

Anterior insular cortex

Cognitive control, with a limited capacity, is a core process in human **cognition** for the **coordination** of thoughts and actions. Although the regions involved in cognitive control have been identified as the **cognitive control network** (CCN), it is still unclear whether a specific region of the CCN serves as a bottleneck limiting the capacity of cognitive control (CCC).

Wu et al., used a perceptual decision-making task with conditions of high cognitive load to challenge the CCN and to assess the CCC in a functional magnetic resonance imaging (fMRI) study. We found that the activation of the right anterior insular cortex (AIC) of the CCN increased monotonically as a function of cognitive load and showed a significant correlation to the CCC. In a subsequent study of patients with unilateral lesions of the AIC, we found that lesions of the AIC were associated with a significant impairment of the CCC. Simulated lesions of the AIC resulted in a reduction of the global efficiency of the CCN in a network analysis. Altogether, these findings suggest that the AIC, as a critical hub in the CCN, is a bottleneck of cognitive control ¹⁾.

¹⁾

Wu T, Wang X, Wu Q, Spagna A, Yang J, Yuan C, Wu Y, Gao Z, Hof PR, Fan J. Anterior insular cortex is a bottleneck of cognitive control. *Neuroimage*. 2019 Feb 21. pii: S1053-8119(19)30138-7. doi: 10.1016/j.neuroimage.2019.02.042. [Epub ahead of print] PubMed PMID: 30798012.

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