**Are attention-related modulations of alpha-band dynamics local or global?**

Research on endogenous attention has shown that predictive cues about the location and timing of forthcoming visual stimuli can influence behavior and several stages of neural processing. One proposed neural mechanism is that spatial and temporal predictions influence the processing of visual stimuli by hijacking ongoing alpha-band oscillatory activity in brain areas involved in visual perception. However, it is not known if this top-down modulation of alpha oscillatory activity is selective for the circuits that represent target locations, or if it more broadly influences the physiological tone of the representation of the entire visual field. To answer this question, we manipulated spatial and temporal predictability during a Posner-style visual discrimination task, in which, within a block, stimuli could only appear in two of the four cardinal locations (i.e., either left-right or top-bottom). Consequently, in each block, two locations were task-relevant while the other two were task-irrelevant. Inverted encoding modeling (IEM) was used to isolate patterns of alpha-band activity specific to each of the four locations. Results showed that top-down expectations biased alpha-band power in a target location-specific manner, suggesting that alpha-band oscillatory activity can be controlled within discrete, local networks in order to optimize visual perception. Furthermore, periodic waxing waning of IEM reconstructions between cued and uncued location, consistent with the idea that alpha oscillatory activity sampled the two task-related locations rhythmically.