Tuesday, April 15, 2008

7:00 a.m.  Registration and Continental Breakfast
8:15 a.m.  Conference Welcome and Plenary Session
Sponsored by Medtronic, Inc.
Moderators: Arthur Erdman, Conference Chair
William Durfee, Technical Program Chair
Keynote Address: Creating and Implementing Breakthrough Medical Technology
Robert Langer
Massachusetts Institute of Technology

8:15 a.m.  Session 1B, Ballroom B
○ Technical and Business Challenges
A New Device for Distal Fixation of IM Nails: Technical and Business Challenges
Peter DeLange
Midwest Orthopedic Research Foundation

8:15 a.m.  Session 1A, Ballroom A
○ Developing a Myocardial Equivalent
Lauren Black
Biomedical Engineering, University of Minnesota

9:15 a.m.  Session 1N, Nolte Room
○ The Changing Landscape of IP Law
Toby Nord, Carlson School of Management, University of Minnesota

9:15 a.m.  Session 1D, Ballroom D
○ Cell-based Therapies for Degenerated Intervertebral Discs
Andrew J. L. Walsh
Medtronic Corporate Biotechnology

9:15 a.m.  Session 1C, Ballroom C
○ Beyond Standards: The Need to Investigate the Changing EM Environment During New Product Development
Dick Wessels
Medtronic Incorporated

10:30 a.m. - 12:00 p.m.  Concurrent Technical Sessions

10:30 a.m. - 12:00 p.m.  Ballrooms A-D

ORTHOPAEDIC DEVICES
Session Chairs: Session 1A, Balloom A
Joan E. Bechtold, Orthopaedic Biomechanics Research Laboratory, Hennepin Co. Medical Center
Peter Bianco, Bioscience Business Development Dynamic Knee Brace System for Orthotic Stance Control
Kenton Kaufman
Biomechanics/Motion Analysis Laboratory, Mayo Clinic

FDA Device Evaluation Process
Michael Yaszemski
Mayo Clinic

A New Device for Distal Fixation of IM Nails: Technical and Business Challenges
Peter DeLange
Midwest Orthopedic Research Foundation

NATURAL ORIFICE TRANS'LUMINAL ENDOSCOPIC SURGERY
Session Chairs: Session 1B, Balloom B
Timothy Kinney, Medicine, University of Minnesota and Hennepin Co. Medical Center
Perry Li, Mechanical Engineering, University of Minnesota

NOTES
William Brugge
Gastroenterology, Massachusetts General Hospital

Industry Perspective on NOTES
Vihar Surti
Cook Medical

WIRELESS APPLICATIONS IN MEDICAL DEVICES
Session Chair: Session 1C, Balance C
Rich Nazarian, Minnetronix

Cellular Technology for Remote Patient Monitoring
Mike Fette
Spectrum Design Solutions, Inc.

An Ambulatory Ultra-Wideband Telemetry System for Neurological Instruments
Tim Riehle
Korus Biomedical Technologies Corporation

Beyond Standards: The Need to Investigate the Changing EM Environment During New Product Development
Dick Wessels
Medtronic Incorporated

TISSUE ENGINEERED DEVICES
Session Chair: Robert Tranquillo, Biomedical Engineering, University of Minnesota
Sheet Based Tissue Engineering for Blood Vessels
Nicolas L’Heureux
CytoViva Tissue Engineering, Inc.

