Jacques Beaumont Ph.D. (http://www.clxbs.com)

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EDUCATION:

1993 Post.Doc. Upstate medical University of SUNY, Syracuse NY. Cardiac arrhythmia
1992 Ph.D., Montreal University, Quebec, Canada, Biomedical Engineering
1985 M.S., Laval University, Quebec, Canada, Physics
1982 B.S., Laval University, Quebec, Canada, Engineering Physics

POSITIONS HELD:

2013- Started Complex Biosystems Inc, Syracuse NY
2013- Visiting Scientist, Dept. of Pharmacology, SUNY Upstate Medical University, Syracuse NY
2006-2012 Associate professor, Department of Bioengineering, Binghamton University, Binghamton, NY.
2005-2006 Associate professor, Radiology, SUNY Upstate Medical University, Syracuse, NY
2000-2006 Adjunct Associate Professor, Department of Bioengineering, Syracuse University, Syracuse NY.
1999-2005 Assistant Professor, Pharmacology, SUNY Upstate Medical University, Syracuse, NY.
1994-1999 Research Assistant Professor, Pharmacology, SUNY Upstate Medical Univ., Syracuse, NY.
1993-1994 Senior Research Scientist, Pharmacology, SUNY Upstate Medical University, Syracuse, NY.
1992-1993 Postdoctoral Research Associate, Pharmacology, SUNY Upstate Medical University, Syr. NY.
1988-1992 Graduate Student Institute of Biomedical Engn, University of Montreal, Montreal ,Canada.
1987-1988 Clinical software engineer, Clinical Research Institute, Montreal, Canada.
1985-1987 Consultant in Computer Science, DMR (now owned by Fujitsu), Montreal, Canada.

MEMBER OF THE FOLLOWING PROFESSIONAL SOCIETIES

Biophysical Society.
Society for Industrial and Applied Mathematics (SIAM).
Heart and Rhythm Society

AWARDS:

1. Funded by the National Partnership for Advance Computational Infrastructure 1996, 1998, 1999, 2000.
2. Mentor of Gregory Hoofnagle, Bioengineering Student, Syracuse University, which receives the Bioengineering Founder award for a research project hosted in my laboratory.
3. Mentor of the Syracuse University Scholar Andrew Goodwin. April 2000.
4. American Heart Association, New York Affiliate, Inc. and Upstate New York Cardiac Electrophysiology Society. Gordon K. Moe Young Investigator Award. October 1994.
5. Funded by the Whitaker Foundation 2001.
6. Funded by the NSF TeraGrid 2007-2011
7. Funded by NIH 1995-2005

MEMBER OF THE FOLLOWING STUDY SECTIONS

1. NSF Biomedical Engineering and Research to Aid Persons with Disabilities, 2001,2002, 2004, and 2005.
2. National academy of sciences, International collaboration program, 2003
3. NSF Departmental Reform, April 2004
4. The Health Research Council of New Zeland, 2005
5. NSF International Research Fellow Awards, 2006.
6. Institutional Review Board, Binghamton University 2007 to 2010
7. Advisory Committee for Scholar and Research, Binghamton University, 2008 to 2010
8. Strategic Partnership for Industrial Resurgence, Binghamton University, 2009 to 2010
9. National Institute of Health, panel ZRG1 SBIB-V 2009 to 2010
10. American Heart Association, Bioengineering and Cardiac Electrophysiology panels 2008 to present

REVIEWER FOR THE FOLLOWING JOURNALS

Proceedings of the National Academy of Sciences
Biophysical Journal
Annals of Biomedical Engineering
IEEE Transactions on Biomedical Engineering
IEEE Transaction on Medical Imaging
Bioelectromagnetism
Circulation Research
American Journal of Physiology
Neurocomputing
Cardiovascular Engineering and Technology

THESES COMMITTEE

1. Ali Awada. Modeling the propagation of electrical impulses in a tri-dimensional model of cardiac tissue. Ecole Polytechnique of Montreal University. 2000.
2. Jim Hitt. Visual coding in the limulus horseshoe crab, limulus polyphemus. Upstate Medical University of SUNY 2004.
3. Moamer Hassanovic. Electromagnetic scattering from an arbitrary shaped three-dimensional inhomogeneous chiral body. Syracuse University. 2006.
4. Jason Bayer. Geometrical modeling of papillary muscle in the heart. Upstate Medical University of SUNY. August 2005.
5. Jason Cole. Role of muscle imbalance in knee injury. Bioengineering Department, Binghamton University, May 2007
6. Ravi Mathur Machine learning algorithms applied to the analysis of DNA Microarray data. Bioengineering Department, Binghamton University, July 15, 2011
7. Anthony Costantino. Versatile interface electronic for implantable medical devices. Electrical Engineering Department Binghamton University.
8. Jiang Wu. New algorithms in speech recognition. Electrical Engineering Department Binghamton University.
9. Adriano V. De Oliveira Geometric version of the twisted Nil-Groups. Mathematics Department, Binghamton University

