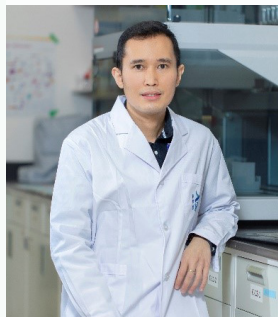


Publication(s)

1. Lu, F. M., Liu, P. Q., Chen, H., Wang, M. Y., Xu, S. Y., **Yuan, Z.**, Wang, X. P., Wang, S., and Zhou, J. S. (2020) More Than Just Statics: Abnormal Dynamic Amplitude of Low-Frequency Fluctuation in Adolescent Patients with Pure Conduct Disorder. *J Psychiatr Res* **131**, 60-68 **[5yr IF = 4.36]**

Article Sharing

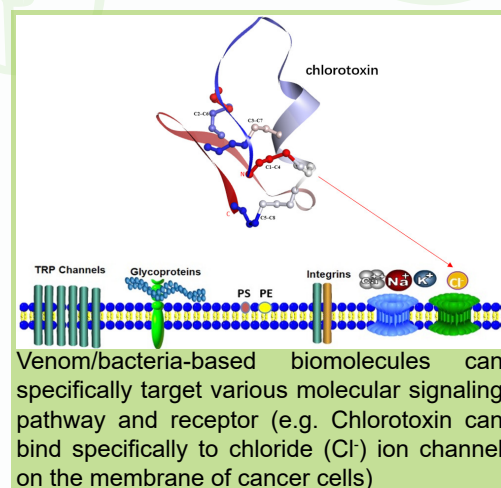
A New Type of Venom-based and Bacteria-derived Biomolecules for Cancer Targeted Therapy – Prof. Henry KWOK



By the invitation of the international authoritative cancer journal -- *Seminars in Cancer Biology*, Prof. Henry KWOK recently wrote a paper on the development of a new generation of anticancer drugs from venomous species and bacteria with a title of “New Opportunities and Challenges of Venom-Based and Bacteria-Derived Molecules for Anticancer Targeted Therapy”. The paper explores the development of venom and toxin as cancer targeted therapy and highlights the key anticancer molecular mechanisms that could be induced by venom-based and bacteria-derived bioactive molecules.

Complete utilization of venom-based and bacteria-derived drugs in the market are still staggering since their mode of action is still not clear yet. In the paper, Prof. Kwok (the corresponding author) and his recent graduated PhD student – Dr. Rui MA (the first author) discussed various venom-based anticancer biomolecules along with their modes of action, such as disruption of the cell plasma membrane, regulation of cell cycle, induction of cancer cell apoptosis, and inhibition of cancer cell proliferation, invasion, metastasis, and angiogenesis. The molecular mechanisms of venom-based and bacteria-derived biomolecules have tremendous variations, and molecular diversities can open up new avenues for future pharmacological studies. In conclusion, Prof Kwok and Dr. Ma suggested that identifying cancer targets for these biomolecules is a crucial step, which is the first element that initiates subsequent effects and is essential for understanding their molecular mechanisms.

In the last few years of research work, Prof. Kwok and the members of his team dissected various cancer-related signaling pathways/receptors such as ion channels, transient receptor potential channels, membrane non-receptor molecules and integrins, which can be specifically targeted by venom and bacterial biomolecules (Caption 1). From their recently published research findings, they unveiled a novel concept on designing a bioactive venom-based peptide as a potent and specific anticancer prototype drug [1]. In addition, Prof. Kwok, Dr. Ma and Prof. Guokai CHEN also proposed a stem cell application on their newly discovered venom-based peptide named M6 to maintain the self-renewal of human embryonic stem cells (hESCs) by activating fibroblast growth factor (FGF) and transforming growth factor-beta (TGF- β) signalling [2]. With the support from UM, a China patent and a PCT patent on M6 peptide were filed in May and June this year respectively.



