"Integrating MEG/EEG with fMRI"

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The possibility of integrating functional data from magnetoencephalografic (MEG) measurements and functional Magnetic Resonance Imaging (fMRI) offers new insight on brain organization. In fact, MEG and fMRI integration can provide accurate identification of active brain areas as well as a precise identification of the timing of brain response. Recently our group has performed a series of experiments with the aim at characterizing the functional organization of the human somatosensory system (SSS) with respect to selective electric stimulation of different body districts (somatotopy), as well as to painful vs. non-painful stimulation. A combined MEG and fMRI approach yielded interesting results which permitted to identify a specific somatotopic organization not only in the primary and secondary cortices, but also in other cortical areas, such as anterior cyngulate and SMA. Additionally, a clear differentiation of SII with respect to painful vs. non-painful stimulation was observed, although the area activated by painful stimuli did not feature somatotopy. Another study aimed at understanding how the human brain reacts to sounds coming from different spatial directions and the hierarchical processes involved in this analysis.