

# 2025 臺中榮民總醫院院慶國際醫學研討會 TCVGH International Medical Conference

## AI in Medicine

Future of Healthcare by AI



照片請附原始檔	姓名	蔡金吾
	職稱	特聘教授兼任主任秘書
	科別／系所	腦科學研究所
	機構／單位／學院	國立陽明交通大學醫學院
	E-Mail	tsajw@nycu.edu.tw
Professional Career	2023- 國立陽明交通大學先進治療研發中心 主任 2024- 台灣基礎神經科學學會 理事長 2021-2024 國立陽明交通大學 研發長 2024 日本東北大學 客座教授 2010-2012 Genentech Inc.研發部 科學經理 2009-2010 加州大學舊金山分校(UCSF) 博士後研究員 2008-2009 紐約大學(NYU) 博士後研究員	
Speech Title	Unveiling cellular and molecular mechanisms of brain developmental disorders using spatial transcriptomics	
Abstract( 200 words) :		
<p>Brain developmental disorders such as lissencephaly and microcephaly arise from defects in fundamental processes including progenitor proliferation and neuronal migration. Despite rapid advances in genetics, the cellular mechanisms linking patient-derived variants to cortical malformations remain incompletely understood. In this talk, I will present our recent efforts applying spatial transcriptomics and integrative approaches to dissect disease mechanisms. We identified the first lissencephaly-associated variant in NDEL1 (p.R105P), which impaired nucleokinesis by disrupting its interaction with LIS1. Spatial transcriptomic profiling revealed complementary expression patterns of NDE1 and NDEL1 in progenitors and postmitotic neurons, highlighting their distinct yet cooperative functions in cortical development. In a separate study, we uncovered a BAIAP2 variant (p.R29W) in a patient with posterior-predominant lissencephaly. Spatial transcriptomic mapping demonstrated a posterior-high expression gradient of <i>Baiap2</i> in the developing cortex, providing a mechanistic link between gene expression and regional disease severity. Functional studies confirmed migration and morphogenesis defects caused by this variant. Finally, I will briefly discuss our work on KIF23, a mitotic kinesin required for neural stem cell maintenance, underscoring the importance of mitotic regulation in cortical size control. Together, these studies demonstrate how spatial biology enables mechanistic insights into neurodevelopmental disorders and points toward precision medicine strategies for their treatment.</p>		