ACADEMIC ACTIVITIES

B-CAT #21 Recap

Novel Molecular Imaging Technologies and Their Application in Disease Theranostics

B-CAT Meeting #21 was hosted by Prof. Zhen YUAN on 4 July 2018 (Wednesday). He shared his views on the novel molecular imaging technologies and their applications in disease theranostics.

Photoacoustic tomography/microscopy, fluorescence imaging, and optical coherence tomography are non-invasive, non-ionizing, and inexpensive monitoring and imaging techniques that use near-infrared light to probe tissue physiological properties. Regional variations in oxy- and deoxy-hemoglobin concentration as well as blood flow can be imaged by monitoring spatial-temporal variations in the optical or acoustic properties, giving optical imaging methods the special ability to directly measure the hemodynamic, metabolic, and tissues and organs activation with a high spatial and a temporal resolution as well as a good penetration depth. These capabilities make optical imaging technologies a unique stand-alone imaging tool and useful complement to MRI and CT in studies of normal physiology and pathology.

In this talk, Prof. Yuan mainly talked about his recent research work on the development of novel and functional biomedical optical imaging technologies including fluorescence imaging, molecular imaging and nanoprobe development, photoacoustic imaging/microscopy, and optical coherence tomography. It almost covers the major aspect of Prof. YUAN's research advances in molecular imaging and cancer theronotics—from physics, chemistry, reconstruction algorithms, instrumentation to *in vitro*, preclinical and clinical biomedical applications.

Publications of the week

1. Xia, Y., Zhang, H., Zhu, X., Zhang, Q., Fang, M., Li, X., Zhou, H., Yang, X., Zhang, X., and Tian, Y. (2018) Two-photon fluorescent probe with enhanced absorption cross section for relay recognition of Zn^{2+}/$P_2O_7^{4-}$ and *in vivo* imaging. *Spectrochim Acta A Mol Biomol Spectrosc* **204**, 446-451

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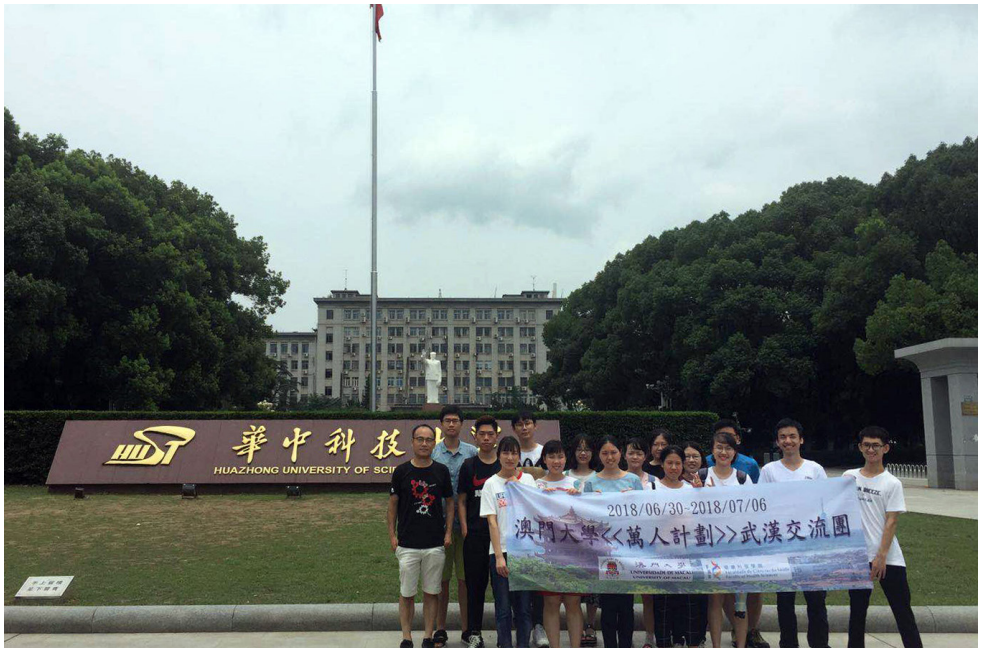
FHS NEWS

"10,000 Scheme" Tour: Wuhan came to a fruitful end on 5 July 2018

The "10,000 Scheme" Tour in Wuhan sponsored by the Ministry of Education, led by Prof. Guokai CHEN and Prof. Gang LI, came to a fruitful end on 5 July 2018. FHS students and professors toured the Huazhong University of Science and Technology and the Tongji Medical College Campus History Museum together with the students from Tongji Medical College. They also visited the Hubei Institute of Drug Control. Students and professors exchanged their experience and knowledge throughout the tour.



