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MONDAY, December 10

C1: Sensors for Healthcare Applications
[Bel Aire North]

7:30 am **Registration and Morning Coffee** [Bel Aire Foyer]

8:25 **Chairperson's Opening Remarks**
Joshua Windmiller, PhD, CTO & Founder, Bioliną Technologies, Inc.

OPENING KEYNOTE PRESENTATION

8:30 **Continuous Glucose Monitoring Sensors: Past, Present and Future...1**
Rohan Sonawane, MD, Clinical Manager, Diabetes, Medtronic

APPLICATIONS AND MARKET FOR INGESTED, TRANSCUTANEOUS & IN VITRO SENSOR SYSTEMS

9:00 **Boston Scientific: Advanced Diagnostics in Endoscopy...22**
George Duval, Principal R&D Engineer, Boston Scientific

9:30 **Microneedle Point-of-Care Diagnostics...N/A**
Ronen Polsky, PhD, Principal Member of the Technical Staff, Physical Biological & Chemical Microsensors Department, Sandia National Laboratories

10:00 **Networking Coffee Break** [Bel Aire Foyer]

10:30 **Objective Measures for Clinical Assessment and Precise Understanding of Disease Progression...31**
Christopher Hartshorn, PhD, Program Director, National Cancer Institute (NIH/NCI)

ADVANCED SENSOR DESIGN

11:00 **Single-Molecule RNA Conductance Measurements for the Electrical Detection of Pathogens...56**
Juan Manuel Artés Vivancos, PhD, Marie Curie Postdoctoral Fellow, Biophysics Photosynthesis & Energy en Vrije Universiteit Amsterdam/VU

11:30 **Probing Bacterial Response to Stress Using Electronic and Electrochemical Sensors...67**
Aida Ebrahimi, PhD, Assistant Professor, Electrical Engineering, Penn State University

12:00 pm **Enjoy Lunch on Your Own**

1:55 **Chairperson's Remarks**
Christopher Hartshorn, PhD, Program Director, National Cancer Institute (NIH/NCI)

2:00 **Coordination-Responsive Longitudinal Relaxation Tuning as a Versatile MRI Sensing Protocol for Malignancy Targets...N/A**
Yongxiang Zhao, PhD, Professor, Vice-president, Guangxi Medical University, China

2:30 **Next Generation of Diagnostic Tools: From Microneedles to Nanochannel Arrays...N/A**
Beatriz Prieto Simón, Senior Research Fellow, Monash University

MONDAY, December 10

C1: Sensors for Healthcare Applications

[Bel Aire North]

SENSORS ROADMAP FOR HEALTHCARE

3:00 **Smart Healthtech Sensor Systems – Driving the Digital Health Revolution...N/A**
Paul Galvin, PhD, Head of ICT for Health Strategic Programmes and Head of Life Sciences Interface Group, Tyndall National Institute, University College Cork

3:30 **Refreshment Break in the Exhibit Hall with Poster Viewing** [Bel Aire South]

4:15 **PANEL DISCUSSION: Overcoming the Challenges of Implementing Data Standardization for Biosensors, Wearables and Implantables...N/A**
Moderator: George Duval, Principal R&D Engineer, Boston Scientific
Christopher Hartshorn, PhD, Program Director, National Cancer Institute (NIH/NCI)
Paul Galvin, PhD, Head of ICT for Health Strategic Programmes and Head of Life Sciences Interface Group, Tyndall National Institute, University College Cork
Mark Buccini, Director, Business Unit Strategy, Texas Instruments
John Murad, Point of Care Director; Director, U.S. Marketing, Abbott

5:15 **Welcome Reception in the Exhibit Hall with Poster Viewing** [Bel Aire South]

6:15 **End of Day**

TUESDAY, December 11

C1: Sensors for Healthcare Applications

[Bel Aire North]

8:30 am Roundtable Discussions with Continental Breakfast [Fairbanks B]

TABLE 1: Clinical Workflow Integration of Wearable and Implantable Devices in the Age of IoMT
Moderator: Christopher Hartshorn, Ph.D., Program Director, National Institutes of Health

TABLE 2: Alternative Energy Sources for Medical Implants.
Moderator: Bill von Novak, Principal Engineer, Qualcomm

TABLE 3: Barriers to Commercializing Sensors in Healthcare
Moderator: Roger H. Grace, President, Roger Grace Associates

