APNSC-HKSAN

2023

3rd Asia-Pacific Neuroscience Student Congress

Message from Our Distinguished Opening Speaker

Dr. Michael Lee

President, The Hong Kong Neurosurgical Society
Coordinator, The Hong Kong Brain Bee Competition
Honorary Clinical Associate Professor, Department of Surgery, CUHK
Adjunct Associate Professor, School of Chinese Medicine, CUHK

Dear Distinguished Guests,
Professors and Delegates,

It is my pleasure to attend as a Guest of honour in this 3rd Asia-Pacific Neuroscience Student Congress and Hong Kong Student Association of Neuroscience 4th Annual Conference (APNSC-HKSAN) 2023. This year the theme is on Paediatric Neuroscience which is a fascinating and intriguing field. As a neurosurgeon, I am fully aware of the challenges in these little brains.

We need the most observant eyes and ears to obtain a proper history and conduct physical exam. We need patience to soothe the parents. Furthermore, we need the most talented and skillful neurosurgeons to operate on the minute brain vessels; their brain tissues are delicate and demand meticulous surgical skills. Intraoperatively, they are intolerant to blood loss and are prone to hypothermia.

Minimal access surgery with less unnecessary exposure would be advantageous in this sense. It is definitely a tall order as we need smaller surgical instruments but without sacrificing the best image quality, e.g. neuro-endoscope for hydrocephalus and skull base surgery. Artificial Intelligence and state-of-the-art robotics would be beneficial. For brain tumour cases, postoperative radiotherapy is usually avoided as it will jeopardize neurocognitive functions.

Very often, kids have a different spectrum of specific diseases such as rare neurological diseases (RND) and neurogenetic disorders, infective and immunological diseases. Not uncommonly, we have traumatic accidents, attention deficit / hyperactivity disorder (ADHD), autism, learning and developmental disorders, as well as drug abuse and cognitive dysfunction disorders in adolescence. Some are amenable to neurosurgical treatments like those with tumours, traumatic brain and spine injuries, moyamoya disease, epilepsy, spasticity in cerebral palsy, Tourette syndrome and dystonia. The plus is they have neuroplasticity and better rehabilitation potentials: time is on their side.

Hong Kong is the hub that connects to the world and that holds true in the realm of neuroscience. We are strategically important in the Greater Bay Area neuroscience development. We have all the hardworking talents. This year for the first time, a Hong Kong student won the Championship in the International Brain Bee World Championship – the neuroscience competition for secondary school students. I am delighted to see so many young and bright students from both medical schools who are interested in Neuroscience. For those who are less determined, I sincerely wish that this Congress can kindle your passion for this field. Many congratulations, and thank you for bringing us this propitious and terrific event.

Message from the Chairperson

Dear Delegates,

On behalf of the Organising Committee of APNSC-HKSAN 2023, I would like to extend my warmest welcome to all of you joining our 3rd Asia-Pacific Neuroscience Student Congress and Hong Kong Student Association of Neuroscience 4th Annual Conference (APNSC-HKSAN) 2023!

Our central nervous system is the hub within our body and the brain is arguably our most irreplaceable organ. It is the organ through which we learn about the world, but of which we have only learnt the tip of the iceberg. At APNSC-HKSAN 2023 this year, we will be focusing on the multidisciplinary nature of neuroscience from bench to bedside, with a Multidisciplinary Day and Main Conference on Paediatric Neuroscience. On Day 1, we will explore how clinical neuroscience is intertwined with other medical specialties, including Ophthalmology, ENT and GI. On Day 2 and 3, we will dive deep into the different aspects within Paediatric Neuroscience, with Plenary Sessions on neuro-oncology, neurosurgery, epilepsy, mental health, neurogenetics and rare neurological diseases, many of which are debilitating for children and heartbreaking for their families because of their virtually incurable nature or long term impact on their quality of life.

We are incredibly proud and honoured to have 24 eminent faculty and distinguished clinicians as our speakers at APNSC-HKSAN 2023 from the world's top universities, medical schools, hospitals, and research institutes, namely University College London, Great Ormond Street Hospital for Children, Harvard University, Stanford University, Johns Hopkins University, University of Washington, Mayo Clinic, Seattle Children's Hospital, Connecticut Children's Medical Center, University of Ottawa, Duke-NUS Medical School, HKU, and CUHK, all of whom are gurus in their field of neuroscience research or clinical practice.

You will be able to learn about current research hot topics in neuroscience, fascinating interrelationships between different medical specialties and clinical neuroscience, as well as their inspiring journeys of developing novel, state-of-the-art technologies for diagnosing, treating and assisting patients with neurological diseases from the best of the best.

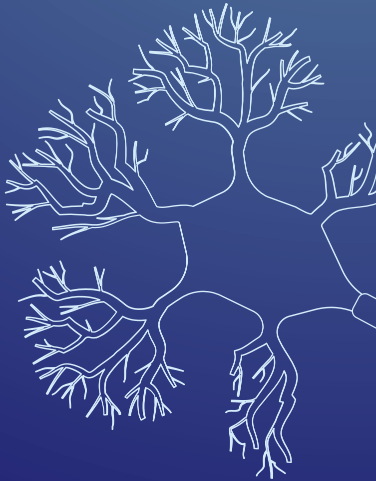
As a means of enhancing the interactive nature of our conference this year, there will be dedicated mingling time and a speed mentoring session for students to facilitate a better platform for delegates to build connections with like-minded peers and interact with our speakers and young clinicians or researchers, in addition to raising questions in a formal setting during Q&A and panel discussion sessions. We hope such mingling opportunities with professionals in different stages of their career will help you gain a better understanding of what challenges in neuroscience and neurological practice await us in the future as new bloods in this field.

I would like to express our heartfelt gratitude to our Guests of Honour, speakers, and panel judges for their selfless contributions and advice, without which APNSC-HKSAN 2023 could not have taken place. I would also like to thank the Hong Kong Institute of Science & Innovation, Chinese Academy of Sciences - Centre for Artificial Intelligence and Robotics (CAIR), The Hong Kong Neurosurgical Society (HKNS), Medical Professional Protection Scheme (MPPS), MontsMed Hong Kong Company Limited and Zurich (Insurance) Hong Kong for their generous support and sponsorship, which has enabled us to make APNSC-HKSAN 2023 accessible and affordable for all. Furthermore, my appreciation goes to all student presenters sharing their excellent work with our delegates, including participants of our first year of HKSAN Research Platform. Last but not least, I would like to thank my fellow Organising Committee members for their months of blood and sweat in organising APNSC-HKSAN 2023.

Once again, welcome to APNSC-HKSAN 2023 and I sincerely hope you will all find this 3-day programme fruitful and enjoyable!

Best regards,

Safari Chiu
President, Executive Committee 2022-23
Hong Kong Student Association of Neuroscience



Introduction

Hong Kong Student Association of Neuroscience

The Hong Kong Student Association of Neuroscience (HKSAN) was founded by a group of medical students from the University of Hong Kong (HKU) and the Chinese University of Hong Kong (CUHK) in 2020, with a bold vision to connect and inspire students in Hong Kong for the popularisation of neuroscience.

As a non-profit-making organisation run by students for students, HKSAN is able to make great strides in enhancing diversity and equal opportunities in the field of neuroscience. We believe in a future of neuroscience merging multiple disciplines, actors, and social sectors. Through a collaborative network built with various Specialty Colleges in Hong Kong and the support from our Honorary Advisors, we equip our audience towards this future by engaging them, at an early career stage, in multidisciplinary academic discourse, including in neurology, neurosurgery, neurogenetics, cognitive neuroscience, oncology, computer science, and biomedical engineering.

We are exceptionally proud of our Youth Ambassador Scheme launched this year which engages high school students in conversations about socially-relevant elements in neuroscience. The Scheme this year was spearheaded by our Department of Public Health with a focus on psychiatric disorders.
The Association engages students of different academic levels and backgrounds, from primary and pre-university students to undergraduates and postgraduates. We also cater to young researchers in various fields of neuroscience.

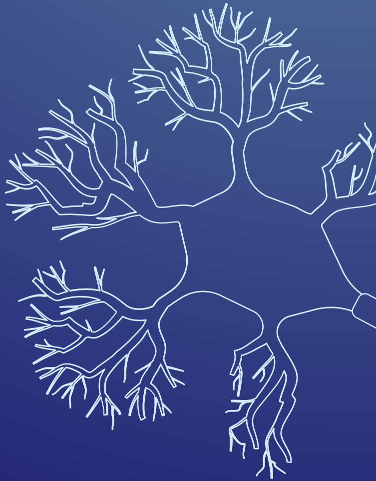
Asia-Pacific Neuroscience Student Congress

Opportunities for undergraduate students and early-career scientists to delve deep into neuroscience are scarcely provided. The Hong Kong Student Association of Neuroscience (HKSAN) is determined to address this unmet need and tap into the undiscovered potential. Through APNSC, HKSAN brings the forefront of neuroscience to aspiring neuroscientists, neurologists, and neurosurgeons across the Asia-Pacific region. Through APNSC, HKSAN empowers undergraduate students and early-career neuroscientists.

APNSC-HKSAN 2023 is a busy three-day hybrid academic conference and the annual flagship event of HKSAN. The conference is completely student-led and is organised by the HKSAN Executive Committee 2022-23, which is comprised of 30 undergraduate students from the two local medical schools. APNSC-HKSAN 2023 is designed to expose delegates to the latest basic and translational research and clinical development in paediatric neuroscience, facilitate two-way interaction and knowledge exchange between delegates and world-renowned speakers, and encourage discussion of the most fascinating neuroscience questions with the best neuroscientists and clinician-scientists in the world in an academic setting.

Speakers at APNSC-HKSAN 2023 will disseminate the latest neuroscience knowledge and introduce delegates across the Asia-Pacific region to novel therapeutic modalities for treating neurological diseases and neurosurgical conditions. Delegates can network with these giants with great convenience. APNSC-HKSAN 2023 is a professional platform for delegates to develop a supportive network with inspirational scientists and clinicians all across the world. In APNSC-HKSAN 2023, delegates stand on the shoulder of giants and gain valuable tips to be excellent neuroscientists and active contributors to the process of scientific inquiry.

Another aim of APNSC-HKSAN 2023 is to introduce delegates to the latest neuroscience research conducted by postgraduate trainees and undergraduate students in the Asia-Pacific region. Through the Oral Presentation sessions, students are provided with the necessary opportunities to present their research findings and increase their professional visibility and exposure.



