香港浸會大學
HONG KONG BAPTIST UNIVERSITY

School of 中醫藥學院
Chinese Medicine

香港浸會大學同心基金高齡疾病中醫藥研究所
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GMCNS 金寧醫療神經再生研究中心

Mr. and Mrs. Ko Chi Ming Centre for Parkinson's Disease Research (CPDR)
Hong Kong Baptist University

2026 Symposium on Autophagy, Aging, Cancer and Neurodegeneration: From Physiology, Pathology to Therapeutic Potential of Chinese Medicine

2026自噬、老化、癌症與神經退行性疾病研討會：從生理學、病理學到中醫藥的治療潛力

2026.06.02 | 09:30 – 17:25

Lam Woo International Conference Centre (WLB103), Hong Kong Baptist University

香港浸會大學林護國際會議中心 (WLB103)

Programme 議程

09:15–09:30 Reception & Registration 招待及登記

09:30–09:45 **Opening Ceremony 開幕式**

Session 1 第一節

09:45–10:05

Exploring the Landscape and Neuroprotective Mechanism of Autophagy in the Central Nervous System
探索自噬在中樞神經的功能及其神經保護機制

Professor YUE Zhenyu 岳振宇教授

Alex and Shirley Aidekman Professor, Director of the Center for Parkinson's Disease Neurobiology, Director of Basic and Translational Research of Movement Disorders, Icahn School of Medicine at Mount Sinai, USA

美國西奈山伊坎醫學院 Alex and Shirley Aidekman Professor

10:05–10:10 Q & A 問答環節

10:10–10:30

Repair of Lysosome Membrane Damage by TECPR1
溶酶體膜損傷感知與修復的機制和功能

Professor ZHONG Qing 鍾清教授

Chair Professor, Director, Department of Pathophysiology, School of Medicine, Shanghai Jiao Tong University, China

上海交通大學醫學院病理生理學系講座教授及主任

10:30–10:35 Q & A 問答環節

10:35–10:55

Understanding the Novel Regulatory Mechanisms of Mitophagy by Focusing on PINK1
聚焦 PINK1 解析線粒體自噬的新型調控機制

Professor SHEN Hanming 沈漢明教授

Chair Professor, Associate Dean (Teaching), Faculty of Health Sciences, University of Macau, Macao SAR, China

澳門大學健康科學學院講座教授及副院長（教學）

10:55–11:00 Q & A 問答環節

11:00–11:15 Coffee Break 茶歇

Session 2 第二節

11:15–11:35

Drug Discovery and Pathogenic Study in ALS
ALS 治療藥物篩選與驗證及其致病機制探討

Professor SU Huanxing 蘇煥興教授

Professor, Institute of Chinese Medical Sciences, University of Macau, Macao SAR, China

澳門大學中華醫藥研究院教授

11:35–11:40 Q & A 問答環節

11:40–12:00

Ubiquitin-dependent Golgiphagy
泛素依賴型高爾基體自噬

Professor FENG Du 馮杜教授
Dean, School of Basic Medical Sciences, Guangzhou Medical University, China
廣州醫科大學基礎醫學院院長

12:00–12:05 Q & A 問答環節

12:05–12:25

Changing Our Nutrition and Lifestyles to Promote Healthy Brain Ageing Via Mitophagy Stimulation
透過刺激粒線體自噬改變營養和生活方式，促進大腦健康老化

Professor Evandro Fei FANG 方飛教授
Professor of Gerontology and Neuroscience, University of Oslo, Norway
挪威奧斯陸大學老年學和神經科學教授

12:25–12:30 Q & A 問答環節

Lunch Break 午膳

Session 3 第三節

14:30–14:50

Transplantation of Encapsulated Mitochondria Alleviates Dysfunction in Mitochondrial and Parkinson's Disease Models
線粒體膠囊移植緩解重大疾病的功能障礙

Professor LIU Xingguo 劉興國教授
Director, Institute of Development and Regeneration, Guangzhou Institutes of Biomedicine and Health, Chinese Academy of Sciences, China
中國科學院廣州生物醫藥與健康研究院發育與再生醫學研究所所長

14:50–14:55 Q & A 問答環節

14:55–15:15

From Intracellular Autophagy to Extracellular Glymphatic Drainage: A Novel Xingnao Kaiqiao Acupuncture-Herb Synergy Strategy for α-Synuclein Clearance in Parkinson's Disease
從微觀自噬到宏觀引流：醒腦開竅針藥協同清除帕金森病α-突觸核蛋白的新策略

Professor WANG Nanbu 王南卜教授
Vice President and Professor, Shenzhen Hospital (Futian) of Guangzhou University of Chinese Medicine
廣州中醫藥大學深圳醫院（福田）副院長及教授

15:15–15:20 Q & A 問答環節

15:20–15:40

Biochemical and Structural Characterization of the Nutrient-regulated Nucleocytoplasmic Shuttling Process of TFEB: A Master Regulator of Autophagy and Lysosomal Function
生化與結構生物學研究解析自噬與溶酶體功能主調控因子 TFEB 在營養信號調控下的核質穿梭過程

Professor ZHAO Yanxiang 趙燕湘教授

Chair Professor, Associate Head, Department of Applied Biology and Chemical Technology, The Hong Kong Polytechnic University, HKSAR, China
香港理工大學應用生物及化學科技學系講座教授及副系主任

15:40–15:45 Q & A 問答環節

15:45–16:00 Coffee Break 茶歇

Session 4 第四節

16:00–16:20

Autophagic Protein NRBF2 Is Required for Astrocytic Phagocytosis to Maintain Synapse Homeostasis During Aging
自噬相關蛋白 NRBF2 是星形膠質細胞吞噬功能所必需的關鍵因子以維持衰老過程中的突觸穩態

Professor LU Jiahong 路嘉宏教授

Associate Professor, Deputy Director (Research and Technology Transfer), Institute of Chinese Medical Sciences, University of Macau, Macao SAR, China
澳門大學中華醫藥研究院副院長（研究及技術轉移）及副教授

16:20–16:25 Q & A 問答環節

16:25–16:45

Biallelic Hexose-6-phosphate Dehydrogenase Variants Cause Mitochondrial Dysfunction Underlying Parkinson's Disease
己糖-6-磷酸脫氫酶雙等位基因變異通過介導線粒體功能障礙參與帕金森病發病

Professor TAN Jieqiong 譚潔瓊教授

Professor, School of Life Sciences, Central South University, China
中南大學生命科學學院教授

16:45–16:50 Q & A 問答環節

16:50–17:10

The Multifaceted Roles of VCP/p97 in Regulation of Mitophagy
VCP/p97 對線粒體自噬的多重調控作用

