

## *Curriculum Vitae*

# PAUL ANTHONY IAIZZO

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### PERSONAL INFORMATION

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Business: Department of Surgery Phone: (612) 624-7912  
University of Minnesota Fax: (612) 624-2002  
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B172 Mayo, MMC 195  
Minneapolis, MN 55455

Birthplace/Date: Superior, Wisconsin, USA; November 26, 1956

Citizenship: USA

Marital Status: Married to Margaret K. Iaizzo, PT (8/13/83)

Children: Maria (7/13/84), Jenna (6/4/86), Hanna (12/3/90)

Grandchildren: Giada, Fiona, Cosetta, Reven, Lucia

### EDUCATION

1978 BS, Biology, University of Minnesota, Duluth

1980 MS, Physiology, University of Minnesota, Duluth  
Advisor: Robert S. Pozos, MS  
Thesis: "The effect of fatigue on physiological action tremor of the ankle"

1986 PhD, Physiology (Neurophysiology), University of Minnesota  
Advisors: Richard E. Poppele, PhD, Stuart R. Taylor, PhD  
Thesis: "Aequorin luminescence from stimulated skeletal muscle cells: relation between changes in intracellular calcium and contractile force"

### POSTDOCTORAL POSITIONS

1986 Postdoctoral NIH research fellowship, Department of Pharmacology, Mayo Foundation  
Advisor: Robert G. Tancredi, MD (Rochester, MN)

1987-88 Postdoctoral Alexander von Humboldt-Stiftung research fellowship, Department of Neurology, Technical University of Munich  
Hosts: Albrecht Struppler, MD and Frank Lehmann-Horn, MD (Munich, Germany)

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## ACADEMIC POSITIONS

1979-81	Sea Grant Pre-doctoral Trainee (Advisor: Robert S. Pozos, PhD)
1981-83	Research and Teaching Assistant, Department of Physiology, Laboratory of Neurophysiology, University of Minnesota (Chairman: Eugene Grim, PhD)
1986	NIH Research Fellow, Department of Pharmacology, Mayo Foundation, Rochester, MN (Director: Robert G. Tancredi, MD)
1987-88	Alexander von Humboldt-Stiftung Research Fellow, Department of Neurology, Technical University of Munich, Germany (Hosts: Albert Struppler, MD and Frank Lehmann-Horn, MD)
1988-90	Assistant Professor of Anesthesiology, Research Associate, Mayo Medical School, Rochester, MN (Chairmen: Alan Sessler, MD, Roy Cucchiara, MD, and D Rorie, MD, PhD)
1990-91	Research Associate, Department of Anesthesiology, University of Minnesota (Chairman: Richard J. Palahniuk, MD)
1990-92	Visiting Scientist, Department of Anesthesiology, Mayo Clinic, Rochester, MN (Hosts: Jack D. Michenfelder, MD and William L. Lanier, MD)
1990-01	Director of Anesthesia Research, Department of Anesthesiology, University of Minnesota
1991-96	Assistant Professor, Department of Anesthesiology, University of Minnesota (Chairman: Richard J. Palahniuk, MD)
1992-96	Assistant Professor, Department of Physiology, University of Minnesota (Chairman: Robert F. Miller, MD)
1992-99	Associate in the Center for Interfacial Engineering, University of Minnesota (Director: DF Evans, PhD; center closed in 1999)
1993-00	Guest Professor, Abteilung Angewandte Physiologie, Universität Ulm, Ulm, Germany; 1-2 visits annually (Professor and Head: Frank Lehmann-Horn, MD)
1996-01	Guest Professor, Biomedical Engineering, Fachhochschule Anhalt, Köthen, Germany; 4-5 lectures annually (Host: Professor Markus J. Seewald, PhD)
1996-01	Associate Professor, Departments of Anesthesiology and Physiology, University of Minnesota (Chairmen: Richard J. Palahniuk, MD and Joseph Di Salvo, PhD)
1996-03	Co-Director, Center for Muscle and Muscle Disorders, University of Minnesota (Co-Director: John W. Day, MD, PhD)
1999-01	Associate Professor, Carlson School of Management, University of Minnesota (Associate Dean: C.J. Nachtsheim, PhD)
1990-Present	Director of the Malignant Hyperthermia Muscle Biopsy Center, Department of Surgery, University of Minnesota
1993-Present	Graduate Faculty, Biomedical Engineering, University of Minnesota (Director: Victor Barocas, PhD)
1993-Present	Graduate Faculty, Physiology, University of Minnesota (Directors: John Osborn, PhD, Stephen Katz, PhD, Catherine Kotz, PhD)
1996-Present	Faculty, Carlson Entrepreneurship Program, Carlson School of Management, University of Minnesota (Director: Harry Sapienza, PhD)
1998-Present	Graduate Faculty, Neuroscience, University of Minnesota (Director: Virginia S. Seybold, PhD)
2001-Present	Professor, Carlson School of Management, University of Minnesota (Associate Dean: C.J. Nachtsheim, PhD)

- 2001-2003 Professor, Department of Anesthesiology, University of Minnesota (Chairman: Richard C. Prielipp, MD)
- 2001-Present Professor, Department of Integrative Biology and Physiology, University of Minnesota (Chairman: Joseph Metzger, PhD)
- 2002-Present Professor, Department of Surgery, University of Minnesota (Chairmen: Selwyn M. Vickers, MD, David Rothenberger, MD, Sayeed Ikramuddin, MD, MHA)
- 2002-2015 Professor, Experimental Surgical Services, Department of Surgery, University of Minnesota (Director: Richard W. Bianco)
- 2002-Present Director of Education, Lillehei Heart Institute, University of Minnesota (Directors: Daniel J. Garry, MD, PhD, Samuel Dudley, MD, PhD)
- 2003-Present Affiliate Member, Graduate Faculty in Biological Science, University of Minnesota (Director: James A. Fuchs, PhD)
- 2004-Present Medtronic Professorship in Visible Heart Research, Department of Surgery, University of Minnesota
- 2005-Present Affiliate Senior Member, Graduate Faculty in Mechanical Engineering, Institute of Technology, University of Minnesota
- 2007-2013 Associate Director for Education, Institute for Engineering in Medicine, University of Minnesota (Director: Jeffery McCullough, MD)
- 2013-2019 Associate Program Director for Education and Outreach, Institute for Engineering in Medicine, University of Minnesota (Director: Bin He, PhD, John Bischof, PhD)
- 2015-Present Graduate Faculty, Bioinformatics and Computational Biology, University of Minnesota
- 2019-Present Medtronic Bakken Professorship for Engineering in Medicine, University of Minnesota (Director: John Bischof, PhD)

### HONORS AND AWARDS

- 1979-81 Sea Grant Pre-doctoral Traineeship
- 1986 National Institutes of Health Research Fellowship
- 1987-88 Alexander von Humboldt-Stiftung Research Fellowship
- 1988-92 Alexander von Humboldt-Stiftung Collaborative Research Travel Awards (7 trips to Germany)
- 1992 Organization for Economic Cooperation and Development; Research project on biological resource management; Paris, France (three-week fellowship in Germany)
- 1995 John Tate Award for Excellence in Academic Advising, University of Minnesota
- 1999,00,01 Finalist for the Horace T. Morse-Minnesota Alumni Association Award for Outstanding Contributions to Undergraduate Education, University of Minnesota
- 2002 University Recipient of the Award for Outstanding Contributions to Postbaccalaureate, Graduate, and Professional Education, University of Minnesota
- 2002 Academy of Distinguished Teachers, University of Minnesota
- 2002 Academy of Medical Educators, University of Minnesota
- 2004 Medtronic Professorship in Visible Heart Research
- 2007 Recognition of 5 years of service to the University for organizing President's 21<sup>st</sup> Century Conferences on the Design of Medical Devices
- 2012 American Institute for Medical and Biological Engineering (AIMBE), College of Fellows 2012
- 2013 Academy of Medical Device Innovators, Institute for Engineering in Medicine
- 2013 Director's Award, Institute for Engineering in Medicine

2015 Fellow of Heart Rhythm Society  
 2015 Wangenstein Surgical Society  
 2016 IEEE Senior Member

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### PROFESSIONAL MEMBERSHIPS

1979-81 American College of Sports Medicine  
 1985-Present Biophysical Society—USA  
 1986-Present European Malignant Hyperpyrexia Group (EMHG)  
 1989-Present American Society of Anesthesiologists (ASA)  
 1989-Present Minnesota Society of Anesthesiologists (MSA)  
 1990-Present North American Malignant Hyperthermia Registry (NAMHR)  
 1996-Present Biomedical Engineering Society (BMES)  
 2000-Present NASPE—Heart Rhythm Society (HRS)  
 2002-Present American Physiological Society (APS)  
 2002-Present American Heart Association (AHA)  
 2003-Present Heart Failure Society (HFS)  
 2006-Present American Society of Mechanical Engineers (ASME)  
 2008-Present Institute for Electrical and Electronics Engineers (IEEE)  
 2008-Present IEEE, Engineering in Medicine and Biology Society (EMBS)  
 2011-Present International Society for Cardiovascular Translational Research (ISCTR)  
 2014-Present American Institute for Medical and Biological Engineering (AIMBE)

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### PROFESSIONAL ACTIVITIES

1991-04 Consultant, Augustine Medical Inc.  
 1992 Organizing Committee, VI International Malignant Hyperthermia Workshop  
 1992-Present Ad Hoc Grant Reviewer, Schweizerischer Nationalfonds zur Förderung der  
 Wissenschaftlichen Forschung  
 1993-Present Professional Advisory Council of the Malignant Hyperthermia Association of the  
 United States  
 1993-Present Ad Hoc Grant Reviewer, Naval Medical Research and Development Command  
 1994-96 Executive Committee, VIII International Malignant Hyperthermia Workshop  
 1994-96 Scientific Committee, VIII International Malignant Hyperthermia Workshop  
 1994-01 Board of Directors, North American Malignant Hyperthermia Registry  
 1995-2009 TELTECH Technical Knowledge Service  
 1998 Textbook Reviewer: Principles of Anatomy and Physiology, 8th edition  
 1999-05 Medical Advisory Board, Spinal Designs International  
 1999-Present Consultant, Medtronic  
 2004-Present Research Committee, LifeSource, Upper Midwest Organ Procurement Organization  
 2005-Present Special Issue Associate Editor, Journal of Biomechanical Engineering and Medical  
 Devices, ASME  
 2007-Present Associate Editor, Journal of Medical Devices, ASME  
 2008-Present Member of Technical Committee on Cardio-Pulmonary Systems, IEEE Engineering  
 in Medicine and Biology Society

2008-2010	Chair of Technical Committee on Cardio-Pulmonary Systems, IEEE Engineering in Medicine and Biology Society
2008-2010	Track Chair and Co-Chair on Cardio-Pulmonary Systems, IEEE Engineering in Medicine and Biology Society, 2009, 2010
2008-2009	Theme Chair on Cardiovascular & Respiratory System Engineering, 31 <sup>st</sup> International Conference of the IEEE EMBS, September 2009
2009-2014	Executive editor of the Journal of Cardiovascular Translational Research
2009-Present	Organizing Committee of the Innovations in Cardiovascular Interventions (ICI), annual meeting and workshop
2012-2014	Education Subcommittee of the American Institute for Medical and Biological Engineering

### JOURNAL REFEREE

1989-Present	Muscle & Nerve
1990-Present	Anesthesiology
1992-Present	Anesthesia and Analgesia
1992-Present	Acta Anaesthesiologica Scandinavica
1994-Present	Journal of Applied Physiology
1994-Present	Liver Transplantation and Surgery
1995-Present	Mayo Clinic Proceedings
1998-Present	Wound Repair and Regeneration
1999-Present	IEEE Transactions on Medical Imaging
2000-Present	IEEE Transactions on Biomedical Engineering
2001-Present	Journal of Cardiovascular Pharmacology
2002-Present	Annals of Thoracic Surgery
2003-Present	Animal Science
2004-Present	BioMed Central Musculoskeletal Disorders
2004-Present	Current Pharmaceutical Design
2005-Present	Physiological Genomics
2005-Present	Journal of Biomechanical Engineering
2006-Present	Journal of Medical Devices
2007-Present	Medical Physics
2008-Present	Annals of Biomedical Engineering
2009-Present	Journal of Cardiovascular Translational Research
2010-Present	Interventional Cardiology
2010-Present	The Anatomical Record
2011-Present	International Journal of Hyperthermia
2011-Present	Clinical Anatomy
2012-Present	Heart
2012-Present	Regulatory Peptides
2012-Present	Anesthesiology Research and Practice
2012-Present	Journal of Translational Engineering in Health and Research
2012-Present	Journal of Experimental Biology
2012-Present	Journal of Medical Physics
2013-Present	Journal of Cardiovascular Engineering

## UNIVERSITY AND DEPARTMENTAL ACTIVITIES

### UNIVERSITY ACTIVITIES: ACADEMIC HEALTH CENTER

- 1991-94 Mentor for Advanced Admission Students (Program ended 1994)
- 1996-Present UMHS Minority Program: High School Research Apprentice Program
- 1998-99 Catalyst Program (project of the 2001 Medical School class)
- 1999-01 Stem Cell Institute Search Committee
- 2000-Present Faculty Interviewer: Medical School Admissions
- 2004-Present Interviewer: Medical School, Pre-medical Scholars Program
- 2005-2008 Ad Hoc Committee on Space for Biomedical Engineering/Medical Device Center (Erdman, Iaizzo, Kaveh, Keller, McCullough, Moldow, Wederstrom, Tranquillo)

### UNIVERSITY ACTIVITIES: BIOMEDICAL ENGINEERING

- 1993-Present Graduate Faculty in Biomedical Engineering
- 1994-95 Faculty Advisory Panel to the Biomedical Engineering Center
- 1994 Biomedical Interfacial Engineering Task Force
- 1995-Present Core Faculty of the Biomedical Engineering Institute
- 1997-Present Chair, Nominations Committee
- 1998-00 Undergraduate Degree and Curriculum Committee
- 1999-00 Biomedical Engineering Space Committee
- 2000-01 Executive and Program Committees, "Minnesota's Medical Device Community Forum: Design of Medical Devices"
- 2001-03 Membership Committee, Biomedical Engineering Institute
- 2001-Present Faculty Advisory Board, Institute for Engineering in Medicine (formally BMEI)
- 2001-Present Program Committee, Design of Medical Devices Conference, University of Minnesota
- 2003-2010 Group Leader, Cardiovascular Physiology, Institute for Engineering in Medicine
- 2003-2010 Program Chair, President's Commissioned Conferences on Medical Devices  
2004: "Maintaining Minnesota as the Leader in the Medical Device Industry;" 2005: "Leading the Change for Breakthroughs in Health through Medical Device Advancements;" 2006: "Medical Devices for Delivering the New Biology;" 2007: "Inventing Medical Devices;" 2008: "Lifelong Learning of the Medical Device Engineer;" 2009: "Translational Research: From Prototype to Product"
- 2004-2010 Local Organizing Committee, Joint Meeting of 5<sup>th</sup> International Conference on Bioelectromagnetism & 5<sup>th</sup> International Symposium on Noninvasive Functional Source Imaging within the Human Brain and Heart
- 2004-06 Co-organizer, Midwest Chapter of the Biomedical Engineering Society
- 2005-07 Ad-hoc member of Medical Devices Planning Committee
- 2007-Present Academic Advisory Board, Medical Devices Center
- 2011-2012 Search Committee for Director of Institute for Engineering in Medicine

### UNIVERSITY ACTIVITIES: LILLEHEI HEART INSTITUTE

- 2002-2014 Director of Education
- 2002-Present Steering Committee Member

### UNIVERSITY ACTIVITIES: OTHER

- 1992-96 Faculty Advisor, Center for Interfacial Engineering Small Company Program, supported by NSF

1992-99	Project Leader, Research Explorations: "Biomedical Research on Diseases of Muscle," CEE
1994-Present	President's Distinguished Faculty Mentor Program
1994-Present	Teaching Opportunity Program for Doctoral Students (TOPDS)
1995-Present	Undergraduate Research Opportunity Program (UROP)
1995-Present	University of Minnesota Alumni Association Mentor Program
1998-05	Page Education Foundation's Senior Mentor Program
2004-06	Twin Cities Campus Assembly, Advisory Committee on Athletics

#### **DEPARTMENTAL ACTIVITIES: SURGERY**

2002-2015	Staff, Experimental Surgical Services
2005-06	Faculty Recruitment, Development, and Retention Committee
2005-2015	Development and Fundraising Committee
2006-07	Search Committee for Head of Cardiovascular Surgery
2007-2015	Executive Research Council
2007	Founder of annual "Bakken Surgical Device Symposium"
2007-Present	Organizing Committee of "Bakken Surgical Device Symposium"

#### **DEPARTMENTAL ACTIVITIES: INTEGRATIVE BIOLOGY AND PHYSIOLOGY**

1993-Present	Graduate Faculty, Cellular and Integrative Physiology
1994-00	Faculty Evaluation Committee
2000-06	Physiology Industrial Advisory Board
2006-07	Search Committee for new Professor and Head

#### **DEPARTMENTAL ACTIVITIES: ANESTHESIOLOGY**

1990-01	Coordinator, Bi-monthly Research Conferences
1990-present	Director, Malignant Hyperthermia Clinical Diagnostic Laboratory
1990-96	Coordinator, Malignant Hyperthermia Journal Club
1991-93	Chairman of Research Committee
1991-01	Coordinator, Annual Clinical Symposium
1991-01	Coordinator, Undergraduate Summer Research Fellowship
1991-01	Research Committee
1992-01	Coordinator for Laboratory Safety
1995-01	Continuing Education Committee
1996-01	Chairman of Research Committee

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#### **RESEARCH INTERESTS**

1. Physiology of skeletal and cardiac muscle (in vivo, in situ and in vitro)
2. Pathophysiology of human skeletal muscle (malignant hyperthermia, myotonic dystrophy, recessive generalized myotonia, myotonia congenita, Schwartz-Jampel syndrome, paramyotonia, hyperkalemic periodic paralysis, and hypokalemic periodic paralysis)
3. Effects of anesthetic agents on the function of extrafusal and intrafusal skeletal muscle and cardiac muscle
4. Development of novel instrumentation and biomedical devices for physiological monitoring, clinical evaluation, and/or therapeutic use

5. Role of elevated intracellular [Ca<sup>2+</sup>] in: 1) cell signaling; 2) dystrophic processes within skeletal muscle; and 3) cell toxicity
6. Physiological and pathological oscillations of the musculoskeletal system (tremor, shiver and clonus)
7. Anesthetic effects on the physiology of thermoregulation and biomedical applications of heat transfer in humans
8. Noninvasive and invasive correlates of wound formation, status, healing and prevention: development of animal models, effects of anesthetics, and design of biomedical instrumentation
9. Cervical and lumbar spinal cord biomechanics and management of back pain

### OUTSIDE INTERESTS AND ACTIVITIES

1. Running, tennis, biking, and hiking (bear dens, searching for mushrooms, chaga)
2. Fishing and fly-fishing
3. Coaching soccer: club teams, both outdoor and indoor; E -level coaching license
4. Coaching basketball: recreational teams (since 1993): school, AAU and travel club teams; 1997 Girls 7A (State Champions); 1998 Girls 8A (State Champions); 1998 Girls 6AA (State Runner-ups); 1999 Girls 7AAA (State Champions); 2000 Girls 8AAA (State Champions); 2004 Girls 8AAA (State Runner-ups)
5. Gardening, home repairs, and woodworking

### FORMAL CLASSROOM TEACHING

- 1992-Present University of Minnesota, Minneapolis, MN, Medical School: **Anesthesiology Residents, (2 hours).**  
*Topic: Skeletal muscle physiology*
- 1993-Present University of Minnesota, Minneapolis, MN: **BMEN 8970, Literature Seminar: Biomedical Journal Club at weekly laboratory meetings (15 hours)**
- 1994-Present University of Minnesota, Minneapolis, MN: **(Course Originator and Director) BMEN 5371/5701, Biomedical Application of Heat Transfer in Humans (10 hours, offered every other year)**  
*Lecture topics: Course introduction; composition of the human body; biology of skin; physiology of thermoregulation; consequences of hypothermia or hyperthermia; treatment of hypothermia or hyperthermia; malignant hyperthermia; applications of IR imaging (live demo)*
- 1996-Present University of Minnesota, Minneapolis, MN, Biomedical Engineering and the Carlson School of Management: **BMEN 8401-8402, ME 8221-8222, ENTR 6041-6042, New Product Design and Business Development (5-8 hours per week; fall and spring semesters)**  
*Lecture topics: Course introduction; designing medical devices and clinical testing. Faculty Mentor for Teams: (1996-97) Spinal Designs International and Augustine Medical Inc.; (1997-98) Augustine Medical Inc., Select Comfort, and Sulzer Medical; (1998-99) Medtronic, Shepherd Medical, and Sulzer Medical; (1999-00) Medtronic and EnduraTEC; (2000-01) Medtronic CRM; (2001-02) 3M Surgical; (2002-03) 3M Surgical; (2003-04) Arctic Cat; (2004-05) Medtronic CRDM; (2005-06) Medtronic CRDM; (2006-07) Medtronic Cardiac Surgery; (2007-08) Augustine*



- Biomedical and Design; (2008-10) Medtronic Cardiac Surgery; (2010-18) Medtronic*
- 1996-Present University of Minnesota, Minneapolis, MN: **Neuroscience 5100/4185/5551 (1 week at Itasca Biological Station, Course Director; 45+ contact hours)**  
*Lecture topics: Course introduction and lab notebooks; basic muscle contraction; dissection; neuromuscular junction; force assessment in humans; cardiac muscle (isolated heart studies)*
- 1999-Present University of Minnesota, Minneapolis, MN, Medical School, 1st Year: **Physiology 5111-5112, Physiology Laboratory (10 hours, Winter Quarter)**  
*Lecture topics: Stimulated muscle force assessment; ex vivo four-chamber working swine heart model*
- 2000-Present University of Minnesota, Minneapolis, MN: **(Course Originator and Director) PHSL 5510, Advanced Cardiac Physiology and Anatomy (10 hours)**  
*Lecture topics: Course introduction and review of the cardiovascular system; cellular (conduction system and arrhythmias); autonomic nervous system and cardiac function; Visible Heart®; fresh cadaver demo; demo of open-heart surgery in a swine (small groups)*
- 2000-Present University of Minnesota, Minneapolis, MN, Dental School: **Dent 8440, TMJ and Craniofacial Pain: Advanced Theory and Principles (3 hours)**  
*Lecture topics: Skeletal muscle physiology; skeletal muscle patho-mechanisms*
- 2000-Present University of Minnesota, Minneapolis, MN: **Bioc/Phsl/Nsc/MVB/BMEN 5444, Muscle (3 hours)**  
*Lecture topics: Visible Heart®; stimulated force assessment*
- 2001-Present University of Minnesota, Minneapolis, MN: **BMEN3701, Physiology Laboratory (15 hours)**  
*Lecture topics: Course introduction, BioPac systems and lab notebooks; cardiovascular system; skeletal muscle and force assessment; designing your own experiments*
- 2001-Present University of Minnesota, Minneapolis, MN: **BMEN 5041, Tissue Engineering (1 hour)**  
*Lecture topics: Mesenchymal tissues (muscle)*
- 2001-Present University of Minnesota, Minneapolis, MN: **BMEN 2602, Sophomore Seminar (2 hours)**  
*Topics: Laboratory tour; discussion of required animal testing for implanted medical devices*
- 2002-Present University of Minnesota, Minneapolis, MN: **Physiology 5511, The Neuromuscular Junction (10 hours)**  
*Lecture topics: Basic muscle contraction; nerve/muscle dissection; neuromuscular junction; force assessment in humans*
- 2007-Present University of Minnesota, Minneapolis, MN: Medical Industry Leadership Institute: **MILI 6990, Anatomy and Physiology for Managers**  
*Lecture topics: Cardiovascular system and devices*

### PREVIOUS TEACHING EXPERIENCES

- 1980 College of St. Scholastica, Duluth, MN: Guest lecturer, Neurophysiology, Physical Therapy Students (2 hours). *Topic: Tremors and clonus*

- 1980 University of Minnesota School of Medicine, Duluth, MN: Guest lecturer, Human Physiology, Medical Students (3 hours). *Topics: Pathological oscillations and spinal cord injuries*
- 1981-82 University of Minnesota Health Sciences, Minneapolis, MN: Teaching Assistant, Human Physiology and Neurophysiology, Medical, Dental and Pharmacy Students (30 hours). *Topics: General physiology; cardiovascular system; muscle, respiratory and motor control*
- 1984-85 University of Minnesota School of Medicine, Duluth, MN: Guest lecturer, Animal Physiology (6 hours). *Topics: Sensory systems; skeletal muscle physiology; temperature regulation*
- 1984-85 University of Minnesota School of Medicine, Duluth, MN: Guest lecturer, Human Physiology, Medical Students (4 hours). *Topics: Motor control and pathological oscillations*
- 1989 Mayo Medical School, Pharmacology, Rochester, MN: Medical Students (1 hour). *Topic: Local anesthetics*
- 1989 College of St. Scholastica, Duluth, MN: Invited lecturer, Neurophysiology: Physical Therapy Students (7 hours). *Topics: Pain; anesthesia; vestibular system; hearing; ascending reticular activating system and sleep*
- 1989 University of Minnesota School of Medicine, Duluth, MN: Invited lecturer, Animal Physiology: ANS (5 hours). *Topics: Sensory physiology; programmed motor behavior*
- 1989 University of Minnesota School of Medicine, Duluth, MN: Invited lecturer; Human Physiology, Medical Students (8 hours). *Topics: Pain; anesthesia; vestibular system; hearing; ascending reticular activating system and sleep*
- 1990 Mayo Medical School, Rochester, MN: Invited lecturer in Pharmacology: Medical Students (1 hour). *Topic: Local anesthetics*
- 1992 University of Minnesota, Minneapolis, MN: *Physiology 5444, Muscle contraction* (4 hours). *Topic: Metabolism and excitation*
- 1992-2017 University of Minnesota, Minneapolis, MN: *Physiology 3053/3056/5441 Quantitative Physiology* (10 hours); *Physiology 3061/3071/5061, Principles of Physiology*  
*Lecture topics: Somatosensory systems and neuronal circuits; general anatomic and functional components of motor system; maintenance of upright posture and sense of equilibrium; complex integrative functions of motor system; pathophysiology of motor system; autonomic nervous system; hypothalamus and limbic system; ascending reticular activating system (sleep, pain); regulation of body temperature; vision, sound and hearing, taste, and smell*
- 1993-94 University of Minnesota College of Biological Sciences, Minneapolis, MN: Honors Seminar (15 hours). *Topic: Muscle diseases*
- 1994-99 University of Minnesota Medical School, Minneapolis, MN: Medical Student Rotation in Anesthesiology (1 hour). *Topic: Thermoregulation and consequences of anesthesia*
- 1996 Engineering, Fachhochschule Anhalt, Köthen, Germany: Engineering and Nutrition (15 hours). *Topic: Neurophysiology*
- 1996 University of Minnesota Medical School, Neurology, Minneapolis, MN: Scientific Basis of Neurology Course (1.5 hours). *Topic: Fundamentals of muscle physiology*

- 1996 College of St. Catherine, Minneapolis, MN: Master of Physical Therapy Program (24 hours and Course Director). *Topic: Applied physiology*
- 1999 University of Minnesota Program in Physical Therapy, Minneapolis, MN: *PMed 8101, Physical Therapy* (3 hours, Winter Quarter). *Topic: Skeletal muscle force assessment*
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## ADVISING RESPONSIBILITIES

### INTERNATIONAL GUEST RESEARCHERS

1. **Oliver Bandschapp, MD**, Visiting Scholar (10/07 to 11/07; 5/10 to 3/11) from Universitätsspitals Basel, Switzerland
2. **Hans M. Eichinger, PhD**, Visiting Scientist (7/91 to 8/91) from Versuchsstation Thalhausen, Technische Universität München, W-8051 Kranzberg, Germany. Funded via Cooperative Research Project Grant of the Organization for Economic Cooperation and Development, Paris, France
3. **Federica Sacco, PhD**, Visiting Doctoral Candidate (9/18 to 12/18) from University of Pompeo Fabra, Spain
4. **Alfonso Santiago, PhD**, Visiting Doctoral Candidate (11/18 to 12/18) from University of Pompeo Fabra, Spain
5. **Markus J. Seewald, PhD**, Visiting Scientist (7/91 to 8/91; 9/95) from Abteilung für Allgemeine Physiologie, Universität von Ulm, Oberer Eselberg, 7900 Ulm, Germany. Funded via grant from Boehringer Ingelheim
6. **Hiroshi Yamada, MD**, Visiting Scientist in Orthopedic Surgery and Anesthesiology (6/92 to 11/93) from Wakayama Medical College, Wakayama, Japan. Supported via fellowship from the Nanki Scholarship Fund, Japan

### RESEARCH AND POST-DOCTORAL FELLOWS AND ASSOCIATES

1. **Shancy Augustine, PhD**, Electrical and Computer Engineering, University of Florida, Postdoctoral Volunteer (4/15 to 12/15); Lead Scientist/BioMEMS/Microfluidics Engineer, Achira Labs Pvt. Ltd. (India)
2. **Oliver Bandschapp, MD**, Post-doctoral Fellow in Surgery (4/10 to 3/11); Anesthesiologist, University of Basel, Switzerland
3. **George Bojanov, MD**, Cardiac Fellow in Anesthesiology (7/99 to 7/00), Department of Anesthesiology, University of Minnesota. Departmental support via funds from Minnesota Medical Foundation; Anesthesiologist, Twin Cities Anesthesia Associates PA, MN
4. **Jason Johnson**, Resident Physician, Anesthesiology (9/06 to 5/07); University of Minnesota
5. **M.V. Shailesh Kumar, PhD**, Post-doctoral Fellow in Anesthesiology (8/96 to 5/99), National Institute of Mental Health and Neurosciences, Bangalore University, India; Principal Scientist, Medtronic, MN
6. **Xiaohuan (Rebecca) Li, MD**, Post-doctoral Fellow in Surgery (8/06 to 5/11)
7. **Michael Loushin, MD**, Chief Resident in Anesthesiology, University of Minnesota (12/01 to 6/02); Anesthesiologist, Twin Cities Anesthesia Associates PA, MN
8. **Anthony Prisco MD, PhD**, Cardiology Fellow (7/19 to present) Physician Scientist Training Program University of Minnesota
9. **Daniel C. Sigg, MD**, Post-doctoral Fellow in Anesthesiology (8/97 to 6/99), Department of Anesthesiology, University of Basel, Switzerland. Supported via fellowship from the Swiss National Research Foundation; Professional Photographer, Self employed, MN

10. **John R. Spratt MD, MA**, General Surgery Resident, University of Minnesota (8/15 to 7/17); Fellow in Thoracic and Cardiovascular Surgery at the University of Florida.
11. **Robert S. Zink, MD**, Research Fellow (7/91 to 6/92); Clinical practice in Wisconsin

#### **CURRENT DOCTORAL STUDENTS**

1. **Renee Brigham**, Doctoral student in Biomedical Engineering (1/19 to present)
2. **Alex Deakyne**, Doctoral candidate in Bioinformatics & Computational Biology (1/19 to present)
3. **Mikayle A. Holm**, Doctoral candidate in Biomedical Engineering (11/16 to present)
4. **David Ramirez**, Doctoral candidate in Biomedical Engineering (11/17 to present)
5. **Emma Schinstock**, Doctoral candidate in Mechanical Engineering (5/18 to present)
6. **Amanda Tenhoff**, Doctoral student in Biomedical Engineering (1/19 to present)
7. **Tommy Valenzuela III**, Doctoral candidate in Biomedical Engineering (9/17 to present)
8. **Jorge Vergen**, Doctoral student in Bioinformatics & Computational Biology (11/19 to present)
9. **Jorge D. Zhingre Sánchez**, Doctoral candidate in Biomedical Engineering (11/16 to present)

#### **DOCTORAL STUDENTS WITH COMPLETED DEGREES**

1. **Sarah E. Ahlberg, PhD**, Doctoral degree in Biomedical Engineering (1/04 to 4/07), Thesis: "Investigation of the influence of long and short term cardiac pacing from alternate sites on the electrical and mechanical performance of the heart in the *in vivo* animal model." Senior Research Manager, Medtronic, MN
2. **Sara E. Anderson, PhD**, Doctoral degree in Biomedical Engineering (12/04 to 4/08), Thesis: "Effects of pacing lead position and cardiac anatomy on left ventricular venous pacing." Global R&D Sensor Director, Medtronic Covidien, CO
3. **Michael G. Bateman, PhD**, Doctoral degree in Biomedical Engineering (9/07 to 5/12), Thesis: "Investigations into the effects of transcatheter valve implantations on the cardiac conduction system and cardiac anatomy." Principal Test Development Engineer, Cardiovascular Systems, Inc., MN
4. **Mark A. Benscoter, PhD, MBA**, Doctoral degree in Biomedical Engineering (1/09 to 4/15), Thesis: "Study of atrial septal puncture and monophasic action potential contact force for medical device **enhancements** to improve ablation procedure outcomes." Electronics & Safety Engineering Unit Head, Mayo Clinic, MN
5. **Edward C. Chinchoy, PhD, Doctoral degree in Biomedical Engineering (12/96 to 12/99)**. Thesis: "An ex vivo four chamber working swine heart model." President, VisCardia, 3VO, CA
6. **James A. Coles Jr., PhD**, Doctoral degree in Biomedical Engineering (4/00 to 9/02). Thesis: "Pharmacological approaches to cardioprotection." Director Global Downstream Marketing, Medtronic, MN
7. **Michael D. Eggen, PhD**, Doctoral degree in Biomedical Engineering (1/06 to 10/09). Thesis: "**Heart failure and associated structural and functional remodeling: assessment employing** various magnetic resonance imaging methodologies." Senior Principal Mechanical Engineer, Medtronic, MN
8. **Jon H. Falkenberg, PhD**, Doctoral degree in Cellular and Integrative Physiology (12/97 to 9/00). Thesis: "Assessment and treatment of disorders of the spinal musculoskeletal system." Deceased 2011
9. **Sarah A. Frommer, PhD**, Doctoral degree in Biomedical Engineering (7/01 to 3/07). Thesis: "Investigating the use of multipotent adult progenitor cells for treatment of Suchtneen"

- muscular dystrophy: a translational approach.” Co-Advisor Catherine M. Verfaillie, MD, University of Minnesota Medical School MD/PhD program. Plastic Surgeon, Craniofacial Team of Texas
10. **Erik N. Gaasedelen**, Doctoral degree in Bioinformatics and Computational Biology (8/15 to 6/19). Thesis: “Deep learning and virtual reality in the surgical sciences.” Lyft Self Driving Division, Level 5, Palo Alto, CA
  11. **Ryan P. Goff, PhD**, Doctoral degree in Biomedical Engineering (11/09 to 3/14). Thesis: “Studies of cryothermal ablation for the treatment of atrial fibrillation.” Program Manager, R & D, CryoLife, Inc., TX
  12. **Gary L. Hansen, PhD**, Doctoral degree in Biomedical Engineering (6/93 to 11/95). Thesis: “Evaluation of cutaneous and deep tissue injuries using computer imaging.” Director of R&D, Arizant Healthcare Inc., MN
  13. **Alexander J. Hill, PhD**, Doctoral degree in Biomedical Engineering (1/99 to 11/03). Thesis: “Large mammalian comparative cardiac anatomy.” Senior Program Director, Medtronic, MN
  14. **Jin Back Hong, PhD**, Doctoral degree in Biomedical Engineering (9/98 to 1/03). Thesis: “The development of outcomes diagnostic measurement and potential therapies on patients with a neuromuscular disorder and/or skeletal muscle weakness.” Principal Consultant/Scientist, Medtronic, MN
  15. **Brian T. Howard, PhD**, Doctoral degree in Biomedical Engineering (5/12 to 7/16). Thesis: “Investigative applications of isolated cardiopulmonary systems.” Senior Biomedical Engineer, Medtronic, MN
  16. **Stephen A. Howard, PhD**, Doctoral degree in Biomedical Engineering (9/08 to 8/13). Thesis: “Interatrial septal anatomy, physiology and biomechanics: implications for percutaneous delivery of cardiac devices.” Principal Systems Engineer, Medtronic, MN
  17. **Tinen L. Iles**, Doctoral degree in Bioinformatics & Computational Biology (8/15 to 11/17). Thesis: “Big data analyses to identify physiologic adaptive responses in the American Black Bear (*Ursus americanus*): from basic biological knowledge to clinical applications.” Assistant Professor, University of Minnesota, MN
  18. **Michael W. Kimmel, PhD**, Doctoral degree in Biomedical Engineering (12/02 to 4/07). Thesis: “Swine models for study and optimization of biventricular pacing therapies as treatments for heart failure.” Senior R&D Engineer, Medtronic, MN
  19. **Jaydeep Y. Kokate, PhD**, Doctoral degree in Biomedical Engineering (1/93 to 12/96). Thesis: “Critical thresholds for causation of cutaneous and subcutaneous injury in a porcine model: experimental and numerical approaches.” Director of Research and Development, Boston Scientific, MN
  20. **Timothy G. Laske, PhD**, Doctoral degree in Biomedical Engineering (5/00 to 3/04). Thesis: “The application of an isolated perfused working heart model to the design of endocardial pacing systems.” Vice President of Research and Business Development, Medtronic, MN
  21. **Alexander R. Mattson, PhD**, Doctoral degree in Biomedical Engineering (11/14 to 7/18). Thesis: “Anatomical, biomechanical, and end-of-life considerations for emergent cardiac pacing technologies.” Senior Scientist, Medtronic, MN
  22. **Lars M. Mattison**, Doctoral degree in Biomedical Engineering (11/13 to 1/19). Thesis: “An examination of the cardiothoracic tissue biophysical response to electroporation therapies.” Senior Scientist, Medtronic, MN
  23. **Stephen G. Quallich, PhD**, Doctoral degree in Biomedical Engineering (11/11 to 9/15). Thesis: “Studies of ablation complications during the treatment of atrial fibrillation.” Quality Program Manager, Medtronic MN

24. **Jason L. Quill, PhD**, Doctoral degree in Biomedical Engineering (9/05 to 5/09). Thesis: "Applications of the Visible Heart for cardiac valve repair and replacement devices." Project Team Leader (atrial fibrillation treatment), AtriCure, Inc. MN
25. **Eric S. Richardson, PhD**, Doctoral degree in Biomedical Engineering (9/05 to 5/09). Thesis: "Intrapericardial delivery of anti-arrhythmic agents." Associate Professor, Duke University, NC
26. **Christopher D. Rolfes, PhD**, Doctoral degree in Biomedical Engineering (11/07 to 5/12). Thesis: "Intrapericardial delivery of omega-3 polyunsaturated fatty acids." Senior Program Manager, T3labs (Translational Testing and Training Laboratories), GA
27. **Megan M. Schmidt, PhD**, Doctoral in Biomedical Engineering (11/13 to 4/18). Thesis: "Utility of monophasic action potentials in the diagnosis and treatment of cardiac arrhythmias." Senior Scientist, Medtronic, MN
28. **Maneesh Shrivastav, PhD**, Doctoral degree in Biomedical Engineering (11/04 to 4/07). Thesis: "The monophasic action potential: an investigation of ischemic cardiomyopathy." Director of Market Development (Medical Devices), Medtronic, MN
29. **Daniel C. Sigg, MD, PhD**, Doctoral degree in Cellular and Integrative Physiology (6/99 to 12/01). Thesis: "Pharmacological preconditioning with opioids for myocardial protection" Professional Photographer, Self employed, MN
30. **Ashish Singal, PhD**, Doctoral degree in Biomedical Engineering (1/08 to 8/14). Thesis: "The comparative assessment of clinical ablative therapies: effects on physiological and biomechanical properties of tissues in response to therapeutic doses." Medical student
31. **Nicholas D. Skadsberg, PhD**, Doctoral degree in Biomedical Engineering (3/03 to 12/04). Thesis: "Single site cardiac pacing: influence of pacing site on electrophysiology and performance in the normal swine heart." Global Downstream Marketing Director-AF Solutions, Medtronic, MN
32. **Julianne H. Spencer**, Doctoral degree in Biomedical Engineering (11/09 to 11/13). Thesis: "The implications and effects of coronary venous anatomy on clinical interventions." Principal Scientist, Medtronic, MN

