

Natalia Trayanova, PhD

Mobile: 504-606-7198

Curriculum Vitae

Professional Experience

- 9/18-present **Co-Director.** Alliance for Cardiovascular and Treatment Innovation (ADVANCE), Whiting School of Engineering, Johns Hopkins University, Baltimore MD
- 9/12-present **Professor.** Department of Medicine, Johns Hopkins School of Medicine
- 4/12 -present **Murray B Sachs Endowed Chair.** Department of Biomedical Engineering, Johns Hopkins University
- 8/06 -present **Professor,** Department of Biomedical Engineering and Institute for Computational Science, Johns Hopkins University
- 5/02 -7/06 **Professor,** Department of Biomedical Engineering, Tulane University, New Orleans LA
- 1/02 -5/02 **Distinguished Fulbright Visiting Professor.** Laboratory of Physiology, University of Oxford, Oxford, United Kingdom.
- 1/95 -5/02 **Associate Professor.** Department of Biomedical Engineering, Tulane University, New Orleans, LA
- 1/90 -12/94 **Assistant Research Professor.** Department of Biomedical Engineering, Duke University,
- 6/88 -12/89 **Assistant Professor.** Bulgarian Academy of Sciences, Sofia, Bulgaria.
- 12/86 -5/88 **Postdoctoral Fellow.** Department of Biomedical Engineering, Duke University

Education

- 1982–6 Ph.D. in Biophysics from the Central Laboratory of Biophysics (Section Bioengineering), Bulgarian Academy of Sciences, Sofia, Bulgaria
- 1980–2 M.S. in Physics from the Department of Physics, Sofia University, Bulgaria

Honors and Awards

- 2021 **Douglas Zipes Lectureship Award,** Heart Rhythm and Cardiac EP Societies
- 2020 **Fellow** of the European Society of Cardiology
- 2020 **Selected to deliver the Graeme Clark Oration,** Melbourne, Australia (postponed)
- 2020 **Women in STEM Champion Award,** NYU School of Engineering
- 2020 **Fellow, National Academy of Inventors**
- 2019 **Inductee, Women in Technology International Hall of Fame**
- 2019 **Distinguished Scientist Award,** Heart Rhythm Society
- 2018 invited appearance on **Reddit AMA,** r/science
- 2017 **Capitol Hill Briefing,** United for Medical Research
- 2017 **Fellow** of the International Academy of Medical and Biological Engineering
- 2017 **TEDx Talk**
- 2015 **Discovery Innovation Award,** Johns Hopkins School of Medicine
- 2015 **Frank Howard Lectureship,** GWU
- 2013 **NIH Director's Pioneer Award**
- 2012 **Murray B Sachs Endowed Chair,** Johns Hopkins University
- 2010 **Fellow** of the Biomedical Engineering Society
- 2010 **Fellow** of the American Heart Association
- 2009 **William R. Brody Faculty Scholar** (Named Chair), Johns Hopkins University
- 2009 **Chair,** Gordon Research Conference on Cardiac Arrhythmia Mechanisms
- 2008 **Fellow** of the Heart Rhythm Society
- 2007 **Vice Chair,** Gordon Research Conference on Cardiac Arrhythmia Mechanisms
- 2005 **Award for Excellence in Research and Scholarship,** Tulane University
- 2004 **Astor Visiting Lectureship,** Oxford University, UK
- 2003 **Fellow,** American Institute for Medical and Biological Engineering
- 2002 **Outstanding Researcher Award,** Tulane School of Engineering
- 2002-2006 **Established Investigator Award,** American Heart Association
- 2001-2002 **Fulbright Distinguished Scholars Research Award**
- 2000 **Lee H. Johnson Award for Teaching Excellence,** Tulane University
- 2000 **AETMB Teaching Award,** Biomedical Engineering, Tulane University
- 1999 **AETMB Teaching Award,** Biomedical Engineering, Tulane University

Awards to Members of Trayanova Laboratory and Trainee Co-authors

- 2020 Eric Sung, PhD student, *finalist*, Young Investigator Award, Asia-Pacific Heart Rhythm Society
- 2020 Rebecca Yu, undergraduate researcher, PURA award, Johns Hopkins University
- 2020 Changxin Lai, PhD student, David C. Gakenheimer Fellowship award
- 2020 Joseph Yu, awardee, NIH F31 pre-doctoral fellowship
- 2020 Eric Sung, PhD student, *finalist*, Young Investigator Award, ISCE
- 2020 Haley Abramson, PhD student, awardee, NSF Graduate Fellowship
- 2019 Karla Robles, PhD student, awardee, NSF Graduate Fellowship
- 2019 Dante Basile, undergraduate researcher, PURA award, Johns Hopkins University
- 2019 Rheeda Ali, Asish Doshi and Shije Zhou (postdoctoral fellows), and Konstantinos Aronis (clinical fellow), awardees, HRS travel awards
- 2019 Shije Zhou, postdoctoral fellow, awardee, HRS postdoctoral fellowship
- 2019 Shije Zhou, postdoctoral fellow, **winner**, Clinical Research Award from Heart Rhythm Society in Honor of Mark Josephson and Hein Wellens
- 2018 Annie Liang, undergraduate researcher, PURA award, Johns Hopkins University
- 2018 Alexandra Bardeceanu, PhD student, David C. Gakenheimer Fellowship award
- 2018 Kalen Clifton, PhD student, awardee, NSF Graduate Fellowship
- 2018 Julie Shade, PhD student, awardee, NSF Graduate Fellowship
- 2018 Ashish Doshi, postdoctoral fellow, awardee, AHA postdoctoral fellowship
- 2018 Farhad Pashakhanloo, postdoctoral fellow, awardee, AHA postdoctoral fellowship
- 2017 Rheeda Ali, postdoctoral fellow, Provost Postdoctoral Fellowship award, JHU
- 2017 Alexandra Bardeceanu, PhD student, second David C. Gakenheimer Fellowship award
- 2017 Farhad Pashakhanloo, postdoctoral fellow, **winner** Young Investigator Award, 44th International Congress on Electrophysiology, Portland, Oregon
- 2017 Ryan O'Hara, PhD student, awardee, NSF Graduate Fellowship
- 2017 Farhad Pashakhanloo, postdoctoral fellow, **winner**, Nature Reviews Cardiology competition for year-long journal cover image
- 2016 Joseph Yu, PhD student, awardee, NSF Graduate Fellowship
- 2016 Melanie Zile, PhD student, **winner**, Student Poster Competition, Cardiac Mechanoelectric Coupling and Arrhythmias, Freiburg, Germany
- 2016 Alexandra Bardeceanu, PhD student, David C. Gakenheimer Fellowship award
- 2015 Melanie Zile, PhD student, David C. Gakenheimer Fellowship award
- 2015 Hermenegild Arevalo, postdoctoral fellow, **winner**, Young Investigator Award Competition, *clinical category*, Heart Rhythm Society Scientific Sessions
- 2015 Sohail Zahid, PhD student, awardee, NSF Graduate Fellowship
- 2015 Eran Ukwatta, postdoctoral fellow, **winner**, Imaging Network Symposium, Ontario, Canada
- 2015 Sohail Zahid, PhD student, awardee, ARCS Foundation Scholarship award
- 2014 Eran Ukwatta, postdoctoral fellow, BME Centennial Fellowship award
- 2014 Lukas Rantner, PhD student, first-author paper selected the best of 2013 in Heart Rhythm
- 2014 Kelly Chang, PhD student, ARCS Foundation Scholarship award
- 2013 Hermenegild Arevalo, PhD student, *finalist*, Young Investigator Award, Electrophysiology Society
- 2013 Thomas OHara, postdoctoral fellow, awardee, NIH post-doctoral fellowship
- 2013 Lukas Rantner, PhD student, **winner**, Stefan-Schuy Prize for best paper, Austrian BMES
- 2013 Kathleen McDowell, PhD student, **winner**, Best poster presentation, Gordon Research Conference on Cardiac Arrhythmia Mechanisms
- 2013 Fijoy Vadakkumpadan, awardee, Smith Charitable Foundation Award
- 2013 Takashi Ashihara, former member and co-author with Dr. Trayanova, **winner**, Suzuken Memorial Foundation Award of the Japanese Society of Electrophysiology for publication in the journal Circulation Research with Dr. Trayanova
- 2012 Fijoy Vadakkumpadan, awardee, AHA Scientist Development Award
- 2012 Patrick Boyle, postdoctoral fellow, **winner**, poster competition, Physiome meeting
- 2012 Jason Constantino, PhD student, awardee, Siebel Scholarship
- 2012 Kathleen McDowell, PhD student, awardee, AHA pre-doctoral fellowship
- 2012 Patrick Boyle, postdoctoral fellow, *finalist*, Rosa Delgani Young Investigator Award, CinC
- 2012 Kathleen McDowell, PhD student, **winner**, Jos Willems Young Investigator Award, ISCE
- 2011 Brent Millare, PhD student, awardee, NIH pre-doctoral fellowship
- 2011 Hiroshi Ashikaga, *finalist*, Young Investigator Award Competition, AHA Scientific Sessions

