FACULTY OF HEALTH SCIENCES

2021 WEEKLY NEWSLETTER

Issue 30 | 26 - 30 July

Publication

1. Yan, J., Li, B., Yang, P. P., Lin, J., and **Dai, Y. L.** (2021) Progress in Light-Responsive Lanthanide Nanoparticles toward Deep Tumor Theranostics. *Adv Funct Mater*, 2104325 **[2020 IF = 18.808]**

2. Li, S., Peng, T., Zhao, X., Silva, M., Liu, L., Zhou, W., Chen, L., and **Zheng, W.** (2021) Artemether Confers Neuroprotection on Cerebral Ischemic Injury through Stimulation of the Erk1/2-P90rsk-CREB Signaling Pathway. *Redox Biol* **46**, 102069 **[5yr IF = 12.038]**

3. Han, C. Y., Patten, D. A., Kim, S. I., Lim, J. J., Chan, D. W., Siu, M. K. Y., Han, Y., Carmona, E., Parks, R. J., Lee, C., **Di, L. J.**, Lu, Z., Chan, K. K. L., Ku, J. L., Macdonald, E. A., Vanderhyden, B. C., Mes-Masson, A. M., Ngan, H. Y. S., Cheung, A. N. Y., Song, Y. S., Bast, R. C., Jr., Harper, M. E., and Tsang, B. K. (2021) Nuclear HKII-P-P53 (Ser15) Interaction is a Prognostic Biomarker for Chemoresponsiveness and Glycolytic Regulation in Epithelial Ovarian Cancer. *Cancers (Basel)* **13** (14) **[5yr IF = 6.999]**

4. Cai, H., Bai, W., Liu, S., Liu, H., Chen, X., Qi, H., Liu, R., Cheung, T., Su, Z., Ng, C. H., and **Xiang, Y. T.** (2021) Attitudes toward COVID-19 Vaccines in Chinese Adolescents. *Front Med (Lausanne) 8*, 691079 **[5yr IF = 5.184]**

5. Jin, Y., Li, Y., Li, X. Y., Zhao, Y. J., Cheung, T., Ungvari, G. S., Li, M., An, F. R., and **Xiang, Y. T.** (2021) Prevalence of Fatigue and Its Association with Quality of Life among Frontline Clinicians in Ophthalmology and Otolaryngology Departments During the COVID-19 Pandemic. *Front Psychiatry* **12,** 678917 **[5yr IF = 4.408]**

1 Event

UM Summer Camp Helps Secondary School Students to Experience University Life of Whole-person Education

The Biomedical Sciences Summer Camp 2021, organised by FHS, was held from 26 to 30 Jul 2021. Two sessions of the summer camp attracted over 60 high school students from 35 local secondary schools, featuring splendid activities which included a series of lectures and hands-on experiments taught by FHS professors. The students were housed at the residential college to truly approximate university experience from classroom to dormitory under UM's 4-in-1 education model.

As a prelude to the opening ceremony, Prof. Chuxia DENG warmly welcomed the participants, and introduced that the key to ending the global health crisis, such as the rising prominence of cancer as a leading cause of death and the COVID-19 pandemic, is the scientific progress and technological innovation of biomedicine. He encouraged the students to immerse themselves into the activities of the summer camp in hope to learn new knowledge and foster their interests in biomedicine. As a local scholar born and bred in Macao, Prof. Wakam CHANG shared his academic and research experience with the students. He invigorated them to be goal-oriented and devote to achieving the goal.

Jeya Verschuren, a Form 5 student of the International School of Macao, was grateful to the student mentors who took care of her during the summer camp. She enjoyed staying at the residential college, through which she could build stronger friendship with other members of the summer camp. She thought that this well-organized summer camp made her summer break more productive. Wai Hang AO, a Form 4 student of Saint John De Brito School, was engrossed in conducting experiments during which he discussed, explored and solved problems with other team members, bringing teamwork into full play. Lek Hang LEI, a Form 5 student of Escola Católica Estrela do Mar, learned the importance of delicacy and meticulosity towards a research experiment of which the result will be affected by just one subtle step. He expressed that the activities outside the classroom allowed him to get closer to the professors and the FHS students and also the other camp members.

With the theme of 'Biological Detectives', the camp which was composed of lectures, hands-on experiments, visits and exchange activities allowed the students to explore the world of biomedical research and learn about various biomedical technologies progressively through case investigation. Equally important is the opportunity for students to live, play and interact with other members. Hence, the students were accommodated to stay in the residential college, an on-campus staff-student learning community, to experience a university life in the environment of whole-person education. The camp was sponsored by the he Science and Technology Development Fund (FDCT) of Macao S.A.R.

