The 21st Asia Pacific Multidisciplinary Meeting for Nervous System Diseases

BRAIN 2025

17-18 JANUARY

PROGRAMME BOOK

CONTENTS

We are delighted to announce the 21st Multidisciplinary Meeting for Nervous System Diseases, BRAIN 2025, is going to be held on 17-18 January 2025.

Advancements in medical technology are changing the healthcare landscape. In BRAIN 2025, we will bring focuses on Language Brain Mapping, Neuro-imaging, Artificial Intelligence & Smart Theatre, along with updates in Brain Tumours and Dementia & Alzheimer's Disease. We are pleased to invite neurologists, neurosurgeons, pathologists, paediatricians, radiologists, intensive care professionals, clinical and basic scientists, biomedical engineers and related health care professionals from local and overseas to this multidisciplinary meeting.

We would like to express our gratitude towards speakers, delegates, sponsors from industries and the Secretariat for making this year's conference a success.

Danny T.M. CHAN
Division of Neurosurgery
Department of Surgery

Thomas W.H. LEUNG
Division of Neurology
Department of Medicine
and Therapeutics

Ho-Keung NG
Department of Anatomical
and Cellular Pathology

Organiser

Division of Neurosurgery
Division of Neurology
Neuropathology
The Chinese University of Hong Kong

Supporting Organisations

Hong Kong Neurological Society
Hong Kong Neuro-oncology Society
The Hong Kong Neurosurgical Society
The Hong Kong Neurosurgical Society (Nursing Chapter)
Hong Kong Student Association of Neuroscience
International Academy of Pathology, Hong Kong Division

Congress Secretariat

Division of Neurosurgery
Department of Surgery
The Chinese University of Hong Kong
4/F Lui Che Woo Clinical Sciences Building
Prince of Wales Hospital, Shatin, Hong Kong
Tel: (852) 3505 1316/ 3505 2624 / 3505 1852
Fax: (852) 2637 7974
E-mail: brain2025@surgery.cuhk.edu.hk
Website: cu-brain.cuhk.edu.hk

Emily K.Y. CHAN
Division of Neurosurgery, Department of Surgery
The Chinese University of Hong Kong, &
Department of Neurosurgery, Prince of Wales Hospital
Hong Kong, China

David Y.C. CHAN
Division of Neurosurgery, Department of Surgery
The Chinese University of Hong Kong, &
Department of Neurosurgery, Prince of Wales Hospital
Hong Kong, China

Carol Y.L. CHEUNG
Department of Ophthalmology and Visual Sciences
The Chinese University of Hong Kong
Hong Kong, China

Joseph C.H. CHOI
Department of Medicine and Therapeutics
Prince of Wales Hospital
Hong Kong, China

Tengfei GUO
Division of Haematology and Oncology
Department of Paediatrics and Adolescent Medicine
Hong Kong Children's Hospital
Hong Kong, China

Michal HOLUB
International Business & Product Architect
Cadwell Industries, Inc
Singapore

Dennis T.L. KU
School of Medicine and Surgery
University of Milano-Bicocca
Milan, Italy

Ka Wai KWOK
Department of Mechanical and Automation Engineering
The Chinese University of Hong Kong
Hong Kong, China

David C.C. LAM
School of Engineering
The Hong Kong University of Science and Technology
Hong Kong, China

Cindy X. LENG
Department of Medicine and Therapeutics
The Chinese University of Hong Kong
Hong Kong, China

Zheng LI
Department of Surgery
The Chinese University of Hong Kong
Hong Kong, China

Sharon Y.Y. LOW
Department of Neurosurgery
National Neuroscience Institute
Singapore

Kwun Lin MAN
Department of Neurosurgery
Queen Elizabeth Hospital
Hong Kong, China

Ying MAO
Department of Neurosurgery
Huashan Hospital, Fudan University
Shanghai, China

Ken MASAMUNE
Institute of Advanced Biomedical Engineering and Science
Tokyo Women's Medical University
Tokyo, Japan

Nassir NAVAB
School of Computation, Information and Technology
Technical University of Munich
Munich, Germany

Venus Y.H. TANG
Department of Neurosurgery &
Department of Clinical Psychology
Prince of Wales Hospital
Hong Kong, China

Patrick C.M. WONG
Brain and Mind Institute
The Chinese University of Hong Kong
Hong Kong, China

Peter Y.M. WOO
Division of Neurosurgery, Department of Surgery
The Chinese University of Hong Kong, &
Department of Neurosurgery, Prince of Wales Hospital
Hong Kong, China

Vincent C.T. MOK
Department of Medicine and Therapeutics
The Chinese University of Hong Kong
Hong Kong, China

Stephen J. PRICE
Department of Clinical Neuroscience
University of Cambridge
Cambridge, UK

Kay Cheong TEO
Department of Medicine
LKS Faculty of Medicine
University of Hong Kong
Hong Kong, China

Like W.M. WONG
Department of Neurosurgery
Prince of Wales Hospital
Hong Kong, China

Jinsong WU
Department of Neurosurgery
Huashan Hospital, Fudan University
Shanghai, China

VENUE FLOOR PLAN

Postgraduate Education Centre
Prince of Wales Hospital, Shatin, Hong Kong, Shatin, N.T., Hong Kong

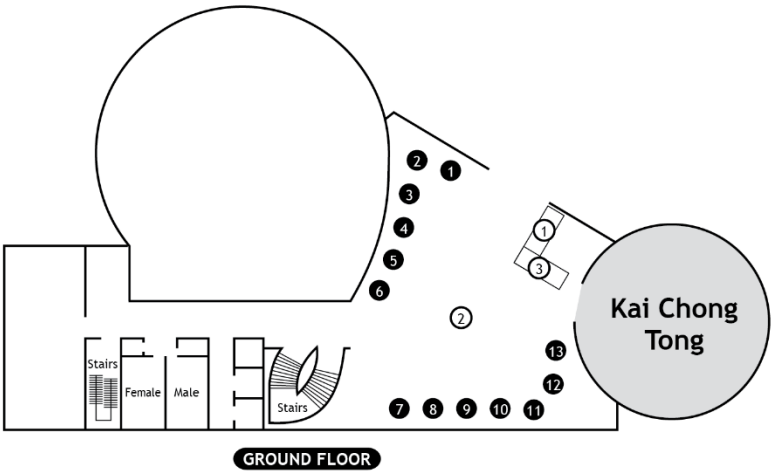
Ground Floor

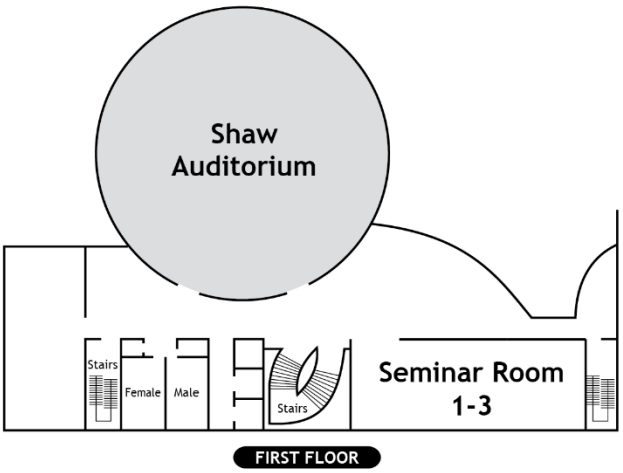
① Registration Area

② Exhibition Area

1. Boehringer Ingelheim (Hong Kong) Ltd.
2. Greyon Healthcare Co. Ltd.
3. Elite Medical Techonology Limited
4. Stryker China Limited
5. Nutricia Clinical (Hong Kong) Limited
6. Kerry Medical Limited
7. Baxter Healthcare Ltd.
8. DCH Auriga Hong Kong Limited
9. Eisai (HK) Co. Ltd
10. Zai Lab (Hong Kong) Limited
11. Brainlab Limited
12. Medtronic Hong Kong Medical Limited
13. Prism Technologies Limited

③ Sign up for CME / CNE / CPD





All communicated times in the Scientific Programme are Hong Kong Time. Hong Kong is 8 hours ahead of Greenwich Mean Time (i.e. GMT+8 hours).

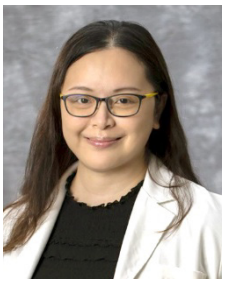
<table>
<tr><th>Time</th><th colspan="2">17 January (Friday)</th><th>18 January (Saturday)</th></tr>
<tr><td>0830-0900</td><td colspan="2">Registration</td><td>Registration</td></tr>
<tr><td>0900-0930</td><td colspan="2" rowspan="3">HKSAN Symposium –
Paediatric Neuro-oncology</td><td rowspan="3">Nursing Session –
Intra-operative Neuromonitoring</td></tr>
<tr><td>0930-1000</td></tr>
<tr><td>1000-1030</td></tr>
<tr><td>1030-1100</td><td colspan="2">Break & Exhibition</td><td>Break & Exhibition</td></tr>
<tr><td>1100-1130</td><td colspan="2">Opening Address</td><td rowspan="5">Artificial Intelligence & Smart Theatre</td></tr>
<tr><td>1130-1200</td><td colspan="2" rowspan="4">Language Brain Mapping</td></tr>
<tr><td>1200-1230</td></tr>
<tr><td>1230-1300</td></tr>
<tr><td>1300-1330</td><td colspan="2" rowspan="2">Lunch & Exhibition</td></tr>
<tr><td>1330-1400</td><td rowspan="2">Lunch & Exhibition</td></tr>
<tr><td>1400-1430</td><td rowspan="3">Neuroimaging</td><td rowspan="2">Brain Tumour</td></tr>
<tr><td>1430-1500</td><td rowspan="2">Mr POON Yee Wo Visiting Professorial Lecture in Neurosurgery</td></tr>
<tr><td>1500-1530</td><td rowspan="2"></td></tr>
<tr><td>1530-1600</td><td colspan="2">Break & Exhibition</td></tr>
<tr><td>1600-1630</td><td colspan="2" rowspan="3">Dementia & Alzheimer’s Disease</td><td>Free Paper Presentation</td></tr>
<tr><td>1630-1700</td><td>Closing Remarks</td></tr>
<tr><td>1700-1730</td><td rowspan="2"></td></tr>
<tr><td>1730-1800</td><td colspan="2"></td></tr>
<tr><td></td><td colspan="2"></td><td></td></tr>
</table>

Session 1 : HKSAN Symposium – Paediatric Neuro-oncology		**Kai Chong Tong, G/F**
Chairpersons : Hayden C.H. CHOY & Daniel X. ZHENG		
09:00 – 09:05	Welcome Address	
09:05 – 09:30	Paediatric Oncology – A Surgical Perspective	Emily K.Y. CHAN
09:30 - 09:55	Paediatric Brain Tumours: A Delicate Balance of Science, Art and Compassion	Dennis T.L. KU
09:55 – 10:20	Keeping Paediatric Neuro-oncology Updated and Relevant: Challenges Faced from an Island City-state	Sharon Y.Y. LOW
10:20 - 10:30	Conclusion	
10:30 - 11:00	*Break & Exhibition*	
Session 2 : Language Brain Mapping		**Kai Chong Tong, G/F**
Chairpersons : Danny T.M. CHAN & Joyce S.W. CHOW		
11:00 - 11:05	Opening Address by the Organising Committee	
11:05 - 11:25	Neural Basis of Language Learning	Patrick C.M. WONG
11:25 - 11:45	Beyond Conventional Brain Mapping – State of The Art	Peter Y.M. WOO
11:45 - 12:05	The Art and Science of Awake Brain Mapping: A Neuropsychological Perspective	Venus Y.H. TANG
12:05 - 12:35	Speech Output Centres for English and Chinese Following Direct Electrical Stimulation in Awake Surgery	Jinsong WU
12:35 - 13:05	Rehabilitation for Brain Tumours	Steven J. PRICE
13:05 - 14:00	*Group Photo, Lunch & Exhibition*	
Session 3A : Neuroimaging		**Kai Chong Tong, G/F**
Chairperson : Thomas W.H. LEUNG & Bonaventure Y.M. IP		
14:00 - 14:30	Imaging on Neuroimmunological Diseases	Joseph C.H. CHOI
14:30 - 15:00	Neuroimaging on Stroke	Cindy X. LENG
15:00 - 15:30	Neuroimaging on intracerebral Hemorrhage	Kay Cheong TEO
15:30 - 16:00	*Break & Exhibition*	

Session 3B : Brain Tumours		**Seminar Room 1-3, 1/F**
Chairpersons : Tak Lap POON & Sui To WONG		
14:00 - 14:30	Precision Surgery for Glioblastomas - Improving Outcomes	Steven J. PRICE
14:30 - 15:00	Molecular Stratification of Adult Diffuse Gliomas Based on Multi-omics Study	Ying MAO
15:00 - 16:00	*Break & Exhibition*	
Session 4 : Dementia & Alzheimer's Disease		**Kai Chong Tong, G/F**
Chairpersons : Owen H. KO & Vincent C.T. MOK		
16:00 - 16:30	Advancement in Prevention and Treatment in Dementia	Vincent C.T. MOK
16:30 - 17:00	AI Model for Alzheimer's Diseases Detection	Carol Y.L CHEUNG
17:00 – 17:30	Early Detection of Alzheimer's Disease Using Fluid Biomarkers and Neuroimaging	Tengfei GUO

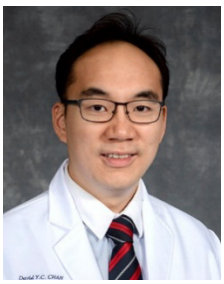
Session 5 : Nursing Session – Intraoperative Neuro-monitoring		**Seminar Room 1-3, 1/F**
Chairpersons : Priscila M.P. CHOI & Michael W.Y. LEE		
09:00 – 09:20	Neuro-Spine -Sharing by NS Nurse-led Intraoperative Neurophysiological Monitoring (IONM) Team	Like W.M. WONG
09:20 - 09:40	Nurse-led Intraoperative Neurophysiological Monitoring Service in Clusters Neurosurgical Centers of Hospital Authority Hong Kong	Kwun Lin MAN
09:40 – 10:00	NS Spine IOM: Sharing on Pearls & Pitfalls	David Y.C. CHAN
10:00 - 10:30	Optimizing the SEEG Clinical Workflow Perspective	Michal HOLUB
10:30 - 11:00	*Break & Exhibition*	
Session 6 : Artificial Intelligence & Smart Theatre (Sponsored by Agilis Robotics Limited) **Room 1-3, 1/F**		**Seminar**
Chairpersons : Danny T.M. CHAN & Hongbin LIU		
11:00 - 11:20	Big Data and Machine Learning in The Diagnosis or Prediction of Patients at Risk of Suffering from Neurological Diseases	David C.C. LAM
11:20 - 11:40	Intelligent Assistive Medical Robots	Zheng LI
11:40 - 12:00	How Would Robots Improve MRI-guided Stereotactic Neurosurgery?	Ka Wai KWOK
12:00 - 12:25	Holistic OR Domain Modelling for AI, AR and Robotic Assisted Precision Surgery	Nassir NAVAB
12:25 - 12:50	Technology Driven Operation Theatre Development - A Nexus of Innovative Therapies	Ken MASAMUNE
12:50 - 13:15	Robots in the Field of Ophthalmology	Koorosh FARIDPOOYA
13:15 - 13:30	Discussion	
13:30 - 14:30	*Group Photo, Lunch & Exhibition*	
Mr POON Yee Wo Visiting Professorial Lecture in Neurosurgery **Auditorium, 1/F**		**Shaw**
14:30 - 15:30	Deciphering the Mechanisms of Immune Evasion and Charting the Path to Immune Revitalization in Malignant Brain Tumors	Ying MAO

Session 7 : Free Paper Presentation		**Seminar Room 1-3, 1/F**
Chairpersons : Danny T.M. CHAN & Wai S. POON		
15:30 - 15:40	Activation of Sirtuin 3 Protects Hippocampal Neurons against Transient Forebrain Ischemic Damage Reducing Oxidative and Inflammatory Responses	In Koo HWANG
15:40 - 15:50	Monitoring Drug Efficacy through Multi-Omics Research Initiative in Alzheimer's Disease (MEMORIAD): A Protocol for a Multisite Exploratory Prospective Cohort Study on the Drug Response-related Clinical, Genetic, Microbial and Metabolomic Signatures in Filipino Patients with Alzheimer's Disease	John Carlo B. REYES
15:50 - 16:00	Rea-time Prediction of Intracranial Hypertension Events in Traumatic Brain Injury Patient Using Ensemble Deep Learning Models	Tianchen LUO
16:00 - 16:10	TGFB1 Induced TET3 Dependent Regulation of *OTX2* Super Enhancer Hypomethylation Promotes Group3 Medulloblastoma Progression	Xuen CHEN
16:10 - 16:20	Pipeline for Measuring Residual Tumour Volume in Patients with Glioblastoma Based on a Diffusion Tensor Tissue Signature	Queenie H.W. WONG
16:20 - 16:30	Assessment of Multiple Sclerosis (MS) Lesion Activity with T1rho Magnetic Resonance Imaging	Tiffany Y. SO
16:30 - 16:40	**Closing Remarks**	



Emily K.Y. CHAN

Emily is a 2008 Medical Graduate and acquired a Master degree in Neuroscience in 2014 from The Chinese University of Hong Kong (CUHK). She was qualified as a specialist neurosurgeon in 2016. She subspecialises in Paediatric Neurosurgery and Epilepsy. Current, Emily is a Consultant Neurosurgeon serving Prince of Wales Hospital and she is also a Clinical
Assistant Professor (Honorary) at Department of Surgery, CUHK.



David Y.C. CHAN

David is currently an Assistant Professor at The Chinese University of Hong Kong. He obtained his medical degree from The University of Hong Kong in 2010 after completing his overseas elective training at the University of Cambridge Addenbrooke's Hospital, and St Thomas' Hospital, King's College London.

During his Neurosurgery Fellowship training, David was awarded the Best Research Award for two consecutive years from the College of Surgeons of Hong Kong (CSHK) in 2016 and 2017. He completed the training in 2018 with a Distinction in his Higher Surgical Training Research Project and was awarded the Best Original Paper Award in 2019 from CSHK.

David is active in both research and teaching. His research interests are endoscopic surgery and minimally invasive surgical techniques in Neurosurgery, head and spine injury.

