87-90.
- Y.Rudy** and R. Plonse, "The Eccentric Spheres Model as the Basis for a Study of the Role of Geometry and Inhomogeneities in Electrocardiography" *IEEE Trans Biomed Eng BME* 1979; 26: 392-399.
- Y.Rudy**, R. Plonse, and J. Liebman, "The Effects of Variations in Conductivity and Geometrical Parameters on the Electrocardiogram, Utilizing an Eccentric Spheres Model" *Circ Res* 1979; 44: 104-111.
- R. Plonse and **Y.Rudy**, "Electrocardiogram Sources in a 2-Dimensional Anisotropic Activation Model" *Medical and Bio Eng and Comp* 1980; 18: 87-94.
- Y.Rudy** and R. Plonse, "A Comparison of Volume Conductor and Source Geometry Effects on Body Surface and Epicardial Potentials" *Circ Res* 1980; 46: 283-291.
- Y.Rudy** and R. Plonse, "Comments on the Effect of Variations in the Size of the Heart on the Magnitude of ECG Potentials" *J Electrocardiology* 1980; 13: 79-82.
- J. Liebman, C. Thomas, **Y.Rudy**, and R. Plonse, "Electrocardiographic Body Surface Potential Maps of the QRS of Normal Children" *J Electrocardiology* 1981; 14: 249-260.
- Y.Rudy**, R. Wood, R. Plonse, and J. Liebman, "The Effect of High Lung Conductivity on ECG Potentials: Results Obtained from Human Subjects Undergoing Bronchopulmonary Lavage" *Circulation* 1982; 65: 440-445.
- P. Diaz, **Y.Rudy**, and R. Plonse, "A Model Study of the Effect of the Intercalated Discs on Discontinuous Propagation in Cardiac Muscle" *Advances in Experimental Medicine and Biology* 1983; 161 ("Myocardial Injury"): 79-90.
- P. Diaz, **Y.Rudy**, and R. Plonse, "The Intercalated Discs as a Cause for Discontinuous Propagation in Cardiac Muscle: A Theoretical Simulation" *Annals of Biomedical Engineering* 1983; 11: 177-189.
- J. Liebman, **Y.Rudy**, P. Diaz, C.W. Thomas, and R. Plonse, "The Spectrum of Right Bundle Branch Block as Manifested in Electrocardiographic Body Surface Potential Maps" *J Electrocardiology* 1984; 17: 329-346.
- B.J. Messenger-Rapport and **Y.Rudy**, "Effects of the Torso Boundary and Internal Conductivity Interfaces in Electrocardiography: An Evaluation of the "Infinite Medium" Approximation" *Bulletin of Mathematical Biology* 1985; 47: 685-694.
- B.J. Messenger-Rapport and **Y.Rudy**, "The Inverse Problem in Electrocardiography: A Model Study of the Effects of Geometry and Conductivity Parameters on the Reconstruction of Epicardial Potentials" *IEEE Trans Biomed Eng BME* 1986; 33: 667-676.

- Y. Rudy** and W. Quan, "A Model Study of the Effects of the Discrete Cellular Structure on Electrical Propagation in Cardiac Tissue" *Circ Res* 1987; 61: 815-823.
- L. Widman, J. Liebman, C.W. Thomas, R. Fraenkel, and **Y. Rudy**, "Electrocardiographic Body Surface Potential Maps of the QRS and T of Normal Young Adults - Qualitative Description and Selected Quantifications" *J Electrocardiology* 1988; 21: 121-136.
- J.N. Amoores and **Y. Rudy**, "The Effect of Variations of Ventricular Volume on the Electrocardiogram. A Comparison of Two Models" *J Electrocardiology* 1988; 21: 154-160.
- B.J. Messenger-Rapport and **Y. Rudy**, "Regularization of the Inverse Problem in Electrocardiography: A Model Study" *Mathematical Biosciences* 1988; 89: 79-118.
- J.N. Amoores, **Y. Rudy**, and J. Liebman, "Respiration and the ECG. A Study Using Body Surface Potential Maps" *J Electrocardiology* 1988; 21: 263-271.
- Y. Rudy** and B.J. Messenger-Rapport, "The Inverse Problem in Electrocardiography: Solutions in terms of Epicardial Potentials" *CRC Critical Reviews in Biomedical Engineering* 1988; 16: 215-268.
- F. Dexter, G.M. Saidel, M.N. Levy, and **Y. Rudy**, "Mathematical Model of the Dependence of Heart Rate on the Tissue Concentration of Acetylcholine" *Am J Physiol* 1989; 256 (*Heart Circ Physiol* 25): H520-H526.
- F. Dexter, **Y. Rudy**, M.N. Levy, "Muscarinic Autoreceptors do not Modulate Kinetics of Acetylcholine Release in Hearts" *Am J Physiol* 1989; 256 (*Heart Circ Physiol* 25): H1073-H1078.
- J. Liebman, C.W. Thomas, R. Fraenkel, and **Y. Rudy**, "Analysis of the Hypoplastic Right Ventricle Utilizing Electrocardiographic Body Surface Potential Mapping" *J Electrocardiology* 1989; 22: 195-209.
- F. Dexter, M.N. Levy, **Y. Rudy**, "Mathematical Model of the Changes in Heart Rate Elicited by Vagal Stimulation" *Circulation Research* 1989; 65: 1330-1339.
- B.J. Messenger-Rapport and **Y. Rudy**, "Computational Issues of Importance to the Inverse Recovery of Epicardial Potential in a Realistic Heart-Torso Geometry" *Mathematical Biosciences* 1989; 97: 85-120.
- D. Khoury, H. McAlister, B. Wilkoff, T. Simmons, **Y. Rudy**, R. McCowan, V. Morant, L. Castle, and J. Maloney, "Continuous Right Ventricular Volume Assessment by Catheter Measurement of Impedance for Antitachycardia System Control" *PACE* 1989; 12: 1918-1926.

- F. Dexter, G.M. Saidel, and **Y. Rudy**, "Simulation of the diffusion of Acetylcholine in the Neuroeffector Junctions of the Sinus Node" *J Theo Boils* 1989; 141: 505-514.
- W. Quan and **Y. Rudy**, "Unidirectional Block and Reentry of Cardiac Excitation—A Model Study" *Circulation Research* 1990; 66: 367-382.
- B.J. Messinger-Rapport and **Y. Rudy**, "Non-Invasive Recovery of Epicardial Potentials in a Realistic Heart-Torso Geometry: Normal Sinus Rhythm" *Circulation Research* 1990; 66: 1023-1039.
- Y. Reich, C.W. Thomas, J. Liebman, Y.H. Pao, and **Y. Rudy**, "Multi-Category Classification of Body Surface Potential Maps" *IEEE Trans Biomed Eng BME* 1990; 37: 945-955.
- J. Liebman, B. Olshansky, A. Zeno, A. Geha, **Y. Rudy**, W. Henthorn, M. Cohen, and A.L. Waldo, "Electrocardiographic Body Surface Potential Mapping in the Wolff - Parkinson -White Syndrome: Non-invasive Determination of the Ventricular Insertion Sites of AV Connections" *Circulation* 1991; 83: 886-901.
- F. Dexter, **Y. Rudy**, M.N. Levy, and E.N. Bruce, "Mathematical Model of Cellular Basis for the Respiratory Sinus Arrhythmia" *J Theor Biol* 1991; 150: 157-173.
- A. Shimizu, A. Nozaki, **Y. Rudy** and A.L. Waldo, "Onset of Induced Atrial Flutter in the Canine Pericarditis Model" *J Amer College Cardiol* 1991; 17: 1223-1234.
- A. Shimizu, A. Nozaki, **Y. Rudy**, and A.L. Waldo, "Multiplexing Studies of the Effects of Rapid Atrial Pacing on the Area of Slow Conduction During Atrial Flutter in the Canine Pericarditis Model" *Circulation* 1991; 83: 983-994.
- C. Luo and **Y. Rudy**, "A Model of the Ventricular Cardiac Action Potential: Depolarization, Repolarization and their Interaction" *Circulation Research* 1991; 68: 1501-1526.
- Y. Rudy** and W. Quan, "Propagation Delays Across Gap Junctions and their Reflection in Extracellular Potentials: a Simulation Study" *J Cardiovascular Electrophysiology* 1991; 2: 299-315.
- W. Quan and **Y. Rudy**, "Termination of Reentrant Propagation by a Single Stimulus - A Model Study" *PACE* 1991; 14: 1700-1706.
- H.S. Oster and **Y. Rudy**, "The Use of Temporal Information in the Regularization of the Inverse Problem of Electrocardiography" *IEEE Trans Biomed Eng* 1992; 39: 65-75.
- Y. Rudy** and H.S. Oster, "The Electrocardiographic Inverse Problem" *CRC Critical Reviews in Biomedical Engineering* 1992; 20: 25-46.
- D. Khoury and **Y. Rudy**, "A Model Study of Volume Conductor Effects on Endocardial and Intracavitary Potentials" *Circulation Research* 1992; 71: 511-525.

- J. Liebman, C.W. Thomas, and **Y. Rudy**, "Electrocardiographic Body Surface Potential Mapping Many Years After Successful Surgery for Coarctation of the Aorta" *J Electrocardiology* 1993; 26: 25-41.
- A. Shimizu, A. Nozaki, **Y. Rudy**, and A.L. Waldo, "Characterization of Double Potentials in a Functionally Determined Reentrant Circuit" *J Amer Coll Cardiol* 1993; 22: 2022- 2032.
- J. Ortiz, M. Igarashi, H.X. Gonzalez, K. Laurita, **Y. Rudy**, and A.L. Waldo, "Mechanism of Spontaneous Termination of Stable Atrial Flutter in the Canine Sterile Pericarditis Model" *Circulation* 1993; 88: 1866-1877.
- Y. Rudy** and C. Luo, "Cellular Responses to Electrical Stimulation—A Study Using a Model of the Ventricular Cardiac Action Potential" *Adv Exp Med Biol* 1993; 346: 79-90.
- F. Dexter, **Y. Rudy**, and G.M. Saidel, "Mathematical Model of Acetylcholine Kinetics in Neuroeffector Junctions" *Am J Physiol* 1994; 266 (*Heart Circ. Physiol* 35): H298-H309.
- J. Ortiz, S. Niwano, H. Abe, H.X. Gonzalez, **Y. Rudy**, N. Johnson and A.L. Waldo, "Mapping the Conversion of Atrial Flutter to Atrial Fibrillation and Atrial Fibrillation to Atrial Flutter - Insights into Mechanism" *Circulation Research* 1994; 74: 882-894.
- C. Luo and **Y. Rudy**, "A Dynamic Model of the Cardiac Ventricular Action Potential: I. Simulations of Ionic Currents and Concentration Changes" *Circulation Research* 1994; 74: 1071-1096.
- C. Luo and **Y. Rudy**, "A Dynamic Model of the Cardiac Ventricular Action Potential: II. Afterdepolarizations, Triggered Activity and Potentiation" *Circulation Research* 1994; 74: 1097-1113.
- D.W. Whalley, D.J. Wendt, C.F. Starmer, **Y. Rudy**, and A.O. Grant, "Voltage-Independent Effects of Extracellular K^+ on the Na^+ Current and Phase 0 of the Action Potential in Isolated Cardiac Myocytes" *Circulation Research* 1994; 75: 491-502.
- J. Ortiz, A. Nozaki, A. Shimizu, **Y. Rudy**, and A. Waldo, "Mechanism of Interruption of Atrial Flutter by Moricizine: Electrophysiological and Multiplexing Studies in the Canine Sterile Pericarditis Model of Atrial Flutter" *Circulation* 1994; 89: 2860-2869.
- S. Niwano, J. Ortiz, H. Abe, X. Gonzalez, **Y. Rudy**, and A.L. Waldo, "Characterization of the excitable gap in a functionally determined reentrant circuit" *Circulation* 1994; 90: 1997-2014.

- D.S. Khoury, B. Taccardi, R.L. Lux, P.R. Ershler, and **Y. Rudy**, "Reconstruction of Endocardial Potentials and Activation Sequences from Intracavitary Probe Measurements: Localization of Pacing Sites and Effects of Myocardial Structure" *Circulation* 1995; 91: 845-863.
- J. Zeng and **Y. Rudy**, "Early Afterdepolarizations in Cardiac Myocytes: Mechanism and Rate Dependence" *Biophys J* 1995; 68: 949-964.
- R.M. Shaw and **Y. Rudy**, "The Vulnerable Window for Unidirectional Block in Cardiac Tissue: Characterization and Dependence on Membrane Excitability and Cellular Coupling" *J Cardiovascular Electrophysiology* 1995; 6: 115-131.
- Y. Rudy**, "Reentry: Insights from Theoretical Simulations in a Fixed Pathway" *J Cardiovascular Electrophysiology* 1995; 6: 294-312.
- J. Zeng, K. R. Laurita, D. S. Rosenbaum, and **Y. Rudy**, "Two Components of the Delayed Rectifier K^+ Current in Ventricular Myocytes of the Guinea Pig Type: Theoretical Formulation and their Role in Repolarization" *Circulation Research* 1995; 77: 1-13.
- Y. Rudy**, "Model Studies of Cellular Excitation" *Adv Exp Med Biol* 1995; 382: 67-77.
- H.S. Oster and **Y. Rudy**, "Regional Regularization of the Electrocardiographic Inverse Problem: A Model Study using Spherical Geometry" *IEEE Trans BME* 1997; 44: 188-199.
- H.S. Oster, B. Taccardi, R.L. Lux, P.R. Ershler, **Y. Rudy**, "Noninvasive Electrocardiographic Imaging: Reconstruction of Epicardial Potentials, Electrograms and Isochrones, and Localization of Single and Multiple Electrocardiac Events" *Circulation* 1997; 96: 1012-1024.
- R.M. Shaw and **Y. Rudy**, "Electrophysiologic Effects of Acute Myocardial Ischemia: A Mechanistic Investigation of Action Potential Conduction and Conduction Failure" *Circ Res* 1997 ; 80:124-138.
- Z.W. Liu, P. Jia, P.R. Ershler, B. Taccardi, R.L. Lux, D.S. Khoury, **Y. Rudy**, "Noncontact Endocardial Mapping: Reconstruction of Electrograms and Isochrones from Intracavitary Probe Potentials" *J Cardiovasc Electrophys* 1997; 8: 415-431.
- R.M. Shaw and **Y. Rudy**, "Electrophysiologic Effects of Acute Myocardial Ischemia: A Theoretical Study of Altered Cell Excitability and Action Potential Duration" *Cardiovascular Research* 1997; 35: 256-272
- K.R. Laurita, S.D. Girouard, **Y. Rudy**, D.S. Rosenbaum, "Role of Passive Electrical Properties During Action Potential Restitution in the Intact Heart" *Am J. Physiol* 1997; 273: H1205-H1214.
- Y. Rudy** and R.M. Shaw, "Cardiac Excitation: An Interactive Process of Ion Channels and Gap Junctions" *Adv Exp Med Biol* 1997; 430: 269-280.

