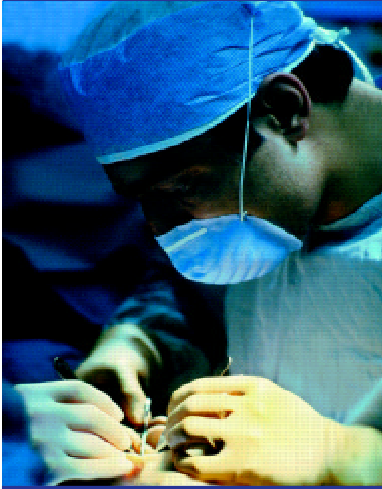


The Biomedical Engineering Institute Presents its Third Annual Symposium on Biomedical Engineering



April 24 & 25, 2003

## Design of Medical Devices:

Minnesota's Medical Device Community Forum

Radisson Hotel Metrodome  
615 Washington Ave SE  
Minneapolis, MN

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### *Special thank you to:*

Prof. Arthur G. Erdman, Conference Chair  
Ms. Alyssa A. Burger, Conference Administrator  
Prof. Victor Barocas, Poster Session Coordinator  
Dr. Nibab Narayan, CD-Rom Coordinator

# Minnesota's Medical Device Community Forum: Design of Medical Devices

April 24 & 25, 2003

## THURSDAY APRIL 24

8:00-9:45

### Medtronic Opening Session

Ballroom B,C,D

Chair: **Arthur G. Erdman** – Dept. of Mechanical Engineering, University of Minnesota

Keynote Speakers: **Christine Maziar** – University of Minnesota Executive Vice President & Provost  
**Don Gerhardt** – Medical Alley President  
**Jeffrey McCullough** – Director of Biomedical Engineering Institute  
**Stephen N. Oesterle** – Senior Vice President of Medicine & Technology, Medtronic

9:45-10:30

### Refreshment Break: Corporate Exhibit and Student Poster Session Opens

10:30-12:00

### Session A1: Medical Devices in Urology

Ballroom B

Chair: **Gerald Timm** – Acme Medical, Inc.

“Medical Devices in Urology: Past, Present and Future” – **Gerald Timm**, Acme Medical, Inc.  
“Electrical Stimulation for the Treatment of Urinary Control Disorders” – **Jeff Williams**, CystoMedix, Inc.  
“Design of Devices for Relief of Urinary Obstructive Disease and Stress Incontinence” – **Claude Tihon**, ContiCare Medical, Inc.  
“Advances in Negative Pressure Devices for Erectile Therapy” – **David Anderson**, Endocare, Inc.  
“Implantable Protheses for Restoration of Erectile Function” – **Mark McIntyre**, American Medical Systems, Inc.  
“Surgical Considerations in Design of Urological Implants” – **Jon Pryor**, Dept. of Urology, U of M

10:30-12:00

### Session A2: Radiology / Imaging

Ballroom C

Chair: **Bruce Hammer** – Dept. of Radiology, University of Minnesota

“Intravascular Imaging Modalities” – **Scott Smith**, Boston Scientific  
“Magnetocardiography and its Projected Impact on Cardiology” – **Carl Rosner**, CardioMag, Inc.  
“High Field MR Coils and Applications” – **Kevin Sundquist**, MR Instruments, Inc.

10:30-12:00

### Session A3: NanoBioTechnology

Ballroom D

Chair: **David Y.H. Pui** – Dept. of Mechanical Engineering, University of Minnesota

“Introduction to NanoBioTechnology” – **David Y.H. Pui**, Dept. of Mechanical Engineering, U of M  
“Regulation of Growth and Regeneration of Nerve Axons” – **Paul Letourneau**, Dept. of Neuroscience, U of M  
“Dispersion of Powders for Human Inhalation Therapy” – **Leon Gradon**, Warsaw University of Technology  
“High Mass Throughout Nanoparticle Generation using Multiple-Nozzle Electro spraying” – **Da-Ren Chen**, Washington University

12:15-2:00

### Guidant Luncheon

HHH Room

“A Vision of a Future Regulatory Regime for Medical Devices” **Kenneth H. Keller** – Hubert H. Humphrey Institute, University of Minnesota  
“A Medical Device Manufacturer's Perspective of Research, Development and Manufacturing in the Future Regulated Environment” **Keith Johnson**, Guidant Corp.

