

ACADEMIC ACTIVITIES

Publication(s) of the week

1. Shan, L., Gao, G., Wang, W., Tang, W., Wang, Z., Yang, Z., Fan, W., Zhu, G., Zhai, K., Jacobson, O., Dai, Y., and Chen, X. (2019) Self-Assembled Green Tea Polyphenol-Based Coordination Nanomaterials to Improve Chemotherapy Efficacy by Inhibition of Carbonyl Reductase 1. *Biomaterials* **210**, 62-69 [IF=9.315]
2. Zhu, L., Li, P., Gao, D., Liu, J., Liu, Y., Sun, C., Xu, M., Chen, X., Sheng, Z., Wang, R., Yuan, Z., Cai, L., Ma, Y., and Zhao, Q. (2019) pH-Sensitive Loaded Retinal/Indocyanine Green Micelles as an "All-in-One" Theranostic Agent for Multi-Modal Imaging *In Vivo* Guided Cellular Senescence-Photothermal Synergistic Therapy. *Chem Commun (Camb)* [IF=6.064]
3. Feng, Y., Xiao, L., Wang, W. W., Ungvari, G. S., Ng, C. H., Wang, G., and Xiang, Y. T. (2019) Guidelines for the Diagnosis and Treatment of Depressive Disorders in China: The Second Edition. *J Affect Disord* **253**, 352-356 [IF=4.035]

Seminar Series

Epigenomic Identification of Critical Cancer Genes - Prof. Qian TAO

Prof. Qian TAO, Professor of Department of Clinical Oncology, The Chinese University of Hong Kong, presented a talk on "Epigenomic Identification of Critical Cancer Genes" on 14 May.

Prof. TAO introduced the pathways of how his team established the CpG methylomes from the genomic DNA of several common tumours including nasopharyngeal, esophageal, lung and digestive carcinomas and some lymphomas. He also presented how he identified multiple novel TSGs and characterized their molecular functions in cell signalling and tumorigenesis. Moreover, Prof. TAO showed how he developed multiple epigenetic biomarkers and epigenetic therapeutics and performed the epigenetic regulation of cell signalling.



PHD ORAL DEFENSE

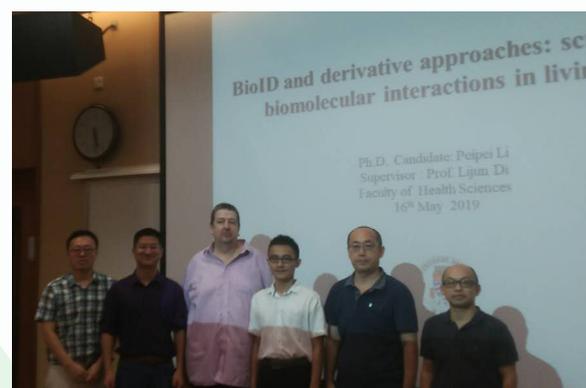
PhD Oral Defenses by Jingjing LI, Yang YANG and Li LU of Prof. Guokai CHEN's group and Prof. Lijun DI's group

Ms. Jingjing LI supervised by Prof. Lijun DI, Ms. Yang YANG supervised by Prof. Guokai CHEN and Ms. Peipei LI supervised by Prof. Lijun DI completed their PhD Oral Defenses on 14, 15 and 16 May with thesis titles of “Data and Mechanism-driven Novel Combination Therapies in Ovarian Cancer”, “Paracrine Activity Modulates Cell Microenvironment to Influence Mesoderm towards Cardiomyocytes Differentiation” and “BioID and Derivative Approaches: Screening for Biomolecular Interactions in Living Cells”, respectively.

Ms. Jingjing LI claimed that a big challenge of ovarian cancer therapy is drug resistance. Platinum resistance frequently occurred during the first-line chemotherapy, and finally led to the therapeutic failure for cancer relapse and metastasis. Therefore, she tried to find out some novel drug combination pairs not only with according to a clear mechanism guided mean, but also using the computational method with pharmacogenomics data. Ms. LI presented the several drug pairs she discovered with a synergistic effect through the computational analysis with public pharmacogenomics data and performed validation. She finally concluded that her discovery is available to provide basic support for the clinical drug combination utilization.

