ACADEMIC ACTIVITIES

Publication(s) of the week

1. Huang, S., Yang, J., Fong, S., and Zhao, Q. (2019) Artificial Intelligence in Cancer Diagnosis and Prognosis: Opportunities and Challenges. *Cancer Lett* **471**, 61-71 **[5yr IF =6.232]**

2. Zhou, H., Shao, M., Yang, X., Li, C., Cui, G., Gao, C., Di, L., Zhong, H., Wang, Y., Zhang, Z., and Lee, S. M. (2019) Tetramethylpyrazine Analogue T-006 Exerts Neuroprotective Effects against 6-Hydroxydopamine-Induced Parkinson's Disease in Vitro and in Vivo. *Oxid Med Cell Longev* **2019**, 8169125 **[5yr IF =5.392]**

UM TALK

Evolution in action - Why is cancer different from other diseases and is that bad? – Prof. Chung-I WU

Prof. Chung-I WU, Professor of University of Chicago, Academician of Academia Sinica and UM Macao Distinguished Visiting Scholar, presented "Evolution in action - Why is cancer different from other diseases and is that bad?" on 19 December.

Prof. WU started the lecture with the evolution of human beings and different races. He briefly described the basic concepts of evolution and biology, and then explained the relationship between cancer and evolution from a new and professional perspective. His talk was mainly based on three concepts: i) evolution is the foundation of biological, ii) cancer is an evolutionary phenomenon, and iii) cancer therapy. He illustrated that most diseases are related to the degradation of the normal function of the body, but cancer cells rely on the body tissues for their growth. Based on this new perspective, and coupled with the clinical research examples, Prof. WU proposed a new effective cancer treatment plan to the audiences.

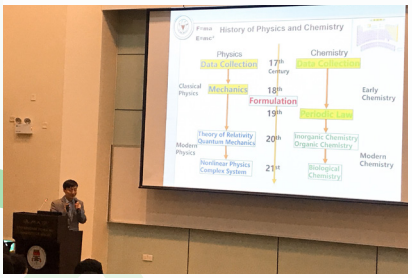
BCAT MEETING – Prof. Zhen YUAN

Prof. Zhen YUAN presented a talk on the study of "Clinically Potential Biomedical Probes for Optical Imaging-Guided Cancer Theranostics" in the BCAT meeting on 18 December. Prof. YUAN claimed that optical molecular imaging techniques can detect small tissue structures with high sensitivity and deep tissue penetration in the second near-infrared (NIR-II) window, which plays considerable roles in cancer early diagnosis and personalized treatment guidance. Prof. YUAN introduced several novel natural products as clinically potential biomedical probes for noninvasive cancer diagnosis and precise ablation of tumors. In particular, the as-prepared non-toxicity theranostic agents were identified to possess several advantages: i) water-soluble and excellent biocompatible; ii) good stability; and iii) easy to be functionalized. In particular, as clinically potential contrast agent for optical coherence tomography imaging that is an FDA approved clinical imaging technique, the multifunctional probes exhibited optical scattering covered the NIR-II window, in which laser possessed its maximum depth of penetration in tissue.

In addition, Prof. YUAN presented that an organic nano-drug delivery platform was constructed as a biocompatible cancer chemotherapeutic system, in which clinically approved sorafenib was loaded in the redox responsive polymeric micelles, enabling dose-control release of drug to cancer tissues. In addition, visualizing tumor microenvironment changes is also essential for cancer chemotherapy, which can provide a priori and feedback control of drug delivery with reduced side effect. Therefore, second near-infrared window (NIR-II) dual-modal optical coherence tomography (OCT) and photoacoustic tomography (PAT) were performed for real-time visualizing tumor microenvironment changes in vivo during treatment. In particular, the tumor angiogenesis, the vascular networks density change, the drug biodistribution, and the quantitative oxyhemoglobin (HbO2) and oxygen saturation (STO2) concentrations of cancer tissues were clearly characterized for individually optimized cancer chemotherapy.