#### **CURRENT MASTERS STUDENTS**

1. **Alyssa Jackson**, MS student in Biomedical Engineering (2/14 to present)
2. **Jorge Vergen**, MS student in Bioinformatics and Computational Biology (9/19 to present)

#### **MASTERS STUDENTS WITH COMPLETED DEGREES**

1. **Matthew Adams**, MS in Biomedical Engineering (1/02 to 6/05). Vice President and General Manager, Minnetronix Neuro, MN
2. **Ivan Akunovich**, MS in Biomedical Engineering (6/11 to 6/12). Senior Program Manager, Epic Sciences, CA
3. **Lina Alzate**, MD, MS in Biomedical Engineering (10/01 to 6/03). Senior Director Safety Operations, Johnson & Johnson, Medical Devices, FL
4. **Sara Anderson**, MS in Biomedical Engineering (12/04 to 2/06). Global R&D Sensor Director, Medtronic Covidien, CO
5. **Sally Anzelc**, MS in Biomedical Engineering (7/08 to 11/08). President, Quality Foundations LLC, MN
6. **Lindsey Arndt**, MS in Biomedical Engineering (9/17 to 5/18). Systems Engineer, Restorative Therapies, Medtronic, MN

7. **Brent Barnstuble**, MS in Biomedical Engineering (4/00 to 5/02). Family Medicine Physician, MN
8. **Esha Bhargava**, MS student in Health Informatics (9/05 to 6/06). Vice President, Experience Research, Ascension, IL
9. **Tom Brass**, MS in Biomedical Engineering (1/94 to 10/95). Senior Systems Engineer, Saint Bernard Engineering Inc., MN
10. **Josh Brauer**, MS in Biomedical Engineering (1/00 to 7/01). Internal Medicine Physician, The Permanente Medical Group, CO
11. **Robin Brusen**, MS in Biomedical Engineering (5/08 to 5/10), MD/MS program. General Cardiologist, Kaiser Permanente, WA
12. **Robert Buechler**, MS in Biomedical Engineering (9/10 to 10/13). Medtronic, MN
13. **Maria Burbano**, **MS in Biomedical Engineering (9/15 to 6/17). Global Field Service and Technical Support Engineer, Medtronic, MN**
14. **Angela Burgess**, MS in Biomedical Engineering (9/17 to 5/18). Mechanical Design Engineer, Medtronic, MN
15. **Edward C. Chinchoy**, MS in Mechanical Engineering (6/95 to 12/96). Executive Vice President, VisCardia, OR; **Founder and CEO, 3VO, CA**
16. **Woohyek Choi**, MS in Electrical Engineering (3/99 to 6/00). Leader of HW Development Group, Philosys, Korea
17. **James A. Coles Jr**, MS in Biomedical Engineering (1/99 to 7/00). Director of Global Downstream Marketing, Medtronic, MN
18. **Alex Deakyne**, MS in Bioinformatics & Computational Biology (6/18 to 1/19). Research Scientist, Visible Heart Laboratories, University of Minnesota, MN
19. **Anthony Dupre**, MS in Biomedical Engineering (12/02 to 12/04). Senior R&D Engineer, St. Jude Medical, MN
20. **Salah El Haddi**, MD/MS Program, (1/14 to 11/17). Surgical Resident, University of Michigan, MI
21. **Jon Falkenberg**, MS in Physiology (8/95 to 12/97). Deceased 2011
22. **Kevin Fitzgerald**, MS in Biomedical Engineering (9/02 to 5/04). Program Manager, Medtronic Surgical Technologies, CO
23. **Yan Gao**, MS in Mechanical Engineering (2/93 to 8/95)
24. **Sarah Hamlin**, MS in Biomedical Engineering (9/17 to 5/18). Reliability Engineer, Medtronic, MN
25. **Sarah Handahl (Ahlberg)**, MS in Biomedical Engineering (1/04 to 5/05). Senior Research Manager, Medtronic, MN
26. **Megan Harris**, MS in Biomedical Engineering (7/15 to 6/17). Scientist, Medtronic, MN
27. **Alexander J. Hill**, MS in Biomedical Engineering (1/99 to 9/00). Senior Program Director, Medtronic, MN
28. **Ross Hinrichsen**, MS in Biomedical Engineering (5/15 to 5/16). Mechanical Design Engineer, Medtronic, MN
29. **Bryce Cole Holmgren**, MS in Biomedical Engineering, Plan B (5/12 to 5/14), Medical student (MD/MS Program). Anesthesiologist, KS
30. **Jin Back Hong**, MS in Electrical Engineering (4/97 to 9/98). Principal Consultant/Scientist, Medtronic, MN
31. **Tinen L. Iles**, MS in Biological Science (8/13 to 5/15). Assistant Professor, Visible Heart Laboratories, MN

32. **Aaron Janke**, MS in Biomedical Engineering (11/94 to 6/96). Field Clinical Studies Engineer, Biotronik Inc, MI
33. **Yong Jeon**, MS in Biomedical Engineering (7/93 to 7/95). Owner/Consultant, Tulip Engineering, CA
34. **Evan Johnson**, MS in Biomedical Engineering (8/15 to 6/17). Hardware Engineer, Medtronic, MN
35. **Traci Jones (Kress)**, MS in Biomedical Engineering (1/16 to 5/17). Senior Pre-Market Reliability Engineer, Medtronic, MN
36. **Shanthi Kandikonda**, MS in Computer Science (1/08 to 5/08). Senior Manager, Identity and Access Management, Charles Schwab, TX
37. **Jaydeep Kokate**, MS in Biomedical Engineering (1/93 to 8/93). Director of Research and Development, Boston Scientific, MN
38. **Narasimhararo Kommamuri**, MS in Biomedical Engineering (7/93 to 1/97). Software Engineer, Abbott Diabetes Care Inc., CA
39. **Graig Kveen**, MS in Biomedical Engineering (6/93 to 12/95). R&D Engineer, 3M, MN
40. **Ryan Lahm**, MS in Biomedical Engineering (1/97 to 6/99). Senior Engineering Manager and Technical Fellow, Medtronic, MN
41. **George Mallin**, MS in Mechanical Engineering (1/10 to 3/11). Product Manager, Optina Diagnostics, Montreal
42. **Mark Marshall**, MS in Physiology (12/02 to 5/10). Technology Manager and Researcher, Medtronic, MN
43. **Amanda Martel (Wilson)**, MS in Biomedical Engineering (11/09 to 4/12). Senior Engineering Director, Medtronic, MN
44. **Lizzie Mattson**, MS in Biomedical Engineering (8/17 to 5/18). Systems Engineer, Medtronic, MN
45. **Miles McParland**, MS in Biomedical Engineering (12/16 to 12/17). Scientist, Medtronic, MN
46. **Judy A. Miller**, MS in Biomedical Engineering (6/00 to 1/02)
47. **Nathalie Odryzynski**, MS in Biomedical Engineering (11/99 to 7/01). Reliability Engineering Manager, Medtronic, MN
48. **Ky O'Rourke**, MS in Biomedical Engineering (1/18 to 12/18). Quality Engineer, Medtronic, MN
49. **Sara Overgaard**, MS in Mechanical Engineering (12/05 to 5/08). Safety Program Manager, Medtronic, MN
50. **Suman Pal**, MS in Biomedical Engineering (1/07 to 8/08). Senior District Service Manager, Medtronic, OH
51. **Susan Paquette**, MS in Physiology (12/02 to 1/07). Vice President and General Manager, Wound Care, BioMedGPS, LLC, MN
52. **Xavier Pardo**, MS in Mechanical Engineering (3/97 to 9/99). Global Medical Technology Executive, Neo Medical SA, Switzerland
53. **Meenal S. Pathak**, MS in Biomedical Engineering (4/96 to 3/98)
54. **Rian J. Podein**, MS in Physiology (6/96 to 12/97)
55. **Christopher Quinn**, MS in Biomedical Engineering (11/97 to 6/99). Chief Technical Engineer, Smiths Medical, MN
56. **Ali Rafiq**, MS in Biomedical Engineering (10/14 to 7/15). Manufacturing Engineer, The Tech Group, AZ
57. **Jeremy Riedesel**, MS in Biomedical Engineering (1/97 to 12/98). Family Medicine Physician, Family Health Medical Services PLLC, NY



58. **Kaileigh Rock**, MS in Biomedical Engineering (8/17 to 1/19). Research Contingent, Medtronic CRT, MN
59. **Lance Rongstad**, MS in Biomedical Engineering (2/14 to 8/17). Medical Device Sales Representative, Gemini Medical/Arthrex, MN
60. **Alex Ryan**, MS in Mechanical Engineering (5/10 to 9/11)
61. **Justin Schaffer**, MS in Biomedical Engineering (6/06 to 8/06). Cardiothoracic Surgeon, Cardiac Surgery Specialists, TX
62. **Emma Schinstock**, MS in Mechanical Engineering (5/18 to 9/19). PhD Candidate in Mechanical Engineering, University of Minnesota, MN
63. **Tony Schmitz**, MS in Biomedical Engineering (8/15 to 5/17). Reliability Engineer, Medtronic, MN
64. **Douglas Seiffert**, MS in Mechanical Engineering (6/93 to 12/94). Manager of Quality Assurance, Janssen, Pharmaceutical Companies of Johnson & Johnson, NJ
65. **Brice Shireman**, Graduate research fellow in the Center for Interfacial Engineering via the National Science Foundation (7/92 to 9/93), MS in Bioengineering (to 6/94). SciMed, Boston Scientific, MN
66. **Nicholas Skadsberg**, MS in Biomedical Engineering (9/01 to 3/03). Global Downstream Marketing Director-AF Solutions, Medtronic, MN
67. **Scott Skorupa**, MS in Biomedical Engineering (3/08 to 12/15); did not complete degree. Senior Manager, Clinical Project Management, Abbott, MN
68. **Laura Slobotski**, MS in Biomedical Engineering (7/93 to 7/95). Sprint Technology, TX
69. **Jerome Socha**, MS in Biomedical Engineering (granted 3/03). Systems Engineer, Lockheed Martin, TX
70. **Charles Soule**, MS Biology, CBS (12/01 to 6/05). Quality Control Chemist, Interplastic Corp., MN
71. **Vincent Splett**, MS in Physiology (1/06 to 9/07). Principal Scientist, Medtronic, MN
72. **Marc Steckler**, MS in Biomedical Engineering (8/08 to 5/09). Principal Systems Engineer, Medtronic, MN
73. **Jeremy Stimack**, MS in Biomedical Engineering (9/15 to 7/16). R&D Engineer II, Boston Scientific, MN
74. **Dona Suardini**, MS in Biomedical Engineering (11/12 to 7/13). Senior Operations Program Manager, Medtronic, MN
75. **Susan Sun**, MD/MS Program (9/16 to 6/17). University of Minnesota Medical School
76. **Matthew Sweney**, MD, MS in Biomedical Engineering (1/99 to 9/00). Pediatric Neurologist and Epileptologist, University of Utah, UT
77. **Samira Tahvildari**, MS in Mechanical Engineering (3/98 to 2/00). Senior Manager Core Quality Services, Medtronic, MN
78. **Matt Venegoni**, MS, Masters Capstone Project (8/11 to 5/12). Clinical Study Manager, Wright Medical, MN
79. **Sarah Vincent**, MS in Biomedical Engineering (11/02 to 9/04). Engineering Program Manager, Medtronic, MN
80. **Daniel Voce**, MS in Biomedical Engineering (9/18 to 5/19). Research Engineer. MicorOptx, MN
81. **Michael F. Wolf**, MS in Biomedical Engineering (9/06 to 12/09). Scientist and Technical Fellow, Medtronic, MN
82. **Matt Yoder**, MS in Biomedical Engineering (9/08 to 8/16). Principal Systems Engineer, Medtronic, MN

## CURRENT MEDICAL/VETERINARY MEDICINE STUDENTS

None

## FORMER MEDICAL/VETERINARY MEDICINE STUDENTS

1. **Johnathon Aho**, Medical student, University of Minnesota (2008-2009). General Surgeon, Mayo Clinic, MN
2. **Andrea Allen**, Medical student, University of Kansas (5/16 to 8/16). MD Candidate, University of Kansas, KS
3. **Corey Anderson**, Medical student/Research rotation, University of Minnesota (1/03 to 9/06). Anesthesiologist, Essentia Health, MN
4. **Greg Banker**, Medical student, University of Minnesota (8/13 to 10/13). Strategic Market Development Director, Vertiflex, MN
5. **Allison Bradee**, Medical student, University of Minnesota (10/11 to 9/12). Resident Physician, University of Nebraska Medical Center, NE
6. **Robin Brusen**, MD/MS program, University of Minnesota (5/08 to 5/10). General Cardiologist, Kaiser Permanente, WA
7. **Rachel Busko**, Medical student, University of Minnesota (5/16 to 2/17). Medical student, University of Minnesota, MN
8. **Brian Chan**, Medical student, Casual/temp employee (human heart atlas), University of Minnesota (6/09 to 9/09). Fellow in Musculoskeletal Imaging and Intervention, University of Wisconsin School of Medicine and Public Health, WI
9. **Nathan Charles**, MD/PhD program/Research assistant, University of Minnesota (5/03 to 8/03). Physician, Pathology (Anatomic & Clinical), Great Lakes Pathologists, SC, WI
10. **Chen Chen**, Medical student, University of Minnesota (5/15 to 9/15)
11. **Robert Colbert**, Medical student, University of Minnesota (5/13 to 1/14)
12. **Steve Conlon**, Medical student, University of Minnesota (1/12 to 5/13). Resident Physician, Nationwide Children's Hospital, MN
13. **William Dennehy**, Medical student, University of Minnesota (6/18 to 9/18). Medical student, University of Minnesota, MN
14. **Christopher DeNucci**, MD/PhD program/Research rotation, University of Minnesota (6/04 to 9/04). Radiologist, Meritus Health, TX
15. **Alex DiBartolomeo**, Medical student, University of Minnesota (1/16 to 2/17). Medical student, University of Minnesota, MN
16. **Chris Duncan**, Research assistant, University of Minnesota; funded by a grant from the Minnesota Medical Foundation (11/99 to 8/00). Anesthesiologist, Mayo Clinic, MN
17. **Cary Effertz, MS**, Research assistant, University of Minnesota (5/07 to 8/07). Pain Management Specialist/Anesthesiologist, Mayo Clinic, WI
18. **Ellie Engelen**, Veterinary medicine student, University of Minnesota (5/15 to 5/16). Associate Veterinarian, Forest Lake Veterinary Hospital, MN
19. **Anthony Frattalone**, Research assistant, University of Minnesota; recipient of Minnesota Medical Foundation student research grant (1/03 to 8/03). Neurologist, TX
20. **Sarah Frommer, PhD**, MD/PhD program/Research assistant, University of Minnesota (7/01 to 3/07). Plastic Surgeon, Craniofacial Team of Texas
21. **Andrew Geeslin**, Research volunteer, University of Minnesota (11/07 to 5/09). Orthopedic Surgeon, Sports Medicine, Borgess Health, MI

22. **Jeff Hall**, Medical student, University of New England College of Osteopathic Medicine, ME (5/17 to 7/17)
23. **Bryce Cole Holmgren**, Medical student (MD/MS Program), University of Minnesota (5/12 to 5/14). Anesthesiologist, KS
24. **Dih-Dih Huang**, Medical student, University of Minnesota (1/11 to 8/11). Surgery Resident, St. Joseph's Hospital, AZ
25. **Sandra Kopp**, Research assistant, University of Minnesota (8/96 to 5/99). Anesthesiologist, Mayo Clinic, MN
26. **Tarissa Lai**, Medical student, University of Minnesota (1/14 to 9/15). Medical student, University of Minnesota, MN
27. **Alice Lehman**, Medical student, University of Minnesota (5/13 to 10/13). Pediatrics Resident, University of Minnesota, MN
28. **Erica Levine**, Medical student, University of Minnesota (5/14 to 8/15). Medical Resident, University of Minnesota, MN
29. **Timothy Lindsey**, Medical student/Research rotation, University of Minnesota (9/01 to 12/01). Anesthesiologist, TRIA, MN
30. **Michael Loushin**, Advanced admission, University of Minnesota (9/93 to 9/94), Life Sciences Summer Research Programs (6/94 to 8/94), Research assistant (9/94 to 6/98). Twin Cities Anesthesia Associates, MN
31. **Katelyn Madigan**, Medical student, University of Minnesota (1/16 to 2/17). Medical student, University of Minnesota, MN
32. **Sarah Mott**, Medical student, Creighton (5/13 to 8/13). Emergency Medicine Physician, Regions Hospital, MN
33. **Cathy Nguyen**, Medical student, University of Minnesota (6/11 to 8/11)
34. **Zachary Novaczyk**, Medical student, University of Minnesota (5/18 to 9/18). Doctor of Medicine Candidate, University of Minnesota, MN
35. **Carrie Ronstrom**, Medical student, University of Minnesota (9/13 to 5/15). Medical student, University of Minnesota, MN
36. **Theresa Rosendahl**, MD/MPH program/Research assistant, University of Minnesota (8/05 to 6/06)
37. **Cori Russell**, Medical student, Casual/temp employee, University of Minnesota (5/09 to 9/09). Physician, Cardiology, Henry Ford Hospital and Medical Center, MI
38. **Carl Sakamoto**, Medical student research elective in Anesthesiology (3/93 to 5/94). Anesthesiologist, APA, MN
39. **Nathan Schoeneck**, Research volunteer, University of Minnesota (09/08 to 5/09). Assistant Professor, Internal Medicine, Minneapolis VA Medical Center, MN
40. **Maria Seewald**, Medical student, University of Magdeburg, Germany (9/15 to 10/16). Medical student, University of Magdeburg, Germany
41. **Kim Sergerie**, Medical student, McGill University, Montreal (9/16 to 10/16). Medical Science Advisor & Liason, Kinova, Quebec
42. **Erika Sidney**, Research assistant, University of Minnesota (8/98 to 4/99). Pediatric Emergency Medicine Physician, Children's Hospital Colorado, CO
43. **Miriam Smetak**, Medical student, University of Minnesota (6/14 to 5/15). Otolaryngology Resident, Vanderbilt University Medical Center, TN
44. **Bowei (LuLu) Song**, Medical student, University of Minnesota (4/16 to 8/16). Medical student, University of Minnesota, MN

45. **Collin Stinogel**, Medical student, Liberty University College of Osteopathic Medicine, VA (6/16 to 8/16). Medical student, VA
46. **Luke Stoltzfus**, Medical student/Research rotation; MMF research grantee, University of Minnesota (6/05 to 9/06). Anesthesiologist, St. Luke's, MN
47. **Jarrod Tembreull**, Medical student, University of Minnesota (1/15 to 9/15). Medical student, University of Minnesota, MN
48. **Jeff Theismann**, Medical student, University of Minnesota (1/15 to 9/15). Medical Resident, Orthopaedic Surgery, University of Minnesota, MN
49. **Kathryn Thomas**, Medical student, University of Minnesota (5/15 to 8/16)
50. **Chad Thompson**, Medical student, University of Minnesota (10/11 to 1/14)
51. **Mike Torchia**, Medical student, University of Minnesota (10/11 to 12/11). Orthopaedic Surgery Resident, Dartmouth-Hitchcock, NH
52. **Michael Tradewell**, Medical student, University of Minnesota (9/14 to 5/16). Medical student, University of Minnesota, MN
53. **Dan Virnig**, Research assistant, University of Minnesota (9/00 to 12/00). Gastroenterologist, HealthPartners, MN
54. **Gina Weiss**, Medical student, University of Minnesota (1/16 to 8/16). Medical student, University of Minnesota, MN
55. **Oh Sang (Michael) Woo**, Research volunteer, University of Minnesota (5/08 to 9/08)
56. **Melanie Yates**, Medical student, Case Western (5/16 to 8/16). Medical student, Case Western, OH

## CURRENT PHARMACY STUDENTS

None

## FORMER PHARMACY STUDENTS

1. **Andrea Bochna**, Pharmacy student, Research rotation, University of Wisconsin-Madison (8/16 to 10/16)
2. **Dustin Fredrickson**, Pharmacy student, Research rotation, University of Wisconsin-Madison School of Pharmacy (5/16 to 7/16)
3. **Taryn Hinners**, Pharmacy student, Research rotation, University of Wisconsin-Madison (7/16 to 8/16). Pharmacist, Walgreens Specialty Pharmacy LLC, PA
4. **Alexander "AJ" Kellogg**, Pharmacy student, Research rotation, University of Wisconsin-Madison (1/17 to 4/17). Pharmacy Resident, University of Southern California School of Pharmacy, CA
5. **Anna Legreid Dopp**, PharMD, Research volunteer and PharMD program, 4<sup>th</sup> year research rotation, University of Minnesota School of Pharmacy (8/00 to 6/02). Director, Clinical Guidelines & Quality Improvement at the American Society of Health-System Pharmacists, MD
6. **Nate Menninga**, Pharmacy student, University of Wisconsin Madison (5/14 to 8/14). Clinical Pharmacy Specialist, William S. Middleton VA Hospital, WI
7. **Sarah Novak**, PharMD program, 4<sup>th</sup> year research rotation, University of Minnesota School of Pharmacy (6/02 to 8/02)
8. **Adam Remme**, Pharmacy student, Research rotation, University of Wisconsin-Madison (3/18 to 5/18)

## CURRENT NEUROSCIENCE STUDENTS

1. **Ally Fuher**, Volunteer/Student employee (5/14 to present). Medical student, University of Minnesota, MN

#### **FORMER NEUROSCIENCE STUDENTS**

1. **Roman Tyshynsky**, PhD Neuroscience student, Research rotation, University of Minnesota (1/17 to 4/17). Neuroscience student, University of Minnesota, MN

#### **FORMER PHYSICAL THERAPY STUDENTS**

1. **Natalie Amundsen**, MS in Physical Therapy, College of St. Catherine, MN (12/95 to 6/98). Physical Therapist, Mills Health Center, CA
2. **Kristopher Balgaard**, DPT in Physical Therapy, University of Minnesota (1/01 to 7/02). Physical Therapist/Site Lead, Viverant, MN
3. **Brenda Becker**, MS in Physical Therapy, College of St. Catherine, MN (12/95 to 6/98)
4. **Mike Carey**, DPT in Physical Therapy, University of Minnesota (1/01 to 7/02). Physical Therapist, In Motion Physical Therapy & Fitness, MN
5. **Katherine Chromy**, DPT in Physical Therapy, University of Minnesota (1/01 to 7/02). Physical Therapist, Anoka/Hennepin School District, MN
6. **Jeremiah Hales**, MS in Physical Therapy, University of Minnesota (9/98 to 12/00). Physical Therapist, M-Power Physical Therapy, MN
7. **Pete Larson**, MS in Physical Therapy, University of Minnesota (9/98 to 12/00), Physical Therapist, MN
8. **Sonja Lukas (Day)**, DPT in Physical Therapy, University of Minnesota (2/03 to 7/04). Physical Therapist, Courage Center, Golden Valley, MN
9. **Laury Martini-Clymer**, MS in Physical Therapy, College of St. Catherine, MN (12/95 to 6/98)
10. **Erika Sandell**, DPT in Physical Therapy, University of Minnesota (2/03 to 7/04). Physical Therapist, Institute for Athletic Medicine, MN
11. **Kimberly Scharmer-Baumann**, MS in Physical Therapy, College of St. Catherine, MN (12/95 to 6/98)
12. **Margaret Tilman**, DPT in Physical Therapy, University of Minnesota (2/03 to 7/04). Physical Therapist, OSI Physical Therapy, MN

#### **FORMER PHYSIOLOGY STUDENTS**

1. **Jason Foss**, IBP rotation in Physiology (9/09 to 12/10)

#### **CURRENT UNDERGRADUATE STUDENTS AND VOLUNTEERS**

1. **Sydney Crims**, Volunteer (12/18 to present)
2. **Dannyelle Donahue**, Volunteer (8/18 to present)
3. **Kendall Emfield**, Volunteer (5/18 to present)
4. **Rachel Gasser**, Volunteer (11/19 – present)
5. **Brandon Høglund**, Volunteer (9/19 – present)
6. **Mahdi Hurreh**, Volunteer (9/17 to present)
7. **Nick Karlovich**, Volunteer (9/18 to present)
8. **Tran Lu**, Volunteer (9/19 – present)
9. **Savannah Martinson**, Volunteer (6/19 to present)
10. **Alexa Muylaert**, Volunteer (12/18 to present)
11. **Kishan Patel**, Volunteer (9/18 to present)

12. **Nichole Torgerson**, Volunteer (9/17 to present)
13. **Michelle Uchenik**, Volunteer (9/19 to present)
14. **Rachel Wilharm**, Volunteer (9/18 to present)
15. **Emma Wilson**, Volunteer (9/18 to present)
16. **Kirsten Ziegler**, Volunteer (1/19 to present)

#### **FORMER UNDERGRADUATE STUDENTS**

1. **Marina Abramovich**, Honors Thesis Project in Physiology (8/98 to 3/99)
2. **Kymberly Adams**, Undergraduate in Electrical Engineering (4/93 to 7/93)
3. **Varun Agarwal**, Volunteer (12/18 to 8/19)
- 4.
5. **Neil Aggarwal**, Summer Undergraduate Research Program in Science and Engineering via the National Science Foundation (6/98 to 8/98)
6. **Amber Aho**, Volunteer (5/03 to 8/03)
7. **Nadia Altaf**, Undergraduate scholar in the President's Distinguished Faculty Mentor Program (9/97 to 6/98)
8. **Kylea Barnes**, Volunteer (9/18 to 9/19)
9. **Brady Anderson**, Volunteer (1/15 to 6/16)
10. **Danielle Anderson**, Volunteer (8/14 to 1/15)
11. **Perico Noel Cruz Arcedo**, Research Explorations Program, Continuing Education and Extension, University of Minnesota (10/92 to 7/93)
12. **Verna Arcedo**, Research Explorations Program, Continuing Education and Extension, University of Minnesota (6/94 to 9/94)
13. **Gregory D. Ariff**, Summer Fellowship in Biomedical Engineering, Biomedical Engineering Center, University of Minnesota (6/97 to 8/97)
14. **Gunnar Askegaard**, Volunteer (9/14 to 5/15)
15. **Jeremiah Atkinson**, Volunteer (5/13 to 8/13)
16. **Dan Balto**, Volunteer/Undergraduate Research Opportunities Program/Directed research (6/10 to 6/11)
17. **Lukas Baner**, Volunteer (11/15 to 5/16)
18. **Jennifer Bangsund**, Research Experiences for Undergraduates via the National Science Foundation (6/95 to 9/95)
19. **Mariel Barcelos**, Volunteer (10/08 to 5/09)
20. **Aaron Barlow**, Volunteer (1/09 to 10/09); Directed research (5/10 to 8/10)
21. **Alex Barstad**, Volunteer (2/11 to 9/11)
22. **Kasia Bartczak**, Volunteer (2007-8)
23. **Ashley Bartlett**, Directed research, Technology (2007-8)
24. **Katie Batman**, Volunteer (2/14 to 1/15)
25. **Adam Beck**, Volunteer (4/13 to 1/14)
26. **Nick Beck**, Directed research in Biomedical Engineering (1/01 to 5/01)
27. **Grant Beckstrand**, Directed research in Biomedical Engineering (1/02 to 5/02)
28. **Alex Beebout**, Volunteer/Directed research (10/10 to 9/11)
29. **Jason Berg**, Volunteer (5/18 to 5/19)
30. **Stephanie Bersie**, Volunteer (5/13 to 5/15)
31. **Mark Bluemke**, Volunteer (11/05 to 5/06, 9/06 to 5/07)
32. **Vyvian Borse**, Volunteer (5/16 to 8/16)
33. **Hana Boudlali**, Volunteer (1/15 to 9/15)

34. **Tori Boughton**, Directed research in Physiology (5/05 to 8/05)
35. **Karen Broady**, Directed research in Biomedical Engineering (9/00 to 12/00)
36. **Erica Brooks**, Life Sciences Summer Undergraduate Research Program (6/98 to 8/98)
37. **Tara Buhl**, Advanced admission student, University of Minnesota School of Medicine (9/91 to 9/93)
38. **Angela Burgess**, Volunteer (2/17 to 9/17)
39. **Andrew Bursaw**, Directed research in Physiology (9/01 to 12/01)
40. **Theresa Bushman**, Volunteer (5/16 to 11/16)
41. **Michael Caldwell**, Honors Thesis Project in Physiology, Research assistant (7/97 to 3/99)
42. **Stephanie Caldwell**, Volunteer (10/12 to 12/12)
43. **Stuart Campbell**, Biomedical Engineering Life Sciences Summer Undergraduate Research Program (6/04 to 8/04)
44. **Khoa Cao**, Volunteer (2/13 to 6/14)
45. **Gail Carlson**, Volunteer (6/97 to 6/99)
46. **Nathan Carlson**, Research Explorations Program, Continuing Education and Extension, University of Minnesota (3/96 to 9/96)
47. **Elizabeth Carroll**, Honors Thesis Project in Physiology, Volunteer (7/97 to 3/99)
48. **Rachel Carson**, Directed research in Biology (11/04 to 8/05)
49. **Leilani Castleman**, Life Sciences Summer Undergraduate Research Program (6/02 to 8/02)
50. **Santiago Charry**, Volunteer (5/16 to 8/16)
51. **Geoffrey Cherucheril**, Volunteer (12/06 to 2/07, 2/08 to 5/09)
52. **Jennifer Chmura**, Volunteer (8/13 to 2/14, 6/14 to 6/16)
53. **Sung Jun “Paul” Cho**, Volunteer (10/15 to 5/18)
54. **David Choi**, Directed research, Undergraduate Research Opportunity Award recipient (2/03 to 4/04)
55. **Matthew Chu**, Life Sciences Summer Undergraduate Research Program (6/00 to 8/01), Johns Hopkins Medical School
56. **Ioana Ciuta**, Volunteer (11/13 to 6/14)
57. **Madison Clague**, Volunteer (5/15 to 9/15, 5/17 to 8/17)
58. **Ellie Clark**, Volunteer (11/13 to 6/14)
59. **Lynn Clark**, Directed research (Spring 2008)
60. **Ryan Clark**, Directed research (9/10 to 5/11)
61. **Amanda Claseman**, Volunteer (12/13 to 6/14)
62. **Chris Cobar**, Volunteer (11/14 to 5/14)
63. **Dayna Cohen**, Volunteer (10/13 to 2/14)
64. **Jerfiz Constanzo**, Life Sciences Summer Undergraduate Research Program (6/09 to 8/09)
65. **Ben Cooper**, Volunteer (2/11 to 5/11)
66. **Ryan Corcoran**, Directed research in Biology/Volunteer (2/05 to 1/08)
67. **Hailey Corrigan**, Volunteer (5/14 to 1/15)
68. **Jodi Deleski**, Volunteer (5/99 to 6/00)
69. **Erica Delin**, Volunteer (2/05 to 5/07)
70. **Tristan Dockendorf**, Volunteer, Undergraduate Research Opportunities Program (1/09 to 10/09)
71. **Kristin Donley**, Volunteer (9/02 to 8/03), Physical Therapy program, University of Minnesota
72. **Alec Donohue**, Volunteer (9/14 to 12/15)
73. **Peter Downie**, Volunteer (6/13 to 8/13)
74. **Rachel Drake**, Volunteer (5/12 to 6/14)

75. **Sherwin Duke**, Biomedical Engineering Undergraduate Summer Fellow (6/99 to 8/99)
76. **Mitch Dyrdahl**, Directed research (2/03 to 6/04)
77. **Tommica Edwards**, Undergraduate scholar in the President's Distinguished Faculty Mentor Program (9/97 to 6/98)
78. **Alex Eldredge**, Volunteer (9/10 to 7/12)
79. **Katy Empanger**, Volunteer (5/12 to 8/15)
80. **Kristen A. Engelhardt**, Life Sciences Summer Undergraduate Research Program (6/92 to 8/92)
81. **Kyle Erickson**, Volunteer (6/11 to 9/11)
82. **Justin Esterberg**, Research Explorations Program, Continuing Education and Extension, University of Minnesota (7/93 to 10/93)
83. **Sarah Ezzat**, Volunteer, Undergraduate Research Opportunities Program (2/06 to 5/07)
84. **Jon Falkenberg**, Research Explorations Program, Continuing Education and Extension, University of Minnesota (6/94 to 7/95)
85. **Gia Fedo**, Volunteer (10/08 to 10/09)
86. **Rachel (Bersie) Feliciano**, Volunteer (5/14 to 8/16)
87. **Kris Felsman**, Volunteer (6/97 to 6/98)
88. **Jessica Felton**, Volunteer (1/09 to 5/09)
89. **Emily Fiala**, Volunteer (2/17 to 8/18)
90. **Kristi Field**, Research Explorations Program, Continuing Education and Extension, University of Minnesota (3/94 to 11/95)
91. **Darryl Finkton**, Life Sciences Summer Undergraduate Research Program (5/07 to 8/07)
92. **Mary Finta**, Volunteer (10/13 to 5/15)
93. **Emily Fitch**, Volunteer (5/10 to 8/12)
94. **James Fleming**, Volunteer (4/13 to 5/14)
95. **Patrick Fones**, Volunteer (8/08 to 12/08)
96. **Bret Fox**, Volunteer (5/12 to 10/13)
97. **Boutheina Fradj**, Directed research (9/14 to 5/15)
98. **Brad Fredrickson**, Volunteer (9/14 to 12/15)
99. **Andy Freeman**, Volunteer in Biomedical Engineering (2/02 to 5/02)
100. **Ally Fuher**, Volunteer/Student employee (5/14 to 6/17)
101. **Darren Galligan**, Life Sciences Summer Undergraduate Research Program in Biomedical Engineering (6/03 to 8/03)
102. **Dionna Gamble**, Life Sciences Summer Undergraduate Research Program (6/11 to 8/11)
103. **Grant Gangeness**, Volunteer/Undergraduate Research Opportunities Program (5/13 to 8/14)
104. **Josh Gangl**, Volunteer (2016)
105. **Chelsie GawneMark**, Volunteer (8/13 to 6/14)
106. **Erin Ge**, Directed research (6/06 to 8/06)
107. **Tara Gengenbach**, Research Explorations Program, Continuing Education and Extension, University of Minnesota (9/95 to 12/96)
108. **Scott Gershan**, Volunteer (9/05 to 5/06)
109. **Jeff B. Geske**, Directed research in Physiology (1/02 to 5/02), Mayo Medical School, MN
110. **Megan Ghai**, Volunteer (9/08 to 12/11)
111. **Odalys Gonzalez-Rodriguez**, Life Sciences Summer Undergraduate Research Program (6/06 to 8/06)
112. **William Goodson**, Research Experiences for Undergraduates via the National Science Foundation (6/94 to 8/94)



113. **David Grabowski**, Honors Thesis Project in Biochemistry (7/97 to 6/98)
114. **Kevin Graden**, Volunteer (8/09 to 2/11)
115. **Tony Grandelis**, Volunteer (3/09 to 5/09)
116. **Michael Greene**, Volunteer (2016)
117. **Emma Greibenow**, Volunteer (10/15 to 11/16)
118. **Melissa Groen**, Directed research (12/08 to 8/09)
119. **Amelia Gudex**, Directed research (8/16 to 2/17)
120. **Erik Gudmundson**, Volunteer (2008)
121. **Adam Gullickson**, Directed research (2/03 to 6/03)
122. **Jake Gustafson**, Volunteer (5/14 to 12/14)
123. **Annie Haakenstad**, Volunteer (10/15 to 8/16)
124. **Amy Handlogten**, Volunteer/URS (9/11 to 5/12)
125. **Victoria Harp**, SEED program, Center for Interfacial Engineering via the National Science Foundation (6/94 to 8/94)
126. **Sam Harpell**, Volunteer (10/14 to 9/15)
127. **Jack Hartmann**, Directed research (1/16 to 2/17)
128. **Kevin Hartoyo**, Volunteer (9/15 to 2/17)
129. **Moe Hatab**, CHE Research Training Program (5/10 to 6/12)
130. **Josh Havel**, Directed research (1/13 to 5/13)
131. **Jennifer Heidmann**, Research Explorations Program, Continuing Education and Extension, University of Minnesota (1/94 to 8/94)
132. **Salma Helal**, Directed research in Biological Sciences (1/07 to 9/07)
133. **Andrew Held**, Undergraduate research assistant in the Center for Interfacial Engineering via the National Science Foundation (4/92 to 8/93)
134. **Alyssa Hennen**, Volunteer (5/12 to 10/12)
135. **Gabriel Hernandez**, Life Sciences Summer Undergraduate Research Program (6/14 to 8/14)
136. **Mackenzie Herzig**, Volunteer (11/14 to 5/16)
137. **Danielle Hesprich**, Volunteer (9/05 to 8/06)
138. **Erica Hjelle**, Casual/temp employee (6/09 to 8/09)
139. **Mara Hjelle**, Casual/temp employee (4/12 to 10/12)
140. **Thuy Hoang**, Volunteer (2/17 to 6/17)
141. **Matt Hoffman**, Directed research (7/08 to 5/09)
142. **Shawn Hong**, Volunteer (11/13 to 12/14)
143. **Aishania Hopkins**, Senior thesis for summa honors (9/96 to )
144. **Christina Horn**, Life Sciences Summer Undergraduate Research Program (6/02 to 8/02)
145. **Dan Hosker**, Volunteer; Physiology honors project (6/09 to 8/10)
146. **Christopher Howard**, Directed research in Biomedical Engineering, Volunteer (1/03 to 6/05)
147. **Emily Hoyer**, Volunteer (6/12 to 8/12)
148. **Noora Hussain**, Volunteer (9/12 to )
149. **Devon Hutton**, Volunteer (5/09 to 8/10)
150. **Hanna Iaizzo**, Casual/temp employee (6/09 to 8/09)
151. **Jenna Iaizzo**, Directed research in Physiology/Volunteer (5/05 to 8/05, 6/06 to 8/06)
152. **Yoko Ishida**, Volunteer (9/12 to 10/13)
153. **Jihan Jacobs**, Directed research in Physiology/Biology (10/04 to 5/06)
154. **Christine Jauregui**, Research Explorations Program, Continuing Education and Extension, University of Minnesota (7/95 to 9/95)
155. **Dawn Jiang**, Volunteer (12/12 to 5/13)

