Functional Study of the Interaction between SRPK2 and HBV Core Protein and the Regulatory Role of SRPK2 in HBV Replication

Pak Hong Yip and Jacky Ngo
The Chinese University of Hong Kong

Hepatitis B Virus (HBV) infection is a global health issue that many carriers have to bear the risk of development of severe liver diseases, as result of chronic injury to liver. The HBV replication cycle has been extensively revised. As shown in the diagram, there are four major steps of the viral replication: viral entry, DNA replication, virion formation and secretion. The host cellular serine-arginine protein specific kinases (SRPK1 and 2) have been identified to phosphorylate the HBV core protein and such phosphorylation is important for pregenomic RNA (pgRNA) encapsidation during the viral nucleocapsid assembly. SRPK2 is highly homologous to SRPK1, with the same critical amino acids at the docking groove which is crucial for substrate binding. On the other hand, phosphorylation mechanism of SRPKs towards a typical substrate SR protein have been studied, but not HBV core protein. Thus, my project will focus on the phosphorylation mechanism of SRPK2 on HBV core protein (HBVcp) and, more importantly, the structural basis of the interaction between SRPK2 and HBV core protein. Moreover, the role of the SRPK2 on HBV replication in cultured cell will also be investigated.