Professor LU Guang 盧廣教授

Associate Professor, Zhongshan School of Medicine, Sun Yat-sen University, China
中山大學中山醫學院副教授

17:10–17:15 Q & A 問答環節

17:15–17:25 **Closing Remarks 總結**

Biographies and Abstracts of Speakers

講者

簡介及演講摘要

Professor YUE Zhenyu 岳振宇教授

Alex and Shirley Aidekman Professor, Director of the Center for Parkinson's Disease Neurobiology, Director of Basic and Translational Research of Movement Disorders, Icahn School of Medicine at Mount Sinai, USA

美國西奈山伊坎醫學院
Alex and Shirley Aidekman Professor

Biography 簡介

Professor Zhenyu Yue is the Alex and Shirley Aidekman Professor, Director of the Center for Parkinson's Disease Neurobiology, and Director of Basic and Translational Research of Movement Disorders at the Icahn School of Medicine at Mount Sinai. He earned his PhD from Robert Wood Johnson Medical School at Rutgers University and completed his postdoctoral training as a Howard Hughes Medical Institute (HHMI) Fellow at The Rockefeller University.

Professor Yue's laboratory employs multidisciplinary approaches to investigate the cellular and molecular mechanisms underlying neurodegenerative diseases (e.g., Parkinson's, Alzheimer's, and Huntington's diseases) and psychiatric disorders (e.g., bipolar disorder and schizophrenia). His team develops preclinical cell and animal models to identify disease biomarkers and therapeutic targets. His laboratory investigated the transcriptomic landscape of the human substantia nigra, revealing the heterogeneity and selective vulnerability of dopaminergic neurons in Parkinson's disease. By establishing genetic models of Parkinson's disease using iPSC neurons and genetic mouse models, his team elucidate disease mechanisms and advance therapeutic strategies.

A pioneer in autophagy research, Professor Yue was the first to demonstrate the in vivo function of mammalian autophagy gene Beclin 1. His work has provided fundamental insights into core autophagy machinery and how dysfunctional autophagy in neurons and glia contributes to neurological disorders. More recently, his laboratory reported that a bipolar disorder and schizophrenia risk gene AKAP11 encodes an autophagy receptor controlling PKA complex RI homeostasis and synaptic activity. Professor Yue's work shed a light on the molecular mechanism underly psychiatric disorders involving autophagy control of synaptic transmission.

Professor Yue has published more than 170 SCI-indexed papers, including original research articles in *Nature, Science, Cell, Nature Cell Biology, Nature Neuroscience, Neuron, Cell Research, Nature Communications,* and *The Journal of Clinical Investigation*, as well as influential reviews and commentaries. His work has been cited over 48,000 times, with a Google Scholar *h*-index of 85.

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Exploring the Landscape and Neuroprotective Mechanism of Autophagy in the Central Nervous System

探索自噬在中樞神經的功能及其神經保護機制

Abstract 演講摘要

The autophagy–lysosome pathway plays a critical role in maintaining cellular homeostasis by removing aggregated proteins, damaged organelles, and invading pathogens. Autophagy is a tightly regulated process involving the synthesis and degradation of autophagosomes, which can be activated in response to tissue injury and various cellular stresses. Mendelian variants in autophagy-related genes (ATGs) have been linked to brain developmental and neurodegenerative diseases, highlighting the protective function of autophagy in the central nervous system. The studies have explored the landscape of autophagy cargo and autophagy-regulated cellular functions in neurons and glia. The research team has uncovered molecular mechanisms by which disruption of specific autophagy functions leads to neurodegenerative and psychiatric disorders.

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Professor ZHONG Qing 鍾清教授

Chair Professor, Director,
Department of Pathophysiology, School of Medicine,
Shanghai Jiao Tong University, China

上海交通大學醫學院病理生理學系講座教授及主任

Biography 簡介

Shanghai Jiao Tong University School of Medicine Chair Professor. Previously served as faculty at the University of California and the University of Texas in the United States. Currently serves as the Director of the Department of Pathophysiology at the School of Medicine, Shanghai Jiao Tong University, and Director of a Key Laboratory under the Ministry of Education. Elected President of the Cell Death Research Society of the Chinese Society for Cell Biology. Dedicated to researching the biochemical mechanisms and functions of autophagy and necrosis in mammalian cells, with over 80 high-impact publications and more than 10,000 citations. Listed in Elsevier's "Highly Cited Chinese Researchers" for multiple years. Served as the lead scientist for key research and development projects under the Ministry of Science and Technology and has received support from multiple National Natural Science Foundation of China (NSFC) key projects.

上海交通大學醫學院二級研究員，講座教授，獲得國家特聘教授等人才項目支持。曾先後在美國加州大學和德州大學任教，現任上海交通大學醫學院病理生理學系主任和教育部重點實驗室主任，當選中國細胞生物學會細胞死亡研究分會會長。致力於哺乳動物細胞自噬和壞死的生化機制和功能研究，在*Nature*、*Science*、*Cell*等雜誌發表高水平論文80餘篇，引用超過1萬餘次，連續多年入選愛思維爾「中國高被引學者」榜單。作為首席科學家主持科技部重點研發項目，獲得多項國家自然科學基金重點項目的支持。

Repair of Lysosome Membrane Damage by TECPR1
溶酶體膜損傷感知與修復的機制和功能

Abstract 演講摘要

As the most acidic organelle within the cell, lysosomes are rich in proteases, nucleases, and lipolytic enzymes. Once damaged, they can significantly impact the intracellular environment and even lead to cell death. We have discovered that TECPR1, a damage-sensing protein localized on lysosomes, is directly involved in lysosomal damage repair. Lysosomes are susceptible to damage from factors such as drug treatment, hypoxia, energy stress, and pathogen invasion. Under glucose starvation conditions, lipid droplet overload leads to lysosomal damage. TECPR1 repairs damaged lysosomes through membrane tubulation and budding. In a high-fat diet-induced MAFLD mouse model, loss of TECPR1 exacerbates liver damage in mice after fasting. The identification of this novel mechanism of membrane damage repair is crucial for advancing our understanding of its role in metabolic diseases.

溶酶體作為細胞內酸性最強的細胞器，內含豐富的蛋白酶，核酸酶和脂質水解酶，一旦發生破損，會對細胞的內環境產生重大影響，甚至導致細胞死亡。我們發現了一個定位於溶酶體上的損傷感知蛋白TECPR1直接參與溶酶體的損傷修復。溶酶體易受到藥物處理、低氧，能量壓力和病原體入侵等因素而損傷。在葡萄糖饑餓條件下，脂滴的超載導致溶酶體損傷。TECPR1通過膜管出芽的方式修復損傷溶酶體。在高脂餵養的MAFLD小鼠模型中，TECPR1的缺失加劇了禁食後小鼠肝臟損傷。這些膜損傷修復的全新機制鑒定對我們進一步瞭解相關機制在疾病中的作用至關重要。

Professor SHEN Hanming 沈漢明教授

Chair Professor, Associate Dean (Teaching), Faculty of Health Sciences, University of Macau, Macao SAR, China

澳門大學健康科學學院講座教授及副院長（教學）

Biography 簡介

Professor Shen Hanming is currently a Chair Professor and Associate Dean (Teaching), Faculty of Health Sciences, University of Macau. He received his Bachelor of Medicine, Master of Medicine and PhD from Zhejiang Medical University and National University of Singapore (NUS), respectively. He received his postdoctoral training at both NUS and National Cancer Institute, National Institutes of Health, USA. Prior to his current appointment, he worked in NUS School of Medicine, from Assistant Professor to Full Professor. His research is focused on the autophagy-lysosome pathway, mitophagy, as well as on glucose metabolism in cancer cell biology. Currently, he serves as the Associate Editor for Autophagy, and as member of editorial board for several other journals such as *Life Metabolism, Burns & Trauma,* and *Aging Cell*.

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Understanding the Novel Regulatory Mechanisms of Mitophagy by Focusing on PINK1

聚焦 PINK1 解析線粒體自噬的新型調控機制

Abstract 演講摘要

Mitophagy is a selective form of autophagy for clearance of damaged mitochondria via the autophagy-lysosome pathway. Among various mitophagy regulatory mechanisms, PINK1, a protein kinase, and Parkin, an E3 ligase, are two critical players, with important implications in neurodegenerative disorders such as Parkinson's disease (PD). In this presentation, Professor Shen will cover some of the recent work focusing on O-GlcNAcylation and PARylation of PINK1 as a novel forms of post-translational modifications in control of PINK1 activation in response to acute mitochondrial damage. The results thus provide a deeper insight into the molecular mechanisms in control of PINK1, the guardian of mitochondria and lay foundation for development of novel interventional strategies in PINK1 and mitophagy-related human diseases such as neurodegeneration and cancer.

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Professor SU Huanxing 蘇煥興教授

Professor, Institute of Chinese Medical Sciences, University of Macau, Macao SAR, China

澳門大學中華醫藥研究院教授

Biography 簡介

Huanxing Su got his MD from Zhejiang University and PhD in neuroscience from the University of Hong Kong. He is currently a full professor working at Institute of Chinese Medical Sciences, University of Macau. The main research focus of Su's lab is on searching for effective pharmacological interventions for the treatment of neurodegenerative diseases such as Alzheimer's disease and Amyotrophic Lateral Sclerosis. He serves as an Associate Editor for *Aging and Disease* and is an editorial board member of *Brain, Behavior, and Immunity*.

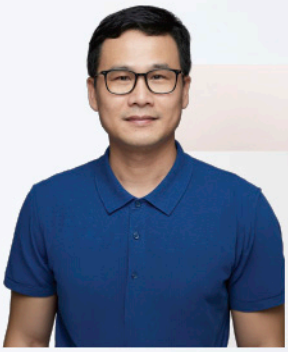
蘇煥興本科畢業於浙江大學醫學院，博士畢業於香港大學醫學院。現任澳門大學中華醫藥研究院教授、博士生導師。多年來從事神經退行性疾病尤其是老年癡呆和肌萎縮側索硬化症治療藥物篩選的研究。目前擔任 *Aging and Disease* 副主編及*Brain, Behavior, and Immunity* 編委。

Drug Discovery and Pathogenic Study in ALS
ALS治療藥物篩選與驗證及其致病機制探討

Abstract 演講摘要

Professor Su's group focus on the study of amyotrophic lateral sclerosis (ALS) research with three core research directions "exploration of biomarkers, elucidation of pathogenic mechanisms, and screening and development of therapeutic drugs". Utilizing large-scale unbiased cerebrospinal fluid proteomics discovery and targeted mass spectrometry validation, followed by orthogonal immunological confirmation and multicenter clinical trials, the group have been working on exploration of ALS biomarkers, achieving a progression from scientific discovery to clinical application. The group are also committed to in-depth elucidation of ALS pathogenic mechanisms, seeking ALS-specific motor neuron pathogenic genes and identifying abnormal activation of motor neuron-specific gene DIAPH3 as significantly associated with motor neuron functional impairment. The group have also established a cross-species drug development platform encompassing nematodes, mice, and iPSCs, providing comprehensive support for drug screening and validation.

澳門大學蘇煥興課題組長期深耕神經系統相關疾病研究，近幾年來聚焦ALS (amyotrophic lateral sclerosis)領域，形成了「生物標誌物探索、致病機制闡釋、治療藥物篩選與開發」三大核心研究方向，構建了完善的ALS科研平台與轉化體系。應用迄今規模最大的ALS腦脊液蛋白質組研究隊列，課題組從大規模無偏蛋白組發現，到靶向質譜驗證，再到免疫學正交確認和多中心臨床驗證，實現了從科研發現到臨床應用候選的系統推進。本課題組致力於ALS致病機制的深度闡釋，尋找運動神經元特異性ALS致病基因，發現運動神經元特異表達基因DIAPH3異常激活與運動神經元功能損傷有明顯的關聯性。ALS治療藥物研發是學術界與產業界的重點關注領域。本課題組構建了涵蓋線蟲、小鼠和iPSCs的跨物種藥物研發平台，為藥物篩選與驗證提供了全方位支撐。



Professor FENG Du 馮杜教授

Dean, School of Basic Medical Sciences,
Guangzhou Medical University, China

廣州醫科大學基礎醫學院院長

Biography 簡介

Du Feng is a Professor at Guangzhou Medical University, China, where he serves as Dean of the School of Basic Medical Sciences. Professor Feng received his PhD from Tsinghua University and completed postdoctoral training at Harvard Medical School. His research focuses on mitochondrial quality control, autophagy, and cellular stress responses. In his early work, as one of the principal discoverers, he identified FUNDC1 as a novel mammalian mitophagy receptor, and subsequently delineated the signalling pathway governing this receptor-mediated mitophagy. More recently, he introduced the concept of "nucleoid autophagy", a novel mitochondrial quality control mechanism mediating clearance of cytosolic ectopic mtDNA and suppressing inflammation. He has published over 50 papers in journals including *Nature Cell Biology, Cell Research, The EMBO Journal,* and *Autophagy*, with over 12,000 citations. He received the Gu Xiaocheng Lecture Award from the Ray Wu Memorial Fund in 2024.

現任廣州醫科大學基礎醫學院院長，呼吸疾病全國重點實驗室PI，廣州醫科大學學術委員會副主任。長期從事線粒體穩態調控與炎症疾病研究。早期作為主要發現者之一鑒定了哺乳動物線粒體自噬新受體，並闡明了其信號轉導通路，近期的工作命名了一條新的線粒體「類核自噬」降解通路。以通訊作者身份在*Nature Cell Biology*（2篇）、*Cell Research*、*EMBO J* 等期刊發表論文 50 餘篇，他引次數超過12,000次（Google scholar）。主持國家基金重點項目、重大研究計劃等；任中國病理生理學會常務理事、中國生物物理學會線粒體分會常務理事等；任國際學術期刊《Cell Stress》學術編輯、愛思唯爾旗下期刊《Mitochondrial Communications》責任主編。獲2024年度吳瑞基金會「顧孝誠講座」獎。

Ubiquitin-dependent Golgiphagy
泛素依賴型高爾基體自噬

Abstract 演講摘要

Selective autophagy of organelles is essential for cellular homeostasis, yet how the Golgi apparatus—the central hub of protein processing, modification and sorting—is selectively recognized and degraded under metabolic stress remains poorly understood, particularly with respect to the ubiquitin signals that mark Golgi membranes for autophagic clearance. Here we show that glucose starvation triggers ubiquitin-dependent Golgiphagy through a cooperative axis between the E3 ubiquitin ligase RX and the Golgi membrane protein ZP. Glucose deprivation drives accumulation of ubiquitin on Golgi membranes and engulfment of GM130-positive vesicles by LC3-decorated autophagosomes. Through an E3 ligase screen, we identify RX as a critical regulator whose catalytic activity is required for Golgi ubiquitination and for the autophagic turnover of multiple Golgi-resident proteins, including GM130, COG3, GORASP2, YIPF4 and ZP. We further demonstrate that ZP is a direct substrate of RX and, through its two N-terminal zinc-finger domains, serves as a receptor-like ligand that recruits RX to the Golgi to initiate Golgiphagy; interaction-deficient mutants fail to rescue this process. Loss of RX disrupts Golgi architecture, perturbs secretion and cargo sorting, and compromises cell viability under starvation. These findings define an RX–ZP axis as a ubiquitin-encoded mechanism of Golgi quality control, with implications for organelle homeostasis in metabolic stress and disease.

細胞器選擇性自噬是維持細胞穩態的關鍵機制，然而作為蛋白質加工、修飾與分選樞紐的高爾基體，在代謝應激下如何被選擇性識別並通過自噬清除，特別是泛素信號如何標記高爾基體膜以啟動其自噬降解，長期未明。本研究揭示，糖饑餓通過 E3 泛素連接酶 RX 與高爾基體膜蛋白ZP的協同作用，觸發泛素依賴的高爾基體自噬（Golgiphagy）。糖剝奪誘導高爾基體膜泛素累積，GM130 標記的高爾基體小囊泡被 LC3 陽性自噬體吞噬。通過 E3 連接酶篩選，我們鑒定 RX 為該過程的關鍵調控分子，其酶活性是高爾基體泛素化以及 GM130、COG3、GORASP2、YIPF4 和 ZP 等多個高爾基體蛋白經自噬降解所必需。我們進一步證明 ZP 既是 RX 的直接底物，又通過其 N 端兩個鋅指結構域作為受體樣配體，將 RX 募集至高爾基體啟動 Golgiphagy；互作缺失突變體無法回補該過程。RX 缺失破壞高爾基體形態、擾亂分泌與分選功能，並降低應激下的細胞存活率。上述發現確立 RX–ZP 軸為一種泛素編碼的高爾基體質量控制機制，對理解代謝應激與相關疾病中細胞器穩態具有重要意義。

Professor Evandro Fei FANG 方飛教授

Professor of Gerontology and Neuroscience,
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挪威奧斯陸大學老年學和神經科學教授

Biography 簡介

Evandro F. Fang is a Professor of Gerontology and Neuroscience at the University of Oslo (UiO) and the Akershus University Hospital, Norway, and his group are working on the molecular mechanisms of human ageing and age-predisposed neurodegeneration (https://evandrofanglab.com/). More specifically, the Fang laboratory is focusing on the molecular mechanisms behind how cells clear their damaged and aged mitochondria, a process termed "mitophagy", as well as the roles of the NAD+-mitophagy/autophagy axis in healthy ageing and AD inhibition. NAD+ is a fundamental molecule in life and health and decreases in ageing and AD. Professor Fang is fascinated with and actively engaged in moving his laboratory findings to translational applications and is involved in 5 NAD+-based clinical trials, with the overarching goal of establishing novel and safe biological approaches to promote longer and healthier human lives.

As a Clarivate Highly Cited Researcher 2025 (1‰; and one of 22 in Norway), he has published over 100 papers in international peer-reviewed journals including papers in *Cell, Cell Metabolism, Nature Reviews MCB, Nature Neuroscience, Nature Ageing, Nature Biomedical Engineering,* and *Lancet Healthy Longevity*. He routinely reviews grants for more than 30 leading foundations, including European Research Council (ERC, EU), Medical Research Council (MRC, UK), and AFAR (USA). He has been associate Editor-in-Chief (Deputy Editor) of 4 leading ageing journals, including Ageing Research Reviews, Mechanisms of Ageing and Development, npj Ageing, and Journal of Gerontology: Biological Section. He has received several awards including the Butler-Williams Scholar on Aging 2016 by NIA (USA), the Scientific Award to Young Scientist in the Natural Sciences for 2020 by The Royal Norwegian Society of Sciences and Letters (Norway), and the 2023 Norwegian National Dementia research award of the National Association for Public Health presented by H.M. King Harald V of Norway.

After finishing his PhD at the Chinese University of Hong Kong, he had a 6-year postdoctoral training with Professor Vilhelm Bohr on molecular gerontology and Professor Mark Mattson on neuronal resilience in Alzheimer's disease at the National Institute on Ageing, Baltimore. He opened his lab in Oslo in the fall of 2017. He is the founding (co)coordinator of the Norwegian Centre on Healthy Ageing network (NO-Age, www.noage100.com), the Norwegian National anti-Alzheimer's disease Network (NO-AD, www.noad100.com), and the Hong Kong-Nordic Research Network. He sits in the expert roundtable on aging research for the United Nation's Scientific Advisory Board. He is an academician of the Norwegian Academy of Science and Letters (DNVA, 挪威科學與文學院院士).