Programme Rundown

DAY 1: Multidisciplinary Day, 30 Sep 2023

(all times specified are in GMT +8)

09:00-09:30
Registration

09:30-09:45
Opening Ceremony

09:45-11:45
Plenary Session 1: Our Five Senses

09:45-09:50 | Welcome Address

09:50-10:20
Eyes as a Window to the Brain - Visual Signs and Symptoms Related to Neurological Disorders
Dr. Kendrick Co SHIH, University of Hong Kong, HK

10:20-10:50
Neural Interface and in vivo Electrophysiology on the Visual System
Dr. Leanne Lai-Hang CHAN, City University of Hong Kong, HK

10:50-11:20
Otorhinolaryngology - Intersection between ENT and Neurological Pathologies
Dr. Jason Ying Kuen CHAN, Chinese University of Hong Kong, HK

11:20-11:40 | Panel discussion

11:40-11:45 | Conclusion

11:45-12:00
Intermission

12:00-13:20
Plenary Session 2: Artificial Intelligence and Robotics in Neuroscience

12:00-12:05 | Welcome Address

12:05-12:30
Robotic Neurosurgery in the Era of AI
Dr. Danny Tat Ming CHAN, Prince of Wales Hospital, HK

12:30-12:55
Procedural Justice and Artificial Intelligence in Neuroscience
Dr. Francis X. SHEN, Harvard Medical School, US

12:55-13:15 | Panel discussion

13:15-13:20 | Conclusion

13:20-13:35
HKSAN Platinum Sponsor Speech - Centre for Artificial Intelligence and Robotics, HKISI, CAS

Centre for Artificial Intelligence and Robotics
Hong Kong Institute of Science & Innovation, Chinese Academy of Sciences

13:35 -14:55
Lunch

14:55-15:45
HKSAN RES Platform Oral Presentation Session

15:45-17:55

Plenary Session 3: Gut-Brain Axis

15:45-15:50 | Welcome Address

15:50-16:20

Brain-gut Axis in Chemotherapy-induced Nausea and Emesis: Discovery of 5-HT3 and NK1 Receptor Antagonists

Prof. John Anthony RUDD, Chinese University of Hong Kong, HK

16:20-16:50

Stem Cell-Based Therapy for Congenital Gastrointestinal Motility Disorder: An Animal Study on Hirschsprung's disease

Prof. Wood Yee CHAN Woody, Chinese University of Hong Kong, HK

16:50-17:30

Keynote Speech: Microbiota and Gut-Brain Axis

Prof. CHAN Ka Leung Francis, SBS, JP, Chinese University of Hong Kong, HK

17:30-17:50 | Panel discussion

17:50-17:55 | Conclusion

17:55-18:30

Mingling Session

DAY 2: Paediatric Neuroscience, 1 Oct 2023

(all times specified are in GMT +8)

09:00-09:30
Registration

09:30-10:00
Main Conference Opening Ceremony

10:00-11:55
Plenary Session 1: Paediatric Neuro-Oncology 1

10:00-10:05 | Welcome Address

10:05-10:40
Recent Advances in Paediatric Neuro-Oncology
Prof. Ching LAU, Connecticut Children's Medical Center, US

10:40-11:15
Neuron-Glial Interactions in Neuro-oncology and Neurodevelopment
Prof. Michelle MONJE, Stanford University, US

11:15-11:50
Cerebellum Development Gone Awry: Malformations and Medulloblastoma
Prof. Kathleen J. MILLEN, Seattle Children's Hospital and University of Washington, US

11:50-11:55 | Conclusion

11:55-13:25
Lunch & Poster Judging

13:25-14:30
Oral Presentation Session

14:30-15:30
Speed Mentoring

15:30-16:25
Keynote Speech

15:30-15:35 | Welcome Address

15:35-16:05
Craniopagus Twin Separation Surgery in the 21st Century
Mr. Owase JEELANI, Great Ormond Street Hospital for Children and Gemini Untwined, UK

16:05-16:20 | Q&A Session

16:20-16:25 | Conclusion

16:25-18:10
Plenary Session 2: Paediatric Neurosurgery

16:25-16:30 | Welcome Address

16:30-17:05
Surgical Revascularisation for Moyamoya Angiopathy
Dr. Kevin King Fai CHENG, Queen Mary Hospital, HK

17:05-17:40
Paediatric Neurosurgery for Congenital Neurological Problems
Dr. Hoi Tung WONG, CUHK Medical Center, HK

17:40-18:00 | Panel Discussion

18:00-18:05 | Conclusion

DAY 3: Paediatric Neuroscience, 2 Oct 2023

(all times specified are in GMT +8)

09:30-11:15
Plenary Session 3: Epilepsy

09:30-09:35 | Welcome Address

09:35-10:05
Dietary Treatment of Childhood Epilepsy
Prof. Eric KOSSOFF, Johns Hopkins University, US

10:05-10:40
Dravet Syndrome: Diagnosis and Management
Dr. Elaine WIRRELL, Mayo Clinic, US

10:40-11:00 | Panel Discussion

11:00-11:05 | Conclusion

11:05-11:25
Intermission

11:25-12:45
Plenary Session 4: Neuropsychology and Mental Health of Adolescents and Children

09:30-09:35 | Welcome Address

11:30-12:05
The Relationship between Hormones in Critical Periods of Development and Social Behaviors, Depression, and Cognition
Prof. Nafissa ISMAIL, University of Ottawa, Canada

12:05-12:40
Neural Mechanisms of Adolescent Depression
Dr. Frances JIN, University of Hong Kong, HK

12:40-12:45 | Conclusion

12:45-13:45
Lunch

13:45-15:30
Plenary Session 5: Rare Neurological Diseases, Neurodevelopmental Disorders and Neurogenetics

13:45-13:50 | Welcome Address

13:50-14:15
The Role of Whole Genome Sequencing in the Diagnosis and Treatment of Neurological Disorders among Children
Dr. Brian Hon-Yin CHUNG, Hong Kong Genome Institute and University of Hong Kong, HK

14:15-14:40
Cellular, Genetic and Biochemical Analyses in Rare Neurological Diseases
Prof. Edwin Ho Yin CHAN, Chinese University of Hong Kong, HK

14:40-15:05
Current and Emerging Therapies for Duchenne Muscular Dystrophy and Spinal Muscular Atrophy Bring New Hope
Dr. Sophelia Hoi Shan CHAN, University of Hong Kong, HK

15:05-15:25 | Panel Discussion

15:25-15:30 | Conclusion

15:30-16:20

Keynote Speech

15:30-15:35 | Welcome Address

15:35-16:05

Pain, Fear and Phantoms

Prof. Nick RAWLINS, Chinese University of Hong Kong, HK

16:05-16:15 | Q&A Session

16:15-16:20 | Conclusion

16:20-16:30

Intermission

16:30-17:50

Plenary Session 6: Paediatric Neuro-Oncology 2

16:30-16:35 | Welcome Address

16:35-17:10

Precision Medicine in Brain Tumours

Dr. Aya El HELALI, University of Hong Kong, HK

17:10-17:45

Drug Development for Paediatric Brain Tumors Using Patient-Derived Orthotopic Brain Tumor Xenograft Modelling

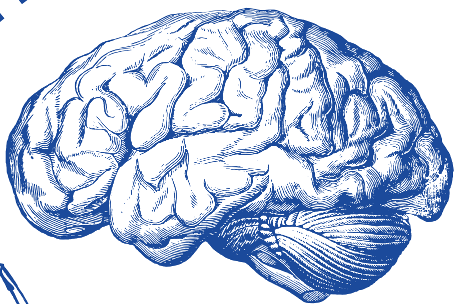
Dr. Wan-Yee TEO, Duke-NUS Medical School, Singapore

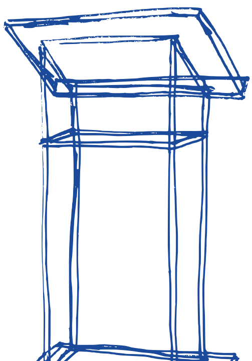
17:45-17:50 | Conclusion

17:50-18:15

Prize Presentation Ceremony and Closing Ceremony

INTRODUCING





OUR KEYNOTE SPEAKERS

Prof. Francis Chan

MBChB(Hons)(CUHK), MD(CUHK), DSc(CUHK), Hon DSc(Osaka City U), FRCP(Lond), FRCP(Edin), FRCP(Irel), FACG, FHKCP, FHKAM(Med)
Dean, Faculty of Medicine, The Chinese University of Hong Kong
Choh-Ming Li Professor of Medicine and Therapeutics, Faculty of Medicine, The Chinese University of Hong Kong
Director, Centre for Gut Microbiota Research
Board Member, Hong Kong Hospital Authority
Honorary Consultant at the Prince of Wales Hospital

Professor Francis Ka-Leung Chan is the current Dean of the Faculty of Medicine and the Choh-Ming Li Professor of Medicine and Therapeutics at The Chinese University of Hong Kong. He is also an Asia-based, internationally renowned clinician-scientist, and an entrepreneur. He is the first in academic history to publish eight first-authored investigator-initiated, original research articles in The New England Journal of Medicine and The Lancet. He is also the first scholar in Asia to be selected for a profile by The Lancet in May 2007 to exemplify his excellence in clinical research. His groundbreaking research has generated over 900 full scientific articles in high impact international journals, yielding an h-index of over 100.

Professor Chan has had extensive experience in transforming innovative discoveries into novel clinical practice. To name a few examples, he was the lead investigator of several multi-national mega clinical trials on the safety and efficacy of cyclo-oxygenase-2 inhibitors in patients with disabling arthritis. His research not only led to publications in top-notch journals but also FDA approval of new drugs in the U.S. and worldwide. His extensive clinical research experience and international pharmaceutical network has put him in a unique position to pioneer the downstream development of novel therapeutics in Hong Kong and the Greater Bay Area. In 2020, Professor Chan co-founded a biotechnology start-up company, GenieBiome Company Limited, to transform microbiome innovations into clinical applications.

As a clinician-scientist, Professor Chan is also a pioneer in fecal bacteria-DNA technology. There is good evidence that the human gut microbiota is the next frontier of Medicine. The trillions of bacteria inside the human gut are like our "second brain" - one with enormous potential for powerful clinical applications.