2:15-3:45

### Session B1: Thermal Therapy - Basic Science

Ballroom B

Chair: **John Bischof** – Dept. of Mechanical Engineering, University of Minnesota

"Acute Phase Tissue Responses to Cryothermic and Hyperthermic Injury" – **Jim Coad**, Surgical Pathology, West Virginia University  
"Biological Considerations for Effective Thermal Therapy" – **Robert Griffin**, Dept. of Therapeutic Radiology, U of M  
"Ultrasound Phased Arrays for Noninvasive Thermal Surgery" – **Emad Ebbini**, Dept. of Electrical Engrg., U of M  
"Induction of Mild Hypothermia for Cerebral Protection" – **Paul Iuzzo**, Dept. of Surgery, U of M  
"Mechanistically Derived Adjuvants to Cryosurgery" – **John Bischof**, Dept. of Mechanical Engineering, U of M

2:15-3:45  
Ballroom C

### **Session B2: MRI-Guided Interventions**

Chair: **Nikolaos V. Tsekos** – Dept. of Radiology and Biophysics, Washington University

"MR-Guided Neurosurgical Procedures" – **Haiying Liu**, Dept. of Radiology, U of M  
"Development of a Robot for MR-Guided Interventions in the Breast" – **Nikolaos V. Tsekos**, Dept. of Radiology and Biophysics, Washington University  
"Cardiac Clinical MRI" – **Michael Jerosch-Herold**, Dept. of Radiology, U of M

2:15-3:45  
Ballroom D

### **Session B3: Barriers to Innovation**

Chair: **Susan Bartlett Foote** – School of Public Health, University of Minnesota

"Traveling the Road to the Medical Device Marketplace – An Overview of Public Policy" – **Susan Bartlett Foote**, School of Public Health, U of M  
"Navigating the Food and Drug Administration" – **Charles Swanson**, Medtronic Inc.  
"Reimbursement and Patient Access" – **Susan Walker**, St. Jude Medical

4:00-5:30  
Ballroom B

### **Session C1: Thermal Therapy - Applications**

Chair: **John Bischof** – Dept. of Mechanical Engineering, University of Minnesota

"The Need of Basic Science in the Use of New Technologies in Clinical Urology" – **Thayne Larson**, Mayo Scottsdale  
"Radiofrequency Thermal Ablation of Liver Tumors" – **Timothy Sielaff**, Dept. of Surgery, U of M  
"Various RF Thermal Therapy Modalities" – **Michael Hoey**, ThermEmed VTS and Medical Products Consultant  
"Microwave Thermal Therapy of Prostate and Kidney" – **Eric Rudie**, Urologix  
"Design Considerations for Radio-Frequency Based Devices" – **Jay Kokate**, Boston Scientific

4:00-5:30  
Ballroom C

### **Session C2: Cardiovascular Devices**

Chair: **Soon J. Park** – Dept. of Surgery, University of Minnesota

"Optimized Scaleable Pulsatile Family of VADs" – **Theodosios Korakianitis**, University of Glasgow  
"Cardiovascular Therapy in New Proportions" – **Dallas Anderson**, MicroMed Technology, Inc.  
"Mechanical Heart Pumps: From Design to Patients and Back Again" **James Long**, LDS Hospital / Salt Lake Cardiovascular and Thoracic Surgery Association

4:00-5:30  
Ballroom D

### **Session C3: Panel: Best Practices in Manufacturing**

Chair: **Jim Gustafson** – Possis

Panelists: **Kirk Linderholm**, Possis,  
**Christina Brickett**, Guidant Corporation  
**Duane Willms**, 3M

5:30-6:30  
Ballroom A

### **Cocktail Reception Student Poster Session Judging**

6:30-9:00  
Ballroom B,C,D

### **Faegre & Benson LLP Conference Dinner**

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**Frank B. Cerra**, Senior Vice President for Health Sciences, University of Minnesota  
"A Model for Tomorrow's Academic Health Center"  
**Kenneth A. Liebman**, Faegre & Benson, LLP  
"Recent Trends in IP Litigation and Protection"

