

**Left prefrontal tumor and widespread cognitive impairment: multivariate lesion-symptom mapping evidence**

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**Introduction:** *Despite consistent evidence of hub brain regions with multifaceted functional roles coming from cognitive neuroscience (van den Heuvel & Sporns, 2011), the neuropsychological approach has mainly focused on the functional specialization of individual brain regions. Relatively few neuropsychological studies are focused on studying whether the severity of cognitive impairment across multiple cognitive abilities can be related to focal brain injuries.*

**Methods:** *Here we approached this issue by applying a latent variable modeling of the severity of cognitive impairment in brain tumor patients, followed by multivariate lesion-symptom mapping (Zhang et al., 2014) identifying brain regions critically involved in multiple cognitive abilities.*

**Results:** *We observed that lesions in confined left lateral prefrontal areas including the inferior frontal junction produced the most severe cognitive deficits, above and beyond tumor histology. This effect remained even when performance on non-verbal tasks only was analyzed.*

**Discussion:** *Our findings demonstrate that specific brain regions are highly involved across different sub-networks and underpin a vast range of cognitive abilities. Defining such brain regions is relevant not only theoretically but also clinically, since it may facilitate tailored tumor resections and improve cognitive surgical outcomes.*

**References:** Zhang Y et al. *Hum Brain Mapp* (2014) 35:5861–5876  
van den Heuvel MP & Sporns O. *J Neurosci* (2011) 31:15775–15786

**Keywords:** Action & Executive functions; patients; group study; adults; Brain Tumor; lesion mapping, behavioural.