INVITED LECTURES

1. Termination of cardiac arrhythmias as a control problem. Ninth International Colloquium on Numerical Analysis and Computer Science Applications. Plovdiv, Bulgaria. August 2000.
2. Dynamics of vortices of excitation evolving in the heart muscle. Seminar Series of the Bioengineering Department. Syracuse University, Syracuse, NY. September 2000.
3. From membrane channel kinetics to vortex dynamics. Workshop on Mapping and Control of Complex Arrhythmias. Centre de Recherches Mathematiques. Montreal, Canada. October 29-November 1, 2000.
4. Role played by various membrane channels in the dynamics of vortices of excitation evolving in the heart muscle. Seminar Series Institute of Biomedical Engineering. Montreal, Canada. January 2001.

5. Supercomputer and Arrhythmias: Building a realistic model of the excitable heart. Annual meeting of the North American Society for Pacing and Electrophysiology. San Diego, CA. May 2002.
6. Three Dimensional Cardiac Conduction. Session: Computer Modeling of Cardiac Activity. Annual meeting of Cardiostim. Nice, France. June 2002.
7. Toward a rational approach for the design of cardiovascular drugs. Annual Biomedical retreat of the Upstate Medical University of SUNY held September 2003 in Syracuse.
8. New perspectives on the rational design of antiarrhythmic agents. Seminar series in quantitative biology held by the Center for Nonlinear Dynamics. Department of Physiology and Medicine. McGill University Montreal. Nov. 2003.
9. Molecular basis of cardiac rhythm disturbances. Seminar help at Hospital Sacre-Coeur Montreal Canada. Nov. 2003.
10. Multiscale modeling of cardiac arrhythmias in mice. SIAM meeting on life sciences held at Portland Oregon, July 11-14,2004
11. Realistic modeling of the mouse heart. A tool for genomic. The 74th congress of the ACFAS. May 15 to 19, 2006. University McGill, Montreal, Canada.
12. Inversion of Markov processes in bioelectricity. Implications for Cardiac Modeling. 6th International Congress on Industrial and Applied Mathematics. Zurich, July 16-20, 2007
13. Numerical Treatment of the Bidomain Equations in Large Scale Simulations. SIAM Life Science Conference. Montreal August 4-7, 2008
14. Multiscale analysis of cardiac rhythm disturbances in genetically altered substrate. SIAM Life science conference, Pittsburg PA, July 12-15, 2010.
15. Role played by cardiac tissue microanatomy in the spread of excitation. Multiscale modeling with experimental validation. World congress on mathematical modeling and computational simulation of cardiovascular and cardiopulmonary dynamics NIH sponsored symposium. Richmond Virginia, May 31 to June 3rd 2011.
16. Iterative methods for the solution of the cardiac Bidomain equations. Eastern sectional meeting of the American Mathematical Society. Held in Rochester New York, September 22-23, 2012.
17. Inverse problems in the interpretation of cardiac bioelectric data. Seminar series of the Mathematics Department at Rochester University. Held Nov 5, 2012

ORGANIZED SYMPOSIA

Methods and investigations in cardiac modeling. 6th International Congress on Industrial and Applied Mathematics. Zurich, July 16-20, 2007
Multiscale modeling of normal and abnormal impulse propagation in the heart. SIAM Life Science Conference. Montreal, Quebec, Canada, August 4-7, 2008.
Multiscale analysis of cardiac rhythm disorders. SIAM Life science conference, Pittsburg PA, July 12-15, 2010.

TEACHING EXPERIENCE

1.BE-470 Autonomous agents. Bioengineering Undergraduate. Bioengineering Department Binghamton University. core course of 4 credits with laboratories. 2006-2012

The goal of the course is to become familiar with the main physiological mechanisms of learning, how we can model them, and use them to control a robot.

2.BE-211 Professional skills. Problem solving. Bioengineering Undergraduate. Bioengineering Department Binghamton University. core course of 1 credit. 2007-2012

In undergraduate scientific education in general, we do observe a relatively low level of retention, and a difficulty to solve problems formulated in an elaborate context. This goes along with the well documented observation that Physics students may solve relatively complex problems without thoroughly understanding the underlying concepts. In BE-211 we prepare the students to overcome this difficulty by informing them about the learning process from a neuroscience perspective.

Complementing this with good practices to analyze scientific texts we equipe the students will skills to better assimilate and organize their knowledge.

3. *BE-472 Cardiac Bioelectricity, Bioengineering Undergraduate. Bioengineering Department Binghamton University. elective course of 3 credits. 2009-2012*
The basic physiology (hemodynamic and electrophysiology) of the heart and important pathophysiologies (arrhythmias) are introduced. The electrophysiology of the heart is studied more in depth with a coverage of the basic mechanisms of generation of electrical impulses by cardiac cells, and how it differs for various cell types in the heart. In the last segment of the class to understand how genetic mutations or exogenous stress (oxygen deprivation, alteration in electrolyte concentration, injuries, ... etc.) lead to cardiac rhythm disorders.

4. BME-572 *Cardiac Bioelectricity, Bioengineering Graduate. Bioengineering Department Binghamton University. Elective course of 3 credits. 2009-2012*
*S*tudents take the BE-472 lectures but make additional readings. They include book chapters on cardiac electrophysiology, and recent articles on: excitation contraction coupling, collective dynamics of myocardial cell receptors, and mechanisms of cardiac arrhythmias.

4. *BME-525 The Finite Element Method with Applications to Biomedical Problems. Graduate elective course, 3 credits, 2009-2012*
This course is intended to developers, i.e. computational Engineers interested in developing applications for the study of complex systems modeled with nonlinear partial differential equations (PDEs). We teach concept at the basis of the finite element method and provide a library that students use in simulation laboratories to build an application. There is an emphasis on the modeling of Biological systems, but the course is open to any engineering student meeting the pre-requisites.

5.BME-501 Perspective on Complex system Engineering. 3 credits 2010-2012
Introduce the students to modern Engineering methods that are used to study complex Biological systems and by the same occasion to develop a perspective on how this may influence the practice of Medicine, i.e, diagnostic, treatment, the discovery of the mechanisms of diseases, and their prevention.

6. *BME-590 Biomedical Engineering seminars, 1 credit 2009-2012*
While mandatory for the duration of their graduate studies, graduate students take this class for one credit for two consecutive semesters. During the seminars the students are exposed to various topics in Biomedical Engineering. The seminar series has a focus on complex systems, from an experimental as well as from a theoretical perspective.

PREVIOUS GRANT SUPPORT
National Institute of Health. Program Project: PO1-HL-39707.
Period: May 1995 to April 2000
Title: Intercellular communication and impulse propagation.
Goal: Develop a better understanding of the dynamics of vortices of electrical waves in the heart

Core B: Computer and electronic core
Total Direct Costs: $571,857
PI: Jalife J.
Role: Core facility director. I wrote this grant

Project III. Nonlinear dynamics of propagation in two-dimensional cardiac tissue.
Total Direct Costs $727,450
PI: Jalife J.
Role: Senior research staff. I wrote this grant

National Institute of Health. Program Project: PO1-HL-39707.

Period: May 2000 to April 2005 (First 3 year of the program)
Title: Intercellular communication and impulse propagation.
Goal: Elucidate the role played by key membrane proteins in the dynamics of vortices of electrical waves

Core B: Computer and electronic core
Total Direct Costs $914,423
PI: Jalife J.
Role: Core facility director. I wrote this grant

Project II. Role of membrane current kinetics in dynamics of vortex-like reentry.
Total Direct Costs: $817,238
PI: Jalife J.
Role: Project director. I wrote this grant

Whitaker Foundation. Biomedical Engineering Research Grants program.
Period: April 1999 to October 2002
Title; Computer modeling of spiral wave activity: Ionic mechanism leading to termination.
Goal: Determine how alteration of membrane currents can lead to the termination of vortices of electrical waves in the heart.

Total direct costs: $203,433
Role: Principal investigator

National Institute of Health. Share Instrumentation Grant Program, application 1 s10 RR12917-01A1.
Period: 2004, on time purchase
Title: Computer modeling of propagation in the heart
Goal: Purchase of 30 nodes shared memory system, with 12 UNIX workstations, storage array, and robotic tape backup system. The equipment is used to support large scale simulations of impulse propagation in heart tissue.

Total direct costs: $396,561.
Role: Principal investigator

Hendrix funds. SUNY Research foundation
Period: 04/01/06 to 08/31/07
Title: Computer model of genetically induced phase II reentry in the human heart.
Goal: Discover the mechanisms by which phase-II reentry is initiated in genetically altered substrate.

Total direct costs: $50,000
Role: Principal investigator

National Science Foundation, Teragrid. TG-IBN070001T
Period: 01/11/06 to 10/31/07
Title: Multiscale modeling of inherited arrhythmias.
Goal: Migrate on massively parallel multicore computers of the NSF TeraGrid, various parallel implementations of a finite element models of impulse propagation in the heart. T

Resources: 30,000 service units on massively parallel computers
Role: Principal investigator

National Science Foundation, Teragrid. TG-IBN080014N
Period: 08/28/08 to 07/31/09
Title: Multiscale modeling of impulse propagation in the heart.