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## FRIDAY APRIL 25

- 8:00-8:30 Coffee, Refreshments and Registration Table Open
- 8:30-10:00 **Session A1: BioMEMS - Diagnostic**  
*Ballroom B* Chair: **Brad Nelson** – Swiss Federal Institute of Technology (ETH), Zurich
- “BioMEMS Management of Protein Solutions” – **Victor Barocas**, Dept. of Biomedical Engineering, U of M  
“Digital Genetic: New Strategies for Gene Based Testing” **Ronald McGlennen**, Dept. of Lab Med. & Pathology, U of M  
“Designing BioMEMS for Liquid Applications” – **Susan C. Mantell**, Dept. of Mechanical Engineering, U of M
- 8:30-10:00 **Session A2: Neurological Devices**  
*Ballroom C* Chair: **A. David Redish** – Academic Health Center, University of Minnesota
- “Deep Brain Stimulation for the Treatment of Movement Disorders” **Mark T. Rise**, Medtronic, Inc.  
“A Multidisciplinary Approach to Neural Implant Design” **David J. Anderson**, University of Michigan  
“Issues in Neural Ensemble Recording” **A. David Redish**, Academic Health Center, U of M
- 8:30-10:00 **Session A3: Panel: Regulatory Changes Impacting Medical Device Development**  
*Ballroom D* Chair: **Elaine Duncan** – Paladin Medical
- “Current Medical Device Regulatory Challenges: The Good, The Bad and the Ugly” **Elaine Duncan**, Paladin Medical  
“Designing for International Markets” **Valerie Kellogg**, HBS Consulting  
“Liability Implications of the Regulatory System” **Joe Price**, Faegre & Benson, LLP  
“Practical Considerations for FDA Interactions” **Brian Novak**, Guidant Corp.
- 10:00-10:30 **Refreshment Break**
- 10:30-12:00 **Session B1: BioMEMS - Implantable Devices**  
*Ballroom B* Chair: **Brad Nelson** – Swiss Federal Institute of Technology (ETH), Zurich
- “Hydrogel-Based Microsystems for Physiological Sensing and Active Flow Control” – **Babak Ziaie**, Dept. of Electrical Engineering, U of M  
“Polymer-Based Biomedical Microsystems” – **Peter Krulevitch**, Lawrence Livermore National Laboratory  
“Microrobotics for Biomicromanipulation” – **Brad Nelson**, Swiss Federal Institute of Technology (ETH), Zurich
- 10:30-12:00 **Session B2: Cellular Engineering and Preservation**  
*Ballroom C* Co-Chairs: **Allison Hubel** – Dept. of Mechanical Engineering, and **Jeffrey McCullough** – Biomedical Engineering Institute, University of Minnesota
- “Cellular Engineering for the Production of Novel Blood or Tissue Products” – **Jeffrey McCullough**, Biomedical Engineering Institute, U of M  
“Preservation of Novel Engineered Cellular and Tissue Products” – **Allison Hubel**, Dept. of Mech. Engrg, U of M  
“Device and Process Design for Mammalian Cell Culture and Application to Development of a Personalized Lymphoma Vaccine” – **Michael J. Gramer**, BioVest International, Inc.  
“The R & D Path to Diabetes CapCells (TM)” – **Nancy Drake**, Islet Technologies
- 10:30-12:00 **Session B3: Panel: Starting Medical Device Companies**  
*Ballroom D* Chair: **Doug Johnson** – Carlson School of Management, University of Minnesota
- Gene Berghoff**, MR Instruments, Inc.  
**Frank Freedman**, Alliancz Medical Consultants  
**Mark Knudson**, CEO of Ventruui Group  
**Enrique Malaret**, MedTech Development  
**Tom Hektner**  
**Andrew Humphrey**, Faegre & Benson LLP
- 12:15-2:00 **Luncheon**  
*HHH Room* “Global Public Policy Challenges Facing the Medical Technology Industry” – **Peter Gove**, St. Jude Medical

2:15-3:45  
Ballroom B

### **Session C1: Turning Customer Needs Into Compelling New Product Opportunities**

Chair: **Susan Z. Paquette** – 3M

“Accelerating Organic Growth at 3M: From Automotive Body Repair to Human Body Repair” – **Susan Z. Paquette**, 3M

“From Insights to Prototypes” **Andrew Burroughs**, IDEO  
**Rich Nazarian**, Minnetronix, Inc.

2:15-3:45  
Ballroom C

### **Session C2: Tissue Engineered Devices**

Chair: **David Odde** – Dept. of Biomedical Engineering, University of Minnesota

“Cardiovascular Tissue Engineering Using Cell-Contracted Biopolymer Scaffolds” – **Robert Tranquillo**, Dept. of Biomedical Engineering, U of M

“Direct Writing of Biological and Electronic Materials” – **Mike Renn**, Optomec Design Company

“Micromechanical Approaches to Neural Tissue Engineering” – **David Odde**, Dept. of Biomedical Engineering, U of M

2:15-3:45  
Ballroom D

### **Session C3: New Medical Device Demonstrations**

Chair: **Kristina R. K. Sticha** – Patents and Technology Marketing, University of Minnesota

“An Illuminated, Automated Scleral Depression System for Vitreoretinal Surgery” **Paul Loftness**, Dept. of Mechanical Engineering, U of M

“Clinically Driven Design in Minimal Access Surgery and Rehabilitation” **Just L. Herder**, Delft University of Technology, The Netherlands

“Mirror Vision, Left-Hand Learning on Demand” **Will Pitts**, Inventor

“Planar Waveguide Genetic Assay Readout Device” **David Wulfman**, IMBT, U of M

“Design of a Remote-Actuated Device for MRI-guided Interventions for Early Detection and Treatment of Breast Cancer” **Blake Larson**, Dept. of Mechanical Engineering, U of M

“A Compliant Organ-Manipulator for Robotic Surgery” **Sridhar Kota**, Dept. of Mechanical Engineering, U of MI

“New Handle Assembly for Surgical Instruments” **Jonas B. Lim**, St. Jude Medical

4:00-5:30  
Ballroom B

### **Session D1: Patents and Intellectual Property**

Chair: **Susan M. Patow** – Office of Patents and Technology Marketing, University of Minnesota

“Identification and Protection of Device Related IP Developed at Academic Institutions” – **Susan M. Patow**, Office of Patents and Technology Marketing, U of M

“Emerging Patent Issues at the Intersection of Biotechnology and Medical Devices” – **Ann Viksnins**, Schwegman, Lundberg, Woessner and Kluth, P.A.

