Lecture by Phd fellow Andrew Hayward
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Time: Wednesday, 31 May 2017, at 11:30 – 12:00
Venue: AAU, Fredrik Bajers Vej 7E, room 1-214

Title: Attention in Rodents: Pharmacology and the Role of the Frontoparietal Network

Abstract:
Attention is the filter used to prioritise information adaptively. How this filter works is a fundamental issue to understand, firstly due to its role in shaping our perception of the world and secondly due to the involvement of inattention in many neuropsychiatric conditions such as schizophrenia, Alzheimer’s disease and Attention Deficit/ Hyperactivity Disorder (ADHD). The recent high profile failures in drug discovery in psychiatric conditions have demonstrated that there is a need to improve translation of pre-clinical findings. Validating and refining novel and existing models of inattention will facilitate this translation and therefore the development of novel therapeutic strategies.

My work has focused on using the 5 choice continuous performance task (5C-CPT) as a test of attention which is designed for high translation. Using the 5C-CPT we can group animals based on natural variation in performance and assess how the effects of compounds differ depending on baseline attention. We have so far demonstrated the pharmacological validity of the method by testing methylphenidate, which is the first line treatment for ADHD. We have also used this to study the α7 nicotinic acetylcholine receptor partial agonist encenicline which is in research for schizophrenia and Alzheimer’s disease.

This work has also found that the frontoparietal network plays a role in task engagement by staining for the immediate early gene C-Fos after task performance. This has lead onto studying the role of the frontoparietal cortex in the response to methylphenidate. This research has found that an attention promoting dose of methylphenidate (1 mg/kg) promotes alpha band (12-30 Hz) oscillations in neuron firing across the frontoparietal cortex in anaesthetised rats. As α band oscillations are linked to the process of suppression and selection of stimuli, this is a potential biomarker of pro-attentive action. Finally these findings will be discussed along with the future directions to promote the production of novel pharmaceuticals for conditions with inattention.