HEALTH AND LIFE SCIENCES

From diagnostic mobile phones to implantable therapeutics, smart medical devices are poised to change health care as we know it. A wide-ranging discussion on how tomorrow’s technologies may address today’s health care challenges.

10:00  In Vivo Microsystems for Tomorrow’s Medicine: Today’s Research

Dr. Kenichi Takahata  
Associate Professor,  
Electrical & Computer Engineering  
University of British Columbia

Rapid advances in medical technologies are revolutionizing the way we fight disease. Microsystems, with embedded sensors and actuators, have an enormous potential to play a key role in this trend. Implantable microsystems are emerging to offer a variety of innovative functions to monitor and treat localized lesions inside the body directly and more effectively via minimally invasive forms. These “smart” devices could be implanted via non-surgical procedures (catheterizations and even injections) and wirelessly linked to an external network to enable continuous diagnosis and therapy. Their significant potential also extends to surgical applications. I will show a few examples recently developed in my laboratory, including implantable drug delivery chips, MEMS-embedded stents, and catheter-based micro motor for 3D microendoscopy.

10:20  Everything’s Connected: Strategies for Testing New Medical Devices

Jim Bokos  
Vice-President Sales - Global Accounts,  
Averna

The challenge of “connectivity” in the medical device industry is impacting product design and increasing the difficulty of both R&D test and production test. Connectivity is a generic term with multiple meanings, including: interoperability for health record tracking; device connectivity with smart phones and PCs; and internal connections in designs using smart sensors. To attain these new levels of connectivity, many medical devices are evolving considerably in complexity. While some devices now feature RF components to speak wireless protocols, and many others incorporate smarter sensors in their designs, all are trying to keep up with the burgeoning standards for medical health records. This article will explore these three types of connectivity, with a focus on effective strategies for functionally testing these new medical device designs.

10:40  Opportunities, challenges and solutions for medical device innovation in Canada

Jean-François Houle,  
Director of R&D, National Research Council

Socio-economic factors are moving healthcare towards value-based delivery, which is creating numerous opportunities for the health technologies industry, particularly for cost-effective innovations. Regulatory constraints and competitive pressures to reduce time-to-market create challenges for the medical device industry. The NRC’s innovative Health Technologies Program offers pre-clinical medical device research and product development solutions that enable companies to reach the market faster. The Health Technologies program provides product development and testing services, access to NRC infrastructure and supports industry-focused strategic R&D projects. In addition, the NRC provides state-of-the-art, patent-protected technological solutions that may be integrated into a client’s proprietary product, providing additional product differentiation in target markets. Our services
and solutions for *in Vitro* Diagnostics, *in Vivo* Devices, Implantable Devices, Simulation and Digital Health, will be described.

11:00  
Supporting Medical devices SME – Panel

Stephen Dibert  
Life Sciences Advisor, Department of Foreign Affairs, Trade and Development (DFATD)  
Moderator

Panelists:
- Jean-François Houle, National Research Council
- Jim Bokos, Averna
- Charudutt Shah, Spartan Bioscience
- Roozbeh Safavieh, Sensoreal