Goal: Implement a new algorithm for the solution of the bidomain equations, and make simulations aiming at testing an hypothesis for the initiation of arrhythmia in the LQT2 and LQT3 syndromes.

Resources: 250,000 service units on massively parallel computers
Role: Principal investigator

Research Foundation of SUNY. Interdisciplinary collaboration grant. Grant: Project 1063339, Award 32816
Period: 05/14/07 - 03/26/09
Title: Distributed cyberinfrastructure for cardiac modeling
Goal: Support graduate students to assist in the migration of a computational infrastructure on massively parallel multicore computers of the TeraGrid.

Total direct costs: $10,000
Role: Co-principal investigator

National Science Foundation, Teragrid. Research (MRAC) application. Grant: TG-BCS090011
Period: 03/26/09 to 12/30//2010
Title: Multiscale modeling of impulse propagation in the heart.
Goal: Simulation of impulse propagation three-dimensional portions of the free ventricular wall of porcine hearts. We study the detailed sequence of excitation across the myocardial wall and validate with experiments.

Resources: 250,000 service units
Role: Principal investigator

National Science Foundation, Teragrid. Research (MRAC) application. Grant: TG-BCS110013
Period: 07/02/2011- 01/02/2013
Title: Multiscale modeling of impulse propagation in the heart.
Goal: We improve the performance of a multiscale multiphysics Finite element model of impulse propagation.The goal is to obtain linear or quasi-linear scaling over several thousands cores.

Resources: 200,000 service units, computational resources, 1,000 service units visualization resources
Role: Principal investigator

UNFUNDED PROJECTS THAT WILL EVENTUALLY BE EXTENDED and RESUBMITTED
American Heart Association, Grant in Aid. GRNT2060733,
Title: Role played by cardiac microanatomy in the arrhythmogenicity of the LQT syndromes.
Goal: While gene mutations associated to the LQT syndromes render the myocardium at high risk for the incidence of cardiac death, the nature of the triggering event remains poorly understood. Here we address this problem with a multiscale model of impulse propagation and experiments in a cell expression systems. Our aim is to determine the conditions triggering an abnormal beat which subsequently develop into a fatal arrhythmia. Our governing hypothesis involves an interplay between current kinetics, tissue microanatomy, and heart geometry.

Total Direct Costs: $198,000
Role: Principal investigator
Review: Score 1.9, pay line 1.5

National Institute of health, program (R-15): NIH Academic Research Enhancement. 1R15HL114015-01
Title: Scroll wave anchoring. A mechanism of cardiac death.
Goal: Test a mechanism of life threatening arrhythmias which can explain the individual variability in the risk of incidence to cardiac death. Our perspective is that there exists in the heart of large mammals including

the human, specific sites where scroll of electrical waves emanating from injuries or premature beats may anchor and revolve at high frequency. In such conditions the scroll wave may produce a disorganized excitation pattern in its periphery that generates VF.

Total direct costs: $300,000
Role: Principal investigator
Review: Average score 3 over a total of 9. Very close to pay line.

PUBLICATIONS

Peer reviewed articles

Beaumont, J., Roberge, F.A. and Leon, L.J. On the interpretation of patch-clamp data using the Hodgkin-Huxley model. Math. Biosci. 115:65-101, 1993a.

Beaumont, J., Roberge, F.A. and Lemieux, D.R. Estimation of the steady-state characteristics of the Hodgkin-Huxley model from patch clamp data. Math. Biosci. 115: 145-186, 1993b.

Beaumont, J., Michaels, D., Delmar, M., Davidenko, J.M. and Jalife, J. A model study of changes in excitability of ventricular muscle cells with repetitive stimulation. Inhibition, facilitation and hysteresis. Am. J. Physiol. 268 (Heart Circ. Physiol.) 37:H1-H14, 1995.

Beaumont, J., Davidenko, N., Davidenko, J.M. and Jalife, J. Self-Sustaining spiral wave activity in a two-dimensional ionic model of cardiac ventricular muscle. Computer Simulations in Biomedecine. Power H., Hart R.T., Computational Mechanics Publications Southampton and Boston. 75-87, 1995.

Davidenko, J.M., Delmar, M., **Beaumont, J.**, Michaels, D. and Jalife, J. Electrotonic inhibition and active facilitation of excitability in ventricular muscle. J. Cardiovasc. Electr. 5,11, 945-960, 1994.

