

ACADEMIC ACTIVITIES

B-CAT Meeting #23

During the B-CAT Meeting on 1 August, Prof. Jun ZHENG presented his work on the Mechanistic and Functional Studies on Type VI Secretion Systems in *Vibrio parahaemolyticus*.

Type VI secretion systems (T6SSs) are complex molecular nanomachines for the translocation of effector proteins to eukaryotic cells or prokaryotic competitors. Effectors identified to date are secreted, presumably at full-length, by covalently or non-covalently decorating the expelled Hcp-VgrG-PAAR puncturing device. In the study, Prof. ZHENG's team presented an unprecedented effector delivery process deployed by T6SS for a subset of rearrangement hotspot (RHS) repeats containing proteins (Rhs protein) that lack a PAAR motif. The *Vibrio parahaemolyticus* RhsP, an Rhs protein proven to be an effector of T6SS2, contains a functional WHH domain at its C-terminal with DNase activity. However, the full-length RhsP is biologically inactive both *in vivo* and *in vitro*. They showed that the C-terminal of RhsP is encapsulated by its N-terminal RHS-repeat-containing fragment (Rhs fragment) and is released by auto-proteolysis before secretion. While the Rhs fragment remains inside the producing cells, the released C-terminal fragment binds to PAAR2 through a PAAR-interacting domain (PID) and is secreted by T6SS2. RhsP, thus defined as a pro-effector, together with the associated immunity protein contributes to the policing of "social cheaters" in the *V. parahaemolyticus* community. A comparative genomic analysis revealed that this type of "pro-effectors" is widely distributed and is highly diverse in both toxin domain architectures and genomic loci. Their findings suggest that T6SS adopts diverse mechanisms to expand its weaponry during evolution. In addition, Prof. ZHENG also discussed the decisive factors for the localization of T6SSs in *V. parahaemolyticus*.

Publications of the week

1. Shen, Y. M., Chan, B. S. M., Liu, J. B., Zhou, Y. Y., Cui, X. L., He, Y. Q., Fang, Y. M., Xiang, Y. T., and Luo, X. R. (2018) The prevalence of psychiatric disorders among students aged 6~ 16 years old in central Hunan, China. *BMC Psychiatry* **18**, 243
2. Wang, M. Y., Zhang, J., Lu, F. M., Xiang, Y. T., and Yuan, Z. (2018) Neuroticism and conscientiousness respectively positively and negatively correlated with the network characteristic path length in dorsal lateral prefrontal cortex: A resting-state fNIRS study. *Brain Behav*, e01074
3. Zhang, B., Lyu, J., Liu, Y., Wu, C., Yang, E. J., Pardeshi, L., Tan, K., Wong, K. H., Chen, Q., Xu, X., Deng, C. X., and Shim, J. S. (2018) BRCA1 deficiency sensitizes breast cancer cells to bromodomain and extra-terminal domain (BET) inhibition. *Oncogene*
4. Zhang, W., Hu, X., Zhou, W., and Tam, K. Y. (2018) Liquid Chromatography-Tandem Mass Spectrometry Method Revealed that Lung Cancer Cells Exhibited Distinct Metabolite Profiles upon the Treatment with Different Pyruvate Dehydrogenase Kinase Inhibitors. *J Proteome Res*

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Seminar Series #19 **PTEN and Beyond**

Prof. Hong WU, Chair Professor and Dean of School of Life Sciences, Peking University discussed her recent work on PTEN null leukemia stem cells and intrinsic and microenvironmental pathways of prostate cancers with FHS academic staff and students.

FHS NEWS

Representatives from Imperial College London visited FHS

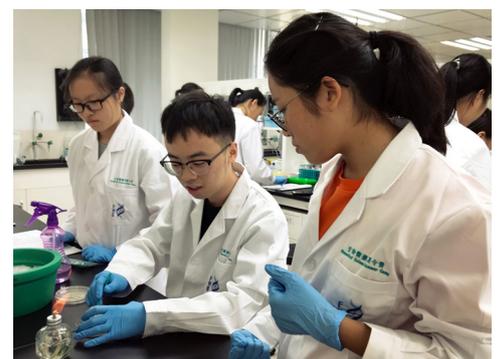
Professor Maggie DALLMAN, Vice President (International) and Associate Provost (Academic Partnerships), and Mr. Alex PAGE, Senior International Relations Officer (Asia) International Relations Office of Imperial College London visited FHS as part of their courtesy visit at the University of Macau on 26 July. They were accompanied by Rector Yonghua SONG, VRR Rui MARTINS, and Director of GAO, Ms. Cindy LAM and led on a tour of FHS by Prof. Chuxia DENG and other Faculty members. The delegation showed great interest in FHS's history, development and facilities.



FHS NEWS

Biomedical Sciences Summer Camp 2018- Camp 1

Every year, FHS hosts the Biomedical Sciences Summer Camp for local highschool students to better understand biomedical sciences and gain hands-on experience so as to peak their interest in science. This year, 30 local high school students from participated in the first camp this summer which commenced on 30 July and came to an end on 1 August. The students learned and performed experiments such as DNA fingerprinting, cell transfection, DNA transformation and bioinformatics laboratory. In the camp, there was also a “Night Talk” sharing session for students to chat about their experience. They greatly enjoyed and learned a lot in the three-day immersive learning program.



AUGUST				
Mon	Tues	Wed	Thurs	Fri
6	7	8	9	10
<p>Summer Camp (2)</p> <p>Summer Laboratory Work Experience Programme (Phase IV)</p>		<p>PhD Oral Defense Ms. Chenyin WANG Time: 10:00 Venue: N6-G010</p>		
13	14	15	16	17
<p>Summer Laboratory Work Experience Programme (Phase V)</p>	<p>PhD Oral Defense Mr. Zheng YANG Time: 10:00 Venue: N6-G010</p>	<p>Seminar Series Metabolomics and antibiotic-resistant bacteria Prof. Xuanxian PENG Time: 10:00-11:00 Venue: E12-G004</p> <p>PG New Student Orientation Time: 10:30-12:00 Venue: E12-G003</p> <p>UG New Student Orientation Time: 14:30-16:00 Venue: E12-G003</p> <p>B-CAT Meeting #24 Prof. Xiaoling XU Time: 17:00 Venue: E12-G004</p>		
20	21	22	23	24
	<p>New Student Welcome Reception Venue: E12 Learning Common</p>			
27	28	29	30	31
	<p>Seminar Series The Promises and Challenges of Non-coding RNA Studies in Neurodegenerative Diseases Prof. Hermona SOREQ Time: 11:00-12:00 Venue: E12-G004</p>			

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For more information or submission of articles to be featured, please contact Ms. Vivienne Fong at viviennefong@umac.mo or 8822 4230.