Special lecture 2

Dissecting the genetic and epigenetic pathways for non-alcoholic fatty liver diseases

○Ng Huck Hui
Genome Institute of Singapore, Agency for Science, Technology and Research, Singapore

Non-alcoholic fatty liver disease (NAFLD) is gaining track as an imminent global pandemic that is estimated to impact up to a quarter of the adult population worldwide. Anticipated to place a significant strain on the healthcare system, NAFLD is expected to have a considerable impact due to its widespread occurrence and the potential health complications associated with obesity and diabetes. NAFLD encompasses a range of disease stages, starting from benign accumulation of fat in the liver (steatosis) to the degeneration, inflammation, and cirrhosis of liver cells. The organoid system is a highly important tool for investigating hepatocyte functions and advancing our understanding of liver biology in NAFLD progression. Our lab has made significant research progress on the generation of liver organoids from pluripotent stem cells (PSCs) and went a step further to develop a one-step protocol for directed differentiation of adult liver stem cells (LSCs) to a hepatocyte-like cell (HLC) lineage. The successful generation of liver organoids from both PSCs and LSCs showcases their versatility, offering promising prospects for their utilization in modeling drug-induced liver injury and fatty liver disease. In addition, our laboratory has also further developed an algorithm that utilizes transcriptomic data from diverse patients across different continents for the continuous staging of patients with NAFLD. In this presentation, we will explore how a multi-disciplinary approach can uncover valuable insights into NAFLD mechanisms and stages, providing promising avenues for tackling this complex disease.

Professor Ng Huck Hui is the Assistant Chief Executive of the Biomedical Research Council, under the Agency for Science, Technology and Research.

Prof Ng is renowned in the field of gene regulation and genomics. His laboratory is developing diagnostic and therapeutics modalities for brain and liver diseases. Prof Ng had held several administrative positions. He was the Executive Director of the Genome Institute of Singapore and the Executive Director of the A*STAR Graduate Academy.

Prior to joining A*STAR, Prof Ng was a postdoctoral fellow with Harvard Medical School under the prestigious Damon Runyon-Walter Winchell Postdoctoral Fellowship. Prof Ng is renowned in the field of stem cells, having spent more than a decade in research to understand and uncover the intricacies of gene regulation and how they relate to cell biology. He was also the President for the Stem Cell Society Singapore, which is a major platform for educating the public on stem cell research. In 2016, Prof Ng was elected to be an Associate Member of the European Molecular Biology Organization, making him the only associate member to be based in Singapore. Most recently, Prof Ng was also elected as Fellow of the Singapore Academy of Science (SNAS).

In recognition of his scientific contributions, Prof Ng has received numerous local and international honours and awards, including the Young Scientist Award in 2004, Singapore Youth Award in 2005, National Science Award in 2007, Junior Chamber International (JCI) The Outstanding Young Persons Singapore Awards in 2009, Singapore Youth Award (Commendation Medal) in 2010, President's Science Award (Team Award) in 2011, President's Science Award (Team Award) in 2018 and The Public Administration Medal (Silver), National Day Awards 2019.

Outside of A*STAR, Prof Ng is very active in the local universities and organizations, and holds adjunct positions at the National University of Singapore (NUS) Yong Loo Lin School of Medicine, NUS Faculty of Science, Nanyang Technological University (NTU) School of Biological Sciences and LKC Medicine and the Singapore Eye Research Institute (SERI). He also sits on the Board of Consortium for Clinical Research and Innovation Singapore (CRIS) Pte Ltd, National Medical Research Council (NMRC), Science Centre Singapore and NUS High School.