SEMINAR SERIES

Mapping Cell Landscapes by Single-cell Analysis – Prof. Guoji GUO



Prof. Guoji GUO, Professor and Deputy Director of Center for Stem Cell and Regenerative Medicine, Zhejiang University School of Medicine, presented "Mapping Cell Landscapes by Single-cell Analysis" on 16 December.

Prof. GUO claimed that the transcriptome of a cell represents its unique cell-type identity. However, a systematic single-cell atlas has not been achieved for humans. Therefore, Prof. GUO has used single-cell RNA sequencing to determine the cell-type composition of all major human organs and constructed a basic scheme for the human cell landscape (HCL). Prof. GUO reported a single-cell hierarchy for many tissues that have not been well characterized previously. Besides, Prof. GUO presented a 'single-cell HCL analysis' pipeline that helped to define human cell types and exemplified its utility in stem cell biology. Moreover, Prof. GUO introduced how he performed a single-cell comparative analysis of the HCL and mouse cell atlas to reveal the conserved genetic networks in the mammalian system.

Joint Symposium - Precision Medicine and Immunology

FHS hosted a joint symposium with the School of Medicine of Zhejiang University on Precision Medicine and Immunology on 19 December. Students and researchers from Zhejiang University and FHS reported and exchanged their research achievement and ideas during the symposium.

健康科學學院
Faculdade de Ciências da Saúde
Faculty of Health Sciences

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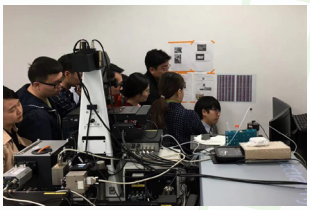
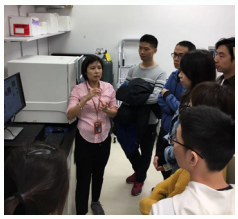
Winter camp of School of Basic Medical Sciences, Zhejiang University

A group of professors, students and staffs from the School of Basic Medical Sciences, Zhejiang University visited the Faculty of Health Sciences on 15-18 December.

FHS held a Life & Health Frontier Seminar to exchange and discuss the cutting-edge technologies in single cell sequencing, structure biology, neuron protection in Alzheimer diseases, cancer biology, bacteria sensing, and molecular imaging with the delegation group on 16 December.



PhD ORAL DEFENSE

PhD Oral Defense by Rui MA of Prof. Henry KWOK's group

Mr. Rui MA supervised by Prof. Henry KWOK completed their PhD oral defense on 18 December. His thesis title was "Exploring Biomedical Applications of Venom-based peptides: A New Class of Anti-cancer Drug Candidate / A Novel Reagent for Optimizing Stem Cell Culture Condition".

Mr. MA claimed that with the development of venomics and modern analytical techniques, the number of venom-based protein/peptide sequences has exponentially increased. Mr. MA thought that their functional annotations needed to be further explored to accommodate the development of the modern biomedicine. Then he focused his research on the functional activities of two venom-based peptides and expanded on their applications. He reported that the goal of his first study was to convert an antimicrobial peptide AcrAP1 into an anti-cancer peptide. The second study aimed to develop a novel venom-based peptide P13 to replace one or two growth factors in stem cell culture media. He concluded that his study broadened the understanding of venom-based peptides in the field of anticancer drug development and stem cell culture optimization.

Admission talk

Admission talk to Pooi To Middle School and Instituto Salesiano

Prof. William CHAO and Prof. Vivien WANG gave two admission talks at two local high schools, Pooi To Middle School and Instituto Salesiano on 16 and 17 December respectively. They introduced the overview of the faculty, the academic programmes and the study prospects to the students during the talk.


UPCOMING

December / January 2020

Mon	Tues	Wed	Thurs	Fri
23 Holiday The first working day after Winter Solstice	24 Holiday Christmas Eve	25 Holiday Christmas Day	26	27
30	31 Holiday (afternoon) New Year's Eve	January 2020 1 Holiday New Year's Day	2	3
6	7	8 **B-CAT Meeting #23** Speaker: Prof. Jun ZHENG Time: 17:00 Venue: E12-G004	9	10

For more information or submission of articles to be featured, please contact Ms. Mathilde CHEANG at mathildec@um.edu.mo or 8822 4909.