Carol Y.L. CHEUNG

Dr Cheung's main research interest is "imaging of the eye", based on the concept that the eyes are the "window" to the human circulation and nervous systems. She has been working in the field of ocular imaging for more than 15 years in Hong Kong and in Singapore, focus on development and application of image analysis techniques and artificial intelligence for studying diabetic retinal disease, glaucoma and Alzheimer's disease. She is now focused on translating her artificial intelligence-related research from "concept" to "implementation", with an aim to enhance eye disease screening in primary care, and eye disease triaging in tertiary clinics, for timely eye disease management and treatment. This will bring significant societal impact by improving quality and efficiency of the clinical service in Hong Kong and beyond the region. Dr Cheung has authored more than 250 original research articles, 9 commentary or editorial articles and 27 review articles in SCI international indexed peer reviewed journals, and 14 book chapters. She has published several landmark papers on development of AI-based technologies in ocular imaging for detection of multiple eye diseases, and quantitative analysis for assessing diabetic microvascular diseases from optical coherence tomography angiography, with an H-index of 55 and citations >10,200 (Scopus, Jan 2022).

Joseph C.H. CHOI

Joseph graduated from The Chinese University of Hong Kong in 2016 and completed his Neurology and Advanced Internal Medicine speciaty training in 2024. He has extensive research experience in multiple sclerosis, serving as a Principal Investigator and Sub-Investigator in several Phase III clinical trials and projects, including the Hong Kong Multiple Sclerosis Registry. His work has been published in peer-reviewed journals, focusing on neurology and neuroimmunology.

Koorosh FARIDPOOYA

Dr Faridpooya is a distinguished ophthalmologist specializing in vitreoretinal surgery. He serves as the Senior Vitreoretinal Consultant and Head of the Vitreoretinal Department at The Rotterdam Eye Hospital. With over a decade of expertise, his innovative work in robotic vitreoretinal surgery has set global benchmarks, including the first world robotic-assisted retinal procedure.

Dr Faridpooya's research encompasses robotic surgery, endophthalmitis, and retinal disease management. He actively leads groundbreaking studies, including developing advanced surgical robots for gene therapy and virtual reality training tools. A prolific researcher, he has authored numerous peer-reviewed publications and is a sought-after speaker at international conferences.

Tengfei GUO

Dr Guo is a Distinguished Researcher at the Institute of Biomedical Engineering, Shenzhen Bay Laboratory. His research team is committed to investigating the pathological features and evolutionary mechanisms of Alzheimer's disease and to developing novel early-stage diagnostic and therapeutic technologies for AD. He also serves as a reviewer for several international journals and has received multiple honors and awards.

Michal HOLUB

Michal is a biomedical engineer with nearly 30 years of experience in neurodiagnostic product development, including EEG, EMG, and intraoperative neuromonitoring (IONM). He is currently Vice President of Product Architecture & International Sales at Cadwell Laboratories.

Michal oversees international sales and product architecture, leveraging his extensive background in medical devices and biomedical engineering. His expertise continues to drive advancements in neurophysiology and electrodiagnostic technologies globally.

Dennis T.L. KU

Dennis completed his medical education at The University of Hong Kong and completed his paediatrics training at Tuen Mun Hospital, where he developed an interest in paediatric haematology and oncology. He further trained in neuro-oncology at The Hospital for Sick Children (Toronto SickKids) in 2014–2015, focusing on clinical and research fellowships. Since 2022, he has been the first Fellow in the subspecialty of Paediatric Haematology & Oncology (PHO).

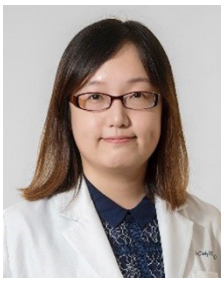
Ka Wai KWOK

Currently, **Ka-Wai** is a Professor at Department of Automation and Computer-aided Engineering, CUHK. Before then, he served as faculty for Department of Mechanical Engineering, The University of Hong Kong (HKU), in 2014-2024. His research interests focus on surgical robotics, intra-operative image processing, and their uses of control and intelligent systems. He has participated in various designs of robotic devices/interfaces for endoscopy, and MRI-guided interventions. To date, he has co-authored >165 peer-reviewed articles with >80 clinical fellows and >160 scientists/engineers. His multidisciplinary work has been recognized with various (>10) awards in international conferences/journals, e.g. the largest flagship conferences of robotics, ICRA and IROS. He was the recipient of ICRA Best Conference Paper Award in 2018, and IROS Toshio Fukuda Young Professional Award in 2020. He also obtained awards in his early career for robotics, e.g. the Early Career Awards 2015/16 offered by Research Grants Council (RGC) of Hong Kong, Actuators 2020 Young Investigator Award, HKU 2019-2020 Outstanding Young Researcher Award, HKU Young Innovator Award 2020 and HKU Research Output Prize 2021-22.

Ka-Wai is the principal investigator of group for Interventional Robotic and Imaging Systems (IRIS), which has (>5) inventions licensed/transferred from university to industry in support for their commercialization. He is also a co-founder and director of Agilis Robotics Limited aiming at advancing the interventional endoscopy with small, flexible robotic instruments and their intelligent control systems.

David C.C. LAM

Professor Lam is a professor at the Hong Kong University of Science and Technology (HKUST). Prof. Lam's contributions include blood-based AI risk scores for predicting strokes, heart attacks, and cancers, a smart wound healing patch for diabetes, and the therapeutic wearable for dry eyes, glaucoma, and macular degeneration. He co-developed the RF thrombectomy device with Professor John Kwok. His work has advanced early diagnosis of non-communicable diseases, preventive care in primary medicine, and patient outcomes.



Cindy X LENG

Dr Leng's research focuses on stroke and intracranial atherosclerotic disease (ICAD). In the past few years, Dr. Leng has been utilizing multimodal neuroimaging and computational methods to study cerebral hemodynamics and plaque characteristics in ICAD and its clinical implications, using a cross-disciplinary approach. She also works on the efficacy and safety of medical and interventional treatment regimens in ischemic stroke, and investigates mechanisms of collateral circulation recruitment and its prognostic values in stroke patients. In these research areas, she has close collaboration with University of Oxford, University of California Los Angeles, Shenzhen Institutes of Advanced Technology of the Chinese Academy of Sciences, and Beijing Tiantan Hospital of Capital Medical University.

Dr Leng has been funded by the Research Grants Council of Hong Kong, Health and Medical Research Fund, the National Natural Science Foundation of China, China Association for Science and Technology, and the Lee Hysan Foundation. Since 2013, Dr Leng has published more than 60 peer-reviewed articles in international academic journals, including Circulation, Ann Neurol, Neurology, J Neurol Neurosurg Psychiatry, Stroke, etc.

Zheng LI

Zheng received his B.S and M.S degrees in Mechanical Engineering from Beihang University, China, and his Ph.D. degree in Mechanical and Automation Engineering from The Chinese University of Hong Kong, Hong Kong SAR. After that, he joined the National University of Singapore as a research fellow. Currently, he is an Associate Professor in the Department of Surgery, Multi-scale Medical Robotics Centre, Chow Yuk Ho Technology Centre for Innovative Medicine, and Li Ka Shing Institute of Health Sciences, The Chinese University of Hong Kong. His research mainly focuses on the area of intelligent bio-inspired medical robots, including flexible surgical robots, magnetically actuated medical robots, and soft medical robots/devices.

Zheng is a senior member of IEEE, and a member of ASME, RAS, and EMBS. In the past years, he served as topic editor of Frontiers of Robotics & AI, IEEE BioRob, and associate editor of TMRB, RA-L, ICRA, IROS, RoboSoft, BioRob, etc. In addition, he is a committee member of several conferences, such as Robio, ICIA, and CCECE, and a reviewer of journals, including Advanced Sciences, Science Advances, IEEE TRO, SORO, IJRR, IEEE/ASME T-MECH, Cybernetics, TIE, Bioinspiration & Biomimetics, etc. Zheng is the author of one book, three book chapters, over 160 peer-reviewed journal/conference papers, and several patents/copyrights with three have been licensed. He received the gold of International Exhibition of Inventions Geneva, gold of Emedic Global 2019, 2024 i-CREATe & WRRC Best Conference Paper Award, IEEE Robio 2022 Best Paper in Robotics, IEEE CCECE 2015 Conference Paper Award, Best Paper Finalist of IEEE Robio 2012, and Best Poster Finalist of IEEE ICRA 2017, etc.

Sharon Y.Y. LOW

Sharon is the current Head of the Neurosurgical Service at the KK Women's and Children's Hospital. She completed her Advanced Surgical Training (Neurosurgery) at the National Neuroscience Institute (Singapore). In 2015, she obtained her research PhD at the National University of Singapore (NUS) and her specialty FRCS (Surgical Neurology) exams. In her pursuit of holistic care for patients, she undertook the Graduate Diploma of Palliative Medicine (GDPM) in 2020.

At present, Sharon is an Assistant Professor at the Duke-NUS School of Medicine and is one of the Principal Investigators of the VIVA-KKH Paediatric Brain and Solid Tumours Laboratory. She strongly believes that the best approach to managing patients requires good neurosurgical techniques and in-depth understanding of each condition. Her ethos is that lives of patients can only be objectively improved through evidence-based medicine. Her main research interest is in paediatric neuro-oncology, with a focus on difficult childhood brain tumours that are refractory to treatment.

To date, Sharon has contributed more than 70 peer-reviewed clinical and scientific publications and continues to do so as part of her commitment to academic medicine. In addition, she has won several awards in health services, research, and clinical contributions at institutional and national levels.

Kwun Lin MAN

Kwun Lin is currently nurse consultant at Department of Neurosurgery in Queen Elizabeth Hospital. She obtained Diploma in Intensive Care Nursing from The university of Hong Kong in 2000, Master of Science in Epidemiology and Biostatistics in 2006 followed by Master of Science in Stroke and Clinical Neuroscience in 2009 from The Chinese University of Hong Kong. She was awarded Excellence Vocational Services Award by Rotary Club of Kowloon Golden Mile in 2011 and Outstanding Staff of 2012.

