



Konstanze Tan

Ph.D candidate (final year)
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RESEARCH INTERESTS

- Epigenome-wide DNA methylation alterations linked to cardiovascular disease
- Multi-omics approaches to investigate the functional contribution of DNA methylation in cardiovascular disease.
- Causal analyses of the relationship between DNA methylation and cardiovascular disease

EDUCATION AND RESEARCH EXPERIENCE

PhD Candidate in Cardiovascular Epidemiology, Lee Kong Chian School of Medicine, Nanyang Technological University — Aug 2021—Present
(Thesis advisor: Asst Prof Marie Loh Chiew Shia)

My thesis investigates the relationship between DNA methylation alterations and cardiovascular disease (CVD) through epigenome-wide association studies (EWAS) of two conditions: subclinical atherosclerosis, measured by carotid intimal-media thickness (cIMT) and dilated cardiomyopathy (DCM). Both investigations utilise a similar methodology, beginning with epigenome-wide mapping of CpG methylation, followed by quantitative trait loci and Mendelian Randomisation to identify regulatory and causal pathways in CVD. These investigations are conducted in disease-relevant tissues and multi-ethnic cohorts with unique CVD risk profiles that are not fully explained by varying prevalence of risk factors, aim to identify methylation-regulated molecular mechanisms contributing to CVD pathogenesis.

Bachelor of Science in Biological Sciences — Aug 2017—Dec 2020
(Advisor for final year project: Assoc Prof Christine Cheung)

My final year project assessed endothelial perturbations in Nonalcoholic Fatty Liver Disease (NAFLD), which is linked to a high risk of cardiovascular disease, using patient-derived endothelial cells and diet-induced mouse models. This research was published as Ng et al. 2022 (doi/full/10.15252/embr.202154271), where my main contributions included histological staining and quantifying endothelial CXCL12 levels and leukocyte infiltration in diet-induced NAFLD mice.

PUBLICATIONS

1. **K. Tan**, R. Foo, M. Loh*. Cardiomyopathy in Asian Cohorts: Genetic and Epigenetic Insights. *Circulation: Genomic and Precision Medicine*, 2023, 16(5):496-506.
2. C. Ng, K. Lee, M.D. Muthiah, K.X. Wu, F. Chioh, **K. Tan**, G. Soon, A. Shabbir, W.M. Loo, Z.S. Low, Q. Chen, W. Wahli, N.S. Tan, H.H. Ng, Y.Y. Dan, and C.Cheung*, Endothelial-immune crosstalk contributes to vasculopathy in nonalcoholic fatty liver disease, *EMBO reports*, 2022, 23: e54271

SUBMITTED PUBLICATIONS

1. **K. Tan**, D. Tay, W. Tan, H. K. Ng, E. Wong, M. P. Morley, G. K. Singhera, P. R. Jain, F. L. Tai, P. J. Hanson, T. P. Cappola, K. B. Margulies, R. Foo, M. Loh. **Epigenome-wide association study for dilated cardiomyopathy in left ventricular heart tissue identifies putative gene sets associated with cardiac development and early indicators of cardiac risk**. Submitted and under peer review at *Clinical Epigenetics: Clinical Epigenetic of Heart Failure*. [Preprint available at medRxiv: <https://doi.org/10.1101/2024.07.16.24310537>]

ORAL PRESENTATIONS

1. **Integrative Analysis of Omics Summary Data Reveals Putative Mechanisms Underlying Dilated Cardiomyopathy**. PRECISE-IHCC Conference 2024, 2024/8, Singapore.

POSTER PRESENTATIONS

1. **Integrative Analysis of Omics Summary Data Reveals Putative Causal Involvement of Cardiac DNA methylation in Dilated Cardiomyopathy**. ASHG 2024, 2024/11, Denver, Colorado, USA.
2. **Epigenome-wide association of DNA methylation markers for dilated cardiomyopathy in left ventricular heart tissues**. ASHG 2022, 2022/10, Los Angeles, California, USA.

TEACHING

- Graduate Teaching Assistant, **Introduction to Data Science**, 2022/11, School of Biological Sciences, Nanyang Technological University. Responsibilities: Graduate teaching assistant.
- Student Communications Coach, 2018-Present, Language and Communication Centre (LCC) Communication Cube, Nanyang Technological University. Responsibilities: Provide personalized feedback to graduate and undergraduate students on the organization, tone, style, and mechanics of their manuscripts and presentations.

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