

Biosensor-based detection of cancer biomarkers in precision medicine

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Precision Medicine, which involves the orchestration of medical treatment of a particular patient, is a rapidly growing sector of medical science. President Obama mentioned the concept in his last State of the Union Address. Key components of the approach are clinical diagnostics, imaging and data analysis. Biosensor devices and technology represent a very useful diagnostic tool with respect to the assay of biomarkers in biological fluids. This is especially the case for various cancers present in patients. Development of biosensor detection in the oncology depends on the possibility to identify potential biomarkers, choice of a specific transducer and attachment of an appropriate probe to the device. Coupled with latter aspect is the necessity to operate the sensor in difficult media such as serum. In this presentation we describe our research on the mandatory surface chemistry and use of high frequency acoustic wave detection of biomarkers for ovarian cancer and species associated with metastatic breast cancer. The former involves lysophosphatidic acid and heat shock protein 10 and latter, parathyroid hormone-related peptide.

Speaker Bio: Professor Michael Thompson obtained his undergraduate degree from the University of Wales, UK and his PhD in analytical chemistry from McMaster University. Following a period as Science Research Council PDF at Swansea University he was appointed Lecturer in Instrumental Analysis at Loughborough University. He then moved to the University of Toronto where he is now Professor of Bioanalytical Chemistry. He has held a number of distinguished research posts including the Leverhulme Fellowship at the University of Durham and the Science Foundation Ireland E.T.S Walton Research Fellowship at the Tyndall National Institute, Cork City. He is recognized internationally for his pioneering work over many years in the area of research into new biosensor technologies and the surface chemistry of biochemical and biological entities. He has made major contributions to the label-free detection of immunochemical and nucleic acid interactions and surface behavior of cells using ultra high frequency acoustic wave physics.

Thompson has served on the Editorial Boards of a number of major international journals including Analytical Chemistry and The Analyst and is currently Editor-in-Chief of the monograph series “Detection Science” for the Royal Society of Chemistry, UK and Associate Editor of IEEE Sensors. He has been awarded many prestigious international prizes for his research including The Robert Boyle Gold Medal of the Royal Society of Chemistry, The Elsevier Prize in Biosensor and Bioelectronic Technology and the E.W.R. Steacie Award of the Chemical Society of Canada. He was made a Fellow of the Royal Society of Canada in 1999.