

## ACADEMIC ACTIVITIES

### Publication(s) of the week

1. Li, B., Pu, W., Xu, H., Ge, L., Kwok, H. F., and Hu, L. (2019) Magneto-controlled flow-injection device for electrochemical immunoassay of alpha-fetoprotein on magnetic beads using redox-active ferrocene derivative polymer nanospheres. *Analyst* [IF=3.791]
2. Li, P., Meng, Y., Wang, L., and Di, L. J. (2019) BioID: A Proximity-Dependent Labeling Approach in Proteomics Study. *Methods Mol Biol* 1871, 143-151 [IF: currently not available]

### B-CAT Meeting:

#### Effects of Cisplatin in Cancer Growth and Metastasis - Prof. Chuxia DENG

At the B-CAT meeting on 9 January, Prof. Chuxia DENG presented the recent research from his lab about the effects of cisplatin in cancer growth and metastasis. Cisplatin is widely used for the treatment of various types of cancers, yet drug resistance frequently occurs through various mechanisms. His team has previously shown that despite the drug resistance, cisplatin treatment elicits strong inhibitory effect on tumor metastasis. Thus, they have conducted synthetic lethal screenings against several siRNA libraries in order to find conditions that can overcome cisplatin resistance while keeping its ability for inhibiting cancer metastasis. They first conducted a mini siRNA screen targeting 55 custom-selected genes, and found that ATP7A, which sequesters cisplatin in the cytoplasm for exporting out the cell, was a top synthetic lethal gene as a pre-target mechanism for cisplatin resistance. Then they used a kinase library containing 704 kinases and found that cisplatin activates ATR, CHK1 and WEE1, which shut down DNA replication and attenuate cisplatin induced-lethality, as an on target mechanism for the resistance. They conducted a whole genome screening with 6400 siRNAs targeting 21585 human genes, and uncovered that reduced energy metabolism and enhanced proteolysis as a post-target mechanism for cisplatin resistance, which can be overridden by a proper drug combination. Meanwhile their study also indicated that one of the main mechanisms through which cisplatin inhibits cancer metastasis is by antagonizing TGFbeta signaling. Potential clinical applications of these findings were also discussed in the B-CAT meeting.

## PhD ORAL DEFENSE

### PhD Oral Defense by Zhiqiang ZHAO of Prof. Lijun DI's group



Mr. Zhiqiang ZHAO, supervised by Prof. Lijun DI, completed his PhD Oral Defense on 7 January. The title of his thesis was “A Metastatic Cascade in Breast Cancer formed by TGF-beta Signaling-CtBP-Cholesterol Feedback Loop”.

Mr. Zhiqiang ZHAO presented why and how he proposed a feedback loop formed by CtBP, cholesterol and TGF-beta signalling pathway. He found that CtBP is a major regulator of intracellular cholesterol homeostasis in breast cancer cells. CtBP mainly regulated cholesterol homeostasis by forming complex with ZEB1 and transcriptionally repressing SREBF2 expression. Importantly, CtBP repression of intracellular cholesterol abundance led to the increase of EMT and cell migration. The reason was that cholesterol negatively regulated the stability of TGF-beta receptors on the cell membrane. Moreover, TGF-beta was also capable of reducing the intracellular cholesterol relying on the increased recruitment of ZEB1 and CtBP complex to SREBF2 promoter.

He has also analyzed the public breast cancer datasets and concluded that CtBP expression negatively correlates with SREBF2 and HMGCR expression. A high expression of CtBP and a low expression of SREBF2 and HMGCR significantly correlate with high EMT capacity of the primary tumors.

## STUDENT ACTIVITIES

### FHS Postdoc Student Seminar - Presented by Prof. Chuxia DENG's group and Prof. Chris WONG's group

This week, the 2019 FHS Postdoc Student Seminar series begins. On 10 January, Dr. Heng SUN of Prof. Chuxia DENG's group presented “Investigation of Cell Heterogeneity within Mouse Mammary Epithelia and BRCA1-related Mammary Tumors via Single Cell RNA Sequencing” and Dr. Maruti Nandan Rai of Prof. Chris WONG's group presented “CgXbp1 Directs Early Transcription during Interaction with Macrophages, and Regulates Antifungal Drug Resistance in an Opportunistic Human Fungal Pathogen *Candida Glabrata*”. The next seminar will be held on 24 January, presented by the group members of Prof. Xuanjun ZHANG and Prof. Qi ZHAO.



JANUARY / FEBRUARY				
Mon	Tues	Wed	Thurs	Fri
14	15	16 <b>Seminar Series</b> Prion-like dissemination of synuclein pathology using human brain-derived alpha-synuclein in monkeys Speaker: Dr. Erwan Bezard Host: Prof. Garry WONG Time: 15:00-16:00 Venue: E12-G003	17	18
21	22	23 <b>B-CAT Meeting #2</b> Speaker: Tzu-Ming LIU Time: 17:00 Venue: E12-G004	24 <b>FHS Postdoc/ Student Seminar</b> Host: Prof. Xuanjun ZHANG and Prof. Qi ZHAO Time: 17:00-18:00 Venue: N22-G002	25
28	29	30	31	1 <b>Seminar Series</b> Rare Earth Up-conversion Luminescent Nanomaterials: Controllable Synthesis, Property Modification and Biomedical Application Speaker: Prof. Jun Lin Host: Prof. Yunlu DAI Time: 10:00-11:00 Venue: E12-G004