

Q & A with CHAN KUAN RONG

Research on Emerging Infectious Diseases

In this issue, we are featuring our NGS alumnus Dr. Chan Kuan Rong. He is currently working at Duke-NUS Medical School as a Principal Research Scientist. His current research focuses on host immune and metabolic responses to viruses and vaccines, as well as in the understanding of the molecular underpinnings underlying virus pathogenesis. He also shares with us his view on the current COVID-19 pandemic.

1. Could you introduce yourself and what you are doing now?

I am a Principal Research Scientist in the Programme in Emerging Infectious Diseases at Duke-NUS Medical School. After my graduation from NGS, I did my post-doctoral training in Duke-NUS Medical School under Prof Ooi Eng Eong, and is a Principal Research Scientist since 2018. At present, I have most experiences with viral diseases caused by dengue, zika, and yellow fever viruses, although I am starting to be involved in SARS-CoV2 research, which is the cause of the COVID-19 pandemic. The close collaborations between clinicians, clinician scientists and research scientists have allowed us to gain some fundamental insights into the molecular mechanisms that lead to disease outcome. Based on our studies, we are in the midst of testing potential therapeutics and vaccines that can hopefully, reduce the global disease burden caused by these deadly viruses.

2. How has your NGS PhD experience equipped you to perform your role?

I am most grateful for the flexibility that NGS has provided me in pursuing my passion in the study of infectious diseases. Since NGS encourages multidisciplinary research, I could venture into any innovative research as long as the project is meaningful. During my PhD, I was able to explore the interface between two broad specialties, namely virology and immunology, to investigate how the host antibody responses affect dengue virus pathogenesis. This multidisciplinary mindset has also shaped my research beyond PhD, where

I was able to integrate metabolomics, which is the study of biological small molecules (metabolites), to interrogate how metabolites interact with viruses and the host immune system to cause disease. By integrating various broad disciplines in the study of virus pathogenesis, I hope to uncover the wholistic understanding of the biological processes that lead to disease, thereby accelerating the development of effective therapeutics and vaccines.

3. Could you share with us the career prospects for infectious disease research, in light of the current global COVID-19 situation?

The COVID-19 pandemic highlights the critical need to train future personnel to conduct infectious diseases research, which will be useful for the development of diagnostics, vaccines, therapeutics, as well as to conduct of surveillance and contact tracing, to quickly control the spread and burden of viral diseases. The current bottleneck for infectious disease research is to be able to develop vaccines and therapeutics in a timely fashion so that the interventions can be given before reaching the peak of the epidemic. Therefore, I believe there will be opportunities for research that can accelerate vaccine or therapeutics development, including bioinformatics that enable rapid rational design of drugs, discovery of biochemical formulations that can improve drug/vaccine delivery, identification of reliable correlates of drug/vaccine safety and efficacy, manufacturing of biologics at industrial scale and clinical research on adaptive trial designs that



can shorten clinical trials. Interestingly, in the COVID-19 outbreak and other viral outbreaks, elderly people, especially those with co-morbidities, are more susceptible to severe disease outcome. Hence, I envisage that more research opportunities to look into the effects of aging on viral infections.

4. Do you have other things to share with our NGS alumni?

Research is not a sprint but a marathon. There will be frequent cycles of successes and failures, so it is important to stay positive during times of failure. In my opinion, the best way is to build friendship with your colleagues, peers, and even your mentor during your research career, as these are the people that will keep you motivated during downtime. On the other hand, when you are successful, help those who are in need. Over time, this will build a positive relationship that will keep your passion alive, in whatever you do.

