

## **Neural substrates supporting the influence of working memory contents on visual attention**

### **Results:**

In the research project we present causal evidence from a lesion study with rare thalamic patients that the anterior ventrolateral (VL) region plays a pivotal role in linking mnemonic and attention control functions in the human brain. Subsequent fMRI work with healthy volunteers further demonstrated how the role of anterior VL thalamus in cognitive control may be shaped by experience-dependent learning, namely, in task contexts where the association between memory contents and the incoming perceptual data needs to be learned in order for memory to guide search behavior.

Together, these findings provide new and unique insight into the functional role of thalamic structures for high-level behavioral control, critically, for the biasing of attentional selection through memory and learning. The results furthermore stress the importance of characterizing the functional role of subcortical nuclei, in addition to cortical systems (e.g. parietofrontal), for a complete understanding of the mechanisms of attention and cognitive control.

### **Area(s) of interest:**

Working memory (WM); selective visual attention; interplay between WM and attention; eye movements; explicit and implicit mechanisms of memory, attention and learning; effects of cognitive training in working memory and attention – behavioural and neural plasticity; cognitive deficits in neurological patients (i.e. stroke); visual spatial neglect after brain injury

### **Researchers' contacts:**

Dr. David Soto  
Dept. of Medicine, Centre for Neuroscience, Imperial College London  
Charing Cross Campus  
St Dunstan's Rd  
London W6 8RP

Tel: +44 (0)20 8846 7296  
+44(0)78 462 701 91