Controlled Cyclic Stretching of Fibrin-Based Heart Valve Equivalent
Zeeshan Syedain
Chemical Engineering & Material Science, University of Minnesota

Development of a Fibrin-Gel Based Myocardial Equivalent
Lauren Black
Biomedical Engineering, University of Minnesota

OPHTHALMIC ENGINEERING
Session Chair: Session 1N, Nolte Room
Victor Barocas, Biomedical Engineering, University of Minnesota

Optical Coherence-Based Imaging and Sensing in Biomedicine and Biotechnology
Joseph Izatt
Duke University

Engineering an Intravitreal Drug Delivery System
Konrad Kauper
Neurotech USA

Computer Modeling of Drug Delivery to the Posterior Eye
Victor Barocas
Biomedical Engineering, University of Minnesota

12:00 p.m.  Break for Lunch

12:15 p.m.  HH1 Ballroom
KEYNOTE LUNCHEON
Sponsored by St. Jude Medical
Moderator: Arthur Erdman, Conference Chair
Thomas Gunderson
Managing Director and Senior Research Analyst, Piper Jaffray

(KEYNOTE lunches are a separate billable event, meal tickets are required for entry)

2:00 p.m. - 3:30 p.m.  Concurrent Technical Sessions

LIVE SURGERY
Session 2H, HH1 Ballroom
Surgeon: Kenneth Liao
Cardiothoracic Surgery Division, University of Minnesota

3:30 p.m.  Ballrooms A-D
SCIENTIFIC POSTER SESSION: Emerging Medical Device Technologies
Sponsored by SIMULIA

3:30 p.m.  Pre-Function Area
Reception and Sponsor Exhibit Showcase

5:00 p.m.  Adjourn

REGULATORY AFFAIRS AND INTELLECTUAL PROPERTY
Session Chair: Session 2A, Regents Room
Toby Nord, Carlson School of Management, University of Minnesota

The 510(k) Process: Recent Trends and Changes
Clay Anselmo
Reglera, LLC

The Changing Landscape of IP Law
Brad Pedersen
Patterson, Thuente, Skaar & Christensen

Patent Litigation Strategies and Alternatives in the New Legal Environment
Mathias W. Samuel
Fish & Richardson P.C.

MEDICAL-DEFENSE TECHNOLOGIES
Session Chair: Session 2N, Nolte Room
Chip Laingen, Defense Alliance of Minnesota

U.S. Army Medical Research & Material Command (MRMC) and TATRC Overview
David A. Smart
Research Center (TATRC)

The session will open with a brief tutorial by surgical tools for the audience to manipulate. The objective of the session is to discuss the limitations and design opportunities for the tools and devices used in modern surgery. The moderator will explain and show the use of each tool and to take questions from the audience. There may be a collection of surgical tools for the audience to manipulate. The session will open with a brief tutorial by the moderator on the surgical procedure.

Moderator:
Herb Ward
Surgery, University of Minnesota

A cardiac procedure performed at the University of Minnesota Medical School Fairview will be transmitted to the conference room via live video feed. The objective of the session is to discuss the limitations and design opportunities for the tools and devices used in modern surgery. The moderator will explain and show the use of each tool and to take questions from the audience. There may be a collection of surgical tools for the audience to manipulate. The session will open with a brief tutorial by the moderator on the surgical procedure.

Minnetronix Incorporated
Kenneth Liao

Fairview will be transmitted to the University of Minnesota Medical School - Medicine, University of Minnesota

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Sponsored by St. Jude Medical

Reception and Sponsor Exhibit Showcase

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Wednesday, April 16, 2008

7:00 a.m. Pre-Function Area
Registration and Continental Breakfast

7:15 a.m. Ballrooms A-C
SPECIAL EVENT: High-Impact Networking
Breakfast for Scientists & Engineers
Organized by LifeScience Alley

Keynote Speaker:
Janet Stacey
Vice President, Health Care and
Medical Device—Padilla Speer Beardsley

8:30 a.m. - 10:00 a.m.
Concurrent Technical Sessions

NEURAL ENGINEERING I:
NEUROMODULATION

Session Chair: Session 3A, Ballroom A
Bin He, Biomedical Engineering, University of Minnesota
Greg Worrell, Neurology, Mayo Clinic
Engineering Devices to Treat Epilepsy
Brian Litt
Neurology & Bioengineering, University of Pennsylvania
Clinical Indications for Neuromodulation
Aviva Abosch
Neurosurgery, University of Minnesota
Practical Sensing and Algorithm Constraints in Neuromodulation Devices
Tim Denison
Neuro IC Technology, Medtronic

