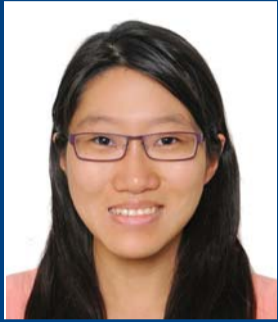


Oral PQE



MS GOH SUH YEE

Graduate Student

Supervisor: A/P Tay Sam Wah, Samuel

**16 May 2018, Wednesday
10am – 11am**

**MD10 Anatomy Museum
Level 2, Seminar Room**

miRNA-Mediated Neurodegeneration in Parkinson's Disease

Parkinson's disease (PD) is the most common motor disorder and the second most prevalent neurodegenerative disease in the aging population. Owing to many gaps in knowledge about this disease, current treatment methods only provide symptomatic relief and not neuroprotection. Previously, our lab has shown that there is an upregulation of miR-9 and miR-219 in the substantia nigra pars compacta (SNc) in the mouse model of PD (1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP)-treated mice. This trend is also similarly observed in the post-mortem SNc of PD patients. miRNAs are post-transcriptional regulators of gene expression and are involved in the maintenance of normal cellular functions. In this study, we are interested to investigate the miRNA-mediated mechanisms involved in the development of PD. Our adopted in vitro models of PD involve the treatment of SH-SY5Y and differentiated MN9D neuronal cell lines with MPP iodide (1-methyl-4-phenylpyridinium iodide) for 24 hours. Using miRNA qPCR, we verified the increase in miR-9 and miR-219a levels in these in vitro PD models. We found that MPP+ treatment decreased neuronal cell viability by about 30% and the inhibition of miR-9 significantly reversed this trend. This suggests that the miR-9 upregulation in PD is cytotoxic and promotes neurodegeneration. In addition, using NanoSight technology, we observed that MPP iodide-treated neurons released significantly more exosomes and these exosomes were ~20 nm bigger in size as compared to the exosomes released by healthy control neurons. Interestingly, these exosomes also contained higher levels of miR-9. This suggests that miR-9 may be transported to other cell types (such as microglia) to regulate other events in PD, for instance, neuroinflammation. These research findings implicate miR-9 as a potential diagnostic biomarker of PD. Downstream targets of miR-9 may also be useful in the development of neuroprotective treatments for PD.

Please contact **Dr Hu Qidong at 6601 3730** or **Ms Nuramalina at 6516 3200** for more queries. All are welcome.