- 2011 David Krummen, *finalist*, Young Investigator Award Competition, AHA Scientific Sessions
- 2011 Hiroshi Ashikaga, **winner**, Young Investigator Award Competition, 4th APHRS
- 2011 Jason Constantino, PhD student, and Seth Weinberg, co-author, third place in trainee poster competition, Gordon Research Conference on Cardiac Arrhythmia Mechanisms
- 2010 Jason Constantino, PhD student, awardee, NIH pre-doctoral fellowship
- 2010 Jason Bayer, PhD student, awardee, AHA pre-doctoral fellowship
- 2010 Jason Bayer, PhD student, *finalist*, Young Investigator Award Competition, ISE meeting
- 2009 Hermenegild Arevalo, PhD student, awardee, NIH pre-doctoral fellowship
- 2009 Kathleen McDowell, PhD student, awardee, NSF pre-doctoral fellowship
- 2009 Carolyn Park, undergraduate student, PURA award, Johns Hopkins University
- 2009 Grace Tan, undergraduate student, **winner**, trainee poster competition, Arrhythmia Mechanisms, Gordon Conference on Cardiac Arrhythmia Mechanisms
- 2009 Dr. Takashi Ashihara, **winner**, 2009 Young Investigator Award, Japanese Society of Electrocardiology, Kyoto, Japan
- 2009 Lukas Rantner, PhD student, awardee, Doctoral Fellowship, Austrian Academy of Sciences
- 2008 Grace Tan, undergraduate student, PURA award, Johns Hopkins University
- 2008 Dr. Gernot Plank, **winner**, Stefan Schuy Award of the Austrian BME Society
- 2007 Martin Bishop, **winner**, student poster competition, Organ-level Arrhythmia Mechanisms, Gordon Research Conference on Cardiac Arrhythmia Mechanisms
- 2006 Molly Maleckar, PhD student, **winner**, Outstanding Graduate Student Award, Tulane Engineering
- 2006 Brock Tice, PhD student, **winner**, Outstanding Research Graduate Student Award, Department of Biomedical Engineering, Tulane University
- 2005 Martin Bishop, **winner**, student paper competition, IEEE EMBC annual meeting
- 2005 Brock Tice, PhD student, AHA pre-doctoral fellowship
- 2005 Molly Maleckar, PhD student, **winner**, Best Poster Presentation, Organ/Tissue Category, Gordon Conference on Cardiac Arrhythmia Mechanisms, St. Ivez, CA
- 2005 Weihui Li, PhD student, **winner**, Outstanding Graduate Student Award, Tulane Engineering
- 2004 Dr. Blanca Rodriguez, postdoctoral fellow, **winner**, Young Investigator Award, Heart Rhythm Society
- 1999 Ezana Azene, MS student, **winner**, Delgani Young Investigator Award, Computers in Cardiology
- 1999 James Wall, undergraduate student, *finalist*, EMBS/BMES Student Competition
- 1997 Kirill Skouibine, PhD student, *finalist*, EMBS Student Competition

Scientific Review Activities

- *Book Editor:*

Cardiac Defibrillation: Mechanisms, Challenges and Implications, InTech Publishing, 2011

- *Journal Associate Editor:*

Heart Rhythm, January 2014 – present

Frontiers in Computational Physiology and Medicine, 2010 – present

IEEE Transactions on Biomedical Engineering, 1997-2006

- *Journal Editorial Board Member:*

Circulation: Arrhythmia and Electrophysiology, 2016 - present

Journal of Interventional Cardiac Electrophysiology, 2016 - present

Heart Rhythm Journal, 2005 – 2014

American Journal of Physiology, Heart and Circulatory Physiology, 2011 – 2015

In Silico Pharmacology, 2012 – 2015

- *Area Editor:*

IEEE Reviews in Biomedical Engineering, 2008 – 2015

- *NIH Review Service:*

NIH ZRG, latest 2020, many others

NIH Directors New Innovator Award, 2014 - 2019

MABS Study Section, member 2011-2012

ESTA Study Section, member 2005 – 2009

ESTA Study Section, ad hoc member 2004 – 2005 NIH,

Chair, BRP Special Study Section (ZRG) 2004 – 2005

AHA, Electrophysiology Study Section, 2003 – 2004

CVA Study Section, ad hoc member 2000 – 2003

NSF, Bioengineering Directorate, 1999 Israeli National Science Foundation,
2014 Swedish Academy of Sciences, 2013-2014
Hong Kong Research Council, 2008
Swiss National Academy of Sciences, 1999
Cornell Theory Center, 1999

- *NIH NHLBI Strategic Planning Committee*, 2006:
Group on Bioinformatics and Computational Biology

- *Abstract Reviewer*: International Society for Computerized Electrophysiology, Heart Rhythm Society, AHA Scientific Sessions, World Congress of Biomechanics
Reviewer, Young Investigator Competitions: North American Society of Pacing and Electrophysiology

Reviewer, Journals (selected): Science Translational Medicine, Nature Communications, Circulation Research, Circulation, Circulation Electrophysiology and Arrhythmias, Biophysical Journal, Journal of the American College of Cardiology, Cardiovascular Research, Heart Rhythm, Journal of the American College of Cardiology, Journal of Cardiovascular Electrophysiology, American Journal of Physiology, Progress in Biophysics and Molecular Biology, IEEE Transactions on Biomedical Engineering, Annals of Biomedical Engineering, Drug Metabolism and Pharmacokinetics, Chaos, Journal of Electrocardiography, Journal of Mathematical Biology, Mathematical Biosciences, Journal of Theoretical Biology, Medical and Biological Engineering and Computing, CRC Critical Reviews in Biomedical Engineering, Mathematical Biosciences, Philosophical Transactions of the Royal Society London, Physical Review, Journal of Physiology, Experimental Physiology, PLoS One, PLoS Computational Biology, Progress in Biophysics and Molecular Biology, Drug Discovery Today: Disease Models, JACC, JACC Electrophysiology and Arrhythmias, Frontiers, and others

Professional Memberships

Fellow: National Academy of Inventors

Fellow: International Academy of Medical and Biological Engineering

Fellow: Heart Rhythm Society

Fellow: American Heart Association

Fellow: American Institute for Medical and Biological Engineering

Fellow: Biomedical Engineering Society

IEEE Engineering in Biology and Medicine Society

International Society for Heart Research

International Society for Computerized Electrophysiology

Society for Industrial and Applied Mathematics

American Association for Advancement of Science

Cardiac Muscle Society

Cardiac Electrophysiology Society

Biophysical Society

New York Academy of Sciences

American Society for Engineering Education

Selected Society Committees, External Advisory Boards, External Institutional Evaluations

2020 -present Heart Rhythm Society Global Relations Committee

2019 – 2020 Program Committee, iHEART Program, Milano, Italy

2018 –present Member of the Board, *CardioSolv Ablation Technologies, Inc*

2018 Scientific and Organizing Committee, Forum of Arrhythmology, Saint Petersburg, Russia

2018 –present IAMBE Fellow selection committee

2017 – 2018 American Heart Association Research Committee

2017 Organizer, AMiTaNS'17 Conference, Albena, Bulgaria

2015-present External Advisory Board, SCI Institute, University of Utah

2013 -- 2017 CIPA Steering Team, FDA

2013 -- 2017 American Heart Association, Mid-Atlantic Affiliate Research Committee

2013 -- 2018 AIMBE Fellow selection committee

2012 -- 2018 Heart Rhythm Society Publications Committee

2012 Cardiac Electromechanics Minisymposium Organizer, 8th European Solid Mechanics Conference

2011 Chair of Evaluation Panel, Center for Biomedical Computing at Simula Research Laboratory, Oslo, Norway

2011 Minisymposium Organizer, ICNAAM meeting
 2011 -- 2018 Trainee Competition Judge, Gordon Research Conference on Cardiac Arrhythmia Mechanisms
 2010 -- 2014 Member, National Biomedical Computation Resource Advisory Committee, UCSD
 2007 -- 2009 Chair, Gordon Conference on Cardiac Arrhythmia Mechanisms
 2007-- 2016 Cardiomim meeting, Program Committee
 2006-- 2010 Heart Rhythm Society Scientific Sessions Program Committee
 2007 Vice Chair, Gordon Conference on Cardiac Arrhythmia Mechanisms
 2007 Session Organizer and Chair, ISCE meeting
 2007 Program Committee Member, Cardiac Mechano-electric Feedback Meeting
 2004 -- 2005 Program Committee Member, IASTED meetings
 2001 Program Committee, Conference on Medical and Biological Modeling

Selected Johns Hopkins University Institutional Service

2020 -present *AI-X Effort*, Johns Hopkins University
 2020 -present *Diversity Committee*, Department of Biomedical Engineering
 2020 -present Department of Biophysics Director search committee, School of Medicine
 2019 Committee on *Diagnostic Errors in Medicine*, Johns Hopkins University
 2018-2020 Program Committee, Department of Medicine Research Retreat
 2018 Ad hoc tenure committee, Whiting School of Engineering
 2017-2018 Center for Cell Dynamics Faculty Search Committee
 2017 Evaluation Committee, Department of Neuroscience, School of Medicine
 2017 Head of Mechanical Engineering Search Committee
 2014-2017 *Research Council*, School of Medicine, Johns Hopkins University
 2014-2015 Whiting School of Engineering *Dean of Research* Search Committee
 2014-2015 *Team Leader, Research Council*, School of Medicine, Johns Hopkins University
 2013-2014 *Master Mentor Program*, Johns Hopkins University
 2013-2014 BME Centennial Postdoctoral Fellowship Committee, Johns Hopkins University
 2012-2013 Johns Hopkins University *Provost Search Committee*
 2012-2013 Whiting School of Engineering *Centennial Committee*
 2011 JHU High Performance Computing Committee
 2008 Ad hoc tenure committee, Whiting School of Engineering
 2007 Whiting School of Engineering International Affairs Advisory Committee
 2007 JHU Health Professions Committee
 2007 Applied Math and Statistics Department Review Committee

Selected Tulane University Institutional Service

2005 Honors Committee, School of Engineering
 2005 Honor Board, Tulane University
 2003 - 2005 Faculty Search Committee, Department of Biomedical Engineering
 2005 Outstanding Researcher Award Committee, School of Engineering
 2004 Presidential Early Career Development Awards Committee, Tulane University
 2003 Graduate Studies Committee, Department of Biomedical Engineering
 2003 Outstanding Researcher Award Committee (Chair), School of Engineering
 2003 Associate Dean of Research Search Committee, School of Engineering
 2002-2003 Promotion and Tenure Committee, School of Engineering
 2002-2003 Honors Committee, School of Engineering
 2002-2003 Faculty Search Committee (5 positions), Tulane Department of Mechanical Engineering
 2000-2001 ABET Task Force, Department of Biomedical Engineering
 2000-2001 Assessment Committee, School of Engineering
 2000 Undergraduate Curriculum Task Force, Department of Biomedical Engineering
 2000 Search and Rating Committee, School of Engineering
 1999-2005 Member, Tulane University Senate Committee on Teaching Quality
 1995-1999 International Program Committee, School of Engineering
 1995-2001 Director of Undergraduate Studies, Department of Biomedical Engineering
 1996-1998 Interviewer, Health Professions Advising Committee
 1995-1997 BMES Faculty Adviser, Department of Biomedical Engineering
 1995-1998 Member, Faculty Search Committee, Department of Biomedical Engineering