156. **Brooks Johnson**, Volunteer in Physiology (6/95 to 9/98)
157. **Chloe Johnson**, Volunteer (5/16 to 8/18)
158. **Graham Johnson**, Volunteer (5/16 to 7/17)
159. **Karl Johnson**, Honors thesis in Physiology (9/05 to 5/06)
160. **Lisa Johnson**, Junior Research Project in Physics (1/02 to 5/02)
161. **Zach Juveli**, Volunteer (7/08 to 12/08)
162. **David Kalb**, Life Sciences Summer Undergraduate Research Program (6/93 to 8/93)
163. **Amy Kaleita**, Summer Fellowships in Biomedical Engineering, Biomedical Engineering Center, University of Minnesota (6/95 to 8/95)
164. **Christina Kang**, Directed research (9/03 to 1/04)
165. **Cory Kasprzak**, Volunteer (6/10 to 12/10)
166. **Megan Katopodis**, Casual/temp employee (5/17 to 7/17)
167. **Daniel Kehler**, Volunteer (10/06 to 4/07)
168. **Jackie Kehler**, Volunteer (6/03 to 8/03)
169. **Alexander (AJ) Kellogg**, Volunteer (5/12 to 10/12)
170. **Brenna Kelly**, Post-baccalaureate volunteer (9/17 to 5/18)
171. **Kyrsten Kelley**, Volunteer/Undergraduate Research Opportunities Program (CBS) (2005-8)
172. **Hayden Kelly**, Volunteer (12/11 to 5/12)
173. **Jason Kelly**, Life Sciences Summer Undergraduate Research Program (5/15 to 8/15)
174. **Todd Kerkow**, Undergraduate research assistant in the Center for Interfacial Engineering via the National Science Foundation. (12/93 to 9/95)
175. **Michael Kern**, Volunteer (9/05 to 5/06)
176. **Alyssa Kessel**, Volunteer (7/12 to 5/13)
177. **Mira Khatib**, Volunteer (5/13 to 8/13)
178. **Tarek Khatib**, Post-baccalaureate volunteer (1/18 to 12/18)
179. **Martin Khoury**, Volunteer (9/15 to 6/16)
180. **Sheena Kiaei**, Volunteer (9/16 to 7/17)
181. **Jennifer Kim**, Volunteer (5/15 to 8/15)
182. **Jennifer Kim**, Volunteer (5/16 to 7/17)
183. **Gayla King**, Volunteer (8/99 to 12/99)
184. **Steve Kiviahde**, Directed research (9/08 to 5/09)
185. **Will Kivlin**, Volunteer (1/15 to 9/15)
186. **Katherine G. Koff**, Research Explorations Program, Continuing Education and Extension, University of Minnesota (1/96 to 4/99)
187. **Emily Kollenbroich**, Volunteer (8/16 to 5/17)
188. **John Korkko**, Volunteer (5/09 to 10/09)
189. **Becky Kortum**, Volunteer (8/13 to 6/14)
190. **Mariya Kovaleva**, Volunteer (9/08 to 11/08, 2/09 to 5/09, 10/09 to 5/10)
191. **Konstantin Kravcheuko**, Directed research (10/10 to 6/11)
192. **Beth Kregel**, Volunteer (9/10 to 5/12)
193. **Traci Kress**, Volunteer, Casual/temp employee (8/12 to 12/12)
194. **Kevin Kriege**, Volunteer (5/13 to 6/16)
195. **Lori Kruse**, Biological Sciences Alumni Society mentor Program, Volunteer (1/96 to 6/98)
196. **Roby Kuderko**, Volunteer (1/12 to 12/12)
197. **Daniel Kuivinen**, Volunteer (2/17 to 9/17)
198. **Elizabeth Laakso**, LHI scholar (5/15 to 9/15)

199. **Dan Lackas**, Undergraduate research assistant in the Center for Interfacial Engineering via the NSF (6/93 to 6/94, 9/94 to 7/96); Research Experiences for Undergraduates via the NSF (6/94 to 9/94)
200. **Joe Lai**, Volunteer (1/09 to 8/09)
201. **Maria LaNasa**, Volunteer (7/09 to 12/10)
202. **Xiao-yu (Matt) Lao**, Research Experiences for Undergraduates via the NSF (6/94 to 8/94)
203. **Allison Larson**, Volunteer (6/11 to 8/13)
204. **Jessie Lasher**, Volunteer (6/08 to 8/08, 5/09 to 8/09)
205. **Juliet Laske**, Volunteer, Casual/temp employee (10/13 to 8/14)
206. **Tod Leaven**, Neuroscience, Life Sciences Summer Undergraduate Research Program (6/97 to 8/97)
207. **Mai Yer Lee**, Volunteer (9/11 to 2/14)
208. **Panyia Lee**, Volunteer (12/08 to 8/09)
209. **Keith Leland**, Undergraduate research assistant in the Center for Interfacial Engineering via the National Science Foundation (7/93 to )
210. **Ed LeMahieu**, Directed research in Physiology (1/00 to 12/00)
211. **Charles LeNeave**, Volunteer (1/16 to 7/17)
212. **Elizabeth Lezama**, Life Sciences Summer Undergraduate Research Program (6/13 to 8/13, 6/14 to 8/14)
213. **Jason Liao**, Volunteer (10/14 to 1/15)
214. **Kevin Liao**, Volunteer (7/10 to 9/10)
215. **Annette Lindblom**, Research Experiences for Undergraduates via the NSF (6/97 to 8/97)
216. **Xiaoyin Ling**, Volunteer (2/18 to 12/18)
217. **Cindy Liu**, Directed research for honors project in Physiology (9/00 to 12/00)
218. **Meghan Longen**, Volunteer (1/18 to 8/18)
219. **Jim MacKenzie**, Volunteer, pre-med student at the University of Minnesota (7/95 to 9/95)
220. **Libby Magnuson**, Graphic art designer (6/07 to 9/07)
221. **Erin Mahre**, Casual/temp employee (5/17 to 8/17)
222. **Claire Manlove**, Volunteer (11/12 to 5/15)
223. **Aamir Mansoor**, Volunteer (2006-7)
224. **Jade Marchiniak**, Volunteer (1/12 to 5/12)
225. **Irmarr Marie Marrero-Marrero**, Life Sciences Summer Undergraduate Research Program (6/12 to 8/12)
226. **Phil Matta**, Directed research/Volunteer (12/07 to 10/09)
227. **Kari Mattison**, Casual/temp employee (5/15 to 8/15)
228. **Frances Maybach**, Directed research/Volunteer (1/05 to 12/05, 6/06 to 1/07)
229. **Sheena Mbachu**, Volunteer (2/10 to 12/10)
230. **Anna McCormick**, Directed research (10/05 to 1/07)
231. **Gannon McGrath**, Volunteer (8/12 to 8/13, 6/14 to 1/15)
232. **Brendan McKnight**, Volunteer (1/06 to 1/07)
233. **Nathan McLean**, Directed research (2/03 to 6/03)
234. **Melanie Menk**, Volunteer (1/15 to 1/18)
235. **Nate Menninga**, Casual/temp employee (5/14 to 8/14)
236. **James Mika**, Undergraduate Research Opportunity Program (2/05 to 6/05)
237. **Jesse Miller**, Volunteer (2/03 to 6/03)
238. **Laura Miller**, Volunteer and Honors Project in Physiology (1/01 to 12/01, 7/03 to 5/05), School of Public Health, University of Minnesota (7/05)

239. **Nana Mitsuishi**, Volunteer (11/14 to 7/17)
240. **Jacquelyn Mohn**, Senior honors project (2007-8)
241. **Allison Mumbleau**, Volunteer (6/04 to 8/04)
242. **Semal Musleh**, Volunteer (10/14 to )
243. **Nancy Nacker**, Volunteer (9/97 to 6/98)
244. **Max Nagarajan**, Volunteer/URS (10/11 to 1/12)
245. **Caroline Nam**, Biomedical Engineering Undergraduate Summer Fellow (6/99 to 8/99)
246. **Cherie Nau**, Volunteer (9/95 to 3/96)
247. **Denise Nelson**, Volunteer/Directed research (9/11 to 5/12)
248. **Mitch Nelson**, Volunteer (1/10 to 5/12)
249. **Nicole Neumann**, Volunteer (8/13 to 12/14)
250. **Krista Neururer-Rothstein**, Volunteer/Directed research (1/10 to 8/11)
251. **Sydney Newton**, Volunteer (5/15 to 12/18)
252. **Mary Nguyen**, President's Distinguished Faculty Mentor Program; Undergraduate Research Opportunity Award (1/01 to )
253. **Nicki Nguyen**, President's Distinguished Faculty Mentor Program (10/95 to 12/99)
254. **Lesa Nord**, Volunteer, Casual/temp employee (8/10 to 8/12)
255. **Edna Nore**, Life Sciences Summer Undergraduate Research Program (6/03 to 8/03)
256. **Meagan Nowariak**, LHI Scholar (6/17 to 8/17)
257. **Maureen O'Connor**, Volunteer (2008)
258. **Naomi Ollila**, Volunteer (12/13 to 8/14)
259. **Steve Oommen**, Directed research, Undergraduate Research Opportunity Award (2/03 to 5/04)
260. **Lev Ostrer**, Volunteer (9/11 to 5/12)
261. **Kate Overgaard**, Volunteer (9/09 to 12/09)
262. **Maria Pagnetta**, Professional Learning Experience Program, Biological Sciences, University of Minnesota (6/94 to 8/94)
263. **Drew Paradis**, Volunteer (1/13 to 5/13)
264. **Nia Patterson**, Life Sciences Summer Undergraduate Research Program (6/11 to 8/11)
265. **Scott Pearson**, Volunteer (1/11 to 5/12)
266. **Michelle Perry**, Life Sciences Summer Undergraduate Research Program (5/07 to 8/07)
267. **Lee Peters**, Volunteer (9/10 to 8/11)
268. **Brent Peterson**, Volunteer (10/11 to 12/11)
269. **Justin Peterson**, Volunteer (5/06 to 1/08)
270. **Emily Pfieffer**, Volunteer (9/16 to 9/18)
271. **Catherine Pham**, Pre-med Scholar (10/03 to 8/05)
272. **Nicholas Plachinski**, Volunteer (5/18 to 12/18)
273. **Dmitrii Pokhil**, Volunteer (6/11 to 12/11)
274. **Tracy Powell**, Volunteer (1/07 to 8/08)
275. **Garrett Prah**, Volunteer (7/12 to 5/13)
276. **Conner Prasky**, Volunteer (10/16 to 7/17)
277. **Dawn Qiu**, Directed research (12/05 to 5/07)
278. **Amelia Raether**, Volunteer (6/10 to 8/10)
279. **Henry Raether**, Volunteer (6/13 to 8/13)
280. **Starr Ramirez**, University of Minnesota Health Sciences Minority Program: High School Research Apprentice Program (6/97 to 8/97)
281. **Dylan Redden**, Volunteer (12/13 to 8/14)
282. **Elizabeth Reily**, Biomedical Engineering Undergraduate Summer Fellow (6/00 to 8/00)

283. **Dannah Reiter**, Volunteer (2/14 to 8/15)
284. **Jessica Reynertson**, Volunteer (1/09 to 9/09)
285. **Aaron Richter**, Volunteer (11/13 to 9/15)
286. **Casey Rieck**, Volunteer (10/14 to 8/16)
287. **Tyler Riedinger**, Volunteer (11/13 to 6/14)
288. **Mathew Robertson**, Summer Research Programs via Goucher University (6/03 to 8/03)
289. **Laura Rogers**, Volunteer (10/14 to 9/15)
290. **Alison Rolandelli**, Volunteer (5/15 to 9/15)
291. **Paul Rolfes**, Volunteer, Casual/temp employee (6/11 to 8/11)
292. **Jocelyn Rowe**, Biology Colloquium Course, volunteer (12/98 to 6/99)
293. **Andrew Roy**, Volunteer (5/13 to 8/13)
294. **Sam Rush**, Volunteer, National High School Science Fair Competitions (6/94 to 9/97)
295. **Emily Sakamoto**, Volunteer (5/13 to 7/13)
296. **Shireen Sakizadeh**, Directed research in Physiology (9/01 to 12/01)
297. **Lahiru Samarsinghe**, Volunteer (5/16 to 7/17)
298. **Marit Sanders**, Volunteer (1/07 to 9/07)
299. **Kristy Schaefer**, Directed research in Physiology (1/02 to 5/02)
300. **Bill Schertzing**, Volunteer (9/07 to 12/10)
301. **Bryant Schmitz**, Volunteer (11/12 to 5/13)
302. **Michael Schnaus**, Volunteer (6/09 to 5/10)
303. **Nate Schneider**, Volunteer (1/11 to 6/11)
304. **Keriann Schulkers**, Volunteer (10/06 to 4/07)
305. **Katrina Schweiker**, Junior Research Project in Physics (1/02 to 5/02)
306. **Ashley Scott**, Life Sciences Summer Undergraduate Research Program (6/13 to 8/13)
307. **Jamilisse Segarra**, Life Sciences Summer Undergraduate Research Program (5/15 to 8/15)
308. **Maria Seewald**, Volunteer (3/12 to 4/12)
309. **Kelly Seifert**, Research Explorations Program, Continuing Education and Extension, University of Minnesota from Wellesley College (6/96 to 9/96)
310. **Neda Shahghasemi**, Directed research in Biomedical Engineering (5/04 to 5/05)
311. **Salma Shaker**, Volunteer (5/07 to 6/09)
312. **Olivia Shepler**, Volunteer (5/15 to 8/15; 5/16 to 8/16)
313. **Margaret Shevik**, Volunteer (11/12 to 10/13)
314. **Nina Sigg**, Volunteer (3/13 to 6/13)
315. **Laura Skadsberg**, Undergraduate Research Opportunity Award (1/04 to )
316. **Laura Skarie**, Volunteer, University of Minnesota (9/98 to 4/99)
317. **Kaley Smith**, Volunteer (2009)
318. **Jaime Smith**, Volunteer (1/06 to 5/06)
319. **Sarah Sneider**, Volunteer (8/05 to 12/05)
320. **Oliver Sogard**, Volunteer (4/14 to 1/15)
321. **Nancy Sokkary**, Magna cum laude paper, Physiology (1/02 to )
322. **Tanya Solovey**, Undergraduate Research Opportunity Award, pre-med student at University of Minnesota (5/94 to 7/96)
323. **Danielle Sorensen**, Volunteer (1/18 to 5/18)
324. **Mario Soto**, Life Sciences Summer Undergraduate Research Program (6/16 to 8/16)
325. **Zach Sperry**, Volunteer (9/10 to 12/11)
326. **Natasha Srb**, Volunteer (3/99 to 10/99)
327. **Jenna Stangland**, Volunteer in CBS (9/06 to 5/07)

- 328. **Jake Starsiak**, Volunteer (5/13 to 12/14)
- 329. **Chelsea Steinborn**, Volunteer (9/07 to 4/09)
- 330. **Zak Stelter**, Volunteer (9/10 to 12/10)
- 331. **Justine Sternke**, Volunteer (11/13 to 2/14)
- 332. **Luis Cesar Suarez-Rodriguez**, Life Sciences Summer Undergraduate Research Program (6/06 to 8/06)
- 333. **Sean Sullivan**, Biomedical Engineering Undergraduate Summer Fellow (6/01 to 8/01)
- 334. **Cassandra Sundaram**, Volunteer (3/12 to 12/14)
- 335. **Kimberly Swanson**, Volunteer, nursing student, University of Minnesota (7/94 to 12/94)
- 336. **Geoff Swisher**, Volunteer (1/13 to 5/13)
- 337. **Emily Syverud**, LHI scholar (5/15 to 8/15)
- 338. **Nick Tassoni**, Volunteer (9/12 to 5/13)
- 339. **Ryan Taylor**, Volunteer (5/10 to 5/11)
- 340. **Melissa (Toolie) Tetzner**, Volunteer (6/09 to 8/09)
- 341. **Rohan Thakur**, Volunteer (6/18 to 5/18)
- 342. **Kelly Thao**, Volunteer (5/12 to 9/15)
- 343. **Claire Thomas**, Volunteer (8/17 to 8/19)
- 344. **Sara Torgerson**, Life Sciences Summer Undergraduate Research Program (6/01 to 8/01)
- 345. **Katia Y. Torres Román**, Life Sciences Summer Undergraduate Research Program (6/12 to 8/12)
- 346. **Peter Toy**, Volunteer (6/10 to 8/13)
- 347. **Jack Trebelhorn**, Volunteer (9/10 to 6/12)
- 348. **Ben Troness**, Volunteer (8/13 to 8/14)
- 349. **Nolan Turner**, Volunteer (5/09 to 5/10)
- 350. **Joanna Ulmen**, Casual/temp employee (2008-09)
- 351. **John Uphoff**, Volunteer (11/09 to 9/11)
- 352. **Kristen Upson**, Directed research in Physiology (12/00 to 12/01)
- 353. **Uzma Usmani**, Life Sciences Summer Undergraduate Research Program (6/09 to 8/09)
- 354. **Mike Van Heel**, Volunteer (3/13 to 12/14)
- 355. **Julia Van Luyk**, Volunteer (2/17 to 8/18)
- 356. **Sukanya Varadharajan**, Volunteer (11/09 to 5/10)
- 357. **Kari Varichak**, Directed research in Biomedical Engineering (9/00 to 12/00)
- 358. **Matt Varner**, Directed research (1/04 to 5/05)
- 359. **Aileen Villanueva**, Undergraduate scholar in the President's Distinguished Faculty Mentor Program (10/94 to 6/95)
- 360. **Sarah Vincent**, Directed research in Biomedical Engineering, Biomedical Engineering Undergraduate Summer Fellow (1/01 to 9/01)
- 361. **Chelsea Wallace**, Directed research (9/03 to 6/05)
- 362. **Lisa Weeks**, Work Study (10/12 to 6/14)
- 363. **Josh Weinberger**, Life Sciences Summer Undergraduate Research Program (7/08 to )
- 364. **Melissa White**, Volunteer (10/11 to 2/14)
- 365. **Mark Wieland**, Life Sciences Summer Undergraduate Research Program (6/98 to 8/98)
- 366. **Erin Williams**, Research Explorations Program, Continuing Education and Extension, University of Minnesota (6/95 to 1/96)
- 367. **Jonathan Williams**, Volunteer (10/16 to 7/17)
- 368. **Marta Williams**, LHI Scholar (6/17 to 8/17)
- 369. **Anna Windfeldt**, Directed research in Biology (9/02 to 12/02)

- 370. **Simon Wing**, Volunteer (6/99 to 6/00)
- 371. **Steve Wisniewski**, Biological Sciences Alumni Society Mentor Program, Undergraduate Research Opportunity Program (1/95 to 9/96)
- 372. **Kylie Wittl**, Volunteer (5/14 to 12/14)
- 373. **Jade Wulff**, Volunteer (3/04 to 6/05)
- 374. **Nadine Yacoub**, Volunteer/Directed research (9/11 to 10/13)
- 375. **Mai Der Yang**, LHI Scholar (5/14 to 9/14), Volunteer (5/15 to 9/15)
- 376. **Pang Dra Yang**, Undergraduate scholar in the President's Distinguished Faculty Mentor Program (9/96 to 6/97)
- 377. **Melanie Yates**, Volunteer (5/15 to 9/15)
- 378. **KC (Kojo) Yeboa**, Life Sciences Summer Undergraduate Research Program (6/10 to 8/10)
- 379. **Jon Yoon**, Volunteer (5/15 to 8/15)
- 380. **Jackie Youtsos**, Honors Thesis Project in Physiology, Undergraduate Research Opportunities Program (3/04 to 6/05)
- 381. **Shawn Zani**, Volunteer (9/09 to 5/11)
- 382. **Maria Zauner**, Volunteer/Life Sciences Summer Undergraduate Research Program, Undergraduate Research Opportunities Program (6/10 to 5/12)
- 383. **JingJing Zhu**, LHI Scholar (6/16 to 8/16)
- 384. **Patrick Zielie**, Pre-med undergraduate student, summa thesis (4/93 to 8/93)
- 385. **Kim Zillig**, Directed research in Biomedical Engineering (1/04 to 6/04)
- 386. **Jenna Zimmerman**, Volunteer (1/10 to 6/14)
- 387. **Shannon Zhou**, Volunteer (9/16 to 7/17)
- 388. **Fu Zurovac**, Directed research (9/03 to 12/05)

#### **CURRENT HIGH SCHOOL STUDENTS**

None

#### **FORMER HIGH SCHOOL STUDENTS**

- 1. **Bobby Gelly**, Volunteer, Mahtomedi High School (6/13 to 8/13)
- 2. **Daniel Geoffrion**, ISEF program via Breck High School (5/05 to 8/05)
- 3. **Nia Jones**, University of Minnesota Health Sciences Minority Program: High School Research Apprentice Program (6/96 to 9/96)
- 4. **Keshav Kohli**, Volunteer (7/08 to 8/09)
- 5. **Sabina Kumar**, Volunteer (5/09 to 5/10)
- 6. **Aamir Mansoor**, Volunteer (2/06 to 5/06)
- 7. **Andrew McCullough**, ISEF program via Breck High School (5/05 to 8/05)
- 8. **Andrew Nelson**, Volunteer via St. Cloud Apollo High School (6/06 to 8/06)
- 9. **Arsalan Radmehr**, Volunteer (Wayzata High School) (6/11 to 12/11)
- 10. **Vidur Sharma**, Volunteer, Eagan High School (6/07 to 8/07, 7/08 to 8/09)
- 11. **Noah Smith**, St. Paul Academy (5/05 to 6/05)
- 12. **Zach Soule**, Volunteer, Blaine High School (7/08 to 8/08)
- 13. **Sally Swanson**, Volunteer, St. Paul Academy (5/05 to 6/05)
- 14. **Mai Der Yang**, LHI Summer Scholar (6/14 to 8/14)

#### **FORMER INTERNATIONAL STUDENTS**

- 1. **Gunter Apelt**, Practicum in Biomedical Engineering from the Fachhochschule Anhalt, Köthen, Germany (5/96 to 7/96)

2. **Eva Geissler**, Physical therapist from Germany (4/05)
3. **Holger Lerche, MD**, Medical student from the University of Munich, Germany (6/93 to 7/93)
4. **Carl Meissner**, Intern from Wohlsdorf, Germany (2003)
5. **Karsten Meissner**, Practicum in Biomedical Engineering from the Fachhochschule Anhalt, Köthen, Germany (7/96 to 10/96)
6. **Susanne Ruff**, Graduate student in Nutritional Sciences from the Technical University of Munich, Germany (5/98 to )
7. **Andrea Sammler**, Graduate student in Nutritional Sciences from the Technical University of Munich, Germany (9/94 to 12/94)
8. **Maria Seewald**, Medical student from the University of Magdeburg, Germany (2/12 to 4/12)

#### **STUDENTS (Initiated programs and then considered other options)**

1. **Mark Hilse**, MS student in Biomedical Engineering, Plan B (1/99 to)
2. **Janice Kruse**, MS student in Biomedical Engineering, Plan B (2/08 to 5/08)
3. **Robert Schmitt**, MS student in Physiology (12/05 to 10/07)
4. **Ryan Scott**, MS student in College of Biological Sciences, Directed Research (1/07 to 8/08)
5. **Hua Sun**, Doctoral student in Biomedical Engineering, Medtronic, MN (1/07 to 6/08)
6. **Samira Tahvildari, MS**, Doctoral student in Biomedical Engineering (5/00 to 8/08)
7. **Meredith Thompson**, Doctoral student in Biomedical Engineering (10/07 to 9/08)

#### **STUDENTS (Member of thesis committees only)**

1. **Devesh Amatya**, Biomedical Engineering, PhD (passed prelim 12/05)
2. **Joseph Anderson**, Mechanical Engineering, MS granted 5/13
3. **Itzhak Zach Attia, PhD**
4. **Paul R. Barratt**, Mechanical Engineering, MS granted 5/99
5. **Kaysie L. Banton, MD**, Surgery, PhD (passed prelim 5/09)
6. **Diana Burns**, Biomedical Engineering, MS granted 1/95
7. **Ricky Chow**, Biomedical Engineering, MS granted 12/09
8. **Razvan Cornea**, Biochemistry, PhD (passed prelim 1/94)
9. **Kelsey Davis**, Mechanical Engineering, MS granted 12/17
10. **Lisa M. Durhman**, Biomedical Engineering, MS granted 8/99
11. **Michelle Fangmeier**, Mechanical Engineering, MS granted 10/02
12. **Juan Feng**, Biomedical Engineering, PhD granted 11/07
13. **Julia Feygin**, Biomedical Engineering, PhD granted 10/07
14. **Stefan Freeman**, Mechanical Engineering, MS granted 9/09
15. **Michael Eggen**, Mechanical Engineering, MS granted 12/05
16. **Vadim Gektin**, Mechanical Engineering, MS granted 12/93; PhD (passed prelim 5/96)
17. **Matthew Geeslin**, Mechanical Engineering, MS granted 12/03
18. **Jesse Geroy**, Mechanical Engineering, MS granted 8/07
19. **Adam Gladen**, Mechanical Engineering, MS granted 6/11
20. **Robert Griffin**, Biophysical Science, PhD granted 6/98
21. **Ghazaleh Haghtashtiani**, Mechanical Engineering, PhD program 2019
22. **Brent T. Harrold**, Mechanical Engineering, MS granted 12/98
23. **Jud Herrig**, Mechanical Engineering, MS granted 3/08
24. **Margaret A. Hartfel**, Mechanical Engineering, PhD granted 2/01
25. **Xiaoming He**, Mechanical Engineering, PhD granted 5/04
26. **Dillon Hodapp**, Mechanical Engineering, MS granted 12/09



27. **Bradley S. Karon**, Biochemistry, PhD granted 8/94
28. **Jason Kelly**, Mechanical Engineering, PhD candidate (2019 to )
29. **Scott Kimmel**, Biomedical Engineering, MS granted 11/04
30. **James Krolnik**, MS-MDI (2018 to )
31. **Brian Krueger**, Mechanical Engineering, MS granted 10/12
32. **John A. Krueger**, Biomedical Engineering, MS granted 9/94
33. **Po-Chih Lee**, Mechanical Engineering, PhD granted 5/19
34. **Jeffery Lind**, Mechanical Engineering, MS granted 4/14
35. **Chenguang Liu**, Biomedical Engineering, PhD granted 12/09
36. **Ryan Mach**, Mechanical Engineering, MS granted 12/04
37. **Michael S. Mata**, Mechanical Engineering, MS granted 5/07
38. **Brian T. McHenry**, Mechanical Engineering, MS granted 5/02
39. **Alexandra M. Naughton**, Aerospace Engineering, MS granted 5/98
40. **Josie Nelson**, Physical Therapy, MS granted 6/02
41. **Julia Neuman**, Mechanical Engineering, MS granted 12/07
42. **Duy Nguyen**, Biomedical Engineering, MS granted 12/04
43. **Brenda Ogle**, Biomedical Engineering, PhD granted 9/00
44. **Deb O'Reilly**, Physical Therapy, MS granted 6/02
45. **E. Michael Ostap**, Biochemistry, PhD granted 8/93
46. **Suku Ponkshe**, Mechanical Engineering, MS granted 5/09
47. **A.J. Reis**, Biomedical Engineering, MS granted 6/97
48. **Spencer Rettler**, Conservation Sciences, Wildlife, PhD program
49. **Chad Ritter**, Physical Therapy, MS granted 6/02
50. **Adam Rivard**, Mechanical Engineering, MS granted 5/04
51. **Cindy Satterness**, Biomedical Engineering, PhD (passed prelim 7/01)
52. **Diane Schebonski**, Mechanical Engineering, MS granted 5/13
53. **Robert Schulzetenberg**, Biomedical Engineering, MS granted 7/16
54. **Colin Sehnert**, Mechanical Engineering, MS granted 9/03
55. **Alexander Shrom**, Biomedical Informatics & Computational Biology, MS granted 5/19
56. **Allan Shuros**, Integrative Biology & Physiology, MS granted 12/11
57. **Jason Sprain**, Biomedical Engineering, MS granted 10/03
58. **Sachin Shah**, Biomedical Engineering, MS granted 7/13
59. **Tom Suszynski**, Biomedical Engineering, MD, PhD granted 8/12
60. **Kevin Thissen**, Mechanical Engineering, MS granted 4/09
61. **David Tkach**, Biological Sciences, MS granted 9/10
62. **Sang Tran**, Biomedical Engineering, MS granted 3/95
63. **Dawn Violette**, Physical Therapy, MS granted 6/02
64. **Rachel Weathers-Pawson**, Mechanical Engineering, PhD (passed prelim 2/01)
65. **Samuel Lee Will**, Mechanical Engineering, MS granted 12/05
66. **Elizabeth Wilson**, Biomedical Engineering, PhD granted 8/19
67. **Terri Wright**, Biomedical Engineering, MS granted 10/01
68. **Jade Erin Wulff**, Biological Sciences, MS granted 7/07
69. **Long Yu**, Biomedical Engineering, PhD granted 11/16
70. **Zhaoye Zhou**, Biomedical Engineering, PhD (passed prelim 9/10)

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## PUBLICATIONS

## ORIGINAL ARTICLES

1. Pozos RS, **Iaizzo PA**, Petry RW: Physiological action tremor of the ankle. *Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology* 52:226-230, 1982. DOI: 10.1152/jappl.1982.52.1.226.
2. Iaizzo PA, Pozos RS: Exercise-induced amplitude modification of physiological action tremor of the ankle. *Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology* 53:1164-1170, 1982. DOI: 10.1152/jappl.1982.53.5.1164.
3. Quinlan JG, Iaizzo PA, Gronert GA, Taylor SR: Use of dantrolene plus multiple pulses to detect stress-susceptible porcine muscle. *Journal of Applied Physiology* 60:1313-1320, 1986. DOI: 10.1152/jappl.1986.60.4.1313.
4. Iaizzo PA, Klein W, Lehmann-Horn F: Fura-2 detected myoplasmic calcium and its correlation with contracture force in skeletal muscle from normal and malignant hyperthermia susceptible pigs. *Pflügers Archive* 411:648-653, 1988. DOI: 10.1007/BF00580861.
5. Iaizzo PA: The effects of temperature on relaxation in frog skeletal muscle. *Pflügers Archive* 412:195-202, 1988. DOI: 10.1007/BF00583750.
6. Oakes SG, Iaizzo PA, Richelson E, Powis G: Histamine-induced intracellular free  $\text{Ca}^{++}$ , inositol phosphates and electrical changes in murine N1E-115 neuroblastoma cells. *Journal of Pharmacology and Experimental Therapeutics* 247:114-121, 1988. PMID: 3262737.
7. Quinlan JG, Iaizzo PA, Lambert EH, Gronert GA: Ankle dorsiflexor twitch properties in malignant hyperthermia. *Muscle & Nerve* 12:119-125, 1989. DOI 10.1002/mus.880120206.
8. Iaizzo PA, Lehmann-Horn F, Taylor SR, Gallant EM: Malignant hyperthermia: effects of halothane on the surface membrane. *Muscle & Nerve* 12:178-183, 1989. DOI: 10.1002/mus.880120303.
9. Iaizzo PA, Lehmann-Horn F: The in vitro determination of susceptibility to malignant hyperthermia. *Muscle & Nerve* 12:184-190, 1989. DOI: 10.1002/mus.880120304.
10. Iaizzo PA, Seewald M, Oakes SG, Lehmann-Horn F: The use of Fura-2 to estimate myoplasmic  $[\text{Ca}^{2+}]$  in human skeletal muscle. *Cell Calcium* 10:151-158, 1989. DOI: 10.1016/0143-4160(89)90069-9.
11. Lanier WL, Iaizzo PA, Milde JH: Cerebral function and muscle afferent activity following intravenous succinylcholine in dogs anesthetized with halothane: the effects of pretreatment with a defasciculating dose of pancuronium. *Anesthesiology* 71:87-95, 1989. DOI: 10.1097/00000542-198907000-00016.
12. Lehmann-Horn F, Iaizzo PA: Resealed fiber segments for the study of the pathophysiology of human skeletal muscle. *Muscle & Nerve* 13:222-231, 1990. DOI: 10.1002/mus.880130309.
13. Iaizzo PA, Lehmann-Horn F: The correlation between electrical after-activity and slowed relaxation in myotonia. *Muscle & Nerve* 13:240-246, 1990. DOI: 10.1002/mus.880130311.
14. Iaizzo PA, Seewald MJ, Powis G, Van Dyke RA: The effects of volatile anesthetics on  $\text{Ca}^{++}$  mobilization in rat hepatocytes. *Anesthesiology* 72:504-509, 1990. DOI: 10.1097/00000542-19900300-00019.
15. Quinlan JG, Iaizzo PA, Gronert GA, Lambert EH: Twitch response in a myopathy with impaired relaxation but no myotonia. *Muscle & Nerve* 13:326-329, 1990. DOI: 10.1002/mus.880130408.
16. Powis G, Seewald MJ, Sehgal I, Iaizzo PA, Olsen RA: Platelet-derived growth factor stimulates non-mitochondrial  $\text{Ca}^{2+}$  uptake and inhibits mitogen-induced  $\text{Ca}^{2+}$  signaling in Swiss 3T3 fibroblasts. *Journal of Biological Chemistry* 265:10266-10273, 1990. PMID: 2113051.

17. Lehmann-Horn F, Iaizzo PA, Franke C, Hatt H, Spanns F: Schwartz-Jampel syndrome: II. Na<sup>+</sup> channel defect causes myotonia. *Muscle & Nerve* 13:528-535, 1990. DOI: 10.1002/mus.880130609.
18. Franke C, Hatt H, Iaizzo PA, Lehmann-Horn F: Characteristics of Na<sup>+</sup> channels and Cl<sup>-</sup> conductance in resealed muscle fibre segments from patients with myotonic dystrophy. *Journal of Physiology* 425:391-405, 1990. DOI: 10.1113/jphysiol.1990.sp018110.
19. Lanier WL, Iaizzo PA, Milde JH: The effects of intravenous succinylcholine on cerebral function and muscle afferent activity following complete ischemia in halothane-anesthetized dogs. *Anesthesiology* 73:485-490, 1990. DOI: 10.1097/00000542-199009000-00019.
20. Iaizzo PA: Histochemical and physiological properties of *Rana temporaria* tibialis anterior and lumbricalis IV muscle fibres. *Journal of Muscle Research and Cell Motility* 11:281-292, 1990. DOI: 10.1007/BF01766666.
21. Quinlan JG, Wedel DJ, Iaizzo PA: Multiple-pulse stimulation and dantrolene in malignant hyperthermia. *Muscle & Nerve* 13:904-908, 1990. DOI: 10.1002/mus.880131003.
22. Iaizzo PA, Olsen RA, Seewald MJ, Powis G, Stier A, Van Dyke RA: Transient increases of intracellular Ca<sup>2+</sup> induced by volatile anesthetics in rat hepatocytes. *Cell Calcium* 11:515-524, 1990. DOI: 10.1016/0143-4160(90)90027-R.
23. Lehmann-Horn F, Iaizzo PA: Are myotonias and periodic paralyses associated with susceptibility to malignant hyperthermia? *British Journal of Anaesthesia* 65:692-697, 1990. DOI: 10.1093/bja/65.5.692.
24. Iaizzo PA, Poppele RE: Twitch relaxation of the cat soleus muscle at different lengths and temperatures. *Muscle & Nerve* 13:1105-1112, 1990. DOI: 10.1002/mus.880131204.
25. Olsen RA, Seewald MJ, Melder DC, Berggren M, Iaizzo PA, Powis G: Platelet-derived growth factor blocks the increase in intracellular free Ca<sup>2+</sup> caused by calcium ionophores and a volatile anesthetic agent in Swiss 3T3 fibroblasts without altering toxicity. *Toxicology Letters* 55:117-125, 1991. DOI: 10.1016/0378-4274(91)90033-3.
26. Wedel DJ, Iaizzo PA, Milde JH: Desflurane is a trigger of malignant hyperthermia in susceptible swine. *Anesthesiology* 74:508-512, 1991. DOI: 10.1097/00000542-199103000-00020.
27. Iaizzo PA, Seewald MJ, Olsen R, Wedel DJ, Chapman DE, Berggren M, Eichinger HM, Powis G: Enhanced mobilization of intracellular Ca<sup>2+</sup> induced by halothane in hepatocytes isolated from swine susceptible to malignant hyperthermia. *Anesthesiology* 74:531-538, 1991. DOI: 10.1097/00000542-199103000-00023.
28. Iaizzo PA, Franke C, Hatt H, Spittelmeister W, Ricker K, Rüdel R, Lehmann-Horn F: Altered sodium channel behaviour causes myotonia in dominantly inherited myotonia congenita. *Neuromuscular Disorders* 1:47-53, 1991. DOI: 10.1016/0960-8966(91)90042-Q.
29. Lehmann-Horn F, Iaizzo PA, Hatt H, Franke C: Altered gating and conductance of Na<sup>+</sup> channels in hyperkalemic periodic paralysis. *Pflügers Archive* 418:297-299, 1991. DOI: 10.1007/BF00370530.
30. Seewald MJ, Eichinger HM, Lehmann-Horn F, Iaizzo PA: Characterization of swine susceptible to malignant hyperthermia by in vivo, in vitro and post-mortem techniques. *Acta Anaesthesiologica Scandinavica* 35:345-349, 1991. DOI: 10.1111/j.1399-6576.1991.tb03303.x.
31. Seewald MJ, Eichinger HM, Iaizzo PA: Malignant hyperthermia: an altered phospholipid and fatty acid composition in muscle membranes. *Acta Anaesthesiologica Scandinavica* 35:380-386, 1991. DOI: 10.1111/j.1399-6576.1991.tb03314.x.

32. Franke C, Iaizzo PA, Hatt H, Spittelmeister W, Ricker K, Lehmann-Horn F: Altered Na<sup>+</sup> channel activity and **reduced** Cl<sup>-</sup> conductance cause hyperexcitability in recessive generalized myotonia (Becker). *Muscle & Nerve* 14:762-770, 1991. DOI: 10.1002/mus.880140811.
33. Iaizzo PA, Wedel DJ, Gallagher WJ: In vitro contracture testing for determination of susceptibility to malignant hyperthermia: a methodological update. *Mayo Clinic Proceedings* 66:998-1004, 1991. DOI: 10.1016/S0025-6196(12)61722-4.
34. Pozos RS, Iaizzo PA: Shivering and pathological and physiological clonic oscillations of the human ankle. *Journal of Applied Physiology* 71:1929-1932, 1991. DOI: 10.1152/jappl.1991.71.5.1929.
35. Lanier WL, Iaizzo PA, Murray MJ: The effects of convective cooling and rewarming on systemic and central nervous system physiology in isoflurane-anesthetized dogs. *Resuscitation* 23:121-136, 1992. DOI: 10.1016/0300-9572(92)90197-K.
36. Iaizzo PA: The effects of halothane and isoflurane on intracellular Ca<sup>2+</sup> regulation in cultured cells with characteristics of vascular smooth muscle. *Cell Calcium* 13:513-520, 1992. DOI: 10.1016/0143-4160(92)90019-O.
37. Iaizzo PA, Pozos RS: Analysis of multiple EMG and acceleration signals of various record lengths as a means to study **pathological** and physiological oscillations. *Electromyography and Clinical Neurophysiology* 32:359-367, 1992. PMID: 1526216.
38. Pozos RS, Iaizzo PA: Effects of topical anesthesia on essential tremor. *Electromyography and Clinical Neurophysiology* 32:369-372, 1992. PMID: 1526217.
39. Deufel T, Müller-Felber W, Pongratz DE, Hübner G, Johnson K, Iaizzo PA, Lehmann-Horn F: Chronic myopathy in a patient suspected of carrying two malignant hyperthermia susceptibility (MHS) mutations. *Neuromuscular Disorders* 2:389-396, 1992. DOI: 10.1016/S0960-8966(06)80010-6.
40. Iaizzo PA, Seewald MJ, Powis G, Van Dyke RA: The effects of sevoflurane on intracellular Ca<sup>2+</sup> regulation in rat hepatocytes. *Toxicology Letters* 66:81-88, 1993. DOI: 10.1016/0378-4274(93)90082-9.
41. Zink RS, Iaizzo PA: Convective warming therapy does not increase the risk of wound contamination in the operating room. *Anesthesia and Analgesia* 76:50-53, 1993. DOI: 10.1213/00000539-199301000-00009.
42. Seewald MJ, Iaizzo PA, Heisswolf E, Eichinger HM: Effects of meat quality and storage on the breakdown of adenosine triphosphate in muscle from swine. *Meat Science* 35:47-61, 1993. DOI: 10.1016/0309-1740(93)90069-T.
43. Wedel DJ, Gammel SA, Milde JH, Iaizzo PA: Delayed onset of malignant hyperthermia induced by isoflurane and desflurane compared with halothane in susceptible swine. *Anesthesiology* 78:1138-1144, 1993. DOI: 10.1097/00000542-199306000-00018.
44. Otten W, Wirth C, Iaizzo PA, Eichinger HM: A high omega 3 fatty acid diet alters the fatty acid composition of heart, liver, kidney, adipose tissue and skeletal muscle in swine. *Annals of Nutrition and Metabolism* 37:134-141, 1993. DOI: 10.1159/000177761.
45. Beebe DS, Gauthier RL, DeMars JJ, Iaizzo PA: Lower extremity hypothermia is beneficial during infra-renal aortic cross-clamping in pigs. *Anesthesia and Analgesia* 77:241-249, 1993. DOI: 10.1213/00000539-199308000-00006.
46. Lanier WL, Iaizzo PA, Milde JH, Sharbrough FW: The cerebral and systemic effects of movement in response to a noxious stimulus in lightly anesthetized dogs. Possible modulation of cerebral function by muscle afferents. *Anesthesiology* 80:392-401, 1994. DOI: 10.1097/00000542-199402000-00019.