- R.M. Shaw and **Y. Rudy**, "Ionic Mechanisms of Propagation in Cardiac Tissue: Roles of the Sodium and L-Type Calcium Currents During Reduced Excitability and Decreased Gap-Junction Coupling" *Circ Res* 1997; 81:727-741.
- J.E. Burnes, D.C. Kaelber, B. Taccardi, R.L. Lux, P.R. Ershler, **Y. Rudy**, "A Field-Compatible Method for Interpolating Biopotentials: Development and Evaluation in Electrocardiographic Imaging" *Annals of Biomedical Engineering* 1998; 26: 37-47.
- H.S. Oster, B. Taccardi, R.L. Lux, P.R. Ershler, **Y. Rudy**, "Electrocardiographic Imaging: Noninvasive Characterization of Intramural Myocardial Activation from Inverse Reconstructed Epicardial Potentials and Electrograms" *Circulation* 1998; 97:1496-1507.
- Y. Rudy**, B. Taccardi, "Noninvasive Imaging and Catheter Imaging of Potentials, Electrograms and Isochrones on the Ventricular Surfaces" *J Electrocardiology* 1998; 30:19-23.
- Z.W. Liu, P.Jia, L.A. Biblo, B. Taccardi, **Y. Rudy**, "Single-Beat Endocardial Mapping from a Noncontact Nonexpandable 9F Catheter: A Feasibility Study" *Annals of Biomedical Engineering* 1998; 26:994-1009.
- Y. Rudy**, "Cardiac Conduction: An Interplay Between Membrane and Gap Junction" *J Electrocardiology* 1999; 31:1-5.
- S.G. Priori, J. Barhanin, R.N.W. Hauer, W. Haverkamp, H.J. Jongsma, A.G. Kleber, W.J. McKenna, D.M. Roden, **Y. Rudy**, K. Schwartz, P.J. Schwartz, J.A. Towbin, A.M. Wilde, "Genetic and Molecular Basis of Cardiac Arrhythmias, Parts I and II" *Circulation* 1999; 99:518-528. (Also published in *Eur Heart J.* 1999;20:179-195).
- "Genetic and Molecular Basis of Cardiac Arrhythmias, Part III" *Circulation* 1999; 99:674-681. (Also published in *Eur Heart J.* 1999; 20:179-195).
- P.C. Viswanathan, R.M. Shaw, **Y. Rudy**, "Effects of I_{Kr} and I_{Ks} Heterogeneity on Action Potential Duration and its Rate - Dependence: A Simulation Study" *Circulation* 1999; 99:2466-2474.
- P.C. Viswanathan, **Y. Rudy**, "Pause Induced Early Afterdepolarizations in the Long QT Syndrome: A Simulation Study" *Cardiovascular Research* 1999; 42:530-542.
- Y. Rudy**, J.E. Burnes, "Noninvasive Electrocardiographic Imaging (ECGI)" *Annals of Noninvasive Electrocardiology* 1999;4:340-359.
- C. E. Clancy, **Y. Rudy**, "Linking a genetic defect to its cellular phenotype in a cardiac arrhythmia" *Nature* 1999;400:566-569.
- Y.H. He, R.N. Ghanem, A.L. Waldo, **Y. Rudy**, "An Interactive Graphical System for Automated Mapping and Display of Cardiac Rhythms" *J Electrocardiology* 1999;32:225-241.

- Y. Rudy**, "ECGI: A Noninvasive Imaging Modality for Characterization of Intramural Myocardial Activation" *J Electrocardiology* 1999;32: 1-6.
- P.C. Viswanathan, **Y. Rudy**, "Cellular Arrhythmogenic Effects of the Congenital and Acquired Long QT Syndrome in the Heterogeneous Myocardium" *Circulation* 2000;101:1192-1198.
- J.E. Burnes, B. Taccardi, R.S. MacLeod, **Y. Rudy**, "Noninvasive Electrocardiographic Imaging of Electrophysiologically Abnormal Substrate in Infarcted Hearts: A Model Study" *Circulation* 2000;101:533-540.
- Y. Wang, **Y. Rudy**, "Action Potential Propagation in Inhomogeneous Cardiac Tissue: Safety Factor Considerations and Ionic Mechanism" *Am J Physiol (Heart)* 2000;278:H1019-H1029.
- G.M. Faber, **Y. Rudy**, "Action Potential and Contractility Changes in [Na⁺]_i Overloaded Cardiac Myocytes: A Simulation Study" *Biophys J* 2000; 78:2392-2404.
- J. E. Burnes, B. Taccardi, **Y. Rudy**, "A Noninvasive Imaging Modality for Cardiac Arrhythmias" *Circulation* 2000; 102:2152-2158.
- Y. Rudy**, "From Genome to Physiome: Integrative Models of Cardiac Excitation" *Annals of Biomedical Engineering* 2000; 28:945-950.
- T. J. Hund, N.F. Otani, **Y. Rudy**, "The Dynamics of Action Potential Head-Tail Interaction During Reentry in Cardiac Tissue: Ionic Mechanisms" *Am J Physiol (Heart)* 2000; 279:H1869-H1879.
- E. Ficker, D. Thomas, P.C. Viswanathan, A. T. Dennis, S. G. Priori, C. Napolitano, M. Memmi, B.A. Wible, E. S. Kaufman, S. Iyengar, P. J. Schwartz, **Y. Rudy**, A.M. Brown, "Novel Characteristics of a Misprocessed Mutant HERG Channel Linked to Hereditary Long QT Syndrome" *Am J Physiol (Heart)* 2000; 279:H1748-H1756.
- T. J. Hund, **Y. Rudy** "Determinants of Excitability in Cardiac Myocytes: Mechanistic Investigation of Memory Effect" *Biophys J* 2000; 79:3095-3104.
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- Y. Rudy** and R.M. Shaw, "Ionic Mechanisms of Propagation in Cardiac Tissue: Roles of Sodium and L-type Calcium Currents During Reduced Excitability and Decreased Gap-Junction Coupling" Biophysical Society 41st Annual Meeting. New Orleans, LA, March 2-6, 1997. *Biophys J* 1997; 72 No.2: A110.
- Y. Rudy**, "Interactive Membrane Processes and Gap Junction Properties During Cardiac Action Potential Propagation" XXXIII International Congress on Physiological Sciences, St. Petersburg, Russia, June 1997.
- Y. Rudy**, "Cardiac Conduction: An Interplay Between Membrane and Gap Junction" 23rd Annual Conference of the International Society for Computerized Electrocardiology (ISCE), Keystone, Colorado, April 18-23, 1998.
- Y. Rudy**, "Electrocardiographic Imaging (ECGI)" Biomedical Engineering Society 1998 Annual Meeting. Cleveland, OH, October 1998. *Annals of Biomedical Engineering* 1998; 26(1): S -18.
- Y. Rudy**, "Cardiac Conduction: An Interplay Between Membrane and Gap Junction" Biomedical Engineering Society 1998 Annual Meeting. Cleveland, OH, October 1998. *Annals of Biomedical Engineering* 1998; 26(1): S-17.
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- Y. Rudy**, "From Genome to Physiome: Integrative Models of Cardiac Excitation" World Congress on Medical Physics and Biomedical Engineering, Chicago, July 2000.
- C.E. Clancy, **Y. Rudy**, "A Single Channel Model of Cardiac I_{kr} and its Role in Action Potential Repolarization" World Congress on Medical Physics and Biomedical Engineering, Chicago, July 2000.
- G. M. Faber, **Y. Rudy**, "Efficacy of Na^+ - Ca^{2+} Exchange Blockade and Sarcolemmal Ca^{2+} Pump Enhancement in Prevention of $[Ca^{2+}]_i$ – Overload: A Simulation Study" World Congress on Medical Physics and Biomedical Engineering, Chicago, July 2000.

- K. Gima, **Y. Rudy**, “The Ionic Channel Basis of Electrocardiographic Waveforms: A Simulation Study” World Congress on Medical Physics and Biomedical Engineering, Chicago, July 2000.
- J. E. Burnes, R. N. Ghanem, **Y. Rudy**, “Electrocardiographic Imaging: Reflection of Myocardial Repolarization Heterogeneities in Body Surface Indices of Dispersion” World Congress on Medical Physics and Biomedical Engineering, Chicago, July 2000.
- C. Ramanathan, **Y. Rudy**, “Electrocardiographic Imaging: Effect of Torso Inhomogeneities on Body Surface Electrocardiographic Potentials” World Congress on Medical Physics and Biomedical Engineering, Chicago, July 2000.
- C. Ramanathan, **Y. Rudy**, “Electrocardiographic Imaging: Effect of Torso Inhomogeneities on the Noninvasive Reconstruction of Epicardial Potentials, Electrograms and Isochrones” World Congress on Medical Physics and Biomedical Engineering, Chicago, July 2000.
- P. Jia, B.B. Punske, B. Taccardi, **Y. Rudy**, “Electrophysiological Endocardial Imaging Using a Noncontact Nonexpandable Geometry-Based Catheter” World Congress on Medical Physics and Biomedical Engineering, Chicago, July 2000.
- C. E. Clancy, **Y. Rudy**, “A Single Mutation in the Cardiac Sodium Channel is Sufficient to Cause Both the Brugada and Long QT Syndrome Phenotypes” American Heart Association Scientific Sessions 2000. New Orleans, LA, Nov. 12-15, 2000. *Circulation* 2000;102 No. 8:II-355.
- Y. Rudy**, “From Genome to Physiome: Integrative Models of Cardiac Excitation and Arrhythmia” Workshop on Mapping and Control of Complex Arrhythmias. University of Montreal, Canada, October 29 – November 1, 2000.
- Y. Rudy**, “Non-Invasive Electrocardiographic Imaging of Cardiac Excitation and Arrhythmia” Second International Workshop on Computer Simulation and Experimental Assessment of Electrical Cardiac Function. Lausanne, Switzerland, December 4-5, 2000.
- Y. Rudy**, “The Ionic Mechanisms of Conduction in Cardiac Tissue” International Society For Computerized Electrocardiology. Hutchinson Island, Florida, April 2001.
- Y. Rudy**, “From Genetics to Function: Computational Models of Cardiac Arrhythmia” Frontiers in Mathematical and Computational Biology, University of Texas, Dallas, June 2001.
- Y. Rudy**, “Mechanistic Insights from Quantitative Models of Genetically Inherited Cardiac Arrhythmias” International Congress on Electrocardiology, Sao Paulo, Brazil, June 2001.
- Y. Rudy**, “Ventricular Cell Electrophysiology: From Mutations to Cell Function” Satellite Meeting of the 34th World Congress of the international Union of Physiological Sciences, Queenstown, New Zealand, August 2001.