To realize this dream, he established the first microbiota innovation center (MagIC Centre) with an international alliance in Asia. Just with a tiny stool sample, Professor Chan and his team have decoded the trillions of bacteria DNA inside our gut with their artificial intelligent-driven algorithms to predict risk of diseases. He has successfully transformed gut microbiome into novel innovations for early disease detection, prevention and treatment. M3CRC, his first technology, can detect early colon cancer and polyps in the gut with high accuracy when cure is possible. This precision stool test has benefited thousands of people every year who otherwise are reluctant to undergo invasive screening with colonoscopy. During the COVID-19 pandemic, Professor Chan and his team, for the first time in the world, identified a panel of gut microbes with next generation sequencing technology that regulates our immunity against SARS-CoV2. Using big data analysis and machine learning, they have successfully developed a novel oral microbiome formula (SIM01). Its safety and efficacy for acute COVID-19 and post-acute COVID syndrome have been confirmed by large-scale, double-blind, randomized trials. Millions of people have already benefited from this innovation. These microbiome-based inventions have received multiple international awards including the Gold Medal with Congratulation of the Jury, Gold Medals and Silver Medals of International Exhibition of Inventions Geneva 2022 and 2023 in recognition of their novelty and contributions to society.

To acknowledge his outstanding achievements over the years, Professor Chan received the degree of Doctor of Science from The Chinese University of Hong Kong (2011), Honorary Fellow of the Royal College of Physicians of Thailand (2018), Vikit Viranuvatti Plenary Lecturer (2018), Honorary Doctorate of the Osaka City University (2018) - an honor that only 12 doctorates were awarded in its 138-year history. In the same year, he, being among the first in Asia, was conferred the International Leadership Award by the American College of Gastroenterology. In 2019, ExpertScape named him top 0.06% world expert in Aspirin, Helicobacter Infections and Peptic Ulcer. In 2023, he received the Research Mentor Award from the American Gastroenterology Association to recognize his research and mentorship achievements.

Mr. Owase Jeelani

BMed.Sci, BMBS, MRCS, MBA, MPhil (Medical Law), FRCS (NeuroSurg.)
Consultant Paediatric Neurosurgeon, Great Ormond Street Hospital for Children
Founder, Gemini Untwined
Honorary Associate Professor, Institute of Child Health, University College London
Founder, Interface Health Solutions

Mr. Owase Jeelani is a Kashmiri-British Consultant Paediatric Neurosurgeon at the Great Ormond Street Hospital for Children (GOSH) in the UK. Mr. Jeelani is world-renowned for his expertise in craniopagus twin separation surgery, having successfully separated five sets of conjoined twins from 2011 to 2022. His outstanding clinical work has earned him numerous awards and titles, including being named the top 100 surgeons in the UK in 2011 and top 100 children's doctors in 2012 by "The Times".

Mr. Jeelani is a philanthropist with a global vision. After undertaking his fellowships and GOSH and Sick Kids in Canada, he gives back to the global community by conducting surgery for conjoined twins from different developing countries. In 2019, he founded Gemini Untwined, an international charity dedicated to support pioneering research and treatment logistics for cranially conjoined twins, providing hope for these patients and families around the world by breaking geographical boundaries in medicine.

In addition to his clinical work, Mr. Jeelani is also an eminent entrepreneur, inventor and academic in medical devices and artificial intelligence. Affiliated with the Institute of Child Health at University College London (UCL), he leads the FaceValue research programme in Craniofacial Morphometrics, focusing on improving surgical outcomes through machine learning algorithms. With his background in medical law, he founded Interface Health Solutions in 2003 and conducts healthcare advisory work for the NHS. In 2007, Mr. Jeelani invented the spring distractor technology CranioXpand, which is now widely used in minimally invasive treatment of sagittal craniosynostoses.

Prof. Nick Rawlins

BA (Oxon); MA (Oxon); DPhil (Oxon); FMedSci; FBPsS
Pro-Vice-Chancellor, The Chinese University of Hong Kong
Vice-President (Student Experience), The Chinese University of Hong Kong
Master of Morningside College, The Chinese University of Hong Kong

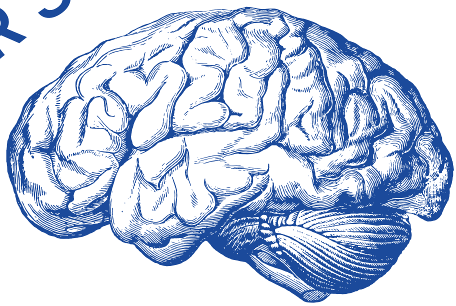
Professor Nick Rawlins is a Pro-Vice-Chancellor and the Vice-President (Student Experience) at the Chinese University of Hong Kong. He is also the current Master of Morningside College. Professor Rawlins graduated with a B.A. in Psychology and Physiology from University College, Oxford, followed by a D.Phil from Oxford's Department of Experimental Psychology. After graduation, he underwent an academic career of fifty years at the University of Oxford. During his time in Oxford, he contributed as a Junior Research Fellow, then as a Fogarty Fellow at Johns Hopkins, a Royal Society Research Fellow, a Tutorial Fellow and a Statutory Professor. He was eventually appointed as the Pro-Vice-Chancellor for Development and External Affairs, and under his leadership, the largest and most successful fund-raising campaign that had ever been conducted by a university outside North America was successfully launched. His teaching career at the University of Oxford was followed by his positions as the Vice-President of the Toulouse School of Economics and a Fellow of the Institute for Advanced Studies. After serving in Toulouse, he joined the Chinese University of Hong Kong in 2018.

As a behavioural neuroscientist, Professor Rawlins' research draws focus on the intersection of behaviour with brain function and dysfunction. Extending beyond the studies on the neural bases of learning, attention, and memory in organisms ranging from the medicinal leech to human subjects, he is also interested in further investigation on fear, anxiety, pain, schizophrenia, neurodegeneration and neural repair.

Pain, Fear and Phantoms

Chronic pain can impose immense personal and societal costs. The pain itself is only part of the problem: anxiety about pain in the future also contributes. Functional imaging shows that related, yet separate, brain circuits underlie these different aspects of painful experiences. Signals that an impending event could be particularly painful make subjects more anxious and enhance perceived pain intensities, through yet further circuits. Might signals that reduce anxiety about impending pain therefore reduce perceived pain intensity? Finally, could understanding the neural basis of phantom limb pain lead to interventions that ameliorate this highly distressing, yet treatment-resistant, condition?

OUR SPEAKERS



MULTIDISCIPLINARY DAY

Dr. Kendrick Shih

MBBS, MRes(Medicine), MRCSEd, FCOphth HK, FHKAM (Ophthalmology), FHEA
Director of Student Affairs, School of Clinical Medicine, The University of Hong Kong
Clinical Associate Professor of Practice, Department of Ophthalmology, School of Clinical Medicine, The University of Hong Kong
Honorary Consultant (Ophthalmology), Queen Mary Hospital
Honorary Consultant (Ophthalmology), Grantham Hospital

Dr. Kendrick Co Shih is the Director of Student Affairs at the School of Clinical Medicine, The University of Hong Kong. Specialized in Ophthalmology, he is also a Clinical Associate Professor of Practice at the Department of Ophthalmology at HKUMed. In recognition of his dedication to teaching, Dr. Shih was awarded the 2021 Faculty Teaching Medal by the Li Ka Shing Faculty of Medicine.

As an academic ophthalmologist, Dr. Shih is interested in research topics such as sight-threatening ocular surface diseases, cornea wound healing, and artificial intelligence-assisted clinical decision-making. With more than 80 publications in international peer-reviewed journals, Dr. Shih was awarded the 2018 Asia Pacific Academy of Ophthalmology Achievement Award, the 2021 Asia Pacific Academy of Ophthalmology Best Young Ophthalmologist Influencer Award, and the 2021 Japanese Ophthalmology Society Young International Investigator Award. With his expertise in Ophthalmology, he is also a current Honorary Consultant at the Department of Ophthalmology at Queen Mary Hospital and Grantham Hospital.

Dr. Leanne Chan

BEng(HKU), MSc(USC), PhD(USC)
Associate Professor, Department of Electrical Engineering, City University of Hong Kong

Dr. Leanne Chan is an Associate Professor at the Department of Electrical Engineering at the City University of Hong Kong. After receiving her undergraduate degree in electrical and electronic engineering from The University of Hong Kong, she was conferred an MS in electrical engineering and a PhD in biomedical engineering from the University of Southern California. Before joining the City University of Hong Kong in 2011, she underwent several years of postdoctoral work in the Developmental Neuroscience Program of the Saban Research Institute at Children's Hospital Los Angeles.

With her expertise in electrical and biomedical engineering, Dr. Chan's research work mainly focuses on investigating the neural response to electrical stimulation and the mechanisms that link electrical stimulation to neuromodulation in the visual and non-visual brain circuitries. Apart from her achievements in research work, she is also a member of the Society of Neuroscience, the Engineering in Medicine and Biology Society (EMBS), and a senior member of the IEEE Society.

Neural Interface and in vivo Electrophysiology on the Visual System

This presentation will explore the fascinating field of neural interface and in vivo electrophysiology in the context of the visual system. The concept of neural interface will be introduced, highlighting its significance in both neuroscience and engineering. Preclinical studies in neural interface research will be discussed, with a focus on retinal prostheses as illustrative examples. The potential translation of these advancements to clinical practice, particularly as a treatment option for neurodegenerative diseases, will be explored. The role of neuromodulation in this context will also be examined. Ultimately, this talk will emphasize the strong connections between in vivo electrophysiology, preclinical studies, and their potential impact on clinical practice.

Dr. Jason Chan

LMCHK, MBBS (London), DABOto, FRCSEd(ORL), FHKCORL, FHKAM (Otorhinolaryngology)
Assistant Dean (Health Systems), Faculty of Medicine, The Chinese University of Hong Kong
Director of Undergraduate Teaching, Department of Otorhinolaryngology, Head and Neck Surgery, Faculty of Medicine, The Chinese University of Hong Kong
Associate Professor, Department of Otorhinolaryngology, Head and Neck Surgery, Faculty of Medicine, The Chinese University of Hong Kong
Deputy Director, CUHK Jockey Club Minimally Invasive Surgical Skills Centre

Dr. Chan graduated from Guy's, King's and St Thomas' School of Medicine in London, followed by specialist training in Otolaryngology, Head and Neck surgery at the Johns Hopkins Medical Institutions with advanced training in Head and Neck surgery, microvascular reconstruction and robotics. He is currently an Associate Professor in the Department of Otorhinolaryngology, Head and Neck Surgery at The Chinese University of Hong Kong.