47. Iazzo PA, Wedel DJ: Response to succinylcholine in porcine malignant hyperthermia. *Anesthesia and Analgesia* 79:143-151, 1994. DOI: 10.1213/0000539-199407000-00027.
48. Yamada H, Transfeldt EE, Tamaki T, Torres F, Iazzo PA: The effects of volatile anesthetics on the relative amplitudes and latencies of spinal and muscle potentials evoked by transcranial magnetic stimulation. *Spine* 19:1512-1517, 1994. DOI: 10.1097/00007632-199407000-00018.
49. Iazzo PA, Quasthoff S, Lehmann-Horn F: Differential diagnosis of periodic paralysis aided by in vitro myography. *Neuromuscular Disorders* 5:115-124, 1995. DOI: 10.1016/0960-8966(94)00036-9.
50. Wedel DJ, Quinlan JG, Iazzo PA: Clinical effects of intravenously administered dantrolene. *Mayo Clinic Proceedings* 70:241-246, 1995. DOI: 10.1016/S0025-6196(11)64943-4.
51. Yamada H, Transfeldt EE, Tamaki T, Nishiura H, Taylor BA, Torres F, Iazzo PA: General anesthetic effects on compound muscle action potentials elicited by single or dual spinal stimulation. *Journal of Spinal Disorders* 8:157-162, 1995. DOI: 10.1097/00002517-195504000-00011.
52. Lerche H, Fahlke C, Iazzo PA, Lehmann-Horn F: Characterization of the high-conductance Ca(2+)-activated K<sup>+</sup> channel in adult human skeletal muscle. *Pflügers Archive* 429:738-747, 1995. DOI: 10.1007/BF00373997.
53. Verhaegen M, Iazzo PA, Todd MM: A comparison of the effects of hypothermia, pentobarbital, and isoflurane on cerebral energy stores at the time of ischemic depolarization. *Anesthesiology* 82:1209-1215, 1995. DOI: 10.1097/00000542-199505000-00016.
54. Kokate JY, Leland KJ, Held AM, Hansen GL, Kveen GL, Johnson BA, Wilke MS, Sparrow EM, Iazzo PA: Temperature-modulated pressure ulcers: a porcine model. *Archives of Physical Medicine and Rehabilitation* 76:666-673, 1995. DOI: 10.1016/S0003-9993(95)80637-7.
55. Hofer RE, Lanier WL, Iazzo PA: The temporal relationship between intraocular pressure and extraocular muscle activation in cats. *Pflügers Archive* 430:779-786, 1995. DOI: 10.1007/BF00386176.
56. Iazzo PA, Kveen GL, Kokate JY, Leland KJ, Hansen GL, Sparrow EM: Prevention of pressure ulcers by focal cooling: histological assessment in a porcine model. *Wounds: A Compendium of Clinical Research and Practice* 7:161-169, 1995.
57. Lanier WL, Albrecht RF, Iazzo PA: Divergence of intracranial and central venous pressures in lightly anesthetized, tracheally intubated dogs that move in response to a noxious stimulus. *Anesthesiology* 84:605-613, 1996. DOI: 10.1097/00132586-199704000-00027.
58. Iazzo PA, Kehler CH, Zink RS, Belani KG, Sessler DI: Thermal response in acute porcine malignant hyperthermia. *Anesthesia and Analgesia* 82:782-789, 1996. DOI: 10.1097/0000539-199604000-00019.
59. Iazzo PA, Kehler CH, Carr RJ, Sessler DI, Belani KG: Prior hypothermia attenuates malignant hyperthermia in susceptible swine. *Anesthesia and Analgesia* 82:803-809, 1996. DOI: 10.1097/00132586-199704000-00063.
60. Brass TJ, Loushin MK, Day JW, Iazzo PA: An improved method for muscle force assessment in neuromuscular disease. *Journal of Medical Engineering and Technology* 20:67-74, 1996. DOI: 10.3109/03091909609008382.
61. Hansen GL, Sparrow EM, Kamamuri N, Iazzo PA: Assessing wound severity with color and infrared imaging of reactive hyperemia. *Wound Repair and Regeneration* 4:386-392, 1996. DOI: 10.1046/j.1524-475X.1996.40317.x.
62. Janke AW, Kerkow TA, Griffiths HJ, Sparrow EM, Iazzo PA: The biomechanics of gravity-dependent traction of the lumbar spine. *Spine* 22:253-260, 1997. DOI: 10.1097/00007632-199702010-00004.

63. Hansen GL, Sparrow EM, Kokate JY, Leland KJ, Iaizzo PA: Wound status evaluation using color image processing. *IEEE Transactions on Medical Imaging* 16:78-86, 1997. DOI: 10.1109/42.552057.
64. Hartmann S, Otten W, Kratzmair M, Seewald MJ, Iaizzo PA, Eichinger HM: Influences of breed, sex, and susceptibility to malignant hyperthermia on lipid composition of skeletal muscle and adipose tissue in swine. *American Journal of Veterinary Research* 58:738-743, 1997. PMID: 9215450.
65. Otten W, Iaizzo PA, Eichinger HM: Effects of a high n-3 fatty acid diet on membrane lipid composition of heart and skeletal muscle in normal swine and in swine with the genetic mutation for malignant hyperthermia. *Journal of Lipid Research* 38:2023-2034, 1997. PMID: 9374125.
66. Kokate JY, Leland KJ, Sparrow EM, Iaizzo PA: Critical thresholds for pressure ulcer formation in a porcine model. *Wounds: A Compendium of Clinical Research and Practice* 9:111-121, 1997.
67. Chen MF, Niggeweg R, Iaizzo PA, Lehmann-Horn F, Jockusch H: Chloride conductance in mouse muscle is subject to post-transcriptional compensation of the functional Cl<sup>-</sup> channel 1 gene dosage. *Journal of Physiology* 504:75-81, 1997. PMID: 9350619.
68. Hansen GL, Sparrow EM, Kalieta AL, Iaizzo PA: Using infrared imaging to assess the severity of pressure ulcers. *Wounds: A Compendium of Clinical Research and Practice* 10:43-53, 1998.
69. Podein RJ, Iaizzo PA: Applied forces and associated physiological responses induced by axial spinal unloading with the LTX 3000 Lumbar Rehabilitation System. *Archives of Physical Medicine and Rehabilitation* 79:505-513, 1998. DOI: 10.1016/S0003-9993(98)90063-6.
70. McLoon LK, Falkenberg JH, Dykstra D, Iaizzo PA: Doxorubicin chemomyectomy as a treatment for cervical dystonia: histological assessment after direct injection into the sternocleidomastoid muscle. *Muscle & Nerve* 21:1457-1464, 1998. DOI: 10.1002/(SICI)1097-4598(199811)21:11<1457:AID-MUS14>3.0.CO;2-Y.
71. Sigg DC, Houlton AJ, Iaizzo PA: The potential for increased risk of infection due to the reuse of convective air-warming/cooling coverlets. *Acta Anaesthesia Scandinavica* 43:173-176, 1999. DOI: 10.1034/j.1399-6576.1999.430209.x.
72. Shailesh Kumar MV, Carr RJ, Komanduri V, Reardon RF, Beebe DS, Iaizzo PA, Belani KG: Differential diagnosis of thyroid crisis and malignant hyperthermia in an anesthetized porcine model. *Endocrine Research* 25:87-103, 1999. DOI: 10.1080.07435809909066132.
73. Iaizzo PA, Johnson BA, Nagao K, Gallagher WJ: 4-chloro-m-cresol triggers malignant hyperthermia in susceptible swine at doses greatly exceeding those found in drug preparations. *Anesthesiology* 90:1723-1732, 1999. DOI: 10.1097/00000542-199906000-00030.
74. Musley SK, Beebe DS, Komanduri V, **Iaizzo PA**, Belani KG: Hemodynamic and metabolic manifestations of acute endotoxin infusion in pigs with and without the malignant hyperthermia mutation. *Anesthesiology* 91:833-838, 1999. DOI: 10.1097/00000542-199909000-00036.
75. Iaizzo PA, Jeon YM, Sigg DC: Facial warming increases the threshold for shivering. *Journal of Neurosurgical Anesthesiology* 11:231-239, 1999. DOI: 10.1097/00008506-199910000-00002.
76. Brinkmeier H, Krämer J, Krämer R, Iaizzo PA, Baur C, Lehmann-Horn F, Rüdel R: Malignant hyperthermia causing Gly2435Arg mutation of the ryanodine receptor facilitates ryanodine-induced calcium release in myotubes. *British Journal of Anaesthesiology* 83:855-861, 1999. DOI: 10.1093/bja/83.6.855.
77. Sigg DC, Iaizzo PA: Malignant hyperthermia phenotype: hypotension induced by succinylcholine in susceptible swine. *Anesthesiology* 92:1777-1788, 2000. PMID: 10839930.

78. Jurkat-Rott K, Mitrovic N, Hang C, Kouzmekine A, Iaizzo P, Herzog J, Lerche H, Nicole S, Vale-Santos J, Chauveau D, Fontaine B, Lehmann-Horn F: Voltage-sensor sodium channel mutations cause hypokalemic periodic paralysis type 2 by enhanced inactivation and reduced current. *Proceedings of National Academy of Science* 97:9549-9554, 2000. DOI: 10.1073/pnas.97.17.9549.
79. Chinchoy E, Soule CL, Houlton AJ, Gallagher WJ, Hjelle MA, Laske TG, Morissett J, Iaizzo PA: Isolated four-chamber working swine heart model. *Annals of Thoracic Surgery* 70:1607-1614, 2000. DOI: 10.1016/S0003-4975(00)01977-9.
80. Thompson MD, Gallagher WJ, Iaizzo PA, Lanier WL: The effect of chronic dexamethasone-induced hyperglycemia and its acute treatment with insulin on brain glucose and glycogen concentrations in rats. *Anesthesiology* 93:1279-1284, 2000. PMID: 11046217.
81. Harlow HJ, Lohuis T, Beck TD, Iaizzo PA: Muscle strength in overwintering bears. *Nature* 409:997, 2001. DOI: 10.1038/35059165.
82. Falkenberg JH, Iaizzo PA, McLoon LK: Physiological assessment of muscle strength in vitro after direct injection of doxorubicin into rabbit sternocleidomastoid muscle. *Movement Disorders* 16:683-692, 2001. DOI: 10.1002/mds.1125.
83. Sweney MT, Sigg DC, Tahvildari S, Iaizzo PA: Shiver suppression using focal hand warming in unanesthetized normal subjects. *Anesthesiology* 95:1089-1095, 2001. DOI: 10.1097/00000542-200111000-00011.
84. Falkenberg J, Podein RJ, Pardo X, Iaizzo PA: Surface EMG activity of the back musculature during axial spinal unloading using an LTX 3000 Lumbar Rehabilitation System. *Electromyography and Clinical Neurophysiology* 41:419-427, 2001. PMID: 11721297.
85. Sigg DC, Coles JA Jr, Gallagher WJ, Oeltgen PR, Iaizzo PA: Opioid preconditioning: myocardial function and energy metabolism. *Annals of Thoracic Surgery* 72:1576-1582, 2001. DOI: 10.1016/S0003-4975(01)03084-3.
86. Hales J, Larson P, Iaizzo PA: Treatment of adult lumbar scoliosis with axial spinal unloading using the LTX3000 Lumbar Rehabilitation System. *Spine* 27:E71-79, 2002. DOI: 10.1097/00007632-200202010-00012.
87. Day JW, Sakamoto C, Parry GJ, Lehmann-Horn F, Iaizzo PA: Force assessment in periodic paralysis after electrical muscle stimulation. *Mayo Clinic Proceedings* 77:232-240, 2002. DOI: 10.4065/77.3.232.
88. Cardozo RN, Durfee WK, Ardichwili A, Adams C, Erdman AG, Hoey M, Iaizzo PA, Mallick DN, Bar-Cohen A, Beachy R, Johnson A: Experiential education in new product design and business development. *Journal of Product Innovation Management* 19:4-17, 2002. DOI: 10.1111/1540-5885.1910004.
89. Hong JB, Iaizzo PA: Force assessment of the stimulated arm flexors: quantification of contractile properties. *Journal of Medical Engineering & Technology* 26:28-35, 2002. DOI: 10.1080/03091900110099558.
90. Falkenberg JH, Iaizzo PA, McLoon LK: Muscle strength following direct injection of doxorubicin into rabbit sternocleidomastoid muscle in situ. *Muscle & Nerve* 25:735-741, 2002. DOI: 10.1002/mus.10082.
91. Sigg DC, Coles JA Jr, Oeltgen PR, Iaizzo PA: Role of delta-opioid receptors on infarct size reduction in swine. *American Journal of Physiology: Heart and Circulatory Physiology* 282:H1953-1960, 2002. DOI: 10.1152/ajpheart.01045.2001.
92. Lahm R, Iaizzo PA: Physiologic responses during rest on a sleep system at varied degrees of firmness in a normal population. *Ergonomics* 45:798-815, 2002. DOI: 10.1080/00140130210159968.

93. Schulte-Mattler WJ, Müller T, Deschauer M, Gellerich FN, Iaizzo PA, Zierz S: Increased metabolic muscle fatigue is caused by some but not all mitochondrial mutations. *Archives of Neurology* 60:50-58, 2003. DOI: 10.1001/archneur.60.1.50.
94. Christiansen SP, Becker BA, Iaizzo PA, McLoon LK: Extraocular muscle force generation after ricin-mAb35 injection: implications for strabismus treatment. *Journal of American Association for Pediatric Ophthalmology and Strabismus* 7:1-6, 2003. DOI: 10.1067/mpa.2003.S1091853103000569.
95. Coles JA Jr, Sigg, D, Iaizzo PA: Role of kappa-opioid receptor activation in pharmacological preconditioning in swine. *American Journal of Physiology: Heart and Circulatory Physiology* 284:H2091-2099, 2003. DOI: 10.1152/ajpheart.00843.2002.
96. Hilse MA, Erdman AG, Iaizzo PA: Axial unloading therapy device for cervical spine rehabilitation. *Journal of Medical Engineering & Technology* 27:207-217, 2003. DOI: 10.1080/0309190031000096685.
97. Hill AJ, Coles JA Jr, Sigg DC, Laske, TG, Iaizzo PA: Images of the human coronary sinus ostium obtained from isolated working hearts. *Annals of Thoracic Surgery* 76:2108, 2003. DOI: 10.1016/S0003-4975(03)00268-6.
98. He X, McGee S, Coad JE, Schmidlin F, Iaizzo PA, Swanlund DJ, Kluge S, Rudie E, Bischof JC: Investigation of the thermal and tissue injury behaviour in microwave thermal therapy using a porcine kidney model. *International Journal of Hyperthermia* 20:567-593, 2004. DOI: 10.1080/0265673042000209770.
99. Ginz HF, Zorzato F, Iaizzo PA, Urwyler A: Effect of three anaesthetic techniques on isometric skeletal muscle strength. *British Journal of Anaesthesia* 92:367-372, 2004. DOI: 10.1093/bja/ae080.
100. Iaizzo, PA: Temperature modulation of pressure ulcer formation: using a swine model. *WOUNDS: A Compendium of Clinical Research and Practice* 16:336-343, 2004.
101. Hong J, Falkenberg JH, Iaizzo PA: Stimulated muscle force assessment of the sternocleidomastoid muscle in humans. *Journal of Medical Engineering & Technology* 29:82-89, 2005. DOI: 10.1080/03091900412331271158.
102. Hill AJ, Laske TG, Coles JA Jr, Sigg DC, Skadsberg ND, Vincent SA, Soule CL, Gallagher WJ, Iaizzo PA: In vitro studies of human hearts. *Annals of Thoracic Surgery* 79:168-177, 2005. DOI: 10.1016/j.athoracsur.2004.06.080.
103. Hong J, Sigg DC, Coles JA JR, Oeltgen PR, Harlow HJ, Soule CL, Iaizzo PA: Hibernation induction trigger reduces hypoxic damage of swine skeletal muscle. *Muscle & Nerve* 32:200-207, 2005. DOI: 10.1002/mus.20354.
104. Coles JA Jr, Sigg DC, Iaizzo PA: The potential benefits of 1.5% hetastarch as a cardioplegia additive. *Biochemical Pharmacology* 69:1553-1558, 2005. DOI: 10.1016/j.bcp.2005.03.010.
105. Laske TG, Vieau SA, Skadsberg ND, Iaizzo PA: High pacing impedances: are you overtorquing your leads? *Pacing and Clinical Electrophysiology* 28:883-891, 2005. DOI: 10.1111/j.1540-8159.2005.00192.x.
106. Laske TG, Skadsberg ND, Iaizzo PA: A novel ex vivo heart model for the assessment of cardiac pacing systems. *Journal of Biomechanical Engineering* 127:894-898, 2005. DOI: 10.1115/1.2049312.
107. Laske TG, Harlow HJ, Werder JC, Marshall MT, **Iaizzo PA**: High capacity implantable data recorders: system design and experience in canines and denning black bears. *Journal of Biomechanical Engineering* 127:964-971, 2005. DOI: 10.1115/1.2049340.



108. Ginz HF, Iaizzo PA, Girard T, Urwyler A, Pargger H: Decreased isometric skeletal muscle force in critically ill patients. *Swiss Medical Weekly* 135:555-561, 2005. DOI: 2005/37/smw-11139.
109. Laske TG, Skadsberg ND, Hill AJ, Klein GJ, Iaizzo PA: Excitation of the intrinsic conduction system through His and intraventricular septal pacing. *Pacing and Clinical Electrophysiology* 29:397-405, 2006. DOI: 10.1111/j.1540-8159.2006.00360.x.
110. Solá S, Garshelis DL, Amaral JD, Noyce KV, Coy PL, Steer CJ, Iaizzo PA, Rodrigues CM: Plasma levels of ursodeoxycholic acid in black bears, *Ursus americanus*: seasonal changes. *Comparative Biochemistry and Physiology Part C: Toxicology & Pharmacology* 143:204-208, 2006. DOI: 10.1016/j.cbpc.2006.02.002.
111. Xiao YF, TenBroek EM, Wilhelm JJ, **Iaizzo PA**, Sigg DC: Electrophysiological characterization of murine HL-5 atrial cardiomyocytes. *American Journal of Physiology: Cell Physiology* 291:C407-416, 2006. DOI: 10.1152/ajpcell.00020.2006.
112. Hill AJ, Ahlberg SE, Wilkoff BL, Iaizzo PA: Dynamic obstruction to coronary sinus access: the Thebesian valve. *Heart Rhythm* 3:1240-1241, 2006. DOI: 10.1016/j.hrthm.2006.04.013.
113. Sigg DC, Iaizzo PA: In vivo versus in vitro comparison of swine cardiac performance: induction of cardiodepression with halothane. *European Journal of Pharmacology* 543:97-107, 2006. DOI: 10.1016/j.ejphar.2006.06.011.
114. Chromy CA, Carey MT, Balgaard KG, Iaizzo PA: The potential use of axial spinal unloading in the treatment of adolescent idiopathic scoliosis: a case series. *Archive of Physical Medicine and Rehabilitation*, 87:1447-1453, 2006. DOI: 10.1016/j.apmr.2006.08.325.
115. Snedeker JG, Barnstuble BB, Iaizzo PA, Farshad M, Niederer P, Schmidlin FR: A comprehensive renal injury concept based on a validated finite element model of the human abdomen. *Journal of Trauma: Injury, Infection, and Critical Care* 62:1240-1249, 2007. DOI: 10.1097/01.ta.0000215531.05677.19.
116. Lohuis TD, Harlow HJ, Beck TD, Iaizzo PA: Hibernating bears conserve muscle strength and maintain fatigue resistance. *Physiological and Biochemical Zoology* 80:257-269, 2007. DOI: 10.1086/513190.
117. Ahlberg SE, Ripplinger CM, Skadsberg ND, Iaizzo PA, Mulligan LJ: Effects of pacing rate on mechanical restitution within the in vivo canine heart: study of the force-frequency relationship. *Journal of Cardiovascular Electrophysiology*, 18:212-217, 2007. DOI: 10.1111/j.1540-8167.2006.00712.x.
118. Shrivastav M, Iaizzo PA: In vivo cardiac monophasic action potentials recorded using electromyogram needles. *IEEE Biomedical Circuits and Systems Conference*, 2006. DOI: 10.1109/BIOCAS.2006.4600350.
119. Bischoff TC, Martens MD, Adams MH, Gallagher WJ, Iaizzo PA: Measurement of impact loads applied to an implanted drug pump connector in a porcine cadaver specimen. *Journal of Medical Devices* 1:119-125, 2007. DOI: 10.1115/1.2736398.
120. Lü F, Iaizzo PA, Benditt DG, Mehra R, Warman EN, McHenry BT: Isolated atrial segment pacing: an alternative to His bundle pacing after atrioventricular junctional ablation. *Journal of the American College of Cardiology* 49:1443-1449, 2007. DOI: 10.1016/j.jacc.2006.12.034.
121. Ahlberg SE, Hamlen RC, Ewert DL, Iaizzo PA, Mulligan LJ: Novel means to monitor cardiac performance: the impact of the force-frequency and force-interval relationships on recirculation fraction and potentiation ratio. *Cardiovascular Engineering* 7:32-38, 2007. DOI: 10.1007/s10558-007-9023-y.
122. Shrivastav M, Shrivastav R, Iaizzo PA: Following the beat of cardiac potentials. *IEEE Potentials* 26:19-25, 2007. DOI: 10.1109/MP.2007.361640.

123. Anderson SE, Skadsberg ND, Laske TG, Benditt DG, Iaizzo PA: Variation in pacing impedance: impact of implant site and measurement method. *Pacing and Clinical Electrophysiology* 30:1076-1082, 2007. DOI: 10.1111/j.1540-8159-2007.00816.x.
124. Ginz HF, Iaizzo PA, Urwyler A, Pargger H: Use of non-invasive-stimulated muscle force assessment in long-term critically ill patients: a future standard in the intensive care unit? *Acta Anaesthesiologica Scandinavica* 52:20-27, 2008. DOI: 10.1111/j.1399-6576.2007.01427.x.
125. Ahlberg SE, Grenz NA, Ewert DL, Iaizzo PA, Mulligan LJ: Effect of pacing site on systolic mechanical restitution curves in the in vivo canine model. *Cardiovascular Engineering*, 7:89-96, 2007. DOI: 10.1007/s10558-007-9033-9.
126. Anderson SE, Hill AJ, Iaizzo PA: Venous valves: unseen obstruction to coronary sinus. *Journal of Interventional Cardiac Electrophysiology* 19:165-166, 2007. DOI: 10.1007/s10840-007-9161-6.
127. Kimmel MW, Skadsberg ND, Byrd CL, Wright DJ, Laske TG, Iaizzo PA: Single-site ventricular and biventricular pacing: investigation of latest depolarization strategy. *Europace*, 9:1163-1170, 2007. DOI: 10.1093/europace/eum218.
128. Quill JL, Laske TG, Hill AJ, Bonhoeffer P, Iaizzo PA: Images in cardiovascular medicine. Direct visualization of a transcatheter pulmonary valve implantation within the Visible Heart—a glimpse into the future. *Circulation* 116:e548, 2007. DOI: 10.1161/CIRCULATIONAHA.107.728667.
129. Ahlberg SA, Yue AM, Skadsberg ND, Roberts PR, Iaizzo PA, Morgan JM: Investigation of pacing site-related changes in global restitution dynamics by non-contact mapping. *Europace* 10:40-45, 2008. DOI: 10.1093/europace/eum238.
130. Hucker WJ, McCain ML, Laughner JI, Iaizzo PI, Efimov IR: Connexin 43 expression delineates two discrete pathways in the human atrioventricular junction. *Anatomical Record* 291:204-215, 2008. DOI: 10.1002/ar.20631.
131. Liu C, Skadsberg ND, Ahlberg SE, Swingen CM, Iaizzo PA, He B: Estimation of global ventricular activation sequences by noninvasive three-dimensional electrical imaging: validation studies in a swine model during pacing. *Journal of Cardiovascular Electrophysiology* 19:535-540, 2008. DOI: 10.1111/j.1540-8167.2007.1066.x.
132. Iaizzo PA, Hill AJ, Laske TG: Cardiac device testing enhanced by simultaneous imaging modalities: the Visible Heart, fluoroscopy, and echocardiography. *Expert Review of Medical Devices* 5:51-58, 2008. DOI: 10.1586/17434440.5.1.51.
133. Xiao YF, Sigg DC, Ujhelyi MR, Wilhelm JJ, Richardson ES, **Iaizzo PA**: Pericardial delivery of omega-3 fatty acid: a novel approach to reducing myocardial infarct sizes and arrhythmias. *American Journal of Physiology: Heart and Circulatory Physiology* 294:H2212-2218, 2008. DOI: 10.1152/ajpheart.91502.2007.
134. Anderson SE, Quill JL, Iaizzo PA: Venous valves within left ventricular coronary veins. *Journal of Interventional Cardiac Electrophysiology* 23:95-99, 2008. DOI: 10.1007/s10840-008-9282-6.
135. Liu C, Skadsberg ND, Ahlberg SE, Swingen CM, Iaizzo PA, He B: Noninvasive estimation of three-dimensional cardiac electrical activities from body surface potential maps. *Conference Proceedings of IEEE Engineering in Medicine and Biology Society* 2008:4544-4547, 2008. DOI: 10.1109/IEMBS.2008.4650223.
136. Anderson SE, Hill AJ, Iaizzo PA: Microanatomy of human left ventricular coronary veins. *Anatomical Record* 292:23-28, 2009. DOI: 10.1002/ar.20766.
137. Love CJ, Ahlberg SE, Hiniduma-Lokuge P, Brabec S, Iaizzo PA: Novel visualization of intracardiac pacing lead extractions: methodologies performed within isolated canine hearts.

- Journal of Interventional Cardiac Electrophysiology 24:27-31, 2009. DOI: 10.1007/s10840-008-9306-2.
138. Quill JL, Hill AJ, Laske TG, Alfieri O, Iaizzo PA: Mitral leaflet anatomy revisited. *Journal of Thoracic and Cardiovascular Surgery* 137:1077-1081, 2009. DOI: 10.1016/j.jtcvs.2008.10.008.
  139. Whitson BA, Richardson E, Iaizzo PA, Hess DJ: Not every bulb is a rose: a functional comparison of bulb suction devices. *Journal of Surgical Research* 156:270-273, 2009. DOI: 10.1016/j.jss.2009.03.096.
  140. Bandschapp O, Ginz HF, Soule CL, Girard T, Urwyler A, Iaizzo PA: In vitro effects of propofol and volatile agents on pharmacologically induced chloride channel myotonia. *Anesthesiology* 111:584-590, 2009. DOI: 10.1097/ALN.0b013e3181b05f23.
  141. Richardson ES, Whitson BA, Iaizzo PA: A novel combination therapy for post-operative arrhythmias. *Journal of Medical Devices* 3:027511, 2009. DOI: 10.1115/1.3135155.
  142. Skadsberg ND, Kaiser DR, Fischer TM, Iaizzo PA: Global electrophysiological and hemodynamic assessment of ventricular pacing employing non-contact mapping. *Journal of Interventional Cardiac Electrophysiology* 26:185-194, 2009. DOI: 10.1007/s10840-009-9431.6.
  143. Shrivastava D, Hanson T, Kulesa J, DelaBarre L, **Iaizzo P**, Vaughan JT: Radio frequency heating at 9.4T (400.2 MHz): in vivo thermoregulatory temperature response in swine. *Magnetic Resonance in Medicine* 62:888-895, 2009. DOI: 10.1002/mrm.22072.
  144. Anderson SE, Iaizzo PA: Effects of left ventricular lead positions and coronary venous microanatomy on cardiac pacing parameters. *Journal of Electrocardiology* 43:136-141, 2010. DOI: 10.1016/j.jelectrocard.2009.08.002.
  145. Marshall MT, Liao KK, Loushin MK, Iaizzo PA: The effects of temperature on cardiac pacing thresholds. *Pacing and Clinical Electrophysiology* 33:826-833, 2010. DOI: 10.1111/j.1540-8159.2009.02681.x.
  146. Shrivastav M, Iaizzo PA: An interactive graphical user interface for comprehensive analysis of human and swine cardiac monophasic action potential. *Computers in Biology and Medicine* 39:1105-1116, 2009. DOI: 10.1016/j.compbimed.2009.09.005.
  147. Eggen MD, Bateman MG, Rolfes CD, Howard SA, Swingen CM, Iaizzo PA: MRI assessment of pacing induced ventricular dyssynchrony in an isolated human heart. *Journal of Magnetic Resonance Imaging* 31:466-469, 2010. DOI: 10.1002/jmri.22050.
  148. Xiao YF, Chandler N, Dobryzynski H, Richardson ES, Tenbroek EM, Wilhelm JJ, Sharma V, Varghese A, Boyett MR, Iaizzo PA, Sigg DC: Hysteresis in human HCN4 channels: a crucial feature potentially affecting sinoatrial node pacemaking. *Sheng Li Zue Bao* 62:1-13, 2010. PMID: 20179882.
  149. Laske TG, Harlow HJ, Garshelis DL, Iaizzo PA: Extreme respiratory sinus arrhythmia enables overwintering black bear survival—physiological insights and applications to human medicine. *Journal of Cardiovascular Translational Research* 3:559-569, 2010. DOI: 10.1007/s12265-010-9185-7.
  150. Venkatasubramanian RT, Wolkers WF, Sheno MM, Barocas VH, Lafontaine D, Soule CL, Iaizzo PA, Bischof JC: Freeze-thaw induced biomechanical changes in arteries: role of collagen matrix and smooth muscle cells. *Annals of Biomedical Engineering* 38:694-706, 2010. DOI: 10.1007/s10439-010-9921-9.
  151. Lai D, Liu C, Eggen MD, Iaizzo PA, He B: Equivalent moving dipole localization of cardiac ectopic activity in a swine model during pacing. *IEEE Transactions on Information Technology in Biomedicine* 14:1318-1326, 2010. DOI: 10.1109/TITB.2010.2051448.

152. Shrivastava D, Abosch A, Hanson T, Tian J, Gupte A, Iaizzo PA, Vaughan JT: Effect of the extracranial deep brain stimulation lead on radiofrequency heating at 9.4 Tesla (400.2 MHz). *Journal of Magnetic Resonance Imaging* 32:600-607, 2010. DOI: 10.1002/jmri.22292.
153. Richardson ES, Iaizzo PA, Xiao YF: Electrophysiological mechanisms of the anti-arrhythmic effects of omega-3 fatty acids. *Journal of Cardiovascular Translational Research* 4:42-52, 2011. DOI: 10.1007/s12265-010-9243-1.
154. Quill JL, Bateman MG, St. Louis JL, Iaizzo PA: Edge-to-edge repairs of P2 prolapsed mitral valves in isolated swine hearts. *Journal of Heart Valve Disease* 20:5-12, 2011. PMID: 21404891.
155. Bateman MG, Iaizzo PA: Comparative imaging of cardiac structures and function for the optimization of transcatheter approaches for valvular and structural heart disease. *International Journal of Cardiovascular Imaging* 27:1223-1234, 2011. DOI: 10.1007/s10554-011-9807-4.
156. Bandschapp O, Iaizzo PA: Induction of therapeutic hypothermia requires modulation of thermoregulatory defenses. *Therapeutic Hypothermia and Temperature Management* 1:77-85, 2011. DOI: 10.1089/ther.2010.0010.
157. Quill JL, Hill AJ, Menk AR, McHenry BT, Iaizzo PA: Multimodal imaging of a transcatheter aortic valve implantation within an isolated heart. *JACC Cardiovascular Imaging* 4:1138-1139, 2011. DOI: 10.1016/j.jcmg.2011.02.025.
158. Liu C, Iaizzo PA, He B: Three-dimensional imaging of ventricular activation and electrograms from intracavitary recordings. *IEEE Transactions on Biomedical Engineering* 58:868-875, 2011. DOI: 10.1109/TBME.2010.2097598.
159. Anderson SE, Eggum JH, Iaizzo PA: Modeling of induced electric fields as a function of cardiac anatomy and venous pacing lead location. *Cardiovascular Engineering and Technology* 2:399-407, 2011. DOI: 10.1007/s13239-011-0057-3.
160. Eggen MD, Swingen CM, Iaizzo PA: Ex vivo diffusion tensor MRI of human hearts: relative effects of specimen decomposition. *Magnetic Resonance in Medicine* 67:1703-1709, 2012. DOI: 10.1002/mrm.23194.
161. Richardson ES, Rolfes C, Woo OS, Elmquist WF, Benditt DG, Iaizzo PA: Cardiac responses to the intrapericardial delivery of metoprolol: targeted delivery compared to intravenous administration. *Journal of Cardiovascular Translational Research* 5:535-540, 2012. DOI: 10.1007/s12265-011-9315-x.
162. Lai D, Liu C, Eggen MD, Iaizzo PA, He B: Localization of endocardial ectopic activity by means of noninvasive endocardial surface current density reconstruction. *Physics in Medicine and Biology* 56:4161-4176, 2011. DOI: 10.1088/0031-9155/56/13/027.
163. Laske TG, Garshelis DL, Iaizzo PA: Monitoring the wild black bear's reaction to human and environmental stressors. *BMC Physiology* 11:13, 2011. DOI: 10.1186/1472-6793-11-13.
164. Rolfes CD, Howard SA, Goff RP, Iaizzo PA: Cardiac remodeling as a consequence of atrial fibrillation: an anatomical study of perfusion-fixed human heart specimens. *Journal of Geriatric Cardiology* 8:141-146, 2011. DOI: 10.3724/SP.J.1263.2011.00141.
165. Eggum JH, Howard SA, Goff RP, Iaizzo PA: Imaging of a coronary artery stent implantation within an isolated human heart. *Journal of Cardiovascular Translational Research* 5:73-74, 2012. DOI: 10.1007/s12265-011-9322-y.
166. Iaizzo PA, Laske TG, Harlow HJ, McClay CB, Garshelis DL: Wound healing during hibernation by black bears (*Ursus americanus*) in the wild: elicitation of reduced scar formation. *Integrative Zoology* 7:48-60, 2012. DOI: 10.1111/j.1749-4877.2011.00280.x.

167. Bandschapp O, Sweney MT, Miller JA, Tahvildari S, Sigg DC, Iaizzo PA: Induction of mild hypothermia by noninvasive body cooling in healthy, unanesthetized subjects. *Therapeutic Hypothermia and Temperature Management* 1:193-198, 2011. DOI: 10.1089/ther.2011.0006.
168. Faridar A, Bershad EM, Emiru T, Iaizzo PA, Suarez JJ, Divani AA: Therapeutic hypothermia in stroke and traumatic brain injury. *Frontiers in Neurology* 2:80, eCollection 2011. DOI: 10.3389/fneur.2011.00080.
169. Bandschapp O, Soule CL, Iaizzo PA: Lactic acid restores skeletal muscle force in an in vitro fatigue model: are voltage-gated chloride channels involved? *American Journal of Physiology-Cell Physiology* 302:C1019-1025, 2012. DOI: 10.1152/ajpcell.00279.2011.
170. Cressman EN, Geeslin MG, Shenoi MM, Hennings LJ, Zhang Y, Iaizzo PA, Bischof JC: Concentration and volume effects in thermochemical ablation in vivo: results in a porcine model. *International Journal of Hyperthermia* 28:113-121, 2012. DOI: 10.3109/02656736.2011.644621.
171. Cressman EN, Shenoi MM, Edelman TL, Geeslin MG, Hennings LJ, Zhang Y, Iaizzo PA, Bischof JC: In vivo comparison of simultaneous versus sequential injection technique for thermochemical ablation in a porcine model. *International Journal of Hyperthermia* 28:105-112, 2012. DOI: 10.3109/02656736.2011.644620.
172. Shrivastav M, Ghai MB, Singal A, Iaizzo PA: The design and use of an optical mapping system for the study of intracardiac electrical signaling. *Indian Pacing and Electrophysiology Journal* 12:138-151, 2012. PMID: 22912535.
173. Liu C, Eggen MD, Swingen CM, Iaizzo PA, He B: Noninvasive mapping of transmural potentials during activation in swine hearts from body surface electrocardiograms. *IEEE Transactions on Medical Imaging* 31:1777-1185, 2012. DOI: 10.1109/TMI.2012.2202914.
174. Bandschapp O, Goff R, Mallin G, Loushin M, Iaizzo PA: The path of a pulmonary artery catheter visualized through a beating human heart. *American Journal of Respiratory and Critical Care Medicine* 186:385, 2012. DOI: 10.1164/rccm.201112-2227IM.
175. Tsang W, Bateman MG, Weinert L, Pellegrini G, Mor-Avi V, Sugeng L, Yeung H, Patel AR, Hill AJ, Iaizzo PA, Lang RM: Accuracy of aortic annular measurements obtained from three-dimensional echocardiography, CT and MRI: human in vitro and in vivo studies. *Heart* 98:1146-1152, 2012. DOI: 10.1136/heartjnl-2012-302074.
176. Bateman MG, Iaizzo PA: Imaging in the context of replacement heart valve development: use of the Visible Heart® methodologies. *Cardiovascular Diagnosis and Therapy* 2:220-230, 2012. DOI: 10.3978/j.issn.2223-3652.2012.07.01.
177. Howard SA, Bateman MG, Hill AJ, Anderson RH, **Iaizzo PA**: In vitro images of a double orifice mitral valve in a reanimated human heart. *Annals of Thoracic Surgery* 95:1456, 2013. DOI: 10.1016/j.athoracsur.2012.08.061.
178. **Iaizzo PA**, Anderson RH, Hill AJ: The importance of human cardiac anatomy for translational research. *Journal of Cardiovascular Translational Research* 6:6:105-106, 2013. DOI: 10.1007/s12265-012-9419-y.
179. Bateman MG, Quill JL, Hill AJ, Iaizzo PA: The clinical anatomy and pathology of the human atrioventricular valves: implications for repair or replacement. *Journal of Cardiovascular Translational Research* 6:155-165, 2013. DOI: 10.1007/s12265-012-9437-9.
180. Bateman MG, Quill JL, Hill AJ, Iaizzo PA: The clinical anatomy and pathology of the human arterial valves: implications for repair or replacement. *Journal of Cardiovascular Translational Research* 6:166-175, 2013. DOI: 10.1007/s12265-012-9438-8.

