



Biomedical Engineering Seminar Series

1st Semester, Academic Year 2019

Date: September 24, 2019

Time: 11.00 AM – 12.00 PM

Room 6373, 3rd level, Building 3,
Faculty of Engineering; Mahidol University



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"Characterizing mismatch negativity biomarker signatures in preclinical models relevant to schizophrenia"

Mismatch negativity (MMN) is an electrophysiological signal observed from human EEG recorded during an oddball paradigm experiment. When a pattern of repetitive standard stimuli is interrupted by a deviant oddball stimulus, the MMN component is elicited. This is analyzed following a waveform subtraction between standard and deviant event-related potentials, and typically presents a negative peak between 150-250 ms post-stimulus. Two competing hypotheses are proposed to explain this phenomena: 1) a violation of sensory-memory, known as a prediction error, or 1) by uneven adaptation to standard and deviant stimuli, which are presented at different rates. Of clinical importance, there is a substantial body of research indicating that patients diagnosed with schizophrenia tend to show diminished MMN amplitude compared with healthy controls; providing incentive for modelling this potential biomarker in non-human species. This would enable a closer inspection of the neurophysiological mechanisms underlying MMN and its reduction in schizophrenia. In this study, three experiments were performed to examine MMN in the mouse model. Auditory stimuli varying in duration, frequency, intensity, and inter-stimulus interval were employed, and multiple control paradigms were included in the experimental design. Ultimately, the results present little evidence to objectively support either of the existing hypotheses describing human MMN, and suggest more fundamental mechanisms may explain findings from the mouse model.

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