Kwun Lin serves key positions at Nurse Chapter of the Hong Kong Neurosurgical Society and the Specialty Board of the Hong Kong College of Surgical Nursing. She has been invited as Asian Congress of Neurological Nurses (ACNN) board member since Dec 2023. She was awarded the best oral paper presentation by the Hong Kong Neurosurgical Society in 2007. She continuously cultivates team mates in study and presenting papers in annual scientific meeting. Her team got support from hospital to establish the first Integrated Model of Specialist Outpatient Service through Neurosurgical Nurse Clinic in Hong Kong in 2021.

Ying MAO

Ying MAO
Dean, Huashan Hospital, Fudan University

Professor Mao is a leading Neurosurgeon, Researcher, and Academician at Fudan University with over 30 years of experience in the treatment of brain diseases, such as brain tumour, cerebral vascular diseases and neural disorders. He pioneered the concept of "pan-functional neurosurgery" and has developed numerous innovative methods in this field. During the past decade, he has published over 200 articles in top journals such as The New England Journal of Medicine, Cancer Cell, Nature Biomedical Engineering, and Annals of Neurology. His academic work has earned him three National Science and Technology Progress awards and recognition in the "Top Ten Achievements of Reform and Opening Up in Shanghai."

Currently, Professor Mao is the serving Dean of Huashan Hospital, Director of National Center for Neurological Disorders, Fudan University, and Chairman of The Chinese Neurosurgical Society. He was highly praised as "the weather vane for the development of neurosurgery worldwide" by Anil Nanda, the foundation Editor-in-Chief of the World Federation of Neurosurgical Societies (WFNS) Journal.

Ken MASAMUNE

Professor Masamune is a leading expert in computer-aided surgery and medical robotics. Currently a Professor at the Institute of Advanced Biomedical Engineering and Science at Tokyo Women's Medical University, he has been at the forefront of integrating advanced technologies into surgical workflows. His pioneering contributions include the development of the Smart Cyber Operating Theater (SCOT) and groundbreaking work in minimally invasive surgery.

Professor Masamune has received numerous accolades, such as the Japan Open Innovation Award and the Japan Society of Mechanical Engineers Award. His research spans medical systems, human interfaces, and precision engineering, with a strong focus on enhancing surgical precision and patient outcomes

Vincent C.T. MOK

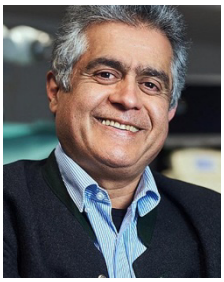
Professor Vincent C.T. MOK
Endowed Mok Hing Yiu Professor of Medicine, The Chinese University of Hong Kong

Professor Mok's research aims to understand mechanisms of dementia and to investigate strategies that may help to prevent dementia. He is the first to report the association of cerebral small vessel disease (CSVD) and cognitive impairment in Asia and the first to report the community prevalence of CSVD among Asians (Chinese). Such findings have significantly increased the awareness that strategies targeting CSVD can help to prevent dementia in this region, where the burden of dementia is particularly huge. Professor Mok conducted one of the largest single-centre studies investigating the prevalence and mechanisms of early and delayed cognitive decline in the context of stroke and found that concurrent presence of amyloid plaques as detected by in-vivo amyloid PET imaging and CSVD are important factors associated with early and delayed cognitive decline after stroke, respectively. Such findings provide a road map of how to prevent vascular cognitive impairment. Professor Mok, along with Dr Adrian Wong (Clinical Psychologist) validated the Hong Kong-Montreal Cognitive Assessment (HK-MoCA) and developed norms for HK-MoCA performance according to age and education. HK-MoCA is currently the commonest brief cognitive assessment used for the assessment of cognitive function and the detection of mild cognitive impairment in Hong Kong.

Professor Mok has been involved in the validation and clinical application of a novel artificial intelligence (AI) derived MRI-based Index, which was developed by a spin-off company of The Chinese University of Hong Kong (CUHK), for the detection of early Alzheimer's disease. He has also been involved in developing and validating an AI derived retinal imaging analysis for the detection of Alzheimer's disease. Moreover, he also specializes in Parkinson's disease and was one of the pioneers of developing Deep Brain Stimulation programme in Asia for the treatment of Parkinson's disease.

Professor Mok received the Higher Education Outstanding Scientific Research Output Award (Science & Technology) in Natural Sciences (1st Class) from the Ministry of Education, People's Republic of China in 2011 for his research in cerebrovascular disease, Outstanding Fellow Award from the Faculty of Medicine of CUHK for his exceptional academic leadership in areas of research, education and service in 2016, Endowment as Mok Hing Yiu Professor of Medicine by CUHK in 2017, the Excellent Research Award and the 10th Health and Medical Research Fund Anniversary Award by the Food and Health Bureau of the Hong Kong Special Administrative Region (HKSAR) for his research in vascular cognitive impairment in 2017 and 2021, respectively. He was conferred the Chief Executive's Commendation for Community Service by the Government of the HKSAR in 2022 for his contribution in combating COVID-19 pandemic.

Professor Mok has authored more than 400 publications in peer-reviewed international journals (with book chapters), with publications at Lancet, JAMA, Lancet Neurology, Nature Reviews Neurology, Alzheimer's & Dementia, JAMA Neurology, JAMA Psychiatry, Journal of Neurology, Neurosurgery and Psychiatry (JNNP), Annals of Neurology, Neurology and Stroke.



Nassir NAVAB

Nassir NAVAB
Chair of Computer Aided Medical Procedures & Augmented Reality
Technical University of Munich, Germany

Professor Navab is a renowned figure in the field of computer-aided medical procedures and augmented reality. He holds the position of Chair at the Technical University of Munich (TUM) and is also affiliated with Johns Hopkins University. He has made groundbreaking contributions to medical imaging, augmented reality, and computer vision, with his research bridging clinical and technological advancements.

Professor Navab has received numerous awards, including the MICCAI Enduring Impact Award and the IEEE Technical Achievement Award, for his exceptional contributions to medical image analysis and augmented reality. His research focuses on the integration of computer vision technologies in surgical workflows and the development of innovative tools for enhanced medical diagnostics.

A prolific author and leader, Prof. Navab continues to drive innovations in medical technology, advancing the collaboration between clinical practice and computational science.

Steven J PRICE

Stephen J. PRICE
Professor of Neurosurgical Oncology, University of Cambridge

Stephen is the Professor of Neurosurgical Oncology and Honorary Consultant Neurosurgeon in Cambridge. He is the surgical lead for neuro-oncology and has a clinical interest in surgical oncology for gliomas, awake craniotomy and brain mapping, fluorescence guided surgery and patient reported outcomes.

Stephen's research interest is in using advanced MRI and PET imaging to understand pathological changes in the tumour and surrounding brain, as well as cognitive outcomes in brain tumour patients. His Precision Surgery programme aims to develop individualised surgical treatment volumes for patients to maximise the amout of tumour we remove and minimise morbidity. He is the Co-Director of the CRUK-Minderoo Brain Cancer Virtual Institute and the Director of the Cambridge Brain Tumour Imaging Laboratory. He is the chief investigator for the PRaM-GBM study (prediciting sites of tumour progression in newly diagnosed glioblastomas) and SCARF-BT – a rehabilitation feasibility trial for emotional recognition in brain tumour patients. He has a strong interest in training and is a member of the Neurosurgery Specialist Advisory Committee for training and is the past Chair of the European Association of Neuro-oncology (EANO) Education Committee.

Venus Y.H. TANG

Venus is a Clinical Psychologist specialising in neuropsychology at the Department of Neurosurgery and Department of Clinical Psychology, Prince of Wales Hospital, Hong Kong. She graduated from the University of Hong Kong (HKU) and thereafter received her Master Degree in Clinical Psychology and Doctor of Philosophy in the Faculty of Medicine from The Chinese University of Hong Kong (CUHK). She was a visiting scholar in the Department of Neurology, David Geffen School of Medicine in the University of California, Los Angeles (UCLA). Her clinical and research interest has been on clinical neuropsychology and her studies are published in international top-ranking journals, e.g. Neurology. She serves as Adjunct Assistant Professor in HKU and CUHK. She is an Associate Fellow of the Hong Kong Psychological Society, the Division of Clinical Psychology and an Associate Member of the American Psychological Association.

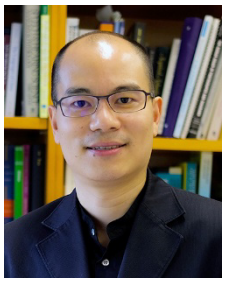
Kay Cheong TEO

Kay graduated from The University of Hong Kong in 2009 and completed his Neurology and Advanced Internal Medicine specialty training at Queen Mary Hospital. He joined the Department of Medicine at the University of Hong Kong as a Clinical Assistant Professor in December 2023.

Kay's clinical expertise is in stroke and neurocritical care. He contributed significantly to the development of these fields in Hong Kong where his team pioneered prehospital stroke notification and the use of continuous quantitative electroencephalogram locally. He also received certification in Neurosonology from the American Society of Neuroimaging in 2019.

Kay's key research area includes stroke, intracerebral hemorrhage, and post-stroke blood pressure management. He has been the principal investigator of the HKU Intracerebral Hemorrhage cohort since 2013 and is currently the deputy director of the HKU Stroke Research and Prevention Group (HKU Stroke). Prof Teo had conducted clinical research in intracerebral hemorrhage as a visiting researcher at the Rosand Lab, Havard Medical School, in 2019. He has multiple publications relating to stroke and intracerebral hemorrhage, including in Stroke and the Journal of the American Heart Association.

