

**Mechanisms of arrhythmogenesis in Brugada Syndrome:
Insights from human pluripotent stem cell-derived cardiomyocyte models**

Dr. Gary Tse

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Date : 5 May 2022 (Thu)
Time : 4:00pm - 5:30pm (Hong Kong Time)
Zoom <https://cityu.zoom.us/j/91599402492>
Link: (Meeting ID: 915 9940 2492, Passcode: 044884)

Abstract

Brugada Syndrome (BrS) is an inherited ion channelopathy that is associated with increased risks of ventricular tachycardia/ventricular fibrillation and sudden cardiac death. However, the disease mechanisms are incomplete understood. Affected patients have different risks of adverse events and risk stratification remains difficult for clinicians, leading to under- and over-treatment. Our group conducts pre-clinical, translational, clinical, and population-based research focusing on the molecular and electrophysiological mechanisms of disease, identification of risk factors and the development of multivariable predictive models to improve risk stratification for arrhythmic outcomes in BrS. This talk will focus on the translational work using bioengineering platforms generated from patient-derived induced pluripotent stem cell-derived cardiomyocytes of a BrS proband in Hong Kong. This patient suffered from recurrent syncope and arrhythmias and was later found to have a novel A1427S missense mutation in the SCN5A gene previously not implicated in BrS. The discussions will be on the preliminary results from investigations of SCN5A expression in BrS cardiomyocytes, arrhythmogenicity, electrophysiological and calcium handling abnormalities in the human ventricular cardiac anisotropic sheets and mechanical function in human ventricular cardiac tissue strips, both in untreated preparations, and following ajmaline and flecainide used clinically to diagnose BrS, and quinidine used as an anti-arrhythmic agent.

Biography

Institutional Website: <https://kmms.ac.uk/person/dr-gary-tse/>
Research Website: <https://kmms.ac.uk/cardiovascular-disease/>

Dr. Gary Tse read undergraduate Physiology at the University of Cambridge (2008), followed by clinical medicine training from Imperial College London, before completing his Ph.D. in cardiac electrophysiology a Doctor of Medicine (M.D.) in cardiovascular medicine at the University of Cambridge. He is currently a Clinical Reader at the Kent and Medway Medical School in the UK and Professor at the Tianjin Institute of Cardiology of the Tianjin Medical University in China and Visiting Professor at the Faculty of Health and Medical Sciences, University of Surrey.

Dr. Tse is a Medical Examiner Member of the Royal College of Pathologists, received his Membership of the Faculty of Public Health (UK) and was elected a Fellow of the European Society of Cardiology (2016), American College of Cardiology (2017), Society for Cardiovascular Angiography and Interventions (2019), Heart Rhythm Society (2018), Royal College of Physicians and Surgeons of Glasgow (Fellowship qua Physician) (2017), Royal College of Physicians of Edinburgh (2018), Royal College of Physicians of London (2019), Royal College of Paediatrics and Child Health (2019) and Faculty of Public Health (UK) (2019).

In recognition of contributions to the understanding of cardiac electrophysiology, Dr. Tse was selected for the ECG Bayés Award by the International Congress of Electrocardiology for the best research output by a young investigator in 2018, The Bruce del Mar Junior Investigator Award by the International Society for Noninvasive Electrocardiology (ISHNE) in 2021, and senior author of the work selected as First Prize for the Young Investigator Award of the International Congress of Electrocardiology in 2021, and for the Young Investigator Award at the European Society of Cardiology Asia Congress 2021.

He is the Secretary of the Cardiovascular Analytics Group, Hong Kong, China-UK Collaboration. With a collective team effort, his group has established more than 20 longitudinal cohorts, allowing the application of data- and hypothesis-driven methodologies to investigate the epidemiology, risk factors, and outcomes of a number of rare and common cardiovascular diseases. Using these cohorts, it was possible to develop predictive risk models that were enhanced by artificial intelligence and machine learning algorithms. On cardiac ion channelopathies, his team established the International Brugada Electrocardiographic Indices Consortium, which is currently one of the largest registries involving >1500 patients from 21 countries.

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All are welcome!