EEG Biomarkers in Psychiatry

Lecture by Prof. Jury Kropotov

Prof. Jury Kropotov is a world renowned neuroscientist, USSR State Prize Winner, director of laboratory of the Institute of the Human Brain of Russian Academy of Sciences, St. Petersburg, Russia, Professor II of Norwegian University of Science and Technology, Trondheim, Norway.

Juri Kropotov, Ph.D. has earned three doctorates: in theoretical physics, in philosophy and in neurophysiology. From 1970 to 1990, he practiced at the psychiatric clinics of the Institute of Experimental Medicine and Institute of the Human Brain at the Russian Academy of Sciences in St. Petersburg. His work with psychiatric patients included electrode implantation for neurological research, evaluation, diagnosis and therapy. For this research, in 1985 he was awarded the country’s highest scientific award – the USSR State Prize. His scientific interests are now focused on Quantitative EEG and normative data bases, event related potentials (ERPs), neurotherapy (neurofeedback, tDCS, DBS), QEEG/ERP markers of psychiatric and neurological disorders.

Brief synopsis

MRI, fMRI, PET and electrophysiological studies play an important role in applied neuroscience for defining biomarkers of psychiatric and neurological disorders. Because of high temporal resolution, EEG recordings are the only methods that allow neuroscientists to assess dynamic brain functions.

Research shows that quantitative EEG (QEEG) and event related potentials (ERPs) reflect quite independent domains of brain functioning: QEEG reflect mechanisms of cortical self-regulation whereas ERPs reflect information flow within cortical neuronal networks. The patient might have a normal self-regulation but abnormal information flow, and vice versa.

Meta analysis of applied neuroscience literature within the frames of “diagnosis and treatment of brain dysfunction” shows that the number of papers in ERP research is 10 times larger than the number of papers in QEEG research with this ratio dramatically increasing over the last five years. The effect size in ERP discriminant (patients vs. norms) analysis is usually much higher than the effect size in QEEG analysis.

The core part of the lecture is intended to introduce ERP-based biomarkers. The methodology of recording and analysis of ERPs will be presented. The focus will be made on recently emerged tools such as Independent Component Analysis and sLORETA imaging.

Application of ERP for diagnosing ADHD, schizophrenia and Traumatic Brain Injury will be discussed. Biomarkers of these disorders (amplitude and latencies of independent ERP components) will be presented. Finally, our own experience of using ERPs for constructing protocols of neurofeedback and tDCS will be discussed.

The lecture will start from reception on March 20th 2012
Time: 19:00-20:30 NSW (AEST)
Venue: Terraces Room, Outrigger Twin Towns Resort
Cnr of Griffith and Wharf St Coolangatta/Tweed Heads

To register for these events please visit
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NB! Only a few places left for 5-day in depth training course with Prof. Jury Kropotov
From A-Z of Quantitative EEG, Event Related Potentials & Neurotherapy
21-25 March 2012
Outrigger Twin Towns Resort