“How Does Business Identify, Invest and Cultivate Device Related Technology?” – **Jagjit Gill**, Boston Scientific

4:00-5:30  
Ballroom C

### **Session D2: Medical Product Design and Development**

Chair: **Will Durfee** – Dept. of Mechanical Engineering, U of M, and **Michael Hoey** – ThermEmed VTS and Medical Products Consultant

“Medical Device Design from the Perspective of an Established Company” – **Carl Schmuland**, Medtronic

“Medical Device Design from the Perspective of a Startup” – **Michael Hoey**, ThermEmed VTS and Medical Products Consultant

“Medical Device Design from the Perspective of a Product Design Firm” – **Robert Worrell**, Worrell Design

“Designing Medical Products Through SBIR/STTR” – **Will Durfee**, Dept. of Mechanical Engineering, U of M

4:00-5:30  
Ballroom D

### **Session D3: Educational and Training Needs of Medical Device Designers**

Chair: **Arthur G. Erdman** – Dept. of Mechanical Engineering, University of Minnesota

**Doug Lang**, Guidant Corporation

**Tim Laske**, Medtronic

**Tim Dirr**, 3M



# Design of Medical Devices Speaker Biographies:

**David W. Anderson** (BSME., BA Physiology, U of M) P.E. is the Director of R&D for Endocare, Inc. and is responsible for the design & development of vacuum erection therapy devices, urodynamic diagnostics and urinary incontinence implants. He also worked for Timm Medical Technologies, Inc., Lotek, Inc. and American Medical Systems, Inc.

**Victor Barocas** (BS (1988), MS (1989) in Chem. Engrg. MIT, PhD (1996) Chem. Engrg. U of M). Research interests include the application of fundamental transport and mechanics concepts to biological and biomedical problems.

**Andrew Burroughs** (MDes, IE, Royal College of Art, London; BSc, ME, London's Imperial College). IDEO Chicago's most senior product design engineer, with over 15 years of multidisciplinary project team leadership in the development of consumer products and medical devices.

**Christina Brickett** (BSIE, U of Iowa, MSE, Arizona State U, Industrial Engineering). Industrial Engineer for 3M and Honeywell prior to joining GUIDANT. At GUIDANT I have held the following positions over 14 years: Industrial Engineer; Inter-plant Liaison; Sr. System's Analyst; Manager, Information Systems; Manager, Quality Assurance; Manager, Manufacturing.

**Da-Ren Chen** (PhD, Mech. Engrg. U of M). Asst. Prof. in Mech. Engrg. Dept. and the Joint Program in Environmental Engineering, Washington University in St. Louis. Research interests include nanoparticle instrumentation and fluid/particle trajectory modeling.

**Frank B. Cerra** (BA, Biology, State U of NY at Binghamton; MD, Northwestern U). Senior Vice President for health sciences at the U of M, leads one of the largest and most comprehensive academic health centers in the United States. An accomplished researcher as well as administrator and clinician, he is co-developer of the bioartificial liver, a device similar to a kidney dialysis machine.

**James Coad** (MD 1993, U of M). He is an Assoc. Prof. of Pathology at West Virginia University and is a nationally recognized pathologist in tissue ablation/destruction induced by thermal injury. He also serves as the Director of the Thermal Tissue Ablation Laboratory at his Institution.

**Nancy J. Drake** (BA, Biochemistry, Mt. Holyoke College; MA, Biochemistry; Rice U). VP of Operations and Regulatory Affairs at Islet Technology, Inc. Prior to joining Islet, she was Director of Product Development and QA at B. Braun Medical, Inc. and Manager of Mechanical Valve Technologies at St. Jude Medical, Inc.

**Elaine Duncan** (M.S.M.E. U of MN 1981) is president of Paladin Medical®, Inc. Elaine has had broad development, regulatory, pre-clinical and clinical trial experience in diverse areas including artificial hearts, vascular grafts, urology, disposable sterile products and powered standing wheelchairs, just to name a few.

**William Durfee** is a Prof. and Director of Design Education in the Department of Mech. Engrg. at the U of M. His professional interests include rehabilitation engineering, muscle mechanics, and product design.

**Emad Ebbini** is a Prof. of EE, U of M and has been actively engaged in research on diagnostic and therapeutic aspects of medical ultrasound. His publications covered the optimization of phased array patterns for hyperthermia, noninvasive two-dimensional temperature imaging, filter-based high-speed cardiac imaging, and nonlinear imaging methods for contrast-assisted ultrasonic imaging.