- Y. Rudy**, “Genetically Inherited Cardiac Arrhythmias: Mechanistic Insights from Theoretical Simulations” 34th International Congress of Physiological Sciences, Christchurch New Zealand, August 2001.
- R. N. Ghanem, J.E. Burnes, A.L. Waldo, **Y. Rudy**, “Electrocardiographic Imaging: Noninvasive Reconstruction of Epicardial Measures of Dispersion of Repolarization” 3rd International Symposium on Noninvasive Functional Source Imaging, Austrian Society of Biomedical Engineering, Innsbruck Austria, September 2001
- C.E. Clancy, **Y. Rudy**, “From Genetic Defect to Cell Dynamics” SIAM Life Sciences 2001 Conference, Boston, September 2001.
- T.J. Hund, J.P. Kucera, N.F. Otani, **Y. Rudy**, “Charge Conservation and Steady State in the Luo-Rudy Dynamic Model of the Cardiac Cell” Biomedical Engineering Society Annual Meeting, Durham, North Carolina, October 2001. *Annals of Biomed Eng* 2001; Vol 29, Supp 1.
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- Y. Rudy**, “Abnormal Repolarization: Simulation of Mechanism and Noninvasive Electrocardiographic Imaging” International Congress on Electrocardiology, Montreal, July, 2002.
- Y. Rudy**, “From Genome to Physiome: Integrative Models of Cardiac Arrhythmia” Japan – Canada Conference on Cardiac Arrhythmias, Montreal, Canada, July 2002.
- Y. Rudy**, “Cardiac Arrhythmias: Computational Models of Mechanisms and Electrocardiographic Imaging (ECGI)” *Japanese J. Electrocardiology* 2002; 22:357
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- C. Ramanathan, P. Jia, R. Ghanem, K. Ryu, **Y. Rudy** “Noninvasive Electrocardiographic Imaging (ECGI) of Normal Activation and Repolarization of the Human Heart” North American Society of Pacing and Electrophysiology (NASPE), 24th Annual Scientific Sessions, Washington DC, May 14-17, 2003. *PACE* 2003; 26 No. 4: II-995.
- G. M. Faber, **Y. Rudy**, “A Single Channel Markov Model of the Cardiac L-Type Ca^{2+} Channel: Simulation Studies in the Luo-Rudy Model of the Guinea Pig Ventricular Myocyte” North American Society of Pacing and Electrophysiology (NASPE), 24th Annual Scientific Sessions, Washington DC, May 14-17, 2003. *PACE* 2003; 26 No. 4: II-1022.
- R. N. Ghanem, C. Ramanathan, P. Jia, **Y. Rudy** “Noninvasive Electrocardiographic Imaging (ECGI) of Cardiac Arrhythmias” Gordon Research Conference on Cardiac Arrhythmia Mechanisms, Colby-Sawyer College, New London, New Hampshire, August 10-15, 2003.
- T. J. Hund, **Y. Rudy**, “Regulation of Electrophysiology and Calcium Handling in a Model of the Canine Ventricular Myocyte” Gordon Research Conference on Cardiac Arrhythmia Mechanisms, Colby-Sawyer College, New London, New Hampshire, August 10-15, 2003.
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- T. J. Hund, **Y. Rudy**, “Calcium Regulation and Cellular Electrophysiology” 25th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Cancun, Mexico, September 17-21, 2003.
- T.J. Hund, **Y. Rudy**, “Altered Calcium Handling and Electrophysiological Remodeling in Cells from Infarcted Myocardium” Gordon Research Conference on Cardiac Arrhythmia Mechanisms, Santa Barbara, California, February 20-25, 2005.

- J. R. Silva, **Y. Rudy**, “Molecular Interactions Determine Effects of I_{ks} on the Cardiac Action Potential: Modulation by KCNE1 and Chromanol 293b” Gordon Research Conference on Cardiac Arrhythmia Mechanisms, Santa Barbara, California, February 20-25, 2005.
- S. Ghosh, **Y. Rudy**, “Electrocardiographic Imaging (ECGI) of Cardiac Electrophysiology in Humans” Gordon Research Conference on Cardiac Arrhythmia Mechanisms, Santa Barbara, California, February 20-25, 2005.
- L. Livshitz, **Y. Rudy**, “Interactive Tool for Cell Model Simulation” Gordon Research Conference on Cardiac Arrhythmia Mechanisms, Santa Barbara, California, February 20-25, 2005.
- Y. Rudy**, “Noninvasive Electrocardiographic Imaging (ECGI) of Cardiac Electrophysiology and Arrhythmia” *JPNJ Electrocardiology* 2005;25:357.
- G. M. Faber, **Y. Rudy**, “Calsequestrin Mutation Results in Spontaneous Calcium Release and Delayed Afterdepolarizations in a Model of the Cardiac Ventricular Myocyte” *Circulation* 2005;112, No.17: II-17.
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- Y. Rudy**, “Modeling Cardiac Excitation and Arrhythmias” Keystone Symposium on Cardiac Arrhythmias, Tahoe City, California, January 29-February 3, 2006 (P.20).
- Y. Rudy**, “Electrocardiographic Imaging (ECGI): a new noninvasive imaging modality for cardiac electrophysiology and arrhythmia” SPIE Medical Imaging, San Diego, California, February 11-16, 2006 (P. 123).
- Y. Rudy**, “Noninvasive Electrocardiographic Imaging (ECGI) in Humans” International Society for Computerized Electrocardiology, Niagara-on-the-Lake, Canada, April 2006.
- L.M. Livshitz, **Y. Rudy**, “Dysfunction of Calcium Subsystem Including CaMKII Signaling Pathway Cause Electromechanical Alternans in Guinea Pig and Dog Myocyte Models” *Heart Rhythm* 2006; 3, Issue 1S: S65.
- T.J. Hund, K.F. Decker, **Y. Rudy**, “Altered Calcium handling and Action Potential in Post- Infarction Remodeled Myocytes: Role of CaMKII” *Heart Rhythm* 2006; 3, Issue 1S: S65.
- Y. Rudy**, “Noninvasive Electrocardiographic Imaging (ECGI) for Cardiac Electrophysiology and Arrhythmias” *J Molecular and Cellular Cardiology* 2006; 40: 988.
- Y. Wang, **Y. Rudy**, “Meshless Methods in Potential Inverse Electrocardiography” IEEE/EMBS 28th International Conference, New York, September 2006.

- M. Bébarová, T. O'Hara, J. Geelen, R. Jongbloed, C. Timmermans, Y. Arens, L.M. Rodriguez, **Y. Rudy**, P., Volders, "C-Terminal SCN5A Mutation, F2004L, in Brugada Syndrome: New Arrhythmogenic Concepts" 83rd Physiological Days, Brno, Czech Republic, February 6- 8, 2007.
- H. Pan, D. Wu., J. Silva, X. Yang, J. Li, J. Shi, **Y. Rudy**, J. Cui, "KCNE1 Modulates Voltage Sensor Movements in KCNQ1 to Form Iks Properties" Biophysical Society 51st Annual Meeting, Baltimore, Maryland, March 3 – 7, 2007.
- A. Nekouzadeh, **Y. Rudy**, "Statistical Properties of Ion Channel Records: Relation to and Estimation from Macroscopic Current" Gordon Research Conference on Cardiac Arrhythmia Mechanisms, Ventura Beach, California, March 18 – 23, 2007.
- L. Livshitz, **Y. Rudy**, "Regulations of Calcium and Electrical Alternans in Cardiac Myocytes: Role of CaMKII and Repolarizing Currents" Gordon Research Conference on Cardiac Arrhythmia Mechanisms, Ventura Beach, California, March 18 – 23, 2007.
- J. Silva, H. Pan, D. Wu, J. Cui, **Y. Rudy**, "Naturally Occurring LQT1 Mutation E160K Inhibits Two-Stage Voltage Sensor Activation in IKS" Gordon Research Conference on Cardiac Arrhythmia Mechanisms, Ventura Beach, California, March 18 – 23, 2007.
- T. O'Hara, M. Bébarová, P. Volders, **Y. Rudy**, "Bradycardia-Induced ST Elevation in Brugada Syndrome (Mutation F2004L in SCN5A) is Due to Discontinuous Conduction, Not Abnormal Repolarization" Gordon Research Conference on Cardiac Arrhythmia Mechanisms, Ventura Beach, California, March 18 – 23, 2007.
- K. Decker, **Y. Rudy**, "Mechanisms of Action Potential Rate Dependence in Normal and Infarcted Myocardium" Gordon Research Conference on Cardiac Arrhythmia Mechanisms, Ventura Beach, California, March 18 – 23, 2007.
- Y. Wang, S. Ghosh, L. El-Esber, P. Cuculich, B.D. Lindsay, R.B. Schuessler, R.J. Damiano, P.K. Woodard, **Y. Rudy**, "Noninvasive Electrocardiographic Imaging (ECGI) of Atrial Arrhythmias in Patients", Gordon Research Conference on Cardiac Arrhythmia Mechanisms, Ventura Beach, California, March 18 – 23, 2007.
- M. Bebarova, T. O'Hara, J.L. Geelen, R.J. Jongbloed, C. Timmermans, Y.H. Arens, L.M. Rodriguez, **Y. Rudy**, P.G. Volders, "Subepicardial Phase-0 Block and Discontinuous Transmural Conduction Underlie Right-Precordial ST-Segment Elevation in Brugada Syndrome by a Novel C-Terminal SCN5A Mutation" Heart Rhythm Society 28th Annual Scientific Sessions, May 9-12 2007, Denver, Colorado.
Heart Rhythm 2007; 4, Issue 5S:S111.

- S. Ghosh, E.K. Rhee, J.N. Avari, P.K. Woodard, **Y. Rudy**, “Electrocardiographic Imaging (ECGI) before and after Catheter Ablation in Wolff-Parkinson-White Syndrome: Cardiac Memory in a Group of Pediatric Patients” Heart Rhythm Society 29th Annual Scientific Sessions, May 14-17 2008, San Francisco, California. *Heart Rhythm* 2008; 5, Issue 5S:S40.
- Y. Wang, P.S. Cuculich, P.K. Woodard, M.N. Faddis, **Y. Rudy**, “Electrocardiographic Imaging (ECGI): Noninvasive Characterization of Electrophysiological (EP) Substrate in Post-Myocardial Infarction (Post-MI) Patients” Heart Rhythm Society 29th Annual Scientific Sessions, May 14-17 2008, San Francisco, California. *Heart Rhythm* 2008; 5, Issue 5S:S110.
- N. Varma, P. Jia, C. Ramanathan, **Y. Rudy**, “Left Ventricular Pacing Elicits Variable Paced Propagated Wavefronts during CRT” Heart Rhythm Society 29th Annual Scientific Sessions, May 14-17 2008, San Francisco, California. *Heart Rhythm* 2008; 5, Issue 5S:S136.
- J.N. Avari, E.K. Rhee, S. Ghosh, T. Bowman, **Y. Rudy**, “Novel Application of Noninvasive Electrophysiologic Imaging in Pediatric Heart Failure: Pre and Post Cardiac Resynchronization Therapy” Heart Rhythm Society 29th Annual Scientific Sessions, May 14-17 2008, San Francisco, California. *Heart Rhythm* 2008; 5, Issue 5S:S201.
- T. Sanagala, S. Johnston, D. Rhine, G. Groot, N. Brysiewicz, C. Ramanathan, P. Jia, **Y. Rudy**, N. Varma, “Right Ventricular Apical Pacing Exerts Detrimental Electro-Mechanical Effects on Right Ventricular Function” Heart Rhythm Society 29th Annual Scientific Sessions, May 14-17 2008, San Francisco, California. *Heart Rhythm* 2008; 5, Issue 5S:S238.
- K. F. Decker, J. Heijman, J.R. Silva, T. J. Hund, **Y. Rudy**, “Properties and Ionic Mechanisms of Action potential Adaptation, Restitution and Accommodation in Canine Epicardium”. Gordon Research Conference on Cardiac Arrhythmia Mechanisms. Barga, Italy, February 2009.
- L. Livshitz, Y. Rudy, “Hyperphosphorylation of Ryanodine Receptors by PKA and CaMKII Causes Spontaneous Diastolic Ca²⁺ Release in a Rate-dependent Manner”. Gordon Research Conference on Cardiac Arrhythmia Mechanisms. Barga, Italy, February 2009.
- TJ O’Hara, H Sale, J Yang, DJ Tester, P Phartiyal, JQ He, MJ Ackerman, GA Robertson, **Y Rudy**, “Physiological properties of hERG 1a/1b heteromeric currents and hERG 1b-specific mutation associated with long-QT syndrome”. Gordon Research Conference on Cardiac Arrhythmia Mechanisms. Barga, Italy, February 2009.

- J. R. Silva, H. Pan, D. Wu, A. Nekouzadeh, K. Decker, J. Cui, N. Baker, D. Sept, **Y. Rudy**, “Linking Ion-channel Molecular Dynamics and its Alteration by Mutations to the Cardiac Action Potential and Arrhythmia”. Biophysical Society 53rd Annual Meeting, Boston, Feb.28-March 4, 2009. 2009 Biophysical Society Meeting Abstracts, Biophysical Journal, Supplement.
- W. A. Macdonald, N. Gaur, **Y. Rudy**, L. C. Hool, “The Role of Depolarizing And Repolarizing Currents in the Induction of Early Afterdepolarizations during Acute Hypoxia in Ventricular Myocytes”. Biophysical Society 53rd Annual Meeting, Boston, Feb.28-March 4, 2009. 2009 Biophysical Society Meeting Abstracts, Biophysical Journal, Supplement.
- A. Nekouzadeh, **Y. Rudy**, "Simulation of Ion Channel Gating: from Energy Landscape to Macroscopic Currents". Biophysical Society 53rd Annual Meeting, Boston, Feb.28-March 4, 2009. 2009 Biophysical Society Meeting Abstracts, Biophysical Journal, Supplement.
- J. Heijman, P. Volders, R. Westra, **Y. Rudy**, “A computational model of beta-adrenergic signaling in cardiac myocytes: local control and rate-dependent action-potential effects”. Heart Rhythm Society 30th Scientific Sessions, Boston, May 2009. *Heart Rhythm* 2009;6, issue 5S: S97.
- S. Ghosh, JN Avari, RM Canham, TM Bowman, EK Rhee, PK Woodard, **Y Rudy**, “Concordance between left ventricular electrical and mechanical synchrony in nonischemic patients undergoing cardiac resynchronization therapy”. Heart Rhythm Society 30th Scientific Sessions, Boston, May 2009. *Heart Rhythm* 2009;6, issue 5S: S127.
- N. Gaur, W. A. Macdonald, L.C. Hool, **Y. Rudy** “Relative contribution of ion currents to action potential changes and induction of early afterdepolarizations during acute hypoxia in ventricular myocytes”. Heart Rhythm Society 30th Scientific Sessions, Boston, May 2009. *Heart Rhythm* 2009;6, issue 5S: S169.
- P. Cuculich, Y. Wang, B. Lindsay, **Y. Rudy**, “Noninvasive real-time electroanatomic mapping of incomplete pulmonary vein isolation”. Heart Rhythm Society 30th Scientific Sessions, Boston, May 2009. *Heart Rhythm* 2009;6, issue 5S: S201.
- Y. Wang, P. Cuculich, M. Faddis, B. Lindsay, T. Smith, **Y. Rudy**, “Mechanisms of human ventricular tachycardia: insights from ECG imaging (ECGI)”. Heart Rhythm Society 30th Scientific Sessions, Boston, May 2009. *Heart Rhythm* 2009;6, issue 5S: S225.
- N. Varma, P. Jia, C. Ramanathan, **Y. Rudy**, “Right ventricular electrical activation in heart failure during right, left, and biventricular pacing”. Heart Rhythm Society 30th Scientific Sessions, Boston, May 2009. *Heart Rhythm* 2009;6, issue 5S: S314.