Meijler, F.L., Jalife, J., **Beaumont, J.** and Vaidya, D. AV nodal function during atrial fibrillation: the role of electrotonic modulation of propagation. J. Cardiovasc. Electr. 7(9):843-861; 1996

Beaumont, J., Davidenko N., Davidenko, J.M. and Jalife, J. Spiral waves in a two-dimensional model of ventricular muscle: Formation of a stationary core. Biophys. J. 75:1-14; 1998

Beaumont J. and Jalife J. Rotors and spiral waves in two-dimensions. In: Cardiac Electrophysiology; from cell to bedside, third edition. Zipes D. and Jalife J. Chap 38. 2000:327-335.

Samie, F.H., Mandapati, R., Gray, R.A., Watanabe, Y., Zuur, C., **Beaumont, J.** and Jalife, J. A Mechanism of transition from ventricular fibrillation to tachycardia: Effect of calcium channel blockade on the dynamics of rotating waves. Circ. Res. 2000:86:684-691.

Samie, H. F., Berenfeld, O., Anumonwo, J., Mironov, S., Udassi, S., **Beaumont, J.**, Taffet, S., Pertsov, A.M. and Jalife, J. Rectification of the background potassium current: a determinant of rotor dynamics in ventricular fibrillation. Circulation Research 2001;89:1216-1223 (This paper made the cover page I did the computer modelling part of this work).

Wang G.J., **Beaumont J.** Parameter estimation of the Hodgkin-Huxley gating model: An inversion procedure. SIAM J. Appl. Math. 2004:64(4):1249-1267

Bayer J.D., **Beaumont J.**, Krol A. Laplace-Dirichlet energy field specification for deformable models. An FEM approach to active contour fitting. Annals of Biomedical Engineering. Ann. of Biomed. Engn. 2005;33(9):1175-1186.

Poddar A.H., Krol A., **Beaumont J**., Price R.L., Slamani M.A., Fawcett J., Subramanian A., Coman I.L., Lipson E.D., Feiglin D.H. Ultrahigh resolution 3D model of Murine heart from micro-CT and serial confocal laser scanning microscopy images. Proc. IEEE Nuclear science symposium and medical imaging conference, 2005.

Slamani A., Krol A., **Beaumont J.**, Price R.L., Coman I.L., Lipson E.D. Application of phase correlation to 3D reconstruction of large tissue volumes from scanning laser confocal microscopy. Microscopy and Microanalysis. 2006;12(2):106-112.

Raba A.E, Cordeiro J.M., Antzelevitch C. **Beaumont J.,** Extending the conditions of application of an inversion of the Hodgkin-Huxley gating model. Bulletin of Mathematical Biology 2013;75(5):752-773.

Bayer J.D., Epstein M., **Beaumont J**. Fitting continuous parametric surfaces to frontiers delimiting physiologic structures. Computational and Mathematical Methods in Medicine 2014 (2014).
Special issue: Image-Based Computational Cardiology: From Data to Understanding. 2014:1-16

Beaumont J., Wang G.. Inversion of time continuous Markov processes in bioelectricity. I Treatment of the chain. In review *SIAM J. Appl Matrix Analysis.*

Costantino A.J., Hyatt C.J., Kollisch-Singule M.C., **Beaumont J**., Roth B.J., and Pertsov A.M. Determining the light scattering and absorption parameters from forward directed flux measurements in cardiac tissue. Journal of Biomedical Optics. 2017;22(7);076009, 1-11

Beaumont J. Dynamics of Pivoting Electrical Waves in a Cardiac Tissue Model. Bull Math. Biol. 2019;81(7):2649-2690.

