Neurobiology/Ageing Programme

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"NFIX regulates neural progenitor cell differentiation during hippocampal morphogenesis. "

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Biography

Evelyn Heng is a doctoral student in developmental neuroscience working under Dr Michael Piper. She received her BSc with first class honours, majoring in biomedical science from the University of Queensland. The working title of her thesis is "The analysis of Nfix in the development of the embryonic and adult CNS". Her research will address the role of Nfix, a transcription factor, in neural progenitor cell proliferation and differentiation in the developing of the adult brain using Nfix knockout mice.

Abstract

Neural progenitor cells are self-renewing cells that have the ability to give rise to neurons and glia in the embryonic, neonatal and adult brain. The control of progenitor cells formation and maintenance or exiting the cells cycle and differentiation is critical for the proper development of the central nervous system. However, our understanding of the molecular regulation of these fundamental events remain limited. Here we demonstrate that NFIX is expressed by neural progenitor cells in the hippocampus, and that progenitor cell differentiation is delayed within *Nfix*$^{-/-}$ mice. Moreover, the morphology of the dentate gyrus in postnatal *Nfix*$^{-/-}$ mice appeared to be abnormal. At a mechanistic level, we demonstrate that the progenitor cell maintenance factor SOX9 is upregulated in the hippocampus of *Nfix*$^{-/-}$ mice, and that NFIX can repress *Sox9* promoter-driven transcription. Collectively, these data suggest that *Nfix* plays a key role in hippocampal morphogenesis through controlling the timely differentiation of neural progenitor cells into neuronal and glial popluations within the embryonic hippocampus.

Date and time: Monday, 27 August 2012
Time: 3.00 – 4.00pm
Venue: NUS Centre for Life Sciences Seminar Room 2
Host: A/P Lim Kah Leong, Dept of Physiology