On the other hand, Ms. Yang YANG presented how two endogenous factors, insulin-like growth factors (IGFs) and serine proteases (SPs) played essential roles in regulating the downstream lineage specification in the mesoderm. She found that the cells in the mesoderm can spontaneously differentiate into the epicardium or cardiomyocytes. The addition of insulin to the medium can stabilize the epicardium while suppressing cardiomyocytes. She considered that insulin played a critical role in the determination of cardiac fate. Ms. YANG finally concluded that IGFs and SPs were endogenous factors that influenced the microenvironment to regulate mesodermal downstream differentiation.

In addition, Ms. Peipei LI presented how she created the BioID derivative approach, CRISPR-BioID, which can be targeted to a specific genome locus *in vivo* by expressing dCAS9 and BirA* in fusion. She reported that the application of CRISPR-BioID on telomere can identify some novel telomere binding proteins including the desmosome protein DSP. Ms. LI continued her research on telomere-bound DSP and finally concluded that BioID and the derivative approach was a powerful tool for the identification of protein-protein and DNA-protein interactions.



PI INTRODUCTION SERIES

Prof. Joong Sup SHIM has succeeded in the application for the academic promotion and is going to be an associate professor in FHS. Let us know about him and his work here.

Prof. SHIM obtained his Bachelor degree of Biology in 1998 and Master degree of Applied Biology in 2000 from Dongguk University, Korea. He received his Ph.D degree of Bioscience and Biotechnology from Sejong University, Korea in 2004. After that, he had worked as a research scientist in the Department of Biotechnology in Yonsei University, Korea for 2 years. Prof. SHIM then moved to the United States and received postdoctoral fellow training in the Department of Pharmacology and Molecular Sciences, Johns Hopkins School of Medicine from 2006 to 2011. He continued his career there as Research Associate from 2011 to 2013. Prof. SHIM joined the Faculty of Health Sciences, University of Macau in 2013 as Assistant Professor, and started his own laboratory.



Prof. SHIM has broad research interests in the area of chemical biology, cancer drug and target discovery using the drug repurposing and synthetic lethality approaches. So far, he has published total 59 papers in international journals, including *Nat Commun* (IF: 12.353), *J Natl Cancer Inst* (IF: 11.238), *Proc Natl Acad Sci USA* (IF: 9.504), *Cancer Discov* (IF: 24.373), *Gene Dev* (IF: 9.462), *Hepatology* (IF: 14.079), *Clinical Cancer Res* (IF: 10.199), *Oncogene* (IF: 6.854), and *Cancer Lett* (IF: 6.491), with a total citation of 3,027 and an h-index of 25 (as of 14 May 2019 based on Google Scholar). Since he joined the UM, he has been reviewers for more than 20 international journals and has been the principal investigator of two FDCT and two MYRG grants.



One of his research interests is ‘drug repurposing’, a drug development approach that uses old drugs (existing drugs) for new pharmacological applications. He has made significant contributions to drug repurposing by establishing a clinical drug library containing mostly FDA-approved drugs (dubbed as Johns Hopkins Drug Library or JHDL), and collaborating with a number of research groups internationally. From his studies, he identified an old antibacterial drug nitroxoline as a potential bladder cancer drug (*J Natl Cancer Inst*, 2010), an anti-HIV drug nelfinavir for HER2-positive breast cancer treatment (*J Natl Cancer Inst*, 2012), and an antifungal itraconazole isomers as potential anti-angiogenic and anticancer agents (*Proc Natl Acad Sci USA*, 2015; *Clin Cancer Res*, 2016). These drugs are currently under Phase I-II Clinical Trials for the treatment of human cancer in the US and in China, suggesting a significant impact of his research works in cancer research field. With the continuing effort in drug repurposing, his group recently identified clinically-relevant cholesterol trafficking inhibitors from JHDL and reported them as novel anti-angiogenic and anticancer agents (*Cancer Lett*, 2017; *Int J Biol Sci*, 2018; *Cells*, 2019).