His research interests lie in early diagnosis and treatment of head and neck cancers, the microbiome in head and neck cancers and the application of robotics in Head and Neck Surgery. Recently, his research team collaborated with The University of Hong Kong and developed a soft robotic manipulator for transoral laser microsurgery on head and neck cancer, guided by intra-operative magnetic resonance imaging.

Dr. Danny Chan

MBChB, FRCS, FHKAM, FRSCEdin(SN)
Consultant, Division of Neurosurgery, Prince of Wales Hospital
Director, Otto Wong Brain Tumour Centre, The Chinese University of Hong Kong

Dr. Danny Chan is a Consultant in the Division of Neurosurgery in the Prince of Wales Hospital, and Director of the CUHK Otto Wong Brain Tumour Centre. He graduated from the Chinese University of Hong Kong with MBChB in 1995, entered specialty training and subsequently obtained his FRCSEdin(SN). His research interests are in glioma surgery, neuro-oncology and functional neurosurgery (stereotactic neurosurgery and deep brain stimulation).

Dr. Chan's multi-disciplinary work in neuro-oncology and functional neurosurgery has been recognised locally and internationally with the establishment of the CUHK Otto Wong Brain tumour centre, the combined neuro-oncology clinic, the annual Brain conference, the Mr. Otto Lien Da Wong visiting professorship in neuro-oncology, the combined movement disorder clinic and the Deep Brain Stimulation program.

In recent years, he has expanded his collaborations to the field of medical bio-engineering. He is collaborating with the medical bio-engineers of various Hong Kong institutes (HKU, CUHK, HKUST and CAIR) on stereotactic neuro-robots, novel cellular imaging techniques and AI precision therapeutics. His team received both the best paper award in Medical Robotics and the best Conference paper award at the IEEE international conference on Robotics and Automation-ICRA 2018 (Brisbane, Australia), as well as a Bronze medal at the 2022 special edition of the Geneva International Exhibition of Inventions. Recently, he has been awarded the first BOCHK Science and Technology Innovation Prize in artificial intelligence and robotics with MicroNeuro, a flexible endoscopic robot for minimally invasive brain surgery.

Dr. Francis Shen

Member of the Faculty in the Department of Global Health and Social Medicine and Lecturer on Psychology in the Department of Psychiatry at Massachusetts General Hospital
Harvard University Affiliated Professor at Harvard Law School
Member, HMS Center for Bioethics

Francis X. Shen, JD, PhD is a Member of the Faculty at the Center for Bioethics and Department of Global Health and Social Medicine at Harvard Medical, a faculty member in the Department of Psychiatry at Mass General Hospital, and a Harvard University Affiliated Professor at Harvard Law School. The Shen Lab at Harvard explores the emerging intersection between law, ethics, neuroscience, and artificial intelligence. The Lab motto is, "Every story is a brain story". Dr. Shen has co-authored 3 books, including the first Law and Neuroscience casebook, and published articles on a range of neurolaw and neuroethics topics, including computational phenotyping, portable neuroimaging, memory and lie detection, cognitive enhancement, criminal justice, brain injury, evidentiary admissibility, sports concussion, juror decision-making, criminal mental states, dementia, and mental health. He is currently leading the creation of a Dana Foundation Career Network in Neuroscience and Society, and co-leads projects on portable MRI portable MRI, the ethics of digital phenotyping in psychiatry, and pursuing neurotech justice, improving neuroscience training for judges. In 2021, he was awarded the Early Career Scholars Medal by the American Law Institute, one of two medals awarded every other year by the ALI, for being "a pioneer in establishing the interdisciplinary field of law and neuroscience." He received his B.A. from the University of Chicago, his JD from Harvard Law School, and his PhD from Harvard University.

Dr. Shen also directs the Dana Foundation Career Network in Neuroscience & Society (neuroXcareers.org). All are invited to subscribe to the Career Network newsletter to receive updates on career-related topics in neuroscience and society.

Procedural Justice and Artificial Intelligence in Neuroscience

AI-enabled neuroscience research and neurotech development raises many ethical, legal, and social issues (ELSI) as well as justice, equity, diversity, and inclusion (JEDI) challenges. This talk will provide a neuroethics lens on these developments, with an emphasis on procedural justice issues that emerge from the construction of training datasets for AI-neuroscience, including how to define concepts such as "diverse", "representative" and "bias" in this context. The talk will cover both conceptual and theoretical issues, as well as provide practical neuroethics guidance centered on community engagement. The talk will draw on Dr. Shen's experience co-leading NIH BRAIN neuroethics research on the ethics of portable neuroimaging, and contributing to ethical and trustworthy AI analysis in the NIH Bridge2AI program.

Prof. John Rudd

Professor, School of Biomedical Sciences, Faculty of Medicine, The Chinese University of Hong Kong
Managing Director of Animal Holding Core, School of Biomedical Sciences, Faculty of Medicine, The Chinese University of Hong Kong
Director, Laboratory Animal Services Centre, The Chinese University of Hong Kong
Co-Founder, Director and Chief Scientific Advisor, Gut Rhythm R&D (Hong Kong) Limited

Professor John A. Rudd is a pharmacologist interested primary on the mechanisms of actions of drugs on the Brain-Gut axis. He has been working on mechanisms of the emetic reflex for more than thirty years and have contributed to drug development for the treatment of chemotherapy-induced nausea and emesis.

During the late 1980s, he worked with Glaxo Group Research to investigate the potential sue of the 5-HT3 receptor antagonist, ondansetron, to antagonize chemotherapy- and drug-induced emesis. He was also part of a team that mapped 5-HT3 receptor distribution in the human and ferret brainstem and first to show increases in 5-HT in the plasma of patients receiving cisplatin-based chemotherapy. He pioneered the use of ferrets to model acute and delayed emesis induced by chemotherapy, which has now become a gold standard model. He also made a breakthrough discovery that NK1 tachykinin antagonists could be used to prevent the acute and delayed phases of emesis induced by cisplatin. NK1 tachykinin antagonists have now become cornerstone of treatment for delayed emesis. Recently he collaborated with Helsinn on developing the second generation 5-HT3 and NK1 receptor antagonists, palonosetron and netupitant, respectively. His ongoing interest lies in broad inhibitory antiemetic drugs and partners with several leading pharmaceutical companies to aid drug development.

Brain-gut Axis in Chemotherapy-induced Nausea and Emesis: Discovery of 5-HT3 and NK1 Receptor Antagonists

The introduction of cisplatin-based chemotherapy in the 1970s heralded a revolution in the treatment of cancer. However, cisplatin itself was associated with unacceptable nausea emesis in practically all patients. Metoclopramide's unique profile as a dopaminergic receptor antagonist to reduce nausea and emesis prompted a dissection of its pharmacology. The discovery of its additional action to block 5-hydroxytryptamine3 (5-HT3) receptors opened up a race to develop selective 5-HT3 receptor antagonists. In the late 1980s, ondansetron and granisetron and other 'setrons' were synthesised and their potential to reduce emesis via blocking 5-HT3 receptors was demonstrated in animals and man. There was still a problem of delayed nausea and emesis – the resistant mechanism was unknown. This led to the search for 'broad inhibitory' anti-emetics that could work against a number of disparate challenges, with a view suppress unidentified mechanisms active during delayed emesis. A model of cisplatin-induced acute and delayed emesis was developed that identified the anti-emetic potential of NK1 receptor antagonists such as aprepitant. Nausea still remains a problem for many patients and the recent use of techniques to decode the action of drugs on gastrointestinal slow waves using artificial intelligence opens up new possibilities for screening drugs that may have a clinical utility.

Prof. Woody Chan

B.Sc. (Hons.), M.Phil., Ph.D., C.Biol., M.I.Biol.
Professor and Associate Director (Graduate Education), School of Biomedical Sciences, Faculty of Medicine, The Chinese University of Hong Kong
Chief, Developmental and Regenerative Biology Thematic Research Programme, School of Biomedical Sciences, Faculty of Medicine, The Chinese University of Hong Kong
Head, Graduate Division of Biomedical Sciences and Graduate Division of Medicine, The Chinese University of Hong Kong
Co-Director of Center for Neuromuscular Restorative Medicine Limited

Professor Woody Chan completed his Bachelor and Master degrees in Biochemistry in the Department of Biochemistry and Ph.D. in Basic Medical Sciences in the Department of Anatomy of the Chinese University of Hong Kong. He is currently Professor and Associate Director (Graduate Education) of the School of Biomedical Sciences at the Chinese University of Hong Kong. He is also Chief of the Developmental and Regenerative Biology Thematic Research Programme in the School of Biomedical Sciences, Head of the Graduate Division of Biomedical Sciences and Graduate Division of Medicine, and Associate Head of Shaw College. He is also the Co-Director of one of the InnoHK Centres, Center for Neuromusculoskeletal Restorative Medicine.

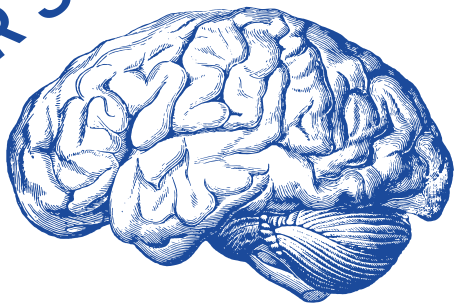
Professor Chan is a renowned expert in developmental, regenerative, and stem cell biology. His research interests focus mainly on the early development of nervous systems of both mouse embryos and human fetuses shortly after implantation to the uterus. Recently, his research focuses more on the migration and differentiation of neural crest cells in post-implantation mouse embryos, the pre- and post-natal development of the rodent enteric nervous system, stem cell therapy for congenital gastrointestinal motility disorders such as Hirschsprung's disease, and also teratogenic effects of bioactive compounds.