The study was funded by the Science and Technology Development Fund, Macao SAR [File no. 019/2017/A1] and the UM Multi-Year Research Grant [File no. MYRG2015-00025-FHS]. For more information about the study, please visit:
<https://www.sciencedirect.com/science/article/pii/S1044579X20301826>



[1] <https://www.sciencedirect.com/science/article/pii/S2372770519301020?via%3Dihub>
[2] <https://stemcellres.biomedcentral.com/articles/10.1186/s13287-020-01766-9>

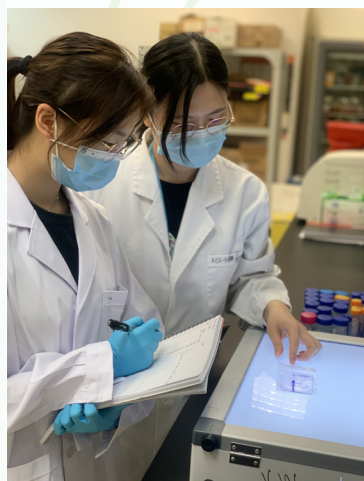
News

Summer Laboratory Work Experience Programme 2020 Boosts Local High School Students' Interest in Biomedical Science

In the summer of 2020, a total of 13 local high school students participated in the “Summer Laboratory Work Experience Programme 2020”. They went to different research teams of FHS and pursued sophisticated research projects by conducting various research work in the laboratories. This programme stimulated students' interest in biomedical science by offering them valuable chances of conducting hand-on experiments.



Kary CHOI, one of the students admitted to this programme, has learned the basic theories of single-cell RNA-seq analysis under the supervision of Prof. Douglas ZHANG and his team members. She utilized the knowledge to assist in processing the single-cell RNA-seq data for downstream analysis. Kary mentioned that this programme has met her interest in biomedical science, and enabled her to obtain a profound research experience from which she realized that teamwork was key in accomplishing the research work, and individual member's capability in working independently, perseverance and self-motivation were also crucial particularly when experiencing a massive setback.



Ruby NG expressed appreciation to Prof. Vivien WANG and her PhD student for their earnest guidance during her participation in this programme. She has learnt how to transfect mammalian cells, analyze protein expression using Western blotting, construct recombinant plasmid, and obtain purified protein sample. Ruby expressed her excitement about her operation of the state-of-the-art equipments in conducting the hand-on experiments, which broadened her vision as she has never run such studies in her high school.

Both Kary and Ruby spontaneously acknowledged the value of the programme in which they have spent a very meaningful summer break. Not only the programme boosted their interests in biomedical science, but it also helped them identify their passions for their upcoming graduate studies.

Students under the “Summer Laboratory Work Experience Programme” can take part in the research work in wide research fields, such as big data science, genetics, microbiology, molecular biology, neuroscience, and structural biology, etc. The flexible timetable allows the students to participate in different research projects to obtain first-hand experimental experience according to their own schedule. Furthermore, each participant has well managed his/her personal health by following strictly the epidemic prevention measures to secure a safe and fruitful learning experience.

Visit

FDCT Encourages FHS to Explore Industry-academia Collaboration

A delegation, led by Mr. Samuel Wan Hei CHAN, President of Administrative Committee of the Science and Technology Development Fund (FDCT), paid a visit to FHS on 17 September, and was warmly received by Prof. Chuxia DENG.

Prof. Deng shared FHS' history, latest developments, research accomplishments and the international collaborations with the guests. Prof. Deng emphasized that FHS always strives to pursue high quality of the research output. Mr. Chan praised FHS for its effort in scientific research. He expressed his hope for FHS to turn technological progress into productivity growth, which is highly upheld by the Macao Government. He suggested FHS to collaborate with local hospitals for the application of the research output, which will certainly be the highlights of FHS. In addition, Mr. Chan expected FHS to nurture local high school students by strengthening efforts in the science popularization activities.

Mr. Chan also mentioned that FDCT is going to pay more attention to the support of applied science and technology research. FDCT now collects opinions from the higher educational institutes about the definition and the areas of applied science and technology research.



FHS Postdoc Student Seminar

Presented by Prof. Garry WONG's group and Prof. Yutao XIANG's group

On 17 September, Ms. Linjing SHEN of Prof. Garry WONG's group presented "TDP-1/TDP-43 Potentiates Human α -Synuclein (HASN) Neurodegeneration in *Caenorhabditis elegans*" and Ms. Wen LI of Prof. Yutao XIANG's group presented "The Prevalence of Depression and Anxiety and their Associations with Quality of Life among Clinically Stable Older Patients with Psychiatric Disorders during the COVID-19 Pandemic".

