

Symposium | Schizophrenia : [Symposium 28] Neurophysiological studies from a perspective of predictive coding in psychiatry

📅 Fri. Sep 26, 2025 9:00 AM - 10:30 AM JST | Fri. Sep 26, 2025 12:00 AM - 1:30 AM UTC 🏢 Session Room 6 (Conference Room B)

[Symposium 28] Neurophysiological studies from a perspective of predictive coding in psychiatry

Moderator: Kenji Kiriwara (Center for Coproduction of Inclusion, Diversity and Equity, The University of Tokyo)

[SY-28-04] Propagation of prediction signals in the front-temporal network during tone omission

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Keywords : prediction、 cerebral cortex、 macaque monkey

Proactive sensory processing based on prediction is a fundamental ability for humans to respond appropriately to external events. Our brain forms predictions based on sensory context, and produces prediction error signals from comparisons with the actual sensory events, suggesting a mutually active exchange of information between prefrontal areas that generate predictions, and sensory areas that represent sensory information. To elucidate the neural network involved in prediction and prediction error, we investigated functional coupling between prefrontal and temporal cortices from 256 electrocorticogram (ECoG) electrodes implanted in two macaque monkeys using an omission paradigm, which examined responses to omission events embedded in repetitive tone stimuli. Monkeys were presented with tone stimuli under two conditions: one where the timing of omission could be predicted, and one where it could not. We found differences in ERP before omission onset mainly at frontal pole, DLPFC and peri-arcuate area electrodes, whereas differences after omission onset were mainly observed at VLPFC and peri-arcuate area electrodes. θ and α -band phase synchrony between STG and each prefrontal cortices increased for predicted tone omission compared to unpredicted tone omission before omission onset, whereas α and β -band phase synchrony increased after omission onset. Phase directionality analysis suggest that information involved in omission prediction may be propagated between front-temporal cortices, with bottom-up signals conveyed through θ -band and top-down signals through α and β -bands. Considering their time course, θ -band phase synchrony may be involved in generating prediction itself, and β -band in generating prediction error, and α -band in both during tone omission.