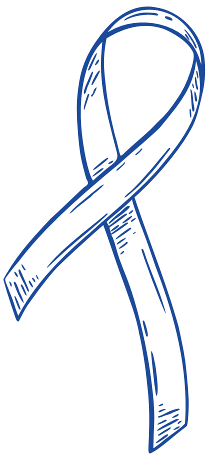
Stem cell-based therapy for congenital gut motility disorder: An animal study on Hirschsprung's disease

Hirschsprung's disease (HSCR) is a common congenital gastrointestinal motility disorder characterized by regional absence or reduction of enteric neurons in the colon. It has been known that all intrinsic enteric neurons are derived from neural crest cells (NCCs) during early embryonic development. In this study, we used Dominant megacolon mice, which carry a Sox10 mutation, as an animal model of HSCR to explore the potential of stem cell-based therapy with iPSC-derived NCCs for HSCR. We first derived iPSCs from embryonic skin fibroblasts of wild type (Sox10+/+) and homozygous (Sox10Dom/Dom) mice, and corrected the Sox10 mutation in Sox10Dom/Dom iPSCs with CRISPR/Cas9 gene editing to change them to Sox10Cor/Cor iPSCs. Next, we developed an induction protocol to induce NCCs (iNCCs) from mouse iPSCs in vitro. Last, we transplanted these iNCCs to the colon of mutant mice and found that transplanted iNCCs formed a network of enteric neurons in the host myenteric plexus. In conclusion, we were able to reprogram skin fibroblasts into iPSCs, correct the gene mutation in mutant iPSCs, induce NCCs from iPSCs and then transplant iNCCs to the colon to form enteric neurons.

The work was supported by grants from the Research Grants Council of Hong Kong Special Administrative Region, China (General Research Fund: CUHK14102214, CUHK14118818 CUHK14120522, and Theme-based Research Scheme: T12C-714/14-R), and the research fund from Health@InnoHK program launched by Innovation and Technology Commission, the Government of Hong Kong Special Administrative Region, China.

OUR SPEAKERS





PAEDIATRIC NEURO-ONCOLOGY

Prof. Ching Lau

BA, MD, PhD
Director, Center for Cancer and Blood Disorders, Connecticut Children's Specialty Care Center
Martin J. Gavin Chair of Hematology and Oncology, Connecticut Children's Specialty Care Center
Professor, Jackson Laboratory for Genomic Medicine
Division Head, Division of Paediatric Hematology-Oncology, Department of Paediatrics, University of Connecticut School of Medicine

Professor Ching Lau developed a great love for cancer biology and paediatrics during his clinical rotations as a medical student, which he integrated together to specialize in paediatric hematology and oncology. As both a caring physician and a passionate researcher, Professor Lau is fascinated by the complexity of hematology and oncology that lies beneath diseases that may seem simple and straightforward. With his job as a paediatrician, he believes there is great, tangible value in the long-lasting influence that his care brings onto the lives of young children.

Professor Lau has devoted a large portion of his career into researching paediatric bone and brain tumors, hoping to better understand and develop therapeutic approaches for patients using genomic technology. His many investigations that combine in silico drug screening, animal models, and genomic medicine have contributed to the acceleration and success of many clinical trials. His recent study draws limelight onto the complex genomics behind brain tumors, and a novel genetic approach to the treatment of these tumors that are common, yet difficult to treat. Ultimately, Professor Lau hopes to be able to offer an expanded series of therapies for brain tumors. He hopes that by being able to select the best treatment for each patient, doctors will be able to promote speedy treatment, better outcomes, and reduced side effects.

As a leading researcher of medical genetics and cancer biology, Professor Lau is also involved in active liaison with industry and academia all around the world. This team of investigators envision an online cloud-based platform where data from international institutions can be shared and integrated, striving towards the overarching goal of treating brain tumors.

Prof. Michelle Monje

MD, PhD (Neuroscience, Stanford University)
Professor, Department of Neurology and Neurological Sciences, Stanford University
Professor (By courtesy), Department of Neurosurgery, Stanford University
Professor (By courtesy), Department of Paediatrics, Stanford University
Professor (By courtesy), Department of Pathology, Stanford University
Professor (By courtesy), Department of Psychiatry and Behavioral Sciences, Stanford University
Investigator, Howard Hughes Medical Institute

Professor Michelle Monje is a world-renown neuro-oncologist and an ardent researcher of neuron-glial interactions in neurological diseases. Her current research draws focus onto the growth and development of healthy and cancerous cells in the brain and how these shape the brain's structure and function. Her team has previously found that the neuronal activity regulates the function of myelin forming cells, which in turn influence neurological function - simultaneously, it also regulates malignant activities that can lead to the onset of gliomas. This pioneering research has posed immense influence on current ongoing research into malignant gliomas, and was awarded the Richard Lounsbery Award presented by the National Academy of Science. Rooting in these findings, Professor Monje's research aims to identify the biological mechanisms that influence myelin plasticity, as well as the complex molecular mechanisms behind maladaptive myelination and their role in the expression of diseases.

As a leading researcher, she leads a team at the Monje Lab which focuses on investigating the critical nature of healthy and mature neural circuits for the growth of new glial cells that support neurons, creates synapses, and myelination - her team believes that these circuits are key for the execution of cognition and motor functions. As such, by investigating the molecular and cellular mechanisms of postnatal brain development, the Monje Lab aims to explore how the neural microenvironment interacts with neural precursor cells to induce development, and how this dysfunction of neural precursor cells can lead to brain tumors. Moreover, through her collaborative projects with other laboratories, Professor Monje identified a specific molecule that lies on the surface of gliomas that can be targeted with a specialized form of T-cell therapy. This ground-breaking finding has opened several doors for further explorations and clinical trials for various treatments against gliomas.

Her work extends beyond the laboratory as she contributes to the advisory boards of multiple research and charity organisations including the Paediatric Brain Tumor Consortium and the Alex's Lemonade Stand Foundation for Childhood Cancer. Furthermore, as a member of the editorial board for the scientific journals Cancer Cell and Neuron, Professor Monje continues to make active contributions towards the medical community and the overarching goal of devising tumor therapies.

Neuron-glial Interactions in Gealth and Disease: from Cognition to Cancer

In the central nervous system, neuronal activity is a critical regulator of development and plasticity. Activity-dependent proliferation of healthy glial progenitors, oligodendrocyte precursor cells (OPCs), and the consequent generation of new oligodendrocytes contributes to adaptive myelination. This plasticity of myelin tunes neural circuit function and contributes to healthy cognition, while disruption of myelin plasticity contributes to cancer therapy-related cognitive impairment. The robust mitogenic effect of neuronal activity on normal oligodendroglial precursor cells, a putative cellular origin for many forms of glioma, suggests that dysregulated or "hijacked" mechanisms of myelin plasticity might similarly promote malignant cell proliferation in this devastating group of brain cancers. Indeed, neuronal activity promotes progression of both high-grade and low-grade glioma subtypes in preclinical models. Crucial mechanisms mediating activity-regulated glioma growth include paracrine secretion of BDNF and the synaptic protein neuroligin-3 (NLGN3). NLGN3 induces multiple oncogenic signaling pathways in the cancer cell, and also promotes glutamatergic synapse formation between neurons and glioma cells. Glioma cells integrate into neural circuits synaptically through neuron-to-glioma synapses, and electrically through potassium-evoked currents that are amplified through gap-junctional coupling between tumor cells This synaptic and electrical integration of glioma into neural circuits is central to tumor progression in preclinical models. Thus, neuron-glial interactions not only modulate neural circuit structure and function in the healthy brain, but paracrine and synaptic neuron-glioma interactions also play important roles in the pathogenesis of glial cancers. The mechanistic parallels between normal and malignant neuron-glial interactions underscores the extent to which mechanisms of neurodevelopment and plasticity are subverted by malignant gliomas, and the importance of understanding the neuroscience of cancer.

Prof. Kathleen Millen

PhD (Medical Genetics, University of Toronto)
Professor, Department of Pediatrics, University of Washington School of Medicine
Associate Director and Principal Investigator, Center for Integrative Brain Research, Seattle Children's Hospital Research Institute

Professor Kathleen Millen's current research into the genetic basis of structural birth defects in the brain was rooted in her love for developmental biology, first inspired by her observations of a fertilized and dividing worm egg in real time, conducting undergraduate research. From then on, she has preformed avid research investigating the basic mechanisms that build the brain.

The long-term goal of her research program is to understand the developmental biology and genetic basis of developmental brain disorders combining the strengths of human and mouse genetics. Most of her work has focused on cerebellar disorders but has recently expanded to encompass disorders of human cerebral cortical development including brain growth disorders, epilepsy and hydrocephalus. She has made foundational discoveries regarding the genetic and developmental causes of human and mouse brain malformations, defining multiple novel and central regulators of brain development. Functional analyses of gene function in my lab have focused primarily on studies in mouse models. Most recently, we have identified a number of important features of developing human cerebellar progenitor zones as well as neuronal developmental trajectories that differ significantly from well-known rodent cerebellar developmental programs. These striking species differences have caused us to rethink the relevance of our mouse models of human cerebellar developmental disorders. They have also completely overturned our hypotheses regarding the developmental disruptions that cause human cerebellar developmental disorders, including cerebellar and posterior fossa tumors.

Cerebellum Development Gone Awry: Malformations and Medulloblastoma

Developmental disorders of the human cerebellum including structural birth defects and medulloblastoma are clinically significant and have long been modeled in mice. We recently described multiple aspects of human cerebellar development that differ significantly from the well-known developmental programs established from rodent studies and appear to be human specific. Most importantly we identified novel progenitors and niches which do not appear to be shared even with non-human primates. For example, we recently focused analyses on human cerebellar rhombic lip progenitors – the stem cells that all cerebellar glutamatergic neurons which represent 80% of all neurons of the human CNS. Our findings regarding progenitor trajectories and molecular programs challenge many prior mouse-centric hypotheses regarding the pathogenesis of cerebellar developmental disorders. In particular, by comparing single cell RNAseq data of native developing human cerebella to single cell data from medulloblastoma samples, we recently identified the previously elusive cells of origin of medulloblastoma groups 3/4 – the most mysterious, aggressive and common forms of this cerebellar developmental cancer. Our studies are informing in vitro cerebellar differentiation protocols for human pluripotent cells to model these tumors and developing new targeted therapeutics. The value of studying human development cannot be overemphasized. We can't model what we don't know.