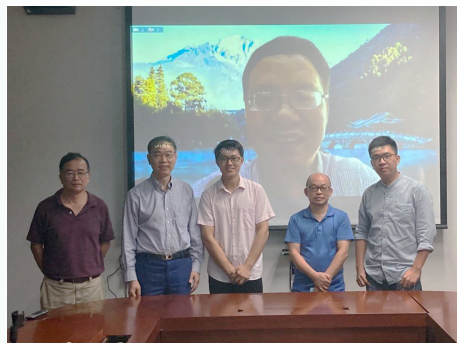
The next seminar will be held on 8 October, and presented by the group members of Prof. Edwin CHEUNG and Prof. Chuxia DENG, via Zoom again.



PhD Oral Defence

PhD Oral Defences by Fangyuan SHAO of Prof. Chuxia DENG's group and Shuai LI of Prof. Wenhua ZHENG's group

Mr. Fangyuan SHAO supervised by Prof. Chuxia DENG and Ms. Shuai LI supervised by Prof. Wenhua ZHENG completed their PhD oral defences on 11 and 16 September. Their thesis titles are "Enhanced Protein Damage Clearance Induces Broad Drug Resistance in Multi-type of Cancers Revealed by an Evolution Drug Resistant Model and Genome-wide siRNA Screening" and "The Neuroprotective Effect of Artemether and Its Implication in the Treatment of Alzheimer's Disease".



Mr. Shao said that resistance to therapeutic drugs occurs in all types of cancers virtually, and the tolerance to one drug frequently becomes broad therapy resistance. The underlying mechanism of drug resistance is unknown too. Therefore he has combined the whole-genome-wide RNA interference screening and an evolutionary drug pressure model with MDA-MB-231 cells and found that enhanced damaged-protein clearance and reduced mitochondrial respiratory activity were critical for the development of cisplatin resistance. Moreover, he has screened many anticancer drugs, which are used to treat drug-resistant cancer cell, human

patient-derived breast and colon cancer organoids, and found that the activation of the mitochondrial protein import surveillance system enhanced the proteasome activity and minimized the caspase activation. He concluded his study that the broad drug resistance was overcome by the cotreatment with the proteasome inhibitor bortezomib.



Ms. Li claimed that artemether, a derivative of artemisinin, has been clinically used as an anti-malarial. However, there are very few studies reporting the neuroprotective effect of artemether, especially in Alzheimer's disease (AD). She said that AD is a chronic neurodegenerative disease and is the most common cause of senile dementia. Therefore, she emphasized that the development of novel and more effective therapies against AD is urgent as there is still no effective therapeutic approach to treat AD. In her project, she has evaluated the neuroprotective effect of artemether and its

potential use in the treatment of AD. She then established a link among oxidative stress, apoptosis and inflammation during AD and the neuroprotective action of artemether. She has further elucidated the key factors and the underlying mechanisms in AD.

Sep / Oct				
Mon	Tue	Wed	Thu	Fri
21 <u>Qualifying Exam</u> Lipeng ZHU Supervisor: Prof. Qi ZHAO Time: 14:00 Venue: E12-4044	22	23 <u>BCAT Meeting</u> Speaker: Prof. Tzu-Ming LIU Time: 17:00-18:00 Venue: E12-G004 <u>Oral Defence</u> Carlos Godoy PAREJO Supervisor: Prof. Guokai CHEN Time: 10:00 Venue: N6-2022	24 <u>Qualifying Exam</u> Pu Kei MOU Supervisor: Prof. Joong Sup SHIM Time: 15:00 Venue: N22-3042	25 <u>Qualifying Exam</u> Wenshu ZHOU Supervisor: Prof. Wenhua ZHENG Time: 14:30 Venue: E12-4044
28	29 <u>Qualifying Exam</u> Quan LIU Supervisor: Prof. Kin Yip TAM Time: 10:00 Venue: E12-4004	30	Oct 1 Holiday - National Day of the People's Republic of China	2 Holiday - The Day following the National Day of the People's Republic of China
5 Holiday - Exemption from work by the Chief Executive	6	7 <u>BCAT Meeting</u> Speaker: Speaker: Prof. Kathy LUO Time: 17:00-18:00 Venue: E12-G004	8 <u>FHS Postdoc/ Student Seminar</u> Session: Cancer research Host: Prof. Edwin CHEUNG and Prof. Chuxia DENG Time: 17:00-18:00 Venue: N22-G002 and Zoom	9