

[Presenter]

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[Title]

Evidence of an insula mechanism for interoception and interoceptive awareness

[Abstract]

The insular cortex, organized hierarchically into three modules (granular, dysgranular and agranular), plays an important role in interoception, the neural sensing of visceral and physiological signals. The insula is also involved in interoceptive awareness, the subjective and conscious perception of body signals. Disturbances in insula function and structure are predictive of physiological dysfunctions and the development of mental disorders. However, a mechanism for how the insula processes interoceptive information and supports interoceptive awareness is still unknown.

Here, we show that structural covariance networks of the insula are associated with interoceptive awareness of heartbeat signals. Specifically, we found that strengthened intra-insula granular-agranular covariance networks were associated with higher interoceptive awareness. Furthermore, using transcutaneous auricular vagus nerve stimulation (taVNS) and intracranial recordings with EEG, we found a sequential mechanism of interoceptive information propagation within the granular input region of the insula, with signals travelling in a dorsal to ventral direction. We will discuss the implications of these findings to understand psychiatric disorders.