

YOUNG SCIENTIST AWARD 2025

CHAN YI HAO

Principal Investigator

Genetics of Host Immunity Lab

A*STAR Infectious Diseases Labs

Agency for Science, Technology and Research

“For his research on viral encephalitis, revealing how the brain defends itself from
life-threatening viral infections.”

+++

Dr Chan Yi Hao is a multidisciplinary biomedical researcher specialising in human immunogenetics and infectious diseases. Dr Chan’s work aims to understand why people respond so differently to the same infection. By identifying genetic flaws and immune weaknesses that make some individuals more vulnerable, he is uncovering new ways the body fights viruses and deepening our understanding of human biology.

Dr Chan’s laboratory focuses on arthropod-borne viral diseases, which are of particular relevance in Singapore’s tropical environment. To this end, Dr Chan has made landmark contributions in the fields of inborn errors of immunity and viral immunology. In a groundbreaking study involving an international cohort of patients with herpes simplex encephalitis, he identified a novel human restriction factor for HSV-1. This discovery revealed a new genetic cause of herpes-related brain infection and showed how brain cells can defend themselves against viruses. In another breakthrough, Dr Chan demonstrated that a rare genetic condition weakens the brain’s ability to fight SARS-CoV-2, leading to severe brain infections. This provided the first clear explanation for a rare and serious illness.

Dr Chan also played a key role in Singapore's national COVID-19 response. Collaborating with clinicians across Singapore's major hospitals, he characterised the immune responses of SARS-CoV-2-infected patients and evaluated the therapeutic efficacy of anti-viral and anti-inflammatory drugs, such as remdesivir, etoricoxib and celecoxib. These studies guided primary care providers, serving not only as prognostic tools to identify patients likely to require intubation, but also in assessing the effectiveness of therapeutic interventions at a time when much about the pandemic remained unknown.

Despite his young age, Dr Chan's scientific contributions have earned wide recognition. He is the recipient of the National Research Foundation Fellowship (2025), the ASTAR Young Achiever Award (2023), the ASTAR International Fellowship (2021) and the A*STAR Graduate Scholarship (2015). He has published 39 peer-reviewed articles, including in prestigious journals such as *Nature*, *Science* and *Cell*, and has achieved an h-index of 25. His work has also been featured on the cover of the *Journal of Experimental Medicine*, a highly influential journal in medicine and biology. In addition, he was awarded The Rockefeller University's Center for Clinical and Translational Science (RUCCTS) pilot grant from the Shapiro-Silverberg Fund for the Advancement of Translational Research.

Beyond research, Dr Chan is deeply committed to mentoring the next generation of scientists, having guided over 10 young researchers. He also contributes to the scientific community, serving as an associate editor of *Frontiers in Immunology* and as a member of the editorial board of the *Journal of Human Immunity*.