Kay has been rewarded the Paul Dudley White International Scholar Award (2020), the Hong Kong West Cluster Outstanding Team Award for Comprehensive Acute Stroke Service, and the Best Free Paper Award at the Asia Pacific Stroke Conference (2023). Currently, he is focusing research on novel acute therapies for stroke, artificial intelligence-driven prognostication in intracerebral hemorrhage, and strategies to optimize cardiac and cerebrovascular outcomes after stroke, especially in telemedicine.



Patrick C.M. WONG

Patrick C.M. WONG
Stanley Ho Professor of Cognitive Neuroscience, The Chinese University of Hong Kong

Patrick is Professor of Linguistics and Cognitive Neuroscience and Founding Director of the Brain and Mind Institute at The Chinese University of Hong Kong (CUHK). Before moving to Hong Kong, he served on the faculty of Northwestern University for close to a decade. His research covers a wide range of basic and translational issues concerning the neural basis and disorders of language and music. Findings from this research have appeared in a broad array of interdisciplinary scholarly venues such as Nature Neuroscience, PNAS, and Science Advances. In 2021, he was named a Guggenheim Fellow for Humanities.

Patrick's research has received public attention from media outlets such as The New York Times and the British Broadcasting Corporation/Public Radio International. A versatile and effective teacher, research mentor, and clinical educator, Wong is a four-time recipient of the Faculty Outstanding Teaching Award at CUHK. He actively seeks to translate his research into clinical and educational solutions. One of his patented inventions, Precision Listening®, was awarded the Gold Medal with Congratulations of the Jury at the 2023 International Exhibition of Inventions Geneva. Wong has been Associate Vice-President (Research) at CUHK since 2023.

Like W.M. WONG

Like is currently the Nurse Consultant in Department of Neurosurgery, Prince of Wales Hospital/New Territories East Cluster since 2013. She joined the Division of Neurosurgery, Prince of Wales Hospital as Registered Nurse in 1994; and became the Advanced Practice Nurse from 2008-2013. Like is the holder of MSc Stroke & Clinical Neuroscience (2008) and MSc Health Services Management in 2011. She is the visiting lecturer in different nursing specialty course and honourable speaker of master program. She is devoted herself in High Dependency Care and Neuro-critical Care, and its running in the clinical neuroscience setting. Her main areas of clinical interest are intraoperative neurophysiological monitoring and Neuro-critical care.

Peter Y.M. WOO

Peter completed his undergraduate medical education in 2004 at the University of Hong Kong and completed his neurosurgery residency training in 2012. Thereafter he received his Master in Medical Science degree from the University of Hong Kong. He is currently serving as a consultant at Prince of Wales Hospital, Hospital Authority (HA), Hong Kong. In 2020, he was awarded the HA Young Achiever of the Year.

Peter's clinical interests are in surgical neuro-oncology especially with regard to high-grade gliomas. As an Esther Wu Memorial Fund and GB Ong Travelling Grant recipient, he embarked on a visiting scholarship at the University of California San Francisco's Department of Neurosurgery under the leadership of Professor Mitchel Berger. He is currently the Honorary Secretary of the College of Surgeons of Hong Kong (CSHK), Treasurer and immediate-past President of the Hong Kong Neuro-oncology Society, Executive Board Member of the Asian Society for Neuro-oncology, Chairman of the Neuro-oncology Subcommittee of the Hong Kong Hospital Authority Coordinating Committee for Neurosurgery and Convener of the Hong Kong Brain Tumor Patient Support Group. Peter is actively involved in neurosurgical training as an elected Member and Honorary Secretary of the Neurosurgery Specialty Board, CSHK and as Honorary Clinical Associate Professor at The Chinese University of Hong Kong.

Jinsong WU

Jinsong is currently Professor and Vice-Chair (Research) in Department of Neurosurgery of Huashan Hospital, Fudan University in Shanghai. He also serves as Deputy Director of the Neurosurgical Institute of Fudan University and Head of Glioma Division of the National Center of Neurological Disorders.

Jinsong is a medical graduate and PhD graduate of the Medical College of Fudan University. He did his overseas training in Neuro-oncology at Mayo Clinic in 2010. He has been doing impactful work on glioma surgery, awake surgery and its intraoperative monitoring. His researches are all clinically relevant, funded by National Key Technology R&D Program of China, the National Natural Science Foundation of China and the Shanghai Science and Technology Committee. Professor Wu is also the recipient of many awards, prizes and gold medals, for example from the National Science and Technology Advance Award (second-class), Ministry of Education's Science & Technology Development/Achievement (first-class) in 2013 and 2014, the 2013 Journal of Neuro-oncology Award granted by the American Association of Neurological Surgeons (AANS).

Jinsong is the Vice-Chair of the Chinese Society of Neuro-oncology (CSNO), Chinese Anti-cancer Association, and Chair of the Scientific Committee of the Asian Society of Neuro-oncology (ASNO). He is the first neurosurgeon successfully conquered a Himalaya summit, Mount Everest, Earth's highest mountain above sea level (>8,000 metres).

MR POON YEE WO
VISITING PROFESSORIAL LECTURE IN NEUROSURGERY

Deciphering the Mechanisms of Immune Evasion and Charting the Path to Immune Revitalization in Malignant Brain Tumors

Ying MAO

Dean of Huashan Hospital
Director of National Center for Neurological Disorders
Fudan University, Shanghai, China

All Are Welcome

Date : 18 January 2025 (Saturday)
Time : 13:30 – 14:30
Venue : Shaw Auditorium
1F, Postgraduate Education Centre
Prince of Wales Hospital
Shatin, Hong Kong

Deciphering the Mechanisms of Immune Evasion and Charting the Path to Immune Revitalization in Malignant Brain Tumors

Ying MAO
Department of Neurosurgery, Huashan Hospital, Fudan University, Shanghai, China
National Neural Disorders Center, Fudan University, Shanghai, China

Historically, the brain has been regarded as an immunologically privileged sanctuary since the early 20th century. Yet, the emergence of single-cell sequencing and high-resolution imaging has shed new light on the indispensable function of immune cells in the central nervous system's homeostatic balance. Malignant brain tumors, encompassing gliomas and metastases, manifest as either immune-desert or immune-excluded entities, each employing distinct strategies for immune evasion. The understanding of these evasion mechanisms has evolved from the traditional "3E process"—encompassing elimination, equilibrium, and escape—to the more nuanced 3C model, which includes camouflage, coercion, and cytoprotection. Our research focuses on the coercion component of immune evasion, deciphering the intricate ways in which tumors alter immune regulatory ligands. We have uncovered the upregulation mechanisms of B7 family members, and CTLA4 in gliomas and metastases, which are pivotal in this context. Leveraging these insights, we are developing targeted strategies for immune revitalization aimed at enhancing the clinical outcomes for patients afflicted with malignant brain tumors. By dismantling the coercion mechanisms at the heart of immune evasion, we are poised to bolster the immune system's counterattack against these tenacious tumors, thereby holding the promise of improved patient prognoses.

Activation of Sirtuin 3 Protects Hippocampal Neurons against Transient Forebrain Ischemic Damage Reducing Oxidative and Inflammatory Responses

In Koo Hwang[1*], Kyu Ri Hahn[1], Hyun Jung Kwon[2,3], Dae Young Yoo[1], Dae Won Kim[2]

[1]Department of Anatomy and Cell Biology, College of Veterinary Medicine, and Research Institute for Veterinary Science, Seoul National University, Seoul 08826, South Korea
[2]Department of Biochemistry and Molecular Biology, Research Institute of Oral Sciences, College of Dentistry, Gangneung-Wonju National University, Gangneung 25457, South Korea
[3]Department of Biomedical Sciences, and Research Institute for Bioscience and Biotechnology, Hallym University, Chuncheon 24252, South Korea

Background: Sirtuin 3 (SIRT3), a deacetylase and redox enzyme, controls metabolic transitions during mitochondrial respiration and glycolysis. Glycolytic and related enzymes demonstrate neuroprotective effects against ischemic damage, and the administration of exogenous L-lactate significantly increases SIRT3 expression in the hippocampus.

Objective: In the present study, we examined the chronological and spatial changes in SIRT3 expression in the hippocampal CA1 region and investigated the effects of adjudin, an activator of SIRT3, on ischemic damage in the gerbil hippocampal CA1 region.

Methods: The forebrain ischemia was induced by occlusion of both common carotid arteries for 5 min. To elucidate the effects of the SIRT3 activator on ischemic damage, animals were randomly divided into four groups: sham-operated (sham), ischemia-operated vehicle-treated (vehicle), ischemia-operated 15 mg/kg adjudin-treated (Adjudin-15), and ischemia-operated 50 mg/kg adjudin-treated (Adjudin-50). Adjudin was sequentially dissolved in 50 µL DMSO (75 mg/ml), 400 µL PEG300, 50 µL Tween80, and 500 µL ddH_2O. The solutions were mixed during each step to clarify this, and the final solution was diluted to 1:10 in corn oil. Adjudin or vehicle was administered to the gerbils immediately after reperfusion and, thereafter, one a day before sacrifice.