TABLE 4: How Do You Make Digital Endpoint Initiatives A Success in Your Clinical Trials?
Moderator: Janet Munro, General Manager, Digital Endpoints and Evidence, Novartis

NEXT GENERATION WEARABLES

9:25 **Chairperson's Opening Remarks**
George Duval, Principal R&D Engineer, Boston Scientific

9:30 **A Front End for the Digital Health Ecosystem...N/A**
Josh Windmiller, PhD, CTO, Bioliq

10:00 **Soft Electronics for Noninvasive Healthcare: From the Skin to below the Skin...N/A**
Sheng Xu, PhD, Assistant Professor at University of California, San Diego

10:30 **Coffee Break in the Exhibit Hall with Poster Viewing** [Bel Aire South]

REGULATORY COMPLIANCE CHALLENGES TO COMMERCIALIZATION

11:15 **The Future at FDA and What to Expect...N/A**
Alex Slizza, President, Aegis Regulatory Consulting, LLC

11:45 **FDA and the Relentless Digital Health - Challenges and Opportunities...N/A**
Jafar Shenasa, Vice President, Regulatory Affairs, Proteus Digital Health

12:15 **End of Sensors for Healthcare Applications**

TUESDAY, December 11

Shared Plenary Session
C2: Sensors for Emerging Applications AND C3: Implantable Biomedical Systems
[Bel Aire North]

12:15 pm Registration [Bel Aire Foyer]

APPLICATIONS AND MARKET FOR WEARABLES AND IMPLANTABLES

1:55 Chairperson's Remarks
Radislav A. Potyrailo, PhD, Material Characterization & Chemical Sensing, GE Global Research Center

2:00 OPENING KEYNOTE PRESENTATION: Enabling New Applications with Multivariable Chem/Bio Sensors: From Ideas to Product ...81
Radislav A. Potyrailo, PhD, Material Characterization & Chemical Sensing, GE Global Research Center

2:30 Facilitating Collaboration to Advance the Commercialization of Nanosensors: The NNI Sensors Signature Initiative...97
Lisa Friedersdorf, Director, National Nanotechnology Coordination Office, National Nanotechnology Initiative

3:00 The Emergence of New Sensing Capabilities from Commercially Available Sensors...105
Thomas Dawidczyk, Lead Analyst, Lux Research

3:30 Coffee Break in the Exhibit Hall with Poster Viewing [Bel Aire South]

C2: Sensors for Emerging Applications [Bel Aire North]	**C3: Implantable Biomedical Systems** [Fairbanks A]
NEW APPLICATIONS AND COLLABORATIVE INITIATIVES FOR ENABLING SENSOR COMMERCIALIZATION	**WIRELESS POWER FOR IMPLANTABLES**
4:00 Printable Wearable Electrochemical Sensors: Toward Lab on the Body...N/A *Joseph Wang, PhD, SAIC Endowed Chair, Distinguished Professor, Chair of Nanoengineering Department, University of California, San Diego*	**4:00 Addressing the Unique Problems in Power Storage for Miniaturized Sensors...N/A** *Erik Scott, PhD, Bakken Fellow, Technical Fellow, Director of Advanced Development, Medtronic*
4:30 PANEL DISCUSSION: Sensor Commercialization – Challenges and Opportunities...N/A *Moderator: Lisa Friedersdorf, Director, National Nanotechnology Coordination Office, National Nanotechnology Initiative* *Radislav A. Potyrailo, PhD, Material Characterization & Chemical Sensing, GE Global Research Center* *Joshua Windmiller, PhD, CTO & Founder, Biolinq Technologies, Inc.* *Aida Ebrahimi, PhD, Assistant Professor, Electrical Engineering, Penn State University*	**4:30 PANEL DISCUSSION: Expanding Implant Applications to Improve Outcomes for Future Applications...N/A** *Moderator: Bill von Novak, Principal Engineer, Qualcomm* *Erik Scott, PhD, Bakken Fellow, Technical Fellow, Director of Advanced Development, Medtronic* *Reza Sehdehi, Auckland Bioengineering Institute, The University of Auckland, New Zealand* *Farah Laiwalla, MD, PhD, Senior Research Associate, Neuroengineering and Nanophotonics Laboratory, Brown University* *Deborah Munro, PhD, Adjunct Faculty, OHSU Department of Orthopaedics & Rehabilitation, Oregon Health and Science University; Biomedical Engineering Research Consultant, Munro Medical, LLC*

