



Figure 1: Correlation maps of the default mode network during rest (alpha band), mindfulness meditation (beta band), and focussed attention meditation (beta band) across 13 participants.

Tu-57 - Resting state functional connectivity patterns associated with ApoE genotype. A MEG study in Mild Cognitive Impairment.

Pablo Cuesta Prieto¹, Pilar Garcés López², Sara Aurtenetxe Vicandi³, Maria Eugenia López García³, Nazareth Perales Castellanos⁴, Ricardo Bajo Bretón⁴, Juan García-Prieto⁴, Pedro Montejo⁵, Pedro Gil⁵, Ana Barabash⁶, José Antonio Cabranes⁶, Miguel Sancho³, Francisco del Pozo⁴, Fernando Maestù Unturbe³

¹Centre for Biomedical Technology. UPM., Pozuelo de Alarcón, Madrid, Spain

²Universidad Complutense Madrid, Madrid, Spain

³Universidad Complutense de Madrid, Pozuelo de Alarcón, Madrid, Spain

⁴Universidad Politécnica Madrid, Pozuelo de Alarcón, Madrid, Spain

⁵Hospital Clínico San Carlos, Madrid, Spain

⁶Laboratory of Psychoneuroendocrinology and Molecular Genetics, Biomedical Research Foundation. Clínico San Carlos Hospital, Madrid, Spain

Alteration of brain communication due to abnormal patterns of synchronization is nowadays one of the most suitable mechanisms for having a better understanding of brain pathologies. Very recently, it has been proved that abnormal changes in both local and long range functional interactions underlie the cognitive deficits associated with different brain disorders. Mild cognitive impairment (MCI) is a state characterized for cognitive dysfunction, such as the memory. The study of the spatial and dynamic alterations in MCI subjects' functional networks could provide important evidences of the brain mechanisms responsible for such impairment. Moreover, there is a growing interest in the role of ApoE genotype in pathological aging. However, its relation with brain electromagnetic activity patterns needs to be looked into. Here we use magnetoencephalography (MEG) to record resting state activity of healthy elderly people and patients with MCI, with both eyes closed and eyes open. Their ApoE genotype was also determined via a genetic test. Additionally, the subjects had a neuropsychological test done to determine their MCI subtype. Our database consists in 40 healthy elderly people and 60 MCI patients (30 with amnesic type and 30 with multidomain type). In order to provide a functional connectivity pattern, we calculate the Synchronization Likelihood of the MEG time series. The analysis is done for the classical frequency bands, via a statistical test to search for differences between groups with different diagnosis and ApoE genotype. Our result shows an increased connectivity in genotype 3-4 and 4-4, when compared with 2-3 and 3-3. Thus, regardless of having multidomain or amnesic MCI, carriers of APOE allele 4 showed higher synchronization values than controls or non APOE 4 carriers. This indicates a potential link between high synchronization (as a sign of abnormal communication) and a genetic risk for the development of dementia.