美国宾夕法尼亚州立大学陈功教授学术报告会

报告题目：In Vivo Reprogramming: Reversing Glial Scar Back To Neural Tissue For Brain Repair

报告人：Gong Chen

报告时间：2015 年 5 月 29 日(星期五) 11:00 - 12:30

报告地点：北京大学医学部神经科学研究所会议室（中心楼）

主持人：于常海教授

陈功教授简介：1987 年毕业于上海复旦大学，随后师从中国科学院上海生理研究所冯德培院士攻读博士学位。之后先后在耶鲁大学（Dr. Anthony van den Pol) 和斯坦福大学(Dr. Richard Tsien) 进行博士后研究。现任宾夕法尼亚州立大学生物学系 维恩·魏勒曼冠名主任教授（Verne M. Willaman Chair in Life Sciences)。研究兴趣主要集中于大脑损伤后的修复和神经退行性疾病的治疗方面，最近发表的脑内在体胶质细胞转化为功能性神经元的工作（Cell Stem Cell, 2014)在世界范围内引起巨大反响,可能给脑疾病的治疗带来一场革命。先后在 Nature ，Cell ，Cell Stem Cell, Nature Communications, PNAS，Neuron, Nature Neuroscience 等世界顶尖杂志发表数十篇高水平论文，并获得 Alzheimer’s Association Zenith Fellows Award 等多项奖励和资助。2014 年 11 月在华盛顿主持了世界上首次干细胞领域内“在体细胞转化”（In vivo reprogramming）的专题报告会，参会者达 800 多人，标志着一个新的领域诞生。

演讲摘要：Glial scar is a common pathological hallmark that is widely associated with brain injury, stroke, glioma, and neurodegenerative disorders such as Alzheimer’s disease. Reactive glials 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 developed an innovative in vivo reprogramming technology to directly convert reactive glial cells into functional neurons inside the 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, making it possible for the first time to

reverse glial scar back to neural tissue. Such internal trans-differentiation method will avoid immunorejection and tumorigenesis associated with conventional stem cell therapy. We have further demonstrated **that cultured human astrocytes can be directly converted into functional neurons by small molecules, suggesting that our cell conversion technology may be developed into drug therapies for human brain repair.**

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