PRESENTATIONS AT SCIENTIFIC CONFERENCES WITH PUBLICATION IN PROCEEDINGS

1. **Beaumont, J.** and Roberge, F.A. The modeling of membrane channel dynamics using patch clamp data. An. Mtg., Int. Group on Model of Ion Channels. Syracuse, NY, 1991.
2. Roberge, F.A., **Beaumont, J.**, and Lemieux, D.R. Estimating the parameter of the Hodgkin-Huxley model from peak current voltage-clamp data. IEEE/Eng. Med. Biol. Conf. Paris, October 1992.
3. **Beaumont, J.** Modeling the calcium currents. Annual Conf. of ACFAS. Montreal, Canada, May 1992.
4. Lemieux, D.R., **Beaumont, J.** and Roberge, F.A. Modeling the slow calcium current using the Hodgkin-Huxley formalism. Int. Soc. for Heart Res. Burlington, VT, May 1992.
5. **Beaumont, J.** and Roberge, F.A. Parameter estimation of an Hodgkin-Huxley model for the cardiac ionic currents. Proc. 18th Can. Med. Biol. Eng. Soc. Toronto, Canada, June 1992.
6. Lemieux, D.R., **Beaumont, J.** and Roberge, F.A. A Hodgkin-Huxley model of the slow calcium current. Biophys. Soc. Mtg. Washington, DC, February 1993.
7. **Beaumont, J.**, Davidenko, J.M., Delmar, M., Michaels, D.C. and Jalife ,J. A model study of the role of potassium currents in the membrane excitability of cardiac ventricular cells. Proceedings of the 15th Ann. Int. Conf. of the IEEE Engn. In Med. and Biol. Soc. San Diego, CA, October 1993; p. 813-814.
8. **Beaumont, J.**, Davidenko, N., Davidenko, J.M. and Jalife, J. Model study of vortex-like activity in a cardiac muscle. PACE 18(4): 934. 1995.
9. **Beaumont, J.**, Davidenko, J.M. and Jalife, J. Spatial gradient in resting potential cause spiral wave drift in an ionic model of 2-dimensional cardiac muscle. PACE 19(4II)664. 1996.
10. Jalife, J., Meijler, F., **Beaumont, J.** and Vaidya, D. Electrotonic inhibition of AV conduction explains ventricular response during atrial fibrillation. PACE 19(4II): 646. 1996.
11. Davidenko, N., **Beaumont, J.**, Davidenko, J.M. and Jalife, J. Spatio-temporal evolution of spiral wave activity. Biophysical J. 1997;72:2. p. A370.
12. Watanabe, Y., Gray, R., Mandapati, R., Asano, Y., Zuur, C., **Beaumont, J.** and Jalife, J. Verapamil converts ventricular fibrillation into sustained monomorphic tachycardia in the isolated rabbit heart. PACE, 1997;20:1136.
13. Goodwin, A., **Beaumont, J.**, Davidenko, N. and Jalife, J. Ionic mechanisms underlying the formation of an unexcited core of a vortex of excitation wave in the cardiac muscle. Upstate New York Cardiac Electrophysiology Society. October 1997.

14. **Beaumont, J.** and Jalife, J. A Geometrical Method for the Inversion of State Models. Biophys. J. 1998;74(2:/2):A321
15. **Beaumont, J.**, Goodwin, A. and Jalife, J. Mechanisms governing the spatial distribution of action potential duration during vortices of excitation. Biophys J. 1999;76:1/2:A368
16. Frederick, J. V., **Beaumont, J.** and Davidenko, N. Fitting highly irregular surfaces to large set of geometric measurement points. Biophys. J. 2000;78(1/2):333A.
17. Samie, F.H., Berenfeld, O., Mironov, S., Udassi, S., Anumonwo, J., **Beaumont, J.**, Pertsov, A. and Jalife, J. An ionic Mechanism for ventricular fibrillation in the langendorff-perfused guinea pig heart. 73th Annual Meeting of the American Heart Association. November 2000.
18. Goodwin, A., Little, J. and **Beaumont, J.** Understanding the mechanisms governing APD regulation during the evolution of stationary vortices of excitation in the heart muscle. Tenth Annual Meeting of the Upstate New York Cardiac Electrophysiology Society. Syracuse, NY. October 2000.
19. Little, J., Goodwin, A., Krol, A. and **Beaumont, J.** Development of a geometrical model of the mouse heart. Tenth Annual Meeting of the Upstate New York Cardiac Electrophysiology Society. Syracuse, NY. October 2000.
20. Jalife, J., Samie, F.H. and **Beaumont, J.** Spatial gradients in activation frequency: a mechanism of stable reentry. Proceedings on a Workshop on Computer Modeling. Lausanne, Switzerland. December 2000.
21. **Beaumont, J.** Understanding the dynamics of vortices of excitation evolving in the heart muscle. Biophys. J. 2001; (80/1) p.645a.
22. Monin, A. and **Beaumont, J.** Mechanisms of Stabilization of Electrical Vortices at High Frequencies in the Myocardium. 11th Annual Meeting of the Upstate New York Cardiac Electrophysiology Society. Rochester, NY. October 2001.
23. Bayer, J., Krol, A. and **Beaumont, J.** Processing of Anatomical Data Obtained from Different Imaging Modalities for the Construction of a geometrical Heart Model. 11th Annual Meeting of the Upstate New York Cardiac Electrophysiology Society. Rochester, NY. October 2001.
24. Torelli, A., Wang, G.J., France, D. and **Beaumont, J.** On the Management and Processing of Cardiac Electrophysiological Data. 11th Annual Meeting of the Upstate New York Cardiac Electrophysiology Society. Rochester, NY. October 2001.
25. **Beaumont, J**., Krol, A. and Price, R.L. Assessing the mechanisms underlying the stabilization of vortices of excitation in the heart. Biophys. J. 2002; 82(1/2). p. 92a.
26. **Beaumont J.** Toward a rational approach to cardiovascular drug design. New Frontiers in Bioinformatics. Meeting held at Buffalo June 5, 2003.
27. **Beaumont J**., Bayer J. Vortices of electrical waves in the heart. Stabilization at high frequencies. SIAM Annual Meting June 16, 2003, held at Montreal.
28. **Beaumont J**. Bayer J., Chen M. Multiscale modelling of impulse propagation in the heart. Digital Biology the Emerging Paradigm. Meeting sponsored by the NIH Biomedical Information Science and Technology Initiative Consortium (BISTIC). November 6-7, 2003, Washington DC. http://www.bisti.nih.gov/2003meeting/abstracts. Poster I58.
29. Coman I.L., Luo M., Krol A., Feiglin D.H., Mandel J.A., Lipson E.D., **Beaumont J.** Multimodality image fusion for enhanced breast cancer diagnosis. Eur. J. Nucl. Medicine and molecular imaging. 2003, 30, suppl 2, p. S330-S331.
30. Krol A., Coman I.L., Mandel J., Luo M., Feiglin D.H., Lipson E.D., **Beaumont J.** Inter-modality non-rigid breast image registration using Finite-Element Method. IEEE Medical Imaging Imaging Conference. Nov. 3, 2003 in Portland Oregon.
31. Slamani MA., Krol A., **Beaumont J.**, Price R.L., Coman I.L., Lipson E.D. 3D reconstruction of large tissue volumes from scanning laser confocal microscopy. SPIE Medical Imaging Conference, February 14-17 2004, San Diego California.
32. Bayer J.D. Krol A., **Beaumont J**. Reconstruction of a heart model from X-ray and confocal microscopy data. Biophys. J. 2004; 86(1;2/2) p. 299a.
33. **Beaumont J.**, Bayer J.D. A molecular basis to the dynamics of of electrical waves evolving in the heart. Biophys. J. 2004; 86(1;2/2) p. 300a.
34. **Beaumont J.**, Bayer J.D. Modelling vortices of electrical waves in Mice hearts. Heart and Rhythm. 2004;1(1S), p.S225.