Selected Session Chair, Track/Theme Chair, Moderator contributions

2019 Session Chair, TRM meeting, Lugano, Switzerland
2019 Session Chair, iHEART - Modelling the Cardiac Function, Varese, Italy
2018 Session Moderator, Atrial Fibrillation Symposium, Orlando, Florida
2018 Session Chair, APHRS, Taipei, Taiwan
2018 Session Chair and Organizer, World Congress of Biomechanics, Dublin, Ireland
2017 Session Chair, TRM meeting, Lugano, Switzerland
2017 Session Chair, Computing in Cardiology, Rennes, France
2017 Session Chair, Asia-Pacific Heart Rhythm Society, Yokohama, Japan
2017 Session Chair, AMiTaNS'17 Conference, Albena, Bulgaria
2016 Session Chair, Japanese Heart Rhythm Society, Sapporo, Japan
2016 Session Chair, ISC2016, Tokyo, Japan
2016 Session Chair, Cardiosim meeting, Nice, France
2016 Session Chair, Western Atrial Fibrillation Symposium, Park City, Utah
2015 Session Chair, TRM Forum, Lugano, Switzerland
2015 Chair of multiple sessions, Heart Rhythm Society Scientific Sessions
2013 Session Chair, TRM Forum, Lugano, Switzerland
2013 Session Chair, Cardiac Electrophysiology Society meeting
2013 Session Chair, 2013 IEEE EMBC meeting
2012 – 2013 Track Chair, 2013 IEEE EMBC meeting
2011 Session Chair, American Heart Association Scientific Sessions
2011 Theme Chair, IEEE EMBC meeting
2010 Session Chair, Cardiac Electrophysiology Society meeting
2010 Session Chair, Computing in Cardiology meeting
2010 Session Chair, ISCE meeting
2009 Session Chair, BMES Annual meeting
2008 Session Chair, American Heart Association Scientific Sessions
2008 Session Chair, BMES Annual meeting
2008 Session Chair, Heart Rhythm Society Scientific Sessions
2008 Session Chair, Workshop on Computer Methods for Cardiovascular Devices
2007 Debate Chair, Heart Rhythm Society Scientific Sessions
2006 Session Chair, Heart Rhythm Society Scientific Sessions
2005 – 2006 Theme and Track Chair, EMBS Annual meeting
2005 Session Chair, Heart Rhythm Society Scientific Sessions
2004 Session Chair, Meeting of the Physiological Society, Oxford
2004 Session Chair, IASTED meeting
2004 Session Chair, Fourth International Workshop on Computer Simulation and Experimental Assessment of Electrical Cardiac Function
2003 Session Chair, NASPE meeting
2002 Session Chair, Third International Workshop on Computer Simulation and Experimental Assessment of Electric Cardiac Function
2002 Cardiopulmonary Theme Chair, EMBS/BMES Conference
2002 Electrophysiology Track Chair and Session Chair, EMBS/BMES Conference
2002 Session Chair, Mechano-Electrical Feedback Meeting
2002 Session Chair, NASPE meeting
2001 Session Chair (2 sessions), IEEE/EMBS Conference
2001 Poster Session Moderator, IUPS Satellite Meeting “The Integrated Heart: Cardiac Structure and Function”
2000 Session Chair, Workshop on Mapping of Control of Complex Cardiac Arrhythmias
2000 Session Chair (3 sessions), World Congress and IEEE EMBS Conference
1999 Session Chair, EMBS/BMES meeting
1998 Track Co-Chair and Session Chair, IEEE EMBS Meeting
1997 Session Chair, Workshop “Computational Biology of the Heart”
1997 Track Chair and Session Chair, BMES Annual Meeting
1996 Conference Animator and Session Chair, IEEE/EMBS Conference
1994 Session Chair, World Congress on Medical Physics and Biomedical Engineering
1992 Session Chair, IEEE EMBS Conference

Courses Taught at John Hopkins University

- EN.580.485. Computational Medicine: Cardiology. Taught for the first time in 2019. Core undergraduate class
- BME 580.421 Systems Bioengineering I: Cellular and Cardiovascular Engineering. Core undergraduate course in Biomedical Engineering. Taught every year since 2006 (except 2015), 120-140 students in the course. The highest student-ranked course in the Department of Biomedical Engineering for 2010 and 2011
- EN.580.739 Advanced Seminars in Cardiac Electrophysiology and Mechanics, taught every semester since 2011

Courses Taught at Tulane University

- BMEN 201 Introduction to BME Design Methods
- BMEN 272 Circuits, Systems and Signals
- BMEN 278 Circuits, Systems and Signals Lab
- BMEN 310/610 Electrophysiology
- BMEN 361/761 Introduction to Bioelectricity
- BMEN 490 Research and Professional Practice I
- BMEN 611 Cardiac Electrophysiology
- BMEN 676 Advanced Topics in Excitable Media
- BMEN 671 BMEN Departmental Seminar
- BMEN 613/MATH774 Cardiac Modeling

Academic Mentorship

• Postdoctoral Research Advisor

- Dr. Sevde Niemier, October 202 - present
- Dr. Nikhail Paliwal, September 2019 - present
- Dr. Shije Zhou, September 2018 - 2020
- Dr. Ashish Doshi, August 2018 - present
- Dr. Rheeda Ali, May 2017 - 2019
- Dr. Farhad Pashakhanloo, July 2016 - July 2018
- Dr. Yasser Aboelkassem, January 2015 - August 2017
- Dr. Dongdong Deng, August 2013 - March 2018
- Dr. Dafang Wang, December 2012 - 2018
- Dr. Adityo Prakosa, August 2013 - September 2015
- Dr. Hemenegild Arevalo, November 2013 - September 2015
- Dr. Eran Ukatta, October 2013 - January 2016
- Dr. Yong-tae Kim, September 2012-September 2013
- Dr. Tom O'Hara, October 2011 - 2015
- Dr. Patrick Boyle, August 2011- February 2014
- Dr. Ge Wang, March 2012 - March 2013
- Dr. Xiaozhong Chen, January 2008 - February 2012
- Dr. Kimoo Lim, September 2010-September 2011
- Dr. Fijoy Vadakkumpandan, July 2007 - June 2011
- Dr. Gernot Plank, October 2006 - April 2008
- Dr. Viatcheslav Gurev, November 2004 - October 2011
- Dr. Takashi Ashihara, October 2002 - April 2004
- Dr. Blanca Rodriguez, May 2002 - August 2004
- Dr. Alexander Komendantov, June 2001 - May 2004
- Dr. James Eason, July 2000 - September 2002
- Dr. Edward Vigmond, August 1999 - July 2001

• Ph.D. Dissertation Research Advisor

- Director:

- Beepul Bhati
Sayd Yusuf Ali
Yingnan Zhang
Karla Robles

Haley Abramson
Changxin Lai
Kalen Clifton
Ryan Brody
Dan Popescu
Eric Sung
Julie Shade
Ryan O'Hara
Joseph Yu
Alexandra Bardeceanu, graduated December 2018
Thomas Karathanos, graduated December 2017
Sohail Zahid, graduated August 2017
Melanie Zile, graduated December 2017
Farhad Pashakhanloo, graduated June 2016
Kelly Chang, graduated June 2016
Brent Millare
Yuxuan Hu, graduated January 2014
Kathleen McDowell, graduated July 2013
Lukas Rantner, graduated June 2013
Jason Constantino, graduated July 2013
Hermenegild Arevalo, graduated November 2013
Jason Bayer, graduated February 2013
Brock Tice, graduated September 2009
Xiao Jie, graduated March 2009
Molly Maleckar, graduated December 2008
Weihui Li, graduated March 2007
Sam Kuo, left the program 2006
David Bourn, graduated March 2006
Jason Meunier, graduated January 2002
Felipe Aguel, graduated August 2001
Kirill Skouibine, graduated August 1998 (co-directed with Dr. Moore)

- PhD Committee Member:

Claire Zhao
Matt Walker
Boombin Limpitikul
Laura Gautier (graduated 2013)
Sarah Parks (graduated 2012)
Seth Weiberg (graduated 2011)
Rajesh Babu Sekar (graduated 2009)
Mike Tadross (graduated 2008)
Joshua Cysyk (graduated 2008)
Valerie Franz (graduated 2007)
Kathleen Rhea (graduated 2004)
Brett Wingier (graduated 2003)
Adam Cates (graduated 1999)
Delilah Huelsing (graduated 1998)
George Cao (graduated 1999)
Lori Vidal (graduated 1999)

- PhD External Examiner:

Simone Scacchi, University of Pavia, Italy, 2007
Eugene Seneta, University of Technology, Sydney, Australia, 1997.
Amr Al Abed, The University of New South Wales, Australia 2011.