FHS NEWS

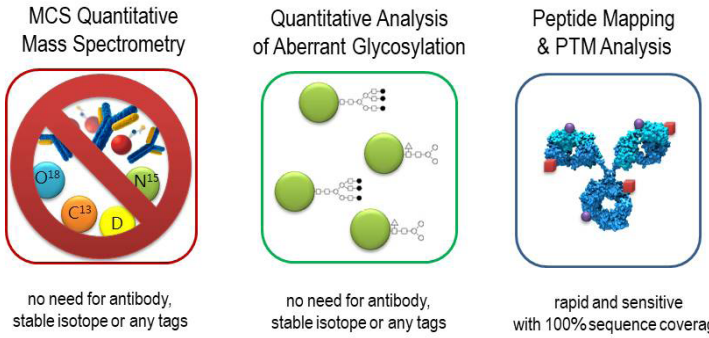
"10,000 Scheme" Tour: Shanghai, where old meets new

On the other side, Prof. Lijun DI and Prof. Qi ZHAO led seventeen students to join the "10,000 Scheme" Tour in Shanghai sponsored by the Ministry of Education. FHS students and professors experienced the ancient art of accupuncture and toured the Suzhou High-tech Industrial Development Zone. Their tour continues till next week.

SPECIAL FEATURES

A Closer look: FHS teams in the "Fosun Protechting" Global Innovation and Entrepreneurship Competition (Part 1)

TMASS: Next Generation Protein Tests



The three core technologies invented by Prof. Poon's team

Basic research and real-world applications coexist in a tangled two-way. With the recent advances in high-throughput technologies, various proteins have been discovered as potential disease biomarkers. The uses of antibodies or stable isotope-labeled internal standards are associated with high cost and long time when developing a new protein test.

To combat the current market's lack of solution to meet the following needs: 1) protein tests for the newly discovered biomarkers for an effective translation of laboratory discoveries to clinical applications; 2) efficient quantitative tests of the disease-specific protein variantes for diagnostic purposes; 3) efficient and simple methods for the quality control of the protein-based drugs and supplements that are gaining popularity in the commercial market, Professor POON's team successfully invented three core technologies with seven patent applications in process. These innovations do not require the use of antibodies and stable isotopes, solving the issues of high cost, long development time and insufficient accuracy. One of them can even obtain a complete picture of protein sequence and modifications of any protein-based products within 4 hours, whereas existing technologies generally takes a week.

TMASS Technology Co., Ltd. was founded in April 2018, and has launched the business project, "Next Generation Protein Analytical Products and Services for Clinical and Research Markets". TMASS targets the global clinical and research market, and offers one-stop solutions, assay kits, services and consultations for protein test development, protein biomarker quantification and protein sequence/modification analysis to medical/biotech technologists and biomedical researchers. The project has recently received the Fosun Protechting Award 2018 and IEEAC Award 2018 at the Parafuturo de Macao Innovation and Entrepreneurship Competition in May 2018.

Prof POON's project has been selected for intensive incubation at the Centre for Innovation, the University of Macau (R to L: Kate Lei, Rui Wei, Dr. Desmond Hau, Prof. Terence Poon, Dr. Ang Ling)

ORAL DEFENSE

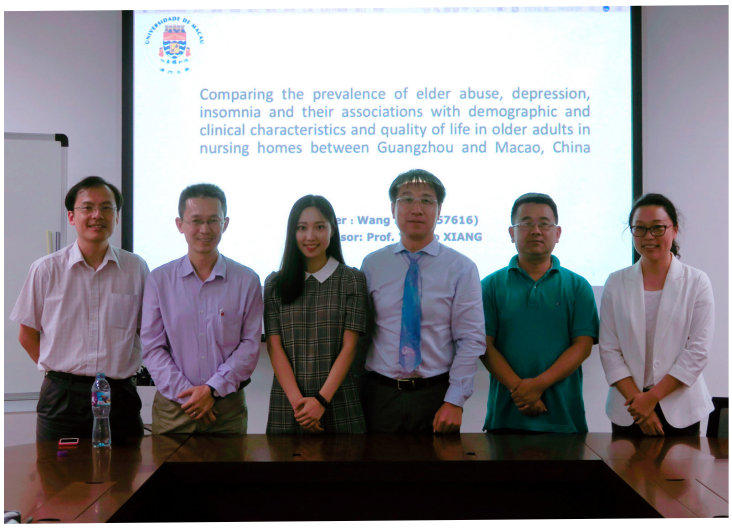
PhD Oral Defense by Wen ZHANG of Prof. Kin Yip TAM's group