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Changing Our Nutrition and Lifestyles to Promote Healthy Brain Ageing via Mitophagy Stimulation

透過刺激粒線體自噬改變營養和生活方式，促進大腦健康老化

Abstract 演講摘要

Why do we age and how can we age successfully – especially the brain? To address these questions, we need to understand the sophisticated and multi-layered nature of biological ageing. One cause of ageing is compromised autophagy. In this lecture, Professor Fang will share the mechanisms of autophagy and the linkage between compromised autophagy (especially mitophagy) and ageing and several other conditions, with a focus on neurodegenerative diseases (including Alzheimer´s disease / AD and depression). Publicly accessible approaches such as calorie restriction and exercise and small natural molecules such as NAD+ precursors, urolithin A, and a small molecule EFF-AA from passion fruit hold promise for the slowing down of ageing and dementia, likely at least partially via mitophagy induction. He will also give an update on the translational progress, including NAD+-based clinical trials investigating the treatment of conditions such as premature ageing diseases, brain diseases, and the applications of autophagy proteins and NAD+ pathway intermediates as biomarkers of disease progression; progress on a Phase II clinical trial looking into the potential benefits of urolithin A for Alzheimer's patients will be covered. Opportunities and strategies in addressing ageing challenges in the populational and societal levels are included.

Key References:

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Professor LIU Xingguo 劉興國教授

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中國科學院廣州生物醫藥與健康研究院發育與再生醫學研究所所長

Biography 簡介

Deputy Director of the National Key Laboratory of Respiratory Diseases, "Distinguish Youth Foundation" of National Natural Science Foundation, Chief Scientist of the National Key Research and Development Program of China (Twice), Recipients of special government allowances, 1st finisher of the first prize of the Guangdong Science and Technology Award in Natural Science, The Shulan Medicine Youth Award, The Ying Ding Science and Technology Award, 2025 Chinese Society of Cell Biology-Promega Innovation Fund, and "Young Bioenergeticist Award" of the International Biophysical Society. He is President of the Chinese Society of Mitochondrial Biology, as well as the Vice President of the Asian Society for Mitochondrial Research and Medicine, the council member of the Biophysical Society of China, and a member of the expert group for the compilation of the special guideline of the National Key R&D Program "Developmental Programming and Its Metabolic Regulation" and "Synthetic Biology". Since 2015, he has published 41 research papers as corresponding author (6 IF>20, 23 IF>10), among which 34 as sole/last corresponding author such as *Cell, Cell Metabolism* (2016, 2018, 2024), *Nature Metabolism* (2020, 2025), *Nature Structural & Molecular Biology*.

呼吸疾病全國重點實驗室副主任，國家傑青，國家重點研發項目首席科學家（2項），國家自然科學基金「基礎科學中心」項目骨幹，政府特殊津貼。獲廣東省自然科學一等獎（第一完成人），樹蘭醫學青年獎，丁穎科技獎，中國細胞生物學學會-普洛麥格創新基金。任*Science Bulletin*、*JBC*編委，亞洲線粒體學會副理事長，中國生物物理學會常務理事、線粒體分會會長。任國家重點研發計劃「發育編程及其代謝調節」專項、「合成生物學」專項指南編制專家組成員。發表論文90餘篇，被引超過1萬次，其中以通訊或第一作者80篇，其中34篇唯一或最後通訊作者發表在 *Cell*、*Cell Metabolism*（3篇）、*Nature Metabolism*（2篇）、*Nature Structural & Molecular Biology*等雜誌。多篇入選ESI 高被引論文，3篇獲得F1000推薦，12篇為封面。

Transplantation of Encapsulated Mitochondria Alleviates Dysfunction in Mitochondrial and Parkinson's Disease Models

線粒體膠囊移植緩解重大疾病的功能障礙

Abstract 演講摘要

Mitochondrial transplantation holds significant potential for mitochondrial diseases treatment. However, how to efficiently deliver exogenous mitochondria to somatic cells or tissues is still unsolved. We present a mitochondrial transplantation approach to deliver mitochondria into cells, mouse and monkey tissues with high efficiency, based on encapsulating mitochondria with vesicles derived from plasma membrane of erythrocytes. Treatment with encapsulated mitochondria complemented the loss, deletion or mutation of mitochondrial DNA, thereby rescuing the associated bioenergetic and biochemical defects in patient-derived cells with mitochondrial disorders. Furthermore, mitochondrial capsules rescued the mitochondrial DNA depletion syndrome and Leigh syndrome in Dguok-/- and Ndufs4-/- mouse models, respectively. Moreover, in a mouse model of Parkinson's disease, mitochondrial capsules rescued neuron loss, improved motor skills and restored mitochondrial function in the affected brain regions. Our study demonstrates the potential of this mitochondrial capsule as a treatment for mitochondrial disorders, and proposes an "organelle therapy" strategy in regenerative medicine.

線粒體移植在線粒體疾病的治療中具有重要潛力。然而，如何高效地將外源性線粒體遞送到體細胞或組織內仍未解決。我們提出了一種基於紅細胞質膜來源囊泡包裹線粒體的移植方法，能夠將線粒體高效遞送到細胞、小鼠及猴的組織中。使用這種包裹化的線粒體進行治療，可彌補線粒體DNA的缺失、丟失或突變，從而挽救來自線粒體疾病患者的細胞中相關的生物能量及生化缺陷。此外，在線粒體DNA耗竭綜合症和Leigh綜合症的Dguok-/-及Ndufs4-/-小鼠模型中，線粒體膠囊分別實現了有效的治療。更重要的是，在帕金森病小鼠模型中，線粒體膠囊能夠挽救受損腦區的神經元丟失、改善運動能力並恢復線粒體功能。我們的研究證明了這種線粒體膠囊作為線粒體疾病治療策略的潛力，並提出了一種再生醫學中的「細胞器療法」新思路。

Professor WANG Nanbu 王南卜教授

Vice President and Professor,
Shenzhen Hospital (Futian) of Guangzhou University of Chinese Medicine
廣州中醫藥大學深圳醫院（福田）副院長及教授

Biography 簡介

王南卜，廣州中醫藥大學第一附屬醫院，廣州中醫藥大學深圳醫院副院長（掛職），副研究員，碩士生導師，臨床醫學博士後，美國麻省總醫院（MGH）訪問學者，致力於中西醫結合治療神經系統疾病的臨床、教學、科研與科普推廣工作，主要研究方向：1）多模態診療體系構建與衰老相關腦病針藥結合干預研究；2）醒腦開竅藥及其配伍治療腦病的作用機理和開發研究。作為項目負責人主持國家博士後面上項目、國家自然科學基金項目、廣東省自然科學基金、廣州市科技計劃等課題多20餘項。已發表學術論文近百篇，（其中SCI 30餘篇，第一作者或通訊作者論著IF124.052）。