35. **Beaumont J**. Devising risk stratification factors for sudden cardiac death from the molecular mechanisms of arrhythmias assessed in a multiscale bioelectric heart model. Presented at the meeting entitled Biomedical Informatics for clinical decision support. A Vision for the 21st century. Held at NIH June 21-22, 2004, and sponsored by BECON and BISTIC. http://www.becon.nih.gov/symposium2004.htm.
36. **Beaumont J.**, Bayer J.D. Multiscale modelling of cardiac arrhythmias in mice hearts. SIAM conference on the life sciences. Held at Portland Oregon USA, from July 11-14, 2004.
37. **Beaumont J.**, Bayer J.D., Pinter J.D., Khobragade A., Hoofnagle G. Multiscale Modelling of Impulse Propagation in Mice Hearts. Annual Meeting of the Biomedical Engineering Society. Philadelphia PA., USA. October 13-16. 2004.
38. **Beaumont J.**, Inversion of Markov processes in bioelectricity. Implications for Cardiac Modeling. 6th International Congress on Industrial and Applied Mathematics. Zurich, July 16-20, 2007
39. **Beaumont J.**, Numerical Treatment of the Bidomain Equations in Large Scale Simulations. SIAM Life Science Conference. Montreal August 4-7, 2008.
40. Raba A., **Beaumont J**. Multiscale analysis of the role played by membrane current kinetics in inherited arrhythmias. IEEE Medicine and Biology Society, Health Tech Symposium, Syracuse New York, November 5, 2009.
41. Raba A., **Beaumont J.** Non-linear analysis of voltage clamp data in the investigation of mechanisms of inherited arrhythmias. 54th Annual meeting of the Biophysical Society. Held in San Francisco, California, February 20-24, 2010.
42. Baldwin J. and **Beaumont J.** Implantable electrical stimulator for the dissociation of the atrioventricular pathway during atrial fibrillation. FDA and NHLBI third annual workshop on cardiovascular device modeling. The integration of nonclinical and computer models. NIH June 10-11, 2010
43. Raba A., **Beaumont J**. A computational approach to the investigation of congenital arrhythmias. SIAM Life Science Conference. July 12-15, 2010, Pittsburgh P.A.
44. **Beaumont J.** Multiscale analysis of cardiac rhythm disorders disturbances in genetically altered substrates. SIAM Life Science Conference. July 12-15, 2010, Pittsburgh P.A.
45. **Beaumont J**. Multiscale modeling of inherited arrhythmias. Multiscale modeling consortium meeting. Held at National Institute of Health, October 27-28, 2010
46. **Raba A., Beaumont J**. Cardiac vortex dynamics: From cell to tissue. 55th Annual meeting of the Biophysical Society. Held in Baltimore Maryland, March 5-9, 2011.
47. **Beaumont J**., Raba A. Initiation of cardiac arrhythmias in the congenital LQT2 and LQT3 syndromes. 55th Annual meeting of the Biophysical Society. Held in Baltimore Maryland, March 5-9, 2011.
48. Raba E.A., **Beaumont J.** Role of protein defects on the creation of premature cardiac beats. 37th annual northeast Bioengineering conference. Troy NY, April 1-3, 2011.
49. Baldwin J. and **Beaumont J**. Control of atrioventricular excitation during atrial fibrillation. National conference on undergraduate research. Held in Ithaca NY, April 1st 2011.
50. Raba A. **Beaumont J**. A Multi-scale Analysis of the Mechanisms of Arrhythmia. World congress on mathematical modeling and computational simulation of cardiovascular and cardiopulmonary dynamics. NIH sponsored symposium. Richmond Virginia May 31 to June 3rd, 2011.
51. **Beaumont J.** and Raba A. New perspectives on the initiation of premature beat in genetically altered cardiac tissue. World congress on mathematical modeling and computational simulation of cardiovascular and cardiopulmonary dynamics. NIH sponsored symposium. Richmond Virginia May 31 to June 3rd, 2011.
52. **Beaumont J**. Role played by cardiac tissue microanatomy in the spread of excitation. Multiscale modeling with experimental validation. World congress on mathematical modeling and computational simulation of cardiovascular and cardiopulmonary dynamics. Sponsored by NIH. Symposium talk. Held in Richmond Virginia, May 31 to June 3rd, 2011.
53. Epstein M., **Beaumont J.** Role played by cardiac tissue microstructure in the detailed sequence of excitation. 21st annual meeting of the Upstate New York Cardiac Electrophysiology Society held in Syracuse October 28, 2011.
54. Raba A.R., **Beaumont J.** Role played by sodium and potassium current kinetics and their level of expression in the initiation of arrhythmias in version II of the LQT syndrome. 21st annual meeting of the Upstate New York Cardiac Electrophysiology Society held in Syracuse October 28, 2011.
55. Raba A.R., **Beaumont J**. Ionic mechanism for the formation of excitable scroll wave filament. 56th Annual metting of the Biophysical Society. Held in SanDiego California February 25-29, 2012.