**Arthur G. Erdman** (BSME, Rutgers, MS, PhD, RPI). He specializes in kinematics, biomechanics and medical device design. His R&D activities include dentistry, orthopedics, ophthalmology, neurology, urology, MR-guided instruments, cardiology and sports biomechanics.

**Frank Freedman**, Ph.D. was a SciMed Founder and Director of BioMedical R&D. He worked at Medtronic and Dacomed before starting his own consulting business in 1985. His experience includes regulatory submissions and clinical studies. Frank teaches at several local colleges.

**Don Gerhardt** (Concordia College; MS, Health Admin, U of Colorado). Joined Medical Alley, a non-profit trade association for the health care industry, as the organization's President and CEO. He sits on the board for a medical manufacturing company and a health care service company.

**Jagjit Gill** is the Director of New Market Development for Boston Scientific. In this role, he is focused on identifying and cultivating new technologies or therapies in order to augment the strategic growth within the cardiovascular group. Jagjit has completed formal training in the medical sciences at the Mayo Clinic, Georgetown Medical Center and McGill University.

**Michael Gramer** (BS, U of M; MS, PhD Stanford U; Chem. Engrg.). He has since been with BioVest International for 9 years, and is currently the Director of Science and Technology. His primary role at the company is to lead cell culture process development efforts related to optimization of cells, culture medium, and culture devices. Also the Scientific Advisory Board of Acceptys, Inc., a start-up company focused on the development of cancer immunotherapeutics.

**Robert Griffin** is an Asst. Prof. of Radiobiology and studies tumor physiology and microenvironmental characteristics that influence response to radiation therapy and thermal therapy. The characteristics of tumor and normal tissue blood flow and oxygenation are studied and these findings are used to design chemical, molecular or physical treatment strategies that enhance the effect of cancer treatment as measured by in vitro and in vivo models.

**Peter Gove** is VP, Corporate Relations at St. Jude Medical, Inc. The bi-leaflet design of St. Jude Medical's "gold standard" mechanical heart valve occurred at the U of M as well as the first implant of the SJM valve in 1977. Mr. Gove is responsible for global communications strategy, media relations and government affairs at St. Jude Medical. He is co-chair of the Advanced Medical Technology Association (AdvaMed) Public Affairs Committee and a founding board member of the Medical Technology Leadership Forum.

**Just L. Herder** (MSc, 1992; PhD, Delft U of Tech). Assistant professor on mechanical design in human-machine systems, including medical and rehabilitation technology.

**Michael Hoey** taught and performed research at the U of M for over 15 years in the areas of cardiovascular physiology, urology, and cancer research. Presently he teaches, is a business strategy and product development consultant, and serves as Chief Technology Officer for a company he founded in 2001, ThermEmed VTS.

**Allison Hubel** Assoc. Prof. of Mech. Engrg. and Laboratory Medicine and Pathology at the U of M. After receiving her graduate training at MIT and post doctoral training at Massachusetts General Hospital, she has been a faculty at the U of M since 1993. Her work has involved the study of preservation techniques for cells and tissue used for human therapeutic applications.

**Andrew G. Humphrey** (1983 Amherst College; 1986 U of Chicago Law School) is a partner with the Corporate Finance Group at Faegre & Benson and is head of the Firm's Emerging Companies Practice. His practice focuses primarily in the areas of general corporate counseling, venture capital financing, mergers and acquisitions and securities regulation.

**Paul Iazzo** Prof. of Surgery and Anesthesiology. He is also the Director of Education of the Lillehei Heart Institute and the Director of the Malignant Hyperthermia Biopsy Center. His laboratories are part of Experimental Surgical Services at the U of M. He also performs applied research in the areas of clinical thermoregulation, cardiac protection, skeletal muscle force assessment, the biomechanics of the spine, and the overwintering of black bears.

**Doug Johnson** is currently the Director of the Carlson Ventures Enterprise at the Carlson School of Management. He has prior experience in the information technology, investment banking and venture capital industries. Prior to working with the Carlson School, Doug also served for 10 years as a General Partner with Norwest Venture Capital.

**Kenneth H. Keller** is Charles M. Denny, Jr. Professor of Science, Technology and Public Policy at the U of M and Prof. of Chem. Engrg. and Materials Science. Educated at Columbia and Johns Hopkins, he joined Minnesota's faculty in 1964, became Vice President for Academic Affairs in 1980 and President of the University in 1985. He presently chairs the Medical Technology Leadership Forum, is Vice President of the American Institute for Medical and Biological Engineering, and serves on a number of governmental and non-profit boards.

