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Distinguished Lecture Series

SPEAR vs SHIELD: SARS-CoV-2 and Polymerase Inhibitors

22 December 2021 (Wednesday)
2:30-3:30 p.m. GMT+8 (Hong Kong Time)

OEE1017 and Online via Zoom
(Meeting ID: 971 8539 9267)

ABSTRACT

As of September 2021, more than 229 million cases of COVID-19 infections with more than 4.6 million deaths worldwide have been recorded for the current pandemic. COVID-19 has become the most devastating and urgent challenge to the global public health system of a century.

After the identification of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) as the causative agent of COVID-19, there has been intense interest in using antiviral drugs in treating the disease. During the early days of the pandemic, nucleotide analogue (NA) antiviral drugs (e.g. Remdesivir) were tried with great hope. However, as it turned out, a unique proofreading mechanism facilitated by the viral encoded nsp14 bi-functional enzyme during viral replication/ transcription, significantly limits the efficacy of NA inhibitors and clinical utilities. We therefore set out to investigate the molecular mechanisms underlying SARS-CoV-2 RNA synthesis, understand how the virus escapes the attacks from NA inhibitors, and find effective clinical solutions.

Professor Rao Zihe

Tsinghua University

Professor Rao Zihe's research has provided ground-breaking insights into how pathogens infect their hosts, replicate and assemble, as well as the mechanisms for pathogen latency and drug resistance. His works present unprecedented insights into the life cycle of pathogens resulting severe human infectious diseases (including influenza virus, SARS-CoV/SARS-CoV-2, HIV, HAV, picornaviruses, herpesvirus, and etc) and provide valuable information for drug discovery. In the recent global pandemic of COVID-19, he determined the structures of two key targets for antiviral development, main protease and RNA-dependent RNA polymerase, accelerating the global efforts against COVID-19. Amongst others, he also solved structures of giant viruses with innovative technologies, including Herpesvirus and Africa Swine Fever virus. To date, Professor Rao has published over 400 peer reviewed research papers, including 23 papers in Science, Nature and Cell, with over 23,000 citations. He also advances the development of anti-infection therapies (including anti-SARS-CoV-2 neutralizing antibodies and vaccines) and has 38 innovation patents.

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