• *M.S. Thesis Research Advising*

- Director:

Carolyn Park (graduated 2011)
Shruthi Shankar (graduated 2010)
Yuxuan Hu (graduated 2010)
Sammy Long (graduated 2009)

Linmiao Xu (graduated 2009)
Claire Larson (graduated 2004)
Carlos Haro (graduated 2004)
Matthew Hillebrener (graduated 2003)
Lubomir Dragnev (graduated 2003)
Craig Campbell (graduated 2002)
Annette Lindblom (graduated 2000)
Cory Anderson (graduated 2000)
Gregory Siekas (graduated 1999)
Ezana Azene (graduated 1999)
Evan Atkinson (graduated 1999)
John T. Parry (graduated 1998)
Kristen Pasnak (graduated 1998)
Ira Nemeth (graduated 1998)

– Committee Member, Tulane University:

Lee Lovejoy (graduated 2000)
Darryl Overby (graduated 1997)
Rock Shi (graduated 1997)
Xiahong Wu (graduated 1996)
Michael Paris (graduated 1996)
Louis Lit (graduated 1996)
Tate Cantrell (graduated 1995)
Lisa Malden (graduated 1994)

• *Senior Projects Directed at Tulane University (*Honors Thesis)*

2006 Paul George, David Siet
2004-2005 *Jason Constantino
2003-2004 *Hermenegild Arevalo, *Brock Tice
2002-2003 *Carlos Haro
2001-2002 *Claire Larson, *Ashley Schneider
2000-2001 *Rachel Ruckdeschel, *Craig Campbell, *Mathew Hillebrener
1999-2000 *Jason Gmyrek, Cristine Guidry
1998-1999 *James Wall, Cory Anderson, *Annette Lindblom
1997-1998 Abigail Moore (with Dr. Pollard), *Ezana Azene, *Evan Atkinson,
1996-1997 *Peter Nelson, Garrett Sipple, Daniel Moller, *Vipul Kapoor, *Suzanne Baker, *Marcella Woods
(with Dr. Pollard)
1995-1996 *Mark Bray, *Felipe Aguel, Kristen Pasnak
1994-1995 *Shrinivas Ganesh, Darren Porras
1993-1994 *Rachel Winokur
1992-1993 *Lisa Malden

• *Undergraduate research projects at JHU*

2019-2020 Annie Liang, Kevin Sompel, Rebecca Yu, Stephen Kyranakis
2018-2019 Kevin Sompel, Rebecca Yu, Annie Liang, Teya Bergamaschi, Sujeon Ju
2018-2019 Dante Basile, Kevin Sompel, Rebecca Yu, Annie Liang, Teya Bergamaschi, Sujeon Ju
2017-2018 Michael Murphy, William Francesci, Tiffany Hu
2016-2017 Michael Murphy, William Francesci, Joe Hakim
2015-2016 Kaitlyn White, Erica Wood, Michael Murphy
2014-2015: Vignesh Ramchandran, Kaitlyn White, Erica Wood
2013-2014 Eric Xie, Anish Dalal, Kristina Li
2012-2014 Alexander Jebb
2012-2013 Seth Hochberg
2007-2010 Carolyn Park
2008-2009 Ted Lee
2007-2009 Grace Tan
2006-2008 Alex Artaki, Linmiao Xu, Francisco Conjitoch, Josef Wang

Funding

Current Support

Supporting Agency: NSF
Award: \$195,000
Duration: 05/01/2020-04/30/2021
Title: RAPID: Prediction of Cardiac Dysfunction in COVID-19 Patients Using Machine Learning
Principal Investigator Natalia A. Trayanova

Supporting Agency: Lowenstein Foundation
Award: \$250,000
Duration: 01/01/2020-01/01/2021
Title: The Deep Heart
Principal Investigator Natalia A. Trayanova

Supporting Agency: NIH
Award: \$3,131,386
Duration: 05/01/2019-02/28/2023
Title: Infarct-related Ventricular Tachycardia Mechanisms: From Micro to Clinical
Principal Investigator Natalia A. Trayanova

Supporting Agency: NIH
Award: \$3,145,000
Duration: 07/15/18-07/14/22
Title: Simulation Guidance of Ablation Therapy for Persistent Atrial Fibrillation
Principal Investigator Natalia A. Trayanova

Supporting Agency: Leducq Foundation
Award: \$898,874 to JHU
Duration: 01/10/16-01/10/21
Title: **RHYTHM:** Repolarization Heterogeneity imaging for personalized Therapy of Heart arrhythmia
MPIs Haisaguerre, Efimov, Trayanova, Rogers, Coronel

Supporting Agency: NIH
Award: \$1,235,167
Duration: 01/01/16-11/30/20
Title: Exploration of Arrhythmogenic Triggers and Substrates in Heart Failure
Principal Investigator Natalia A. Trayanova

Supporting Agency: NIH
Award: subcontract from UC Davis, \$25, 864
Duration: 09/01/15-08/31/20
Title: Predictive Multiscale in Silico Cardio-Pharmacology
Principal Investigator Coleen Clancy
Co-PI Natalia A. Trayanova

Completed Awards

Supporting Agency: TEDCO, MII Innovation Commercialization Program
Award: \$90,000
Duration: 02/01/18-11/01/19
Title: Personalized prediction of ablation targets in patients with atrial fibrillation and fibrotic remodeling
Principal Investigator Natalia A. Trayanova

Supporting Agency: **NIH Director's Pioneer Award**
Award: \$4,075,000
Duration: 9/13-8/19

Title: Virtual Electrophysiology Laboratory
Principal Investigator Natalia A. Trayanova

Supporting Agency: *inHealth* Pilot Project Discovery Award
Award: \$75,000

Duration: 01/01/16-04/30/17

Title: Personalized Risk Stratification for Sudden Cardiac Death Using Cardiac MRI and Virtual Heart Electrophysiologic Studies (PuRSUit-Virtual Heart)

Principal Investigator Katherine Wu
Co-PI Natalia A. Trayanova

Supporting Agency: NIH
Award: subcontract from Columbia, \$123,853

Duration: 09/15/15-05/31/17

Title: Early Detection and Mapping of Ischemia Using Myocardial Elastography

Principal Investigator Elisa Konofagou
Co-PI Natalia A. Trayanova

Supporting Agency: SOM Discovery Innovation Award
Award: \$50,000

Duration: 07/01/15-06/30/16

Title: Personalized Virtual Heart: Application to Ablation of Persistent Atrial Fibrillation in Patients with Fibrosis

Principal Investigator Natalia A. Trayanova

Supporting Agency: NIH
Award: \$2,715,000

Duration: 6/11-7/16

Title: Resynchronizing the Failing Heart: Insights from a Multiscale Cardiac Model

Principal Investigator Natalia A. Trayanova

Supporting Agency: NSF
Award: \$600,000 (Trayanova portion)

Duration: 9/11-8/15

Title: CDI Type II: Collaborative Research: From Ion Channels to Blood Flow and Heart Sounds

MPIs: Mittal, Trayanova, Huang

Supporting Agency: NIH
Award: \$800,000 (Trayanova portion)

Duration: 4/11-12/15

Title: Redox Modification of the Arrhythmic Substrate in Heart Failure

MPIs: Winslow, Trayanova, O'Rourke

Supporting Agency: NIH
Award: \$300,000 (Trayanova portion)

Duration: 4/10-3/15

Title: Role of Cardiomyocyte Mitochondria in Heart Disease: An Integrated Approach

MPIs: O'Rourke, Trayanova, Bers, Blatter, Van Eyk

Supporting Agency: NIH (BRP grant)
Award: \$915,120 (Trayanova portion)

Duration: 1/10-6/14

Title: Improved Targeting and Assessment of Electrophysiology Intervention

Principal Investigator: Henry Halperin
Subcontract PI: Natalia A. Trayanova

Supporting Agency: NIH
Award: \$375,685 (Trayanova portion)

Duration: 07/10-06/15
Title: LV Structural Predictors of Sudden Cardiac Death
Principal Investigator: Katherine Wu
Co-investigator: Natalia A. Trayanova

Supporting Agency: NIH (pre-doctoral fellowship)
Award: \$123,528
Duration: 2/10-1/13
Title: Image-Based Models that Predict Arrhythmia Morphology in Post-Infarction Hearts
Principal Investigator: Natalia A. Trayanova
Graduate Assistant: Hermenegild Arevalo

Supporting Agency: NIH (pre-doctoral fellowship)
Award: \$124,140
Duration: 7/10-6/13
Title: Image-based models of electromechanics in normal and failing hearts
Principal Investigator: Natalia A. Trayanova
Graduate Assistant: Jason Lance Constantino

Supporting Agency: NSF
Award: \$300,000
Duration: 1/10-12/12
Title: Mechanisms of Mechanically-Induced Arrhythmias in Myocardial Ischemia
Principal Investigator: Natalia A. Trayanova

Supporting Agency: NIH
Award: \$2,130,611
Duration: 1/07-12/11
Title: Defibrillation Mechanisms in Infarcted Hearts
Principal Investigator: Natalia A. Trayanova

Supporting Agency: NIH
Award: \$165,000 (Trayanova portion)
Duration: 7/10-6/12
Title: Early Detection and Mapping of Ischemia using Myocardial Elastography
Principal Investigator: Elisa Konofagou (Columbia University)
Subcontract PI: Natalia A. Trayanova

Supporting Agency: NIH (R21)
Award: \$137,333 (Trayanova portion)
Duration: 07/10-06/12
Title: Termination of Cardiac Arrhythmia by High Frequency Electric Field
Principal Investigator: Leslie Tung
Co-investigator: Natalia A. Trayanova

Supporting Agency: NIH
Award: \$1,029,219 (Trayanova portion)
Duration: 5/07-4/12
Title: Virtual Electrode Hypothesis for Defibrillation
Principal Investigator: Igor Efimov (Washington University)
Co-PI/subcontract PI: Natalia A. Trayanova

Supporting Agency: NIH (R21 grant)
Award: \$170,000 (Trayanova portion)
Duration: 1/10-12/11
Title: Noninvasive Conduction Mapping Using Electromechanical Wave Imaging
Principal Investigator: Elisa Konofagou (Columbia University)
Subcontract PI: Natalia A. Trayanova

Supporting Agency: Medtronic Inc (External Research Program Award)
Award: \$95,000
Duration: 7/10-6/11
Title: A Novel Method to Predict QT interval Instability from Intracardiac Electrograms
Principal Investigator: Natalia A. Trayanova

Supporting Agency: FDA
Award: \$92,500
Duration: 1/10-12/11
Title: Critical Path Project: Pediatric Defibrillation
Principal Investigator: Natalia A. Trayanova

Supporting Agency: American Heart Association (pre-doctoral fellowship)
Award: \$52,900
Duration: 07/10 - 06/12
Title: Mechanisms of T-wave Alternans in Human Heart Failure
Principal Investigator: Natalia A. Trayanova
Graduate Assistant: Jason Bayer

