

Molecular Diagnostics

Genetics of Disease Susceptibility

分子診斷學

PRINCIPAL INVESTIGATOR | **Nelson Tang**

TEAM MEMBERS | Paul Chan, Linda Lam, Suk Ling Ma

Research Progress Summary

Research Directions:

1. Genetics of complex traits: To identify prevalent genetic variants causing common diseases in Han Chinese;
2. Statistical genetics and computational statistical analysis of big genetic and biological datasets;
3. Analysis of variation of the transcriptome using the latest technology of next-generation sequencing.

Research into Genetics of Disease Susceptibility (GDS):

The mission of the GDS laboratory is to identify disease predisposition genes for common diseases, also known as complex traits. The research group led by **Nelson Tang** is involved in the development of various analysis methods and wet laboratory validation of the results generated from such analysis. The team also participates in international consortiums in studies of healthy aging (including bone and other phenotypes), breast cancer, and genetic susceptibility to adolescent idiopathic scoliosis and tuberculosis. With the advances in sequencing and other technologies, they acquire biological data in an unprecedented volume nowadays. The analysis and statistical method become limiting factors in handling such a huge volume of data.

Research and Scholarship

Academic Editorship

Name	Details	
	Role	Journal
Nelson Tang	Editorial Board Member	Pathology

Reviewers of Journal / Conference

Name	Details	
	Role	Journal / Conference
Nelson Tang	Reviewer	Scientific Reports
		The Union World Conference on Lung Health 2024
		Biomedicines
		Cancers
		Diagnostics

Grants and Consultancies

Name	Project Title	Funding Source	Start Date (dd/mm/yyyy)	End Date (dd/mm/yyyy)	Amount (HK$)
Nelson Tang	KIZ-CUHK Joint Laboratory of Bioresources and Molecular Research of Common Diseases	Research Grants Council – Joint Laboratory Funding Scheme	01/01/2024	31/12/2028	1,875,000
	Identifying Novel Cell Subpopulation and Therapeutic Target for Adolescent Idiopathic Scoliosis through Combined Single-Nucleus and Spatial Transcriptomics	Research Grants Council – General Research Fund	01/01/2024	31/12/2026	1,500,000
	Modified Creatinine Index as A Non-invasive Tool for the Monitoring of Muscle Mass in Peritoneal Dialysis	Health Bureau – Health and Medical Research Fund	01/04/2024	31/03/2026	1,025,344

Grants and Consultancies

Name	Project Title	Funding Source	Start Date (dd/mm/yyyy)	End Date (dd/mm/yyyy)	Amount (HK$)
Nelson Tang	Development of a Single-Cell Full-Length Mitochondrial Genome Sequencing Platform Based on Droplet Microfluidics	Research Grants Council – General Research Fund	01/01/2023	31/12/2025	970,181
	Paediatric Biomonitoring Reference Values for Metals and Trace Elements in Urine: A Survey of Hong Kong Children	Health Bureau	04/10/2021	03/10/2024	1,009,167
	Establishment Hong Kong Branch of CAS Center for Excellence in Animal Evolution and Genetics	The Chinese University of Hong Kong – Vice-Chancellor's One-off Discretionary Fund	01/06/2020	31/05/2025	12,000,000

Publications

A. Journal Papers

1. Huang B, Huang J, Chiang NH, Chen Z, Lui G, Ling L, Kwan MYW, Wong JSC, Mak PQ, Ling JWH, Lam ICS, Ng RWY, Wang X, Gao R, Hui DSC, Ma SL, Chan PKS, Tang NLS. Interferon response and profiling of interferon response genes in peripheral blood of vaccine-naive COVID-19 patients. *Frontiers in Immunology*. 2023;14:1315602. doi:10.3389/fimmu.2023.1315602.
2. Huang J, Chow AC, Tang NL, Chi Phillip S, Tang N. Low-Rank Full Matrix Factorization for dropout imputation in single cell RNA-seq and benchmarking with imputation algorithms for downstream applications. *bioRxiv*. Published online October 23, 2024:2024.10.21.619343. doi:10.1101/2024.10.21.619343. (Epub ahead of print)

B. Conference Paper

1. Ou M, Tang NLS. Implication of variants with residual activity in SLC22A5 (OCTN2) in newborn screening for primary carnitine deficiency: A comparison between ethnic groups. *The 15th International Symposium of Variants in the Genome*. 2024.05.

C. Patent

1. **China Patent:**

   Title: Method for quantifying telomere length and genomic motifs
   Inventors: Tang NLS, Ma SL, Woo J
   Patent No.: CN112029841B
   Filing Date: 9 February 2024





Nelson Tang gave an invited lecture called 廣東省醫學會兒科年會 in 2024. They took a photo with other panel experts.

Source: 2024 廣東省醫學會兒科年會