181. Spencer JH, Anderson SE, Iaizzo PA: Human coronary venous anatomy: implications for interventions. *Journal of Cardiovascular Translational Research* 6:208-217, 2013. DOI: 10.1007/s12265-012-9443-y.
182. Howard SA, Quill JL, Eggen MD, Swingen CM, Iaizzo PA: Novel imaging of atrial septal defects in isolated human hearts. *Journal of Cardiovascular Translational Research* 6:218-220, 2013. DOI: 10.1007/s12265-013-9451-6.
183. Bandschapp O, Iaizzo PA, Girard T: Malignant hyperthermia: update of diagnostics. *Trends in Anaesthesia and Critical Care* 2:218-223, 2012. DOI: 10.1016/j.tacc.2012.08.001.
184. Spencer J, Fitch E, Iaizzo PA: Anatomical reconstructions of the human cardiac venous system using contrast-computed tomography of perfusion-fixed specimens. *Journal of Visualized Experiments* 74:e50258:1-5, 2013. DOI: 10.3791/50258.
185. Bandschapp O, Iaizzo PA: Pathophysiologic and anesthetic considerations for patients with myotonia congenita or periodic paralyses. *Pediatric Anesthesia* 23:824-833, 2013. DOI: 10.1111/pan.12217.
186. Spencer JH, Quill JL, Bateman MG, Eggen MD, Howard SA, Goff RP, Howard BT, Quallich SG, Iaizzo PA: The benefits of the Atlas of Human Cardiac Anatomy website for the design of cardiac devices. *Expert Review of Medical Devices* 10:729-734, 2013. DOI: 10.1586/17434440.2013.843449.
187. Gladen A, Iaizzo PA, Bischof JC, Erdman AG, Divani AA: A head and neck support device for inducing local hypothermia. *Journal of Medical Devices* 8:0110021-110029, 2014. PMID: 26734117.
188. Freiermuth D, Bandschapp O, Iaizzo PA: Heat production and the importance of temperature management in malignant hyperthermia. *International Journal of Anesthesiology Research*, 1:47-55, 2013. DOI: 10.14205/2310-9394.2013.01.01.6.
189. Spencer JH, Larson AA, Drake R, Iaizzo PA: A detailed assessment of the human coronary venous system using contrast computed tomography of perfusion-fixed specimens. *Heart Rhythm* 11:282-288, 2014. DOI: 10.1016/j.hrthm.2013.10.038.
190. Eggen MD, Bonner MD, Williams ER, Iaizzo PA: Multimodal imaging of a transcatheter pacemaker implantation within a reanimated human heart. *Heart Rhythm* 11:2331-2332, 2014. DOI: 10.1016/j.hrthm.2014.03.052.
191. Spencer JH, Sundaram CC, Iaizzo PA: The relative anatomy of the coronary arterial and venous systems: implications for coronary interventions. *Clinical Anatomy* 27:1023-1029, 2014. DOI: 10.1002/ca.22419.
192. Spencer JH, Prah G, Iaizzo PA: The prevalence of coronary sinus and left circumflex artery overlap in relation to the mitral valve. *Journal of Interventional Cardiology* 27:308-316, 2014. DOI: 10.1111/joic.12106.
193. Goff RP, Bersie SM, Iaizzo PA: In vitro assessment of induced phrenic nerve cryothermal injury. *Heart Rhythm* 11:1779-1784, 2014. DOI: 10.1016/j.hrthm.2014.06.022.
194. Iles TL, Howard B, Howard S, Quallich S, Rolfes C, Richardson E, Iaizzo HR, Iaizzo PA: Testing the efficacy of pharmacological agents in a pericardial target delivery model in the swine. *Journal of Visualized Experiments* 113:e52600:1-7, July 7, 2016. DOI: 10.3791/52600.
195. Quallich SG, Van Heel M, Iaizzo PA: Optimal contact forces to minimize cardiac perforations before, during, and/or after radiofrequency or cryothermal ablations. *Heart Rhythm* 12:291-296, 2015. DOI: 10.1016/j.hrthm.2014.11.028.
196. Howard SA, Quallich SG, Benscoter MA, Holmgren BC, Rolfes CD, Iaizzo PA: Tissue properties of the fossa ovalis as they relate to transseptal punctures: a translational approach. *Journal of Interventional Cardiology* 28:98-108, 2015. DOI: 10.1111/joic.12174.

197. Laske TG, Garshelis DL, Iaizzo PA: Big data in wildlife research: remote web-based monitoring of hibernating black bears. *BMC Physiology* 14:13, 2014. DOI: 10.1186/s12899-014-0013-1.
198. Yang Z, Eggen MD, Marquardt KR, Asleson AJ, McVenes RD, Iaizzo PA: Direct visualization of an atrial transseptal left ventricular endocardial lead implantation within an isolated heart. *Heart Rhythm Case Reports* 1:107-109, eCollection 2015. DOI: 10.1016/j.hrcr.2015.01.001.
199. Spencer JH, Goff RP, Iaizzo PA: Left phrenic nerve anatomy relative to the coronary venous system: implications for phrenic nerve stimulation during cardiac resynchronization therapy. *Clinical Anatomy* 28:621-626, 2015. DOI: 10.1002/ca.22537.
200. Burzotta F, Cook B, Iaizzo PA, Singh J, Louvard Y, Latib A: Coronary bifurcations as you have never seen them: the Visible Heart® Laboratory bifurcation programme. *EuroIntervention* 11 (Suppl V):V40-43, 2015. DOI: 10.4244/EIJV11SVA9.
201. Colbert RW, Holley CT, Stone LH, Crampton M, Adabag S, Garcia S, Iaizzo PA, Ward HB, Kelly RF, McFalls EO: The recovery of hibernating hearts lies on a spectrum: from bears in nature to patients with coronary artery disease. *Journal of Cardiovascular Translational Research* 8:244-252, 2015. DOI: 10.1007/s12265-015-9625-5.
202. Goff RP, Spencer JH, Iaizzo PA: MRI reconstructions of human phrenic nerve anatomy and computational modeling of cryoballoon ablative therapy. *Annals of Biomedical Engineering* 44:1097-1106, 2016. DOI: 10.1007/s10439-015-1379-3.
203. Quallich SG, Goff RP, Iaizzo PA: Direct visualization of induced steam pops during radiofrequency ablation. *Heart Rhythm Case Reports* 1:264-265, eCollection 2015. DOI: 10.1016/j.hrcr.2015.02.012.
204. Ditmer MA, Vincent JB, Werden LK, Tanner, JC, Laske TG, Iaizzo PA, Garshelis DL, Fieberg JR: Bears show a physiological but limited behavioral response to unmanned aerial vehicles. *Current Biology* 25: 2278-2283, 2015. DOI: 10.1016/j.cub.2015.07.024.
205. Howard SA, Goff RP, Benditt DG, Iaizzo PA: Direct visualization of an iatrogenic septal defect in a reanimated human heart. *Heart Rhythm Case Reports* 1:509-510, eCollection 2015. DOI: 10.1016/j.hrcr.2015.08.011.
206. Benscoter MA, Iaizzo PA: Assessing the relative integrity of formed cardiac linear lesions by recording both focal and monophasic action potentials and contact forces: a technical brief. *IEEE Journal of Translational Engineering in Health and Medicine* 3:1900606, eCollection 2015. DOI: 10.1109/JTEHM.2015.2473856.
207. Benscoter MA, Iaizzo PA: Visualization of catheter ablation for atrial fibrillation: impact of devices and anatomy. *World Journal of Cardiology* 7:754-764, 2015. DOI: 10.4330/wjc.v7.i11.754.
208. Ginz HF, Iaizzo PA, Schweikert K, Durfee WK: Isometric skeletal muscle force measurement in primary myopathies. *Muscle & Nerve* 53:913-917, 2016. DOI: 10.1002/mus.24954.
209. Benscoter MA, Avitall B, Iaizzo PA: Visualization of an innovative approach for mitral isthmus ablation. *Journal of Integrative Cardiology (Open access)*, 2015. DOI: 10.15761/JIC.1000139.
210. Quallich SG, Kriege KE, Iaizzo, PA: The effects of radiofrequency or cryothermal ablation on biomechanical properties of isolated human or swine cardiac tissues. *IEEE Journal of Translational Engineering in Health and Medicine* 4:1900105:1-5, eCollection 2016. DOI: 10.1109/JTEHM.2015.2506160.
211. Ditmer MA, Garshelis DL, Noyce KV, Laske TG, Iaizzo PA, Burk TE, Forester JD, Fieberg JR: Behavioral and physiological responses of American black bears to landscape features

- within an agricultural region. *Ecosphere* 6:Article 28 (Open access, 2015). DOI: 10.1890/ES14-00199.1.
212. Omdahl P, Eggen MD, Bonner MD, Iaizzo PA, Wika K: Right ventricular anatomy can accommodate multiple Micra transcatheter pacemakers. *Pacing & Clinical Electrophysiology* 39:393-397, 2016. DOI: 10.1111/pace.12804.
  213. Goff RP, Howard BT, Quallich SG, Iles TL, Iaizzo PA: The novel in vitro reanimation of isolated human and large mammalian heart-lung blocs. *BMC Physiology* 16:4, 2016. DOI: 10.1186/s12899-016-0023-2.
  214. Singal A, Ballard JR, Rudie EN, Cressman ENK, Iaizzo PA: A review of therapeutic ablation modalities. *Journal of Medical Devices* 10:040801-11, 2016. DOI: 10.1115/1.4033876.
  215. Bandschapp O, Hegge TA, Bhargava EA, Ruppen W, Iaizzo PA: Utility of a standardized, multidisciplinary rehabilitation program for chronic low back pain. *JSM Pain and Management* 1(1): 1001 (Open access, April 2016).
  216. Agger P, Stephenson RS, Dobrzynski H, Atkinson A, Iaizzo PA, Anderson RH, Jarvis JC, Allan SL, Partridge JB, Zhao J, Zhang H, MacIver DH: Insights from echocardiography, magnetic resonance imaging, and microcomputed tomography relative to the mid-myocardial left ventricular echogenic zone. *Echocardiography* 33:1546-1556, 2016. DOI: 10.1111/echo.13324.
  217. Iaizzo PA: The Visible Heart® project and free-access website ‘Atlas of Human Cardiac Anatomy.’ *Europace* 18 (Suppl 4):iv163-172, 2016. DOI: 10.1093/europace/euw359.
  218. Loor G, Howard BT, Spratt JR, Mattison LM, Panoskaltsis-Mortari A, Brown RZ, Iles TL, Meyer CM, Helms HR, Price A, Iaizzo PA: Prolonged EVLP using OCS lung: cellular and acellular perfusates. *Transplantation* 101:2303-2311, 2017. DOI: 10.1097/TP.0000000000001616.
  219. Seewald M, Coles Jr JA, Sigg DC, Iaizzo PA: Featured Article: Pharmacological postconditioning with delta opioid attenuates myocardial reperfusion injury in isolated porcine hearts. *Experimental Biology & Medicine* 242:986-995, 2017. DOI: 10.1177/1535370216684041.
  220. Iles TL, Laske TG, Garshelis DL, Iaizzo PA: Blood clotting behavior is innately modulated in *Ursus americanus* during early and late denning relative to summer months. *Journal of Experimental Biology* 220 (Pt 3):455-459, 2017. DOI: 10.1242/jeb.141549.
  221. Goff RP, Quallich SG, Buechler RA, Bischof JC, Iaizzo PA: Determination of cryothermal injury thresholds in tissues impacted by cardiac cryoablation. *Cryobiology* 75:125-133, 2017. DOI: 10.1016/j.cryobiol.2017.01.002.
  222. Laske TG, Iaizzo PA, Garshelis DL: Six years in the life of a mother bear—the longest continuous heart rate recordings from a free-ranging mammal. *Scientific Reports* 7:40732, 2017. DOI: 10.1038/srep40732.
  223. Schmitz A, Mattison L, Iles TL, Iaizzo PA: Novel visualization of coronary stenting techniques and subsequent 3D modeling and printing of deployed devices. *European Society of Cardiology (ESC) Clinical Case Gallery*. Published March 28, 2017. Link: [http://learn.escardio.org/clinicalcase/EACVI/87660996-24e8-4092-82fb-4c345561a234?\\_ga=2.245188933.1308934638.1514967717-1974636603.1456216351](http://learn.escardio.org/clinicalcase/EACVI/87660996-24e8-4092-82fb-4c345561a234?_ga=2.245188933.1308934638.1514967717-1974636603.1456216351).
  224. Spratt JR, Mattison LM, Iaizzo PA, Brown RZ, Helms H, Iles TL, Howard B, Panoskaltsis-Mortari A, Loor G: An experimental study of the recovery of injured porcine lungs with prolonged normothermic cellular ex vivo lung perfusion following donation after circulatory death. *Transplant International* 30:932-944, 2017. DOI: 10.1111/tri.12981.



225. Eryaman Y, Zhang P, Utecht L, Kose K, Lagore RL, DelaBarre L, Kulesa J, Eberly LE, Adriany G, Iles TL, Iaizzo PA, Vaughan JT, Ugurbil K: Investigating the physiological effects of 10.5 Tesla static field exposure on anesthetized swine. *Magnetic Resonance in Medicine* 79:511-514, 2018. DOI: 10.1002/mrm.26672.
226. Atkinson AJ, Kharche SR, Bateman MG, Iaizzo PA, Dobrzynski H: 3D anatomical reconstruction of human cardiac conduction system and simulation of bundle branch block after TAVI procedure. *Conference Proceedings of IEEE Engineering in Medicine and Biology Society* 2016:5583-5586, 2016. DOI: 10.1109/EMBC.2016.7591992.
227. Paun B, Bijnens B, Iles T, Iaizzo PA, Butakoff C: Patient independent representation of the detailed cardiac ventricular anatomy. *Medical Image Analysis* 35:270-287, 2017. DOI: 10.1016/j.media.2016.07.006.
228. Stephenson RS, Atkinson A, Kottas P, Perde F, Jafarzadeh F, Bateman M, Iaizzo PA, Zhao J, Zhang H, Anderson RH, Jarvis JC, Dobrzynski H: High resolution 3-dimensional imaging of the human cardiac conduction system from microanatomy to mathematical modeling. *Scientific Reports* 7:7188, 2017. DOI: 10.1038/s41598-017-07694-8.
229. Vatterott PJ, Eggen MD, Mattson AR, Omdahl PK, Hilpisch KE, Iaizzo PA: Retrieval of a chronically implanted leadless pacemaker within an isolated heart using direct visualization. *Heart Rhythm Case Reports* 4:167-169, 2018. DOI: 10.1016/j.hrcr.2017.11.014.
230. Ditmer MA, Rettler SJ, Fieberg JR, Iaizzo PA, Laske TG, Noyce KV, Garshelis DL: American black bears perceive the risks of crossing roads. *Behavioral Ecology* 29:667-675, 2018. DOI:10.1093/beheco/ary020.
231. Spratt, JR, Mattison LM, Iaizzo PA, Loor G: The ABCs of autologous blood collection for ex vivo organ preservation. *Journal of Thoracic Cardiovascular Surgery* 155:433-435, 2018. DOI: 10.1016/j.jtcvs.2017.08.036.
232. Holm MA, Mattison LM, Vatterott P, Iaizzo PA: Direct visualization of the removal of chronically implanted pacing leads from an unfixed human cadaver. *Heart Rhythm Case Reports* 4:170-172, 2018. DOI: 10.1016/j.hrcr.2017.12.003.
233. Singal A, Mattison LM, Soule CL, Iaizzo PA: Effects of ablation (radio frequency, cryo, microwave) on physiologic properties of the human vastus lateralis. *IEEE Transactions on Biomedical Engineering* 65:2202-2209, 2018. DOI: 10.1109/TBME.2017.2787041.
234. Singal A, Mattison LM, Soule CL, Ballard JR, Rudie EN, Cressman ENK, Iaizzo PA: Assessment of ablative therapies in swine: response of respiratory diaphragm to varying doses. *Annals of Biomedical Engineering* 46:947-959, 2018. DOI: 10.1007/s10439-018-2014-x.
235. Sacco F, Paun B, Lehmkuhl O, Iles TL, Iaizzo PA, Houzeaux G, Vázquez M, Butakoff C, Aguado-Sierra J: Left ventricular trabeculations decrease the wall shear stress and increase the intra-ventricular pressure drop in CFD simulations. *Frontiers in Physiology* 9:458, eCollection 2018. DOI: 10.3389/fphys.2018.00458.
236. Mattson AR, Soto MJ, Iaizzo PA: The quantitative assessment of epicardial fat distribution on human hearts: implications for epicardial electrophysiology. *Clinical Anatomy* 31:661-666, 2018. DOI: 10.1002/ca.23194.
237. Schmidt MM, Hoang T, Iaizzo PA: The ability to reproducibly record cardiac action potentials from multiple anatomic locations: endocardially and epicardially, in situ and in vitro. *IEEE Transactions on Biomedical Engineering* 66:159-164, 2019. DOI: 10.1109/TBME.2018.2835777.
238. Schmidt MM, Iaizzo PA: The Visible Heart® project and methodologies: novel use for studying cardiac monophasic action potentials and evaluating their underlying mechanisms. *Expert Review of Medical Devices* 15:467-477, 2018. DOI: 10.1080/17434440.2018.1493922.

239. Mattson AR, Mattson E, Mesich ML, Yang Z, Iaizzo PA: Electrical parameters for physiologic His-Purkinje pacing vary by implant location in an ex vivo canine model. *Heart Rhythm* 16:443-450, 2019. DOI: 10.1016/j.hrthm.2018.09.009.
240. Laske TG, Evans AL, Arnemo JM, Iles TL, Ditmer MA, Fröbert O, Garshelis DL, Iaizzo PA: Development and utilization of implantable cardiac monitors in free-ranging American black and Eurasian brown bears: system evolution and lessons learned. *Animal Biotelemetry*. 6:13, 2018. DOI: 10.1186/s40317-018-0157-z.
241. Mattson AR, Zhingre Sanchez JD, Iaizzo PA: The fixation tines of the Micra™ leadless pacemaker are atraumatic to the tricuspid valve. *Pacing and Clinical Electrophysiology* 41:1606-1610, 2018. DOI: 10.1111/pace.13529.
242. Iles TL, Quallich SG, Iaizzo PA: Identification of radiofrequency ablation catheter parameters that may induce intracardiac steam pops: direct visualization of elicitation in reanimated swine hearts. *Journal of Cardiovascular Translational Research* 12:250-256, 2019. DOI: 10.1007/s12265-018-9844-7.
243. Spratt JR, Mattison LM, Iaizzo PA, Meyer C, Brown RZ, Iles T, Panoskaltsis-Mortari A, Loo G: Lung transplant after prolonged ex vivo lung perfusion: predictors of allograft function in swine. *Transplant International* 31:1405-1417, 2018. DOI: 10.1111/tri.13315.
244. Sacco F, Paun B, Lehmkuhl O, Iles TL, Iaizzo PA, Houzeaux G, Vázquez M, Butakoff C, Aguado-Sierra J: Evaluating the roles of detailed endocardial structures on right ventricular haemodynamics by means of CFD simulations. *International Journal for Numerical Methods in Biomedical Engineering* 34:e3115, 2018. DOI: 10.1002/cnm.3115.
245. Bateman MG, Durfee WK, Iles TL, Martin CM, Liao K, Erdman AG, Iaizzo PA: Cardiac patient-specific three-dimensional models as surgical planning tools. *Surgery* S0039-6060(18)30843-2, 2019. DOI: 10.1016/j.surg.2018.11.022.
246. Mattson AR, Yang Z, Iaizzo PA: Direct endoscopic visualization of physiologic His bundle pacing and surrounding anatomy within reanimated human hearts employing Visible Heart methodologies. *Heart Rhythm Case Reports* [Open Access, 2019]. DOI: 10.1016/j.hrcr.2019.01.001.
247. Ditmer MA, Werden LK, Tanner JC, Vincent JB, Callahan P, Iaizzo PA, Laske TG, Garshelis DL: Bears habituate to the repeated exposure of a novel stimulus, unmanned aircraft systems. *Conservation Physiology* 7:coy067, eCollection 2019. DOI: 10.1093.conphys/coy067.
248. Holda MK, Zhingre Sanchez JD, Bateman MG, Iaizzo PA: Right atrioventricular valve leaflet morphology redefined: implications for transcatheter repair procedures. *JACC Cardiovascular Interventions* 12:169-178, 2019. DOI: 10.1016/j.jcin.2018.09.029.
249. Schmidt M, Bencotter MA, **Iaizzo PA**: Contact forces required to record monophasic action potentials: a complement to catheter contact force measurement. *IEEE Transactions on Biomedical Engineering* [Epub ahead of print, February 14, 2019]. DOI: 10.1109/TBME.2019.2899554.
250. Barbato E, Lara-Pezzi E, Stolen C, Taylor A, Barton PJ, Bartunek J, Iaizzo P, Judge DP, Kirshenbaum L, Blaxall BC, Terzic A, Hall JL: Advances in induced pluripotent stem cells, genomics, biomarkers, and antiplatelet therapy highlights of the year in JCTR 2013. *Journal of Cardiovascular Translational Research* 7:518-525, 2014. DOI: 10.1007/s12265-014-9555-7.
251. Seewald MS, Gaasedelen EN, Iles TL, Mattison LM, Mattson AR, Schmidt MM, Braun-Dullaeus RC, Iaizzo PA: Effects of ATP administration on isolated swine hearts: implications for ex vivo perfusion and cardiac transplantation. *Experimental Biology & Medicine* 244:915-922, 2019. DOI: 10.1177/1535370219850786.
252. Howard BT, **Iaizzo PA**: Induced functional modulations of isolated large mammalian hearts. *Pflügers Archiv* 471:1095-1101, 2019. DOI: 10.1007/s00424-019-02277-0.
253. Zhingre Sanchez JD, Bateman MG, **Iaizzo PA**: Multimodal imaging of a self-expanding transcatheter aortic valve replacement (TAVR) procedure in a reanimated human heart and post-implant analyses. *The International Journal of Cardiovascular Imaging* [Epub ahead of print, June 2019]. DOI: 10.1007/s10554-019-01645-2.

254. Juhnke B, Mattson AR, Saltzman D, Azakie A, Hoggard E, Ambrose M, **Iaizzo PA**, Erdman A, Fischer G: Use of virtual reality for pre-surgical planning in separation of conjoined twins: a case report. *Proceedings of the Institution of Mechanical Engineers, Part H, Journal of Engineering in Medicine* [Epub ahead of print, September 2019]. DOI: 10.1177/0954411919878067.
255. Gaasedelen E, Deakyne A, **Iaizzo PA**: Automated multiclass cardiac volume segmentation and model generation. *Electrical Engineering and Systems Science*. September 2019. arXiv: 1909.06685.
256. Iles TL, Holm MA, Calvin AD, Moller JH, **Iaizzo PA**: First successful open-heart surgery utilizing cross-circulation in 1954. *Annals of Thoracic Surgery* (in press, 2019).
257. Deakyne AJ, Iles TL, Mattson AR, Iaizzo PA: Virtual prototyping: computational device placements within detailed human heart models. *Applied Sciences* (in press, 2019).
258. Bateman MG, Iles TL, Quallich SG, Shaffer AW, **Iaizzo PA**: Multimodal functional and still imaging of a transplanted human heart reanimated using Visible Heart® methodologies. *Journal of Cardiac Surgery* (in press, 2019/2020).

## TECHNICAL BRIEFS

1. Laske TG, Skadsberg ND, **Iaizzo PA**: Comparative in vivo and ex vivo pacing and sensing performance study using isolated four-chamber working swine heart model. *Engineering in Medicine and Biology Proceedings*, 2002. DOI: 10.1109/IEMBS.2002.1106379.
2. Adams C, Durfee WK, Erdman AG, **Iaizzo PA**, Mallick DN: An experiential approach to preparing students for leadership in managing technology. *Proceedings-Annual Meeting of the Decision Sciences Institute*. 2003:847-851.
3. Shrivastav M, **Iaizzo P**: Discrimination of ischemia and normal sinus rhythm for cardiac signals using a modified k means clustering algorithm. *Conference Proceedings IEEE Engineering in Medicine and Biology Society*. 2007:3856-9. DOI: 10.1109/IEMBS.2007.4353174. DOI:10.1115/SBC2007-176078.
4. Shrivastava D, Hanson T, Schlentz R, Gallagher W, Snyder C, DelaBarre L, Prakash S, **Iaizzo P**, Vaughan JT: MR safety and in vivo thermal characterization of am RF cpo; at 9.4T. *ASME 2007 Summer Bioengineering Conference*. SBC2007-176078:699-700.
5. **Iaizzo PA**: The functional anatomy of human cardiac valves and unique visualization of transcatheter-delivered valves being deployed. *Conference Proceedings of IEEE Engineering in Medicine and Biology Society* 2009:1098-1099, 2009. DOI: 10.1109/IEMBS.2009.5332487.
6. Lai D, Liu C, Eggen MD, **Iaizzo PA**, He B: Cardiac source localization by means of a single moving dipole solution during endocardial pacing in an animal model. *Conference Proceedings of IEEE Engineering in Medicine and Biology Society* 2009:1778-1780, 2009. DOI: 10.1109/IEMBS.2009.5334014.
7. Brusen RM, Rolfes CD, Howard SA, Bateman MG, **Iaizzo PA**: A device and methodology for continuous hypothermic perfusion of explanted large mammalian hearts, followed by in-vitro Langendorff reanimation: pilot studies. *Journal of Medical Devices* 4:027530, 2010. DOI: 10.1115/1.3443733.
8. Durfee W, **Iaizzo P**, Burgstahler B, Ponkshe S: Non-invasive muscle force assessment apparatus for use in the intensive care unit. *Conference Proceedings IEEE Engineering in Medicine and Biology Society*. 2010:5835-8. DOI: 10.1109/IEMBS.2010.5627502.
9. Laske TG, Garshelis DL, **Iaizzo PA**, Carlson D, Jensen R, Stanslaski S, Weiss S, Afshar P, Cong P, Dension T: Instrumentation enabling the chronic assessment of neural activity: a novel case study of hibernation in *Ursus americanus*. *2011 IEEE Biomedical Circuits and systems Conference (BioCAS)*. DOI: 10.1109/BioCAS.2011.6107737.

10. Martel AL, Bateman MG, Iaizzo HR, Hjelle EM, **Iaizzo PA**: The quantification of anatomical dimensions within fixed specimens using echocardiography. *Journal of Medical Devices* 6:017570. DOI:10.1115/1.4026748.
11. Ginz HR, **Iaizzo PA**, Durfee WK: Next generation of a non-invasive stimulated muscle force assessment system to study the ICU patient. *Journal of Medical Devices* 6:017505. DOI:10.1115/1.4026683.
12. Rolfes CD, Quill JL, Bateman MG, Hill AJ, Eggen MD, **Iaizzo PA**: Using the atlas of human cardiac anatomy to aid in the design of cardiac devices. *Journal of Medical Devices* 6:017574. DOI:10.1115/1.4026752.
13. Eggum JH, Goff RP, Benditt DG, **Iaizzo PA**: Left-sided epicardial pacing via a transvenous lead delivery. *Journal of Medical Devices* 6:017527. DOI: 10.1115/1.4026705
- Singal A, Hussain N, Marcaccini R, Weinhaus AJ, **Iaizzo PA**: Conus arteriosus as an alternate pacing site. *Journal of Medical Devices* 7:030902-2, 2013. MED-13-1033. DOI: 10.1115/1.4024493.
14. Jiang C, Goff R, Patana-anake P, **Iaizzo PA**, Bischof J: Irreversible electroporation of cardiovascular cells and tissues. *Journal of Medical Devices* 7:030903-3, 2013. MED-13-1034. DOI: 10.1115/1.4024510.
15. Howard SA, **Iaizzo PA**: 3D assessments of patent foramen ovale within human hearts: insights relative to design considerations for medical devices. *Journal of Medical Devices* 7:030904-2, 2013. MED-13-1035. DOI: 10.1115/1.4024528.
16. Spencer J, Venegoni M, **Iaizzo PA**: 3-dimensional reconstructions of the human coronary artery system using contrast computed tomography of perfusion-fixed specimens. *Journal of Medical Devices* 7:020901-2, 2013. MED-13-1026. DOI: 10.1115/1.4024308.
17. Quallich SG, Goff RP, **Iaizzo PA**: High-speed visualization of steam popos during radiofrequency ablation. *Journal of Medical Devices* 8:020902-2, 2014. MED-14-1031. DOI: 10.1115/1.4027002.
18. Singal A, Soule CL, **Iaizzo PA**: Measurement of biomechanical properties of tissues under uniaxial stress. *Journal of Medical Devices* 8:020905-2, 2014. MED-14-1034. DOI: 10.1115/1.4027005.
19. Singal A, Soule CL, Ballard JR, Cressman EN, **Iaizzo PA**: Physiological tissue response to various ablative modalities. *Journal of Medical Devices* 8:020906-3, 2014. MED-14-1035. DOI: 10.1115/1.4027006.
20. El Haddi S, Singal A, Soule CL, **Iaizzo PA**: Radiofrequency ablation for hepatocellular carcinoma: enhanced ablative responses utilizing adjuvant NaCl pretreatments. *Journal of Medical Devices* 9:030925-2, 2015. MED-15-1081. DOI: 10.1115/1.4030558.
21. Huynh A, Molina Espinosa M, Lobo Fenoglio FL, Singal A, **Iaizzo PA**: Modeling of swine diaphragmatic tissue under uniaxial loading. *Journal of Medical Devices* 9:030950-23, 2015. MED-15-1106. DOI: 10.1115/1.4030580.
22. Singal A, Ronstrom C, Soule CL, Weinhaus A, **Iaizzo PA**: Interspecies differences in electromechanical and histological characteristics of human and swine esophagus. *Journal of Medical Devices* 9:020903-3, 2015. MED-15-1038. DOI: 10.1115/1.4030113.
23. Quallich SG, **Iaizzo PA**: Acute shrinkage of the pulmonary vein ensuing from radiofrequency and cryoablations. *Journal of Medical Devices* 9:020904-2, 2015. MED-15-1039. DOI: 10.1115/1.4030121.
24. Singal A, **Iaizzo PA**: Biomechanical comparison of human and swine cardiovascular tissues. *Journal of Medical Devices* 10:020902-2, 2016. MED-16-1054. DOI: 10.1115/1.4033114.
25. Singal A, Soule CL, **Iaizzo PA**: Tissue necrosis associated with chemical ablations. *Journal of Medical Devices* 10:020925-3, 2016. MED-16-1060. DOI: 10.1115/1.4033120.

26. Mattson AR, Grubac V, Eggen MD, **Iaizzo PA**: Acute perforation properties of the right atrial appendage. *Journal of Medical Devices* 10:020946-2, 2016. MED-16-1068. DOI: 10.1115/1.4033147.
27. Schmidt MM, Franz MR, Laske TG, Steward MT, **Iaizzo PA**: In vitro evaluations of cardiac mapping catheter designs and utilities: employing Visible Heart® methodologies. *Journal of Medical Devices* 10:020956-2, 2016. MED-16-1071. DOI: 10.1115/1.4033150.
28. Mattson L, Spratt J, Howard B, Augustine S, Musley S, Loor G, Iaizzo PA: A simplified model for the assessment of ex vivo lung perfusion methodologies and treatments. *Journal of Medical Devices* 10:020960-2, 2016. MED-16-1078. DOI: 10.1115/1.4033276.
29. Mattison LM, **Iaizzo PA**: A device to aid in quantifying lung compliance and edema. *Journal of Medical Devices* 10:020963-2, 2016. MED-16-1181. DOI: 10.1115/1.4033284.
30. Iles TL, Laske TG, Garshelis DL, Mattison L, Lee B, Eisele V, Gaasedelen E, **Iaizzo PA**: Medtronic Reveal LINQ™ devices provide better understanding of hibernation physiology in the American black bear (*Ursus Americanus*). *Proceedings of the 2017 Design of Medical Devices Conference*. DMD2017-3498. DOI:10.1115/DMD2017-3498.
31. Mattison LM, **Iaizzo PA**: Physiological assessment of cardiac muscle post-irreversible electroporation therapy. *Proceedings of the 2017 Design of Medical Devices Conference*. DMD2017-3542. DOI:10.1115/DMD2017-3542.
32. Mattson AR, Eggen MD, Grubac V, **Iaizzo PA**: Assessing the relationship between right atrial stiffness and chamber pressure to quantitatively define myocardial tensile properties. *Proceedings of the 2017 Design of Medical Devices Conference*. DMD2017-3491. DOI:10.1115/DMD2017-3491.
33. Schmidt MM, **Iaizzo PA**: Time variate comparison of in situ and in vitro monophasic action potential recordings. *Proceedings of the 2017 Design of Medical Devices Conference*. DMD2017-3431. DOI:10.1115/DMD2017-3431.
34. Gaasedelen E, Deakyne A, Iles T, **Iaizzo P**: Using smartphone-based virtual reality to explore internal anatomy of 3D heart models. *Proceedings of the 2017 Design of Medical Devices Conference*. DMD2017-3472. DOI:10.1115/DMD2017-3472.
35. Mattison LM, Johnson C, **Iaizzo PA**: Biomechanical responses of swine esophagus tissue to irreversible electroporation. *Proceedings of the 2018 Design of Medical Devices Conference*. DMD2018-6963. DOI:10.1115/DMD2018-6963.
36. Holm MA, Mattson A, Mattison L, Gaasedelen E, Sanchez JZ, **Iaizzo PA**: A portable ex vivo heart perfusion apparatus for cardiac CT imaging—Visible Heart® mobile. *Proceedings of the 2018 Design of Medical Devices Conference*. DMD2018-6877. DOI:10.1115/DMD2018-6877.
37. Juhnke B, Mattson A, Saltzman D, Azakie A, Hoggard E, Ambrose M, **Iaizzo P**, Erdman, Fischer G: Preparing for conjoined twins separation through virtual reality. *Proceedings of the 2018 Design of Medical Devices Conference*. DMD2018-6895. DOI:10.1115/DMD2018-6895.
38. Holm MA, Gaasedelen E, **Iaizzo PA**: Using WebGL for teaching bone identification. *Proceedings of the 2018 Design of Medical Devices Conference*. DMD2018-6966. DOI:10.1115/DMD2018-6966.
39. Zhingre Sanchez JD, Mattison LM, Bateman MG, **Iaizzo PA**: Computational simulations of ventricular outflow tract obstructions associated with varied replacement valve geometries. *Proceedings of the 2018 Design of Medical Devices Conference*. DMD2018-6916. DOI:10.1115/DMD2018-6916.

40. Gaasedelen E, Deakyne A, **Iaizzo PA**: The application of deep learning for the classification of internal human cardiac anatomy. *Proceedings of the 2018 Design of Medical Devices Conference*. DMD2018-6887. DOI:10.1115/DMD2018-6887.
41. Bateman MG, Iles TL, Jang S, **Iaizzo PA**, Griselli M: The use of 3D printing in the surgical planning of left ventricular assist device placement in pediatric patients with non-compaction. *Proceedings of the 2019 Design of Medical Devices Conference*. DMD2019-3321. DOI: 10.1115/DMD2019-3321.
42. Zhingre Sanchez JD, Schinstock EA, Bateman MG, **Iaizzo PA**: The development and testing of a fixation apparatus for inducing the coaptation of the cardiac atrioventricular valves. *Proceedings of the 2019 Design of Medical Devices Conference*. DMD2019-3298. DOI: 10.1115/DMD2019-3298.
43. Deakyne A, Gaasedelen E, **Iaizzo PA**: A deep learning approach for the automatic identification of the left atrium within CT scans. *Proceedings of the 2019 Design of Medical Devices Conference*. DMD2019-3282. DOI: 10.1115/DMD2019-3282.
44. Holm M, **Iaizzo PA**: Distributions of arterial calcification along transcatheter delivery system pathway. *Proceedings of the 2019 Design of Medical Devices Conference*. DMD2019-3259. DOI: 10.1115/DMD2019-3259.
45. Venezuela T, Bateman M, Iles T, **Iaizzo PA**: Simulating blood flow in healthy swine coronary arteries after bifurcation stenting procedures. *Proceedings of the 2019 Design of Medical Devices Conference*. DMD2019-3292. DOI: 10.1115/DMD2019-3292.

## EDITORIALS

1. **Iaizzo PA**, Lehmann-Horn F: Anesthetic complications in muscle disorders. *Anesthesiology* 82:1093-1096, 1995. PMID: 7741282

## REVIEW ARTICLES

1. **Iaizzo PA**, Palahniuk RJ: Malignant hyperthermia: diagnosis, treatment, genetics and pathophysiology. *Investigative Radiology* 26:1013-1018, 1991. PMID: 1743909
2. **Iaizzo PA**, Palahniuk RJ, Cameron CB, Belani KG: Malignant hyperthermia. *Journal of Anaesthesiology - Clinical Pharmacology* 9:95-104, 1993.
3. Sigg DC, **Hasinoff IK**, **Iaizzo PA**: Prolonged paralysis and muscular weakness in critically ill patients; Part I. *The American Journal of Anesthesiology* 27:265-272, 2000.
4. Sigg DC, **Hasinoff IK**, **Iaizzo PA**: Prolonged paralysis and muscular weakness in critically ill patients: Part II. Neuromuscular blockers. *The American Journal of Anesthesiology* 27:321-328, 2000.
5. Mallick DN, Adams C, Durfee WK, Erdman A, **Iaizzo PA**: An experiential approach to preparing students for leadership in managing technology. *Decision Line*, pages 4-22, July 2004.

## BOOKS

1. **Iaizzo PA** (Editor). *The Handbook of Cardiac Anatomy, Physiology, and Devices*. Humana Press Inc., Totowa, NJ 2005.
2. **Iaizzo PA** (Editor). *The Handbook of Cardiac Anatomy, Physiology, and Devices*, 2<sup>nd</sup> edition. Springer, New York, NY 2009.

3. Sigg DS, **Iaizzo PA**, Xiao YF, He B (Editors). Cardiac Electrophysiology Methods and Models, Springer, Inc. 2010.
  4. **Iaizzo PA**, Bianco RW, Hill AJ, St. Louis JD (Editors). Heart Valves: From Design to Clinical Implantation, Springer Science + Media, New York, NY 2013.
  5. **Iaizzo PA** (Editor). The Handbook of Cardiac Anatomy, Physiology, and Devices, 3rd edition. Springer, New York, NY 2015.
  6. Durfee WK and **Iaizzo PA** (Editors), Medical Device Innovation Handbook, Medical Devices Center, University of Minnesota, 2015.
  7. **Iaizzo PA** (Editor). Engineering in Medicine: Advances and Opportunities, Elsevier, Cambridge, MA 2019.
- 

## BOOK CHAPTERS

1. Pozos RS, **Iaizzo PA**, Danzl DF, Mills W III: Limits of tolerance to cold. In: Handbook of Physiology: Environmental Physiology. Fregly MJ, Blatteis CM (eds.), Oxford University Press, Chapter 25, pages 557-578, 1996.
2. **Iaizzo PA**, Day JW: The potential for complications due to anesthesia in patients with a muscle disorder. In: Progress in Anesthesiology. Dannemiller Memorial Education Foundation, Volume X, Chapter 9, pages 151-172, 1996.
3. **Iaizzo PA**: Methods for monitoring modulations in intracellular  $[Ca^{2+}]$ . In: Anesthesia: Biological Foundations. Yaksh TL, Lynch C III, Zapol WM, Maze M, Biebuyck JF, Saidman LJ (eds.), Raven Press, Chapter 24, pages 399-415, 1997.
4. Sigg D, Hasinoff IK, **Iaizzo PA**: Weakness in the ICU paralysis syndrome: differential diagnosis. In: Progress in Anesthesiology. Dannemiller Memorial Education Foundation, Volume XII, Chapter 8, pages 127-156, 1998.
5. Sigg D, Hausmann ON, Falkenberg JH, **Iaizzo PA**: Low back pain, part I: Anatomy, physiology, and pathophysiology. In: Progress in Anesthesiology, Dannemiller Memorial Education Foundation. Volume XIV, Chapter 8, pages 115-128, 2000.
6. Sigg D, Hausmann ON, Falkenberg JH, **Iaizzo PA**: Low back pain, part II: differential diagnoses and patient evaluation. In: Progress in Anesthesiology, Dannemiller Memorial Education Foundation. Volume XIV, Chapter 10, pages 151-164, 2000.
7. Sigg D, Hausmann ON, Falkenberg JH, **Iaizzo PA**: Low back pain, part III: treatment approaches. In: Progress in Anesthesiology. Dannemiller Memorial Education Foundation, Volume XIV, Chapter 12, pages 183-200, 2000.
8. **Iaizzo PA**: Blood and blood flow. In: Malignant Hyperthermia. Schulte am Esch J, Scholz J, Wappler F (eds.), Pabst Science Publishers, pages 148-153, 2000.
9. Coles JA Jr, Sigg DC, Bittner HB, **Iaizzo PA**: Surgical myocardial protection: Part I. Physiological basis and clinical relevance. In: Progress in Anesthesiology. Dannemiller Memorial Education Foundation, Volume XVI, Chapter 3, pages 35-48, 2002.
10. Sigg, DC, Coles JA, **Iaizzo PA**: Surgical myocardial protection: Part II. From ischemic preconditioning to gene therapy: emerging experimental cardioprotective approaches. In: Progress in Anesthesiology. Dannemiller Memorial Education Foundation, Volume XVI, Chapter 5, pages 63-80, 2002.
11. **Iaizzo PA**: General features of the cardiovascular system. In: The Handbook of Cardiac Anatomy, Physiology, and Devices. Humana Press, Chapter 1, pages 3-11, 2005.
12. Hill AJ, **Iaizzo PA**: Comparative cardiac anatomy. In: The Handbook of Cardiac Anatomy, Physiology, and Devices. Humana Press, Chapter 5, pages 81-91, 2005.