2 PhD Oral Defence

Six Students Completed PhD Oral Defences

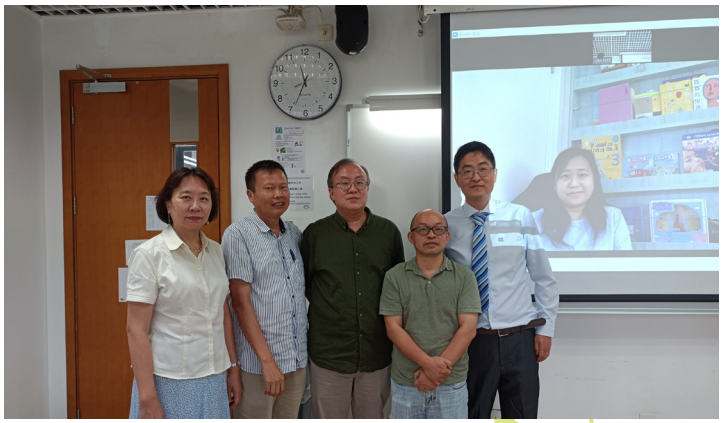
In this week, six FHS students completed their PhD Oral Defences. On 26 July, Ms. Changxiang SHI supervised by Prof. Joong Sup SHIM and Mr. Teng ZHANG supervised by Prof. Douglas ZHANG completed their PhD oral defences with the thesis titles “Targeting SMAD4 Mutations Using Synthetic Lethality in Colorectal Cancer” and “Methodology Development and Application of Time Series Analysis in Biomedical Studies” respectively. On 28 July, Mr. Shan YU supervised by Prof. Leo LEE and Mr. Shixue SUN supervised by Prof. Douglas ZHANG completed their PhD oral defences with the thesis titles “G Protein-coupled Receptor Kinase 2 Suppresses Ovarian Cancer Migration and Adhesion by Modulating Angiotensin II Receptor-mediated Signaling Pathways” and “Post-transcriptional Modifications of Gene Expression in Idiopathic Pulmonary Fibrosis” respectively. Two more students, Mr. Chunhao DENG and Mr. Faxiang XU supervised by Prof. Guokai CHEN, completed their PhD oral defences on 30 July. Their thesis titles are “Thyroid Hormone and Cell Adhesion Modulate Stem Cell Maintenance and Cell Fate Determination in Human Embryonic Stem Cells” and “Lipids Modulate Cellular States of Human Pluripotent Stem Cells”

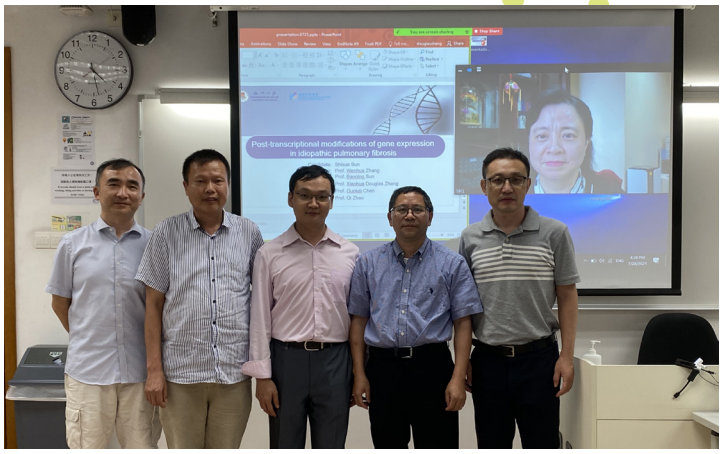
Ms. Shi claimed that the tumor suppressor SMAD4 is frequently mutated in colorectal cancer (CRC and no effective targeted therapies exist for CRC with SMAD4 loss. Therefore, she has performed the synthetic lethality drug screening in isogenic *SMAD4+/+* and *SMAD4-/-* HCT116 CRC cells and found that the bromodomain and extra-terminal motif (BET) inhibitors selectively induced G1 cell cycle arrest in *SMAD4-/-* HCT116 cells via the restoration of the loss of MYC repression. She further found that the Aurora A kinase (AURKA) inhibitors induced the selective apoptosis in SMAD4-/- HCT116 cells through the hyperactivation of the spindle assembly checkpoint (SAC). She has further conducted the tumor xenograft mouse experiments to support her findings. She concluded that her data suggested that BET and AURKA could be the potential drug targets for the treatment of SMAD4-deficient CRC.

Mr. Zhang reported that he has applied the time series analysis methods on the influenza surveillance data, clinical indictors of COVID-19 patients and continuous monitoring of physiological data to reveal the internal structures and dynamics changes of

the biomedical system. He further introduced that he has explored the trend of periodicity and correlation of those biomedical systems and has performed the ARIMA model to predict their changes. Besides, he has applied multifractal analysis to prove the existence of multifractal nature in influenza surveillance time series, blood glucose and respiratory data. Moreover, he has developed the extended BMF model to better describe the multifractal behaviours of biomedical time series and to obtain the accurate multifractal parameters. Last but not the least, he has developed the R packages to implement the fractal and complexity analysis of the respiratory data.