56. **Beaumont J.**, Raba A.R., Cordeiro J., Epstein M., Antzelevitch C. J. A Molecular Mechanism of Triggered Arrhythmia in Version 2 of the LQT Syndrome. 2012 Annual meeting of the Biomedical Engineering Society. Held in Atlanta Georgia, October 24-27, 2012.
57. **Beaumont J.** Iterative methods for the solution of the cardiac Bidomain equations. Eastern sectional meeting of the American Mathematical Society. Held in Rochester New York, September 22-23, 2012
58. Elwell J., Hu D., **Beaumont J.** Investigating the molecular mechanism of sudden infant death of cardiac origin. 22nd annual meeting of the Upstate New York Cardiac Electrophysiology Society held in Rochester, October 26, 2012.
59. Epstein M., **Beaumont J**. Estimation of the cardiac conductivity tensor from surface fluorescence data. 22nd annual meeting of the Upstate New York Cardiac Electrophysiology Society held in Rochester October 26, 2012.
60. Epstein M., **Beaumont J.** Electrical wave dynamics in the sub-endocardium of cardiac ventricles. 23Rd annual meeting of the Upstate New York Cardiac Electrophysiology Society held in Toronto, October 11, 2013.
61. Beaumont E., **Beaumont J.** Integrated visualization environment for the interpretation of Medical and Biomedical Imaging data, 24th annual meeting of the Upstate New York Cardiac Electrophysiology Society held in Buffalo NY, November 4, 2014.
62. Munoz A.C. **Beaumont J.** On the detachment of traveling impulses from the border of cardiac ventricular injuries. Upstate New York Cardiac Electrophysiology Society held in Utica NY, October 28, 2016.
63. **Beaumont J.** Toward an integrated model of nutrient transport and absorbtion in the small intestine. Methodological aspects. Advancing microbiome research symposium. Microbiome & Disease. Held in Chicago Illinois, November 17, 2016
64. Harmon E.S., Thonpson M.O., Mandal K.C., Schmidtlein C.R., Turner J.N., **Beaumont J.**, And Krol A. Development of ultrafast detector for advanced time-of-flight brain PET. SPIE conference on Medical Imaging. To be Held in Houston texas, February 10-15, 2018
65. **Beaumont J.** Principles governing the velocity of traveling electrical waves in cardiac tissue. Upstate New York Cardiac Electrophysiology Society held in Buffalo NY, November 1, 2019.