Results: In the sham-operated group, SIRT3 immunoreactivity was mainly observed in neurons, and its immunoreactivity significantly decreased two days after ischemia. To elucidate the relationship between SIRT3 reduction and neuronal death after ischemia/reperfusion, we administered adjudin, a SIRT3 activator, immediately after ischemia and once a day before sacrifice. Adjudin treatment significantly upregulated the expression of SIRT3 in the CA1 region 2 days after ischemia/reperfusion. The administration of adjudin significantly alleviated ischemia-induced locomotor activity one day after ischemia/reperfusion and neuronal damage in the CA1 region four days after ischemia/reperfusion. In addition, adjudin treatment significantly ameliorated the ischemia-induced formation of reactive oxygen species 3 hours after ischemia and mitigated the reduction in glutathione peroxidase expression in the CA1 region 2 days after ischemia. Ischemia-induced activation of microglia and the release of pro-inflammatory cytokines such as interleukin-1β and interleukin-6 were inhibited after treatment with adjudin in the hippocampus.

Conclusion: These results suggest that adjudin upregulates SIRT3 expression in the hippocampus, and the reduction in SIRT3 expression after ischemia/reperfusion may be associated with neuronal damage in the hippocampus. In addition, the activation of SIRT3 has neuroprotective effects against ischemic damage by reducing oxidative damage and inflammatory cascades and upregulating glutathione peroxidase.

Monitoring Drug Efficacy through Multi-Omics Research Initiative in Alzheimer's Disease (MEMORI-AD): A protocol for a Multisite Exploratory Prospective Cohort Study on the Drug Response-related Clinical, Genetic, Microbial and Metabolomic Signatures in Filipino Patients with Alzheimer's Disease

Fresthel Monica M. Climacosa[1,2], Veeda Michelle M. Anlacan[1,3], Francis James A. Gordovez[1,4], **John Carlo B. Reyes**[1,5], Ian Kim B. Tabios[1,6], Rafael Vincent M. Manalo[1], Joana Marie C. Cruz[1], Joannes Luke B. Asis[1], Rozel B. Razal[1], Mark Joseph M. Abaca[1,7], Aira B. Dacasin[1], Ayra Patrice N. Espiritu[1], Nicole Clarence Louise L. Gapaz[1], Melody Hope L. Lee Yu[1]

[1]Multi-Omics Research Program for Health, University of the Philippines Manila College of Medicine, Manila, Metro Manila, Philippines
[2]Department of Medical Microbiology, University of the Philippines Manila College of Public Health, Manila, Metro Manila, Philippines
[3]Center for Memory and Cognition, Division of Adult Neurology, Department of Neurosciences, University of the Philippines-Philippine Genera, Manila, Metro Manila, Philippines
[4]Department of Psychiatry and Behavioral Medicine, University of the Philippines-Philippine General, Manila, Metro Manila, Philippines
[5]Department of Laboratories, University of the Philippines-Philippine General Hospital, Manila, Metro Manila, Philippines
[6]Institute of Biology, University of the Philippines Diliman, Quezon City, Metro Manila, Philippines
[7]Department of Adult Cardiology, Philippine Heart Center, Quezon City, Metro Manila, Philippines

Background and Objective: Dementia is one of the leading causes of disability among older people aged 60 years and above, with majority eventually being diagnosed with Alzheimer's disease (AD). Pharmacological agents approved for dementia include acetylcholinesterase enzyme (AChE) inhibitors like rivastigmine, donepezil and galantamine and the N-methyl-D-aspartate (NMDA) receptor antagonist memantine, prescribed as monotherapy or in combination with each other, depending on the severity of disease. There is currently no available study demonstrating the clinical response to these drugs for AD in the Filipino population. Hence, this protocol aims to characterize the clinical, genetic, microbial and metabolic factors associated with drug responses to donepezil, rivastigmine and/or memantine for AD in a cohort of Filipinos with late-onset AD.

Methods and Analysis: This protocol involves a multisite descriptive study that will use two study designs: (1) a descriptive, cross-sectional study to characterize the clinical profile of Filipino dementia patients with AD and (2) an exploratory prospective cohort study to investigate drug response-related genetic, gut microbiome and metabolome signatures of a subset of the recruited AD patients. At least 153 patients with mild or moderate AD aged 65 years old and above will be recruited regardless of their treatment status. A subset of these patients (n=60) who meet inclusion and exclusion criteria will be included further in the exploratory cohort study. These patients will be grouped according to their baseline medications and will be observed for treatment response in 6 months. The cognitive, functional and behavioral domains of patients and levels of functioning will be measured using different assessment tools. Drug responses of Filipino patients will then be investigated employing multi-omics technology to characterize genetic variations via whole exome sequencing, gut microbiome profile via shotgun metagenomic sequencing and metabolome profile via liquid chromatography with mass spectrometry.

Trial registration number: Philippine Health Research Registry ID PHRR230220-0054116; ClinicalTrials.gov ID NCT05801380.

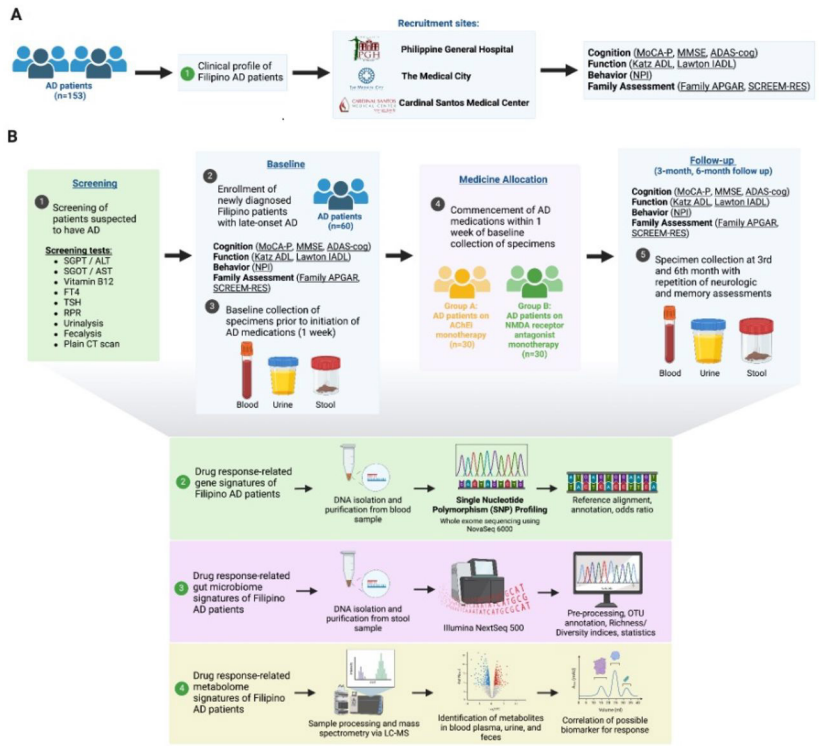


Figure 1. MEMORI-AD workflow. This study will recruit at least 153 patients with dementia aged 65 years old and above. Patients who meet inclusion and exclusion criteria will be enrolled, and their sociodemographic and clinical profiles will be recorded. A subset of recruited AD patients will be followed up for further observation as part of the exploratory prospective cohort to investigate gene, gut microbiome and gut metabolome signatures for treatment response. Patients will be observed from baseline, at 3 month and at 6 month follow-up.

TGFB1 Induced TET3 Dependent Regulation of *OTX2* Super Enhancer Hypomethylation Promotes Group3 Medulloblastoma Progression

Xuan Chen[1,2], Ziwei Wang[2], Dongming Han[1,2], Jiankang Li[2], Tao Jiang[3], Hailong Liu[4]

[1]College of Life Science, University of Chinese Academy of Science, Beijing, China.
[2]BGI Research, Shenzhen, China
[3]Department of Neuro-pathology, Sanbo Brain Hospital, Capital Medical University, Beijing, China
[4]Department of Radiotherapy, Beijing Tiantan Hospital, Capital Medical University, Beijing, China

Background: DNA methylation patterns have been extensively utilized for medulloblastoma (MB) classification. However, the functional implications of enhancer methylation in MB remain poorly understood.

Methods: We conducted bisulfite-based genome-wide sequencing on 189 human MB cases. Upon molecular classification, 80 cases was compared against 8 normal cerebellums, revealing differentially methylated regions (DMRs) . Integration with gene expression data facilitated the identification of DMR target genes, subsequently validated in the 109 cases. Further, leveraging sn-ATACseq, we evaluated the association between DMRs in chromatin accessibility regions and tumorigenesis. Finally, we investigated the impact of upstream epigenetic events involving aberrant methylation on tumor development.

Results: We observed a negative correlation between the methylation levels of DMR overlapping super enhancers (seDMRs) and the expression of targeted genes, particularly in Group_3 MB (G3-MB), the most aggressive subgroup. Genes targeted by hypomethylated seDMRs were significantly enriched in early-stage cerebellum development hallmarks, specifically the rhombic lip subventricular zone (RLSVZ), but not in the late stage. Hypomethylated seDMRs of *OTX2* were associated with elevated chromatin accessibility and oncogenic activation of progenitor-like MB tumor cells, leading to worse prognosis. Integrative epigenetic analysis revealed highly active *OTX2* binding sites within its own hypomethylated seDMRs, indicating feedback auto-regulation. Deletion of motif at this enhancer region reduced *OTX2* expression and attenuated tumor progression. Further, we found that ten-eleven translocation 3 (TET3), a DNA methylation eraser, was recruited by *OTX2* to catalyze active DNA demethylation at binding motifs, thereby organizing chromatin and stimulating gene expression. TET3 was upregulated by TGF-β1/Smad2 signaling. Based on these findings, nanoparticle-coated small interfering RNAs (siRNA) targeting TET3 were designed, effectively suppressing xenograft progression.