ADVANCED REHABILITATION TECHNOLOGIES

Session Chair: Session 3B, Ballroom B
Lars Oddsson, Sister Kenny Research Center, Sister Kenny Rehabilitation Institute
Advances in Gait Training Strategies for Individuals with Lower Limb Impairments
Joe Ridler
National Rehab Hospital & Biomedical Engineering, Catholic University
Wearable Technology for Fall Prevention
Lars Oddsson
Sister Kenny Rehabilitation Institute, Sister Kenny Research Center
A Swedish Example of Research on Design & Use of Technology in Rehabilitation and Health Care
Gerd Johansson
Design Sciences, Lund University

"Biomechanical Tools for Rehabilitation Assessment"
David Nuckley, Physical Med/Rehabilitation, University of Minnesota

MEMS/NANO I

Session Chair: Session 3C, Ballroom C
Rajesh Rajamani, Mechanical Engineering, University of Minnesota
Instrumentation for Biological Imaging and Manipulation at the Molecular Scale
Murti Salapaka
Electrical and Computer Engineering, University of Minnesota
Implantable, Wireless Glucose Microsensor for Remote Telemetry
Ron Siegel
Pharmacology, University of Minnesota
Wireless Carbon Nanotube Gas Sensors for Respiratory Monitoring
Shyam Sivaramakrishnan
Mechanical Engineering, University of Minnesota
MEMS and IT for Better Glycemic Control
Dorian Liepmann
Bioengineering, University of California, Berkeley

CARDIOVASCULAR I:
CARDIAC ANATOMY

Session Chair: Session 3D, Ballroom D
Alexander Hill, Medtronic
The Role of General and Individual Cardiac Anatomy for Development and Application of Medical Devices
André Plass
University Hospital Zurich, Switzerland
Cardiac Image for Catheter Ablation
Fei Lu
Cardiology, University of Minnesota
Attitudinally Correct Cardiac Anatomy
Alexander Hill
Cardiovascular Structural Heart Disease, Medtronic, Inc.

HUMAN FACTORS IN MEDICAL DEVICES

Session Chair: Session 3N, Nolte Room
Richard Stein, St. Jude Medical
User Interface Design Issues for a New Cardiac Monitor
Mary Carol Day
Angel Medical Systems, User Interface Systems
Discovering that Two are Better than One: The Redesign of Catheter Removal Tools
Bill Wenger and Beth Bullemer
Cardiac Rhythm Disease Management, Medtronic, Inc.

Human Factors Issues in the Design and Evaluation of a New Laboratory Analyzer
William H. Muto
Diagnetics Division, Abbott Laboratories
User Centered Lessons Learned in Medical Device Development
Mary Beth Privitera
Medical Device Innovation Program, University of Cincinnati

10:00 a.m. Pre-Function Area
Sponsor Exhibit Showcase
10:45 a.m. - 12:15 p.m.
Concurrent Technical Sessions

NEURAL ENGINEERING II:
TRANSLATIONAL DEVICES

Session Chair: Session 4A, Ballroom A
Theoden Netoff, Biomedical Engineering, University of Minnesota
Potential New Therapies for Neocortical Epilepsy: Focal Cooling and Uncaging
Steve Rothman
Division of Clinical Pediatric Neuroscience, Medical School, University of Minnesota

DBS for Epilepsy: Past and Current Experience
Nina Graves
Medtronic, Inc.

