2015-16
MCB Distinguished Speaker Series

Dr. Michael Moran

Canada Research Chair and Professor
University of Toronto and Hospital For Sick Children

Can "Omics Integration" Reveal Polygenic Cancer Drivers?

Wed. Oct. 7, 2015
MCKN 031 @ 2:30 pm

Working with colleagues at Princess Margaret Cancer Centre, we undertook an unprecedented, large-scale analysis of the molecular make-up of normal and cancerous lung. Our understanding of cancer and other genetic diseases is being revolutionized by technological advances in DNA sequencing. The hope is that by reading the DNA sequence of a tumour, doctors will be able to precisely classify and treat the cancer based on its individualized set of DNA mutations. However, we reasoned that since DNA sequences are simply the blueprints for the production of proteins, we would look for patterns among tumour proteins that differed from normal lung. To accomplish, we used mass spectrometry to identify and quantify thousands of proteins in early stage primary lung tumours and patient-matched normal lung. We were able to recognize sets of proteins that were distinctly different between subsets of lung tumours. Remarkably, some of these protein signatures correlated with patient survival. Our results indicate that in addition to accumulating DNA mutations in the genome, tumours arise also by remodeling of the proteome, that is, the entire complement of expressed proteins in a cell. Another unexpected finding was that the cancer signature proteins were all involved in controlling metabolism, that is, the chemistry within cells, which is well known to be highly irregular in tumours. Curiously, genes encoding metabolism proteins are with few exceptions not typically mutated in cancers, and consequently altered metabolism has often been viewed as a consequence, rather than a cause of cancer. The altered metabolism proteins we found in lung tumours was not at all predicted based on genomics analysis of the same samples. This suggests that dysregulated cancer metabolism is largely a product of proteome remodelling, not genetic mutations. Since drugs are designed to target proteins, and many have been developed to target the enzymes of metabolism, we hope that our findings will open new avenues to precisely classify and treat individual tumours according to their protein and metabolism signatures.

Fall 2015 Schedule	
Oct. 7th	Dr. Michael Moran, University of Toronto and Hospital for Sick Children (Host: Dr. N. Jones)
Oct. 21st	Dr. Tracy Raivio, University of Alberta (Host: Dr. C. Whitfield)
Nov 4th	Dr Rheal Towner, Oklahoma Medical Research Foundation (Host: Dr. D. Josephy)
Nov 18th	Dr. David Evans, University of Alberta (Host: Dr. P. Krell)

"A GREAT OPPORTUNITY TO HEAR LEADING RESEARCHERS IN THE SCIENTIFIC COMMUNITY DISCUSS THEIR WORK"

*** ALL WELCOME TO ATTEND ***

*** COFFEE, TEA AND TIMBITS ***

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