13. Lahm R, **Iaizzo PA**: The coronary system and associated medical devices. In: The Handbook of Cardiac Anatomy, Physiology, and Devices. Humana Press, Chapter 6, pages 93-100, 2005.
14. Chinchoy E, Ujhelyi M, Hill AJ, Skadsberg ND, **Iaizzo PA**: The pericardium. In: The Handbook of Cardiac Anatomy, Physiology, and Devices. Humana Press, Chapter 7, pages 101-110, 2005.
15. Laske TG, **Iaizzo PA**: The cardiac conduction system. In: The Handbook of Cardiac Anatomy, Physiology, and Devices. Humana Press, Chapter 9, pages 123-136, 2005.
16. Fitzgerald K, **Iaizzo PA**: Autonomic nervous system. In: The Handbook of Cardiac Anatomy, Physiology, and Devices. Humana Press, Chapter 10, pages 137-148, 2005.
17. Coles JA Jr, Sigg DC, **Iaizzo PA**: Reversible and irreversible damage of the myocardium: new ischemic syndromes, ischemia/reperfusion injury, and cardioprotection. In: The Handbook of Cardiac Anatomy, Physiology, and Devices. Humana Press, Chapter 12, pages 161-170, 2005.
18. Dupre A, Vincent S., **Iaizzo PA**: Basic ECG theory, recordings and interpretation. In: The Handbook of Cardiac Anatomy, Physiology, and Devices. Humana Press, Chapter 15, pages 191-201, 2005.
19. Loushin MK, **Iaizzo PA**: Mechanical aspects of cardiac performance. In: The Handbook of Cardiac Anatomy, Physiology, and Devices. Humana Press, Chapter 16, pages 203-222, 2005.
20. McManus D, Mahre MA, **Iaizzo PA**: Historical perspective of cardiovascular devices and techniques. In: The Handbook of Cardiac Anatomy, Physiology, and Devices. Humana Press, Chapter 20, pages 273-285, 2005.
21. Laske TG, Legreid A, **Iaizzo PA**: Pacing and defibrillation. In: The Handbook of Cardiac Anatomy, Physiology, and Devices. Humana Press, Chapter 23, pages 323-348, 2005.
22. Skadsberg ND, Laske TG, **Iaizzo PA**: Cardiac mapping systems. In: The Handbook of Cardiac Anatomy, Physiology, and Devices. Humana Press, Chapter 25, pages 361-369, 2005.
23. **Iaizzo PA**: Emerging cardiac devices and technologies. In: The Handbook of Cardiac Anatomy, Physiology, and Devices. Humana Press, Chapter 33, pages 445-457, 2005.
24. Durfee WK and **Iaizzo PA**: Rehabilitation and muscle testing. In: Encyclopedia of Medical Devices and Instrumentation, 2nd edition. John Wiley & Sons, pages 62-71, 2006.
25. **Iaizzo PA**: General features of the cardiovascular system. In: Handbook of Cardiac Anatomy, Physiology, and Devices, 2<sup>nd</sup> edition. Springer, Chapter 1, pages 3-12, 2009.
26. Hill AJ, **Iaizzo PA**: Comparative cardiac anatomy. In: Handbook of Cardiac Anatomy, Physiology, and Devices, 2<sup>nd</sup> edition. Springer, Chapter 6, pages 87-108, 2009.
27. Anderson SE, Lahm R, **Iaizzo PA**: The coronary vascular system and associated medical devices. In: Handbook of Cardiac Anatomy, Physiology, and Devices, 2<sup>nd</sup> edition. Springer, Chapter 7, pages 109-124, 2009.
28. Richardson E, Hill AJ, Skadsberg ND, Ujhelyi M, Xiao YF, **Iaizzo PA**: The pericardium. In: Handbook of Cardiac Anatomy, Physiology, and Devices, 2<sup>nd</sup> edition. Springer, Chapter 8, pages 125-136, 2009.
29. Laske TG, Shrivastav M, **Iaizzo PA**: The cardiac conduction system. In: Handbook of Cardiac Anatomy, Physiology, and Devices, 2<sup>nd</sup> edition. Springer, Chapter 11, pages 159-176, 2009.
30. Fitzgerald K, Wilson RF, **Iaizzo PA**: Autonomic nervous system. In: Handbook of Cardiac Anatomy, Physiology, and Devices, 2<sup>nd</sup> edition. Springer, Chapter 12, pages 177-190, 2009.
31. Coles Jr JA, Sigg DC, **Iaizzo PA**: Reversible and irreversible damage of the myocardium: new ischemic syndromes, ischemia/reperfusion injury, and cardioprotection. In: Handbook of Cardiac Anatomy, Physiology, and Devices, 2<sup>nd</sup> edition. Springer, Chapter 14, pages 219-230, 2009.



32. Dupre A, Vieau SA, **Iaizzo PA**: Basic ECG theory, 12-lead recordings and their interpretation. In: Handbook of Cardiac Anatomy, Physiology, and Devices, 2<sup>nd</sup> edition. Springer, Chapter 17, pages 257-270, 2009.
33. Loushin MK, Quill JL, **Iaizzo PA**: Mechanical aspects of cardiac performance. In: Handbook of Cardiac Anatomy, Physiology, and Devices, 2<sup>nd</sup> edition. Springer, Chapter 18, pages 271-296, 2009.
34. **Iaizzo PA**, Mahre MA: A historical perspective of cardiovascular devices and techniques associated with the University of Minnesota. In: Handbook of Cardiac Anatomy, Physiology, and Devices, 2<sup>nd</sup> edition. Springer, Chapter 23, pages 365-382, 2009.
35. Laske TG, Legreid Dopp AM, **Iaizzo PA**: Pacing and defibrillation. In: Handbook of Cardiac Anatomy, Physiology, and Devices, 2<sup>nd</sup> edition. Springer, Chapter 27, pages 443-474, 2009.
36. Skadsberg ND, He B, Laske TG, **Iaizzo PA**: Cardiac mapping technology. In: Handbook of Cardiac Anatomy, Physiology, and Devices, 2<sup>nd</sup> edition. Springer, Chapter 29, pages 499-510, 2009.
37. Hill AJ, Laske TG, **Iaizzo PA**: Transcatheter valve repair and replacement. In: Handbook of Cardiac Anatomy, Physiology, and Devices, 2<sup>nd</sup> edition. Springer, Chapter 33, pages 561-570, 2009.
38. **Iaizzo PA**: Emerging cardiac devices and technologies. In: Handbook of Cardiac Anatomy, Physiology, and Devices, 2<sup>nd</sup> edition. Springer, Chapter 38, pages 631-644, 2009.
39. **Iaizzo PA**, Laske TG: Anatomy and physiology of the cardiac conduction system. In: Cardiac Electrophysiology Methods and Models. Springer, Chapter 4, pages 73-90, 2010.
40. Skadsberg ND, Hill AJ, **Iaizzo PA**: Isolated heart models. In: Cardiac Electrophysiology Methods and Models. Springer, Chapter 12, pages 249-260, 2010.
41. Bateman M, Howard SA, Rolfes C, Laske TG, **Iaizzo PA**: Cardiac devices and testing. In: Handbook of Medical Technology. Hoffman KP (ed.), Springer, Chapter 43, pages 855-876, 2011.
42. **Iaizzo PA**, Durfee WK: Functional force assessment of skeletal muscles. In: Handbook of Medical Technology. Springer, Chapter 14, pages 273-287, 2011.
43. Rolfes C, Howard S, Goff R, **Iaizzo PA**: Localized drug delivery for cardiothoracic surgery. In: Current Concepts in General Thoracic Surgery. Cagini L (ed.), InTech, Chapter 14, pages 279-303, 2012.
44. Benscoter MA, **Iaizzo PA**: Cardiac pacing: a review chapter. In: Horizons in World Cardiovascular Research. Nova Publishers, Volume 2, 2011.
45. **Iaizzo PA**: Introduction to neurophysiology. In: Handbook of Neural Engineering, 2nd edition. He B (ed.), Springer Science + Business Media, pages 1-86, 2013.
46. Bateman MG, Quill JL, Hill AJ, **Iaizzo PA**: The anatomy and function of the atrioventricular valves. In: Heart Valves: From Design to Clinical Implantation. Springer Science + Business Media, Chapter 1, pages 3-26, 2013.
47. Bateman MG, Quill JL, Hill AJ, **Iaizzo PA**: The anatomy and function of the semilunar valves. In: Heart Valves: From Design to Clinical Implantation. Springer Science + Business Media, Chapter 2, pages 27-44, 2013.
48. Ahlberg SA, Bateman MG, Eggen MD, Quill JL, Richardson ES, **Iaizzo PA**: Animal models for cardiac valve research. In: Heart Valves: From Design to Clinical Implantation. Springer Science + Business Media, Chapter 14, pages 343-358, 2013.
49. Bateman MG, Hill AJ, Quill JL, Eggen MD, Rolfes CD, **Iaizzo PA**: The use of isolated heart models and anatomic specimens as means to enhance the design and testing of cardiac valve

- therapies. In: Heart Valves: From Design to Clinical Implantation. Springer Science + Business Media, Chapter 15, pages 359-380, 2013.
50. Howard SA, Bateman MG, Laske TG, **Iaizzo PA**: Successful development and regulatory approval of replacement cardiac valves. In: Heart Valves: From Design to Clinical Implantation. Springer Science + Business Media, Chapter 16, pages 381-402, 2013.
  51. Mulligan LJ, Lalonde JP, **Iaizzo PA**, Eggen MD: Electro-physiological solutions for cardiac disease. In: Biomedical Technology and Devices, 2<sup>nd</sup> edition. Moore JE and Maitland DJ (eds.), CRC Press, Chapter 22, 2013. DOI: 10.1201/b15085-28
  52. **Iaizzo PA**: General features of the cardiovascular system. In: Handbook of Cardiac Anatomy, Physiology and Devices, 3<sup>rd</sup> edition. Springer, Chapter 1, pages 3-14, 2015.
  53. Hill AJ, **Iaizzo PA**: Comparative cardiac anatomy. In: Handbook of Cardiac Anatomy, Physiology and Devices, 3<sup>rd</sup> edition. Springer, Chapter 6, pages 89-114, 2015.
  54. Bateman MG, Quill JL, Hill AJ, **Iaizzo PA**: Detailed anatomical and functional features of the cardiac veins. In: Handbook of Cardiac Anatomy, Physiology and Devices, 3<sup>rd</sup> edition. Springer, Chapter 7, pages 115-136, 2015.
  55. Spencer JH, Anderson SA, Lahm R, **Iaizzo PA**: The coronary vascular system and associated medical devices. In: Handbook of Cardiac Anatomy, Physiology and Devices, 3<sup>rd</sup> edition. Springer, Chapter 8, pages 137-162, 2015.
  56. Richardson ES, Hill AJ, Skadsberg ND, Ujhelyi M, Xiao YF, **Iaizzo PA**: The pericardium. In: Handbook of Cardiac Anatomy, Physiology and Devices, 3<sup>rd</sup> edition. Springer, Chapter 9, pages 163-174, 2015.
  57. Laske TG, Shrivastav M, **Iaizzo PA**: The cardiac conduction system. In: Handbook of Cardiac Anatomy, Physiology and Devices, 3<sup>rd</sup> edition. Springer, Chapter 13, pages 215-234, 2015.
  58. **Iaizzo PA**, Fitzgerald K: Autonomic nervous system. In: Handbook of Cardiac Anatomy, Physiology and Devices, 3<sup>rd</sup> edition. Springer, Chapter 14, pages 235-250, 2015.
  59. Howard BT, Iles TL, Coles Jr JA, Sigg DC, **Iaizzo PA**: Reversible and irreversible damage of the myocardium: ischemia/reperfusion injury and cardioprotection. In: Handbook of Cardiac Anatomy, Physiology and Devices, 3<sup>rd</sup> edition. Springer, Chapter 16, pages 279-294, 2015.
  60. Vieau S, **Iaizzo PA**: Basic ECG theory, 12-lead recordings and their interpretation. In: Handbook of Cardiac Anatomy, Physiology and Devices, 3<sup>rd</sup> edition. Springer, Chapter 19, pages 321-334, 2015.
  61. Loushin MK, Quill JL, **Iaizzo PA**: Mechanical aspects of cardiac performance. In: Handbook of Cardiac Anatomy, Physiology and Devices, 3<sup>rd</sup> edition. Springer, Chapter 20, pages 335-360, 2015.
  62. **Iaizzo PA**, Mahre MA: Historical perspective of cardiovascular devices and techniques associated with the University of Minnesota. In: Handbook of Cardiac Anatomy, Physiology and Devices, 3<sup>rd</sup> edition. Springer, Chapter 25, pages 439-456, 2015.
  63. Laske TG, Legreid Dopp A, Eggen MD, **Iaizzo PA**: Pacing and defibrillation. In: Handbook of Cardiac Anatomy, Physiology and Devices, 3<sup>rd</sup> edition. Springer, Chapter 30, pages 543-576, 2015.
  64. Skadsberg ND, He B, Laske TG, Ramanathan C, **Iaizzo PA**: Cardiac mapping technology. In: Handbook of Cardiac Anatomy, Physiology and Devices, 3<sup>rd</sup> edition. Springer, Chapter 32, pages 599-614, 2015.
  65. Mattison LM, Laske TG, **Iaizzo PA**: Transcatheter valve repair and replacement. In: Handbook of Cardiac Anatomy, Physiology and Devices, 3<sup>rd</sup> edition. Springer, Chapter 36, pages 671-684, 2015.

66. Bateman MG, Eggen MD, Spencer JH, Iles TL, **Iaizzo, PA**: The use of isolated heart models and anatomic specimens as means to enhance the design and testing of cardiac devices. In: Handbook of Cardiac Anatomy, Physiology and Devices, 3<sup>rd</sup> edition. Springer, Chapter 41, pages 751-764, 2015.
67. Howard SA, Bateman MG, Laske TG, **Iaizzo PA**: Current status of development and regulatory approval of cardiac devices. In: Handbook of Cardiac Anatomy, Physiology and Devices, 3<sup>rd</sup> edition. Springer, Chapter 42, pages 765-776, 2015.
68. **Iaizzo PA**: Cardiac devices and technologies: continued rapid rates of development. In: Handbook of Cardiac Anatomy, Physiology and Devices, 3<sup>rd</sup> edition. Springer, Chapter 44, pages 787-794, 2015.
69. Shaffer AW, Mattison LM, Spratt JR, Iles TL, Kerns N, Bateman MG, Huddleston SJ, Kelly RF, John R, Liao KK, **Iaizzo PA**: A new era for improving cardiothoracic transplantations. In: Engineering in Medicine: Advances and Opportunities. Elsevier, Chapter 3, pages 55-82, 2018.
70. Bateman MG, Iles TL, **Iaizzo PA**: Advancing the design and testing of novel cardiac device technologies using the Visible Heart®. In: Engineering in Medicine: Advances and Opportunities. Elsevier, Chapter 5, pages 119-152, 2018.
71. Mattson AR, Eggen MD, **Iaizzo PA**: The cardiac pacemaker: a crossroads of engineering and medicine. In: Engineering in Medicine: Advances and Opportunities. Elsevier, Chapter 6, pages 153-178, 2018.
72. Mattison LM, Howard BT, **Iaizzo PA**: Electroporation ablative therapy as a clinical tool: an old technology revisited. In: Engineering in Medicine: Advances and Opportunities. Elsevier, Chapter 7, pages 179-200, 2018.
73. Gaasedelen EN, **Iaizzo PA**: 3D graphics to virtual reality in medicine: opportunities and prospective. In: Engineering in Medicine: Advances and Opportunities. Elsevier, Chapter 8, pages 201-218, 2018.
74. Zhingre Sanchez JD, Bateman MG, **Iaizzo PA**: Engineering and technologies associated with cardiac valve repair and replacement therapies. In: Engineering in Medicine: Advances and Opportunities. Elsevier, Chapter 9, pages 219-254, 2018.
75. Holm MA, **Iaizzo PA**: Importance of human cadaver studies in education and medical device research: insights derived from various imaging studies and modalities. In: Engineering in Medicine: Advances and Opportunities. Elsevier, Chapter 10, pages 255-282, 2018.
76. Durfee WK, **Iaizzo PA**: The medical device innovation process. In: Engineering in Medicine: Advances and Opportunities. Elsevier, Chapter 19, pages 495-510, 2018.
77. Durfee WK, **Iaizzo PA**: Educating innovators of medical technologies. In: Engineering in Medicine: Advances and Opportunities. Elsevier, Chapter 20, pages 511-526, 2018.
78. Durfee WK, **Iaizzo PA**: Medical applications of 3D printing. In: Engineering in Medicine: Advances and Opportunities. Elsevier, Chapter 21, pages 527-544, 2018.
79. **Iaizzo PA**, Durfee WK: Creating an environment for developing and testing surgical devices within an academic medical center. In: Success in Academic Surgery: Innovation and Entrepreneurship. Cohen M (ed.), Springer Nature, 2019.

---

## SPECIAL JOURNAL ISSUE

1. **Iaizzo PA**, Anderson RH, Hill, AJ (Guest Editors). *Journal of Cardiovascular Translational Research, Special Issue on Cardiac Anatomy*, Springer Science + Business Media, New York, NY, April 2013.

---

**INVITED ARTICLES**

1. Pozos RS, Stauffer EK, **Iaizzo PA**, Mills W, Howard D, Israel D: Shivering and other forms of tremor. In: Living in the Cold. Heller E (ed.), Elsevier Press, North Holland, Amsterdam, pages 531-537, 1986.
2. Eichinger H, Seewald M, **Iaizzo PA**: Membrane phospholipid concentrations in cardiac and skeletal muscles from normal and malignant hyperthermia susceptible pigs. In: Control and Regulation of Animal Growth. Quirke JF and Schmid H (eds.), EAAP Pub. No. 36, Pudoc, Wageningen, Netherlands, pages 191-200, 1988.
3. **Iaizzo PA**: The pathophysiology of malignant hyperthermia. *Acta Anaesthesiologica Scandinavica* 33:45-47, 1989.
4. Lehmann-Horn F, **Iaizzo PA**: Physiologie der menschlichen skelettmuskulatur: Ergebnisse an routinemäßig entnommenen muskelpuben. In: Malignant Hyperthermia. Mauritz W, Bergmann H, Steinbereithner K (eds.), Beiträge zur Anaesthesiologie und Intensivmedizin 27:19-23, 1989.
5. Lehmann-Horn F, **Iaizzo PA**: Use of fiber segments to investigate the pathophysiology of human skeletal muscle. In: Advances in Neuromuscular Diseases. Serratrice G, Pellissier JF, Desnuelle C, Pouget J (eds.), Expansion Scientifique Francaise, pages 44-50, 1989.
6. Lehmann-Horn F, **Iaizzo PA**: Neuromuscular diseases and their relationship to malignant hyperthermia. In: Advances in Neuromuscular Diseases. Serratrice G, Pellissier JF, Desnuelle C, Pouget J (eds.), Expansion Scientifique Francaise, pages 260-266, 1989.
7. **Iaizzo PA**, Klein W, Lehmann-Horn F: Myoplasmic calcium and contractures in MH susceptible skeletal muscle. In: Malignant Hyperthermia, An Update. Proceedings of the VI Myology Colloquium. Hofmann JG, Schmidt A (eds.), Volk und Gesundheit, Berlin, pages 247-252, 1989.
8. Lehmann-Horn F, Klein W, Hohne E, **Iaizzo PA**: In vitro diagnosis of susceptibility to malignant hyperthermia. In: Malignant Hyperthermia, An Update. Proceedings of the VI Myology Colloquium. Hofmann JG, Schmidt A (eds.), Volk und Gesundheit, Berlin, pages 97-100, 1989.
9. Eichinger HM, Seewald MJ, **Iaizzo PA**: Porcine malignant hyperthermia: new insights into the pathophysiology as it may relate to meat quality. In: *Proceedings* Vol. III ICOMST. Copenhagen, Denmark, pages 1119-1123, 1989.
10. Lehmann-Horn F, **Iaizzo PA**, Franke Ch: Hyperexcitability of muscle fibers in Schwartz-Jampel syndrome. In: The Motor Unit: Physiology, Diseases, Regeneration. Dengler R (ed.), Urban and Schwarzenberg, München, FRG, pages 63-70, 1990.
11. Lehmann-Horn F, Franke Ch, **Iaizzo PA**, Klein W, Spieß-Kiefer C: Erkrankungen der Skelett Muskulatur. In: Entwicklungen in der Neurologie. Struppler A, Dengler R (eds.), TM-Verlag, Hameln, pages 25-29, 1990.
12. Wagner A, **Iaizzo PA**, Lehmann-Horn F: Relation between electrical and mechanical muscle activity in myotonia. *Psychiatry Neurology and Medical Psychology* 42:569-575, 1990.
13. Seewald MJ, Eichinger HM, Powis G, **Iaizzo PA**: Halothane and putative second messenger agents enhance the release of intracellular Ca<sup>2+</sup> in hepatocytes prepared from swine susceptible to malignant hyperthermia. *Meat Science and Technology* 1:473-476, 1991.
14. Lehmann-Horn F, Spittlemeister W, **Iaizzo PA**, Franke Ch: Veränderungen der Muskelzellmembran bei Myotoner Dystrophie. In: Diagnosis und Therapieansätze bei

- Neuromuskulären Krankheiten. Kunze K, Arct A, Thayssen G (eds.), Gustav Fisher Verlag, Stuttgart, pages 38-43, 1992.
15. **Iaizzo PA**: The physiology and biochemistry of skeletal muscle contraction and correlation to malignant hyperthermia. In: Anaesthesia and Pharmacogenetic Diseases: Malignant Hyperthermia. *Minerva Anaesthesiologica* 60:131-136, 1994.
  16. **Iaizzo PA**, Held AM, Zink RS, Williams GW, Leon AS, Palahniuk RJ: Exercise-induced heat stress: passive recovery or subsequent treatment. In: Proceedings of the Sixth International Conference on Environmental Ergonomics. Frim J, Ducharme MB, Tikuisis P (eds.), Government of Canada Catalogue # D2-47/1994E, pages 8-9, 1994.
  17. Shireman BL, Oakes SG, **Iaizzo PA**, Sparrow EM: Laboratory simulations of air jet dynamics found in forced-air warming systems. In: Proceedings of the Sixth International Conference on Environmental Ergonomics. Frim J, Ducharme MB, Tikuisis P (eds.), Government of Canada Catalogue # D2-47/1994E, pages 152-153, 1994.
  18. Seiffert DJ, Oakes SG, Ziaimehr H, Stapf D, **Iaizzo PA**, Sparrow EM: A thermoelectric-based forced -air delivery system to induce controlled changes in body temperatures. In: Proceedings of the Sixth International Conference on Environmental Ergonomics. Frim J, Ducharme MB, Tikuisis P (eds.), Government of Canada Catalogue # D2-47/1994E, pages 118-119, 1994.
  19. Shireman BL, Oakes SG, **Iaizzo PA**, Sparrow EM: A heat flux mannequin instrumented with 28 thermal guarded calorimeters. In: Proceedings of the Sixth International Conference on Environmental Ergonomics. Frim J, Ducharme MB, Tikuisis P (eds.), Government of Canada Catalogue # D2-47/1994E, pages 180-181, 1994.
  20. Kokate J, Leland K, Johnson BA, Kveen G, Oakes SG, Sparrow EM, **Iaizzo PA**: Thermoregulation of the skin in a porcine model. In: Proceedings of the Sixth International Conference on Environmental Ergonomics. Frim J, Ducharme MB, Tikuisis P (eds.), Government of Canada Catalogue # D2-47/1994E, pages 158-159, 1994.
  21. **Iaizzo PA**: Assessment of stimulated muscle force in humans. In: Proceedings of the Tage der Elektrotechnik der Fachhochschule Anhalt. Hoffmann K-P, Weber B (eds.), pages 1-11, 1997.
  22. Schulte-Mattler WJ, **Iaizzo PA**: NIR-Spektroskopie und stimulierte Kraftmessung. Proceedings of the Tage der Elektrotechnik der Fachhochschule Anhalt. Hoffman KP, Weber B (Hrsg.), 1998.
  23. **Iaizzo PA**, Laske TG: The Visible Heart™: The collaborative development and use of this educational tool by the University of Minnesota and Medtronic. *Proceedings of the Second Joint EMBS/BMES Conference Houston TX*, pages 2625-2627, 2002.
  24. Skadsberg ND, Coles Jr JA, **Iaizzo PA**: Electrophysiologic assessment of right ventricular cardiac pacing sites employing non-contact electrical mapping. *International Journal of Bioelectromagnetism* 7:325-328, 2005.
  25. Laske T, Bonhoeffer P, **Iaizzo P**: Visualization of transcatheter valve implantation in isolated human and porcine hearts. 5<sup>th</sup> World Congress of Biomechanics, pages 407-410, 2006.
  26. Shrivastava D, Hanson T, Schlentz R, Gallagher W, Snyder C, DelaBarre L, Prakash S, **Iaizzo P**, Vaughan JT: MR safety and in vivo thermal characterization of an RF coil at 9.4T. ASME 2007 Summer Bioengineering Conference, June 20-24, 2007.

---

## LETTERS TO THE EDITOR

1. Lehmann-Horn F, **Iaizzo PA**: Are myotonias and periodic paralysis associated with susceptibility to malignant hyperthermia? (Correspondence: Reply). *British Journal of Anaesthesia* 67:221-222, 1991.

2. Zink RS, **Iaizzo PA**: Convective warming therapy does not increase the risk of wound contamination in the operating room. *Anaesthesia Digest* 3:9, 1993.
3. **Iaizzo PA**, Sessler: Skeletal muscle is responsible for heat production in porcine malignant hyperthermia (In Response: Letter to the Editor). *Anesthesia and Analgesia* 83:1134, 1996.
4. **Iaizzo PA**, Belani KG, Rosenberg H: VIIIth International workshop on malignant hyperthermia. *The American Journal of Anesthesiology* 24:40, 1997.
5. McLoon L, **Iaizzo PA**, Falkenberg J, Dykstra D: Doxorubicin chemomyectomy as a treatment for cervical dystonia (Reply: Letter to the Editor). *Muscle and Nerve* 22:652-653, 1999.
6. Ginz HF, Bandschapp O, Urwyler A, Girard T, **Iaizzo PA**: Tissue oedema is not associated with skeletal muscle weakness in septic patients. *Acta Anaesthesia Scandinavica* 54:904, 2010. PMID: 20649524
7. Bandschapp O, Soule CL, Urwyler A, **Iaizzo PA**: Excess hydrogen ion in weaning failure: what are the critical tissue levels? *British Journal of Anesthesia*, E-letter published 9/20/10 (<http://bj.a.oxfordjournals.org>).

## UNITED STATES GOVERNMENT PUBLICATIONS

1. Pozos RS, Iaizzo PA, Danzl DF, Mills WJ: Limits of tolerance to hypothermia. Report # A572873, 57 pages, 1993.
2. Pozos RS, Iaizzo PA, Danzl DF: Hypothermia. Report # AA762873, 36 pages, 1993.

## EDUCATIONAL MATERIALS

1. **Iaizzo PA**: Anesthetic complications in patients with skeletal muscle disorders. Practical Reviews in Anesthesiology: *Educational Reviews Audio Program*, March 1997.
2. **Iaizzo PA**, Principal Investigator, The Visible Heart™: A New View Into the Heart. Demonstration CD, **Version 1.0**, University of Minnesota and Medtronic, November 1999.
3. **Iaizzo PA**, Principal Investigator, The Visible Heart™ Viewer. Demonstration CD, University of Minnesota and **Medtronic**, PACE, Volume 23, April 2000.
4. **Iaizzo PA**, Principal Investigator, The Visible Heart™ Viewer. Educational CD, Version 1.1, University of Minnesota and Medtronic, December 2000.
5. "The Bear Evidence," 50-minute film produced by Henson International Television, shown on National **Geographic** International, Fall 2001.
6. **Iaizzo PA**, Principal Investigator, The Visible Heart CD Version 1.0, University of Minnesota and Medtronic, 2002.
7. "Waking up hibernating bears in Washington State," taped interview for National Public Radio, October 22, 2003. <http://www.npr.org/run downs/segment.php?wfId=1474914>
8. **Iaizzo PA**, Principal Investigator, The Visible Heart™ Viewer. Educational CD, Version 1.2, University of Minnesota and Medtronic, 2004.
9. Atlas of Human Cardiac Anatomy: a Web based textbook ([www.vhlab.umn.edu/atlas](http://www.vhlab.umn.edu/atlas)), 2005.
10. Ellenbogen KA, Kay GN, Wilkoff BL (eds.). Clinical Cardiac Pacing and Defibrillation, 2<sup>nd</sup> edition. WB Saunders Company, Philadelphia, PA, 2006. Visible Heart pictures are featured in this book.
11. **Iaizzo PA**: U.S. History, 1865 to the Present. Educational CD, Firm Foundations and New Perspectives, Osher Lifelong Learning Institute, College of Continuing Education, University of Minnesota. Presentation on "Technological and Medical Advancements," 2006.

12. **Iaizzo PA**, Principal Investigator, The Atlas of Human Cardiac Anatomy: Interactive Learning Tool Video Clips; CD Version, University of Minnesota and Medtronic, 2002.

## WEBSITES

1. Visible Heart® Laboratories (<http://www.vhlab.umn.edu/index.html>)
2. Visible Heart website (<http://www.visibleheart.com>)
3. Atlas of Human Cardiac Anatomy (<http://www.vhlab.umn.edu/atlas>)
4. Surgery (<https://www.surgery.umn.edu/research/research-groups>)
5. Integrative Biology & Physiology, Graduate Faculty  
(<https://www.physiology.umn.edu/degrees-and-programs/graduate-program/IBP-graduate-faculty>)
6. Carlson School of Management (<https://carlsonschool.umn.edu>)
7. Malignant Hyperthermia Diagnostic Center (<http://www.vhlab.umn.edu/clinical>)
8. Biomedical Engineering, Graduate Faculty (<https://cse.umn.edu/bme/graduate-program>)
9. Mechanical Engineering, Affiliate Senior Member (<http://www.me.umn.edu/index.shtml>)
10. Neuroscience (<http://www.neuroscience.umn.edu/alphabetical-faculty-list#I>)
11. Lillehei Heart Institute (<http://www.heart.umn.edu/bio/lhi-administration/paul-iaizzo>)
12. Design of Medical Devices Conference (<http://www.dmd.umn.edu/contact.html>)
13. Institute for Engineering in Medicine (<http://www.iem.umn.edu/about/administration.html>)
14. Medical Devices Center (<http://www.mdc.umn.edu/mdc/board.html>)
15. Advanced Cardiac Physiology & Anatomy course (<https://www.physiology.umn.edu/degrees-and-programs/industry-professionals/phsl-5510-cardiac-short-course>)
16. New Product Design & Business Development  
(<http://carlsonschool.umn.edu/departments/strategic-management-entrepreneurship-department/academic-programs/new-product-design>)
17. Paul and Sheila Wellstone Muscular Dystrophy Center (<http://www.mdcenter.umn.edu/about-us/our-faculty>)
18. Health Sciences (<https://www.health.umn.edu/people>)
19. Minnesota Supercomputing Institute  
(<https://www.msi.umn.edu/pi/5b97f34cfbc223870930210f798ae183/26198>)
20. Award for Outstanding Contributions to Postbaccalaureate, Graduate, and Professional Education, 2002 (<http://www.scholarswalk.umn.edu/awards/aoce/gradprof.html>)
21. Academy of Distinguished Teachers, Medical School, 2002 (<http://www.adt.umn.edu/>)

## MEDIA PRESENTATIONS OR INTERVIEWS (<http://www.vhlab.umn.edu/media>)

1. "Hyperthermia," Simply Science, KARE 11 News, August 1998.
2. "The bear evidence," 50-minute film produced by Henson International Television and shown on National Geographic International, Fall 2001.
3. "Those cuddly Camp Ripley bears," Minnesota Video Vault, March 14, 2003.  
[http://www.mnvideovault.org/mpml\\_player\\_embed.php?vid\\_id=410&select\\_index=4](http://www.mnvideovault.org/mpml_player_embed.php?vid_id=410&select_index=4)
4. "Waking up hibernating bears in Washington State," National Public Radio, October 22, 2003.
5. "Sleeping it off: how animals use hibernation and other cold-weather survival strategies to stay alive," Science Daily, January 11, 2005.  
<http://www.sciencedaily.com/releases/2005/01/050111152415.htm>

6. "Device and conquer," University of Minnesota Pictures of Health (Academic Health Center), March 9, 2005.
7. "Apollo health career students visit research lab," St. Cloud School District 742, October 12, 2005.
8. "Tech Talk: Medical devices," Minnesota Public Television, January 29, 2006.  
<http://techtalk.umn.edu/episodes/season4/411.shtml>
9. "Camp Ripley," On the Road with Jason Davis, KSTP 5 Eyewitness News ABC, May 20, 2007. [http://www.minnesotanationalguard.org/camp\\_ripley/index.php](http://www.minnesotanationalguard.org/camp_ripley/index.php)
10. "Real hearts, remarkable images," April 1, 2008. <http://drwes.blogspot.com/2008/04/real-hearts-remarkable-images.html>
11. "The Visible Heart lab," KSTP 5 Eyewitness News ABC, April 29, 2008.  
<http://kstp.com/article/stories/S428535.shtml>
12. "Visualizing the beating heart," ReachMD (Radio XM157), May 26, 2008.  
<http://www.testMD.com/xmsegment.aspx?sid=2952>
13. "Opioids, fish oils, and hibernating bears," ReachMD (Radio XM157), May 19, 2008.  
<http://www.testMD.com/xmsegment.aspx?sid=2953>
14. "U lab puts human hearts in the hands of fairgoers to spark interest in science," August 28, 2008.
15. "10 lessons medicine can learn from bears," Scientific American, January 6, 2009.  
<http://www.scientificamerican.com/article.cfm?id=bear-hibernation-science>
16. "Black bear research may revolutionize medicine," Bear Smart Society, March 9, 2010.
17. "Learning from the bears," Northland Outdoors, March 14, 2010.
18. "U researchers get inside look at the heart," Minnesota Daily, April 29, 2010.
19. "Visible Heart laboratory," Minnesota Daily/youtube, April 30, 2010.  
<http://www.youtube.com/watch?v=VS22U4S8G1c>
20. "Can dormant bears help us heal?" Minneapolis Star Tribune, December 26, 2010.
21. "U of M bear study could help critical care patients," KSTP 5 Eyewitness News ABC, January 6, 2011.
22. "Good Question: How does hibernation work?" WCCO CBS, January 20, 2011.  
<http://minnesota.cbslocal.com/2011/01/20/good-question-how-does-hibernation-work/>
23. "Bringing dead hearts back to life—Horizon: How to mend a broken heart—BBC Two," February 14, 2011. <http://www.youtube.com/watch?v=Fi7cb449Xjc>
24. "Collaboration: the heart of scientific discovery," University of Minnesota Academic Health Center, February 23, 2011.
25. "A look inside: the Visible Heart® laboratory seeks solutions for muscle atrophy," University of Minnesota Academic Health Center, February 23, 2011.
26. "Photos: Bear research in northwestern Minnesota," Minnesota Public Radio News, March 15, 2011. <http://minnesota.publicradio.org/display/web/2011/03/14/photos-bear-researcher/>
27. "Understanding bears could help us survive heart attacks, researchers say," MPR News, June 7, 2011. <http://www.mprnews.org/story/2011/06/07/hibernating-bears>
28. "Beware the black bear—even if it looks asleep," The Independent, UK, August 17, 2011.  
<http://www.independent.co.uk/news/science/beware-the-black-bear-ndash-even-if-it-looks-asleep-2338815.html>
29. "Cutting edge research being done at U of M lab filled with hearts," Kare 11 News NBC, October 25, 2011.



30. "Minnesota sounds and voices: Paul Iaizzo is the Visible Heart lab's beating core," Minnesota Public Radio, January 27, 2012. <http://www.mprnews.org/story/2012/01/27/minnesota-sounds-and-voices-visible-heart-lab>
31. "Where engineering meets imagination," IEEE Engineering in Medicine & Biology Society, April 15, 2012.
32. "Laboratory Profiles: Visible Heart Laboratory," IEEE Engineering in Medicine & Biology Society, June 26, 2012. <http://www.embs.org/videos/laboratory-profiles/>
33. "Black bear: medical marvel," University of Minnesota Medical School, Medical Bulletin, October 29, 2012.
34. "Inside the beating heart," University of Minnesota Medical School, Medical Bulletin, October 29, 2012.
35. "Minnesota in photos, MPR photos of the year," Minnesota Public Radio, December 22, 2012. <http://www.mprnews.org/story/2012/12/21/mpr-photos-of-the-year#fig-107892>
36. "Next generation of lifesaving devices could come from conference at U of M," KSTP, April 9, 2013.
37. "Whole body donations help teach future doctors," WCCO, August 5, 2013. <http://minnesota.cbslocal.com/2013/08/05/anatomy-bequests-help-teach-future-doctors/>
38. "Why Paul Iaizzo does what he does," Academic Health Center, University of Minnesota, October 14, 2013. <http://www.youtube.com/watch?v=o8zIIEHsBt0>
39. "Midwest's first breathing lung transplant performed at University of Minnesota Medical Center, Fairview," University of Minnesota Health Talk, November 22, 2013. <http://www.healthtalk.umn.edu/2013/11/22/umn-breathing-lung-transplant/>
40. "U of M researches connection between black bears and human heart health," KSTP, January 7, 2014.
41. "Dr. Paul Iaizzo discusses the Visible Heart Lab at the University of Minnesota," Lillehei Heart Institute, February 27, 2014. <https://www.youtube.com/watch?v=QHxC6CBn-d4>
42. "An underground lab at the heart of cardiovascular innovation," May 1, 2014.
43. "TCT innovation update 2014," September 17, 2014. <http://www.tctmd.com/multimedia/?section=/video/interviews/2014/79e0ce7a4eb84786adc832ff9970eb92>  
<http://www.tctmd.com/multimedia/?section=/video/interviews/2014/b7f0e1c88b1c43dda6dfa17d6cc9479f>
44. "ICI Meeting 2014—Academy Day," January 5, 2015. <https://www.youtube.com/watch?v=UgCo1qDoJp0>
45. "From the lab to the north woods," University of Minnesota Foundation, January 28, 2015.
46. "The big sleep," Scholastic, February 2, 2015.
47. "Bear study teams DNR, Medtronic and University of Minnesota researchers," Grand Forks Herald, March 14, 2015.
48. "Turns out that Medtronic is really interested in bears," Qmed, March 17, 2015. <http://www.qmed.com/mpmn/medtechpulse/turns-out-medtronic-really-interested-bears>
49. "University of Minnesota researcher has one of the first 'bioprinters' using living tissue," Minneapolis Star Tribune, May 21, 2015. <http://www.startribune.com/university-of-minnesota-researcher-has-one-of-the-first-bioprinters-using-living-tissue/304654771/>
50. "Made to order," University of Minnesota Medical School, Medical Bulletin, October 19, 2015. <http://www.med.umn.edu/news-events/medical-bulletin/made-order>
51. "Next big thing: 3D printing," KARE 11, February 9, 2016. <http://www.kare11.com/news/next-big-thing-3d-printing/37756290>

52. "How 3-D imaging could change heart surgery in the future," The Washington Post, February 22, 2016. [https://www.washingtonpost.com/national/health-science/how-3-d-imaging-could-change-heart-surgery-in-the-future/2016/02/22/48f28a44-cf62-11e5-88cd-753e80cd29ad\\_story.html](https://www.washingtonpost.com/national/health-science/how-3-d-imaging-could-change-heart-surgery-in-the-future/2016/02/22/48f28a44-cf62-11e5-88cd-753e80cd29ad_story.html)
53. "U of M experts share innovative research at Red Wing Golf Club," University of Minnesota Foundation Sparks Series, March 28, 2016. <http://www.republican-eagle.com/news/3995108-u-m-experts-share-innovative-research-red-wing-golf-club>
54. "3D printed hearts are a model teaching tool at U of M," KARE 11, March 29, 2016. <http://www.kare11.com/news/3d-printed-hearts-are-a-model-teaching-tool-at-u-of-m/101999972>
55. "To repair Karlie's weakened heart, her care team turned to a 3-D printer," Mhealth, April 6, 2016.
56. "3D printing gives doctors a new view," KARE 11, April 15, 2016. <http://www.kare11.com/news/3d-printing-gives-doctors-a-new-view/135852297>
57. "U scientists recreate woman's aorta with 3-D printer," WCCO, May 26, 2016. <http://minnesota.cbslocal.com/2016/05/26/scientists-recreate-heart-3d-printer/>
58. "At heart lab, anatomy gains new perspective," Minnesota Daily, July 13, 2016.
59. "Studying the heart, hands-on," Inquiry, July 18, 2016. <https://inquiry.research.umn.edu/2016/07/18/studying-the-heart-hands-on/>
60. "This reanimated heart footage is amazing," QMED, August 4, 2016. <http://www.qmed.com/mpmn/medtechpulse/reanimated-heart-footage-amazing>
61. "Minnesota is re-animating dead pig hearts for science: LiveBIG," Big Ten Network LiveBIG, August 11, 2016. <http://btn.com/2016/08/11/minnesota-is-re-animating-dead-pig-hearts-for-science-livebig/>
62. "Minnesota lab takes a close-up look at hearts, beat by beat: LiveBIG," Youtube, January 4, 2017. <https://www.youtube.com/watch?v=a57l8ZuqPrA>
63. "Heart in a box," University of Minnesota Medical School, Medical Bulletin, March 28, 2017. <https://www.med.umn.edu/news-events/medical-bulletin/heart-box>
64. "Bear Week: Researchers look to hibernating bears for advancements in human medicine," FOX 9, May 14, 2017. <http://www.fox9.com/news/researchers-look-to-hibernating-bears-for-advancements-in-human-medicine>
65. "Bear Week: Scientists look to unlock the mysteries of hibernation," FOX 9, May 16, 2017. <http://www.fox9.com/news/bear-week-scientists-look-to-unlock-the-mysteries-of-hibernation>
66. "VR & 3D printing for heart treatment: a tour," ASME. June 23, 2017. <https://aabme.asme.org/posts/virtual-reality-and-3d-printing-for-heart-treatment-a-tour>
67. "How virtual reality is changing cardiovascular care," American Heart Association, August 3, 2017. <https://news.heart.org/virtual-reality-changing-cardiovascular-care/>
68. "University of Minnesota Medical School celebrates 40 years of heart transplants," Fox 9, March 1, 2018. <http://www.fox9.com/news/university-of-minnesota-health-celebrates-40-years-of-heart-transplants>
69. "See it in 3-D, The U's Visible Heart Lab has printed 1,000 or so heart models to educate students, researchers, surgeons, and patients," University of Minnesota Brief, March 14, 2018.
70. "Red Heart Soiree: an evening to benefit cardiovascular health," September 13, 2018. <https://www.youtube.com/watch?v=dRT46w0qwvc&feature=youtu.be&t=167>
71. "How ancient remedies are changing modern medicine," National Geographic, January 1, 2019.