Neuroanatomical Strategies for Physicochemical Therapeutics in the Epilepsies
Thomas R. Henry
Epilepsy Care and Research Program, Medical School, University of Minnesota

TRANSPORT ISSUES IN MICRO AND NANO MEDICAL DEVICES

Session Chair: Session 4B, Ballroom B
Allison Hubel, Mechanical Engineering, University of Minnesota
Alptekin Aksan, Mechanical Engineering, University of Minnesota
Microscale Technologies for Probing Neutrophil Function in Health and Disease
Daniel Irimia
Harvard Medical School
Experimental Study of Diffusion-Based Extraction from a Cell Suspension
Clara Mata
Aerospace Engineering & Mechanics, University of Minnesota
Peptide-Functionalized Nanoparticles for Targeted Delivery of Therapeutics
Effe Kokkoli
Chemical Engineering & Materials Science, University of Minnesota

MEMS/NANO II

Session Chair: Session 4C, Ballroom C
Tianhong Cui, Mechanical Engineering, University of Minnesota
Guided-Wave Acoustic and Optical Biosensors for Liquid Detection
Yihui Wu, Laboratory of Applied Optics, Chinese Academy of Sciences
Polymer Microfluidic Chips Fabricated with Hot Embossing
Yi Luo, Microsystem Research Center, Dalian University of Technology
BioMEMS Biocompatibility, FDA and ISO 10993
Steven S. Saltzman, Biomedical Engineering, University of Minnesota
Microfluidic and Infrared Sensors
Joseph Talghader, Electrical Engineering, University of Minnesota

CARDIOVASCULAR II: BIOLOGIC DELIVERY SYSTEMS FOR THE HEART

Session Chair: Session 4D, Ballroom D
Daniel Garry, Lillehei Heart Institute, University of Minnesota
Molecules and Stem Cells for Myocardial Regeneration
Daniel Garry
Lillehei Heart Institute, University of Minnesota
Bio-Artificial Organs - a Hope for a Cure
Doris Taylor
Center for Cardiovascular Repair, University of Minnesota
Enhanced Delivery by PEGylated Fibrin 3D Porous Biomaterial
Jianyi Zhang, Cardiology, University of Minnesota
Cardiac Stem Cells  
Annarosa Leri  
Brigham and Woman’s Hospital/  
Harvard Medical School

ASSESSING EARLY STAGE MEDICAL DEVICE TECHNOLOGY  
Special Session Organized by the Medical Industry Leadership Institute  
Session Chair: Stephen Parente, Carlson School of Management,  
Medical Industry Leadership Institute  
Finding the Right Data or Technology Assessment  
Michael D. Finch  
Fitch & King  
Leveraging University and Private Enterprise  
Expertise to Develop Innovative Medical Devices  
Randy Nelson  
Evergreen Medical Technologies, LLC  
The Value of Early Technology Assessment to the Venture Capital Community  
Kevin Roche  
Entrepreneur

12:15 p.m.  
Break for Lunch

12:30 p.m.  
AWARD LUNCHEON  
Sponsored by Boston Scientific Corporation  
Moderator: Arthur Erdman, Conference Chair  
Being Successful in the Field of Medical Devices - What Does It Take?  
Fred Colen  
Executive Vice President,  
Operations & Technology,  
Boston Scientific CRM  
(Keynote lunches are a separate billable event,  
meal tickets are required for entry.)

2:00 p.m. - 3:30 p.m.  
Concurrent Technical Sessions

NEURAL ENGINEERING III: NEURAL IMAGING  
Session Chair: Taner Akkin, Biomedical Engineering,  
University of Minnesota  
Achieving Higher Resolution for Functional MRI  
Zhi-Pei Liang  
Electrical and Computer Engineering,  
University of Illinois at Urbana-Champaign  
High Resolution Brain Imaging of Perception and Cognition  
Geoff Ghose  
Neuroscience, Radiology and Psychology, University of Minnesota  
Functional MRI of Visual Cortex  
Stephen Engel  
Psychology, University of Minnesota

COMPUTER-AIDED ENGINEERING OF MEDICAL DEVICES  
Session Chair: Victor Barocas, Biomedical Engineering,  
University of Minnesota  
Spectral Element Simulation of Pulmonary Drug Delivery