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From Intracellular Autophagy to Extracellular Glymphatic Drainage: A Novel Xingnao Kaiqiao Acupuncture-Herb Synergy Strategy for α-Synuclein Clearance in Parkinson's Disease

從微觀自噬到宏觀引流：醒腦開竅針藥協同清除帕金森病α-突觸核蛋白的新策略

Abstract 演講摘要

Aberrant aggregation of α-synuclein (α-Syn) and its prion-like transneuronal spreading are core pathological events driving the progression of Parkinson's disease (PD). Intracellular autophagy is a key pathway for degrading misfolded α-Syn, but simply enhancing it is insufficient to block the prion-like intercellular spreading of this protein into the extracellular space. Our previous studies have confirmed that Xingnao Kaiqiao herbal medicine can regulate the autophagy-related signaling network through multi-target mechanisms, enhance autophagic flux, significantly reduce α-Syn levels, and exert neuroprotective effects. However, the therapeutic efficacy of merely enhancing intracellular autophagy is limited, and there is an urgent need to establish an intervention strategy that integrates "intracellular autophagy" with "extracellular glymphatic drainage." Recent studies have shown that glymphatic clearance impairment caused by aquaporin-4 (AQP4) depolarization is a key link in promoting α-Syn accumulation and pathological propagation. Acupuncture, on the other hand, can not only suppress astrocytic reactivity and restore AQP4 polarity distribution to enhance glymphatic drainage, but also repair the autophagy-lysosome system and regulate related signaling pathways to inhibit the abnormal aggregation of α-Syn. Based on the complementary features of acupuncture and herbal medicine in regulating autophagy and activating the glymphatic system, we propose a novel "acupuncture-herb synergy with dual-pathway coupling" strategy: the combination of Xingnao Kaiqiao acupuncture and herbal medicine, in which the herbal medicine primarily enhances intracellular autophagic degradation, while acupuncture mainly promotes extracellular glymphatic drainage. This approach achieves spatiotemporal coupling and synergistic enhancement of α-Syn intracellular degradation and extracellular clearance, offering a new intervention paradigm for the treatment of PD.

α-突觸核蛋白（α-synuclein，α-Syn）的異常聚集及其朊病毒樣跨神經元擴散是驅動帕金森病（Parkinson's disease，PD）進展的核心病理事件。細胞內自噬是降解錯誤折疊 α-Syn 的關鍵通路，但面對該蛋白的朊病毒樣胞間傳播，單純增強自噬難以有效阻斷其在胞外間隙的擴散。我們前期研究證實，醒腦開竅中藥可通過多靶點調控自噬相關信號網絡，增強自噬流，顯著降低 α-Syn 水平，發揮神經保護作用。然而，僅憑胞內自噬調節作用有限，亟需建立一種貫通「微觀自噬」與「宏觀引流」的干預策略。近年研究顯示，水通道蛋白-4（aquaporin-4，AQP4）去極化所致的類淋巴清除障礙是促進 α-Syn 積累和病理傳播的關鍵環節；而針刺既可抑制星形膠質細胞反應性、恢復 AQP4 極性分佈以增強類淋巴引流，又能修復自噬-溶酶體系統、調控相關通路以抑制 α-Syn 異常聚集。基於針藥在自噬調控與類淋巴激活方面的互補特徵，我們提出「針藥協同—雙通路耦合」新策略：醒腦開竅針藥聯合，以開竅藥物側重增強胞內自噬降解，以針刺側重促進胞外類淋巴引流，實現 α-Syn 胞內降解與胞外清除的時空耦合與協同增效，為 PD 治療提供一種新的干預範式。

Professor Zhao Yanxiang 趙燕湘教授

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香港理工大學應用生物及化學科技學系講座教授及副系主任

Biography 簡介

Professor Zhao Yanxiang is a distinguished researcher in applied biology and chemical technology, currently serving as a Chair Professor at the Hong Kong Polytechnic University. She earned her PhD from The Rockefeller University and has an extensive background in cellular signaling and autophagy. Professor Zhao's research focuses on the functional mechanisms of cellular signaling proteins and the development of novel therapeutic strategies, particularly through autophagy-targeting peptides and immunotherapy for cancer treatment. She has published extensively in high-impact journals, including Nature Communications, Science Advances, and PNAS, contributing significantly to the understanding of autophagy's role in cellular homeostasis and disease processes. Her innovative work has led to the identification of critical interactions within autophagy pathways, providing insights into potential therapeutic applications. Professor Zhao is also recognized for her leadership in academic service, serving as an ad hoc reviewer for multiple prestigious journals and participating in various research panels. Her contributions position her as a leader in the field of biomedical research.

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Biochemical and Structural Characterization of the Nutrient-regulated Nucleocytoplasmic Shuttling Process of TFEB: A Master Regulator of Autophagy and Lysosomal Function

生化與結構生物學研究解析自噬與溶酶體功能主調控因子TFEB在營養信號調控下的核質穿梭過程

Abstract 演講摘要

The Transcription Factor EB (TFEB) is a member of the MiT-TFE family of transcription factors with a conserved basic helix-loop-helix-leucine-zipper (bHLHZip) domain for DNA binding. TFEB binds to a network of genes containing the Coordinated Lysosomal Expression and Regulation (CLEAR) motif and acts as master regulator of autophagy and lysosomal function. Dysregulated TFEB activity has been linked to obesity and tumorigenesis.

TFEB undergoes nutrient-driven nucleocytoplasmic shuttling as regulated by mTOR-related pathways. Under nutrient-rich conditions, TFEB is phosphorylated and retained in the cytosol. Nutrient deprivation triggers the dephosphorylation of TFEB and its rapid nuclear import to activate transcription of the CLEAR network of autophagy and lysosomal genes. Following nutrient refeeding, nuclear TFEB is re-phosphorylated and exported back to the cytosol to turn off the transcription activity.

The molecular machinery that carries out the nuclear import/export of TFEB and their modulation by mTOR signaling is not fully understood. Additionally, TFEB was recently reported to undergo liquid-liquid phase separation (LLPS) in the nucleus. The resulting TFEB condensates was shown to be critical for transcription of the CLEAR network. How the LLPS of TFEB affects its nutrient-driven nucleocytoplasmic shuttling is also not known.

