香港浸會大學 HONG KONG BAPTIST UNIVERSITY

School of 中醫藥學院 Chinese Medicine

SCM Seminar

In vivo reprogramming for brain repair

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Date: 23 June 2014 (Monday)
Time: 11:30 am – 12:45pm
Venue: SCM 809
Language: English
Facilitator：Prof. Bian Zhaoxiang

Abstract

The human brain has billions of neurons and brain repair has been thought to be mission impossible due to the complexity of brain structures. Reactive gliosis is a common pathological hallmark that is widely associated with brain injury, stroke, glioma, and neurodegenerative disorders such as Alzheimer's disease. Reactive astrocytes initially exert neuroprotective effects but later form glial scars to inhibit neuronal growth. Currently, there is no effective way to reverse glial scars back to normal neural tissue. We have recently established an innovative in vivo cell conversion technology to directly convert reactive astrocytes into functional neurons in mouse brain (Guo et al., Cell Stem Cell, 2014). This is achieved through in vivo expression of a single neural transcription factor NeuroD1 in the reactive astrocytes in injured mouse brain or model animals for Alzheimer's disease. Our in vivo direct cell conversion technology will not only reduce the number of reactive astrocytes, but also generate new neurons simultaneously at the injury site for brain repair. Such internal trans-differentiation method will avoid immunorejection and cell fate uncertainty associated with conventional stem cell therapy. We have further demonstrated that cultured human astrocytes can be directly converted into functional neurons, suggesting that our in vivo cell conversion technology may be potentially developed into clinical therapies for human brain repair.

**** All are welcome ****