Supporting Agency: NSF
Award: \$10,000
Duration: 12/08-12/09
Title: 2009 Cardiac Arrhythmia Mechanisms Gordon Research Conference
Principal Investigator: Natalia A. Trayanova

Supporting Agency: NIH (R13 grant)
Award: \$15,000
Duration: 12/08-12/09
Title: 2009 Cardiac Arrhythmia Mechanisms Gordon Research Conference
Principal Investigator: Natalia A. Trayanova

Supporting Agency: NIH
Award: \$933,388
Duration: 9/05-8/09
Title: Cardiac Tissue Structure in the Defibrillation Process
Principal Investigator: Natalia A. Trayanova

Supporting Agency: NSF
Award: \$344,098
Duration: 9/06-8/09
Title: Shock-induced Arrhythmogenesis in Regional Myocardial Ischemia
Principal Investigator: Natalia A. Trayanova

Supporting Agency: NIH
Award: \$305,735 (JHU portion) + \$221,888 (Tulane portion)
Duration: 09/04-08/08
Title: The role of electroporation in defibrillation
Principal Investigator: Igor Efimov (Washington University)
Co-PI: Natalia A. Trayanova

Supporting Agency: AHA post-doctoral fellowship
Award: \$70,000
Duration: 07/07-06/09
Title: Defibrillation mechanisms in ventricular dilatation: the role of active deformation
Principal Investigator: Natalia A. Trayanova
Post-doctoral fellow: Viatcheslav Gurev

Supporting Agency: AHA pre-doctoral fellowship
Award: \$33,538

Duration: 07/06-06/08
Title: Investigation into the Mechanisms of Defibrillation Failure using High-Resolution Models of Cardiac Tissue
Principal Investigator: Natalia A. Trayanova
Graduate assistant: Brock Tice

Supporting Agency: AHA, Established Investigator Award
Award: \$310,000
Duration: 8/02-7/06
Title: Analysis of defibrillation mechanisms in acute ischemia
Principal Investigator: Natalia A. Trayanova

Supporting Agency: Medtronic Inc.
Award: \$95,000
Duration: 7/04-6/06
Title: Research Services Agreement
Principal Investigator: Natalia A. Trayanova

Supporting Agency: NIH
Award: \$114,400 (Tulane portion)
Duration: 12/02-11/07
Title: Electrophysiological implications of cardiac bidomain
Principal Investigator: John Wikswo (Vanderbilt University)
Investigator: Natalia A. Trayanova

Supporting Agency: NIH, Pre-NPEBC
Award: \$1,240,887
Duration: 5/03 - 4/06
Title: Biocomputing: Integrating Molecular/Organ-Level Function
MPIs: Donald Gaver, Lisa J. Fauci
Investigator: Natalia A. Trayanova

Supporting Agency: NIH
Award: \$792,433
Duration: 7/99-6/05
Title: Cardiac Tissue Structure in the Defibrillation Process
Principal Investigator: Natalia A. Trayanova

Supporting Agency: Tulane Wall Fund
Award: \$150,000
Duration: 6/01 - 7/04
Title: Center for Computational Science
Principal Investigator: Lisa J. Fauci, Donald Gaver, Ricardo Cortez
Investigator: Natalia A. Trayanova

Supporting Agency: Whitaker Foundation (subcontract to Washington&Lee University)
Award: \$41,000 (Tulane portion)
Duration: 9/02-8/04
Title: The role of phase singularities in determining defibrillation efficacy
Principal Investigator: Natalia A. Trayanova

Supporting Agency: NSF
Award: \$220,000
Duration: 9/98-2/03
Title: ICD Transvenous lead placement: An active bidomain heart/torso simulation study of defibrillation efficacy
Principal Investigator: Natalia A. Trayanova

Supporting Agency: NSF

Award: \$22,000
Duration: 9/98-2/03
Title: REU Supplement to NSF GOALI award
Principal Investigator: Natalia A. Trayanova

Supporting Agency: DOE
Award: \$1,920,000
Duration: 5/01 – 6/03
Title: Livingston Digital Millennium Center for Computational Science
Principal Investigator: Lisa J. Fauci, Donald Gaver, Ricardo Cortez
Investigator: Natalia A. Trayanova

Supporting Agency: American Heart Association
Award: \$90,000
Duration: 7/01-12/02
Title: Roles of Structure and Heterogeneity in the Induction and Maintenance of Atrial Reentry
Principal Investigator: Natalia A. Trayanova

Supporting Agency: NIH
Award: \$15,000 (Tulane portion)
Duration: 3/01-2/02
Title: Magnetic Field of the Heart
Principal Investigator: John Wikswo (Vanderbilt University)
Investigator: Natalia A. Trayanova

Supporting Agency: Tulane ACLRT
Total Award: \$6740
Duration: 1999-2000
Title: Virtual Bioelectricity Labs in BMEN 361/761
Principal Investigator: Natalia A. Trayanova

Supporting Agency: Louisiana Board of Regents (R&D Program)
Total Award: \$109,713 plus \$12,500 match in cash
Duration: 9/98-8/01
Title: Cardiac Tissue in an Electric Field
Principal Investigator: Natalia A. Trayanova

Supporting Agency: ACLRT, Tulane University
Total Award: \$7,000
Duration: 8/99-9/00
Title: Virtual Bioelectricity Labs
Principal Investigator: Natalia A. Trayanova

Supporting Agency: American Heart Association
Total Award: \$25,000
Duration: 9/98-8/99
Title: Analysis of electrode configurations in a high-resolution model of cardiac defibrillation
Principal Investigator: Natalia A. Trayanova

Supporting Agency: Ventritex, a division of St. Jude Medical (research agreement)
Total Award: \$50,000
Duration: 9/97-8/98
Title: Bidomain Model of the Ventricles
Principal Investigator: Natalia A. Trayanova

Supporting Agency: Medtronic, Inc. (research agreement)
Total Award: \$17,000
Duration: 9/97-8/99
Title: Development of a Human Atrial Model

Principal Investigator: Natalia A. Trayanova

Supporting Agency: Medtronic, Inc. (research agreement)
Total Award: \$7,000
Duration: 10/97-9/99
Title: Effects of Ablation and Shocks on Atrial Fibrillation
Principal Investigator: Natalia A. Trayanova

Supporting Agency: The Whitaker Foundation
Total Award: \$179,205
Duration: funding ended August 1, 1996
Title: The Bidomain Model with Periodic Intracellular Junctions: A Study of Cardiac Stimulation
Principal Investigator: Natalia A. Trayanova

Supporting Agency: NSF (subcontract from Duke University)
Total Award: \$10,852
Duration: summer 1995
Title: Cardiac Membrane Polarization in Strong Electric Fields
Investigator: Natalia A. Trayanova

Supporting Agency: NSF (subcontract from Duke University)
Total Award: \$11,181
Duration: summer 1996
Title: Cardiac Membrane Polarization in Strong Electric Fields
Investigator: Natalia A. Trayanova

Supporting Agency: Tulane Committee on Research
Total Award: \$4,000
Duration: summer 1996
Title: Membrane Electroporation during the Defibrillation Shock
Principal Investigator: Natalia A. Trayanova

Supporting Agency: NSF
Total Award: \$1,665
Duration: 9/15/96 - 3/15/96
Title: International Travel to Attend the 18th Conference of the IEEE EMBS, Nov. 1996, Amsterdam, The Netherlands
Principal Investigator: Natalia A. Trayanova

Supporting Agency: LEQSF – Enhancement Program
Total Award: \$126,000
Duration: one year
Title: Biomedical Engineering Enhancement: Establishing an Integrated Tissue Engineering Facility
Principal Investigator: Donald Gaver
Co-PI: Natalia A. Trayanova

Supporting Agency: NSF, Group Infrastructure Grant
Total Award: \$528,779
Duration: 9/97 – 8/02
Title: Computational Science in Biomedical Systems
Principal Investigator: Lisa J. Fauci
Co-PI: Natalia A. Trayanova

Patents (44, US and International)

Publication Number	Title
WO2020154664	Predicting Atrial Fibrillation Recurrence after Pulmonary Vein Isolation Using Simulations of Patient-specific Magnetic Resonance Imaging Models and Machine Learning
US20200261028	Risk Stratification for Ventricular Arrhythmia in Patients With Repaired Tetralogy of Fallot (TOF) Via Image-Based Computational Simulations
WO2018085755	Risk Stratification for Ventricular Arrhythmia in Patients With Repaired Tetralogy of Fallot (TOF) Via Image-Based Computational Simulations
US10842401	Simulation Prediction of Optimal Targets for Catheter Ablation of Left Atrial Flutter in Patients with Atrial Structural Remodeling
WO2016183385	Simulation Prediction of Optimal Targets for Catheter Ablation of Left Atrial Flutter in Patients with Atrial Structural Remodeling
US10363100	Systems and Methods for Patient-specific Modeling of the Heart for Prediction of Targets for Catheter Ablation for Ventricular Tachycardia in Patients with Implantable Cardioverter Defibrillators
WO2016183365	Systems and Methods for Patient-specific Modeling of the Heart for Prediction of Targets for Catheter Ablation for Ventricular Tachycardia in Patients with Implantable Cardioverter Defibrillators
US10687898	Systems and Methods for Atrial Fibrillation Treatment and Risk Assessment
WO2016077154	Systems and Methods for Atrial Fibrillation Treatment and Risk Assessment
WO2015073977	Sudden Cardiac Death Risk Assessment by Analysis of Patients Myocardial Wall Shape
AU2014360697	Personalized Computational Modeling of Atrial Fibrosis to Guide Catheter Ablation of Atrial Fibrillation
EP3076869	Personalized Computational Modeling of Atrial Fibrosis to Guide Catheter Ablation of Atrial Fibrillation
IL245988	Personalized Computational Modeling of Atrial Fibrosis to Guide Catheter Ablation of Atrial Fibrillation
JP2016540570	Personalized Computational Modeling of Atrial Fibrosis to Guide Catheter Ablation of Atrial Fibrillation
US10813698	Personalized Computational Modeling of Atrial Fibrosis to Guide Catheter Ablation of Atrial Fibrillation
WO2015084876	Personalized Computational Modeling of Atrial Fibrosis to Guide Catheter Ablation of Atrial Fibrillation
US10531922	Method for Computationally Predicting Optimal Placement Sites for Internal Defibrillators in Pediatric and Congenital Heart Defect Patients
WO2014182320	Method for Computationally Predicting Optimal Placement Sites for Internal Defibrillators in Pediatric and Congenital Heart Defect Patients
US10827983	System and Method for Personalized Arrhythmia Risk Assessment by Simulating Arrhythmia Inducibility