Dr. Aya El Helali

MB BCh BAO (NU Irel), MRCP (Irel), Ph D (Medicine) (Belf)
Clinical Assistant Professor, Department of Clinical Oncology,
School of Clinical Medicine, the University of Hong Kong
President, Hong Kong Neuro-Oncology Society

Aya is a tenure-track Clinical Assistant Professor at the Department of Clinical Oncology, Li-Ka Shing Faculty of Medicine at the University of Hong Kong. She was conferred the MB BCh BAO degree from the National University of Ireland Galway in 2008 and graduated with first-class honors and gold medals in Medicine and Surgery. She was awarded the Sir Allen McClay Clinical Research Fellowship at the Stratified Medicine Group and conferred a Doctor of Philosophy (Ph.D.) by Queen's University Belfast in 2018. Her Ph.D. focused on stress-activated kinases, biomarker development, and early drug development.

She is a Medical Oncologist and Physician-Scientist with extensive experience in translational research, biomarker development, and cancer genomics. Her subspecialty areas are neuro-oncology, melanoma, and GI tract cancers. She is the principal investigator of several biomarker-driven first-in-human and early-phase trials. Aya serves as the President of the Hong Kong Neuro-Oncology Society.

Dr. Wan-Yee Teo

MBBS, FAAP, MRCPCH (UK), FRCP Edin, FAMS, PhD.
Assistant Professor | Duke-NUS Medical School | Cancer & Stem Cell Biology Program
Assistant Professor | Duke-NUS Medical School | Office of Education
Head and Principal Investigator | Paediatric Brain Tumor Research Office @SingHealth Duke-NUS Academic Medical Center
Clinician-Scientist | Division of Medicine | KK Women's & Children's Hospital
Elected Council, Treasurer | College of Clinician Scientists | Academy of Medicine, Singapore

Dr. Wan-Yee Teo, a clinician-scientist, is Head and Principal Investigator of the Paediatric Brain Tumor Research Office at SingHealth Duke-NUS Academic Medical Center (AMC), Singapore. As a leading researcher, she guides a team of investigators at SingHealth Duke-NUS AMC and her research focuses on translating basic science research on brain tumor microenvironment and genomics to bedside applications that directly influence the lives of patients. Her research combines genomic methodologies and mouse models to study the complex regulation in the developmental biology of brain tumors. An area of emphasis is the preclinical development of therapeutics for brain tumors using patient-derived orthotopic brain tumor xenograft modelling.
Amongst her many research projects, Dr. Teo's investigation on drug therapies for medulloblastoma opened new areas for further research into this aggressive and malignant form of brain tumor in children. She was first intrigued during her early years as a physician, by the complex genomic composition of medulloblastoma, with unique genetic fingerprints among different patients. Her team's investigation led to how the genomics of individual patients impact drug response. Dr. Teo was awarded the Singapore Ministry of Health-National Medical Research Council's Transition Award in 2016, Clinician-Scientist Award in 2019 and another Clinician Scientist Award in 2022. With her research into medulloblastomas and other forms of paediatric brain tumors ongoing, Dr. Teo envisions the development of treatment methods that can more accurately target brain tumors, reaching towards the ultimate goal of making paediatric brain tumor therapies more targetable and effective for a single tumor type among different patients.

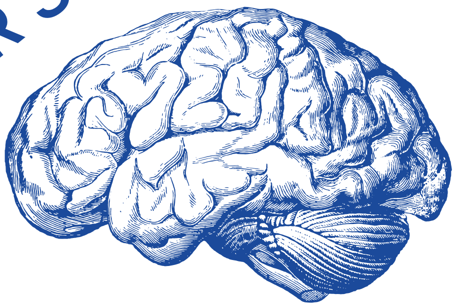
She completed her clinical training in Paediatrics and Paediatric NeuroOncology in the USA, and is board certified with the American Board of Paediatrics, and the Royal College of Paediatrics and Child Health in the UK. Her research training was completed in the Cancer Genomics Program at Baylor College of Medicine, USA.

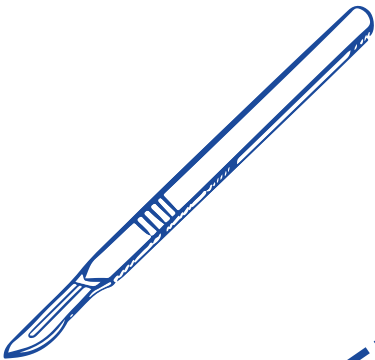
Drug Development for Paediatric Brain Tumors Using Patient-Derived Orthotopic Brain Tumor Xenograft Modelling

Embryonal brain tumor is a major research focus in our laboratory at Paediatric Brain Tumor Research Office, SingHealth Duke-NUS Medical Center in Singapore. Two major types of embryonal brain tumors exist – atypical teratoid rhabdoid tumor (ATRT) and medulloblastoma (MB). ATRT is a rare tumor and most frequently affects infants and young children, accounting for 15-20% of all brain tumors in children less than 3 years of age. It is an aggressive brain tumor and historical survival outcome is poor (10-20%, 5-year survival for patients <3 years old). More recent regimens incorporating high dose chemotherapy and peripheral blood stem cell rescue have improved survival. However, this improved survival was achieved at the cost of treatment toxicity with high dose chemotherapy and the subsequent requirement for peripheral blood stem cell rescue. High rates of treatment failure were observed in this trial.

MB is the most common malignant brain tumor in children. Paediatric MB is molecularly classified into 4 molecular subtypes: sonic-hedgehog (SHH)-activated MB, Wingless (WNT)-activated, and less characterized Group 3 and 4 subtypes. Group 3 and 4 MBs are most the aggressive subtypes with the worst survival outcome with standard of care regimens. Our laboratory has developed approaches to target ATRTs and Group 3 MBs.

OUR SPEAKERS





PAEDIATRIC NEUROSURGERY

Dr. Kevin Cheng

MBBS (HK), FRCSEd (SN), FCSHK, FHKAM (Surgery)
Chief of Service, Department of Neurosurgery, Queen Mary Hospital
Consultant, Department of Neurosurgery, Hong Kong Children's Hospital
Honorary Clinical Associate Professor, Division of Neurosurgery, The University of Hong Kong

Dr. Kevin Cheng is the Chief of Service of Department of Neurosurgery in Queen Mary Hospital and Consultant in Hong Kong Children's Hospital. He graduated from the University of Hong Kong in 2006. He completed his specialist training in Neurosurgery in 2014 and was awarded the J. Douglas Miller Medal in Neurosurgery by the Royal College of Surgeons of Edinburg. He was also the Distinguished Young Fellows at the Hong Kong Academy of Medicine in 2015. He received his Clinical Fellowship at The Hospital of SickKids in Toronto, Canada in 2017. His clinical and research interests over skull base surgery, paediatric neurosurgery, cerebral revascularization procedure and acute stroke care.

Surgical Revascularisation for Moyamoya Angiopathy

In paediatric moyamoya disease, it is difficult to diagnose due to variable clinical presentation and also difficult to manage.The only treatment proven effective is by cerebral revascularization, the most commonly adopted procedure is indirect bypass, while direct vessel anastomosis is technically challenging due to small vessel caliber in paediatric population. In my presentation we will share our experience in surgical management for this group of patients, the workup, the selection criteria for suitable surgical candidates, the peri-operative precautions and how we choose between different treatment options and finally the technical nuances we have encountered.

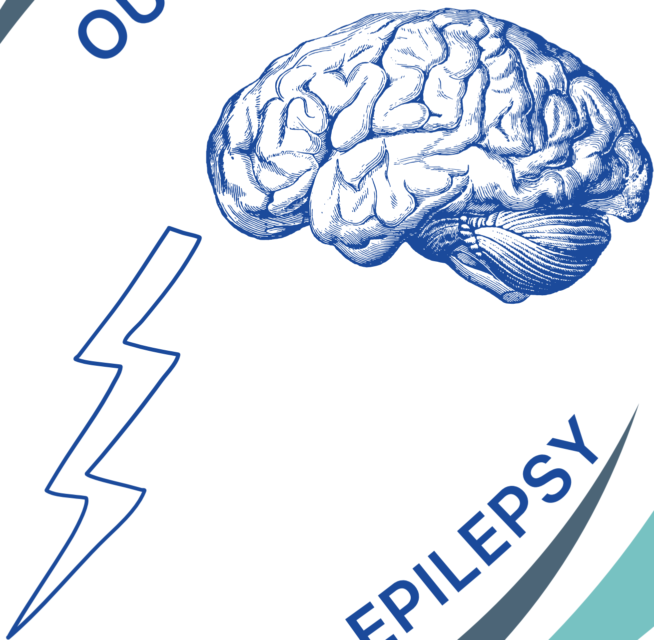
Dr. Hoi Tung Wong

MBChB (CUHK), FCSHK, FKAM (Surgery), FRCSEd (SN)
Consultant Neurosurgeon, Brain & Spine Consultant Clinic
Clinical Associate Professor (Honorary), Department of Otorhinolaryngology, Head and Neck Surgery, Faculty of Medicine, The Chinese University of Hong Kong
Clinical Associate Professor (Honorary), Department of Surgery, Faculty of Medicine, The Chinese University of Hong Kong

Dr. Hoi Tung Wong is a noble alumnus of the Chinese University of Hong Kong, and has been devoted to his work as a neurosurgeon since 2013. As both a specialist in Neurosurgery and Clinical Associate Professor, Dr. Wong is actively involved in serving the general community through healthcare and in nurturing the future generation of physicians. He is also a diligent advocate for common, yet life-altering neurological conditions such as scoliosis, cerebellar lesions, and brain cancer - his passion to raise awareness surrounding such diseases are observable through his numerous articles and radio programme interviews published and broadcasted locally, demonstrating how his reach extends to discuss public health issues surrounding neurological diseases in Hong Kong.

Dr. Wong also previously served as Deputy Chief of Service at Kwong Wah Hospital, Hong Kong.

OUR SPEAKERS



PAEDIATRIC EPILEPSY

Prof. Eric Kossoff

Professor of Neurology and Paediatrics, Johns Hopkins University School of Medicine
Director, Child Neurology Residency Program
Medical Director, Ketogenic Diet Program

Dr. Kossoff received his medical degree from SUNY at Buffalo School of Medicine in New York. He went on to complete a residency in paediatrics at Eastern Virginia Medical School in Norfolk, Virginia, in child neurology and paediatric epilepsy at The Johns Hopkins Hospital in Baltimore, Maryland where has he been since 1998.