Our study reveals that TFEB relies only on the karyopherin β protein (Kap-β), but not the karyopherin α/β protein complex (Kap-α/β) for its nuclear import. Additionally, TFEB undergoes LLPS in the cytosol under nutrient-rich conditions, with the resulting condensates impeding its nuclear import. Furthermore, Kap-β and nutrient-triggered dephosphorylation of TFEB both suppress the LLPS of TFEB to facilitate its nuclear import. Our cryo-EM structure of Kap-β in complex with TFEB shows that the bHLHZip domain of TEFB serves as the Nuclear Localization Signal (NLS) and binds to a conserved site on Kap-β similar to that observed for SREBP-2, another transcription factor with a bHLHZip domain. Overall, our study shows that LLPS is the underlying mechanistic process to facilitate nutrient-regulated nuclear import of TFEB. Findings from this study will offer novel insight on how to target TFEB-related autophagy and lysosomal processes in human physiology and diseases.

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Professor LU Jiahong 路嘉宏教授

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及副教授

Biography 簡介

Professor Lu is an Associate Professor and Deputy Director at the Institute of Chinese Medical Sciences, University of Macau. He obtained his PhD from Hong Kong Baptist University in Hong Kong and completed his postdoctoral training at the Icahn School of Medicine at Mount Sinai in New York City, US. Since 2014, Professor Lu has been working at the Institute of Chinese Medical Sciences, University of Macau, initially as an Assistant Professor and later as an Associate Professor.

Professor Lu's primary research interests revolve around autophagy biology and the pharmacological study of Chinese medicine. He has published more than 150 papers in prestigious journals such as *Nature Biomedical Engineering, EMBO Molecular Medicine, Autophagy, APSB* and others, accumulating over 14,000 citations. Professor Lu has received several notable awards for his work, including the "Standford top 2% Scientists", "Young Qihuang Scholar" in 2025, "Annual Young Scientist Award" from the TCM Brain Science Conference in 2022, and the Third Prize of Macau Natural Science Award in 2024. Furthermore, Professor Lu actively contributes to the scientific community as the associate editor for an Associate Editor for *Pharmacology* and *Therapeutics journal* or as a member of the editorial board for several esteemed SCI-indexed journals including *Acta Pharmaceutica Sinica B and Neurochemistry International.*

路嘉宏，現任澳門大學中華醫藥研究院副院長，粵港澳中醫藥與免疫疾病研究聯合實驗室共同主任（澳門大學）。路嘉宏本科和碩士畢業於中南大學湘雅醫學院，之後在香港浸會大學中醫藥學院獲得博士學位，並在美國伊坎-西奈山醫學院完成博士後培訓。路嘉宏主要研究興趣在於神經退行性疾病的機制和中藥藥理研究，相關研究成果以通訊作者（包括共同通訊）身份在*Nature Biomedical Engineering*（2篇），*Autophagy*（6篇）cz*APSB*（3篇），*Advanced Science, EMBO molecular Medicine*等學術雜誌發表論文60餘篇，總被引14,000餘次，H index 50。路嘉宏被列入斯坦福大學全球前2%頂尖科學家榜單，入選國家青年岐黃學者，獲得2024年澳門自然科學三等獎（排名第一），獲得2022年度中醫腦科學大會青年學者稱號（年度唯一）。路嘉宏目前擔任國際藥理學經典期刊 Pharmacology & Therapeutics 副主編；擔任中國遺傳學會理事、澳門藥理學和實驗治療學會副理事長、澳門免疫學會副主席、中國生理學會中醫藥與腦穩態調控專業委員會委員等職；主持國家自然科學基金青年以及面上專案，科技部港澳重大合作專案，澳門科技發展基金等十餘項課題。

Autophagic Protein NRBF2 Is Required for Astrocytic Phagocytosis to Maintain Synapse Homeostasis During Aging

自噬相關蛋白NRBF2是星形膠質細胞吞噬功能所必需的關鍵因子以維持衰老過程中的突觸穩態

Abstract 演講摘要

Brain aging is associated with decline in synapse number and activity. Astrocyte is the central player in maintaining synapse homeostasis. However, the impact of astrocyte aging on synaptic dysfunction and cognitive decline remains unclear. Here, the research identified a hallmark of aging astrocytes—Senescent Astrocytic Deposits (SAD) observed at aged rodents and macaques hippocampal astrocytic processes—that is associated with tripartite synapse dysfunction and memory decline. Importantly, SAD are markedly accelerated in mice lacking NRBF2, a gene whose coding product is a component of PI3KC3 complex required for autophagy and phagocytosis. Microdissection-coupled mass spectrometry, 3D electronic microscopy and spatia transcriptome analysis on NRBF2-deficient mice reveal SAD are abnormal protein deposits at the processes of ApoE-high expression astrocyte subtype and associated with dysfunctional tripartite synapses. Notably, astrocyte specific NRBF2 deletion induces reduced phagocytic activity, SAD formation, synaptic plasticity impairment, and memory deficits. Furthermore, enhancing astrocytic phagocytosis through astrocyte-specific RAB7 overexpression mitigates SAD formation, emphasizing the phagocytic activity-dependent role of astrocytes in maintaining synaptic homeostasis and cognitive function. The findings establish SAD as a potential marker of astrocyte aging and underscore the critical role of astrocytic NRBF2 in preserving synaptic homeostasis and cognitive function during aging.

大腦衰老伴隨突觸數量與活性的下降，星形膠質細胞是維持突觸穩態的核心參與者。然而，星形膠質細胞老化對突觸功能異常和認知衰退的影響仍不明確。本研究發現，在老年嚙齒類動物和獼猴海馬星形膠質細胞突觸旁結構中存在一種衰老星形膠質細胞沉積物（SAD），此標誌性結構與三方突觸功能障礙及記憶衰退相關。值得注意的是，在缺乏NRBF2基因的小鼠中，SAD的形成顯著加速。NRBF2的編碼產物是自噬和吞噬作用必需的PI3KC3複合體組分。通過顯微切割聯合質譜分析、三維電子顯微成像及空間轉錄組技術對NRBF2缺失小鼠的研究表明，SAD實質上是高表達載脂蛋白E（ApoE）亞型星形膠質細胞突起中的異常蛋白沉積，並與功能異常的三方突觸密切相關。星形膠質細胞特異性敲除NRBF2可導致其吞噬活性降低、SAD形成、突觸可塑性損傷及記憶能力缺損。進一步研究發現，通過星形膠質細胞特異性過表達RAB7增強其吞噬功能，可有效減輕SAD形成。這強調了星形膠質細胞通過吞噬活性依賴性機制在維持突觸穩態和認知功能中的關鍵作用。本研究確立SAD作為星形膠質細胞衰老的潛在標誌物，並揭示了星形膠質細胞NRBF2在衰老過程中維持突觸穩態和認知功能的重要作用。