WO2014070916	System and Method for Personalized Arrhythmia Risk Assessment by Simulating Arrhythmia Inducibility
US9623258	Method for Low Voltage Defibrillation with Far-field Stimuli of Variable Timings based on Feedback from the Heart
WO2013166485	Method for Low Voltage Defibrillation with Far-field Stimuli of Variable Timings based on Feedback from the Heart
AU2012214163	System and Method for Planning a Patient-specific Cardiac Procedure
AU2016204898	System and Method for Planning a Patient-specific Cardiac Procedure
CA2827042	System and Method for Planning a Patient-specific Cardiac Procedure
EP2672889	System and Method for Planning a Patient-specific Cardiac Procedure
IL227906	System and Method for Planning a Patient-specific Cardiac Procedure
JP6203641	System and Method for Planning a Patient-specific Cardiac Procedure
US10765336	System and Method for Planning a Patient-specific Cardiac Procedure
US202016995513	System and Method for Planning a Patient-specific Cardiac Procedure
WO2012109618	System and Method for Planning a Patient-specific Cardiac Procedure
US9215987	A Novel Methodology for Arrhythmia Risk Stratification by Assessing QT Interval Instability
WO2011084636	A Novel Methodology for Arrhythmia Risk Stratification by Assessing QT Interval Instability
US9662027	Methodology for Assessing the Bounded-input Bounded-output Instability in QT Interval Dynamics: Application to Clinical ECG with Ventricular Tachycardia
WO2013184745	Methodology for Assessing the Bounded-input Bounded-output Instability in QT Interval Dynamics: Application to Clinical ECG with Ventricular Tachycardia
US10532216	Method and Device for Treating Cardiac Arrhythmias
WO2015112893	Method and Device for Treating Cardiac Arrhythmias
EP2473232	Method and Device for Treating Cardiac Arrhythmias
US20120215269	Method and Device for Treating Cardiac Arrhythmias
WO2011029029	Method and Device for Treating Cardiac Arrhythmias
CA2569144	Implantable Cardioversion and Defibrillation System Including Intramural Myocardial Electrode
EP1761300	Implantable Cardioversion and Defibrillation System Including Intramural Myocardial Electrode
US20060020316	Implantable Cardioversion and Defibrillation System Including Intramural Myocardial Electrode
WO2005120632	Implantable Cardioversion and Defibrillation System Including Intramural Myocardial Electrode

Entrepreneurship

- Founder and Chief Scientific Officer, ***CardioSolv Ablation Technologies***, a startup company that develops computational strategies to improve the treatment of ventricular tachycardia; seven of the patents and patent applications above are licensed to Cardiosolv
- In negotiations for licensing technology for risk prediction, in real time, of cardiovascular adverse events to ***20/20 GeneSystems***

Principal Investigator on FDA-Approved Clinical Studies

- **IDE Number:** G180087/A001
Trade/Device Name: AVERT-VT study (VAAT approach)
Indications for use: Prospective study of simulation guidance of ventricular tachycardia ablation
- **IDE Number:** G180271/A001
Trade/Device Name: OPTIMA
Indications for use: Prospective randomized clinical trial for simulation-driven guidance of ablation of persistent atrial fibrillation in patients with fibrosis on contrast-enhanced (LGE)-MRI
Registered at *ClinicalTrials.gov*

Selected Invited Talks

- UW Cardiovascular Research Summit, December 2020 (virtual talk)
- AHA Scientific Sessions, November 2020 (several invited virtual talks)
- VT symposium, October 2020 (virtual talk)
- Conference on Modelling the Cardiac Function, Milan, Italy, September 2020 (virtual talk)
- Science Writers Bootcamp, June 2020 (virtual talk)
- Heart Rhythm Society, May 2020 (several invited talks)
- Stanford Biodesign Symposium, May 2020 (virtual talk)
- Western Atrial Fibrillation Symposium, Park City, Utah, February 2020
- 6th UC Davis Cardiovascular Symposium, February 2020
- Center for Cardiovascular Research, Washington University School of Medicine, February 2020
- AF Symposium, Washington DC, January 2020
- TRM Forum, Lugano, Switzerland, December 2019
- AHA Scientific Sessions, Philadelphia, PA, November 2019 (several invited talks)
- Asia-Pacific Heart Rhythm Society, Bangkok, Thailand, October 2019 (several invited talks)
- University of Maryland School of Medicine, Grand Rounds, September 2019
- CMBBE meeting, New York City, August 2019 (plenary lecture)
- International Conference on Instrumentation, Control, and Automation, Bandung, Indonesia, July 2019 (plenary lecture)
- Workshop on Instrumentation, Control, and Automation, Bandung, Indonesia, July 2019 (plenary lecture)
- iHEART - Modelling the Cardiac Function, Varese, Italy, July 2019 (keynote lecture)
- 13th International Conference on Pathways, Networks, and Systems Medicine, Crete, Greece, June 2019
- 2nd UCL-Barts Heart Centre Translational Electrophysiology Symposium, London, June 2019 (keynote lecture)
- Heart Rhythm Society, San Francisco, May 2019 (several invited talks)
- Stanford Biodesign Symposium, May 2019
- 3rd Joint Conference Johns Hopkins Medicine International and Pacifica Salud, Panama City, April 2019
- GRC Cardiac Arrhythmia Mechanisms meeting, Barga, Italy, April 2019
- EHRA meeting, Lisbon, March 2019
- Department of Pediatric Cardiology, February 2019
- AF symposium, Boston, January 2019
- Institute for Research and Innovation in Bioengineering, Technical University of Valencia, Spain, Dec 2018
- AHA Scientific Sessions, Chicago, November 2018
- Asia-Pacific Heart Rhythm Society, Taipei, Taiwan, October 2018 (several invited talks)
- VT Symposium, New York, October 2018
- FICE Workshop, Maastricht, The Netherlands, September 2018 (keynote lecture)
- Computing in Cardiology, Maastricht, The Netherlands, September 2018 (keynote lecture)
- Heart by the Numbers meeting, Berlin, September 2018
- VPH Summer School, Barcelona, Spain, June 2018 (keynote lecture)
- Bioengineering Lecture, Imperial College London, UK, June 2018
- Saint-Petersburg Forum of Arrhythmology, St. Petersburg, Russia, June 2018 (keynote lecture)
- Stanford Biodesign Symposium, May 2018
- Heart Rhythm Scientific Sessions, May 2018 (several talks)
- EHRA meeting, Barcelona, Spain, March 2018
- Department of Medicine Retreat, March 2018 (keynote speaker)
- Western Atrial Fibrillation Symposium, Park City, Utah, 2018
- UC Davis Cardiovascular Symposium, Davis CA, 2018
- Dean's Symposium, Palm Beach, FL, 2018
- AF symposium, Orlando, FL, January 2018
- TRM meeting, Lugano, Switzerland, 2017
- American Heart Association meeting, Anaheim, CA, 2017
- AFIB meeting, Madrid, November 2017
- Leducq Annual meeting, Bordeaux, France, October 2017
- PhystechBioMed-2017, Moscow, Russia, September 2017
- Moscow Institute of Physics and Technology, September 2017
- Moscow State University, Moscow, Russia, September 2017
- Asia-Pacific Heart Rhythm Society, Yokohama, Japan, September 2017 (several invited talks)
- SISSA Summer School, Brashov, Romania, July 2017
- AMiTaNs symposium, Albena, Bulgaria, June 2017