Prof. SHIM's team is also working on the cancer precision medicine by exploiting a genetic concept, synthetic lethality. Synthetic lethality is a genetic interaction between two or more genes where a single gene deficiency is tolerable for cell viability while deficiencies in both genes cause lethality. Although a large portion of human cancers has deficiency mutations in tumor suppressor genes, the mutant tumor suppressors cannot be druggable targets due to their nature of loss-of-function mutations. However, synthetic lethality enables targeting the mutant tumor suppressors with pharmacological agents,



thus becoming an important approach for cancer precision medicine. Prof. SHIM's team has been studying on several major tumor suppressors found mutated in top killing cancers, such as BRCA1 (in breast and ovarian cancers), PTEN (in colorectal and prostate cancers), ARID1A (in colorectal and ovarian cancers), RB1 (in lung cancer), and SMAD4 (in colorectal and pancreatic cancers). Using the synthetic lethality target screening, his team recently discovered several novel synthetic lethality targets, such as aurora kinase A and bromodomain/extraterminal motif, that can be applied for the treatment of cancer with given tumor suppressor mutations. His team's research works have been recognized among the community since his latest publications in *Nat Commun*, *Oncogene* and *Cancer Lett* in 2018.

Let's congratulate again for the promotion of Prof. SHIM!

STUDENT ACTIVITIES

FHS Postdoc Student Seminar - Presented by Prof. Kin TAM's group and Prof. Yunlu DAI's group

On 16 May, Ms. Mengqiao CUI of Prof. Hongjie ZHANG's group presented "Sphingosine 1-phosphate Regulates *C. elegans* Tube Morphogenesis by Binding with CCT-5" and Mr. Kuancheok LEI of Prof. Douglas Xiaohua ZHANG's group presented "Data Analysis of Normal and Tumour Breast Epithelial Cells in BRCA1-mutant Mice from Single Cell RNA-seq Experiment".

The next seminar will be held on 16 May, and presented by the group members of Prof. Ren-He XU and Prof. Joong Sup SHIM.



6th Macau Symposium on Biomedical Sciences 2019



FHS is going to have the 6th Macau Symposium on Biomedical Sciences 2019 on 12 and 13 June, 2019. The theme of this year's symposium is INNOVATION. Let's join together!

For details, please refer to the related information posted on the website: <https://msbs2019.fhs.umac.mo/>.

Sponsors for the 6th Macau Symposium on Biomedical Sciences 2019

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MAY / JUNE				
Mon	Tues	Wed	Thurs	Fri
20	21	22	23	24
<p>Oral Defense Ms. Mingming QIN Supervisor : Prof. Wei GE Time: 10:00 Venue: N6-G010</p>	<p>Seminar Series Cell Polarity and its Interplay with Aging Speaker: Dr. Wakam CHANG Time: 10:30-11:30 Venue: E12-G004</p>	<p>Oral Defense Ms. Chengcheng SONG Supervisor : Prof. Guokai CHEN Time: 16:00 Venue: N6-G010</p> <p>B-CAT Meeting #10 Speaker: Prof. Joong Sup SHIM Time: 17:00 Venue: E12-G004</p>	<p>Seminar Series Industrialized Protein/ Peptide Identification and Characterization with Advanced Scientific Workflow Host: Professional Health Trading Company Ltd. Time: 14:30-15:30 Venue: N22-4028</p>	
27	28	29	30	31
			<p>FHS Postdoc/ Student Seminar Host: Prof. Ren-He XU and Prof. Joong Sup SHIM Time: 17:00-18:00 Venue: N22-G002</p>	
3	4	5	6	7
				<p>Tuen Ng Festival</p>