5:30 End of Day

WEDNESDAY, December 12

C2: Sensors for Emerging Applications [Bel Aire North]	**C3: Implantable Biomedical Systems** [Fairbanks A]
8:30 am Morning Coffee [Bel Aire Foyer]	
	WIRELESS POWER FOR IMPLANTABLES
8:55 Chairperson's Opening Remarks *Mark Buccini, Director, Business Unit Strategy, Texas Instruments*	**8:55 Chairperson's Opening Remarks** *Erik Scott, PhD, Bakken Fellow, Technical Fellow, Director of Advanced Development, Medtronic*
9:00 KEYNOTE PRESENTATION: From Sensors to Wearables to Health Monitoring...115 *Enrique Saldivar, MD, PhD, Director, Wireless Health Program, Chief Medical Advisor, Case School of Engineering, Case Western Reserve University*	**9:00 Sources of Energy for Medical Implants...177** *Bill von Novak, Principal Engineer, Qualcomm*
9:30 FEATURED PRESENTATION: Scalable Manufacture of CNT-Based Microsensor for Lactate Detection in Sweat...129 *Ahmed Busnaina, PhD, William Lincoln Smith Professor, Distinguished University Professor and Director, NSF Nanoscale Science and Engineering Center for High-rate Nanomanufacturing, Northeastern University*	**9:30 Effects of Conductive Tissue on Capacitive Wireless Power Transfer...185** *Reza Sehdehi, Auckland Bioengineering Institute, The University of Auckland, New Zealand*
10:00 Coffee Break in the Exhibit Hall with Poster Viewing [Bel Aire South]	
10:45 Sensors: Changing the PC Experience...151 *Hemant Desai, Senior Sensor Technologist, Intel Corporation*	**10:45 Radiofrequency Ablation with a Wirelessly Powered Catheter and Generator...197** *Julian Moore, UGA Medical Robotics Lab, The University of Georgia*
11:15 Opportunities and Challenges for Emerging Sensor Technologies by Exploring Market Drivers and Technology Developments...N/A *Andy Behr, Technology Manager, Electronic Materials Business, Panasonic*	**11:15 Wireless Power Transfer for Cardiovascular Implants..212** *Paul Mitcheson, PhD, Faculty of Engineering, Department of Electrical and Electronic Engineering, Imperial College London*
11:45 Sensor Applications for Homeland Security...N/A *Luther Lindler, Ph.D., Chief Scientist, U.S. Department of Homeland Security*	**11:45 Miniaturized Hermetic Modules with Integrated Sensors and Communication for Implants...238** *Eckardt Bihler, PhD, Business Development Manager, Dyconex, Switzerland*
12:15 pm Enjoy Lunch on Your Own	
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1:40 Chairperson's Remarks *Erica Lively, PhD, Principal Engineer, Exponent*	**1:40 Chairperson's Remarks** *Bill von Novak, Principal Engineer, Qualcomm*
1:45 Paper, Plastic and Fabric: Emerging Platforms for Sensors and Sensor-Based Systems for Emerging Applications...N/A *Roger Grace, President, Roger Grace Associates*	**1:45 Circuits and System Design for Implantable Wireless Neural Sensors...N/A** *Vincent Leung, PhD, Technical Director, Qualcomm Institute Circuits Labs, UCSD*
ADVANCED CONNECTIVITY, DESIGN & MODELING FOR EMERGING APPLICATIONS	**ADVANCED R&D DEVELOPMENT AND COMMERCIALIZATION FOR IMPLANTABLES**
2:15 Solve the IoT Connectivity Dilemma to Advance Digital Innovation...169 Meenal Prasad, Senior Manager, *SAP Digital Interconnect, SAP*	**2:15 From Wireless Implantable Sensors to an Implant System: A Biomedical Device Development Journey...N/A** *Farah Laiwalla, MD, PhD, Senior Research Associate, Neuroengineering and Nanophotonics Laboratory, Brown University*

WEDNESDAY, December 12

C2: Sensors for Emerging Applications [Bel Aire North]	C3: Implantable Biomedical Systems [Fairbanks A]
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3:30 Quantifying the Unmeasurable: Sensor Design for CX...257 *Erica Lively, PhD, Principal Engineer, Exponent*	**3:30 Thin Film 3-D Hermetic Packaging of Sub-mm Wireless Microelectronic Sensor/Actuator Implants...281** *Joonsoo Jeong, PhD, Professor, Pusan National University, Korea*
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