TEMS

TLL External Monthly Seminar

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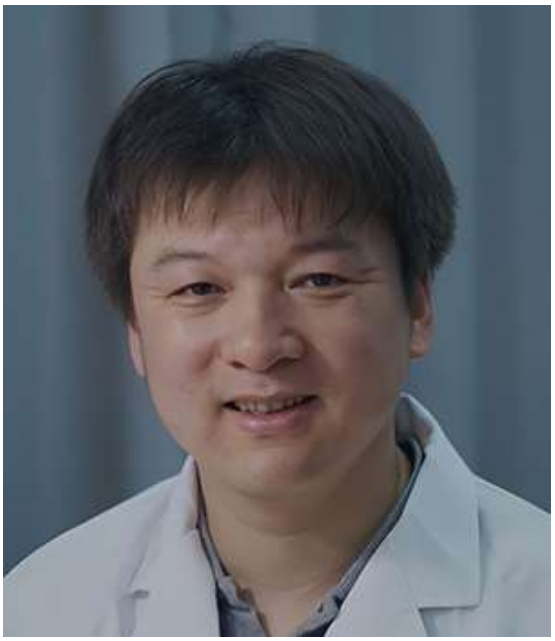
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5 July 2024 (Friday), 3pm
The Auditorium (Level 1)

Hosted by: Dr Cai Yu

Uncovering the secrets of organ regeneration using the tetrapod axolotls

Dr Jifeng Fei
Guangdong Academy of Medical Sciences, China



Guangdong Pearl River Scholar Distinguished Professor. Dr Jifeng Fei received his PhD degree from the Max-Planck Institute of Molecular Cell Biology and Genetics in Germany. He has long been engaged in using animal organisms to generate disease models to study the mechanisms of organ development and regeneration. He is currently working as a group leader at Guangdong Academy of Medical Sciences.

The Mexican axolotl, a tetrapod vertebrate, possesses remarkable regenerative abilities, making it an ideal model for studying the mechanisms of tissue and organ regeneration. For a deeper investigation of this fascinating regeneration phenomenon, we previously established a series of genetic resources and tools in the axolotls, including sequencing and assembling the axolotl genome and developing CRISPR/Cas9 based gene knockout, gene knock-in approaches, and inducible cell-ablation system. In recent years, we have established a series of injury and disease models in axolotls for comparatively elucidating the key molecules involved in organ regeneration, via functional genomics, single-cell sequencing, spatial transcriptomics, living imaging, and drug screening approaches. In this case, we identified the key NSCs involved in brain regeneration, and discovered significant similarities between brain regeneration and development in terms of cellular lineage and molecular pathways. Our study may provide feasible strategies to improve limited regenerative capacity in mammals.

Recent Publications:

1. Wei X et al., Single-cell Stereo-seq reveals induced progenitor cells involved in axolotl brain regeneration. 2022, Science, 377(6610):eabp9444.
2. Nowoshilow S et al., The axolotl genome and the evolution of key tissue formation regulators. 2018, Nature, 554(7690):50-55.
3. Fei JF et al., Efficient gene knockin in axolotl and its use to test the role of satellite cells in limb regeneration. 2017, Proc Natl Acad Sci U S A, 114(47):12501-12506.