Conclusion: Our study highlights the increased transcriptional activity of *OTX2* through cell-type-specific super enhancer demethylation, which is dependent on TGF-β1/Smad-induced TET3. This identifies a potential therapeutic strategy for G3-MB.

Key words: Medulloblastoma, Epigenomics, Tumorigenesis

Real-time Prediction of Intracranial Hypertension Events in Traumatic Brain Injury Patients Using Ensemble Deep Learning Models

Tianchen Luo, Ping Wen
PrimaNova Lab (Shenzhen) Limited

Background: Intracranial pressure (ICP) is a critical indicator for assessing the condition of patients with traumatic brain injuries (TBI). Intracranial hypertension(iHT) can lead to further damage to brain tissue, resulting in severe complications such as brain herniation and cerebral ischemia, and may even be life-threatening. While current research primarily focuses on retrospective analysis, there is a pressing need for real-time predictive models that can be implemented in clinical settings. Traditional monitoring methods often detect critical events too late for preventive intervention, highlighting the necessity for predictive approaches.

Objective: To develop and validate a real-time data-preprocessing pipeline and deep learning prediction model deployable on ICP monitors, capable of predicting potential iHT events 30 minutes in advance based on historical ICP and arterial blood pressure(ABP) monitoring data, thereby enabling timely clinical interventions and improving patient outcomes.

Methods: The study utilized two comprehensive datasets: 13 brain-injured patients from the Charis database (Codman monitor, 50 Hz sampling rate) and 47 patients from clinical trials (PrimaNova monitor, 1000 Hz sampling rate), each monitored for over 24 hours. High ICP events were defined as ICP exceeding 20 mmHg for over 10 minutes. A novel one-minute processing buffer was implemented for real-time data preprocessing, including denoising, normalization, and smoothing, achieving a Pearson correlation coefficient of 0.9748 with actual ICP measurements. The prediction framework consisted of two complementary models: (1) a DLinear-based regression model incorporating self-attention mechanism for precise 30-minute future ICP value prediction (Figure 1), utilizing the previous 30 minutes of monitoring data, and (2) a classification model combining LSTM auto-encoder and Informer architecture for four-level ICP risk stratification (<15 mmHg, 15-20 mmHg, 20-25 mmHg, >25 mmHg). The training data was segmented into 30-minute sequences, with careful attention to maintaining temporal order to simulate real-world clinical scenarios.

Results: The model's performance (Figure 2) was rigorously evaluated on 1,486 independent test segments, demonstrating predictive capabilities with an AUC of 0.933. The sensitivity of 0.921 indicates successful identification of 92.1% of high ICP events, significantly reducing the risk of missed diagnoses. The specificity of 0.945 shows accurate identification of 94.5% of normal ICP states, minimizing false alarms.

Conclusions: This study presents an innovative real-time deep learning model for ICP monitoring that overcomes the limitations of retrospective analyses. The dual-model approach, combining regression and classification predictions enhanced by autoencoder feature extraction, provides comprehensive and reliable predictions. The four-level risk stratification enables clinicians to implement targeted interventions based on predicted risk levels. The model's high accuracy and advance warning capability make it a valuable tool for improving clinical decision-making and potentially enhancing outcomes for TBI patients. Future work will further expand the training and validation datasets, establish multi-center databases to enhance the model's predictive performance, and conduct prospective clinical trials.

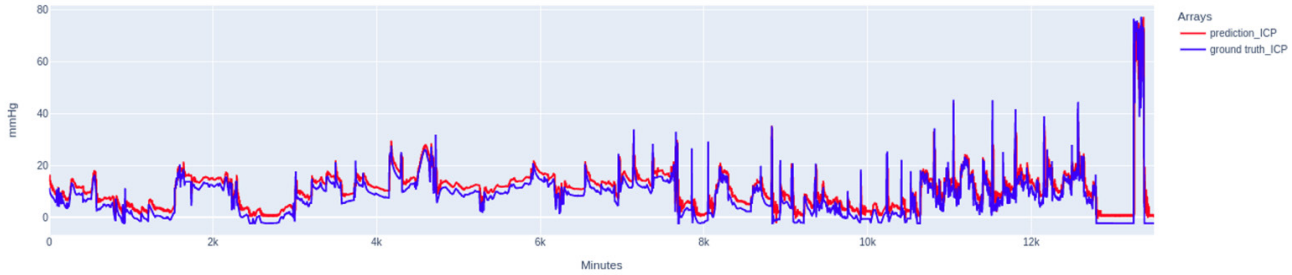


Figure 1: Continuous prediction from D-Linear model

Experiments with different models

Model Types (Same parameters)	Accuracy	AUC	Sensitivity	Specificity
Transformer	0.744	0.918	0.823	0.922
DLinear	**0.868**	0.877	0.824	0.930
NBEATs	0.859	0.915	0.867	0.963
TCN	0.846	0.912	0.855	**0.968**
TFT	0.856	0.914	0.869	0.959
WaveNet	0.843	0.899	0.816	0.963
Informer	0.810	0.916	0.882	0.950
Informer + Multi-head attention	0.863	**0.933**	**0.921**	0.945

Figure 2: Models' performance evaluation and comparison

Pipeline for measuring residual tumour volume in patients with glioblastoma based on a diffusion tensor tissue signature

Queenie Hoi Wing Wong[1], Francesca M Cozzi[1], Roxanne C Mayrand[1], Yonghao Li[1], Stephen J Price[1]

Cambridge Brain Tumour Imaging Laboratory, Division of Neurosurgery, Department of Clinical Neurosciences, Addenbrooke's Hospital, University of Cambridge, Cambridge, United Kingdom

Glioblastoma (GBM), the most common and malignant primary brain tumour in adults, is known for its poor prognosis. Gross total resection was associated with longer overall survival and progression-free survival, and the residual tumour would be treated by chemotherapy and radiotherapy according to the Stupp protocol. However, it is unclear from the literature how residual tumour volume would affect patient survival.

Our study aimed to set up a pipeline for measuring the pre-operative and post-operative brain volumes and tumour volumes based on anatomical magnetic resonance imaging (MRI) brain and diffuse tensor imaging (DTI) images. This would allow subsequent analysis of the association between residual tumour volume and patient outcomes. Our lab developed a diffusion tensor tissue signature method splitting the tensor information into isotropic diffusion (p) and anisotropic diffusion (q) components. It could differentiate regions of pure tumour from invaded white matter and was more sensitive than conventional DTI measures. Hence, measurement of tumour volume in this study was based on the p and q component analysis.

Pre-operative and post-operative MRI brain images, including T1 contrast and DTI, were obtained from patients recruited in the 'Predicting Sites of Tumour Progression in the Invasive Margin of Glioblastomas' (PRaM-GBM) trial. Automated skull-stripping of the MRI brain was done by HD-BET brain extraction tool and the resulting images were reviewed manually on ITK-SNAP. DTI images were processed by FMRIB Software Library (FSL). Traditional DTI metrics, a p-map, and a q-map were generated. These processed DTI files were then co-registered to T1 contrast images. Manual segmentation of the q map was performed to identify areas with q abnormality.

The following volumes were obtained by FSL and relevant calculations, adapted from the 5-aminolevulinic acid (5-ALA) study by Schucht et al. in 2014:

(1) Pre-operative brain volume, excluding CSF spaces and contrast-enhancing tumour;
(2) Post-operative brain volume, excluding CSF spaces and contrast-enhancing tumour;
(3) Pre-operative T1 contrast-enhancing tumour volume;
(4) Pre-operative q-abnormality-defined tumour volume;
(5) Volume of resected non-enhancing tissue, by subtracting (2) from (1);
(6) Overall resection volume, by adding (3) and (5); and
(7) Post-operative residual tumour volume defined by the q abnormality, by subtracting (6) from (4).

Overall, we established a pipeline for measuring the residual tumour volume defined by the q abnormality in DTI. Future work will focus on correlating the residual tumour volume with patient outcomes.

Assessment of Multiple Sclerosis (MS) Lesion Activity With T1rho Magnetic Resonance Imaging

Lei Wang[1], Weitian Chen[1], Tiffany Y So[1*]

[1] Department of Imaging and Interventional Radiology, The Chinese University of Hong Kong, Prince of Wales Hospital, Shatin, Hong Kong SAR, China.
* Correspondence to: Tiffany Y So, MBBS FRANZCR, tiffanyytso11@gmail.com

BACKGROUND:
Active multiple sclerosis (MS) lesions are characterized by ongoing inflammatory changes and tissue injury. They are conventionally defined as enhancing lesions on gadolinium contrast T1-weighted images, or new/enlarging lesions compared with previous imaging. T1rho is an emerging technique which has shown potential for characterization of pathological changes in MS lesions, offering promise for assessment of MS lesion activity.

OBJECTIVE:
This study aimed to quantify T1rho within the intralesional and perilesional regions of MS lesions and evaluate the ability of T1rho to discriminate between active and non-active MS lesions.

METHODS:
This preliminary study recruited 10 patients with relapsing-remitting MS (M: 2, F: 8, age: 26-44) and 10 controls without MS or other known brain disease (M:1, F: 9, age: 36-69). T1rho MRI images were acquired with a Philips Ingenia Elition 3.0T X scanner (Philips Medical Systems, Best, The Netherlands). Thirteen active and 17 non-active lesions in patients, and the corresponding normal white matter in controls were delineated as ROIs. Five perilesional layer masks were created beyond the margin of each ROI using MATLAB R2021a (MathWorks, USA). T1rho maps were fitted using the mono-exponential decay model for T1rho quantification. Mann-Whitney U and t tests were used to test differences between active, non-active lesions and normal white matter. Receiver operating characteristic (ROC) analysis and logistic regression were used to assess the performance of T1rho in distinguishing between the lesion types.