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Biography 簡介

Tan Jieqiong is a professor and doctoral supervisor at the School of Life Sciences, Central South University, and previously completed postdoctoral training at Harvard Medical School. His research focuses on the mechanisms of abnormal protein aggregation and mitochondrial and lysosomal dysfunction in neurodegenerative diseases, as well as the development of novel strategies to eliminate aggregated proteins. He has led projects funded by the National Natural Science Foundation of China (NSFC) and participated in numerous major research initiatives, including the 973 Program, National Key R&D Programs, NSFC Key Projects, and international collaborative projects. He has published over 30 papers in journals such as *The Journal of Clinical Investigation, Brain, The Journal of Cell Biology, The Journal of Biological Chemistry, The British Journal of Dermatology,* and *Molecular Neurobiology.*

譚潔瓊，中南大學生命科學學院教授，博士生導師，哈佛大學醫學院博士後。主要從事神經退行性疾病中異常蛋白聚集、線粒體與溶酶體功能障礙機制及聚集蛋白清除新策略的研究。主持國家自然科學基金等科研項目，並參與973計劃、國家重點研發計劃、國家自然科學基金重點項目及國際合作項目等多項重大科研任務。以第一作者或通訊作者在 *J Clin Invest*、*Brain*、*J Cell Biol*、*J Biol Chem*、*Br J Dermatol*、*Mol Neurobiol* 等國際期刊發表論文30餘篇。

Biallelic Hexose-6-phosphate Dehydrogenase Variants Cause Mitochondrial Dysfunction Underlying Parkinson's Disease

己糖-6-磷酸脫氫酶雙等位基因變異通過介導線粒體功能障礙參與帕金森病發病

Abstract 演講摘要

Parkinson's disease (PD) is a complex neurodegenerative disorder caused by the combined effects of genetic and environmental factors, yet its genetic basis remains incompletely understood. Through whole-exome and whole-genome sequencing of large PD cohorts, the research identified biallelic H6PD variants in eight patients with PD, including homozygous and compound heterozygous cases, most of whom presented with early-onset PD. H6PD, a key enzyme in the endoplasmic reticulum (ER) pentose phosphate pathway, is involved in maintaining cellular NADPH/redox homeostasis, prompting us to investigate its role in PD pathogenesis. Functional studies using cultured cells, Drosophila, and mouse models demonstrated that H6PD deficiency impaired NADPH production, disrupted ER-mitochondria contacts, altered Ca^{2+} homeostasis, induced mitochondrial fragmentation, reduced respiratory capacity, and suppressed PINK1-Parkin-dependent mitophagy. PD-associated H6PD variants lost the ability to maintain redox balance and protect mitochondrial function. In vivo, H6PD deficiency caused dopaminergic neurodegeneration, locomotor defects, and shortened lifespan in Drosophila, while exacerbating MPTP-induced neuronal loss and mitochondrial abnormalities in mice. The findings identify H6PD as a novel PD-associated gene and reveal a critical role for H6PD in maintaining ER redox homeostasis, ER-mitochondria communication, and mitochondrial integrity, providing new insights into mitochondrial dysfunction and potential therapeutic targets in PD.

帕金森病（Parkinson's disease，PD）是一種由遺傳與環境因素共同作用導致的複雜神經退行性疾病，其遺傳機制尚未完全闡明。本研究通過對大規模PD隊列開展全外顯子組和全基因組測序，在8例PD患者中鑒定到H6PD雙等位基因變異，包括純合及複合雜合變異病例，其中多數表現為早發型PD。H6PD是內質網戊糖磷酸途徑中的關鍵酶，參與維持細胞NADPH/氧化還原穩態，因此我們進一步探究了其在PD發病中的功能與機制。結合細胞、果蠅及小鼠模型的功能研究發現，H6PD缺失可導致NADPH生成受損、內質網-線粒體接觸減少、Ca^{2+}穩態紊亂、線粒體碎片化及呼吸功能下降，並抑制PINK1-Parkin依賴性線粒體自噬。PD相關H6PD突變體則喪失維持氧化還原穩態和保護線粒體功能的能力。進一步研究表明，H6PD缺失可誘導果蠅多巴胺能神經元退行性變、運動功能障礙及壽命縮短，並加重MPTP誘導的小鼠神經元損傷。研究結果提示，H6PD通過維持內質網氧化還原穩態及內質網-線粒體通訊來保護線粒體功能，其功能障礙可能參與PD發生發展。本研究鑒定了H6PD作為PD新的致病基因，並為PD線粒體損傷機制及潛在干預策略提供了新的理論依據。

Professor LU Guang 盧廣教授

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Biography 簡介

Professor Guang Lu is an Associate Professor at the Department of Physiology, Zhongshan School of Medicine, Sun Yat-sen University. He obtained his PhD from the National University of Singapore (2019) and completed postdoctoral training with Professor Shen Hanming. His research focuses on mitochondrial early damage sensing and the regulatory mechanisms of mitophagy. Recent work has focused on the multifaceted role of VCP/p97 in controlling mitophagy and the crosstalk between the cGAS-STING pathway and PINK1-mediated mitophagy. As first/corresponding author, he has published in top-tier journals including *Cell Reports, Autophagy, Trends in Cell Biology,* and *Nucleic Acids Research*. He serves as a reviewer for multiple journals including The *EMBO Journal, Autophagy, and Cell Death & Differentiation*, and is a youth editorial board member of *Acta Physiologica Sinica and Burns & Trauma*.

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The Multifaceted Roles of VCP/p97 in Regulation of Mitophagy

VCP/p97對線粒體自噬的多重調控作用

Abstract 演講摘要

Mitophagy is an essential mitochondrial quality control pathway that removes damaged mitochondria, and its dysfunction is linked to various human diseases, including neurodegenerative disorders. The AAA ATPase VCP/p97 has emerged as a key regulator, but how VCP is recruited to mitochondria, which proteins it targets, and its contribution to early mitochondrial damage sensing remain not fully understood. In this presentation, Professor Lu will discuss the recent work addressing these questions from multiple aspects. First, he characterizes the recruitment mechanism of VCP to damaged mitochondria. He finds that the key autophagy protein WIPI2 is essential for mitochondrial recruitment of VCP to facilitate proteasomal degradation of outer mitochondrial membrane proteins. Second, he shows that VCP coordinates with the ubiquitin E3 ligase STUB1 to fine-tune full-length PINK1 levels, ensuring efficient mitophagy. Third, he reveals that VCP and the cGAS-STING pathway act together in sensing early mitochondrial damage, which is critical for activating the TBK1-OPTN axis to drive mitophagy. Together, the work establishes that VCP orchestrates mitophagy at multiple levels, from recruitment and substrate selection to early damage sensing. These insights provide new therapeutic targets for diseases associated with dysregulated mitophagy.

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