Dr. Kossoff is a Professor of Neurology and Paediatrics at the Johns Hopkins University School of Medicine. He focuses on the diagnosis and treatment of childhood seizures and epilepsy, particularly treatments other than medications such as diet, neurostimulation, and surgery. He is one of the world's experts on dietary treatment for epilepsy (ketogenic diet) and lectures around the world about this therapy. His specific research interests include the ketogenic diet, the modified Atkins diet for children and adults, infantile spasms, the interaction of migraine headaches with epilepsy, and Sturge-Weber syndrome.

Dr. Kossoff is also very involved in education and is the Director of the Paediatric Neurology Residency Program. He is a co-author of the 7th edition of Ketogenic Diets. He helped found the new society INKS (International Neurologic Ketogenic Society) and is the chair of the Education Committee. He is considered one of the world experts on dietary treatment for epilepsy.

Dietary Treatment of Childhood Epilepsy

For over 100 years, ketogenic diet therapy has been used for intractable epilepsy in children. In 2023, these treatments are a mainstream, highly effective therapy for epilepsy and the 8th Global Symposium on Ketogenic Therapies was just held in San Diego, California, USA in September. Diet therapy is especially effective for Glut1 deficiency syndrome, infantile spasms, Dravet syndrome, refractory status epilepticus, and epilepsy with myoclonic atonic seizures. Several ketogenic diets exist including the classic ketogenic diet, modified Atkins diet, MCT and low glycemic index therapy. There are various methods of starting and maintaining in order to improve efficacy and provide flexibility to centers and families. Most side effects are gastrointestinal and can be prevented with supplements. New innovations include use for adults, new onset epilepsy, and neurologic conditions other than epilepsy.

Dr. Elaine Wirrell

B.Sc. (Hons.), M.D. (Hons.), FRCSC (Paediatrics), FRCSC (Neurology), FAAN
Professor of Neurology, Mayo Clinic
Consultant, Department of Neurology, Mayo Clinic
Chair, Division of Child and Adolescent Neurology, Department of Neurology, Mayo Clinic

Dr. Elaine Wirrell is the director of paediatric epilepsy and professor of neurology at the Mayo Clinic in Rochester, Minnesota. She completed medical school at the University of British Columbia and her paediatric neurology training at Dalhousie University in Halifax, Nova Scotia.

Dr. Wirrell's main research interests are in early onset, medically intractable epilepsies, and epileptic encephalopathies, with a focus on early diagnosis, treatment, causes and outcomes. She is also interested in the detection and management of common comorbidities in paediatric epilepsy. Dr. Wirrell is co-founder of the Paediatric Epilepsy Research Consortium, a multicenter U.S. group of clinicians that focuses on epilepsy in children.

Dr. Wirrell is the former chair of the Paediatric Content Committee at the American Epilepsy Society. She chairs the Medical Advisory Board of Lennox-Gastaut Foundation. She is also a member of the Medical Advisory Board for the Dravet Syndrome Foundation.

Dravet Syndrome: Diagnosis and Management

Dravet syndrome is a developmental and epileptic encephalopathy that usually onsets in the first year of life with seizures that are often prolonged, associated with fever and hemiconvulsive. More than 90% of patients will be found to have a pathogenic SCN1A variant. Patients are at risk of recurrent status epilepticus particularly in the early childhood years.

While most are developmentally normal at time of initial presentation, with time variable degrees of intellectual disability are seen. Additionally patients are at risk of other comorbidities including crouched gait, behavior and sleep problems. There has been a recent International consensus to guide management of persons with Dravet syndrome.

There has also been several randomized placebo controlled trials which have documented efficacy of fenfluramine, stiripentol and pharma-grade cannabidiol.

In caring for a child with Dravet syndrome, attention to both seizure control as well as management of comorbidities is critical.

OUR SPEAKERS

NEUROPSYCHOLOGY & MENTAL HEALTH

Prof. Nafissa Ismail

Associate Professor
Post-Doctoral Fellowship, Neuroendocrinology, University of Massachusetts, Amherst, 2012
Ph.D., Psychology, Concordia University, Montreal, 2009
M.A., Psychology, Concordia University, Montreal, 2005
B.Sc., Neuroscience, Concordia University, Montreal, 2002

Dr. Nafissa Ismail is a Full Professor at the School of Psychology at the University of Ottawa and the holder of a University Research Chair in Stress and Mental Health. She obtained her PhD from Concordia University in 2009. She then completed a post-doctoral fellowship at the University of Massachusetts and joined the University of Ottawa in 2012. Her research expertise is in Neuroimmunology and Neuroendocrinology. She was awarded Young Researcher of Year by the University of Ottawa in 2017 and the Early Researcher Award by the province of Ontario in 2018. In 2021, she was awarded the prize for activity in the media and in the community by the Faculty of Social Sciences. She is also a member of the Global Young Academy (2020) and she was inducted to the College of New Scholars, Artists and Scientists of the Royal Society of Canada (2022).

The Relationship between Hormones in Critical Periods of Development and Social Behaviors, Depression, and Cognition

Puberty is a sensitive and vulnerable period to environmental stress. Exposure to certain stressors during this period has been associated with mental illnesses like depression and anxiety. For example, exposure to the bacterial endotoxin lipopolysaccharide (LPS) during puberty results in enduring depression-like behavior in females and anxiety-like behavior in males, alters stress-reactivity and as well as glucocorticoid and toll-like receptor 4 expressions in the brain.

Pubertal stress also alters the gut microbiota differently in males and females. However, it was not known whether colonizing the gut with probiotic bacteria could mitigate the effects of pubertal LPS treatment on the brain and behavior. Therefore, we investigated the sex-dependent enduring effects of pubertal probiotic treatment on stress-induced changes in the brain and behavior.

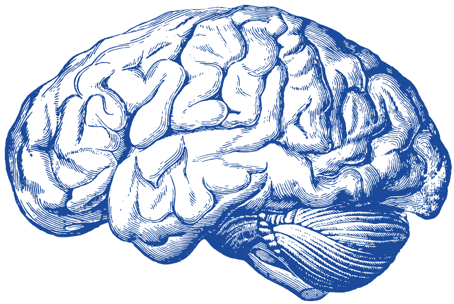
As of 5 weeks of age, mice were exposed to a probiotic solution or a control broth for 2 weeks. At six weeks of age, male and female mice were treated with either saline or LPS. Sickness behavior was measured over 48 hours. Once mice reached adulthood, they were exposed to a battery of tests to examine depression-like and anxiety-like behaviors. Brains were perfused and immunohistochemistry was performed to examine glucocorticoid receptor expression and toll-like receptor 4 expression. We found that pubertal probiotic treatment changed the acute immune response and sickness behavior in a sex-specific manner and mitigated the effect of pubertal immune challenge on the neural mechanisms involved in stress and immune responses, such as glucocorticoid and toll-like receptor 4 expressions. Pubertal probiotic treatment also blocks stress-induced depression-like and anxiety-like behaviors in males and females. These findings show that the gut-brain axis plays an important role in the development of mental illness during puberty and that manipulation of the gut-brain axis with probiotics can lead to a resilience to stress-induced mental illnesses in males and females.

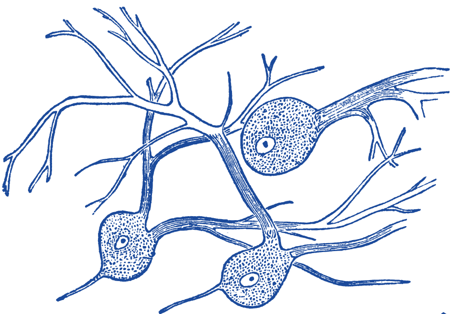
Dr. Frances Jin

Ph.D in Clinical Psychology, 2018, Stony Brook University
B.S. in Psychology, 2011, The University of Iowa
Assistant Professor, Department of Psychology, the University of Hong Kong

Dr. Frances Jingwen Jin is an Assistant Professor at the Department of Psychology at the University of Hong Kong (HKU). She received her Ph. D in Clinical Psychology from Stony Brook University in 2018. Her research targets the intersection between emotion and cognition, investigating the psychological and neural mechanisms of anxiety and depression. She is the Principal Investigator of the Psychopathology, Affective Neuroscience & Decision Making Laboratory (PANDM Lab) at HKU. Her team focuses on decision making, using behavioral experiments, neuroimaging, and computational tools. By examining the decision making processes, they hope to contribute to better understanding of the computational mechanisms behind healthy and abnormal emotional experiences. She is also a Licensed Psychologist, New York State, USA since 2020.

OUR SPEAKERS





RARE NEUROLOGICAL DISEASES

Dr. Brian Chung

MBBS (HK), MSc (Genomics and Bioinformatics) (CUHK), MD (HK), MRCPCH, DCH (Ireland), FHKAM (Paediatrics), FHKCPaed, FRCPCH (UK), FCCMG
Clinical Associate Professor, Department of Paediatrics and Adolescent Medicine, School of Clinical Medicine, the University of Hong Kong
Honorary Consultant Geneticist, Hong Kong Children's Hospital
Honorary Consultant Geneticist, Queen Mary Hospital

Dr. Brian Hon-Yin Chung is a Clinical Associate Professor at the Department of Paediatrics and Adolescent Medicine at HKUMed. Specialized in Clinical Genetics and Genomics, Dr. Chung is interested in research fields including the medical application of whole genome technologies, clinical genetics & genetic counselling, and epigenetics. In recognition of his expertise in these areas, Dr. Chung was awarded the Best Young Investigator Prize by the Hong Kong College of Paediatricians in 2017, the Sir Patrick Manson Gold Medal in 2018, and the Best Paper Award in the 2019 World Federation for Medical Education World Conference.

As a dedicated educator, Dr. Chung was recognized for his efforts in teaching. He was awarded the 2018 Faculty Teaching Medal and the 2019 Outstanding Teaching Award by The University of Hong Kong. Apart from teaching, Dr. Chung also takes up other responsibilities in the field of Genetics and genomics. He is currently the President-Elect of the Asia Pacific Society of Human Genetics and the Chief Scientific Officer at the Hong Kong Genome Institute.

The Role of Whole Genome Sequencing in the Diagnosis and Treatment of Neurological Disorders among Children

Precise diagnosis of neurological disorders among children has been considered challenging due to masking of classical symptoms in developing nervous system and growth of child, unspecific symptoms or genetic heterogeneity.

Technical challenge of testing for complex and repetitive genetic variants with conventional methods also contributes to prolonged diagnosis or often underdiagnosis in children without a family history of neurological disorders.