- P. Cuculich, Y. Wang, B. Lindsay, **Y. Rudy**, “Noninvasive imaging of atrial fibrillation (AF) in humans”. Heart Rhythm Society 30th Scientific Sessions, Boston, May 2009. *Heart Rhythm* 2009;6, issue 5S: S53.
- M. Latacha, N. Memon, P. Cuculich, J. Hertel, Y. Wang, **Y. Rudy**, T Smith, “Epicardial ablation of ventricular tachycardia in cardiac sarcoidosis” . Heart Rhythm Society 30th Scientific Sessions, Boston, May 2009. *Heart Rhythm* 2009;6, issue 5S: S53.
- Y. Rudy**, “Cardiac Excitation and Arrhythmias in the Human Heart: Insights from Noninvasive ECG Imaging (ECGI)” *The Journal of Physiological Sciences* 2009;59:17.

Patents

U.S. patent number 6772004 “System and Method for Non-invasive Electrocardiographic Imaging”

U.S. patent number 6839588 “Electrophysiological Cardiac Mapping System based on Non-contact Non-expandable Miniature Multi-electrode Catheter and a Method Therefore”

U.S. patent number 6975900 “Systems and Methods for Determining Surface Geometry”

U.S. patent number 7016719 “System and Method for Non-invasive Electrocardiographic Imaging (ECGI) Using Generalized Minimum Residual (GMRes)”

U.S. patent number 7471973 “Determining a Surface Geometry of an Object”

Reports in the General Press

New York Times, April 22, 2004, “Beyond the EKG, to a Hypersensitive Heart Monitor”, reported by Anne Eisenberg.

Invited Presentations

Duke University, Department of Biomedical Engineering, March, 1981.

34th Annual Conference on Engineering in Medicine and Biology, Houston, TX, September, 1981.

Ohio State University, Department of Biomedical Engineering, Columbus, OH November, 1982.

Technion - Israel Institute of Technology, Department of Biomedical Engineering, Haifa, Israel, January, 1983.

Tel-Hashomer Heart Institute, Tel-Aviv, Israel, February, 1983.

The fifth Annual Conference of the IEEE/Engineering in Medicine and Biology Society, Columbus, OH, September, 1983.

University of Montreal, Department of Biomedical Engineering, Montreal, Canada, April, 1984.

The First Henry Goldberg Workshop on 3-D Simulation and Imaging of the Cardiac System. Department of Biomedical Engineering, Technion, Haifa, Israel, March, 1984.

The Second Henry Goldberg Workshop on Simulation and Control of the Cardiac System. Department of Biomedical Engineering, Technion, Haifa, Israel, March, 1985.

3rd International Symposium on Body Surface Mapping, Nijmegen. The Netherlands, June, 1985.

University of Akron, Department of Biomedical Engineering, Akron, OH, March, 1986.

The 3rd Henry Goldberg Workshop on Simulation and Modeling of the Cardiac System. Department of Biomedical Engineering, Rutgers University, New Brunswick, NJ, April 1986.

University of Parma, Institute of General Physiology, Parma, Italy, July 1986.

University of Pavia, Institute of Numerical Analysis, Pavia, Italy, July 1986.

Technion-Israel Institute of Technology, Department of Biomedical Engineering, Haifa, Israel, August 1986.

13th International Congress on Electrophysiology, Washington, D.C., September 1986. (Opening talk of the conference).

College of Physicians and Surgeons of Columbia University, Department of Pharmacology, NY, October, 1986.

Eight Annual Conference, IEEE/Engineering in Medicine and Biology Society, Dallas - Fort Worth, TX, November 1986.

University of Utah, Cardiology Division, Salt Lake City, UT, March 1987.

University of Utah, The Nora Eccles Harrison Cardiovascular Research and Training Institute, Salt Lake City, UT, March 1987.

University of Parma, Institute of General Physiology, Parma Italy, July 1987.

Technion - Israel Institute of Technology, Department of Biomedical Engineering, August 1987.

The Canada - U.S. Symposium on Electrophysiology. Niagara Falls, NY, Sept. 1987.

The American Physiological Society Fall Meeting. San Diego, CA, Oct. 1987.

Workshop on Analysis and Simulation of the Cardiac System. Cambridge University, England, April 1988.

Summer Conference on Electrophysiological Mechanisms of Propagation in, and Activation of Cardiac and Smooth Muscle. Federation of American Societies for Experimental Biology. Saxtons River, VT Aug. 1988.

10th Annual Conference, IEEE/Engineering in Medicine and Biology Society. New Orleans, LA, Nov. 1988.

University of Utah, The Nora Eccles Harrison Cardiovascular Research and Training Institute, Salt Lake City, UT, October 1988.

Johns Hopkins University, Department of Biomedical Engineering, Baltimore, MD, October 1988.

Indiana University School of Medicine, Department of Pharmacology and Toxicology, Indianapolis, IN, May 1989.

Mayo Clinic, Department of Physiology and the Biodynamics Research Unit, Rochester MN, May 1989.

Computers in Cardiology. Jerusalem, Israel, September 1989. (A Tutorial on the Inverse Problem in Electrocardiography).

State University of New York, Department of Physiology and Biophysics. Stony Brook NY, October 1989

The 6th Henry Goldberg Workshop on Imaging, Measurement and Analysis of the Heart. Eilat, Israel, December 1989.

The 7th Henry Goldberg Workshop on Micro Phenomena in the Cardiac Muscle: Activation. Circulation and Transport. Berne Switzerland, May 1990.

University of Berne, Department of Physiology, Berne, Switzerland, May 1990.

Columbia University, College of Physicians and Surgeons, Department of Pharmacology, New York, August 1990.

17th International Congress on Electrophysiology. Florence, Italy, September 1990.

University of Utah, The Nora Eccles Harrison Cardiovascular Research and Training Institute. Salt Lake City, UT, October 1990.

Cardiac Electrophysiology Society. Dallas, TX, November 1990.

American Heart Association 63 Scientific Sessions. Dallas, TX, November 1990.

12th Annual Conference, IEEE/Engineering in Medicine and Biology Society, Philadelphia, PA, November 1990.

Washington University, Department of Medicine, St. Louis, MO April 1991.

Conference on Chaos and Sudden Death. The Johns Hopkins University, Baltimore, MD, May 1991.

Tel-Aviv University, Department of Physics and Astronomy, Tel-Aviv, Israel, June, 1991.

Meir Hospital, Kefar-Saba, Israel, July 1991.

JAPAN-USA. Symposium on Cardiac Excitation and Conduction. Palm Desert, CA, November 1991.

Penn State University, Department of Bioengineering, March, 1992.

The International Society for Computerized Electrophysiology. Keystone, CO, May 1992.

The Canadian Association for the Advancement of Science, Montreal, Canada, May, 1992 (Keynote Address).

Computers in Cardiology. Durham, NC, October 1992. (A Tutorial on Models of Cellular Excitation and Propagation in Cardiac Tissue).

Workshop on High Performance Computing in Biomedical Research. Durham, NC, October, 1992. (The Electrocardiographic Inverse Problem).

14th Annual Conference, IEEE/Engineering in Medicine and Biology Society. Paris, France, October, 1992.

The 8th Henry Goldberg Workshop on Interactive Phenomena in the Cardiac System. Bethesda, MD, December, 1992.

International Symposium on Biomedical Optics. Los Angeles, CA, January, 1993.

Cardiac Electrophysiology From Cell to Bedside: A Symposium. Keystone, CO, August, 1993.

State-of-the-Art Conference on Atrial Arrhythmias, American Heart Association, Dallas, TX, October 1993.

AAMI and NIH-NHLBI Cardiovascular Science and Technology Conference, Washington, D.C., December, 1993.

A Symposium on Atrial Flutter. Nice, France, June, 1994.

Columbia University, College of Physicians and Surgeons, Department of Pharmacology, NY, August, 1994.

Cornell University, Department of Physiology, The Gordon K. Moe Lecture, Ithaca, NY, October, 1994.

National Institutes of Health and The National Academy of Sciences, Presentation on Bioelectric/Biomagnetic Imaging. Bethesda, MD, November, 1994.

Cardiac Electrophysiology Society. Dallas, TX, November 1994.

The 9th Goldberg Workshop on Molecular and Subcellular Cardiology. Haifa, Israel, December 1994.

Procter & Gamble Pharmaceuticals, Norwich, NY, March 1995.

NASPE - North American Society of Pacing and Electrophysiology, 16th Annual Scientific Sessions. Boston, MA, May 1995.

Brookhaven National Laboratory, Upton, NY, August 1995.
IEEE Engineering in Medicine and Biology Society, 17th International Conference. Montreal, Canada, September 1995.

NIH/AHA Joint Workshop on Discontinuous Conduction in the Heart. Hilton Head Island, NC, September 1995.

Cardiac Electrophysiology Society. Anaheim, CA, November, 1995.

The Bristol-Myers Squibb Pharmaceutical Research Institute, Princeton, NJ, December 1995.

Masonic Medical Research Laboratory, Utica, NY, December 1995.

SUNY Health Science Center, Department of Pharmacology, Syracuse, NY,
January, 1996.

Washington University, School of Medicine Colloquium, St. Louis, MO, January 1996.

Special Meeting on Myocardial Ion Channels and the Physiology of Cardiac Arrhythmias.
Death Valley, CA, February 1996.

Duke University, NSF Center for Emerging Cardiovascular Technologies, Durham, NC,
March 1996.

Group de Reflexion sur la Recherche Cardiovasculaire. Lyon, France, April 1996.

SmithKline Beecham Pharmaceuticals, Unite de Recherché, Saint-Gregoire Cedex,
France, April, 1996.

Northwestern University Medical School, Department of Medicine, Chicago, IL, May 1996.

Cardiostim 96, 10th International Congress, Nice, France, June 1996

St. Jude Medical, St. Paul, MN, September 1996.

Biomedical Engineering Society 1996 Annual Fall Meeting. Penn State University, October
1996.

The 10th Goldberg Workshop on Analytical and Quantitative Cardiology: From Genetics
to Function. Haifa, Israel, December 1996.

The Rammelkamp Research Conference Seminars, MetroHealth Medical Center,
Cleveland, Ohio, December 1996.

American College of Cardiology, Symposium on New Horizons in Cardiac Mapping,
Anaheim, California, March 1997.

International Society for Computerized Electrocardiology (ISCE), 22nd Annual
Conference, Palm Coast, Florida, April 1997.

Medtronic Inc., Minneapolis, Minnesota, May 1997.

XXXIII International Congress on Physiological Sciences (IUPS), St. Petersburg, Russia,
June 1997.

Masonic Medical Research Laboratory, The Gordon M. Moe Lecture, Utica, NY,
September 1997.

European Society of Cardiology, Study Group on Molecular Basis of Arrhythmias, Nice,
France, October 1997.

Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, March
1998.

International Society for Computerized Electrocardiology (ISCE), 23rd Annual Conference, Keystone, Colorado, April 1998.

International Society for Heart Research (ISHR) World Congress, Rhodes, Greece, May 1998.

Gordon Conference on Cardiac Regulatory Mechanisms, New Hampshire, July 1998.

Cardiovascular and Pulmonary Research Institute, Allegheny University of the Health Sciences, Pittsburgh, August 1998.

Computers in Cardiology International Symposium, Cleveland, September 1998.

Tulane University, Department of Biomedical Engineering, The A.C. Suhren Lecture, New Orleans, September 1998.

Biomedical Engineering Society 1998 Annual Meeting, Cleveland, October 1998.

The University of North Carolina School of Medicine, Chapel Hill, October 1998.

American Heart Association 71st Scientific Sessions, Dallas, TX, Nov. 9 - 11, 1998.

International Workshop on Computer Simulation and Experimental Assessment of Electrical Cardiac Function, Lausanne, Switzerland, December 1998.

University of Berne, Institute of Physiology, Berne, Switzerland, December 1998.

Tel-Aviv University, Departments of Physics and Biomedical Engineering, Tel-Aviv, Israel, January 1999.

Technion-Israel Institute of Technology, Departments of Medicine and Biomedical Engineering, Haifa, Israel, January 1999.

University of California San Diego, Department of Biomedical Engineering, April 1999.

Tokyo University, Tokyo, Japan, April 1999.

International Society for Computerized Electrocardiology (ISCE) 24th Annual Conference, Nara Japan, April 1999.

NASPE - North American Society of Pacing and Electrophysiology 20th Annual Scientific Sessions, Toronto, Canada, May 1999.

Public Meeting on New Strategies for Antiarrhythmic Treatment, Tokyo, Japan, May 1999.

NIH Biomedical Imaging Symposium: Visualizing the Future of Biology and Medicine, Bethesda, Maryland, June 1999.

Physiome Symposium on Integrated Biology of the Heart, Seattle, September 1999.

