ACADEMIC ACTIVITIES

Publication(s) of the week

1. Gao, H. X., Huang, S. G., Du, J. F., Zhang, X. C., Jiang, N., Kang, W. X., Mao, J., and Zhao, Q. (2018) Comparison of Prognostic Indices in NSCLC Patients with Brain Metastases after Radiosurgery. *Int J Biol Sci* **14**, 2065-2072 **[IF=4.95]**

2. Guo, S., and Deng, C. X. (2018) Effect of Stromal Cells in Tumor Microenvironment on Metastasis Initiation. *Int J Biol Sci* **14**, 2083-2093 **[IF=4.95]**

Seminar Series
Molecular Analysis of Cancer with Single-cell RNAseq - Prof. John ZHONG

Prof. John ZHONG, Assistant Professor of School of Dentistry, University of Southern California, presented a talk on “Molecular Analysis of Cancer with Single-cell RNAseq” on 2 January.

Prof. ZHONG has discussed the tools and methods he developed for the molecular analysis of cancer cells. Information concerning cellular heterogeneity is often lost in the physical mixing and averaging of millions of cells with the conventional gene expression profiling. Prof. ZHONG believed that the single-cell transcriptome analysis has the potential to address these issues. Most cancer clinical samples are mixtures of normal and cancer cells. This heterogeneity becomes a hurdle for molecular analysis of cancer with bulk lysates which is a physical mixture of cancer and normal cells. Therefore, Prof. ZHONG’s team used a phase-switch droplet microfluidic platform and next generation sequencing to address this challenge in their research.

健康科學學院
Faculdade de Ciências da Saúde
Faculty of Health Sciences

NEWSLETTER ISSUE 01
01 - 04 JANUARY 2019

Seminar Series

Functional Coupling of Growth hormone and Insulin-like Growth Factors with Spexin Regulation by Insulin at Hepatic Level in Fish Model - Prof. Anderson WONG

Prof. Anderson WONG, Professor of School of Biological Sciences, University of Hong Kong, presented a talk on “Functional Coupling of Growth hormone and Insulin-like Growth Factors with Spexin Regulation by Insulin at Hepatic Level in Fish Model” on 2 January.

Spexin (SPX), a neuropeptide with pleiotropic functions, has been identified as a satiety factor in fish models. In the recent study of Prof. WONG’s team with goldfish, insulin was confirmed to be a functional link between food intake and SPX expression in the liver and IGF-I receptor (IGF1R) together with insulin receptor (InsR) were found to be involved in insulin-induced SPX expression at the hepatic level, which raises the possibility that the hepatic signal of insulin-like growth factor (IGF) induced by growth hormone (GH) may play a role in SPX regulation.

In Prof. WONG’s study, food intake in goldfish was found to up-regulate plasma levels of insulin, SPX and GH with parallel rises of GH mRNA in the pituitary and transcript expression of SPX, IGF-I and IGF-II in the liver. In goldfish pituitary cells, insulin treatment could induce GH secretion without notable changes in GH mRNA expression. In goldfish hepatocytes, GH induction could increase SPX, IGF-I and IGF-II gene expression via activation of JAK2/STAT5, MEK1/2/ERK1/2 and PI3K/ Akt pathways and these stimulatory effects were blocked by inhibiting InsR and IGF1R activation. Interestingly, parallel treatment with insulin was shown to up-regulate IGF-I with concurrent inhibition on IGF-II mRNA expression and these differential effects were mediated by PI3K/ Akt but not MAPK cascades. Meanwhile, insulin-induced IGF-I gene expression was additive to the corresponding stimulation by GH but the parallel rise of IGF-II mRNA induced by GH could be suppressed by insulin co-treatment. At the hepatocyte level, IGF-I and IGF-II were both effective in stimulating SPX mRNA expression mainly through InsR and to a lesser extent via IGF1R, by functional coupling to P38 MAPK and PI3K/Akt pathways.