With the rapid advancement in next-generation sequencing and bioinformatics technologies, whole genome sequencing (WGS) has recently been proven in large genome project to diagnose neurological disorders quickly and accurately, supporting its use as a standard diagnostic tool within routine clinical practice.

The Hong Kong Genome Project (HKGP), the first large-scale WGS initiative in Hong Kong, was launched to serve as a catalyst to advance the development of genomic medicine in Hong Kong. The HKGP aims to conduct WGS for 40,000 – 50,000 genomes in five years and focuses on the key areas of: undiagnosed diseases, hereditary cancers and cases related to genomics and precision health. The framework of HKGP as well as experiences of how WGS can benefit paediatric patients with neurological disorders and their families with a precise diagnosis and treatment will be shared.

Prof. Edwin Chan

Professor, School of Life Sciences, CUHK
Director, Biochemistry Programme, CUHK
Deputy Director, Natural Sciences Programme, Faculty of Science, CUHK
Director, Laboratory of Drosophila Research, CUHK
Co-Founder, Rare Power Limited

Professor Edwin Chan represents the field of rare disease academia as the Director of CUHK's Laboratory of Drosophila research, and is also a renowned professor of the School of Life Sciences at the Chinese University of Hong Kong. He is an avid researcher of molecular genetics, focusing on neurodegenerative and neuromuscular diseases, giving hope to many rare disease patients, particularly sufferers of spinocerebellar ataxia (SCA) and other PolyQ diseases. One of his most significant investigations led him to identify the gene causing SCA40, a novel subtype of SCA. Dr. Chan's research has been extended into the active translation of this knowledge about SCA disease mechanisms for the development of novel drug therapies that target SCA. More specifically, his ongoing project as part of the Nexus of Rare Neurodegenerative Disease (NRND) alongside professors, researchers, and doctors from all across the globe, particularly Professor Knud Jensen from the University of Copenhagen, aims to develop a peptide drug that can block the nuclear pathway via which an RNA hijacks cells and causes neuronal deaths in SCA patients.

Moreover, Professor Chan has extended his reach into the field of academia by serving as an editor for various world-renown journals, including Advances in Alzheimer's Disease, RNA and Disease, and Frontiers in Cellular Neuroscience. He simultaneously holds several research patents, pioneering even more profound research into rare neurological diseases.

Dr. Sophelia Chan

MBBS(HK), MRCP(UK), MMedSc(HKU), FHKAM(Paed), FHKCPaed
Clinical Assistant Professor, Department of Paediatrics and Adolescent Medicine, School of Clinical Medicine
Honorary Consultant, Department of Paediatrics, the University of Hong Kong-Shenzhen Hospital
Honorary Associate Consultant, Department of Paediatrics and Adolescent Medicine, Queen Mary Hospital
Honorary Associate Consultant, Department of Paediatrics and Adolescent Medicine, Hong Kong Children's Hospital

Dr. Sophelia Hoi-Shan Chan is a Clinical Assistant Professor at the Department of Paediatrics and Adolescent Medicine, School of Clinical Medicine, the University of Hong Kong. After undergoing her subspecialty training in Developmental Behavioural Paediatrics and Paediatric Neurology, Dr. Chan completed her Paediatric Rehabilitation Clinical Fellowship, a Paediatric EMG lab attachment, and Paediatric Myology Clinical and Research Fellowship in the New England Medical Centre under the Tuft University, the Children's Hospital in Boston, and the Dubowitz Neuromuscular Centre in the Great Ormond Street Hospital in London respectively. She is currently an Honorary Consultant at The University of Hong Kong-Shenzhen Hospital and an Honorary Associate Consultant at Queen Mary Hospital and Hong Kong Children's Hospital respectively.

With her expertise in Paediatric Neurology and Developmental Behavioural Paediatrics, Dr. Chan's research work mainly focuses on studying rare neurological diseases, especially rare neuromuscular diseases and immune-mediated neurological disorders, both clinically and pre-clinically. With her interest in neuromuscular diseases, she leads the study on clinical trials of spinal muscular atrophy and Duchenne muscular dystrophy as the principal investigator. In 2009, she launched the Paediatric Neuromuscular Disorder Program, leading a multi-speciality team in the Queen Mary Hospital and Duchess of Kent Children's Hospital to work on novel diagnosis, treatment and management of paediatric rare neuromuscular diseases. In recognition of their achievement in the field, her Paediatric Neuromuscular Team was awarded the Outstanding Team Award at the 2016 HK Hospital Authority Convention.

Current and Emerging Therapies for Duchenne Muscular Dystrophy and Spinal Muscular Atrophy Bring New Hope

Advancements in gene discovery and therapeutic development have significantly impacted neuromuscular medicine. Spinal muscular atrophy (SMA) and Duchenne muscular dystrophy (DMD) are monogenic neuromuscular diseases caused by loss-of-function mutations, often diagnosed early in life, with progressive deterioration, severe debilitation, and shortened survival. SMA is caused by the deletion of the SMN1 gene, while DMD results from mutations in the DMD gene. DMD mutations lead to a loss of dystrophin protein, causing severe muscle weakness, cardiac and respiratory failure, and early death. In SMA, the loss of SMN protein leads to ongoing motor neuron degeneration, with disease severity modified by SMN2 protein synthesis. This talk will elucidate the introduction of antisense oligonucleotides that alter pre-messenger RNA splicing (as in nusinersen for SMA and exon-skipping therapies for DMD), gene replacement therapies (for SMA and DMD), and other therapeutic approaches. These emerging therapies offer hope for improved survival, better treatment outcomes, and quality of life for individuals affected by these debilitating neurogenetic conditions.

中國科學院香港創新研究院-人工智能與機器人創新中心

Centre for AI and Robotics (CAIR), Hong Kong Institute of Science & Innovation, Chinese Academy of Sciences

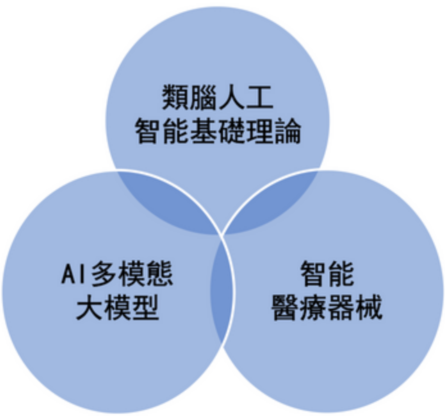
- 中國科學院在香港設立的首個人工智能領域的國家級科研機構
- 中國科學院與香港政府共同出資，中國科學院自動化研究所籌建
- 入選香港InnoHK計劃-為14家人工智能領域的InnoHK中心之一
- 與英國倫敦國王學院共建 HK MedTech Hub 醫療科技實驗室

2019

2022.5

2022.7

中心科研聚焦方向



中国科学院自动化研究所
INSTITUTE OF AUTOMATION
CHINESE ACADEMY OF SCIENCES

INNOHK

中心致力打造的人工智能體(Embodied AI)手術室平臺彙聚了諸如AI增强現實、微創手術機器人、手術AI大模型、手術數字孿生等先進技術。其中包括：

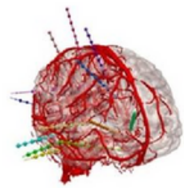
MicroNeuro：聯合香港中文大學神經外科成功研發世界上首個應用于微創腦手術的柔性神經外科機器人系統。 MicroNeuro榮獲首屆**“中銀香港科技創新獎”**。

2022.7.6 特首李家超
參觀中心科研成果

2022.9.19 第一次預臨床
實驗現場

2022.11.03 第二次預臨床實驗
MicroNeuro團隊合影

NeuroNav：與**倫敦國王學院**聯合開發的全球首個基于物理實時模擬的腦外科手術規劃軟件系統。腦外科手術模擬器可用于外科手術訓練、術前計劃和術中預測。

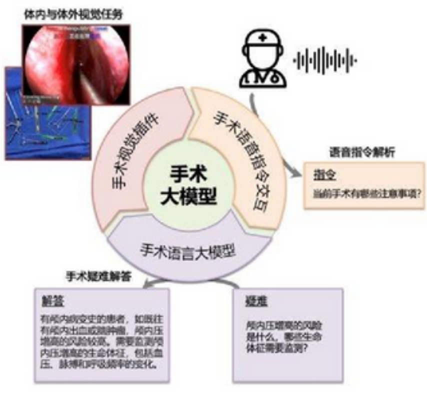


多模態手術大模型CARES Copilot ：

基于多模態手術數據，可完成術中實時影像智能識別、CT/超聲多模態配准、內窺鏡下以及手術室攝像機下場景理解等手術任務。

8月8日與華爲簽署手術大模型合作開發備忘錄；

9月21日在HUAWEI CONNECT 2023上首發並演示。



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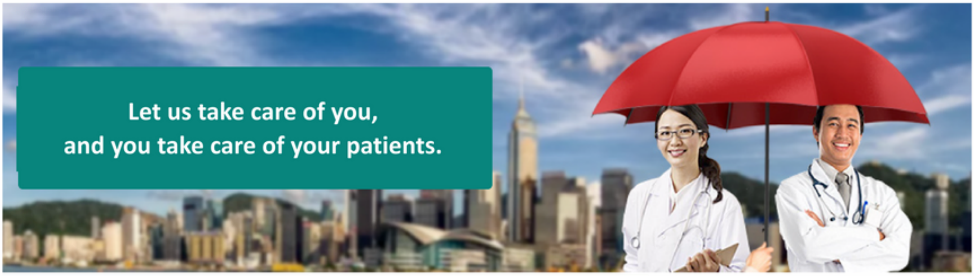
For all Medical Specialists



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Targets	➢ Public, government and private doctors ➢ Private clinics, medical groups, NGO dental clinics, veterinarians, dentists, therapists
Coverage	➢ Cover all medical negligence expenses and all legal advice and representation
Why MPPS?	➢ A genuine insurance contract that doctor's rights are stipulated in the legally binding policy contract, not on discretional basis ➢ Services are subject to stringent governance of the Insurance Authority ➢ With the prime objective to bring in optimum market competition, the overall medical professional indemnity premium has cut down substantially
Period of Protection	<u>Specific to Public and Government Doctors only:</u> As a "claims-made basis" insurance, when an insured member has paid five years of premium or above immediately prior to ceasing to be a member, the company agrees to protect him/her on an occurrence basis in their lifetime for incidents during his/her insured period.