**Valerie Kellogg** (BA, Biology, U of Virginia; MS/MBA, Int'l Business, Purdue U/ESC-Rouen). Previously held a role in medical device Product Management for the Poirier Groupe Invacare in France. In 1997 Valerie took

- up the position of Senior Research Analyst at a leading healthcare market consultancy firm in the UK. Projects included research into the market for Point-of-Care Equipment and Devices in Europe; anaesthetists' opinions of a new airway protection device; laboratory managers' responses to a new handheld POC device; and surgeons' input regarding a wound care device.
- Mark Knudson** (BS, Biology, Pacific Lutheran U; PhD, Cardiovascular Physiology, Washington State U). Chairman and CEO of Venturi Group and Executive Chair and founder of Restore Medical Inc., a company specializing in developing products to treat sleep-disordered breathing (snoring and obstructive sleep apnea).
- Jay Kokate** (MS, '93, PhD, '96, Biomed. Engrg., U of M). In his role at BSC- Scimed, Jay is involved in identifying emerging areas and leading product development activities through initial feasibility. Jay is actively involved with the U of M and for the last few years has been one of the Instructors for BMEn 5701 - Heat Transfer Applications in Humans.
- Sridhar Kota** (MSME, PhD, U of M). Academic career began at the University of Michigan, Ann Arbor in 1987 where he is now a Professor of Mechanical Engineering. His research interests include Biomimetics, Compliant Systems Design, MEMS, Adaptive Structures, Kinematics and Machinery design.
- Douglas Lang** (BS, St. Olaf College, MS, U of IL, Urbana; Physics and Solid State Physics; PhD, Physiology and Biophysics, U of IL, Urbana). Director of Research & Technology and Guidant Research Institute at Guidant Corp., St. Paul, MN. He has worked for Guidant for 16 years, starting as a research scientist in tachyarrhythmia therapies research.
- Blake Larson** (BSME, 2003, PhD candidate, U of M). Blake is a mechanical engineering graduate student and professional engineer. His focus is on the design of medical devices, specifically robotic surgery devices that use medical imaging guidance.
- Thayne Larson** is an Assoc. Prof. of Urology at Mayo Graduate School of Medicine. Member of Board of Directors of Confederation of American Urologists and the Urologists Society of America. Extensive research in the basic science of new technologies in urology.
- Timothy G. Laske** (BS, Biological Sciences, Mech. Engrg., MI Tech. U; MSME, U of MI, PhD candidate in BME, U of M). Director of Product Platform Research and Technology for Medtronic, Inc.'s Cardiac Rhythm Management business. Prior to his position at Medtronic, he worked as a Design Engineer at Ford Motor Company in Crash Safety and Advanced Vehicle Systems Engineering.
- Kenneth A. Liebman** (BA, *summa cum laude*, Philosophy, Columbia U, 1976; JD, Yale Law School, 1979). Head of Faegre & Benson's intellectual property practice. The focus of Ken's practice is on the representation of companies and institutions in the medical technology and information technology fields.
- Jonas B. Lim** (BSME, *Summa Cum Laude*, 1998, MSME, 2001, U of M). Currently employed at St. Jude Medical, Inc. as a Research and Development Engineer developing Anastomotic Devices.
- Paul Loftneses** (Ph.D. candidate, ME, U of M). Current work with Prof. Erdman and Dr. Tim Olsen, a retinal surgeon, to design new medical devices for ophthalmic surgery. Their principal focus is the development of a surgical device for treating macular degeneration.
- Susan Mantell** (BS, PhD, Stanford U). Assoc. Prof. in the Mech. Engrg. department at the U of M. Her research in MEMS focuses on design and modeling for liquid environments.
- Christine M. Maziar** (BSEE, '81, MSEE, '84, PhD, '86, Purdue U). Executive Vice President and Provost at the University of Minnesota. As the University's chief academic officer, she is directly responsible for all colleges and academic units on the Twin Cities campus except those in the Academic Health Center. She came to the University of Minnesota in 1998, serving as Vice President for Research and Dean of the Graduate School prior to her appointment as Provost in July 2002.
- Jeffrey McCullough** Professor of Laboratory Medicine & Pathology, Variety Children's Chair in Molecular and Cellular Therapy, and Director of the Biomedical Engineering Institute at the University of Minnesota. Has expertise in transfusion medicine, blood banking, and cellular engineering.
- Ron McGlennen**, M.D. is an Assoc. Prof. of Pathology at the U of M Medical School. His research interest in biomedical engineering stems from his work in miniaturization technologies for DNA based testing. He is currently the president of Access Genetics, a start-up technology company using concepts of telemedicine and integrated benchtop instruments for clinical laboratory genetics.
