

CANCER SCIENCE INSTITUTE OF SINGAPORE

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Identification and characterization of cancer stem cells in hepatocellular carcinoma (HCC)

Date: Tuesday, 5 March 2013

Time: 11am – 12pm

Venue: LT 36, Centre for Translational Medicine, Level 3
 (14 Medical Drive, Singapore 117599)

Chair: Prof. Daniel Tenen

Abstract:

Recent research efforts in stem cell biology suggest that cancer growth is driven by stem-like cells within a tumor, called cancer stem cells (CSCs). Recently, we have pioneered the identification of a CSC population from HCC cells and xenograft tumors that is marked by their CD133 surface phenotype and bearing features that include the ability to self-renew, differentiate into non-hepatocyte-like lineages, initiate tumors *in vivo* and resist standard chemotherapy via the Akt/PKB and Bcl-2 pathway. Differential microRNA expression profiling of CD133⁺ and CD133⁻ cells from human HCC clinical specimens and HCC lines identified an overexpression of miR-130b in CD133⁺ CSCs. Functional studies demonstrated that miR-130b enhanced tumorigenicity *in vivo* and a greater potential for self-renewal by silencing TP53INP1. Our current work found that HCC tumor cells could be reprogrammed to CSCs by silencing ATOH8 gene, a transcription repressor targeting to several stemness-associated genes including nanog and Sox2. The characterization of liver CSCs will not only allow for the better understanding of the mechanisms that regulate this specific population of cells, but also provide insight into the gradual improvement of more effective cancer therapies against HCC.

Biography:

Dr. Xin-Yuan Guan has been working on cancer genetics for more than 25 years. He got his PhD degree from the University of Arizona in 1993. After postdoctoral training at the University of Michigan, he was recruited by National Human Genome Research Institute, NIH as a senior staff fellow. He joined the Department of Clinical Oncology, The University of Hong Kong in 1999, where he is currently Professor and Director of Laboratory of Cancer Genetics. Dr. Guan's major contributions in cancer research include: 1) development and application of micro-FISH technique in cancer research; 2) identification and characterization of cancer related genes, especially amplified oncogenes such as AIB1, EIF5A2 and CHD1L; and 3) identification and characterization of cancer stem cells in liver and esophageal cancers. Currently, Dr. Guan is focusing his research on cancer stem cell, cancer microenvironment, cancer metabolism and cancer related genes in liver, esophageal and nasopharyngeal cancers. Dr. Guan has published more than 220 peer-reviewed papers in international journals including *Nat Genet*, *Cell Stem Cell*, *Nat Med*, *JCI*, *Gastroenterology*, *Hepatology*, *Gut*, and *Cancer Res*.