Biophysical Society 44th Annual Meeting, New Orleans, February 2000.

The Rammelkamp Research Conference Seminars, MetroHealth Medical Center, Cleveland, Ohio, March 2000.

Daig/St. Jude Medical Corporation, Minneapolis, Minnesota, April 2000.

NASPE – North American Society of Pacing and Electrophysiology 21st Annual Scientific Sessions, Washington D. C., May 2000.

International Congress on Electrocardiology, Milan, Italy, June 2000 (The Rijlant Lecture).

World Congress on Medical Physics and Biomedical Engineering, Chicago, July 2000.

Center for Mathematical Research, University of Montreal, Canada, October 2000.

American Heart Association Scientific Sessions, Seminar on Cardiovascular Ion Channel Function and Human Genetics. New Orleans, LA, November 2000.

International Workshop on Computer Simulation and Experimental Assessment of Electrical Cardiac Function. Lausanne, Switzerland, December 2000.

The Whitaker Foundation Biomedical Engineering Education Summit. Lansdowne, Virginia, December 2000.

Washington University in St. Louis, Department of Medicine, March, 2001.

International Society for Computerized Electrocardiology, Hutchinson Island, Florida, April 2001.

NASPE-North American Society of Pacing and Electrophysiology 22nd Annual Scientific Sessions, Boston, May 2001.

Frontiers in Mathematical and Computational Biology, University of Texas, Dallas, June 2001.

International Congress on Electrocardiology, Sao Paulo Brazil, June 2001.

Meeting on “The Integrated Heart: Cardiac Structure and Function”, Queenstown, New Zealand, August 2001.

The International Congress of Physiological Sciences, Christchurch, New Zealand, August 2001.

Biomedical Engineering Society (BMES) Annual Meeting, Durham, North Carolina, October 2001.

University of Utah, Department of Biomedical Engineering, Salt Lake City, Utah, November 2001.

Maastricht University, Department of Cardiology, Maastricht, The Netherlands, June 2002.

Einthoven 2002; 100 Years of Electrocardiography, Leiden, The Netherlands, June 2002.

University of Bern, Institute of Physiology, Bern, Switzerland, June 2002.

Cardiostim 2002; World Congress on Cardiac Arrhythmias, Nice, France, June 2002.

Japan – Canada Conference on Cardiac Arrhythmias, Montreal, Canada, July 2002.

International Congress on Electrocardiology, Montreal, Canada, July 2002.

International Society for Heart Research, Madison, Wisconsin, July 2002.

The Aspen Institute of Physics, Aspen, Colorado, August 2002.

Japan National Cardiovascular Center, Osaka, Japan, September 2002.

Combined Meeting of the Japanese College of Cardiology and the Japanese Society of Electrocardiology, Nagoya, Japan, September 2002.

Workshop on the “Virtual Heart”, Nagoya, Japan, September 2002.

Research Institute of Environmental Medicine, Nagoya University, Nagoya, Japan, September 2002.

American Heart Association Scientific Sessions, Chicago, November 2002.

3rd International Workshop on Computer Simulation and Experimental Assessment of Electrical Cardiac Function. Lausanne, Switzerland, December 2002.

A Didactic Workshop on Electrophysiology of the Heart, Ecole Polytechnique Federal, Lausanne, Switzerland, December 2002.

The Technion – Bruce Rappaport School of Medicine, Haifa, Israel, January 2003.

Towards a New Era in Interventional Electrophysiology, Mont Tremblant, Canada, March 2003.

Cardiology Grand Rounds, Department of Medicine, Cornell University Medical College, New York, April 2003.

North American Society of Pacing and Electrophysiology (NASPE), 24th Annual Scientific Sessions, Washington DC, May 14-17, 2003.

International Congress on Electrocardiology, Helsinki, Finland, June 11-14, 2003.

NSF/ Pacific Institute for the Mathematical Sciences (PIMS) Workshop on Inverse Problems & Medical Imaging, Vancouver, Canada, August 4-8, 2003.

XIV Paavo Nurmi Symposium on Genetic and Molecular Basis of Cardiac Arrhythmias, Helsinki, Finland, August 27-29, 2003.

Workshop on Cardiac Engineering: From Genes and Cells to Structure and Function, Ettore Majorana Foundation and Center for Scientific Culture, Erice, Sicily, September 20-24, 2003.

American Heart Association Scientific Sessions, Orlando, Florida, November 2003.

Pfizer Global Research and Development, Groton, Connecticut, January 2004.

Workshop on Multiscale Computational Models for Biomedical Research, University of California San Diego, March 2004.

Texas Heart Institute and Baylor College of Medicine, Basic Science Seminar, Houston, April 2004.

Texas heart Institute and Baylor College of Medicine, Cardiology Grand Rounds, Houston, April 2004.

NASPE Heart Rhythm Society, San Francisco, May 2004.

International Workshop on Computer Simulation and Experimental Assessment of Cardiac Function, Cap d'Ail, France, June 2004.

Cardiostim – World Congress in Cardiac Electrophysiology and Cardiac Techniques, Nice, France, June 2004.

The 31st International Congress on Electrocardiology, Kyoto, Japan, June 2004.

International Symposium on Cardiac Arrhythmia – Molecular Basis of Arrhythmogenesis, Nagoya, Japan, July 2004.

28th Meeting of the European Working Group on Cardiac Cellular Electrophysiology, Szeged, Hungary, September 2004.

Symposium on Cardiac Arrhythmias and Sudden Death, Technion School of Medicine, Haifa, Israel, October 2004.

American Heart Association Scientific Sessions, Ask the Expert Session, New Orleans, November 2004.

Gordon Research Conference on Cardiac Arrhythmia Mechanisms, Santa Barbara, California, February 20-25, 2005.

The Reynolds Cardiovascular Research Center, Johns Hopkins School of Medicine, Division of Cardiology, Baltimore, March 2005.

International Union of Physiological Sciences (IUPS) Satellite Meeting for the Physiome Project, San Diego, California, March 2005.

University of Texas at Austin, Department of Biomedical Engineering, Austin, Texas, April 2005.

The International Society for Computerized Electrocardiology (ISCE), Kawai, Hawaii, April 2005.

Heart Rhythm Society Annual Scientific Sessions, New Orleans, May 2005.

Cardiovascular Institute at Loyola University, Medical Grand Rounds, Chicago, May 2005.

Department of Physiology, Loyola University, Chicago, May 2005.

The 32nd International Congress on Electrocardiology, Gdansk, Poland, June 2005.

The Second Key Symposium, The National Swedish Academy of Sciences, Stockholm, June 2005.

Columbia University College of Physicians and Surgeons, Department of Pharmacology, New York, June 2005.

Nagoya University, Research Institute of Environmental Medicine, Nagoya, Japan, October 2005.

The Japanese Society of Electrocardiology, Toyama, Japan, October 2005.

American Heart Association Scientific Sessions, How To Session, Dallas, November 2005.

Keystone Symposium on Cardiac Arrhythmias, Tahoe City, California, January 2006.

SPIE Medical Imaging, San Diego, California, February 2006.

International Society for Computerized Electrocardiology, Niagara-on-the-Lake, Canada, April 2006.

New Leaders in Cardiology and Electrophysiology (A Medtronic Seminar), Boston, May 2006.

International Society for Heart Research (European Section), Manchester, UK, June 2006.

International Congress on Electrocardiology, Cologne, Germany, June 2006.

Cardiostim – World Congress in Cardiac Electrophysiology and Cardiac Techniques, Nice, France, June 2006.

Workshop on Cardiac Electrophysiology and Arrhythmia, The Mathematical Biosciences Institute, Ohio State University, Columbus, Ohio, September 2006.

A joint meeting of the International Dead Sea Symposium and the Rappaport Symposium “Consensus and Controversy in Cardiac Arrhythmias” Tel - Aviv, Israel, October 2006.

Fifth International Workshop on Computer Simulation and Experimental Assessment of Electrical Cardiac Function, Lausanne, Switzerland, December 2006.

Institute of Physiology, University of Bern, Bern, Switzerland, December 2006.

Center for Neurodynamics, Department of Physics and Astronomy, University of Missouri at St Louis, February 2007.

Frontiers in Human Pathobiology, Washington University School of Medicine, St Louis, March 2007.

Cardiovascular Research Center, Department of Medicine, University of Iowa, Iowa City, March 2007.

Gordon Research Conference on Cardiac Arrhythmia Mechanisms, Ventura Beach, California, March 18 – 23, 2007.

International Society for Computerized Electrocardiology, Cancun, Mexico, April 2007.

Heart Rhythm Society 28th Annual Scientific Session, Denver, Colorado, May 2007.

University of Utah, Cardiovascular Research and Training Institute (CVRTI), Salt Lake City, May 18, 2007.

Columbia University, St Luke's-Roosevelt Hospital Center, Grand Rounds in Cardiology, New York, May 30, 2007.

Hopital Cardiologique CHU Haut-Leveque, Grand Rounds in Cardiology, Bordeaux, France, June 20, 2007.

Denis Escande Symposium on Cardiovascular Diseases, Inserm, Nantes, France, June 22, 2007.

Medtronic, Forum Presentation, Minneapolis, Minnesota, July 27, 2007.

NIH-NHLBI Workshop on Systems Approach to Understanding Electromechanical Activity in the Human Heart, Washington DC, August 20-21, 2007.

Workshop on Regulation of Transport Phenomena in the Cardiac System, Antalya, Turkey, September 16 – 20, 2007

An International Symposium on Ventricular Arrhythmias, University of Pennsylvania School of Medicine, Philadelphia, October 26-27, 2007.

University of Michigan, Department of Biomedical Engineering, Ann Arbor, Michigan, November 28, 2007.

Stanford University School of Medicine, Department of Medicine (Cardiology), Stanford, California, December 5, 2007.

Stanford University, Cardiovascular Institute Seminar, Stanford, California, December 5, 2007.

University of Wisconsin, Cardiovascular Research Conference, Madison, Wisconsin, December 18, 2007.

University of Wisconsin, Department of Physiology, Madison, Wisconsin, December, 19, 2007.

New York University (NYU), Cardiology Grand Rounds, New York City, January 4, 2008.

Cornell University, Weill Medical College, Department of Physiology and Biophysics, New York City, January 7, 2008.

University of California, San Francisco, Department of Medicine Grand Rounds, March 13, 2008.

University of California, San Francisco, Cardiology Seminar, March 13, 2008.

Ventricular Arrhythmia and Sudden Death Symposium, San Francisco, March 14-16, 2008.

Heart Rhythm Society 29th Annual Scientific Sessions, May 14-17 2008, San Francisco, California. Session on the Molecular Basis for the Clinical Electrocardiogram.

Heart Rhythm Society 29th Annual Scientific Sessions, May 14-17 2008, San Francisco, California. Session on Why do T-waves Change?

Technion – Israel Institute of Technology, Department of Biomedical Engineering, Special Lecture in memory of Professor Samuel Sideman, Haifa, Israel, June 1, 2008.

Technion – Israel Institute of Technology School of Medicine, Grand Rounds in Cardiovascular Science, Haifa, Israel, June 2, 2008.

Cardiostim – World Congress in Cardiac Electrophysiology and Cardiac Techniques, Nice, France, June 2008.

University of Cape Town, Hatter Cardiovascular Research Institute. The Molecular Basis of Cardiac Repolarization. Cape Town, South Africa, August 15, 2008.

University of Cape Town, Hatter Cardiovascular Research Institute. Noninvasive Electrocardiographic Imaging for Cardiac Arrhythmias. Cape Town, South Africa, August 16, 2008.

Maastricht University, The Netherlands, H.J.J. Wellens Distinguished Professorship presentation. Computational Biology and ECG Imaging in the Study of Cardiac Electrophysiology and Arrhythmia. September 15, 2008.

Maastricht University, The Netherlands, Workshop on Frontiers in Computational Electrocardiology. How to Understand and Model Structure-Function Relations of Ion Channels? September 17, 2008.

Maastricht University, The Netherlands, Workshop on Frontiers in Computational Electrocardiology. Basic Principles of ECG Imaging from the Viewpoint of Computational Modeling. September 17, 2008.

Cardiovascular System Dynamics Society XVIII Conference, St. Louis, Missouri, USA. Relating the Action Potential to the ECG. September 28, 2008.

Division of Biology & Biological Sciences, Washington University in St Louis. Modeling and Imaging Cardiac Electrophysiology and Arrhythmia. November 4, 2008.

Cardiac Bioelectricity and Arrhythmia Center (CBAC) Seminar. Noninvasive ECG Imaging (ECGI) of Cardiac Arrhythmias. Washington University in St Louis, November 17, 2008.

University of Alabama at Birmingham, Department of Medicine. Noninvasive ECG Imaging of Cardiac Electrophysiology and Arrhythmia. December 4, 2008.

University of Alabama at Birmingham, Cardiac Rhythm Management Laboratory. The Molecular Basis of Cardiac Action Potential Repolarization. December 4, 2008.

Duke University, Ion Channel Research Unit. The Molecular Mechanisms of I_{Kr} and I_{Ks} Participation in Rate Dependent Repolarization of the Cardiac Ventricular Action Potential. Durham, North Carolina, January 8, 2009.

Duke University, Grand Rounds in Cardiology. Imaging Cardiac Arrhythmias. Durham, North Carolina, January 9, 2009.

The 6th Fairberg Workshop on Analysis of Cardiac Development. Noninvasive Imaging of Cardiac Electrophysiology and Arrhythmia. Technion, Haifa, Israel, March 2009.

The American Physiological Society's Experimental Biology 2009 *Physiology InFocus* program. Symposium on Integrative and Systems Physiology: An Approach to Understanding Organ System and Disease—Cardiac Ion Transport and Arrhythmias. “The molecular basis of cardiac action potential repolarization: Simulations across scales”. New Orleans, April 2009.

6th International Ascona Workshop on Cardiomyocyte Biology. In Vivo Imaging of Human Cardiac Electrical Excitation. Centro Stefano Franscini, Monte Verita, Ascona, Switzerland, April 2009.

Heart Rhythm Society 30th Scientific Sessions. Noninvasive ECG Imaging in Pediatrics. Boston, May 2009.

Cleveland Clinic Heart and Vascular Institute, Symposium on Cardiovascular Care: Legacy and Innovation. “Atrial Arrhythmias: Insights from Noninvasive ECG Imaging (ECGI)” Cleveland, Ohio, June 2009.

Case Western Reserve University and University Hospitals, Grand Rounds in Cardiology “The Molecular Basis of Cardiac Repolarization”, Cleveland, Ohio, June 2009.

Technion – Israel Institute of Technology, Department of Biomedical Engineering Colloquium, “Noninvasive Imaging of Cardiac Arrhythmias in Patients” Haifa, Israel, June 2009.

36th International Congress of Physiological Sciences (IUPS2009), “Cardiac Excitation and Arrhythmias in the Human Heart: Insights from Noninvasive ECG Imaging (ECGI)” , Kyoto, Japan, July 2009.

National Cheng Kung University, “Noninvasive Imaging of Cardiac Arrhythmias”, Tainan, Taiwan, August 2009.

National Cheng Kung University, “The Molecular Basis of Cardiac Repolarization”, Tainan, Taiwan, August 2009.

Providence University, Department of Applied Mathematics, “Modeling Structure and Function of Cardiac Ion Channels”, Taichung, Taiwan, August 2009.

National Chung Hsing University, Department of Physics, “Noninvasive Imaging Modality for Cardiac Electrophysiology”, Taichung, Taiwan, August 2009.

National Taiwan University College of Medicine and Hospital, Grand Rounds “Mechanisms of Human Cardiac Arrhythmias: Insights from Noninvasive ECG Imaging (ECGI)”, Taipei, Taiwan, August 2009.

Safety in Pharmacology Society 9th Annual Meeting, “Noninvasive ECG Imaging (ECGI) for Cardiac Electrophysiology and Arrhythmia”, Strasbourg, France, September 15-18, 2009.

Catholic University of Leuven, Department of Cardiovascular Medicine, “Modeling and Imaging Cardiac Repolarization”, Leuven, Belgium, September 22, 2009.

Maastricht University and Academic Hospital, Grand Rounds in Cardiology, “Noninvasive ECG Imaging (ECGI) of Cardiac Arrhythmias”, Maastricht, The Netherlands, September 24, 2009.

Maastricht University and Academic Medical Center, Hein Wellens Distinguished Professorship Presentation, “Theoretical Concepts in Cardiac Conduction and Imaging Abnormal Electrophysiological Substrate”, Maastricht, The Netherlands, September 28, 2009.

Maastricht University and Academic Medical Center, Frontiers in Computational Electrophysiology Workshop, “Modeling Electrophysiological Drug Effects and Imaging Arrhythmogenic Substrate”, Maastricht, The Netherlands, October 1, 2009.

American Heart Association Scientific Sessions 2009, Cardiovascular Seminar “From Molecular Structure to Ion Channel Function in Repolarization”, Orlando, Florida, November 15, 2009.

Other Professional Activities:

Organized and chaired a workshop entitled "Interpretation of Body Surface Potential Maps: Which Is The Way To Go?" in the Second Annual Conference of the IEEE/Engineering in Medicine and Biology Society, Washington, D.C., September 1980.

Chairman of the Biomedical Engineering Society (BMES) Meetings Committee for 1981/82. Organized the 1982 Scientific Meeting in New Orleans, LA.

Chairman, Bioelectric Phenomena Committee of the IEEE Engineering in Medicine and Biology Society (IEEE/EMBS), for 1982.

Member of the Nominating Committee of the Biomedical Engineering Society (BMES) for 1982.

Guest Editor, Annals of Biomedical Engineering, 1983.

Organized and chaired a session entitled "Body Surface Potential Mapping - Imaging The Electrical Activity Of The Heart" in the Fifth Annual Conference of the IEEE/Engineering in Medicine and Biology Society, Columbus, OH, September, 1983.

Organized and chaired a session on Electrocardiology in the Seventh Annual Conference of the IEEE/Engineering in Medicine and Biology Society, Chicago, IL, September, 1985.

Organized a Symposium "Theory of ECG" for the 9th Annual Conference of the IEEE Engineering in Medicine and Biology Society, Boston, MA, November 1987.

Organized and chaired a session on the Inverse Problem in Electrocardiography. IEEE/Engineering in Medicine and Biology Society 9th Annual Conference, Boston, MA, November 1987.

Session Chairman, "Cardiac Conduction and Refractoriness" American Heart Association 60th Scientific Sessions, Anaheim, CA, November, 1987.

Reviewer, Abstracts in Electrophysiology and Electropharmacology, American Heart Association 61st Scientific Sessions, Washington D.C., November, 1988.

Session Chairman, "Electrophysiology - Activation I" American Heart Association 61st Scientific Sessions, Washington D.C., November, 1988.

Session Chairman, "Multicellular and Bidomain Systems" IEEE/Engineering in Medicine and Biology Society 10th Annual Conference, New Orleans, LA, November 1988.

Session Chairman, "Inverse Problem" IEEE/Engineering in Medicine and Biology Society 10th Annual Conference, New Orleans, LA, November 1988.

Reviewer, Abstracts in Electrophysiology and Electropharmacology, American Heart Association 62nd Scientific Sessions, New Orleans, LA, November 1989.

Session Chairman, "Electrophysiology and Electropharmacology of the Heart-Arrhythmias" American Heart Association 62nd Scientific Sessions, New Orleans, LA, November 1989.

Scientific Advisory Committee, The Henry Goldberg Workshops on the Cardiac System.

Consultant, "Studies of Atrial Flutter in a Dog Model" A. Waldo, Principal Investigator. Supported by NIH, (Case Western Reserve University).

Consultant, "Three Dimensional Mapping of Cardiac Electric Fields". B. Taccardi, Principal Investigator. Supported by NIH, (University of Utah, Salt Lake City, UT).

Consultant, "Regulation of Myocardial Gap Junctions" Jeffrey E. Saffitz, Principal Investigator. Supported by NIH, (Washington University in St. Louis).

Consultant, "Mechanism of Reentry Based on Dynamic Adaptation of Cardiac Wavelength" David Rosenbaum, Principal Investigator. Supported by VA, (Case Western Reserve University).

Session Chairman, "Electrophysiology and Electropharmacology of the Heart: Mechanisms and Therapy" American Heart Association 63rd Scientific Sessions, Dallas, TX, November 1990.

Session Chairman and Invited Faculty, "Mechanisms of Arrhythmias - Old and New Concepts" IXth World Symposium on Cardiac Pacing and Electrophysiology, Washington, D.C., May 28-31, 1991.

Organizing Committee, JAPAN-USA Symposium on Cardiac Excitation and Conduction, Palm Desert, CA, November 14-17 1991.

Organizing Committee, 14th Annual International Conference of the IEEE/Engineering in Medicine and Biology Society. Paris, France, October 29 - November 1, 1992.

Session Chairman, "New Approaches to ECG and EEG" 14th Annual International Conference of the IEEE/Engineering in Medicine and Biology Society. Paris, France, October 29 - November 1, 1992.

Congressional Liaison Committee, Biophysical Society, 1994 -

Session Chairman, "The Inverse Problem" Computers in Cardiology. Bethesda, MD, September 25-28, 1994.

Session Chairman, "Signal Processing: ECG" 16th Annual International Conference of the IEEE/Engineering in Medicine and Biology Society. Baltimore, MD, November 3-6, 1994.

Member, NIH/National Academy of Sciences special task force on developing a long-term plan for imaging research (in response to a Congressional mandate), 1994.

Session Chairman, "Cell-Cell Interactions in the Pathogenesis of Arrhythmias" American Heart Association 67th Scientific Sessions. Dallas, TX, November 14-16, 1994.

North American Society of Pacing and Electrophysiology (NASPE), Young Investigators Awards Committee, 1994-1999. (Chairman, 1996-1999).

Reviewer, Abstracts in Electrophysiology and Electropharmacology, American Heart Association 68th Scientific Sessions, Anaheim, CA, November 1995.

Session Chairman, "Pharmacology and Abnormal Conduction Patterns in Ventricular Tachycardia/Fibrillation" American Heart Association 68th Scientific Sessions, Anaheim, California, November 13-16, 1995.

Session Chairman, "Ischemia, Autonomics and Drugs" North American Society of Pacing and Electrophysiology (NASPE), 17th Annual Scientific Session. Seattle, WA, May 15-18, 1996.

Reviewer, Abstracts in Electrophysiology and Electropharmacology, American Heart Association 69th Scientific Sessions. New Orleans, LA, November 11-13, 1996.

Co-Organizer, 23rd International Congress on Electrocardiology. Cleveland, OH, July 31-August 4, 1996.

Organizer and Chairman, Symposium: "Cellular Mechanisms of Cardiac Arrhythmias" 23rd International Congress on Electrocardiology. Cleveland, OH, July 31-August 4, 1996.

Organizer and Chairman, Symposium: "Electrocardiographic Imaging: Forward and Inverse Problems" 23rd International Congress on Electrocardiology. Cleveland, OH, July 31-August 4, 1996.

Organizer and Chairman, "Modeling Cardiac Electrocardiology" Biomedical Engineering Society 1996 Annual Fall Meeting. Penn State University, October 3-6, 1996.

Chairman, "Electrocardiology: Forward and Inverse Problems" Biomedical Engineering Society 1996 Annual Fall Meeting. Penn State University, October 3-6, 1996.

Session Chairman, "Cardiac Memory" American Heart Association 69th Scientific Sessions, New Orleans, Louisiana, November 10-13, 1996.

Member, Organizing Committee, The 10th Goldberg Workshop on "Analytical and Quantitative Cardiology: From Genetics to Function" Haifa, Israel, December 2-5, 1996.

Session Chairman, "Cardiac Electrophysiology I" 41st Meeting of the Biophysical Society, New Orleans, Louisiana, March 2-6, 1997.

Organizer and Chairman, Symposium: "New and Inventive Approaches for Electrocardiographic Imaging" 22nd Annual Conference of the International Society for Computerized Electrocardiology (ISCE), Palm Coast, Florida, April 26- May 1, 1997.

Chairman, Young Investigator Award Competition, North American Society of Pacing and Electrophysiology (NASPE), 18th Annual Scientific Sessions, New Orleans, LA, May 7-10, 1997.

Chairman, Core Curriculum "Concepts in Arrhythmogenesis", North American Society of Pacing and Electrophysiology (NASPE), 18th Annual Scientific Sessions, New Orleans, LA, May 7-10, 1997.

Member, Study Group on Molecular Basis of Arrhythmias, European Society of Cardiology, Nice, France, October 1997.

Reviewer, Abstracts in Electrophysiology and Electropharmacology, American Heart Association 70th Scientific Sessions, Orlando, Florida, November 9-12, 1997.

Session Chairman, "Cellular and Multicellular Determinants of Cardiac Excitation" American Heart Association 70th Scientific Sessions, Orlando, Florida, November 9-12, 1997.

Session Chairman, "Computer Models of Cardiac Arrhythmia" International Society for Computerized Electrocardiology (ISCE), 23rd Annual Conference, Keystone, Colorado, April 1998.

Chairman, Young Investigator Award Competition, North American Society of Pacing and Electrophysiology (NASPE), 19th Annual Scientific Sessions, San Diego, CA, May 6-9, 1998.

Session Chairman, "The Mathematics of Ion Channels" North American Society of Pacing and Electrophysiology (NASPE), 19th Annual Scientific Sessions, San Diego, CA, May 6-9, 1998.

Session Organizer and Chairman, "Inverse and Forward Problems in Electrocardiology" Biomedical Engineering Society 1998 Annual Meeting, Cleveland, October 10 - 13, 1998.

Reviewer, Abstracts in Cardiac Electrophysiology, American Heart Association 71st Scientific Sessions, Dallas, TX, Nov. 9-11, 1998.

Chairman, Young Investigator Award Competition, North American Society of Pacing and Electrophysiology (NASPE) 20th Annual Scientific Sessions, Toronto, Canada, May 11-15, 1999.

Session Chairman, “The Remodeled Substrate and the Usefulness of Our Indicators”
Cardiac Electrophysiology Society Annual Meeting, Anaheim, CA, November 2001.

Session Chairman, "Basic Cardiac Electrophysiology: What the Fellow and Practicing
Electrophysiologist Should Know III: Molecular and Ionic Basis of Cardiac Excitability
and Conduction in Health and Disease” NASPE 20th Annual Scientific Sessions,
Toronto, Canada, May 11-15, 1999.

Organizing Committee, The Japanese Gambit Meeting on Strategies for Antiarrhythmic Drug
Development (organizational meeting in Hakone, Japan, May 1999).

Reviewer, Abstracts in Cardiac Electrophysiology, American Heart Association 72nd Scientific
Sessions, November, 1999.

Member, Long-Range Planning Committee, North American Society of Pacing and
Electrophysiology (NASPE), 2000-2003.

Session Chairman, “What Can Computer Simulations Teach the Cardiac Electrophysiologist”
North American Society of Pacing and Electrophysiology (NASPE), 21st Scientific
Sessions, Washington D. C., May 17-20, 2000.