- Heart Rhythm Scientific Sessions, May 2017 (invited faculty, several talks)
- Stanford Biodesign Symposium, May 2017
- CMBE meeting, Pittsburg PA, April 2017 (keynote lecture)
- WSE Dean's Alumni Lecture, Washington DC, March 2017
- Cardiology Grand Rounds, Norfolk, VA, March 2017
- Atrial Fibrillation Symposium, The Hague, The Netherlands, March 2017
- Children's Hospital, Washington DC, March 2017
- **TED talk** at TEDxJHU, February 2017
- Biophysical Society meeting, New Orleans, LA, February 2017
- Atrial Fibrillation Symposium, Orlando FL, January 2017
- Symposium "Cardiomyopathies: a look at the future", Florence, Italy, December 2016
- America Heart Association Scientific Sessions, New Orleans, November 2016
- VT Symposium, New York, October 2016
- Institute for Engineering in Medicine, University of Minnesota, Minneapolis, September 2016
- Cardiac Mechanoelectric Coupling and Arrhythmias, Freiburg, Germany, September 2016 (keynote lecture and closing lecture), September 2016
- Gordon Research Conference on Healthcare Informatics, Hong Kong, July 2016
- Japanese Heart Rhythm Society, Sapporo, Japan, July 2016 (2 talks)
- ISC2016, Tokyo, Japan, July 2016 (keynote lecture)
- Cardiostim meeting, Nice, France, June 2016
- Heart Rhythm Scientific Sessions, May 2016 (invited faculty, several talks)
- Stanford Biodesign Symposium, May 2016
- TRM Forum, Lugano, Switzerland, December 2015
- Asia-Pacific Heart Rhythm Scientific Sessions, Melbourne, Australia, November 2015
- Ohio State University Dorothy M. Davis Heart & Lung Research Institute's Annual Research Day (keynote address)
- Summer Course on Image-based Biomedical Modeling, Park City, UT July 2015 (keynote lecture)
- Lyric Institute, University of Bordeaux, June 2015
- Heart Rhythm Scientific Sessions, Boston, May 2015 (invited faculty, several talks)
- Stanford Biodesign Symposium, Boston, May 2015
- Arrhythmia Satellite Symposium, Physiome meeting, Auckland, New Zealand, April 2015 (keynote lecture)
- Gordon Research Conference on Cardiac Arrhythmia Mechanisms, Barga, Italy, March 2015
- Cell Biology of the Heart Symposium, Keystone, CO, March 2015
- Western Atrial Fibrillation Symposium, Park City, Utah, February 2015
- Cardiac Muscle Society, Baltimore, MD, February 2015 (keynote lecture)
- Center for Biomedical Image Computing and Analytics, University of Pennsylvania, Philadelphia, February 2015
- ICES, University of Austin, Austin, TX, January 2015
- Atrial Fibrillation Symposium, Orlando, FL, January 2015
- FDA CiPA Workshop, Washington DC, December 2014
- American Heart Association Scientific Sessions, Chicago, November 2014 (invited faculty)
- Cardiac Arrhythmias: Challenges for Diagnosis and Treatment, A symposium in honor of GR Mines, McGill University, Montreal, Canada, November 2014
- Women in EP Meeting, Orlando, FL, October 2014 (invited faculty)
- London VT Symposium, London, UK, September 2014
- SIAM Annual Meeting, Chicago, July 2014 (plenary lecture)
- Workshop on Large Scale Modeling of Cardiac Electrophysiology, Dalhousie University, Halifax, Canada, June 2014
- Cardiostim meeting, Nice, France, June 2014
- Radiology Department, Johns Hopkins School of Medicine, May 2014
- Heart Rhythm Scientific Sessions, San Francisco, May 2014 (invited faculty, four talks)
- Stanford Biodesign Symposium, Palo Alto, May 2014
- Medtronic Inc., Minneapolis, MN, April 2014
- Western Atrial Fibrillation Symposium, Park City, UT, March 2014
- Cardiovascular Research Center, University of Wisconsin - Madison, Madison, WI, January 2014
- The Texas Academy of Medicine, Science and Engineering. Austin, TX, January 2014 (keynote lecture)
- TRM Forum, Lugano, Switzerland, December 2013
- American Heart Association Scientific Sessions, Dallas, TX, November 2013 (invited faculty)
- MEDICON meeting, Seville, Spain, September 2013
- Denis Escande Symposium, Amsterdam, September 2013

- IEEE EMBC meeting, Osaka, Japan, July 2013 (keynote lecture)
- Europace, Athens, Greece, July 2013
- Modeling Physiological Flows Meeting, Sardinia, Italy, 2013
- Heart Rhythm Scientific Sessions, Denver, May 2012 (invited faculty, several talks)
- Stanford Biodesign Symposium, Denver, May 2013
- David Rosenbaum Symposium, Metro Health, Cleveland, May 2013
- Department of Biomedical Engineering, Stony Brook University, New York, March 2013
- SIAM Conference on Computational Science and Engineering, Boston, February 2013 (plenary speaker)
- Western Atrial Fibrillation Symposium, Park City, UT, March 2013
- Fourth Chilean Workshop on Numerical Analysis of Partial Differential Equations, Concepcion, Chile, January 2013 (invited talk)
- ICM Distinguished Seminar Series, Johns Hopkins University, December 2012
- IMAG Consortium, NIH, November 2012
- American Heart Association Scientific Sessions, Los Angeles, CA, November 2012 (invited talk)
- Physiome meeting, San Diego, November 2012 (plenary speaker)
- Metro Health Hospital, CWRU, Cleveland, OH, October 2012
- Department of Physiology, CWRU, Cleveland, OH, October 2012
- 4th Computational Pharmacy Workshop, Krakow, Poland, September 2012 (keynote speaker)
- 8th European Solid Mechanics Conference, Cardiac Electromechanics Minisymposium, Graz, Austria, July 2012 (invited talk)
- Cardiostim Meeting, Nice, France, June 2012 (2 invited talks)
- Cardiovascular Research Retreat, Department of Medicine, Johns Hopkins University, June 2012 (invited talk)
- Heart Rhythm Scientific Sessions, Boston, May 2012 (invited faculty, 3 talks)
- Murray B. Sachs Endowed Chair Installation Presentation, May, 2012
- Conference on Engineering Frontiers in Pediatric and Congenital heart Disease, Stanford University, April 2012 (keynote speaker)
- Biomedical Engineering Department, Johns Hopkins University, April 2012
- Cardiovascular Symposium, UC Davis, CA, March 2012
- Western Atrial Fibrillation Symposium, Park City, Utah, February 2012
- National Research Laboratory for Mitochondrial Signaling, Department of Physiology, College of Medicine, Inje University, Busan, South Korea, January 2012 (COOL Lecture)
- Seoul Mini-Workshop on recent Progress in Biosimulation, Seoul, South Korea, January 2012 (keynote speaker).
- Challenges in Computing Conference, Oslo, Norway, December 2011 (keynote speaker)
- CaMo Workshop, Simula Laboratory, Oslo, Norway, December 2011.
- Sixth International Workshop on Computer Simulation and Experimental Assessment of Electrical Cardiac Function, Lugano, Switzerland, December 2011.
- American Heart Association Scientific Sessions, Orlando, Florida, November 2011
- Center for Arrhythmia Research, University of Michigan School of Medicine, Ann Arbor, October 2011
- Cardiology, University of Michigan School of Medicine, Ann Arbor, October 2011 (Founders Lecture)
- Physiome meeting, Oxford, UK, July 2011.
- Imperial College London, UK, July 2011.
- St. Jude Medical, Sunnyvale, CA, June 2011 (Research Lyceum Lecture)
- St. Jude Medical, Silmar, CA, June 2011 (Research Lyceum Lecture)
- NFSI & ICBEM 2011 conference, Banff, Canada, May 2011 (plenary speaker).
- Heart Rhythm Society Scientific Sessions, San Francisco, CA, May 2011.
- American Congress on Pharmacometrics, San Diego CA, April 2011.
- Gordon Research Conference on Cardiac Arrhythmia Mechanisms, Galveston TX, February 2011.
- Department of Biomedical Engineering, Columbia University, NY, January 2011.
- NIH, National Institute for Aging, January 2011.
- FDA, Silver Springs, MD, December 2010.
- Boston Scientific, Inc, Minneapolis, MN, July 2010.
- Simula Research Laboratory, Oslo, Norway, June 2010.
- Cardiostim meeting, Nice, France, June 2010.
- Heart Rhythm Society Scientific Sessions, Denver, Co, May 2010.
- ISCE meeting, Albuquerque, NM, April 2010.
- Division of Cardiology, Johns Hopkins Medical Institutions, April 2010
- Department of Electrical Engineering and Computer Science, University of Calgary, Canada, March 2010.
- Beth Israel Deaconess Medical Center, Boston, MA, March 2010.

- UC Davis Cardiovascular Symposium, Davis, CA, February 2010.
- American Heart Association meeting, Orlando, November 2009.
- NHLBI/VCU workshop, Richmond, VA, October 2009
- University of Pittsburgh School of Medicine, Pittsburgh, October 2009
- Cardiac Physiome meeting, Cambridge, July 2009
- Japanese Society of Electrocardiology and Japanese Heart Rhythm Society Joint Meeting, Kyoto, July 2009 (2 invited presentations)
- ISHR meeting, Baltimore MD, June 2009.
- Heart Rhythm Society Scientific Sessions, Boston, MA, May 2008 (4 invited presentations).
- Mount Sinai, NYC, March 2009.
- Applied Math Department, JHU, November 2008.
- Joint JHU-Thisnua University meeting, Beijing, China, October, 2008
- BMES annual meeting, St. Louis, MO, October 2008.
- CARP User's Meeting. Banff, Canada, September 2008.
- Cardiostim meeting, Nice, France, June 2008.
- Heart Rhythm Society Scientific Sessions, San Francisco, CA, May 2008.
- Workshop on Multi-scale Modelling of the Heart, Auckland, New Zealand, March 2008 (plenary speaker).
- Workshop on Computer Methods for Cardiovascular Devices, Washington DC, March 2008.
- Department of Veterinary Medicine, Cornell University, October 2007.
- Biomedical Engineering Graduate Program Retreat, Johns Hopkins University, Ocean City, MD, September 2007.
- EMBS meeting, Lyon, France, August 2007.
- NHLBI workshop "Systems Approach to Understanding Electromechanical Activity in the Human Heart", Washington DC, August 2007.
- Dalhousie University, Halifax, Nova Scotia, Canada, June 2007.
- Heart Rhythm Society Meeting, Denver, CO, May 2007 (3 invited presentations).
- International Society for Computerized Electrocardiography Meeting, Cancun, Mexico, April 2007.
- Whiting School of Engineering, Johns Hopkins University, April 2007.
- Mechanoelectric Feedback and Arrhythmias Meeting, Oxford University, April 2007
- Department of Pharmacology, Columbia University School of Medicine, March 2007
- Cardiovascular Research Laboratory, UCLA, February 2007.
- Department of Bioinformatics and Computational Biology, George Mason University, January 2007.
- Institute for Molecular Cardiobiology, Johns Hopkins University, January 2007.
- Fifth International Workshop on Computer Simulation and Experimental Assessment of Electrical Cardiac Function, Lausanne, Switzerland, December 2006.
- Third Technion-Johns Hopkins Symposium in Medical Science and Biomedical Engineering, Johns Hopkins University, October 2006 (Fred Hittman Distinguished Lecture).
- Cardiac Electrophysiology and Arrhythmia, Mathematical Biosciences Institute, October 2006.
- Cardiac Mechanics and Remodeling, Mathematical Biosciences Institute, September 2006.
- Symposium on Biomedical Engineering, Zurich, Switzerland, September 2006 (keynote address).
- 4th Fairberg Cardiac Workshop, April 2006.
- Department of Bioengineering, University of Utah, April 2006.
- Department of Bioengineering, UCSD, April 2006.
- Medtronic, Inc., April 2006.
- Department of Biomedical Engineering, University of Minnesota, April 2006.
- Department of Biomedical Engineering, Columbia University, March 2006.
- Department of Biomedical Engineering, Tulane University, March 2006.
- Department of Bioengineering, University of Washington, February 2006.
- Department of Biomedical Engineering, Johns Hopkins University, January 2006.
- Department of Biomedical Engineering, University of Florida, January 2006.
- Department of Bioengineering, UCSD, December 2005.
- Department of Biomedical Engineering, Washington University, St. Louis, December 2005.
- Integrative Biology Meeting, Oxford, UK, October 2005 (keynote address).
- EMBS meeting, Shanghai, China, September 2005.
- 82nd Annual Meeting of the Physiological Society of Japan, Sendai, Japan, May 2005.
- Computational Physiology: From Genome to Physiome Conference, San Diego, March 2005.
- Department of Biomedical Engineering, Vanderbilt University, December 2004.
- Department of Physiology, Nagoya University, Japan, November 2004.
- International Symposium on "Leading Project for Biosimulation", Kyoto, Japan, November 2004.
- Defibrillation Workshop, Medtronic Inc., Minneapolis, October 2004

