

PHD SCHOLARSHIP RECIPIENT

ARIEL GOH

Miss Ariel Goh is a first-year PhD student conducting her research at Monash University. She has recently graduated with a Bachelor of Arts degree with Honours in Psychology from the University of Melbourne, attaining a First-Class Honours. Her honours thesis involved a year-long research project on the neural correlates and computational modelling of visual search, employing advanced neuroimaging techniques such as electroencephalography, and modelling methodologies such as systems factorial technology. For her PhD, Miss Goh will aim to explore the neural correlates of fatigue in medical conditions such as Parkinson's Disease under the supervision of Dr. Trevor Chong.

Research

Cognitive fatigue, or the subjective feeling of lack of mental stamina or increased effort that is accompanied by suboptimal cognitive performance, is ubiquitous and also pervasive across medical conditions such as Parkinson's Disease. However, while it has a significant impact on morbidity, quality of life, and rehabilitative goals, little is known about its underlying mechanisms. It is thus of great interest to further investigate fatigue as this may lay the groundwork for more effective and targeted interventions.

This research will attempt to quantify changes in cognitive fatigue by utilising techniques from neuroeconomics, computational modelling and cognitive neuroscience, and determine how changes in cognitive fatigue might affect decision-making. The study will employ functional magnetic resonance imaging (fMRI) and diffusion tensor imaging (DTI) to identify the neural substrates of cognitive fatigue, and determine the causal involvement of the areas identified in the development of fatigue. Transcranial magnetic stimulation (TMS) might then be used to investigate the effects of transiently disrupting these regions on cognitive fatigue.

While this research will initially focus on Parkinson's Disease, the paradigms used can also be extended to better understand fatigue in other medical conditions. Thus, this research will lay the foundation for an investigation of fatigue across multiple states of disease in which fatigue may have different underlying mechanisms. This will allow the identification of the different neural pathways that lead to the manifestation of fatigue in separate diseases, and may offer insight into how cognitive fatigue can be treated directly in the future.