

Sensorimotor Responses in MEG: Developmental Trends and Advanced Clinical Applications

Chair: William Gaetz, Children's Hospital of Philadelphia, USA

Room: # 103

Date and Time: Tuesday, October 4 / 08:30-10:30

Somatosensory and motor responses (i.e., sensorimotor responses) are among the most well-studied signals of the human brain. In addition to the measurement of resting mu (~11Hz) and beta rhythms (15-30Hz), a variety of different experimental paradigms are now available to identify these cortical areas and associated networks. However, much less is known about how these sensorimotor signals change with development, and the clinical utility of these measures (in children and adults) is constantly evolving. As a result, researchers and clinicians now have numerous experimental choices available for robust assessment of sensorimotor responses, both for research as well as for pre and post surgical functional mapping.

In this symposium, we begin with a demonstration of how resting sensorimotor beta-band rhythms change over the life-span, and how these developmental trends have implications for both source localization methods as well as the interpretation of results. Next we learn how the measurement of sensorimotor responses can be used to gain insight into challenging clinical pediatric populations such as children with Friedreich's Ataxia, and Cerebral Palsy. We next turn to a novel case demonstrating the dynamics of sensorimotor plasticity in a pediatric patient following bilateral hand transplantation. Finally, we explore the current and advanced clinical methods used for pre-surgical mapping of eloquent sensorimotor areas and preserving post-surgical function in the state-of-the-art clinical setting.

Speakers:

Elizabeth Heinrichs-Graham (Univ. of Nebraska Medical Center, USA)

"Is an absolute level of cortical beta suppression required for proper movement?"

Gilles Naeije (Université libre de Bruxelles, Belgium)

"Investigation of proprioceptive pathways degeneration in Friedreich's Ataxia using cortico-kinematic coherence"

Christos Papadelis (Boston Children's Hospital, Mass., USA)

"Multi-modal neuroimaging in cerebral palsy children to assess cortical reorganization in relation to upper limb function"

William Gaetz (Children's Hospital of Philadelphia, USA)

"Sensorimotor reorganization in a child with bilateral hand transplants"

Chun Kee Chung (Seoul Nat'l Univ., Korea)

"Pre-surgical measurement of oscillatory activity in sensorimotor cortex"