Jeffrey Heys  
Chemical Engineering,  
Arizona State University  
Toward Patient-Specific Optimization of Heart-Valve Prostheses via Computational Fluid Dynamics  
Fotis Sotiropoulos  
St. Anthony Falls Laboratory  
University of Minnesota  
Computational Modeling of an Integrated Blood Pump-Oxygenator  
Marc Horner  
ANSYS Inc.  
Computational Modeling of Coating Processes Used for Medical Devices  
Travis Schauer  
Advanced Computational Analysis  
Team (ACAT), Boston Scientific

MEMS/NANO III  
Session Chair: Euisik Yoon, Electrical & Computer Engineering,  
University of Minnesota  
Detection and Manipulation of Magnetic Nanoparticles using MEMS-based Devices for Biosensing Applications  
Mark Tondra  
Diagnostic Biosensors  
Flexible Tactile Sensors for Medical Applications  
Hyung-Kew Lee  
Seagate Technology

CARDIOVASCULAR III: THE HYBRID CARDIAC OR/CATHETERIZATION LAB  
Session Chair: Herbert Ward, Surgery, University of Minnesota  
Hybrid Coronary Artery Intervention  
Kenneth Lao  
Cardiothoracic Surgery Division,  
University of Minnesota  
Congenital Cardiac Hybrid Procedures in the New Age  
Jim St. Louis, Cindy Herrington  
and Dan Gruenstein  
Cardiothoracic Surgery Division,  
University of Minnesota  
Endovascular Treatment of Aortic Dissection  
Steve Santilli  
Surgery, University of Minnesota

MEDICAL DEVICE STARTUPS  
Session Chairs: Karen Kaehler, Technology Commercialization,  
University of Minnesota  
Doug Johnson, Venture Center, University of Minnesota  
Session Panelists:  
Mike Selzer  
ConcepTx Medical  
Steve Waite  
The Innovation Factory  
Bob Worrell, Worrell, Inc.  
Jessica Zeaske, University of Minnesota Venture Center

3:30 p.m.  
Sponsor Exhibit Showcase  
4:00 p.m. - 5:30 p.m.  
Concurrent Technical Sessions

NEURAL ENGINEERING IV: NEURAL TECHNOLOGY START-UPS  
Session Chair: Jagi Gill, Nesos Health Inc.  
Session Panelists:  
Tim O’Malley  
MedTech Development  
Matt Definger  
PhysioStream Inc.  
Rob Kieval  
CVRx, Inc.

HIGH TECH OPERATING ROOMS AND PROCEDURES  
Session Chair: David Nuckley, Physical Med/Rehabilitation,  
University of Minnesota  
Minimally Invasive Surgical Treatment of Brain Aneurysms  
Ramachandra Tummala  
Neurosurgery, University of Minnesota  
Stealth Procedure  
David Polly  
Orthopaedic Surgery  
University of Minnesota  
Surgical Navigation Systems  
David Simon  
Medtronic, Inc.

MEMS/NANO IV: DRUG DELIVERY AND PHARMACEUTICAL TECHNOLOGY  
Session Chair: Ron Siegel, Pharmaceutics, University of Minnesota  
Surface-Functionalized Nanoparticles for Tumor-Targeted Drug Delivery  
Jayanth Panyam  
Pharmaceutics, University of Minnesota  
Needle-Free Liquid Jet Injectors for Transdermal Drug Delivery  
Samir Mitragotri  
Chemical Engineering  
University of California, Santa Barbara  
A Predictive Methodology for Designing Inhaler Systems  
Fernando Muzzio  
Chemical & Biochemical Engineering,  
Rutgers University