## INVITED LECTURES

1. "Relaxation of skeletal muscle: do parvalbumins play a role?," Neurologische Klinik der Technischen Universität München, Munich, FRG, August 27, 1986.
2. "Power-spectral analysis of physiological and pathological oscillations of the ankle," Neurologische Klinik der Technischen Universität München, Munich, FRG, August 28, 1986.
3. "The role of parvalbumins in the relaxation of frog skeletal muscle," Abteilung für Allgemeine Physiologie der Universität Ulm, Ulm, FRG, July 22, 1987.
4. "The diagnosis of malignant hyperthermia," Department of Anesthesiology, Mayo Clinic, Rochester, MN, December 22, 1987.
5. "The effects of halothane on malignant hyperthermia susceptible skeletal muscle," Department of Anesthesiology, Mayo Clinic, Rochester, MN, December 23, 1987.
6. "Physiology of muscular contraction," Department D'Anesthésie-Reanimation Chirurgicale I, Centre Hospitalier Regional DeLille, Lille, France, May 16, 1988.
7. "The effects of halothane and isoflurane on  $Ca^{2+}$  mobilization in rat hepatocytes," Department of Anesthesiology, Mayo Clinic, Rochester, MN, May 31, 1989.
8. "New insights into the pathophysiology of malignant hyperthermia," Department of Anesthesiology, Mayo Clinic, Rochester, MN, June 7, 1989.
9. "The effects of anesthetic agents on intracellular  $Ca^{++}$ ," Neurologische Klinik der Technischen Universität München, Munich, FRG, December 7, 1989.
10. "Mechanical and electrical properties of resealed fiber segments of human skeletal muscle," Departments of Anesthesiology and Physiology, Bowman Gray School of Medicine, Wake Forest University, Winston-Salem, NC, March 1, 1990.
11. "The use of resealed fiber segments of human skeletal muscle to study mechanical and electrical properties," Department of Physiology, Indiana University, Terre Haute Center for Medical Education, Terre Haute, IN, April 23, 1990.
12. "Resealed fiber segments for the study of electrical and mechanical properties of human skeletal muscle," Department of Pharmacology, University of North Dakota, Grand Forks, ND, May 3, 1990.
13. "The use of resealed fiber segments for the study of the pathophysiology of human skeletal muscle," Department of Anesthesiology, University of Minnesota, Minneapolis, MN, July 31, 1990.
14. "Electrophysiology of muscle disorders," Department of Veterinary Biology, University of Minnesota, Minneapolis, MN, January 17, 1991.
15. "In vitro electrophysiological studies of myotonic muscle," Department of Neurology, University of Minnesota, Minneapolis, MN, February 14, 1991.
16. "In vitro contracture testing to determine susceptibility to malignant hyperthermia," Department of Anesthesiology, University of Minnesota, Minneapolis, MN, May 26, 1991.
17. "Forced air cooling following exercise-induced heat stress," Department of Anesthesiology Research Conference, University of Minnesota, Minneapolis, MN, June 11, 1991.
18. "Tremor, shiver and clonus," Department of Anesthesiology Research Conference, University of Minnesota, Minneapolis, MN, September 10, 1991.
19. "In vitro contracture test," Department of Anesthesiology, University of Minnesota, Minneapolis, MN, 1st Annual Clinical Symposia, November 9, 1991.
20. "Investigations into the pathophysiology of human skeletal muscle," Department of Physiology, University of Minnesota, Minneapolis, MN, February 14, 1992.

21. "Anesthetics and intracellular Ca<sup>2+</sup>," Department of Anesthesiology Research Conference, University of Minnesota, Minneapolis, MN, April 14, 1992.
22. "The physiology of thermoregulation and the clinical occurrence of hypothermia," Department of Kinesiology, University of Minnesota, Minneapolis, MN, May 18, 1992.
23. "Physiological implications of malignant hyperthermia in humans and in the pig model," Lehrstuhl für Tierzucht der Technischen Universität München, Freising-Weihenstephen, Germany, July 30, 1992.
24. "Malignant hyperthermia and temperature regulation," Forschungsinstitut für die Biologie landwirtschaftlicher Nutztiere Fachbereich Physiologische Grundlagen der Tierhaltung, Dummerstorf-Rostock, Germany, August 3, 1992.
25. "Intraoperative patient warming by convection: hygiene aspects with forced air," Zentrum Anaesthesiologie, Universität Göttingen, Göttingen, Germany, August 5, 1992.
26. "The physiology of thermoregulation: the consequences of hypothermia," Abteilung für Allgemeine Physiologie der Universität Ulm, Ulm, Germany, August 6, 1992.
27. "Thermoregulation in humans," Institut für Anaesthesiologie, Universität Erlangen, Erlangen, Germany, October 7, 1992.
28. "The physiology of thermoregulation," Department of Anesthesiology Research Conference, University of Minnesota, Minneapolis, MN, January 7, 1993.
29. "Increased muscle excitability: myotonia," Department of Neurology, University of Minnesota, Minneapolis, MN, April 3, 1993.
30. "Electrophysiological studies of human skeletal muscle," Department of Biomedical Engineering, University of Minnesota, Minneapolis, MN, April 20, 1993.
31. "The measurement of ankle torque for the diagnosis of periodic paralysis," Department of Anesthesiology, University of Minnesota, Minneapolis, MN, November 30, 1993.
32. "Thermal balance during an episode of malignant hyperthermia," Abteilung für Anästhesiologie und Intensivmedizin, Rehabilitationskrankenhaus Ulm, Ulm, Germany, September 21, 1993.
33. "Thermal balance during an episode of malignant hyperthermia," Department of Anesthesiology Research Conference, University of Minnesota, Minneapolis, MN, January 3, 1994.
34. "Thermoregulation and malignant hyperthermia," Institut für Tierzucht und Hausteirgenetik, Justus-Liebig-Universität, Gießen, Germany, May 5, 1994.
35. "Malignant hyperthermia: an update," Department of Anesthesiology Research Conference, University of Minnesota, Minneapolis, MN, September 6, 1994.
36. "Porcine model to study wound formation, healing, and prevention," 3M Health Care Division, St. Paul, MN, October 11, 1994.
37. "Temperature modulated pressure ulcers: a porcine model," Department of Biomedical Engineering, University of Minnesota, Minneapolis, MN, October 25, 1994.
38. "Porcine model to study wound formation, healing and prevention," Research Animal Resources, University of Minnesota, Minneapolis, MN, November 15, 1994.
39. "Malignant hyperthermia: variability in clinical presentation," Department of Anesthesiology, Mayo Clinic, Rochester, MN, January 25, 1995.
40. "Myotonic disorders," Department of Neurology, University of Minnesota, Minneapolis, MN, February 8, 1995.
41. "Biomedical aspects of heat transfer in humans," Engineering, Fachhochschule Anhalt, Köthen, Germany, March 27, 1995.

42. "Malignant hyperthermia: clinical presentation," Department of Neurology, Medizinischen Fakultät der Martin-Luther-Universität, Halle, Germany, March 28, 1995.
43. "The use of fluorophores to monitor modulations in intracellular  $[Ca^{2+}]$  in skeletal muscle," Muskelbiologie und Wachstum, Forschungsinstitut für die Biologie landwirtschaftlicher Nutztier Fachbereich, Dummerstorf-Rostock, Germany, March 29, 1995.
44. "Malignant hyperthermia: variability in clinical presentation," Department of Anesthesiology Research Conference, University of Minnesota, Minneapolis, MN, May 2, 1995.
45. "Muscle force assessment in neuromuscular diseases," Muskelzentrum der Universität Ulm, Ulm, Germany, May 15, 1995.
46. "Malignant hyperthermia: muscle properties," Versuchsstation Thalhausen-Lehrstuhl für Tierzucht, Technische Universität München, Munich, Germany, May 23, 1995.
47. "Prevention of pressure ulcers by focal cooling," Center for Wound Healing and Reparative Medicine, Department of Surgery, University of Minnesota, Minneapolis, MN, February 5, 1996.
48. "Prevention of pressure ulcers by focal cooling," Department of Anesthesiology Research Conference, University of Minnesota, Minneapolis, MN, March 12, 1996.
49. "Prevention of pressure ulcers by focal cooling," Augustine Medical, Inc., Eden Prairie, MN, April 3, 1996.
50. "Muscle force assessment in neuromuscular disorders," Department of Neurology, Medizinischen Fakultät der Martin-Luther-Universität, Halle, Germany, May 2, 1996.
51. "Prevention of pressure ulcers by focal cooling," Muskelzentrum der Universität Ulm, Ulm, Germany, May 6, 1996.
52. "Anesthetic complication in muscle disorders," Department of Anesthesiology Research Conference, University of Minnesota, Minneapolis, MN, August 6, 1996.
53. "Anesthesia and neuromuscular disorders," Departement Anästhesie der Universität Kantonsspital Basel, Basel, Switzerland, September 30, 1996.
54. "Human thermoregulation," Departement Anästhesie der Universität Kantonsspital Basel, Basel, Switzerland, October 1, 1996.
55. "Anesthetic complications and neuromuscular disorders," Department of Anesthesiology, United Hospital, St. Paul, MN, December 5, 1996.
56. "Calcium dysregulation during anesthetic complications and neuromuscular disorders," Department of Laboratory Medicine, Jena, Germany, January 30, 1997.
57. "Anesthetic complications and neuromuscular disorders," Department of Neurology, Medizinischen Fakultät der Martin-Luther-Universität, Halle, Germany, January 30, 1997.
58. "Why perform clinical research?" Department of Anesthesiology Research Conference, University of Minnesota, Minneapolis, MN, March 15, 1997.
59. "Assessment of stimulated muscle force in humans," Clinical Neurosciences Conference, Department of Neurology, University of Minnesota, Minneapolis, MN, September 2, 1997.
60. "Assessment of stimulated muscle force in humans," Department of Animal Physiology, University of Wyoming, Laramie, WY, September 23, 1997.
61. "Axial spinal unloading using an LTX3000™ lumbar rehabilitation system," Muskelzentrum der Universität Ulm, Ulm, Germany, October 9, 1997.
62. "The physiological response to lumbar traction in humans," Department of Neurology, Medizinischen Fakultät der Martin-Luther-Universität, Halle, Germany, October 13, 1997.
63. "Stimulated muscle force assessment in humans," Tage der Elektrotechnik, Biomedizinischen Technik, Fachhochschule Anhalt, Köthen, Germany, October 15, 1997.

64. "Force assessment in overwintering black bears," Department of Anesthesiology Research Conference, University of Minnesota, Minneapolis, MN, January 13, 1998.
65. "Thermoregulation in humans and swine: a comparative analysis," Versuchsstation Thalhausen-Lehrstuhl für Tierzucht, Technische Universität München, Munich, Germany, April 17, 1998.
66. "In vivo stimulated force assessment for diagnosis and measurement of clinical outcomes," Muskelzentrum der Universität Ulm, Ulm, Germany, April 21, 1998.
67. "Critical thresholds for pressure ulcer formation in a porcine model: prevention by focal cooling," Biomedizinischen Technik, Fachhochschule Anhalt, Köthen, Germany, April 24, 1998.
68. "The physiological response to lumbar traction in humans," Departement Anästhesie der Universität Kantonsspital Basel, Basel, Switzerland, September 9, 1998.
69. "An in-vitro four-chamber working swine heart model," Faculty Research Highlights, Biomedical Engineering, University of Minnesota, Minneapolis, MN, September 29, 1998.
70. "An ex-vivo 4-chamber working heart model," Department of Anesthesiology Research Conference, University of Minnesota, Minneapolis, MN, January 1999.
71. "Studies in an animal model of the human working heart," Department of Neurology, Medizinischen Fakultät der Martin-Luther-Universität, Halle, Germany, April 14, 1999.
72. "An ex vivo working heart model: a collaborative project between the University of Minnesota and Medtronic," Biomedizinischen Technik, Fachhochschule Anhalt, Köthen, Germany, April 15, 1999.
73. "Collaborative research, academic and industry partnerships," BioRegioUlm and the Muskelzentrum der Universität Ulm, Ulm, Germany, April 16, 1999.
74. "An ex vivo working heart model: video images for education," LifeSource, Minneapolis, MN, May 6, 1999.
75. "Why clinical research?" Annual Clinicians Meeting, Spinal Designs International, Hinkley, MN, May 19, 1999.
76. "An ex-vivo 4-chamber working heart model," Department of Cardiology, Universität Ulm, Ulm, Germany, July 30, 1999.
77. "Assessment of stimulated muscle force in humans and hibernating black bears," Medtronic Scientific Forum Presentation, Medtronic, Fridley, MN, August 4, 1999.
78. "An ex-vivo 4-chamber working heart model," Department of Anesthesiology, Mayo Clinic, Rochester, MN, September 15, 1999.
79. "Gearing up for the next 50 years," *Keynote speaker*, Catheter Related Technology Symposium, Medtronic, Fridley, MN, September 21, 1999.
80. "Clinical Research," International Academy of Orthopedic Medicine, St. Paul, MN, November 11, 1999.
81. "Pain and pain mechanisms," International Academy of Orthopedic Medicine, St. Paul, MN, November 11, 1999.
82. "An ex-vivo 4-chamber working heart model," LifeSource, St. Paul, MN, January 11, 2000.
83. "Why and what research to perform?" Department of Anesthesiology Research Conference, University of Minnesota, Minneapolis, MN, October 3, 2000.
84. "Stimulated muscle force assessment: the ICU to hibernating bears," Department of Neurology, Universität Regensburg, Germany, April 19, 2001.
85. "Stimulated muscle force assessment: the ICU to hibernating bears," Department of Veterinary Pathobiology, University of Minnesota, Minneapolis, MN, September 12, 2001.

86. "Force assessment and weakness in the ICU," Clinical Neurosciences Conference, University of Minnesota, Minneapolis, MN, February 12, 2002.
87. "The Visible Heart," Health Informatics Seminar, University of Minnesota, Minneapolis, MN, February 14, 2002.
88. "The cardiac conduction system" Therapy Research, Cardiac Rhythm Management, Guidant Corporation, St. Paul, MN, April 17, 2002.
89. "Muscle contraction," Applied Research, Boston Scientific, Scimed, Minneapolis, MN, August 16, 2002.
90. "Skeletal muscle force assessment: from humans to bears," Department of Biomedical Engineering, Marquette University, Milwaukee, WI, October 4, 2002.
91. "The Visible Heart™: the collaborative development and use of this educational tool by the University of Minnesota and Medtronic," Biomedical Engineering Society Meeting, Houston, TX, October 24, 2002.
92. "Induction of mild hypothermia for cerebral protection," Design of Medical Devices Conference, University of Minnesota, Minneapolis, MN, April 24, 2003.
93. "The Visible Heart®: a large mammalian isolated heart model," Department of Surgery Transplant Conference, University of Minnesota, Minneapolis, MN, May 7, 2003.
94. "Update on human anatomical research," Pediatric EP Focus Group, Medtronic Cardiac Rhythm Management, Fridley, MN, September 15, 2003.
95. "The Visible Heart®: functional cardiac anatomy," Department of Medicine, University of Minnesota, Minneapolis, MN, January 14, 2004.
96. "Why study the hibernating black bear?" Department of Biomedical Engineering, University of Minnesota, Minneapolis, MN, April 19, 2004.
97. "The Visible Heart® Center," Medtronic Cardiac Rhythm Management, Fridley, MN, September 2, 2004.
98. "The Visible Heart® Center," Medtronic Minnesota Chapter American Society of Mechanical Engineers, University of Minnesota, Minneapolis, MN, September 22, 2004.
99. "A Working Industry/University of Minnesota Relationship," Nanotherapy Workshop, University of Minnesota, Minneapolis, MN, November 15, 2004.
100. "The Visible Heart™ Center," Minnesota Microscopy Society, St. Paul, MN, February 17, 2004.
101. "The Visible Heart™: video and simulation," Department of Applied Physiology, Universität Ulm, Ulm, Germany, April 21, 2005.
102. "Maintenance of muscle during hibernation," Department of Applied Physiology, Universität Ulm, Ulm, Germany, April 22, 2005.
103. "The Visible Heart®: functional cardiac anatomy," Departments of Neurology and Medicine, Universität Regensburg, Regensburg, Germany, April 26, 2005.
104. "The Visible Heart®: functional cardiac anatomy," Veterans Administration Hospital, San Juan, Puerto Rico, August 10, 2005.
105. "The Visible Heart® Center," Technical Forum, Medtronic Production and Engineering, Villalba, Puerto Rico, August 11, 2005.
106. "The Visible Heart® Center," Technical Forum, Medtronic Production and Engineering, Juncos, Puerto Rico, August 11, 2005.
107. "Translational research: from the bear den to the bedside," Technical Forum, Cardiac Rhythm Management, Medtronic, Minneapolis, MN, August 19, 2005.
108. "Translational research: from the bear den to the bedside," Minneapolis Surgical Society, Minneapolis, MN, September 19, 2005.

109. "Translational research: from the bear den to the bedside," Dialogue North, Itasca Community College Foundation, Grand Rapids, MN, April 27, 2006.
110. "A review of cardiac physiology and anatomy," Transoma Medical, Minneapolis, MN, June 26, 2006.
111. "Translational research: from the bear den to the bedside," Bioanalytik Weißenstephan, Technische Universität München, Freising, Germany, August 22, 2006.
112. "Cardiac pacing: the lead-tissue interface," Department of Applied Physiology, University of Ulm, Ulm, Germany, August 23, 2006.
113. "Functional cardiac anatomy: the Visible Heart<sup>®</sup>," Grand Rounds: Laboratory Medicine and Pathology, University of Minnesota, October 11, 2006.
114. "The Visible Heart<sup>®</sup>: an update," Lillehei Heart Institute, University of Minnesota, January 23, 2007.
115. "Translational research: from the bear den to the bedside," Lake Region Manufacturing Annual Business Meeting, Chaska, MN, January 26, 2007.
116. "The hibernating black bear," 32nd Annual Minnesota Association of Veterinary Technicians Convention, Minneapolis, MN, February 2, 2007.
117. "Malignant hyperthermia: a current view," Idaho Society of Anesthesiologists Annual Conference, Sun Valley, Idaho, March 3, 2007.
118. "Translational research: from bear den to bedside," Idaho Society of Anesthesiologists Annual Conference, Sun Valley, Idaho, March 4, 2007.
119. "A legacy of collaboration between the University of Minnesota and Medtronic: open-heart surgery, biomedical devices and the Visible Heart<sup>®</sup> Laboratory," 2<sup>nd</sup> Annual Patent Recognition Banquet, Cardiac Rhythm and Disease Management, Medtronic, McNamara Alumni Center, University of Minnesota, Minneapolis, MN, June 7, 2007.
120. "Translational research: from bear den to bedside," Departement Anästhesie der Universität Kantonsspital Basel, Basel, Switzerland, June 27, 2007.
121. "Pharmacological preconditioning to prevent ischemic muscle damage," Department of Applied Physiology, University of Ulm, Ulm, Germany, June 28, 2007.
122. "The Visible Heart<sup>®</sup>: functional human cardiac anatomy," Josephson and Wellens How to Approach Complex Arrhythmias for EP Fellows, Boston, MA, July 20, 2007.
123. "The Visible Heart<sup>®</sup>: functional human cardiac anatomy," Regions Hospital, Grand Rounds, St. Paul, MN, September 26, 2007.
124. "A legacy of collaboration between the University of Minnesota and Medtronic: open-heart surgery, biomedical devices and the Visible Heart<sup>®</sup> Laboratory," Cardiovascular, Medtronic, Fridley, MN, October 15, 2007.
125. "Benefits of anatomical donations for medical education and research," The Minnesota Commission of the Procurement and Use of Anatomical Donations in conjunction with LifeScience Alley, St. Paul, MN, February 7, 2008.
126. "The Visible Heart<sup>®</sup>: human cardiac anatomy," 28<sup>th</sup> Annual Spring Seminar, Minnesota Society of Diagnostic Ultrasound, Minneapolis, MN, March 29, 2008.
127. "The Visible Heart<sup>®</sup>: cardiac devices," 28<sup>th</sup> Annual Spring Seminar, Minnesota Society of Diagnostic Ultrasound, Minneapolis, MN, March 29, 2008.
128. "Endoscopic visualization of the coronary veins," CARDIOSIM 2008, 16<sup>th</sup> World Congress on Cardiac Electrophysiology and Cardiac Techniques, Nice, France, June 2008.
129. "An update on the Visible Heart<sup>®</sup> Project and the Atlas of Human Cardiac Anatomy," Lillehei Heart Institute, University of Minnesota, October 15, 2008.



130. "From research to bedside: perspectives from academia and industry," LifeScience Alley, Minneapolis, MN, October 28, 2008.
131. "An update on the Visible Heart® Project and the Atlas of Human Cardiac Anatomy," Grand Rounds, Department of Surgery, University of Minnesota, January 27, 2009.
132. "Pharmacological preconditioning to prevent ischemic muscle damage," Paul and Sheila Wellstone Muscular Dystrophy Center, University of Minnesota, January 30, 2009.
133. "Translational research: from bear den to bedside," Conservation Biology Graduate Program, University of Minnesota, Minneapolis, MN, February 16, 2009.
134. "The Visible Heart® Project and the Atlas of Human Cardiac Anatomy," 29<sup>th</sup> Annual Spring Seminar, Minnesota Society of Diagnostic Ultrasound, Minneapolis, MN, March 28, 2009.
135. "Translational research: from bear den to bedside," 29<sup>th</sup> Annual Spring Seminar, Minnesota Society of Diagnostic Ultrasound, Minneapolis, MN, March 2, 2009.
136. "The Visible Heart® Laboratory and the Atlas of Human Cardiac Anatomy," Department of Medicine, Martin Luther University, Halle/Saale, Germany, April 24, 2009.
137. "The Visible Heart® Laboratory, and the Atlas of Human Cardiac Anatomy," LifeSource, St. Paul, MN, June 2009.
138. "Translational research: from the bear den to the patient bedside," Department of Surgery Grand Rounds, University of Minnesota, Minneapolis, MN, August 18, 2009.
139. "The Visible Heart® Project and the Atlas of Human Cardiac Anatomy," Community Education Conference: Heart of the Matter, St. Joseph's Hospital, St. Paul, MN, October 12, 2009.
140. "A review of cardiovascular physiology and an update on the Visible Heart® Project," LifeSource, St. Paul, MN, October 12 & 14, 2009.
141. "Stimulated muscle force assessment: at the bear den or in an ICU," Department of Neurology Grand Rounds, University of Minnesota, Minneapolis, MN, February 11, 2010.
142. "Physiological engineering within the Visible Heart® Laboratory: guiding the laboratory forward to enhance future cardiovascular device designs," Horizon Series, co-sponsored by Medtronic's Bakken Society and Technical Fellows, Minneapolis, MN, February 22, 2010.
143. "Physiological engineering within the Visible Heart® Laboratory: using swine hearts to save human lives," 6<sup>th</sup> Annual Regional Bioscience Conference, Worthington, MN, March 26, 2010.
144. "The University of Minnesota: one of the pioneering institutions in the field of cardiovascular surgery," 30<sup>th</sup> Annual Spring Seminar, Minnesota Society of Diagnostic Ultrasound, Minneapolis, MN, March 27, 2010.
145. "Physiological engineering within the Visible Heart Laboratory," 2<sup>nd</sup> Annual University of Minnesota Cardiovascular Retreat, St. John's University, MN, June 24, 2010.
146. "The Visible Heart® Project," Department of Surgery Grand Rounds, University of Minnesota, Minneapolis, MN, August 31, 2010.
147. "The Visible Heart® Laboratory," Cardiovascular Innovation Seminars (CVIS), Medtronic, Mounds View, MN, September 1, 2010.
148. "Functional anatomy of the human heart: the Visible Heart® Project," Mayo Clinic Grand Rounds, Jacksonville, FL, November 8, 2010.
149. "Functional anatomy of the human heart: the Visible Heart® Project," Medtronic Ventor, Natanya, Israel, December 2, 2010.
150. "Translational research: from the bear den to the patient bedside," Young Scientist Roundtable, Wayzata High School, Wayzata, MN, February 2011.
151. "Translational research: from the bear den to the patient bedside," Mini Medical School, University of Minnesota, Minneapolis, MN, March 21, 2011.

152. "The Visible Heart® Laboratory: our latest results," Department of Surgery Grand Rounds, University of Minnesota, Minneapolis, MN, January 31, 2012.
153. "New insights in heart physiology," Jubiläumssymposium, Martin-Luther-Universität, Halle-Wittenberg, Germany, April 3, 2012.
154. "Cardiovascular advances by the University of Minnesota: past, present and future," Boston Scientific, Maple Grove, MN, May 16, 2012.
155. "Malignant hyperthermia: a current view," New River Medical Center, Monticello, MN, July 12, 2012.
156. "The Visible Heart® Project: journey inside the heart," Paris, France, January 19, 2013.
157. "The Visible Heart® Laboratory and the Atlas of Human Cardiac Anatomy," Northern Ohio Cardiac Imaging Association, University Hospital, Case Medical Center, Cleveland, OH, April 13, 2013.
158. "The Visible Heart® Lab and the Atlas of Human Cardiac Anatomy," Physiological Research Laboratories, Medtronic, Coon Rapids, MN, August 14, 2013.
159. "The Visible Heart® Laboratory and the Atlas of Human Cardiac Anatomy," Skirball Research Center, Cardiovascular Research Foundation, New York, NY, August 19, 2013.
160. "The Visible Heart® Lab and Medtronic: a partnership between academia and industry," Annual Meeting of Halstad Society, University of Minnesota, Minneapolis, MN, September 12, 2013.
161. "Inside the human heart," I Am Hope LifeSource Symposium, Minneapolis, MN, November 7, 2013.
162. "The Visible Heart® Laboratory and the Atlas of Human Cardiac Anatomy," Innovations in Cardiovascular Interventions, Tel Aviv, Israel, December 1-4, 2013.
163. "Temperature regulation-modulation in clinical settings," Ambulatory Anesthesia Course, Universitätsspital, Basel, Switzerland, August 18-19, 2014.
164. "The Visible Heart Project and the Atlas of Human Cardiac Anatomy," Ambulatory Anesthesia Course, Universitätsspital, Basel, Switzerland, August 18-19, 2014.
165. "Priming innovation: the right environment, tools, partners, and mentors," Transcatheter Cardiovascular Therapeutics (TCT) Annual Conference, Washington DC, September 14, 2014.
166. "Understanding anatomy-device interactions of different bifurcation stent techniques: insights from the Visible Heart Lab," Transcatheter Cardiovascular Therapeutics (TCT) Annual Meeting, Washington DC, September 15, 2014.
167. *Keynote* "The Visible Heart Laboratory," 30<sup>th</sup> Annual Meeting of the Academy of Surgical Research, Hyatt Regency, Minneapolis, MN, September 19, 2014.
168. "Cardiovascular advances at the University of Minnesota: past, present, and future," Human Anatomy and Physiology Society Regional Conference, Eastview High School, Eagan, MN, October 17, 2014.
169. "The science of organ preservation and hidden secrets of the hibernating black bear," 8<sup>th</sup> Annual Department of Surgery Bakken Symposium, Minneapolis, MN, December 2, 2014.
170. "Evaluating your medical device idea using bench tests, animal tests and clinical trials," 2015 Innovation Workshop Program, Design of Medical Devices Conference, Minneapolis, MN, April 11, 2015.
171. "Muscle metabolism and function in the hibernating black bear," 6<sup>th</sup> Basel Muscle Symposium on Skeletal Muscle, Universitätsspital Basel, Basel, Switzerland, May 15, 2015.
172. "Prototyping in the real world: the Minnesota experience," Imaging in Cardiovascular Interventions (CSI 2015), Frankfurt, Germany, June 23, 2015.

173. *Keynote* “Innovation on the edge: from reanimated human hearts to hibernating black bears,” Association of Medical Illustrators 2015 Annual Meeting, Cleveland Clinic, OH, July 22-25, 2015.
174. “Visualizations of cardiac anatomy, activation patterns, and therapy using Visible Heart methodologies,” 8<sup>th</sup> TRF Forum on Computer Simulation and Experimental Assessment of Cardiac Function, Lugano, Switzerland, December 8, 2015.
175. “The Visible Heart Laboratory and the Atlas of Human Cardiac Anatomy,” San Raffaele Hospital, Milan, Italy, December 9, 2015.
176. “Essentials of creativity,” Academy of Innovation Day, 20<sup>th</sup> International Conference for Innovations in Cardiovascular Interventions (ICI), Tel Aviv, Israel, December 13, 2015.
177. “Testing your medical device idea: bench tests, pre-clinical, clinical trials,” Academy of Innovation Day, 20<sup>th</sup> International Conference for Innovations in Cardiovascular Interventions (ICI), Tel Aviv, Israel, December 13, 2015.
178. “Innovation to the edge,” University of Minnesota Alumni Association: Change Meets Innovation, Red Wing, MN, March 22, 2016.
179. “Ecosystem for the development of medical devices, Visible Heart Project,” Cardiac Physiologic Society, Seoul, South Korea, August 24, 2016.
180. “Inspiring structural heart innovation by understanding anatomy and disease states,” Medical Design and Manufacturing Conference, Minneapolis, MN, September 21, 2016.
181. “Advanced applied imaging: 3D printing for cardiac disease,” Lillehei Symposium: Progress in Cardiovascular Care, Minneapolis, MN, October 24, 2016.
182. “The Visible Heart® Project,” 28<sup>th</sup> International Conference of the Society of Medical Innovation and Technology, Delft, The Netherlands, October 6, 2016.
183. White Bear Lake Rotary Club, White Bear Lake, MN, February 15, 2017.
184. “Black bear hibernation: healing the human heart,” Learning Life Program, University of Minnesota, St. Paul, MN, February 16, 2017.
185. “From the Visible Heart Lab to bear dens and back,” Texas Heart Institute, Houston, TX, February 23, 2017.
186. “Translational research through industry partnerships,” Rice University, Houston, TX, February 23, 2017.
187. “The Visible Heart® Project and the Atlas of Human Cardiac Anatomy,” Texas Heart Institute, Houston, TX, Cardiology-Electrophysiology Grand Rounds, February 24, 2017.
188. “How new medical products are developed,” Clinical and Scientific Innovations for Oral and Maxillofacial Surgery (CSIOMS) Conference, Rosemont, IL, April 28, 2017.
189. “Having black bears assist in the operating room: good idea?” Organization of Biological Field Stations Annual Meeting, Itasca Biological Station and Laboratories, Lake Itasca, MN, September 22, 2017.
190. “Monitoring the behaviors of the American Black Bear using implantable devices,” Graduate Program in Neuroscience Colloquium, University of Minnesota, Minneapolis, MN, October 4, 2017.
191. “The Visible Heart® Project and the Atlas of Human Cardiac Anatomy,” Mini Medical School, University of Minnesota, Minneapolis, MN, October 16, 2017.
192. “From the Visible Heart® Lab to bear dens and back,” Whiteside Institute for Clinical Research, St. Luke’s Hospital, Duluth, MN, October 19, 2017.
193. “Insights relative to black bear physiology and potential implications for human medicine,” 78<sup>th</sup> Midwest Fish and Wildlife Conference, Milwaukee, WI, January 30, 2018.

194. "The Visible Heart® methodologies employed to study electrophysiologic therapies and devices," Texas Heart Institute, Houston, TX, March 29, 2018.
195. "Translational research through industry partnerships," Rice University, Department of Biomedical Engineering, Houston, TX, March 29, 2018.
196. "The Visible Heart® Laboratory and the Atlas of Human Cardiac Anatomy," Texas Heart Institute, Houston, TX, March 30, 2018.
197. "From the Visible Heart® Lab to bear dens and back," Texas Heart Institute, Houston, TX, March 30, 2018.
198. "Translational applications of black bear hibernation for ischemic protection and/or wound healing," Children's Hospital, Magdeburg, Germany, May 3, 2018.
199. "The Visible Heart® Project and the Atlas of Human Cardiac Anatomy," Children's Hospital, Magdeburg, Germany, May 3, 2018.
200. "Visible Heart® Lab: driven to train the next generation of medical device innovators," Children's Hospital, Magdeburg, Germany, May 4, 2018.
201. "Visible Heart lab: driven to train the next generation of medical device innovators," 1st Annual Echo Supervisor Summit, September 5, 2018.
202. "The Visible Heart® Project and the Atlas of Human Cardiac Anatomy," University of Central Florida, Orlando, FL, October 15, 2018.
203. "Panel: industry trends in cardiology and the impact on your next device," MD&M Conference, Minneapolis, MN, November 1, 2018.
204. "Medical device innovation," University Hospital of Basel, Basel, Switzerland, November 12, 2018.
205. "Translational applications of black bear hibernation for ischemic protection and/or wound healing," University Hospital of Basel, Basel, Switzerland, November 13, 2018.
206. "Medical device innovation," Pitfalls and Pearls, Roseville Library, Roseville, MN, February 25, 2019.
207. "The Visible Heart® Project and the Atlas of Human Cardiac Anatomy," EuroPCR Advisor Board Meeting, Medtronic Training Pavilion, Bifurcation PCI Session, May 15, 2019.
208. "Leveraging our research partnership with the University of Minnesota," Medtronic, Mounds View, MN, August 7, 2019.
209. "Utilizing the unique capabilities of the VH Laboratories: 23 years of vital collaboration with Medtronic," Medtronic, Mounds View, MN, August 7, 2019.
210. "Insights relative to black bear physiology and their potential implications to humans," Abbott Northwestern Hospital, Minneapolis, MN, September 18, 2019.
211. "Bifurcation PCI: a step by step training approach (Visible Heart)," Transcatheter Cardiovascular Therapeutics (TCT) 2019, San Francisco, CA, 3 talks on September 26 and 28, 2019.
212. "The Visible Heart® Project and the Atlas of Human Cardiac Anatomy," Internistische Intensivmedizin, Universitätsklinikum Magdeburg, Magdeburg, Germany, June 6, 2019.
213. "Medical device innovation," Keynote speaker, Seoul National University Hospital, Korea, October 10, 2019.
214. "Importance of medical device ecosystem," Seoul National University Hospital, Korea, October 11, 2019.
215. "The Visible Heart® Project and the Atlas of Human Cardiac Anatomy," XV European Bifurcation Club Meeting, Barcelona, Spain, October 19, 2019.

## WORKSHOPS

1. "Secondary changes in chloride channel diseases: sodium channel dysfunction," ENMC Workshop on Non-dystrophic Myotonias and Periodic Paralysis, Ulm, Germany, October 6, 1992.
2. "Anesthetic complications in muscle disorders (panel discussion)," VIII International Workshop on Malignant Hyperthermia, Minneapolis, MN, September 7, 1996.
3. "Futuristic technologies workshop," EP, Snowbird, UT, February 11, 2001.
4. "Academy of Innovation: the device development process," Innovations in Cardiovascular Interventions, Co-organizer, Tel Aviv, Israel, December 6, 2009.
5. "The Visible Heart: echocardiography and angiography application in the donor heart," National Association of Transplant Coordinators, National Meeting, Fort Lauderdale, FL, January 15, 2010.
6. "Review of cardiac anatomy and physiology," Lake Region Medical Training Workshop, University of Minnesota, Minneapolis, MN, November 24, 2010.
7. "Academy of Innovation: expanding cardiovascular therapies, the development of new medical devices," Innovations in Cardiovascular Interventions, Co-organizer, Tel Aviv, Israel, December 5, 2010.
8. "Academy of Innovation," Innovations in Cardiovascular Interventions, Tel Aviv, Israel, December 4-5, 2011.
9. "Becoming a medical technology innovator," Design of Medical Devices Conference, Medical Device Innovation Workshop, University of Minnesota, Minneapolis, MN, April 9, 2012.
10. "Academy of Innovation," Innovations in Cardiovascular Interventions, Tel Aviv, Israel, December 2-4, 2012.
11. "Becoming a medical technology innovator," Design of Medical Devices Conference, Medical Device Innovation Workshop, University of Minnesota, Minneapolis, MN, April 2013.
12. "Academy of Innovation," Innovations in Cardiovascular Interventions, Tel Aviv, Israel, December 2013.
13. "Becoming a medical technology innovator," Design of Medical Devices Conference, Medical Device Innovation Workshop, University of Minnesota, Minneapolis, MN, April 2014.
14. "Academy of Innovation," Innovations in Cardiovascular Interventions, Tel Aviv, Israel, December 2014.
15. "Becoming a medical technology innovator," Design of Medical Devices Conference, Medical Device Innovation Workshop, University of Minnesota, Minneapolis, MN, April 2015.
16. "Academy of Innovation," Innovations in Cardiovascular Interventions, Tel Aviv, Israel, December 2015.
17. "Becoming a medical technology innovator," Design of Medical Devices Conference, Medical Device Innovation Workshop, University of Minnesota, Minneapolis, MN, April 2016.
18. "Academy of Innovation," Innovations in Cardiovascular Interventions, Tel Aviv, Israel, December 2016.
19. "Becoming a medical technology innovator," Design of Medical Devices Conference, Medical Device Innovation Workshop, University of Minnesota, Minneapolis, MN, April 2017.
20. "3D modeling and virtual reality in lead extraction," 2017 Lead Extraction Symposium, Minneapolis, MN, October 28, 2017.
21. "Academy of Innovation," Innovations in Cardiovascular Interventions, Tel Aviv, Israel, December 2017.
22. "Becoming a medical technology innovator," Design of Medical Devices Conference, Medical Device Innovation Workshop, University of Minnesota, Minneapolis, MN, April, 2018.