- Physiological Sciences Meeting, Oxford, UK, October 2004.
- Integrative Biology Meeting, Oxford, UK, September 2004.
- Russian Physiome Project Meeting, Ekaterinburg, Russia, September 2004.
- Workshop Cardiac Cellular Electrophysiology: From funny currents to the current Physiome, Montpellier, France, September 2004.
- SIAM Annual Meeting, Portland, Oregon, July 2004.
- Medical School, Shiga University, Shiga Prefecture, Japan, July 2004.
- 31st International Congress on Electrocardiology, Kyoto, Japan, June 2004.
- Laboratory of Precision Biomedical Engineering, Tokyo University, Tokyo, Japan, June 2004.
- Fourth International Workshop on Computer Simulation and Experimental Assessment of Electrical Cardiac Function, Cap d'Ail, France, June 2004
- Cardiostim 2004, Nice, France, June 2004
- Integrative Biology Workshop, Oxford University, UK, June 2004.
- Oxford Institute for Industrial and Applied Mathematics, Oxford University, UK, June 2004.
- Department of Physiology, Oxford University, UK, June 2004.
- NASPE Heart Rhythm Society Annual Meeting, debate, San Francisco, May 2004
- NASPE Heart Rhythm Society Annual Meeting, core curriculum, San Francisco, May 2004
- Workshop on Multiscale Computational Models for Biomedical Research, University of California San Diego, March 2004
- Department of Medical Physics and Biophysics, University of Graz, Austria, February 2004
- Scientific Computing and Imaging Institute, University of Utah, November 2003.
- Gordon Conference on Cardiac Arrhythmia Mechanisms, New Hampshire, August 2003.
- SIAM Annual Meeting, Montreal, Canada, June 2003.
- North American Society for Pacing and Electrophysiology Annual Meeting, clinical tutorial, Washington, DC, May 2003.
- International Society for Computerized Electrocardiology Annual Meeting, Snowbird, Utah, April 2003
- Department of Biomedical Engineering, University of Florida, April 2003
- Department of Electrical Engineering and Computer Science, University of Calgary, March 2003.
- SIAM Conference on Computational Science and Engineering, San Diego, February 2003.
- Department of Pharmacology, Tulane School of Medicine, New Orleans, January 2003.
- Workshop on Computer Simulation and Experimental Assessment of Electrical Cardiac Function, Lausanne, Switzerland, December 2002.
- Outstanding Research Award Ceremony, Tulane School of Engineering, New Orleans, November 2002
- Medtronic, Inc., October 2002.
- Department of Physiology, Tulane School of Medicine, New Orleans, October 2002.
- Mechano-Electric Feedback Meeting, Oxford, UK, September 2002.
- Aspen Institute of Physics, Aspen, Colorado, August 2002.
- Cardiostim meeting, Nice, France, June 2002 (two invited talks).
- Department of Mathematics, University of Liverpool, Liverpool, UK, March 2002.
- Departamento de Ingenieria Electronica, Universidad Politecnica de Valencia, Valencia, Spain, February 2002.
- School of Biomedical Sciences, University of Leeds, Leeds, UK, January 2002
- University Laboratory of Physiology, University of Oxford, Oxford, UK, January 2002.
- The integrated heart: Cardiac structure and function, Satellite meeting of the 34th World Congress of the International Union of Physiological Science, Queenstown, New Zealand, August 2001.
- Cardiology Grand Rounds, Department of Medicine, Division of Cardiology, Tulane University, July 2001.
- Living State Physics Group, Department of Physics, Vanderbilt University, April 2001.
- Department of Cardiology, Cornell Medical School, April 2001.
- Department of Mathematics, Southern Methodist University, March 2001.
- Workshop on Computer Simulation and Experimental Assessment of Electrical Cardiac Function, Lausanne, Switzerland, December 2000.
- Workshop on Mapping and Control of Complex Arrhythmia, Montreal, Oct. 2000.
- Living State Physics Group, Department of Physics, Vanderbilt University, Sept. 2000
- World Congress on Medical Physics and Biomedical Engineering, Chicago, July 2000.
- North American Society for Pacing and Electrophysiology, clinical tutorial, Washington, DC, May 2000.
- Cardiac Rhythm Management Laboratory, University of Alabama, Birmingham, December 1999.
- Biocomputing Symposium'99, Mauna Lani, Hawaii, Jan. 1999.
- International Workshop on Computer Simulation and Experimental Assessment of Electrical Cardiac Function, Lausanne, Switzerland, Dec. 1998.
- 20th Annual International Conference of the IEEE/EMBS, Hong Kong, Oct-Nov, 1998.
- Cleveland Clinic Foundation, Sept. 1998.

- Cardiac Rhythm Management Laboratory, University of Alabama, Birmingham, August 1998.
- International Society for Computerized Electrocardiology, Keystone, Colorado, April 1998.
- Annual Meeting of the BMES, San Diego, October 1997.
- Department of Biomedical Engineering, University of Memphis, Memphis, TN, July 1997.
- Cardiac Rhythm Management Laboratory, University of Alabama, Birmingham, July 1997.
- Workshop "Computation Biology of the Heart", University of California at San Diego, June 1997.
- Medtronic, Inc., June 1997.
- Department of Biomedical Engineering, University of Memphis, Memphis, TN, February 1997.
- Department of Physiology, Tulane University Medical Center, February 1997.
- IEEE/EMBS 17th Annual International Conference, Amsterdam, The Netherlands, November, 1996.
- Auckland University Medical Center, Auckland, New Zealand, July 1996.
- University of Technology, Sydney, Australia, July 1996.
- Tasmania Medical Center, Hobart, Australia, July 1996.
- Department of Engineering Science, Auckland University, Auckland, New Zealand, June 1996.
- First International Conference on Bioelectromagnetism, Tampere, Finland, June 1996.
- Defibrillation Workshop, Birmingham, Alabama, April 1996.
- IEEE/EMBS 16th Annual International Conference, Montreal, Canada, September, 1995 (two talks).
- Defibrillation Workshop, Durham NC, April 1995.
- Annual Fall Meeting of the BMES, Tempe, Arizona, October 1994.
- Department of Biomedical Engineering, University of Memphis, Memphis, TN, July 1994.
- Department of Biomedical Engineering, Tulane University, New Orleans, LA, June 1994.
- Defibrillation Workshop, Durham NC, April 1994.
- Department of Biomedical Engineering, Duke University, Durham NC, March 1994.
- Cray Conference on High-Performance Computing in Biomedical Research, Research Triangle Park, NC, October, 1992.
- IEEE/EMBS 13th Annual International Conference, Orlando, Fla., November, 1991.
- Annual Meeting of the BMES, Charlottesville, Va., October 1991.
- Erasmus University, Rotterdam, The Netherlands, September 1991.
- CVRTI, The University of Utah, Salt Lake City, Utah, August 1991.
- Department of Biomedical Engineering, Duke University, Durham, NC, October 1990.
- Department of Physiology The University of Arizona, Tucson, Az., November, 1987.
- Department of Physiology, University of Alberta, Calgary, Canada. June 1987.

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- https://releases.jhu.edu/2020/05/18/johns-hopkins-researchers-to-use-machine-learning-to-predict-heart-damage-in-covid-19-victims/?fbclid=IwAR3X5VJUIb-0iWhlwj9Slsgjijm_Hy4zSbra4hfn_kxxBk2z38QFYm59xQ
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- <https://www.radiologybusiness.com/topics/artificial-intelligence/machine-learning-covid-19-cardiovascular-care-hopkins>
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- <https://engineering.nyu.edu/news/2020-women-stem-summit>
- https://hub.jhu.edu/2020/02/13/tech-ventures-accelherator-799-em1-art1-dtd-news/?mc_cid=914fa8d1df&mc_eid=1c7ab14338
- <https://hub.jhu.edu/2019/12/03/trayanova-inducted-into-national-academy-of-inventors/>
- <https://spectrum.ieee.org/the-human-os/biomedical/imaging/virtual-hearts-improve-cardiac-surgery>
- <https://www.hopkinsmedicine.org/news/articles/computer-simulations-could-guide-treatment-for-atrial-fibrillation>
- <https://physicsworld.com/a/simulations-guide-targeted-ablation-of-atrial-fibrillation/>
- <https://www.news-medical.net/news/20190819/Computer-simulations-may-guide-precise-treatment-of-patients-with-persistent-atrial-fibrillation.aspx>
- <https://www.dicardiology.com/content/computer-simulations-may-treat-most-common-heart-rhythm-disorder>
- <https://www.medindia.net/news/healthinfocus/new-procedure-helps-treat-most-common-heart-rhythm-disorder-189762-1.htm>
- <https://releases.jhu.edu/2019/08/19/dont-miss-a-beat-computer-simulations-may-treat-most-common-heart-rhythm-disorder/>
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<http://bit.ly/2AKOcZ5ATPvideo> (video of the Capitol Hill briefing)
<https://www.facebook.com/unitedformedicalresearch/videos/529300827425719/> (Capitol Hill briefing)
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Videos:

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