CARDIOVASCULAR IV: CARDIAC IMAGING  
Session Chair: Cory Swingen, Radiology University of Minnesota  
Diagnostic Utility of Pulmonary Vascular Impedance  
Naomi C. Chesler  
Biomedical Engineering,  
University of Wisconsin-Madison  
Cardiac Diffusion Tensor Magnetic Resonance Imaging  
Michael D. Eggen  
Biomedical Engineering  
University of Minnesota  
Real-time MRI Guided Valve Implantation in the Beating Heart  
Elliot McVeigh  
Biomedical Engineering  
John Hopkins University  
5:30 p.m.  
Adjourn
President's 21st Century Interdisciplinary Conference: "Lifelong Learning of the Medical Device Engineer"

Thursday, April 17, 2008

7:00 a.m. Pre-Function Area
Registration and Continental Breakfast

8:00 a.m. Ballrooms A-D
PLENARY SESSION
Moderator: Paul Iaizzo, Program Chair, President's Conference
Welcoming Remarks:
  Jeff McCullough
  Director, Institute for Engineering in Medicine, University of Minnesota
  Paul Iaizzo
  Associate Director, Institute for Engineering in Medicine, University of Minnesota

Keynote Addresses:
  John Raabo Nielsen
  Senior Vice President of Global R&D, Coloplast Corp.
  Brian Brown
  Vice President R&D - Cardiovascular Division, Boston Scientific
  William Durfee
  Mechanical Engineering, University of Minnesota

10:00 a.m. Pre-Function Area
Sponsor Exhibit Showcase

11:00 a.m. Ballrooms A-D
PANEL SESSION: The Industrial Persons’ View of Lifelong Learning
Moderator: Paul Iaizzo, Program Chair, President’s Conference
  Tim Laske
  Medronic
  Susan Paquette
  3M
  Philip Ebeling
  St. Jude Medical
  Dan Kussman
  Boston Scientific

12:15 p.m. HHH Room
KEYNOTE LUNCHEON
Sponsored by Coloplast
Moderator: Paul Iaizzo, Program Chair, President’s Conference
  Alice Seagren
  Commissioner of the Minnesota Department of Education (MDE)
  (Keynote lunches are a separate billable event, meal tickets are required for entry)

1:15 p.m. Ballrooms A-D
PANEL SESSION: How the University Can Aid in Lifelong Learning
Moderator: Jeff McCullough, Director, Institute for Engineering in Medicine, University of Minnesota
  Robert Tranquillo
  Head of Department, Biomedical Engineering, University of Minnesota
  Arthur Erdman
  Director, Medical Devices Center, University of Minnesota

3:00 p.m. Ballrooms A-D
Break

3:30 p.m. Ballrooms A-D
KEYNOTE ADDRESS: The Science and Art of Bear Conservation: What's Technology Got To Do With It?
Moderator: Paul Iaizzo, Program Chair, President’s Conference
  Dave Garshelis
  Fisheries, Wildlife and Conservation Biology, Minnesota DNR Wildlife Research

4:15 p.m. Ballrooms A-D
KEYNOTE ADDRESS: Personal Perspectives on Lifelong Learning
Moderator: Paul Iaizzo, Program Chair, President’s Conference
  Hoops and Hearts
  Fred Holberg
  Assistant General Manager, Minnesota Timberwolves

5:00 p.m. Adjourn
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In 1999, Dawn received a St. Jude Medical® mechanical heart valve, replacing a tissue valve implanted a decade earlier when doctors discovered her mitral valve was severely damaged. Today, Dawn’s passions include marathons, hiking, cross-country skiing, fly fishing and biking.

St. Jude Medical is dedicated to making life better for cardiac, neurological and chronic pain patients worldwide – through excellence in medical device technology and services. From ICDs, pacemakers, and electrophysiology catheters, to vascular closure devices, heart valve replacement and repair products, and neurostimulation devices, our extensive product portfolio reflects our commitment to thinking creatively, acting boldly and executing flawlessly, with the goal of improving patients’ lives.

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- LEED Certification (environmentally sustainable elements)
- Riverfront Beautification
- MIN Job Skills Partnership
- Coloplast Scholars Program

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