Session Chairman, “Electrocardiographic Imaging” International Congress on Electrocardiology,
Milan, Italy, June 2000.

Reviewer, Abstracts in Cardiac Electrophysiology, American Heart Association 73rd Scientific
Sessions, New Orleans, November, 2000.

Council Member, International Society of Electrocardiology, 2000 — .

Track Chair, “Cardiovascular Science and Engineering”, World Congress on Medical Physics
and Biomedical Engineering, Chicago, July 2000.

Session Chairman, “Cellular Models” Computers in Cardiology, Cambridge, Massachusetts,
September 24-27, 2000.

Organizing Committee, The Gambit Meeting on New Strategies for Anti-Arrhythmic Treatment.
Chatham, Cape Cod, October 15-19-2000.

Scientific Board, International Symposium on Non-Invasive Functional Source Imaging,
Innsbruck, Austria, September 2001.

Session Organizer and Chairman “Cardiac Conduction and its Role in
Arrhythmogenesis”, International Society for Computerized Electrocardiology,
Hutchinson Island, Florida, April 2001.

Session Chairman, “The Role of Computer Simulations in Understanding Basic
Electrophysiology”, North American Society of Pacing and Electrophysiology 22nd
Scientific Sessions, Boston, May 2001.

Session Chairman, “Cardiac Dynamics”, Frontiers in Mathematical and Computational Biology, University of Texas, Dallas, June 2001.

Reviewer, Abstracts in Electrophysiology, American Heart Association Scientific Sessions, Anaheim, California, November 2001.

Session Chairman, “Cardiac Arrhythmias”, The International Congress of Physiological Sciences, Christchurch, New Zealand, August 2001.

Member, Strategic Planning, The North American Society of Pacing and Electrophysiology (NASPE), Chicago, October 26-28, 2001.

Member, NASPE Strategic Alliances Task Force Commission, The North American Society of Pacing and Electrophysiology, 2002.

Member, External Advisory Board, The University of Oklahoma Bioengineering Center.

Reviewer, Abstracts in Electrophysiology, American Heart Association Scientific Sessions, Chicago, November 2002.

Session Chairman, “Computer Simulation of Cardiac Electrical Activity “, Cardiosim 2002; World Congress on Cardiac Arrhythmias, Nice, France, June 2002.

Scientific Committee, Japan – Canada Conference on Cardiac Arrhythmias, 2002.

Judge, Poster Competition, American Heart Association Scientific Sessions, Chicago, November 2002.

Member, International Review Committee, Department of Biomedical Engineering, Technion – Israel Institute of Technology, Haifa, January 2003.

Session Chairman, "Simulation of Arrhythmias in Anatomically Correct Hearts" North American Society of Pacing and Electrophysiology (NASPE), 24th Annual Scientific Sessions, Washington DC, May 14-17, 2003.

Session Organizer and Chairman, “Ventricular Repolarization” International Congress On Electrocardiology, Helsinki, Finland, June 11-14, 2003.

Reviewer, Abstracts in Electrophysiology, American Heart Association Scientific Sessions, Orlando, Florida, November 2003.

Discussion Leader, Session on Initiation and Maintenance of Arrhythmias, Gordon Research Conference on Cardiac Arrhythmia Mechanisms, Colby-Sawyer College, New London, New Hampshire, August 10-15, 2003.

Scientific Advisory Committee, Workshop on Cardiac Engineering: From Genes and Cells to Structure and Function, Ettore Majorana Foundation and Center for Scientific Culture, Erice, Sicily, September 20-24, 2003

Session Chair, “Excitation-Contraction Coupling”, Workshop on Cardiac Engineering: From Genes and Cells to Structure and Function, Ettore Majorana Foundation and Center for Scientific Culture, Erice, Sicily, September 20-24, 2003.

Session Chair, “Insights into Arrhythmia Mechanisms”, NASPE Heart Rhythm Society, San Francisco, May 19-22, 2004.

Session Chair, “Pathophysiology of Reentry”, NASPE Heart Rhythm Society, San Francisco, May 19-22, 2004.

Member, Scientific Committee, World Congress on Cardiac Arrhythmias (Cardiostim), Nice, France, June 16-19, 2004.

Session Chair, “Cell-to-Cell Communication in Health and Disease”, World Congress on Cardiac Arrhythmias (Cardiostim), Nice, France, June 16-19, 2004.

Chairman, International Symposium on Cardiac Arrhythmia- Molecular Basis of Arrhythmogenesis, Nagoya, Japan, July 3, 2004.

Session Chair, “Cardiac Cellular Electrophysiology” Montpellier, France, September 2004.

Reviewer, Abstracts in Electrophysiology, American Heart Association Scientific Sessions, New Orleans, November 2004.

Heart Rhythm Society, Committee on Health Policy, Subcommittee on Research

Heart Rhythm Society, Governance Committee, Nominations Subcommittee

Vice President of the Cardiac Electrophysiology Society, 2005-2006.

Session Organizer and Chairman “Cardiac Conduction in Health and Disease” International Society for Computerized Electrocardiology (ISCE), Kawai, Hawaii, April 2005.

Chairman, Clinical Tutorial “New Advances in Cardiac Mapping and Simulation” Heart Rhythm Society Annual Scientific Sessions, New Orleans, May 2005.

Chairman, session on “Computer Modeling/Simulation” Heart Rhythm Society Annual Scientific Sessions, New Orleans, May 2005.

Chairman, session on “Body Surface Potential Mapping” The 32nd International Congress on Electrocardiology, Gdansk, Poland, June 2005.

Chairman, session on “Electrocardiographic Imaging” International Society for Computerized Electrocardiology (ISCE), Niagara-on-the-Lake, Canada, June 2006.

Chairman, session on “Electrocardiography and Imaging” The 33rd International Congress on Electrocardiology, Cologne, Germany, June 2006.

International Society for Computerized Electrocardiology (ISCE) Board of Directors, 2006 - 2007.

Chair, session on “Basic Mechanisms of Cardiac Impulse Propagation and Associated Arrhythmias” A joint meeting of the International Dead Sea Symposium and the Rappaport Symposium “Consensus and Controversy in Cardiac Arrhythmias” Tel - Aviv, Israel, October 2006.

Member, Executive Scientific Board, A joint meeting of the International Dead Sea Symposium and the Rappaport Symposium “Consensus and Controversy in Cardiac Arrhythmias” Tel - Aviv, Israel, October 2006.

Reviewer, Abstracts in Electrophysiology, American Heart Association Scientific Sessions, Chicago, November 2006.

Program Committee, Gordon Research Conference on Cardiac Arrhythmia Mechanisms, Ventura Beach, California, March 18 – 23, 2007.

Organized and chaired the annual conference of the International Society for Computerized Electrocardiology, Cancun, Mexico, April 2007.

Reviewer, Abstracts in Electrophysiology, American Heart Association Scientific Sessions, Orlando, Florida, November 2007.

Heart Rhythm Society, Scientific and Clinical Documents Committee

President of the Cardiac Electrophysiology Society, 2007-2008.

Organized and chaired an NIH - NHLBI Workshop "Systems Approach to Understanding Electromechanical Activity in the Human Heart", Washington, August 20-21, 2007.

Scientific Advisory Committee, Workshop on Regulation of Transport Phenomena in the Cardiac System, Antalya, Turkey, September 16 – 20, 2007

Organized and chaired the Cardiac Electrophysiology Society (CES) Meeting, Orlando, Florida, November 3rd, 2007.

Organizing Committee, Cardiovascular System Dynamics Society XVIII Conference, St. Louis, Missouri, USA, September 27-30, 2008.

Organized and chaired the Cardiac Electrophysiology Society (CES) Meeting, New-Orleans, November 8th, 2008.

Program Committee, Gordon Research Conference on Cardiac Arrhythmia Mechanisms, Barga, Italy, February 2009.

Discussion Leader, “Channelopathies: From Gene to Bedside” Gordon Research Conference on Cardiac Arrhythmia Mechanisms, Barga, Italy, February 2009.

Scientific Advisory Committee, the 6th Fairberg Workshop on Analysis of Cardiac Development, Technion, Haifa, Israel, March 2009.

Chair, Debate: “Who's Keeping Time in the SA Mode? The Funny Current Clock is more Important than the Calcium Clock”, Heart Rhythm Society 30th Scientific Sessions, Boston, May 2009.

Chair, the Irisawa Memorial Symposium on Functional Imaging and Genomics of Arrhythmias, 36th International Congress of Physiological Sciences (IUPS2009), Kyoto, Japan, July 2009.

Post Doctoral Fellows

Pedro Diaz, 1983-84
John Amooore, 1985
Barbara Messinger Rapport, 1987-89
Weilun Quan, 1988-90
Franklin Dexter, 1988-90
Kyoung Joung Lee, 1993-94
Xiaoqin Zou, 1993-95
Simie Platt, 1994-96
Robin Shaw, 1996-97
Jan Kucera, 2000-02
Leonid Livshitz, 2004- 2007 (Winner, Best Poster Presentation, Gordon Conference on Cardiac Arrhythmia Mechanisms, 2007)
Ali Nekouzadeh 2005-2007
Gregory Faber 2007
Jennifer Avari 2007-08
Philip Cuculich 2007-09
Scott Marrus 2007-
Pan Li 2009 –
Kavit Desouza 2009 -

Graduate Students

Ph.D. Degrees Awarded

Pedro Diaz, Ph.D. - 1983
“The Effects of the Intercalated Disc on Propagation in Cardiac Muscle”

Barbara Messinger-Rapport, Ph.D. - 1987
“The Inverse Problem in Electrocardiography: Solutions In Terms Of Epicardial Potentials” (Finalist, EMBS Student Paper Competition)

Jie Cheng, Ph.D. - 1988
“Positive Feedback Mechanism in AV Nodal Wenckebach Phenomenon”

Weilun Quan, Ph.D. - 1988
“Structural Effects on Propagation and Reentry of Electrical Excitation in Cardiac Muscle”

Franklin Dexter, Ph.D. - 1988
“Mathematical Model of the Changes in Heart Rate Elicited By Vagal Stimulation”

Ching Hsing Luo, Ph.D. - 1991
“A Dynamic Model Of The Cardiac Ventricular Action Potential: Formulation And Physiological Simulations”

Luc Mongeon, Ph.D. - 1993

“The Right Atrial Pacemaker Complex: The Underlying Mechanisms Mediating The Multicentric Origin of Atrial Depolarization”

Dirar Khoury, Ph.D. - 1993

“Recovery of Endocardial Potentials from Intracavitary Potential Data”

Howard Oster, Ph.D. - 1995

“Electrocardiographic Imaging: New Applications and New Inverse Methodology”

Madhav Kavuru, Ph.D. - 1995

“The Forward Problem Of Electrocardiography: Ventricular Model With Rotational Anisotropy”

Kenneth Laurita, Ph.D. - 1996

“Repolarization Properties Of Cardiac Tissue: Studies Using Optical Mapping And Theoretical Models”

David Igel, Ph.D. - 1996

“Autonomic Effects on Intra-Atrial Conduction”

Jinglin Zeng, Ph.D. - 1997

“A Dynamic Model of a Cardiac Ventricular Action Potential”

Robin M. Shaw, Ph.D. - 1997

“Theoretical Studies in Cardiac Electrophysiology: Roles of Membrane and Gap-Junctions in Excitability and Conduction” (Finalist, Biophysical Society Student Competition)

Steven D. Girouard, Ph.D. – 1997

“Transmembrane Potential Mapping in the Intact Heart: Role of Cardiac Wavelength in the Mechanism of Reentry”

David Kaelber, Ph.D. – 1999

“Clinical Implementation of Electrocardiographic Imaging (ECGI)”

Prakash Viswanathan, Ph.D. - 2000

"Ion Channel Heterogeneities in Cardiac Tissue and their Arrhythmogenic Consequences"

John E. Burnes, Ph.D. – 2000

“Noninvasive Electrocardiographic Imaging of Abnormal Electrophysiologic Substrate and Arrhythmias”

Colleen E. Clancy, Ph.D. – 2001

“Computational Models of Congenital Abnormalities in Ion Channels: Linking Defects to Abnormal Cellular Function”

Raja N. Ghanem, Ph.D. - 2003

“Noninvasive Electrocardiographic Imaging (ECGI): Contributions to Methodology, Imaging Repolarization and Comparison to Invasive Mapping During Surgery” (Winner, Medtronic Student Award, 3rd International Symposium on Noninvasive Functional Source Imaging, Innsbruck, Austria; Winner, Heart Rhythm Journal Outstanding Publication Award for Young Electrophysiologists)

Thomas Hund, Ph.D. - 2004

“Cardiac Arrhythmia after Myocardial Infarction: Insights from a Dynamic Canine Ventricular Myocyte Model” (Finalist, Biophysical Society Student Competition; Winner, Best Poster Presentation, Gordon Conference on Cardiac Arrhythmia Mechanisms, 2003)

Charulatha Ramanathan, Ph.D. - 2004

“Electrocardiographic Imaging (ECGI): Application of an Iterative Method and Validation in Humans”

Ping Jia, Ph.D. – 2004

“Electrocardiographic Imaging of Paced Sequences and Infarct Substrate in Canine Hearts, and in Patients Undergoing Cardiac Resynchronization Therapy (CRT)”

Gregory M. Faber, Ph.D. – 2007

“Abnormal Calcium Cycling as a Mechanism for the Initiation of Cardiac Arrhythmia: A Simulation Study in a Ventricular Myocyte Model”

