**Objective:** Oscillatory activity power changes in brain tumors, reporting abnormality in slow waves (i.e., delta and theta bands) affecting regions close to the tumor and the surrounding edema. Little is know about how neural networks are disrupted in patients with brain tumors, and how they reorganize it. The aim of our study was to characterize the pattern of network disorganization of patients with glial tumors.

**Materials and Methods:** the MEG activity from 15 patients with LGG and 17 age-matched controls were recorded during a 10 minutes of resting state with eyes opened. The patients were measured before tumor removal. After artifact trials were selected, spectral coherence between the 338 sources was calculated, resulting in a functional connectivity matrix in standard frequency bands. Functional connectivity was estimated in the source space.

**Results:** Our findings revealed a general hyper-synchronization pattern (increase of global coupling strength) in patients with respect to controls, in Theta, Beta and Gamma bands. The number of links, however, was found to be higher in controls, in Alpha and Beta bands.

**Conclusion:** functional networks in controls are characterized by a higher number of connections with low strength, a pattern of hyper-connectivity in patients with LGG is likely due to the loss of low strength functional connections. Patients lost low couplings connecting more distant sources, whereas links with higher strength connected more local sources. Overall findings indicate that the trace of a local tumor affects the global topology of the functional network. Disruption of functional networks are seen even before tumor removal, mainly characterized by a decrease of shortest path-length and an increase in clustering. A cortical hyper-synchronization phenomenon resulting from the loss of the weakest functional connections appears to be particularly sensitive to the brain insult.

**References:**