- Rich Nazarian** (BS, MS, Elec. Engrg., Stanford U, 1984). Has 19 years experience in the medical device development field. Prior to co-founding Minnetronix, Rich led product development efforts for implantable artificial heart electronic systems, cardiopulmonary bypass systems, laser imaging systems, and other medical and industrial devices for 3M Company. At Minnetronix, innovative devices include diverse instruments ranging from cancer treatment systems to heart-lung machines, nerve growth stimulators, and ventricular assist devices.
- Bradley J. Nelson** (PhD, Robotics, Carnegie Mellon U). Professor of Robotics and Intelligent Systems at the Swiss Federal Institute of Technology (ETH), Zurich. There he heads the Institute of Robotics and Intelligent Systems (IRIS), an institute that integrates robotics with the emerging research areas of micromanipulation, hybrid MEMS, biomanipulation and micromechatronic systems. Prof. Nelson has served on the faculty of the University of Minnesota and the University of Illinois at Chicago.
- David Odde** (BS, Chem. Engrg. U of M, MS, PhD, Chem., Biochem. Engrg., Rutgers U). Faculty member in the Chem. Engrg. Dept. at Michigan Technological University before joining the faculty in the department of Biomed. Engrg. at the U of M. Prof. Odde is currently the Director of Undergraduate Studies in Biomed. Engrg., a McKnight Land-Grant Professor, and a member of the Biomedical Engineering Institute.
- Stephen N. Oesterle** (Harvard College, 1973, MD, Yale U, 1977). Senior Vice President for Medicine and Technology at Medtronic Inc. As VP, he provides executive leadership for the company's scientific research, formation of strategies and continued development of strong cooperative relationship with the world's medical communities.
- Susan Z. Paquette** (BS, Chem. Engrg, U of Kansas; MBA, U of St. Thomas). Technical Director for the Medical Division of 3M. Her experience in product development is very broad and includes the development of films for sign graphic applications, new materials for automotive body repair, and new products for healthcare applications. Susan has also led a corporate technology center at 3M focused on manufacturing process development.
- Soon J. Park** (Pritzker School of Medicine, U of Chicago; U of Washington). Associate Professor, Director of Cardiac Assist Device program in the Dept. of Surgery, and the Surgical Director for the Thoracic Transplant Program (Heart and Lung) at the U of M. Dr. Park joined the faculty following his cardiac surgery fellowship at the U of M in 1996. His clinical interest lies with adult cardiac surgery, heart and lung transplantation and the application of mechanical assist devices as replacements for the failing heart.
- Susan Patow** (MS, MBA, Technology Mgmt, U of Maryland). Senior Licensing Associate in the Health Technologies Division of Patents and Technology Marketing at the U of M. Completed a Technology Transfer Fellowship at the National Institutes of Health.
- Will Pitts** (BSME, MI State U, 1981). Worked 16 years for 3M Company as a project engineer in their Medical Division Engineering Group. Currently work as a sales engineer for Classic Manufacturing, Inc., designers and builders of special automation machinery for various industries, including medical. Inventor by hobby.
- Joseph M. Price** (Order of the Coif, *magna cum laude*, U of M Law School, 1972). He has practiced with the Minneapolis based law firm of Faegre & Benson since 1972 and is a partner in the general litigation group. His practice focuses almost exclusively in the area of products liability defense, litigation involving medical devices and pharmaceuticals and mass tort litigation.
- Jon Pryor** (Carleton College, 1979; U of M Med School). Prof. and Chair of Urology at the U of M. After receiving his Medical Degree he did two years of surgery at Hennepin County Medical Center in Minneapolis and then completed his residency in urology at the U of Virginia. During his residency he also obtained a Masters Degree in the area of reproduction. He is a specialist in erectile dysfunction and male infertility.
- David Y. H. Pui**, a Distinguished McKnight University Professor, is the L.M. Fingerson/TSI Inc Chair in Mechanical Engineering and the Director of the Particle Technology Laboratory, University of Minnesota. He has developed/co-developed several widely used aerosol instruments. He served as President of the American Association for Aerosol Research in 2000-01.
- David Redish** (PhD, 1997, Carnegie Mellon U). He worked as a post-doc under the mentorship of Dr. CA Barnes at the U of AZ from 1997-2000, when he joined the Dept of Neuroscience at the U of M, currently as an asst. professor.
- Mike Renn** (BS, Physics & Mathematics, Lawrence U, PhD, Atomic Phys-