RESULTS:
T1rho values of active lesions (mean±SD, 100.48 ±15.83 msec) were significantly lower than that of non-active lesions (125.43±38.62 msec) ($p < 0.01$). T1rho values of the perilesional layers 1-5 of active lesions were lower than that of the non-active lesion perilesional layers ($p < 0.01$). Active and non-active lesion T1rho values were both higher than that of the normal white matter of controls ($p < 0.01$). Multifactor logistic regression model using combined lesional and perilesional layers 1-5 T1rho showed the highest AUC of 0.850 in differentiating active from non-active lesions.

CONCLUSION:
This preliminary work suggests that active and non-active MS lesions may demonstrate differences in T1rho in both their lesional and perilesional regions. These T1rho differences may help in the differentiation of active from non-active MS lesions.
This study was supported by the Research Grants Council Early Careers Scheme (Project 24106022).

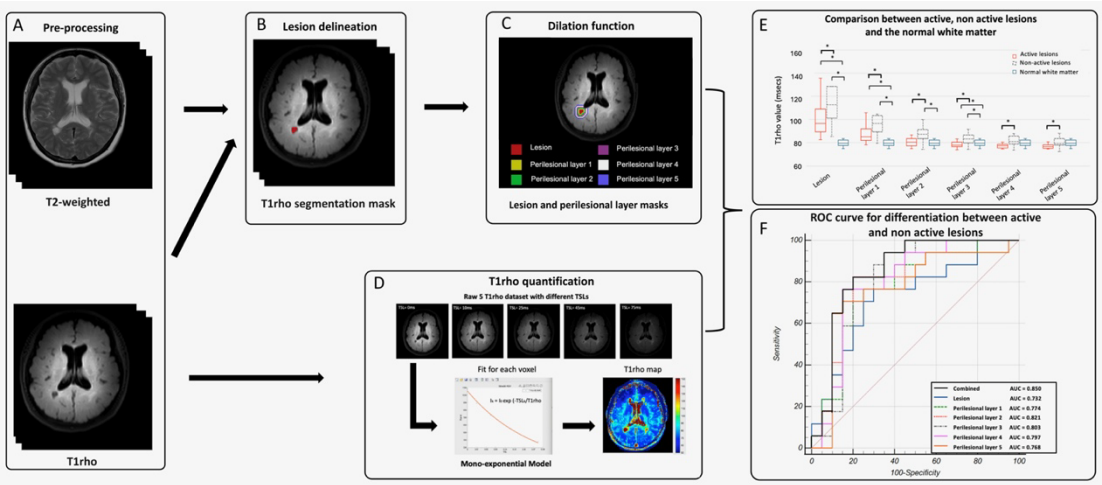


Fig 1. Study design flowchart. A, Pre-processing of T2-weighted and T1rho images. B, Lesion delineation with representative image showing T1rho lesion segmentation mask. C, Perilesional dilation to generate five perilesional layers masks. D, Schematic diagram for T1rho quantification, fitting T1rho images of different TSL to the mono-exponential model. E, Results in comparison of T1rho values between active and non-active lesions and the normal white matter of controls. F, ROC curve for differentiation between active and non active lesions

Date and Venue
17-18 January 2025 (Friday – Saturday)
Postgraduate Education Centre, Prince of Wales Hospital, Shatin, Hong Kong, Shatin, N.T., Hong Kong

Time Zone
All communicated times in the Scientific Programme are Hong Kong Time. Hong Kong is 8 hours ahead of Greenwich Mean Time (i.e. GMT + 8 hours).

Official Language
The official language of the Conference is English.

Trade Exhibition
An exhibition of medical equipment, books and pharmaceutical brochures will be held during the Congress on 17-18 January 2025 onsite and online.

Poster Presentation Awards
Three cash prizes will be awarded for the best 3 oral presentations of the Free Paper Presentation Session.
The judging panel includes the members of the Organizing Committee and session chairpersons. The awards will be presented at the Closing Remarks on 18 January 2025.
Academic Accreditation (for local participants)
Continuing Medical Education (CME), Continuing Nursing Education (CNE) and Continuing Professional Development (CPD) accreditation will be applied from relevant Hong Kong colleges and associations. Accreditation will be given on condition that the College fellows/ Association members are required to attend the Conference in person and are required to sign on the record of attendance at the Conference Venue on 17-18 January 2025.

Letter of Invitation
The Organising Committee would be pleased to provide letters of invitation (without provisions of financial support) upon request, to participants registered for attending the Conference onsite. Please address your request to the Conference Secretariat.

Certificate of Attendance
Electronic Certificate of Attendance will be issued one week after the Conference via email.

Liability and Insurance

The Organiser is not responsible for injury or damage involving persons and property during the Congress. Participants are advised to make their own arrangements for their medical, travel and personal insurance.

Equipment and all related display materials installed by Exhibitors / Sponsors are not insured by the Organiser, and the Organiser under no circumstances will be liable for any loss, damage or destruction caused to equipment, goods or property belonging to Exhibitors/Sponsors.

About Hong Kong

Please visit the website of Hong Kong Tourism Borad for the latest information on immigration, transportation and more.

DISCLAIMER

Whilst every attempt is made to ensure that all aspects of the Conference as mentioned in this website will take place as scheduled, the Organising Committee reserves the right to make changes should the need arise.

The Organising Committee wishes to thank all the following organisations for their generous support.

Abbott Medical (HK) Ltd
Suite 1608, Exchange Tower, 33 Wang Chiu Road, Kowloon Bay, Kowloon
Tel: (852) 2996 7688
Fax: (852) 2956 0622
www.hk.abbott

Agilis Robotics Limited
Room 630, 6/F, Block 17W, No. 17 Science Park West Avenue, Pak Shek Kok, New Territories, Hong Kong
Tel: (852) 3598 3482
https://www.agilisrobotics.com/

Baxter Healthcare Ltd.
Room 1802, No. 8 Queen's Road East, Wanchai, Hong Kong
Tel: (852) 3405 3000
Fax: (852) 2111 0188
https://www.baxter.com.hk/

Boehringer Ingelheim (Hong Kong) Ltd.
Suites 1504-9, Great Eagle Centre, 23 Harbour Road, Wanchai, Hong Kong
Tel: (852) 2596 0033
https://www.boehringer-ingelheim.com/hk/en

BRAINLAB LIMITED
Unit 2502-2503, 25/F, Prosperity Centre, 25 Chong Yip Street, Kwun Tong, Kowloon, Hong Kong
Tel: (852) 2417 1881
Fax: (852) 2413 4321
www.brainlab.com

DCH AURIGA (HK) LTD
11/F, Wyler Centre I, 202 - 210 Tai Lin Pai Road, Kwai Chung, NT, HK
www.dchauriga.com/hk

Eisai (HK) Co. Ltd
Unit A, 29/F, Lee & Man Commercial Center, 169 Electric Road, North Point
Tel: (852) 2516 6128
Fax: (852) 2561 5042
www.eisaihk.info

Elekta Limited

Elite Medical Technology Limited
Rm. 1222, 12/F, Argyle Centre, 688 Nathan Road, Mongkok, Kowloon, Hong Kong
Tel: (852) 36960527
Fax: (852) 36960527

EVER Neuro Pharma (Asia) Limited
29/F, 8 Commercial Tower, 8 Sun Yip Street, Chai Wan, Hong Kong
Tel: (852) 2565 6309
Fax: (852) 2558 8388
www.everpharma.com

Greyon Healthcare Co. Ltd.
Room 14, 3/F, Block A, Wah Tat Industrial Centre, 8-10 Wah Sing Street, Kwai Chung, N.T.
Tel: (852) 2370 3168
Fax: (852) 3741 7189

Kerry Medical Limited
16/F, Kerry Cargo Centre, 55 Wing Kei Road, Kwai Chung, Hong Kong
Tel: (852) 2764 5208
Fax: (852) 2764 5254
https://www.kerrymedical.com/

Medtronic Hong Kong Medical Limited
Suite 1104-11, 11/F, Tower 1, The Gateway, Tsim Sha Tsui
Tel: (852) 2919 6550
Fax: (852) 2891 6872
www.medtronic.com

Nutricia Clinical (Hong Kong) Limited

Otsuka Pharmaceutical (H.K.) Limited
Rm 1801, 18/F, Lee Garden Three, 1 Sunning Road, Causeway Bay, Hong Kong
Tel: (852) 2232 6386
Fax: (852) 2577 5206
https://www.otsuka.hk/en/endsystem-page.php?yes=1

PrimaNova Technologies Limited
Room 618, Building 17W, 17 Science Park West Avenue, Shatin, Hong Kong SAR
primanovamed.com

Prism Technologies Limited
Unit 604, Yee Kuk Industrial Centre, Cheung Sha Wan, Hong Kong
Tel: (852) 2786 3233
Fax: (852) 2786 3812
www.prismtech.com.hk

Stryker China Limited
9th Floor, 12 Taikoo Wan Road, TaiKoo Shing, Hong Kong
Tel: (852) 3969 1330
Fax: (852) 2856 2600
www.stryker.com/HongKong

Zai Lab (Hong Kong) Limited
Rm 2301, 23/F, Island Place Tower, 510 King's Road, North Point, Hong Kong
Tel: (852) 3844 8100
Fax: (852) 3844 8188
https://www.zailaboratory.com/