

4th International Conference and Exhibition on **Cell & Gene Therapy**

August 10-12, 2015 London, UK

A big data analysis platform to unveil gene interactions in cancer

Benjamin Y M Yung¹, Xihong Lin², Godwin Yung², S C Cesar Wong¹, Fengfeng Wang¹ and Lawrence W C Chan¹ ¹The Hong Kong Polytechnic University, Hong Kong ²Harvard University, USA

We have achieved a breakthrough in the cancer genomics by developing a novel big data analysis platform for analysing the interactions among genes. In order to compare distributions of expressional correlations between neoplastic and normal states and to further reveal their structural differences, a threshold was identified to define a strongly co-expressed gene network with the best coherence to neoplasm phenotype. By applying this novel structural co-expression analysis, we found the genome-wide co-expression structure in the normal state was stronger than that in Chronic myelogenous leukemia (CML). Conversely, more links between Nucleophosmin 1 (NPM1) and BCR-ABL-related pathway were noted in CML. Normal-specific network showed dissociation of NPM1 with ribosomal proteins (RP) while CML-specific co-expressions rendered a large network connecting NPM1 to RP genes through RPL10A, RPL31 and RPL36A. Our results revealed a critical role of NPM1 in joining a cascade of ribosomal biogenesis, protein synthesis, cell proliferative and anti-apoptotic events in CML. We speculate that NPM1 and its co-expressed genes may be illegitimately activated in CML, as inferred by their positive expressional correlations. This study has assured a novel structural co-expression network analysis platform, which unveils cancer pathogenesis and its potential NPM1-oriented treatment strategy. Co-expression analysis discovers novel unregulated patterns of gene network for understanding cancer biology, identifying new targets for treatment and all these innovations contribute to great science. This platform can be readily applied to other diseases for diagnostic, prognostic and therapeutic investigation.

Biography

Benjamin Y M Yung obtained his PhD in Pharmacology from Baylor College of Medicine. He had his Postdoctoral training in the lab of the Nobel Laureate Arthur Kornberg at Stanford University. He is currently Chair-Professor of Biomedical Sciences and Head of the Department. For the past 30 years, he has systematically explored the biological role of NPM in cancer. He has published over 100 scientific papers that cover broad range of scientific disciplines and techniques. His achievements and recognitions are reflected in many prestigious awards, including Outstanding Researcher Award, Outstanding Cancer Research Award and Ministry of Education Outstanding Teacher Award.

Notes: