ACADEMIC ACTIVITIES

Publication(s) of the week

1. Zhang, Z., Sang, W., Xie, L. S., and **Dai, Y. L.** (2019) Metal-Organic Frameworks for Multimodal Bioimaging and Synergistic Cancer Chemotherapy. *Coordin Chem Rev* **399** **[IF=13.364]**

2. Wang, X., Jiang, B., Sun, H. Y., Zheng, D. J., Zhang, Z. W., Yan, L., **Li, E. Q.**, Wu, Y. J., and **Xu, R. H.** (2019) Noninvasive Application of Mesenchymal Stem Cell Spheres Derived from Hesc Accelerates Wound Healing in a CXCL12-CXCR4 Axis-Dependent Manner. *Theranostics* **9**, 6112-6128 **[IF=8.651]**

3. Bin, J., Fu, X. F., Yan2, L., Li, S. S., Zhao, D. L., Wang, X. Y., Duan, Y. C., Yan, Y. P., **Li, E. Q.**, Wu, K. H., Inglis, B. M., Ji, W. Z., **Xu, R. H.**, and Si, W. (2019) Transplantation of Human ESC-Derived Mesenchymal Stem Cell Spheroids Ameliorates Spontaneous Osteoarthritis in Rhesus Macaques. *Theranostics* **9**, 6587-6600 **[IF=8.651]**

4. Gong, J., Yu, M. X., Wang, C. F., Tan, J. Y., Wang, S. C., Zhao, S. Y., Zhao, Z. J., Qin, A. J., Tang, B. Z., and **Zhang, X. J.** (2019) Reaction-Based Chiroptical Sensing of ClO(-) Using Circularly Polarized Luminescence Via Self-Assembly Organogel. *Chem Commun* **[IF=5.989]**

5. hou, F. C., Zheng, W., Lu, L., Wang, Y. Y., Ng, C. H., Ungvari, G. S., Li, J., and **Xiang, Y. T.** (2019) Prospective Memory in Schizophrenia: A Meta-Analysis of Comparative Studies. *Schizophr Res* **[IF=4.583]**

6. Yang, Z., Chan, K. I., **Kwok, H. F.**, and **Tam, K. Y.** (2019) Novel Therapeutic Anti-ADAM17 Antibody A9(B8) Enhances EGFR-TKI-Mediated Anticancer Activity in NSCLC. *Transl Oncol* **12**, 1516-1524 **[IF=3.308]**

BCAT Meeting

"The Role of AIB1 in Pancreatic Ductal Adenocarcinoma (PDAC) Progression" – Dr. Qiang CHEN

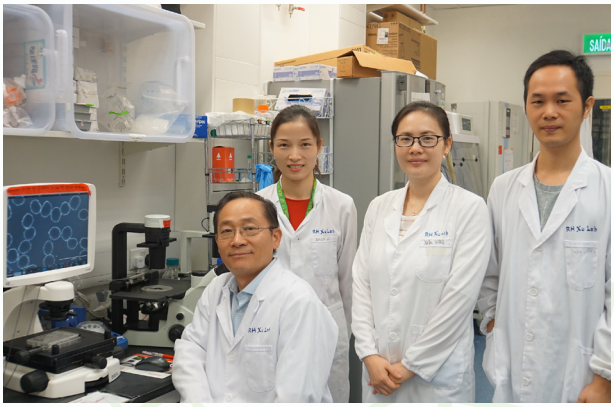
In the BCAT meeting on 28 August, Dr. Qiang CHEN presented his latest research finding on "The Role of AIB1 in Pancreatic Ductal Adenocarcinoma (PDAC) Progression".

AIB1 (Amplified in breast cancer 1), also known as steroid receptor coactivator-3 (SRC-3), is a nuclear coactivator that is found to be frequently amplified in multiple cancers including PDAC. However, the role of AIB1 in PDAC progression remains unknown. In Dr. CHEN's study, he indicated that AIB1 could promote the proliferation and migration of PDAC cells *in vitro* and *in vivo*, and he found that AIB1 interacted with MafB and assisted MafB to promote the expression of SMO and ITGAV, which plays important roles in hedgehog and ECM signaling respectively. Furthermore, the study indicated that PDAC cells with AIB1 high level are more sensitive to hedgehog inhibitor, providing a novel potential strategy to treat PDAC precisely.

Article Sharing

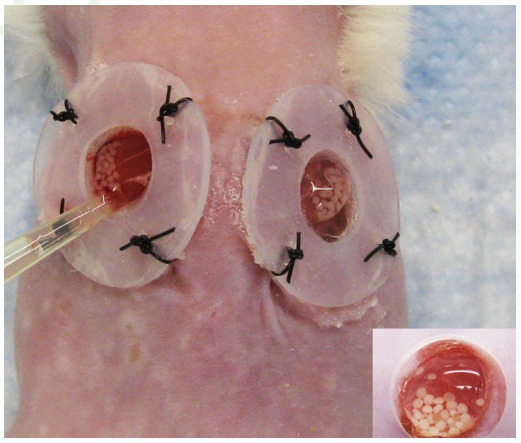
Noninvasive Application of Mesenchymal Stem Cell Spheres Derived From hESC Accelerates Wound Healing in a CXCL12-CXCR4 Axis-dependent Manner – Prof. Renhe XU

Prof. Renhe XU has reported a new method in which mesenchymal stem cells (MSCs) differentiated from human embryonic stem cells (hESCs), when used as spheres but not dissociated cells, promote skin wound healing following topical application onto the wound. The whole process is noninvasive, efficient, and independent on donation of fetal or adult tissues such as umbilical cord or bone marrow as traditional sources for MSCs. This study is published in the international renowned journal *Theranostics* (impact factor 8.063).



This study entitled as "Noninvasive Application of Mesenchymal Stem Cell Spheres Derived From hESC Accelerates Wound Healing in a CXCL12-CXCR4 Axis-dependent Manner" and was led by Prof. Ren-He XU. The first authors are Xiaoyan WANG and Bin JIANG, Ph.D. students from Prof XU's group. Dr. Huiyan SUN, an assistant professor of the Artificial Intelligence Institute of Jilin University was also involved in the research and provided bioinformatic analysis.

This team reported in *Biomaterials* in 2017 that human MSC spheres can survive for up to 10 days under an ambient condition through a "hibernation"-like mechanism, which established a new method for stem cell storage and transportation at room temperature. This study further demonstrates that the MSC spheres can be directly applied to skin wounds. Even in hypoxic and inflammatory environments of the wound, the stem cell spheres can survive much better than dissociated cells and penetrate quickly into the wound to help reepithelization and revascularization. Compared with the traditional method of stem cell injection, the survival rate of transplanted cells is greatly improved, and the topical application of the stem cell spheres greatly alleviates the pain of the transplantation process.



It has been known that exogenous MSCs can promote wound healing. However, most of the transplanted stem cells are derived from the bone marrow, fat and umbilical cord of human body. The cell sources are limited, cell quality and vitality vary, there is a risk of pathogen transmission, and some isolation methods may cause pain to the donors during the collection process. This study used MSCs differentiated from hESCs, which removes the limitation of MSC sources, and the hESC-derived MSCs have stronger viability and more consistent functions than MSCs derived from the somatic sources.

At present, the delivery of stem cells mainly relies on intravenous or local injections. These methods bring inconvenience and pain to the patients, and the injected cells have low vitality and rarely migrates to the target tissue. In this study, stem cells are directly dropped onto the wound in the form of spheres, the transplanted spheres are visible at the early stage, and then rapidly migrate to underneath the wound, and recruite epidermal cells at the edge of the wound to expand and

migrate to the center of the wound. This new technology is convenient, safe and efficient. Combined with the characteristics of spheroid cell storage and transportation under ambient conditions, it is expected to provide a new way for skin wound treatment by using stem cell spheres. Transplanted stem cells gradually disappear after the wound heals. In order to further improve the biosafety of the method, these researchers inserted a suicide gene into the stem cell genome, which can kill the remaining stem cells and their derivatives after the therapy by injecting a small chemical drug that triggers the expression of the suicide gene.

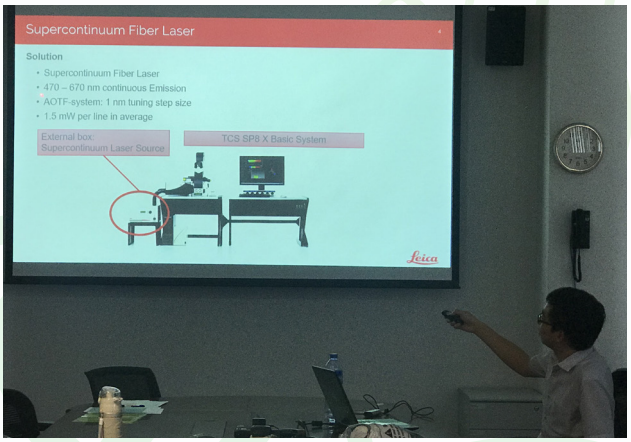
This project is funded by the University of Macau and the Macao Science and Technology Development Fund. A patent on the method has been applied. For more information about this report, please read http://www.thno.org/v09p6112s1.pdf.

Seminar Series

New Dimension Breakthrough in Confocal Microscopy for Life Science Research – Mr. Bob TANG

Mr. Bob TANG, Application Specialist of Leica Company, presented “New Dimension Breakthrough in Confocal Microscopy for Life Science Research” on 29 August.

Mr. TANG shared his experience on the advanced microscope technology including widefield, confocal and super resolution systems. He introduced the operation, application and the mechanism of the data analysis on the use of supercontinuum fiber laser (white light laser, acousto-optical beam splitter (AOBS), super sensitive hybrid detector, confocal super resolution and lutra fast fluorescence lift time imagaing (FLIM). He also shared his experience on some problem-solving skills when operating the microscopes.



UPCOMING

September

Mon	Tues	Wed	Thurs	Fri
2	**3**	**4** **Seminar Series** The Therapeutic Window of Stroke Treatment Speaker: Prof. John H. ZHANG Host: Prof. Wenhua ZHENG Time: 15:00 - 16:00 Venue: E12-G004 **Oral Defense** Rui WEI Supervisor : Prof. Terence POON Time: 16:00 Venue:N6-2022 **B-CAT Meeting #16** Speaker: Prof. Qi ZHAO Time: 17:00 Venue: E12-G004	**5** **Seminar Series** Oxidative Stress and Antioxidant: What Should We Do for Preventing Brain Damage and Improving Brain Repair in Stroke Treatment Speaker: Prof. Jiangang SHEN Host: Prof. Wenhua ZHENG Time: 10:00 - 11:00 Venue: E12-G003 **FHS Postdoc/ Student Seminar** Host: Prof. Wei GE and Prof. William CHAO Time: 17:00-18:00 Venue: N22-G002	**6**
9	**10**	**11**	**12** **Mid-Autumn Festival Gathering** Time: TBC (PM) Venue: E12 Common Area	**13**
16 **The first working day after the Day following the Mid-Autum Festival**	**17**	**18** **Seminar Series** Towards Decoding and Restoration of Visual and Motor Functions Speaker: Prof. Jiayi ZHANG Host: Prof. Zhen YUAN Time: 09:30 - 10:30 Venue: E12-G004 **Seminar Series** (Pro-)fluorescent substrates for oxidizing and conjugating enzymes of drug metabolism Speaker: Prof. Risto Olavi JUVONEN Host: Prof. Garry WONG Time: 15:00 - 16:00 Venue: E12-G004 **B-CAT Meeting #17** Speaker: Prof. Terrence POON Time: 17:00 Venue: E12-G004	**19** **FHS Postdoc/ Student Seminar** Host: Prof. Garry Wong and Prof. Yutao XIANG Time: 17:00-18:00 Venue: N22-G002	**20**

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