Upon these results, Prof. WONG concluded that insulin can induce SPX expression in goldfish liver via indirect action of GH/IGF axis and local production of IGF-I/-II. Since insulin signal triggered by feeding is known to be transient mainly due to the signal termination by glucose homeostasis, the IGF-I/-II expression at hepatic level may play a role in prolonging/maintaining the SPX responses after food intake in fish model.

健康科學學院
Faculdade de Ciências da Saúde
Faculty of Health Sciences

NEWSLETTER ISSUE 01
01 - 04 JANUARY 2019

Seminar Series

Human Genome Editing in Stem Cells for Disease Modeling and Treatment - Prof. Linzhao CHENG

Prof. Linzhao CHENG, Professor of Johns Hopkins University School of Medicine, presented a talk on "Human genome editing in stem cells for disease modeling and treatment" on 4 January.

Prof. CHENG discussed his experience in correcting point mutations involved in two types of blood diseases. He also discussed broadly on the latest advances in genetic medicine that specific genomic DNA is also a target for gene therapies and the challenges he encountered. For many gene and cell strategies, it is highly desirable to target stem cells because they have greater proliferative and differentiation potential but they are normally more refractory to genetic modification. The advent of engineered chimeric nucleases such as ZFNs and TALENs greatly enhanced the capability of Prof. CHENG's research to conduct genome editing of non-transformed human cell types in the past decade.

Prof. CHENG finally concluded that precision genetic medicine is the combined approach of human genome editing and stem cells, and will likely accelerate the whole research progress.

PhD ORAL DEFENSE

PhD Oral Defense by Yibo ZHANG of Prof. Wei GE's group

Mr. Yibo ZHANG, supervised by Prof. Wei GE, has completed his PhD Oral Defense on 3 January. The title of his thesis was "Role of Y-box Binding Protein 1 in Regulating Zebrafish Ovarian Follicle Activation".

Mr. ZHANG presented how he removed nuclear and cytosolic Ybx1 in zebrafish. He truncated the functional domains that control the subcellular locations by modifying the DNA coding sequence of the cytosol retention sequence (CRS), the 20S cleavage site and the C terminal domain (CTD). He then finally demonstrated that the Ybx1 protein resides only in the nucleus in Ybx1ΔCRS mutants, while it is located only in the cytoplasm in Ybx1Δ20S and Ybx1ΔCTD mutants. Besides, Mr. ZHANG established an efficient platform for precise CRISPR/Cas9-mediated gene-editing that yield, an efficiency of 74% in somatic cells with 25% germline transmission for substituting Ser-82 with Ala-82 to study the importance of Ser-82 phosphorylation, and he identified 9 novel phosphorylation sites and 11 novel deamidation sites in zebrafish Ybx1 in PG follicles. He also established an efficient platform for precisely editing the DNA coding sequence of functional domains at single amino acid level, and he identified several novel potential posttranslational modification sites in the zebrafish Ybx1 in PG follicles, which is worth future studies.

Mr. ZHANG finally concluded that his results highlight the dual functions of Ybx1 in regulating zebrafish ovarian follicle activation *in vivo* at the genetic level.

健 康 科 學 學 院
Faculdade de Ciências da Saúde
Faculty of Health Sciences

UPCOMING

JANUARY

Mon	Tues	Wed	Thurs	Fri
07 **Oral Defense** Zhiqiang ZHAO Time: 15:00 Venue: N6-2022 Supervisor: Prof. Lijun DI	**08**	**09** **B-CAT Meeting #1** Speaker: Chuxia DENG Time: 17:00 Venue: E12-G004	**10** **FHS Postdoc/ Student Seminar** Host: Prof. Chuxia DENG and Prof. Chris WONG Time: 17:00-18:00 Venue: N22-G002	**11**
14	**15**	**16**	**17**	**18**
21	**22**	**23** **B-CAT Meeting #2** Speaker: Tzu-Ming LIU Time: 17:00 Venue: E12-G004	**24** **FHS Postdoc/ Student Seminar** Host: Prof. Xuanjun ZHANG and Prof. Qi ZHAO Time: 17:00-18:00 Venue: N22-G002	**25**

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