Jonathan Silva, Ph.D. – 2008

“Linking Molecular Dynamics of Ion Channels to the Cardiac Action Potential: Simulations of Wild Type and Mutant I_{Ks} ” (Winner, Best Poster Presentation, Gordon Conference on Cardiac Arrhythmia Mechanisms, 2005)

Subham Ghosh, Ph.D. - 2009

“Electrocardiographic Imaging : Development Of A Non-Smooth Regularization Method And Clinical Application In Patients With Wolff-Parkinson-White Syndrome And Heart Failure” (Third Prize, Best Poster Presentation, Gordon Conference on Cardiac Arrhythmia Mechanisms, 2005)

Yong Wang, Ph.D.- 2009

“Contributions to the Methodology of Electrocardiographic Imaging (ECGI) and Application of ECGI to Study Mechanisms of Atrial Arrhythmia, Post Myocardial Infarction Electrophysiological Substrate, and Ventricular Tachycardia in Patients” (Recipient of the outstanding original paper award for 2006 in the *Annals of Biomedical Engineering*)

M.S. Degrees Awarded

Barbara Messinger-Rapport, M.S. - 1985

“The Inverse Problem in Electrocardiography: A Model Study of Geometry, Conductivity, And Sampling Parameters”

Franklin Dexter, M.S. - 1986

“Models of Neural Control of Heart Rate”

Eugene Yeh, M.S. - 1987

“Determinants of Diminished Stroke Volume during Ventricular Tachycardia in Man”

Howard Oster, M.S. - 1989

“The Use of Temporal Information in the Regularization of the Inverse Problem of Electrocardiography”

Dirar Khoury, M.S. - 1989

“Continuous Right Ventricular Impedance Volumetry for Diagnosis And Hemodynamically Responsive Antitachycardia System Control”

David Igel, M.S. - 1993

“Feature Extraction for Pattern Recognition of Ventricular Tachyarrhythmias Using Single Surface Lead Electrograms”

Jinglin Zeng, M.S. - 1993

“Simulation Studies of Mechanism of Arrhythmogenic Early Afterdepolarizations In Cardiac Myocytes”

David Kaelber, M.S. 1994

“Feasibility of and Progress towards Clinical Implementation of Electrocardiographic Imaging”

Ann Donohoo, M.S. - 1994

“Further Developments in the Third Generation of Cardiac Potential Mapping Systems”

Steven Girouard, M.S. - 1994

“High Resolution Mapping With Optical Techniques Using Voltage-Sensitive Dyes”

Xiaohua Fang, M.S. - 1994

“Predicting Sudden Cardiac Death from Electrical Alternans of Surface ECG”

Zhiwei Liu, M.S. - 1996

“Inverse Reconstruction of Endocardial Potentials, Electrograms and Activation Sequences from Intracavitary Probe Potential Measurements”

- John Burnes, M.S. - 1996
“Electrocardiographic Imaging: Implementation Issues and Interpolation Studies”
- Joseph Pastore, M.S. - 1997
“Cellular Basis of Electrocardiographic T-Wave Alternans”
- Fadi G. Akar, M.S.-1997
“Cellular Mechanism of Cardiac Defibrillation”
- Ye He, M.S.-1997
“An Integrated System for Interactive Mapping and Display of Cardiac Arrhythmias”
- Ping Jia, M.S. - 1998
“Simultaneous Reconstruction of Endocardial Potentials from Catheter Measurements”
- Yan Wang, M.S. – 1999
“Action Potential Propagation in Inhomogeneous Cardiac Tissue”
- Raja Ghanem, M.S. - 2000
“Hardware and Software Design for Automated Cardiac Mapping”
- Gregory Faber, M.S. - 2000
“Action Potential and Contractility Changes in Sodium Overloaded Cardiac Myocytes: A Simulation Study”
- Thomas Hund, M.S. - 2000
“The Dynamics of Action Potential Head-Tail Interaction During Reentry in Cardiac Tissue”
- Charulatha Ramanathan, M.S. - 2000
“Electrocardiographic Imaging: Effect of Torso Inhomogeneities on Body Surface ECG potentials and on the Noninvasive Reconstruction of Epicardial Potentials, Electrograms, and Isochrones”
- Kazutaka Gima, M.S. - 2002
“Ionic Basis of Electrocardiographic Waveforms”
- Kyungmoo Ryu, M.S. - 2002
“Frequency Analysis of Atrial Electrograms during Atrial Arrhythmia”
- Subham Ghosh, M.S. – 2004
“Accuracy of Quadratic versus Linear Interpolation in Noninvasive Electrocardiographic Imaging”

Jonathan Silva, M.S. – 2004

“Molecular Interactions Determine Effects of I_{Ks} on the Cardiac Action Potential: Modulation by KCNE1 and Chromanol 293B”

Thomas O’Hara, M.S. – 2007

“Modeling the Normal Human Ventricular Myocyte”

Current Students

Keith Decker (Ph.D.)

“Modeling Myocardial Infarction”

Tom O’Hara (Ph.D.)

“Models of Human Cardiac Cells”

Namit Gaur (Ph.D.)

“Calcium Cycling and Arrhythmias”

Jiajing Xu (Ph.D.)

“Molecular Dynamics of Ion Channels”

Ramya Vijayakumar (Ph.D.)

“Electrocardiographic Imaging”

Junjie Zhang (Ph.D.)

“Electrocardiographic Imaging”

Jordi Heijman (Ph.D.)

“Modeling the Beta-Adrenergic Pathway in cardiac Cells”

University and Departmental Activities at Case Western Reserve University

Graduate Studies Committee, Case School of Engineering

Chairman, Departmental Graduate Education Committee. This committee administers a large graduate program (over 100 graduate students) and recommends policies to the department.

Search Committee for Chairman Position, Department of Biomedical Engineering

Departmental Seminar Series Coordinator

Training Faculty and Associate Program Director, Training Program in Biomedical Engineering - Systems and Integrative Biology, NIH

Training Faculty, Cleveland Training Program in Cardiovascular Research, NIH

Training Faculty, Medical Scientist Training Program, NIH

Training Faculty, Cell Physiology Training Grant, NIH

Training Faculty, Heart-Lung Physiology: Molecular-Systemic Integration, Training Grant, NIH

Planning and Steering Committee, Ph.D. program in Biophysics/Bioengineering

Executive Committee, Case School of Engineering

Appointments, Tenure and Promotion Committee, Case School of Engineering

Awards Committee, Case School of Engineering

Ad hoc committee for the implementation of The Case School of Engineering

Planning Committee, Case School of Engineering

Search Committee for Chair of Biomedical Engineering

Search Committee for Dean of The Case School of Engineering

Executive Committee of the General Faculty

President's Advisory Committee on Tenure and Promotion

Research Committee, Case School of Engineering

Appointments, Tenure and Promotion Committee, Department of Physiology & Biophysics

Faculty Liaison to the Graduate Student Association in the Department of Biomedical Engineering

Commission for the Establishment of a Cleveland Center for Biomedical Engineering

The University Honorary Degree Committee

University and Departmental Activities at Washington University

Review Committee for Chairman of the Department of Electrical and Systems Engineering

Training Faculty, Principles in Cardiovascular Research Training Program

Training Faculty, Training the Pediatric Emergency Physician – Scientist

Training Faculty, Basic Science Research Training - Cardiopulmonary Surgery

Washington University Academic Delegation to Israel, January 2006.

School of Engineering and Applied Science Alumni Presentation, February 28, 2006.

Washington University's Ambassador to Technion-Israel Institute of Technology (in the McDonnell International Scholars Academy), 2006-

Committee for appointment, tenure and promotion evaluation

Participated in planning the IP20 initiative on Diabetic Cardiovascular Disease (Department of Medicine, Daniel Kelly, P.I.).

Participated in planning of the Congenital Heart Disease Center – The Children's Discover Institute (Pediatrics, Jonathan Gitlin, Director).

Faculty Mentor to:

Shelly Sakiyama-Elbert

Don Elbert

Kurt Thoroughman

Teaching

Mathematical Modeling of Biomedical Systems

Bioelectric Phenomena

Cardiac Excitation, Rhythm, and Control

Lectures in Cardiac Electrophysiology, Medical School, 1st year

Lectures in Electrocardiography, Medical School, 2nd year

Introduction to Biomedical Engineering

Quantitative Bioelectricity and Cardiac Excitation

Integrative Cardiac Electrophysiology

Grants

Current

Principal Investigator	NIH-R37-HL033343* 07/01/85-06/30/2012	“Inverse and Forward Problems in Electrocardiography”
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*This grant was selected for an NIH MERIT Award.

Principal Investigator	NIH-RO1-HL049054 02/01/93-03/31/2013	“Cardiac Excitation and Arrhythmias”
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Member	FONDATION LEDUCQ 10/01/08- 9/30/2013	“Alliance for CaMK2 Signaling in Heart Disease”
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Principal Investigator	NATIONAL SCIENCE FOUNDATION CBET-0929633 08/15/09-07/31/2012	“Modeling Spatial Organization of Cardiac Cell Function: Application to Calcium Waves and Arrhythmia”
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Previous

Investigator (Dr. Cecil Thomas, P.I.)	NIH (SBIR) 05/85-12/85	“Electrocardiographic Imaging System”
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CO-Principal Investigator (with Dr. Plonsey)	NIH-HL23645 04/01/79-03/03/82	“Study of Cardiac Sources of the ECG”
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CO-Principal Investigator (with Dr. Plonsey)	NIH-HL17931 06/01/81-05/31/84	“Normalized Body Surface Potential Maps”
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Principal Investigator	AHA-HANEO - 4426 07/01/84-06/30/85	“Inverse and Forward Problems in Electrocardiography”
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Collaborating Investigator (Dr. Liebman, P.I.)	AHA-HANEO 07/01/84-06/30/85	“Clinical Application of Electrocardiographic Body Surface Potential Mapping”
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CO-Principal Investigator (with Dr. Liebman)	NIH 12/01/84-11/30/87	“Normalized Body Surface Potential Maps”
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CO-Investigator (Dr. Albert Waldo, P.I.)	AHA Research Initiative Award 1/87-12/89	“Studies of Ventricular Arrhythmias and of Neural Stimulation”
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Principal Investigator	AHA 07/01/90-06/30/91	“Recovery of Endocardial Potential from Cavity Potential Data”
Principal Investigator	NSF (Super computer) 4/87-4/94	“Inverse Problem and Propagation in Cardiac Tissue”
Principal Investigator	AHA - NATIONAL 07/01/91-06/30/94	“Recovery of Endocardial Potential from Cavity Potential Data”
Principal Investigator	NASA Lewis Center (Super computer) 05/01/91-05/01/94	"Elliptic Boundary Value Problems" 400 hours of Cray Computer time.
Associate Director	Whitaker Foundation Development Award 07/01/1996 - 12/31/2000	“Integrated Program for Structural and Functional Cardiovascular and Neural Engineering”

c. As Sponsor

AHA Postdoctoral Fellowship for Dr. Pedro Diaz	01/0183-01/01/84
AHA Postdoctoral Fellowship for Dr. Weilun Quan	07/01/88-06/30/90
Whitaker Foundation Award for Dr. Weilun Quan	01/01/90-12/31/92
Fellowship for Dr. Kyoung Joung Lee from the Korean Academy of Science	01/01/93-01/01/94
AHA Postdoctoral Fellowship for Dr. Xiaoqin Zou	09/01/94-08/31/95
NASPE Fellowship for Dr. Simie Platt	07/01/95-06/30/96
Postdoctoral Fellowship to Dr. Jan Kucera From the Swiss Government	04/01/00 – 03/31/02
Postdoctoral Fellowship to Dr. Ali Nekouzadeh Children’s Discovery institute	02/01/08- 01/31/10
AHA Pre-doctoral Fellowship to Tom O’Hara	07/01/08-06/30/10

Yoram Rudy



The Fred Saigh Distinguished Professor of Engineering, Professor of Biomedical Engineering, Cell Biology & Physiology, Medicine, Pediatrics, and Radiology, 2004

Ph.D., Biomedical Engineering, Case Western Reserve University, 1978

M.Sc., Technion – Israel Institute of Technology, 1973

B.Sc., Technion – Israel Institute of Technology, 1971

RESEARCH INTERESTS

Cardiac bioelectricity; cardiac electrophysiology and arrhythmias; computational biology and mathematical modeling; cardiac imaging and mapping

CURRENT RESEARCH

Our research aims at understanding the mechanisms that underlie normal and abnormal rhythms of the heart at various levels, from the molecular (ion channel) and cellular to the whole heart. We are also developing a novel noninvasive imaging modality (Electrocardiographic Imaging, ECGI) for the diagnosis and guided therapy of cardiac arrhythmias. Rhythm disorders of the heart lead to over 400,000 cases of sudden death annually in the US alone, and to many more cases of disability and compromised quality of life. Through the development of detailed mathematical models of cardiac cells (the Luo-Rudy model) and tissue, we are investigating the mechanisms and consequences of genetically-inherited cardiac arrhythmias, impaired cell-to-cell communication, and abnormal spread of the cardiac impulse in the diseased heart (e.g. myocardial infarction). ECGI imaging has been tested and evaluated extensively with excellent results in experimental setups and in patients with various heart conditions, including comparisons to catheter mapping and multi-electrode mapping directly from the heart during open-heart surgery. ECGI is currently used to study mechanisms of various cardiac arrhythmias (e.g. atrial fibrillation, ventricular tachycardia) in patients and to guide therapeutic interventions. Our premise is that an integrated approach to the study of mechanisms at all levels of the cardiac system, and the development of novel diagnostic and therapeutic tools will lead to successful strategies for prevention and treatment of cardiac arrhythmias and sudden death.