Mr. Yu said that growing evidence is showing that G protein-coupled receptor (GPCR)-mediated signaling widely participates in the cancer cell functions. Hence, he predicted that precise regulation of GPCR signal transduction might provide new therapeutic strategies for cancers, including ovarian cancer. He has evaluated the molecular functions of G protein-coupled receptor kinases (GRKs) in regulating the signaling pathway mediated by angiotensin II receptor type 1 (AGTR1) and the impacts of the protein on ovarian cancer. He found that GRK2 was a potential therapeutic target for the regulation of ovarian cancer peritoneal metastasis due to the increase in GRK2 regulate ovarian cancer metastasis by affecting genes involved in cell adhesion and causing significant redistribution of focal adhesions.





Mr. Sun introduced that idiopathic pulmonary fibrosis (IPF) is an interstitial lung disease characterized by the progressive pulmonary fibrosis and respiratory failure. He has examined the impact of post-transcriptional regulations on the gene expression of IPF and found that the IPF-specific IL7=AC083837.1 gene fusion exacerbated fibrosis in IPF via enhancing the activities of natural killer cell-mediated cytotoxicity, cell apoptosis, and angiogenesis. He further found that the ncRNAs in IPF were associated with the fibrosis and extracellular matrix deposition by

regulating the gene expression after the mRNA transcription. Aberrant alternative splicing significantly impacted the immune system activities and fibroblast construction in IPF. He has performed the multi-omics analysis and it revealed that the differential splicing of TRIM29 led to its IPF-specific expression in IPF and was associated with the wound repair process in IPF.

Mr. Deng claimed that human embryonic stem cells (hESCs) hold great promises on the developmental biology study and regenerative medicine. The cell maintenance and differentiation affected by the culture system include cell culture medium and extra-cellular matrix. He introduced that his study focused on the effect of thyroid hormone and extra-cellular matrix affected stem cell maintenance and cell fate determination in hESCs. He has used hESCs to show that Triiodothyroxine T3 was beneficial for the stem cell maintenance while promoting and promoted trophoblast differentiation under the BMP4 induction. He concluded that the cell adhesions could play pivotal roles in tissue patterning and cell fate determination in embryogenesis. His results also revealed the relationship between cell metabolism and spatial effect in cell colonies.

Mr. Xu claimed that human pluripotent stem cells (hPSCs) can be maintained in a continuum of cellular states with distinct features. The rapid proliferation of hPSCs demands sufficient nutrient supply and active intracellular catabolic and anabolic processes. In his study, he has demonstrated that the metabolic landscape of hPSCs is shifted by signaling lipid lysophosphatidic acid (LPA), but not by other fundamental lipids. He further reported that LPA induced unique and reversible phenotypes in cell cycle, morphology, and mitochondrial state without interfering pluripotency. He concluded that his study has explored the diverse effects of lipids on stem cell culture and revealed a novel primed state that allowed people to drastically alter cell physiology in hPSCs for basic research and stem cell applications.

3 Seminar Series

The Role of ncBAF Complex in Mouse Embryonic Stem Cells – Prof. Wensheng ZHANG

Prof. Wensheng ZHANG, Distinguished Professor of Cam-Su Genomic Resource Center in Soochow University Medical School, presented “The Role of ncBAF Complex in Mouse Embryonic Stem Cells” on 29 July.

In the seminar, Prof. Zhang presented the study of BAF chromatin remodeling complexes in mouse embryonic stem cells (mESCs) and shared the results on the function of canonical BAF chromatin remodeling complex in mESCs, the underlying mechanism and the non-canonical BAF in mESCs.

UPCOMING EVENTS

	August	
Mon	**2**	**9** **Seminar Series** IL-36γ- and IL-36Ra-mediated Reciprocal Regulation of Gastrointestinal Inflammation and Tumorigenesis Speaker: Prof. Bo ZHONG Time: 10:00-11:00 Venue: N22-G002
Tue	**3** **Ministry of Education (MoE) Frontiers Science Center for Precision Oncology (FSCPO) Seminar Series** Title: Genetic Basis of Cancer in Asian Population Speaker: Prof. Sanming WANG Time: 16:00 - 17:00 Venue: ZOOM **Oral Defence** Speaker: Wenhui HAO Supervisor: Prof. Chuxia DENG Time: 9:30 Venue: E12-1015	**10**
Wed	**4** **BCAT Meeting** Speaker: Prof. Zhen YUAN Time: 17:00-18:00 Venue: E12-G004	**11**
Thu	**5** **Seminar Series** Data-driven Systems Biology of Metastasis Speaker: Dr. Peng WANG Time: 10:00-11:00 Venue: N22-G002 **FHS Postdoc/ Student Seminar** Session: Chemistry Host: Prof. Yunlu DAI and Prof. Xuanjun ZHANG Time: 17:00-18:00 Venue: N22-G002 and Zoom	**12**
Fri	**6**	**13**

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