23. "Academy of Innovation," Innovations in Cardiovascular Interventions, Tel Aviv, Israel, December 2018.
24. "Becoming a medical technology innovator," Design of Medical Devices Conference, Medical Device Innovation Workshop, University of Minnesota, Minneapolis, MN, April 2019.
25. Keynote: "The Visible Heart® Lab: driven to train the next generation of medical device innovators," Workshop on VR in Medical Education, Magdeburg, Germany, June 7, 2019.
26. "Academy of Innovation," Innovations in Cardiovascular Interventions, Tel Aviv, Israel, December 2019.

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## **SYMPOSIUM / CONGRESS LECTURES**

1. "Pathophysiology of malignant hyperthermia," 20th Scandinavian Congress of Anaesthesiology, Copenhagen, Denmark, June 28, 1989.
2. "Pathophysiology of malignant hyperthermia," VII International Congress of Neuromuscular Diseases, Co-Chairman of session on malignant hyperthermia, Munich, Germany, September 19, 1990.
3. "Malignant hyperthermia," 1st Annual Symposia on Clinical Anesthesiology, Department of Anesthesiology, University of Minnesota, Minneapolis, MN, November 6, 1991.
4. "Hypothermia post-bypass," American Association of Critical-Care Nurses, Minneapolis, MN, April 28, 1992.
5. "Physiology and biochemistry of muscle contraction," Anaesthesia and Pharmacogenetic Diseases: Malignant Hyperthermia, Co-chairman of session on Muscle contraction, Padova, Italy, May 22, 1993.
6. "The induction of mild hypothermia aided by facial warming," Department of Anesthesiology, 6th Annual Clinical and Research Symposium, University of Minnesota, Minneapolis, MN, September 27, 1997.
7. *Keynote* "Industry sponsored student research," Tage der Elektrotechnik, Fachhochschule Anhalt, Köthen, Germany, October 14, 1997.
8. "Force assessment in the ICU," Department of Anesthesiology, 7th Annual Clinical and Research Symposium, University of Minnesota, Minneapolis, MN, November 20, 1999.
9. "The Visible Heart™," Department of Anesthesiology, 8th Annual Clinical and Research Symposium, University of Minnesota, Minneapolis, MN, November 18, 2000.
10. "Physiology and pathophysiology of skeletal muscle," 21st Myron B. Laver International Postgraduate Course: Impact of Research on Anaesthesia and Intensive Care, University of Basel, Basel, Switzerland, March 16-17, 2001.
11. "Industry-funded basic research," 21st Myron B. Laver International Postgraduate Course: Impact of Research on Anaesthesia and Intensive Care, University of Basel, Basel, Switzerland, March 16-17, 2001.
12. "Malignant hyperthermia," 22nd St. Luke's Hospital and Regional Trauma Center's Annual Surgery Seminar, Duluth, MN, January 19, 2002.
13. "Clinical thermoregulation," Minnesota Society of Anesthesiologists Anesthesia Educational Symposium, Bloomington, MN, February 15, 2002.
14. "Clinical thermoregulation," Arrowhead Region Anesthesia Seminar, Duluth, MN, August 18, 2002.
15. "What's new in heart research," Medical Alley's 3rd Annual Health Care Technology Conference and Expo, Minneapolis, MN, November 17, 2004.

16. "Osteoporose-grundlagenforschung: Was können wir vom winterschlaf des baren lernen?" Osteoporose-eine wachsende Herausforderung, Anhaltinischer Therapeutentag, Hettstedt, Germany, April 23, 2005.
17. "Non-contact mapping and concomitant hemodynamic assessment for the study of heart diseases and their treatment," The Joint Meeting of 5th International Conference on Bioelectromagnetism & 5th International Symposium on Noninvasive Functional Source Imaging within the Human Brain and Heart, Minneapolis, MN, May 15, 2005.
18. Keynote "The Visible Heart®: functional cardiac anatomy," National Association of Transplant Coordinators National Meeting, Atlanta, GA, August 2, 2005.
19. "The Visible Heart®," Simulation in Healthcare at the University of Minnesota: Transforming Education, Minneapolis, MN, November 29, 2005.
20. "Educational activities of IEM" and "The Visible Heart®: device tissue interactions," Institute for Engineering in Medicine Symposium: A New Direction, University of Minnesota, Minneapolis, MN, February 15, 2008.
21. "Muscle trophic maintenance in man and other mammals," Symposium on Periodic Paralysis (PP) and Excitation-Contraction Coupling (ECC), Ulm, Germany, June 23, 2008.
22. "Novel views of valvular function: employing Visible Heart technologies," 2nd Annual Bakken Surgical Device Symposium, University of Minnesota, Minneapolis, MN, December 9, 2008.
23. "In vitro testing and the Visible Heart®," 3<sup>rd</sup> Annual Institute for Engineering in Medicine Educational Symposium, University of Minnesota, Minneapolis, MN, December 9, 2010.
24. Keynote "Functional anatomy of the human heart: Visible Heart® Project," Jubiläumssymposium von Prof. Karl-Ludwig Schober und 50-jähriges Jubiläum der ersten Herz-Operation mit Hilfe der hallechen Herz-Lungen-Maschine. Universitätsklinikum Halle (Saale), Germany, April 3, 2012.
25. Keynote "Cardiovascular advances by the University of Minnesota: past, present and future," 6th Annual Bakken Surgical Device Symposium, University of Minnesota, Minneapolis, MN, May 16, 2012.
26. Keynote "Back to the future: laboratory research on the isolated heart to enhance cardiovascular device design," International Society for Rotary Blood Pumps, Istanbul, Turkey, September 22, 2012.
27. "Lessons from field research: ischemic protection during black bear hibernation," Hibernation 3.0 Regional Conference, Duluth, MN, June 4, 2015.

## EDUCATIONAL PRESENTATIONS

1. Visible Heart video display within the Human Body Exhibit, Minnesota Science Museum, St. Paul, Minnesota (1999 to present).
2. "Medicine: Prescription for Tomorrow," 42nd Annual Nobel Conference, Gustavus Adolphus College, St. Peter, MN, October 3-4, 2006.
3. Interactive Display on Cardiac Anatomy and Physiology, Heart Rhythm Society Meeting, Denver, CO, May 10-12, 2007.
4. Interactive Display on Cardiac Anatomy and Physiology, American Heart Association, Orlando, FL, November 4-7, 2007.
5. Interactive Display on Cardiac Anatomy and Physiology, Society of Thoracic Surgeons, Ft. Lauderdale, FL, January 26-30, 2008.

6. Interactive Display on Cardiac Anatomy and Physiology, American College of Cardiology, Chicago, IL, March 30-April 1, 2008.
7. Interactive Display on Cardiac Anatomy and Physiology, Heart Rhythm Society, San Francisco, CA, May15-17 , 2008.
8. Interactive Display on Cardiac Anatomy and Physiology, International Society of Minimally Invasive Cardiothoracic Surgery (ISMICS), Boston, MA, June 11-14, 2008.
9. Interactive Display on Cardiac Anatomy and Physiology, Academia Village, CARDIOSTIM 2008, 16th World Congress, Nice, France, June 18-21, 2008.

## GRANTS AND FUNDING

### PROPOSALS IN REVIEW

1. "Swine isolated working heart model (contract extension FY21-25)"

### CURRENTLY FUNDED GRANT PROPOSALS

1. "Swine isolated working heart model;" Medtronic; **Iaizzo PA**  
 Overall total amounts of contracts: \$22,556,106 (4/97 to Amendment 20)
  - Initial contract (FY98): \$69,961 total, 4/97, 1 year (20% effort)
  - Laboratory equipment and Medtronic devices: \$470,337, 5/98, 2 years (0% effort)
  - Contract extension (FY99): \$129,604 total, \$110,000 in equipment, 5/98, 1 year (20% effort)
  - Contract extension (FY00-02): \$641,191 total, 5/99, 3 years (20% effort)
  - Contract extension (adjustment for FY01-02 and extension for FY03-05): \$1,485,061 total, 5/02, 3 years (20% effort; 20% salary support and 20% augmentation)
  - Amendment 1: Additional project: \$20,001 total, 11/02, 1 year (1% effort)
  - Amendment 2: Additional project: \$19,999 total, 11/02, 1 year (1% effort)
  - Contract extension, Amendment 3 (FY06-10): \$2,543,088 total, 5/05, 5 years (20% effort; 20% salary support and 20% augmentation)
  - Amendment 4: Additional project: \$39,997 total, 8/04, 1 year
  - Amendment 5: Additional project: \$30,000 total, 5/05, 1.5 years (1% effort)
  - Amendment 6: Additional project: \$14,336 total, 9/05, 1 year (1% effort)
  - Amendment 7: Additional project: \$13,279 total, 4/06, 1 year (1% effort)
  - Amendment 8: Additional project: \$66,502 total, 6/06, 1 year (1% effort)
  - Amendment 9: Additional project: \$1,800 total, 7/06, 1 year
  - Amendment 7+: Additional project: \$1,367 total, 11/07, 6 months
  - Amendment 7+: Additional project: \$2,734 total, 12/07, 6 months
  - Amendment 11: Additional project: \$39,092 total, 8/08, 1 year
  - Amendment 12: Additional project: \$4,673 total, 11/08, 1 year
  - Amendment 7+: Additional project: \$1,367 total, 2/09, 6 months
  - Amendment 7+: Additional project: \$1,557 total, 11/08, 1 year
  - Amendment 7+: Additional project: \$2,734 total, 2/10, 6 months
  - Contract extension, Amendment 13 (FY11-15): \$4,085,371 total, 5/10, 5 years (20% effort)
  - Amendment 7+: Additional project: \$9,454 total, 6/10, ongoing



- Amendment 7+: Additional project: \$11,345 total, 2/11, 1 year
  - Amendment 15: Additional project: \$518,968 total, 9/11, 3 years
  - Amendment 16: Additional project: \$9,850 total, 12/11, 1 year
  - Contract extension, Amendment 18 (FY16-20): \$5,068,863 total, 5/15, 5 years (30% effort)
  - Amendment 19: Additional project: \$59,459 total, 7/14, 1 year
  - Amendment 19+: Additional experiments: \$24,378 total, 2015 (1 year)
  - Amendment 19+: Additional project: \$5,025 total, 7/15 (1 year)
  - Amendment 19+: Additional experiments: \$25,924 (2016)
  - Contract extension, Amendment 20 (FY20-25): \$7,138,789 total, 5/20, 5 years (50% effort)
2. "Minnesota Muscle Training Program;" NIH 5T32 AR007612; Thomas DD; \$594,889 total, 5/19 to 4/20.
  3. "Medical Scientist Training Program;" NIH; Shimizu Y; NIGMS 5T32 GM008244; \$754,740 direct, \$782,369 total; 7/19 to 6/20.
  4. "Summer Research at the University of Minnesota Medical School;" NIH 2R25 HL088728; Campbell CR; \$172,796 direct, \$186,620 total, 6/19 to 5/20.
  5. "Heart preservation and organ care system;" Lillehei Family Foundation; **Iaizzo PA**; \$250,000 over 4 years (\$50K 1/17; \$200K in 2018-2021), 0% effort (purchase/maintenance of organ care system for the heart).
  6. "Breakthrough tissue and organ preservation and transplantation using scaled-up nanowarming technology;" NIH 1R01 HL135046; Bischof JC; \$2,558,872 total; 8/17 to 7/21; PAI 4% effort for 3 years.
  7. "Organ banking for transplant-kidney cryopreservation by vitrification and novel nonwarming technology;" NIH 1R01 DK117425-01; Bischof JC; \$1,669,169 direct cost, \$690,229 indirect, \$2,359,398 total cost. 4/18 to 3/22, 4% effort for 4 years.

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## FUNDED GRANT PROPOSALS

1. "The possible role of parvalbumins in skeletal muscle contraction;" National Science Foundation; Taylor SR, **Iaizzo PA**, Gerday C; \$7,650, 6/86, 2 years.
2. "Episodes of malignant hyperthermia and masseter spasms induced by succinylcholine;" Mayo Foundation; Wedel DJ, **Iaizzo PA**, Joyner MJ; \$24,810, 7/89, 1 year.
3. "The in vitro diagnosis of malignant hyperthermia: an equipment upgrade;" Mayo Clinic, Clinical Practice Committee; Wedel DJ, **Iaizzo PA**; \$41,925, Equipment grant.
4. "The determinants of coughing-induced increases in intracranial pressure in anesthetized dogs;" Mayo Foundation; Lanier WL, **Iaizzo PA**; \$19,101, 7/89, 1 year.
5. "The effects of I-653 on swine susceptible to malignant hyperthermia;" Anaquest; Wedel DJ, **Iaizzo PA**; \$19,002, 10/89, 1 year.
6. "The determinants of increases in intraocular pressure following intravenous succinylcholine in cats;" Mayo Foundation; Hofer RE, Lanier WL, Murray MJ, **Iaizzo PA**; \$22,132, 6/90, 1 year.
7. "The relative potency of desflurane, halothane and isoflurane as triggers of episodes of malignant hyperthermia;" Anaquest; **Iaizzo PA**, Wedel DJ, Milde JH; \$48,578, 9/90, 1 year.
8. "The effect of convection-induced corporeal hypothermia and rewarming on central nervous system temperature and metabolites;" Augustine Medical, Inc.; Lanier WL, **Iaizzo PA**, Sharbrough FW, Murray MJ; \$10,675, 1/91, 1 year.

9. "Are hyperkalemic periodic paralysis and paramyotonia the same entities?;" Muscular Dystrophy Association; Lehmann-Horn F, **Iaizzo PA**; \$90,000, 1/91, 3 years.
10. "The use of forced air cooling to aid in the treatment of malignant hyperthermia;" Minnesota Medical Foundation via a gift from Augustine Medical, Inc.; **Iaizzo PA**, Palahniuk RJ; \$12,380, 4/91, 2 years.
11. "Forced air cooling for the treatment of exercise-induced heat stress;" Minnesota Medical Foundation via a gift from Augustine Medical, Inc.; **Iaizzo PA**, Leon AS, Palahniuk RJ; \$4,900, 9/91, 2 years.
12. "The effects of lower limb surface warming on hypotension following the release of an aortic cross clamp and indices of lower extremity ischemia in pigs;" Minnesota Medical Foundation via a gift from Augustine Medical, Inc; Beebe DS, Gauthier RL, DeMars J, **Iaizzo PA**; \$18,0600, 9/91, 1 year.
13. "Malignant hyperthermia induction in susceptible swine following exposure to ORG 9487;" Organon Grant # 95-9669; Wedel DJ, **Iaizzo PA**; \$69,249, 6/95, 2 years.
14. "The physiological response to lumbar traction in humans;" Spinal Designs International (via Center for Interfacial Engineering; **Iaizzo PA**, Sparrow EM; \$21,560, 6/94, 1 year.
15. "Temperature thresholds at which applied cooling prevents pressure ulcers and at which applied warming promotes healing;" National Science Foundation; **Iaizzo PA**, Sparrow EM; \$49,999, 12/94, 1 year.
16. "Doxorubicin chemomyectomy for the treatment of cervical dystonia;" Dystonia Medical Research Foundation; McLoon L, **Iaizzo PA**, Dykstra D, Thompson L, Nguyen LT; \$23,655, 4/96, 1 year.
17. "Center for Muscle and Muscle Disorders;" Graduate School, University of Minnesota; Day JW, **Iaizzo PA**; \$20,000, 7/96, 2 years.
18. "Doxorubicin chemomyectomy for the treatment of cervical dystonia;" Dystonia Medical Research Foundation; McLoon L, **Iaizzo PA**; \$23,650, 4/97, 1 year.
19. "Swine isolated working heart model;" Medtronic, Cardiac Rhythm Management–Therapy Delivery; **Iaizzo PA**, Houlton AJ; \$38,661 and \$31,300 in equipment, 5/97, 1 year.
20. "Muscle physiology and protein use by overwintering black bears;" National Science Foundation; Harlow H, **Iaizzo PA**, Smith-Sonneborn J, Beck TDI; \$301,598, 7/98, 3 years.
21. "Center for Muscle and Muscle Disorders;" Graduate School, University of Minnesota Day JW, **Iaizzo PA**; \$100,000, 7/98, 3 years.
22. "Axial unloading device therapy for cervical spine rehabilitation;" Spinal Designs and Minnesota Technology Incorporated; **Iaizzo PA**, Erdman AG; \$40,500, 1/99, 1.5 years.
23. "The effect of acute and subacute dexamethasone treatment on brain glucose and glycogen concentrations in anesthetized rats;" Pharmacia & Upjohn Company; Lanier WL, Thompson MD, Gallagher WJ, **Iaizzo PA**; \$5,000, 6/99, 2 years.
24. "Muscle force assessment in critically ill patients;" Center for Excellence in Critical Care and the Graduate School, University of Minnesota; Hong J, Sigg D, **Iaizzo PA**; \$1,000, 7/00, 1 year.
25. "The role of opioids in ischemic preconditioning of skeletal muscle;" Center for Muscle and Muscle Disorders; Sigg D, **Iaizzo PA**; \$4,000, 7/00, 1 year.
26. "Training program in muscle research;" National Institutes of Health, Institutional NRSA – NIAMS; Thomas DD et al.; \$1,478,495, 7/01, 5 years.
27. "Lab-based courses for BME undergraduates and practicing engineers;" The Whitaker Foundation; Tranquillo et al.; \$ 999,432, 1/02, 3 years.

28. "The role of delta-opioids in attenuating reperfusion injury: post conditioning;" Lillehei Heart Institute Grant Revision Award; **Iaizzo PA**; \$20,032 total, 5/02, 6 months.
29. "Force assessment in canines;" Merck, Inc.; **Iaizzo PA**; \$34,950 total, 12/02, 1 year.
30. "Opioid preconditioning of normal and dystrophic heart and skeletal muscle;" Paul & Sheila Wellstone Muscular Dystrophy Center, Nash Avery Award; **Iaizzo PA**; \$10,000 total, 3/04, 1 year.
31. "Opioid preconditioning in normal and dystrophic heart muscle;" Paul & Sheila Wellstone Muscular Dystrophy Center, Nash Avery award; **Iaizzo PA**; \$15,000 total, 8/05, 1 year.
32. "Using an IR camera to assess the effectiveness of back treatment;" National Institutes of Health, Phase I SBIR R43 AT004383-01; \$30,000 total, subcontract from Advanced Medical Electronics Corporation; **Iaizzo PA**; 1/08, 16 months.
33. "Development of a composite drug delivery and electrical sensing/stimulating implantable catheter;" Medical Devices Center of the Institute for Engineering in Medicine; Whitson B, Richardson ES, **Iaizzo PA**; \$25,000 total, 9/08, 1 year.
34. "Multidomal biomedical imaging;" Institute for Engineering in Medicine; He B, **Iaizzo PA**; \$400,000 total, 7/07, 2.5 years.
35. "Muscle force assessment system;" \$39,000 award from the Medical Device Center of the University of Minnesota, with \$10,000 matching funds from the 2007 Design of Medical Devices Conference; Durfee WK, **Iaizzo PA**; 1/08 to 1/10.
36. "Thermochemical ablation in image-guided interventions: initial assessment;" NIH R21 1R21-CA133263-01; Cressman E, Bischof JC, **Iaizzo PA**, Jessurun J; \$268,944 direct, 4/08, 2 years.
37. "Molecular enhancement of cryosurgical ablation of the prostate;" AHC Translational Research Grant TRG #09-08; Metzger G, Bischof J, Slaton J, **Iaizzo PA**; \$133,333 total; 10/09 to 9/11 (translation of gold nanoparticle TNF delivery to enhance and image cryosurgical treatments of prostate cancer in a canine model).
38. "The non-invasive assessment of involuntary muscle forces and muscle diameters in critically ill ICU patients: correlations with extubation criteria;" Excellence in Critical Care Seed Grant; **Iaizzo PA**, Loushin MK; \$5,000 total, 2/10, 1 year.
39. "Quantification and modeling of the human phrenic nerve anatomy;" IEM Seed Grant; **Iaizzo PA**; \$40,000 direct, 1/12, 1 year.
40. "An abnormal detrusor muscle contraction mapping approach in optimizing BTX injection in treating OAB;" IEM Seed Grant; Zhang Y, **Iaizzo P**, Nakib N, Erdman A, Timm G; \$39,833 direct, 1/12, 1 year.
41. "Muscular Dystrophy Center Core Laboratories;" NIH 5P30AR057220/1P30AR057220 (Ervasti JM, Day JW); 5% effort  
     2013: \$573,800 total  
     2012: \$604,000 total  
     2011: \$604,000 total  
     2010: \$601,450 total  
     2009: \$600,175 total
42. "LHI Elementary/College Program," Lillehei Heart Institute, **Iaizzo PA**  
     2017: \$50,000 total  
     2016: \$50,000 total  
     2015: \$50,000 total  
     2014: \$50,000 total  
     2013: \$50,000 total
43. "Minnesota Muscle Training Program;" NIH 5T32 AR007612; Thomas DD

2018: \$571,796 total  
 2017: \$606,558 total  
 2016: \$473,239 total  
 2015: \$463,441 total  
 2014: \$449,250 total  
 2013: \$455,523 total  
 2012: \$457,752 total  
 2011: \$430,218 total  
 2010: \$438,101 total  
 2009: \$438,762 total  
 2008: \$329,857 total  
 2007: \$313,066 total  
 2006: \$170,926 total  
 2005: \$193,567 total  
 2004: \$182,218 total  
 2003: \$168,098 total  
 2002: \$155,516 total

44. "Medical Scientist Training Program;" NIH; NIGMS

2T32GM008244/3T32GM008244/5T32GM008244; LeBien, TW, Shimizu Y;

2018: \$625,559 total  
 2017: \$516,115 total (+ one supplement of \$51,612)  
 2016: \$511,061 total (+ two supplements of \$51,106 and \$86,400)  
 2015: \$455,522 total  
 2014: \$434,448 total  
 2013: \$446,891 total  
 2012: \$446,891 total  
 2011: \$442,692 + \$49,188 total  
 2010: \$438,610 + \$48,734 total  
 2009: \$400,983 + \$44,953 + \$44,953 total  
 2008: \$402,595 total  
 2007: \$402,595 total  
 2006: \$357,862 total  
 2005: \$342,350 total  
 2004: \$80,628 total  
 2003: \$78,891 total  
 2002: \$470,335 total

45. "Summer Research at the University of Minnesota Medical School;" NIH

5R25HL088728/2R25HL088728/1R25HL088725; Campbell CR

2018: \$186,620 total  
 2016: \$157,464 total  
 2015: \$157,464 total  
 2014: \$157,464 total  
 2013: \$149,906 total  
 2012: \$157,464 total  
 2011: \$127,872 total  
 2010: \$127,872 total  
 2009: \$127,872 total

2008: \$127,872 total

2007: \$127,872 total

46. "Image-guided simulation-based approach for native and prosthetic aortic valves in patient-specific anatomies;" Lillehei Heart Institute High Risk High Reward Grant; **Iaizzo PA**, Sotiropoulos F; \$100,000 total, 3/14 to 2/16.
47. "Electroporation for selective, non-thermal, reversible and irreversible tissue ablation;" Minnesota Partnership for Biotechnology and Medical Genomics (capital equipment); Asirvatham SJ, **Iaizzo PA**; \$831,950 total; 7/14 to 8/16.
48. "Neuromuscular blockade assessment of motor point stimulation;" Office of Discovery and Translation (ODAT), Translational Technologies and Resources (TTR) Core Usage Program; **Iaizzo PA**; \$3,500, 1/15 to 1/16.
49. "Ice technology for cooling organs;" Dr. Robroy MacIver (research grant); **Iaizzo PA**; \$17,000 total, 6/15 to 5/18.
50. "3D imaging of congenital hearts;" Dr. Robroy MacIver (research grant); **Iaizzo PA**, Duncanson E; \$8,275 total, 1/16 to 12/16.
51. "3D human torso models;" James B. Linsmayer Foundation; **Iaizzo PA**; \$15,000, 12/15 to 1/17
52. "Human heart library and 3D printing;" Institute for Engineering in Medicine, University of Minnesota; **Iaizzo PA**; \$30,000, 6/16 to 5/17.
53. "Electroporation for selective, non-thermal, reversible and irreversible tissue ablation;" Minnesota Partnership for Biotechnology and Medical Genomics (research grant); Asirvatham SJ, **Iaizzo PA**; \$792,000 total, 2/15 to 12/17.
54. IEM support for heart library and 3D printing;" Institute for Engineering in Medicine; **Iaizzo PA**; \$30,000 direct, 5/16 to 5/18.
55. "Neuromuscular blockade assessments of motor point stimulation;" Institute for Engineering in Medicine Seed Grant; **Iaizzo PA**, Durfee W; \$20,000 total, 1/15 to 1/18.
56. "Cardiovascular remodeling;" Institute for Engineering in Medicine Seed Grant, University of Minnesota; Barocas V, **Iaizzo PA**; \$75,000, 1/17 to 1/18.
57. "IEM book and education;" Institute for Engineering in Medicine; **Iaizzo PA**; \$50,000, 6/17 to 7/18, 0% effort (support IEM book administration and education/outreach).
58. "Medtronic Professor of Visible Heart Research;" Medtronic; **Iaizzo PA**; \$750,000 total, 2/04 to 6/24.
59. "Tissue characterization cooperative agreement—in vivo mechanical tissue properties via robotic smart tools;" Award W911NF-14-2-0035 ARL-HRED-STTC Tissue Characterization Research Initiative; US Army Medical Research and Materiel Command (USAMRMC); Kowalewski TM, **Iaizzo PA**; \$162,524 direct, 12/17 to 12/18, 0% effort.
60. "IEM book and education;" Institute for Engineering in Medicine; **Iaizzo PA**; \$50,000, 6/18 to 7/19, 0% effort (support IEM book administration and education/outreach).

#### ADDITIONAL STUDENT FUNDING

1. Biomedical Engineering Department Undergraduate Fellowships (\$25,000)  
*Kaleita (1995); Ariff (1997); Duke (1999); Reily (2000); Sullivan (2001)*
2. Biomedical Engineering Department Graduate Fellowships (\$10,000)  
*Quill (2005)*
3. Biomedical Engineering Institute (BMEI) Student Research Awards (\$155,000)  
*Kimmel (2003); Dupre (2003/4); Ahlberg (2004/5, 2005/6); Anderson (2005/6, 2006/7); Eggen (2006); Overgaard (2007)*

4. Doctoral Dissertation Fellowships (\$30,000)  
*Richardson (2008/9)*
5. GAANN Fellowships (\$360,000)  
*Richardson (2006/07, 2007/8); Rolfes (2007/8); Thompson (2007/8); Howard (2008/9); Eggum (2009/10); Goff (2009/10); Mattison (2013/14); Schmidt (2013/14); Mattson (2014/15)*
6. Institute for Engineering in Medicine Grants (\$70,000)  
*Bateman (2008/9)*
7. Life Sciences Summer Undergraduate Research Program (LSSURP) (\$64,000)  
*Engelhardt (1992); Kalb (1993); Leaven (1997); Wieland (1998); Brooks (1998); Chu (2001); Torgerson (2001); Castleman (2002); Horn (2002); Nore (2003); Galligan (2003); Campbell (2004); Gonzalez-Rodriguez (2006); Suarez-Rodriguez (2006); Finkton (2007); Perry (2007); Weinberger (2008); Usmani (2009); Constanzo (2009); Yeboa (2010); Zauner (2010); Patterson (2011); Gamble (2011); Marrero-Marrero (2012); Torres Roman (2012); Lezama (2013-4); Scott (2013); Hernandez (2014); Segarra (2015); Kelly (2015); Soto (2016)*
8. Minnesota Medical Foundation Grants (\$20,000)  
*Bojanov (1999/2000); Duncan (1999/2000); Frattalone (2003); Geeslin (2008)*
9. NIH Muscle Training Grant (D Thomas, PI, PA Iaizzo, Co-PI) (\$375,370)  
*Eggen (2007/8, 2008/9); Frommer (2004/5, 2005/6, 2006/7); Rolfes (2009/10, 2010/11); Howard (2011/12, 2012/13); Mattison (2015/6, 2016/7)*
10. National Science Foundation (SURPE, REU, and SEED Programs) (\$33,000)  
*Held (1993); Kerkow (1993); Lackas (1993, 1994); Leland (1993); Goodson (1994); Harp (1994); Lao (1994); Bangsund (1995); Lindblom (1997); Aggarwal (1998)*
11. Research Explorations Program (\$16,500)  
*Cruz Arcedo (1993); Esterberg (1993); Arcedo (1994); Falkenberg (1994); Field (1994); Heidmann (1994); Gengenbach (1995); Jauregui (1995); Carlson (1996); Seifert (1996); Koff (1996)*
12. Undergraduate Research Opportunities Program (UROP) Awards (\$35,400)  
*Solovey (1994); Wisniewski (1995); Nguyen (2002/3); Oommen (2003); Choi (2004); Skadsberg (2004); Wallace (2004); Youtsos (2004/5); Mika (2005); Kelley (2006/7); Ezzat (2006); Powell (2007); Dockendorf (2009); Tetzner (2009); Balto (2011); Schmidt (2011); Zauner (2011); Gangenness (2013/14); Richter (2014); Empanger (2014/15); Cho (2016); Ziegler (2019)*
13. North Star Stem Project Award (\$2,100)  
*Mbachu (2010)*
14. Earl E. Bakken Foundation Fund (for graduate student support)  
\$100,000 (2005-2007)  
\$105,000 (2011-2013)  
\$70,000 (2014-2015)  
\$70,000 (2016-2017)

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## EDUCATIONAL FUNDING

1. Course: New Product Design and Business Development; \$1,000,000+ (48 projects) 1995 to present.
2. Book: Handbook of Cardiac Anatomy, Physiology and Devices; Lillehei Heart Institute, University of Minnesota; \$10,000, 2004.

3. Book: Handbook of Cardiac Anatomy, Physiology and Devices; Biomedical Engineering Institute, University of Minnesota; \$10,000, 2004.
4. Book: Textbook of Cardiac Anatomy, Physiology and Devices; Institute for Engineering in Medicine, University of Minnesota; \$5,000, 2008.

### LICENSING AGREEMENTS

1. US 7,045,279: Use of an isolated perfused heart preparation for device design and medical imaging (P-8207). Exclusive licensing agreement with Medtronic from 5/10 to 4/20 (10 years), \$100,000 annually.

### UNRESTRICTED RESEARCH GIFTS

1. "Human thermoregulation and wound healing;" Augustine Medical, Inc.; **Iaizzo PA**; ~\$400,000, 4/95 through 2002.
2. "Lumbar traction using an LTX3000™ lumbar rehabilitation system;" Spinal Designs International; **Iaizzo PA**; ~\$300,000, 1/95 through 2002.
3. "Ergonomic comfort and spinal alignment;" Select Comfort; **Iaizzo PA**; \$40,000, 4/97, 1 year.
4. "Human thermoregulation and patient warming gowns;" Arizant Healthcare, Inc.; **Iaizzo PA**; \$6,200, 9/03.
5. "A retrospective analyses of the Low Back Rehabilitation Program," Spinal Designs International; **Iaizzo, PA**; \$13,000, 9/05.

## PATENTS

### ISSUED US PATENTS

1. US 5,800,480: Support apparatus with a plurality of thermal zones providing localized cooling. Augustine SD, **Iaizzo PA**, Sparrow EM, Johnson PS, Arnold RC: Issued September 1, 1998.
2. US 5,837,002: Support apparatus with localized cooling of high-contact-pressure body surface areas. Augustine SD, **Iaizzo PA**, Sparrow EM, Johnson PS, Arnold RC, Stapf DE: Issued November 17, 1998.
3. US 5,860,292: Inflatable thermal blanket for convectively cooling a body. Augustine SD, **Iaizzo PA**: Issued January 19, 1999.
4. US 6,010,528: Support apparatus which cradles a body portion for application of localized cooling to high-contact-pressure body surface areas: Augustine SD, **Iaizzo PA**, Sparrow EM, Johnson PS, Arnold RC; Issued January 4, 2000.
5. US 6,033,432: Support apparatus with a plurality of thermal zones providing localized cooling. Augustine SD, **Iaizzo PA**, Sparrow EM, Johnson PS, Arnold RC: Issued March 7, 2000.
6. US 6,119,474: Inflatable thermal blanket for convectively and evaporatively cooling a body. Augustine SD, **Iaizzo PA**: Issued September 19, 2000.
7. US 6,123,716: Support apparatus which cradles a body portion for application of localized cooling to high contact-pressure body surface areas. Augustine SD, **Iaizzo PA**, Sparrow EM, Johnson PS, Arnold RC: Issued September 26, 2000.
8. US 6,210,427: Support apparatus with a plurality of thermal zones providing localized cooling. Augustine SD, **Iaizzo PA**, Sparrow EM, Johnson PS, Arnold RC: Issued April 3, 2001.

9. US 6,224,623: Support apparatus which cradles a body portion for application of localized cooling to high contact-pressure body surface areas. Augustine SD, **Iaizzo PA**, Sparrow EM, Johnson PS, Arnold RC: Issued May 1, 2001.
10. US 6,487,871: Apparatus, system and method for convectively and evaporatively cooling a body. Augustine SD, **Iaizzo PA**: Issued December 3, 2002.
11. US 6,497,720: Support apparatus with a plurality of thermal zones providing localized cooling. Augustine SD, **Iaizzo PA**, Sparrow EM, Johnson PS, Arnold RC: Issued December 24, 2002.
12. US 6,514,214: Intravascular temperature sensor. Kokate JY, DoBrava EM, Berrada MS, Kimmel S, Prstic S, Hoey MF, Bar-Cohen A, **Iaizzo PA**: Issued Feb 4, 2003.
13. US 6,581,400: Apparatus, system and method for convectively and evaporatively cooling a head. Augustine SD, **Iaizzo PA**: Issued June 24, 2003.
14. US 6,671,550: System and method for determining location and tissue contact of an implantable medical device within a body. **Iaizzo PA**, Laske TG: Issued December 30, 2003.
15. US 6,714,806: System and method for determining tissue contact of an implantable medical device within a body. **Iaizzo PA**, Laske TG, Choi W: Issued March 30, 2004.
16. US 7,045,279: Isolated perfused heart preparation and method for use. Laske TG, **Iaizzo PA**, Hjelle MA, Morissette J, Wahlstrom DA, Issued May 16, 2006.
17. US 7,529,584: Pacing method. Laske TG, **Iaizzo PA**: Issued May 5, 2009.
18. US 8,019,437: Lead fixation means. **Iaizzo PA**, Laske TG: Issued September 13, 2011.
19. US 8,332,035: Pacing method. **Iaizzo PA**, Laske TG: Issued December 11, 2012.
20. US 8,734,484: System and method for closure of an internal opening in tissue, such as a transapical access opening. Ahlberg S, Simma S, Rothstein PT, Clements M, Jelich D, Laske TG, Clague C, Green M, **Iaizzo P**: Issued May 27, 2014.
21. US 9,050,129 A1: Auto-closure apical access positioner device and method. Rothstein PT, Hill AJ, Hobday MJ, Green MM, **Iaizzo PA**: Issued June 9, 2015.
22. US 9,445,797: Percutaneous atrial and ventricular septal defect closure device. Rothstein P, **Iaizzo P**: Issued September 20, 2016.
23. US 9,943,682: Method and apparatus for determining suitability of a lead implant location. Eggen MD, Haddad TD, **Iaizzo PA**, Yang Z: Issued April 17, 2018.
24. US 10,098,685: Feedback system for cryoablation of cardiac tissue. Lalonde JP, Groves RE, Laske TG, **Iaizzo PA**, Bischof JC: Issued October 16, 2018.

## US PATENT APPLICATIONS

1. Pending: Method and apparatus for the induction of hypothermia in which the shivering response is suppressed by focal-facial warming. **Iaizzo PA**, Augustine SA: Filed January 2000.
2. Pending: System and method for placing an implantable medical device within a body. **Iaizzo PA**, Laske TG: Filed November 25, 2004.
3. Pending: Ergonomic rake and handling methods. **Iaizzo PA**, Augustine SA: Filed April 12, 2006.
4. Pending: Method of handling ergonomic rake. **Iaizzo PA**, Augustine SA: Filed September 21, 2006.
5. Pending: Novel lead fixation means. **Iaizzo PA**, Laske TG: Filed August 11, 2006.
6. Pending: System and method for closure of an internal opening in tissue, such as a trans-apical access opening. Ahlberg S, Simma S, Rothstein PT, Clements M, Jelich D, Laske TG, Clague C, Green M, **Iaizzo PA**: Filed April 21, 2009.
7. Pending: Auto-closure apical access positioner device and method. Rothstein PT, Hill AJ, Hobday MJ, Green MM, **Iaizzo PA**: Filed March 31, 2010.



8. Pending. Percutaneous atrial and ventricular septal defect closure device. **Iaizzo PA**, Rothstein P: Filed August 2012.
9. Pending: Percutaneous atrial and ventricular septal defect closure device. Rothstein P, **Iaizzo PA**: Filed September 13, 2012.
10. Patent Board Approved for Filing: Algorithm and device to determine fixation state for an implantable pacing device. Eggen M, Haddad T, **Iaizzo PA**, Yang Z: Filed April 8, 2013.
11. Pending: Heart-lung preparation and method of use. **Iaizzo PA**, Laske TG, Eggen MD, Goff RP, Howard B: Filed April 24, 2014.
12. Pending: Method for closure and ablation of atrial appendage. **Iaizzo PA**, Goff RP: Filed October 9, 2015.
13. Pending: Method and apparatus for determining suitability of a lead implant location. Eggen MD, Haddad TD, **Iaizzo PA**, Yang Z: Filed on April 24, 2015.
14. Pending: Laser catheter with use of reflected light to determine material type in vascular system. Kowalewski TM, Beekman DD, Stubbs JB, **Iaizzo PA**, Peterson GK: Filed on December 30, 2014.
15. Pending: Percutaneous atrial and ventricular septal defect closure device. Rothstein P, **Iaizzo PA**: Filed August 29, 2016.
16. Pending: Devices, systems, and methods for monitoring neuromuscular blockage. Durfee WK, **Iaizzo PA**, Cabrera JA, Iaizzo JC, Mehawej J, Ruda K, McConnell JP: Filed January 12, 2017.
17. Pending: Heart-lung preparation and method of use. **Iaizzo PA**, Laske TG, Eggen MD, Goff RP, Howard B: Filed May 11, 2017.

#### EUROPEAN PATENT OFFICE

1. EP1009342A1: An inflatable thermal blanket for convectively and evaporatively cooling a body. Augustine SD, **Iaizzo PA**: Issued September 25, 1998.
2. 01973198.3-2305-US0129289: Improved system and method for determining tissue contact of an implantable medical device within a body. **Iaizzo PA**, Laske TG: Filed May 7, 2003.
3. EP1123000, DE69922985D: Use of an isolated perfused heart preparation for device design and medical imaging (P-8207.00). Laske TG, **Iaizzo PA**, Hjelle MA, Morissette J, Wahlstrom DA: Filed October 22, 1999.
4. EP1009342, DE69827277D: Inflatable thermal blanket for convectively cooling a body. Augustine SD, **Iaizzo PA**: Filed August 26, 1997.

#### PROVISIONAL PATENTS / IP FILED

1. Z09140 Implantable composite catheter. Richardson ES, Whitson BA, Rolfes CD, **Iaizzo PA**, Benditt DG: Filed January 2010.
2. OTC Docket No.: 20100107. Novel methods for teaching ultrasound diagnostic techniques. **Iaizzo PA**: January 2010.

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#### MARKETED INVENTIONS

1. Slapshot Ergonomic Hockey Rake. Augustine Biomedical and Design, 2005, sold on QVC.