ics, U of Virginia). He joined the faculty at Michigan Technological University in the department of physics. Dr. Renn is currently a senior scientist at Optomec, Inc where he directs research on direct write technologies.

**Mark T. Rise** (BS, general science, MS, Elec. Engrg., U of Iowa; PhD, BME, U of M, 1979). Senior Principal Scientist in the Ventures and Business Development Group of the Neurological Business Division of Medtronic. He has been primarily involved in developing new medical therapies utilizing electrical stimulation of the nervous system. He is a fellow of the Bakken Society of Medtronic. He is a member of the Society for Neuroscience and the American Epilepsy Society.

**Carl Rosner** Principal founder of CMI. He is former CEO, Chairman of the Board and President of Intermagnetics General Corporation (IGC), a GE spin-off. Mr. Rosner is a member of the National Academy of Engineering and a world-recognized authority in the areas of super-conductive and electronic devices.

**Carl Schmuland** works part time for Medtronic on special projects following 24 years of full time service. While at Medtronic he led a Reliability Engineering group and was a Technical Fellow in the Cardiac Rhythm Management division with responsibility for developing the Risk Management, Design Control, Design Robustness and Product Validation Processes. Carl also has a consulting business (Practical Quality Solutions) specializing in Risk Management and Design Control systems.

**Timothy Sielaff** is a staff surgeon at the U of M with a clinical practice centering on Hepatopancreatobiliary surgery. Dr. Sielaff has a particular interest in the use of RFA for hepatocellular cancer as a bridge to liver transplantation, multimodality treatments of colorectal metastases and the effects of incomplete RFA on remote tumors.

**Scott Smith** (BSME, U of M) is a Research Fellow at Boston Scientific Corporation. He is currently developing intravascular devices for MR imaging guided interventions. Applications include intracardiac delivery, plaque imaging and neurovascular interventions. Mr. Smith holds 14 patents for stents, balloon catheters, embolic protection devices and thrombectomy systems.

**Kristina Sticha** (BS, Biology, U of WI-Stevens Point, 1993; PhD, Pharmacology, U of M, 1993). At the U of M she gained experience in recombinant protein expression and purification, and recombinant enzyme characterization. Prior to joining PTM in 2001, Dr. Sticha was a postdoctoral associate at the U of M Cancer Center studying the mechanisms of chemopreventive agents in a mouse model for smoking-induced lung cancer.

**Charles Swanson**, Ph.D., is Vice President, Chief Regulatory Officer for Medtronic, Inc. Dr. Swanson has responsibility for leadership of the company's regulatory and clinical affairs worldwide. His major responsibilities include the development of Medtronic's regulatory and clinical policies and strategies, monitoring compliance with worldwide requirements, development of working relationships with top level FDA and worldwide health ministry authorities, and communication of regulatory and clinical matters to the company's executive management.

**Claude Tihon** (PhD, Pathology, Columbia U). President and CEO of

ContiCare Medical, Inc, a medical device company he founded engaging in developing urological products to manage women's stress incontinence and men's prostatic obstruction. From 1987 to 1995, Dr. Tihon served in numerous positions with Pfizer, Inc. culminating in his appointment as VP of Research and Technology Assessment and Manager of the Endourology Strategic Business Unit of American Medical Systems, Inc., a Pfizer subsidiary.

**Gerald W. Timm** (B.E.E., M.S.E.E. and Ph.D.(E.E.), U of M). As a faculty member of the U of M Medical School's Department of Neurology and the IT's Departments of Elec. and Biomed. Engrg., researching problems of the pelvic organs resulting from spinal cord injury, stroke and other neurological disorders. This work resulted in a variety of devices for diagnosing and treating urinary control and male erectile disorders including an electronic bladder pacemaker, the inflatable penile prosthesis, the artificial urinary sphincter, electronic urodynamic equipment, the RigiScan and Snap-Gauge rigidity assessment systems and the malleable and positionable penile implants.

**Robert Tranquillo** (PhD, Chem. Engrg., U of Pennsylvania, 1986). He has served as the head of the new Dept. of Biomedical Engineering since its inception in 2000. He is coordinator for the University's Tissue Science and Engineering Program. He has used a combined modeling and experimental approach to understand cell behavior, in particular, directed cell migration and cell-matrix mechanical interactions. More recently, his research program has focused on the role of cell behavior in cardiovascular and neural tissue engineering applications.

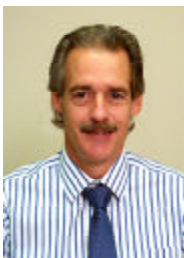
**Ann S. Viksnins** (St. Olaf College, Masters and Law Degrees from the U of M). Ann is a registered patent attorney and shareholder at Schwegman, Lundberg, Woessner and Kluth, P.A. She practices in the areas of biological technologies, nanotechnologies and international patent law.

**Jeffrey M. Williams** (MS, Pharmacology and toxicology, Purdue U). President and CEO of CystoMedix, Inc., a privately held medical device company. He has been involved in business development for 24 years and has managed domestic and international product and market development programs. He has been instrumental in redirecting the corporate strategic plan to focus on electrostimulation and mechanical therapies for the treatment of urinary control disorders.

**W. Robert Worrell** is co-founder and president of Worrell Design, Inc. Mr. Worrell's company offers its proprietary Censys® Voice of the Customer Research technology, industrial design, mechanical engineering, and prototyping services to medical device companies ranging from venture start-ups to multinational fortune 100's. He is named on over 30 patents, is the inventor of Censys®, and holds a provisional black belt certificate in QFD from the QFD Institute.

**David Wulfman** is currently a research fellow in the Dept. of Mechanical Engineering working closely with the Department of Laboratory Medicine and Pathology at the U of M. Mr. Wulfman has advanced degrees in architecture and mechanical engineering with over ten years of professional experience working in the fields of architecture, product design, and medical device development. His current professional interests have been focused on the development of instrumentation for molecular diagnostics.

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