

## **fMRI and MEG study of reorganization of brain function in dystonia**

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Functional neuroimaging using positron emission tomography (PET), and more recently functional MRI (fMRI) and magnetoencephalography (MEG), is a valuable tool to study functional anomalies in dystonia. Activation studies have contributed to a better understanding of cerebral dysfunction in dystonia showing two main types of abnormalities: changes in activation levels during performance of sensory or motor tasks and disorganization of the selectivity of neuronal representations. In primary dystonia, most PET and fMRI studies have shown overactivity in premotor and prefrontal areas and underactivation of primary sensorimotor areas. In secondary dystonia, premotor and prefrontal areas are similarly overactive as well as primary sensorimotor areas. Altered selectivity of neuronal representations has been described more recently along cortico-subcortical circuits. The loss of neuronal selectivity may contribute to the loss of selectivity of muscular contractions observed in dystonia. Spectroscopic MRI may also be used to measure GABA levels, which are decreased in the cortex and basal ganglia in these patients.