Ms. Wen ZHANG, supervised by Prof. Kin Yip TAM, has completed her PhD Oral Defense on 2 July 2018 (Monday). The title of her thesis was "Identification of novel pyruvate dehydrogenase kinase 1 (PDK1) inhibitors for anticancer therapeutics".

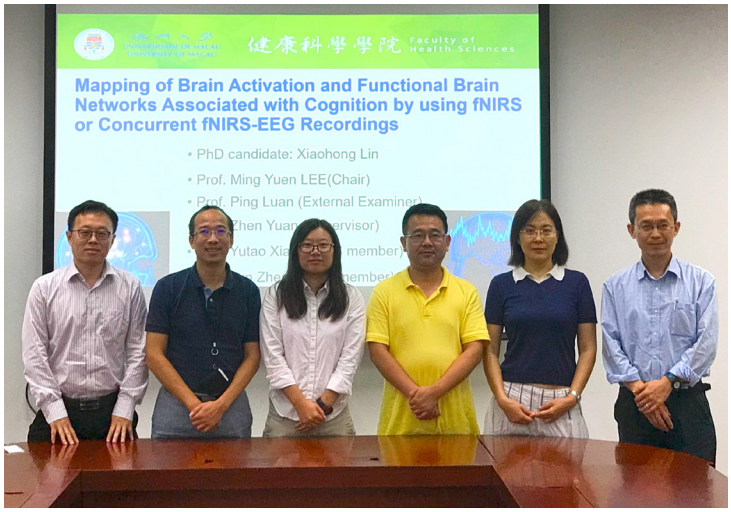
During her studies in FHS, she has drafted five manuscripts as first author, amongst which three has been published.

PhD Oral Defense by Fei WANG of Prof. Yutao XIANG's group

Ms. Fei WANG, from Prof. Yutao XIANG's team, has completed her PhD Oral Defense on 3 July 2018 (Tuesday). She defended her thesis on "Comparing the prevalence of elder abuse, depression, insomnia and their associations with demographic and clinical characteristics and quality of life in older adults in nursing homes between Guangzhou and Macao, China". Her study aimed to compare the prevalence of elder abuse/depression/insomnia and related issues among older adults in nursing homes; explore the factors associated with elder abuse/depression/insomnia; determine the older adults' QOL and its associations with socio-demographic and clinical data.



PhD Oral Defense by Xiaohong LIN of Prof. Zhen YUAN's group



Ms. Xiaohong LIN of Prof. Zhen YUAN's team, has completed her PhD Oral Defense on 6 July 2018 (Friday). Her thesis topic was "Mapping of Brain Activation and Functional Brain Networks Associated with Cognition by using fNIRS or Concurrent fNIRS-EEG Recordings". This study focused on the investigation of EEG-fNIRS neuroimaging techniques and their associated applications in brain cognition and brain diseases.

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UPCOMING

UPCOMING: SEMINARS

#16 Title: Critical Regulations of Cardiac Niche on Stem Cell Fate
Speaker: Xi-Yong YU
School of Pharmaceutical Sciences, Guangzhou Medical University
Date: 10 July 2018 (Tue)
Time: 15:00 – 16:0
Venue: E12 – G004

#17 Title: Generation of pluripotent stem cells using SCNT and IPS cell technologies in African Green Monkeys
Speaker: Young Gie CHUNG
Department of Psychiatry, Yale Medical School
Date: 13 July 2018 (Fri)
Time: 16:00 – 17:00
Venue: E12 – G004

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For more information or submission of articles to be featured, please contact Ms. Vivienne Fong at viviennefong@umac.mo or 8822 4230.