Presentation 1:

Translating New Gene Regulatory Mechanisms into Effective Cancer Immunotherapy

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Summary:

Immune-checkpoint blockade (ICB) therapies have revolutionized cancer treatment. Hepatocellular carcinoma (HCC) is highly-prevalent in China and Southeast Asia. In Hong Kong, HCC is currently the fifth leading cancer type and the third largest cause of cancer deaths. Despite unprecedented success in recent clinical trials, no biomarker to predict response to immunotherapy exists in HCC. Since the majority of patients still do not respond to ICB therapies, our overall objective is to discover new combination strategies to maximize the clinical benefits of immunotherapy. With the generous support from HMRF and other funding agencies, we have elucidated new transcriptional and epigenetic mechanisms by which HCC cells avoid immune destruction. Unraveling the molecular and cellular crosstalk that establishes the immunosuppressive tumor microenvironment holds the key to the development of effective cancer immunotherapy, which will have major impact in both basic research and clinical services for this fatal malignancy.

Presentation 2:

Applications of CRISPR technology in Epstein-Barr virus research and therapy

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Summary:

CRISPR is a game-changing technology in biology and medicine which has been awarded the Nobel Prize in Chemistry in 2020. In this seminar I will talk about how this emerging technology can be used to advance EBV research and anti-EBV therapy in five areas with real-life examples. First, CRISPR was used for mutant construction for genetic study and vaccine development. Comparison will be made with a live attenuated vaccine for varicella zoster virus (VZV). Second, CRISPR had wide applications in marker insertion and rapid cloning of EBV. This might be employed to achieve rapid cloning of recombinant EBV from clinical samples. Third, CRISPR was harnessed to eradicate EBV from infected cells. A combination of CRISPR with chemotherapeutic agents was also tested, Fourth, CRISPR screening was performed to identify hot dependency factors and host restriction factors in an unbiased and genome-wide manner. The example of TOPBP1 as a novel EBV dependency factor will be presented. Finally, CRISPR technology was adopted to induce the expression of endogenous EBV genes. Taken together, innovative use of CRISPR technology will provide valuable new tools and platforms in EBV research and therapy.