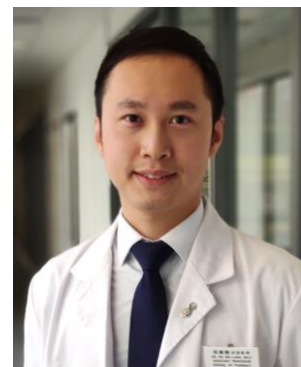


Drug discovery for COVID-19

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Abstract

The outbreak of coronavirus disease 2019 (COVID-19), caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), is a global threat to human health. Using in vitro screening and biochemical characterization, we identified the hepatitis C virus (HCV) protease inhibitor simeprevir as an especially promising repurposable drug for treating COVID-19. Simeprevir potently reduces SARS-CoV-2 viral load by multiple orders of magnitude and synergizes with remdesivir in vitro. Mechanistically, we showed that simeprevir inhibits the main protease (Mpro) and unexpectedly the RNA-dependent RNA polymerase (RdRp). Our results thus reveal the viral protein targets of simeprevir, and provide preclinical rationale for the combination of simeprevir and remdesivir for the pharmacological management of COVID-19 patients.

Biography

Professor Wai-Lung (Billy) Ng leads the Ng Lab of Chemical Biology & Drug Discovery at the School of Pharmacy, the Chinese University of Hong Kong (CUHK). His research interests are chemical biology, drug discovery, and medicinal chemistry. Professor Ng completed his postdoctoral training at Harvard Medical School / Dana-Farber Cancer Institute. Prior to Harvard, he was a research fellow at University of Oxford, with funding supports from the Croucher Foundation and Marie Curie Fellowship (declined). He was a Fulbright Scholar at Massachusetts Institute of Technology (MIT) during his graduate study. He obtained his Ph.D. and B.Sc. (1st Class Hons.) in Chemistry from CUHK.