CRC 1451 - Project C03: Dopamine-deficiency-related reorganization of the somatomotor network in prodromal and early Parkinson's disease

Network attack tolerance (NAT) measures how well a brain network keeps exchanging information when its most important hubs are removed one by one (1). In Parkinson's disease (PD), NAT has been linked to motor compensation, which may help explain why PD symptoms only appear after substantial dopamine loss. Using resting-state fMRI and DaT-SPECT data from 182 PPMI participants, we found that NAT of the somatomotor network (SMN) increased with declining putaminal dopamine and showed a graded elevation from HC to prodromal PD, with significantly higher levels in early PD *(2A). This suggests the presence of mechanisms that actively reorganize the SMN throughout the early disease stages of PD. Exploratory longitudinal analyses further indicate that higher SMN NAT goes along with slower motor decline (2B). The key question now: how can we make the SMN more robust?*

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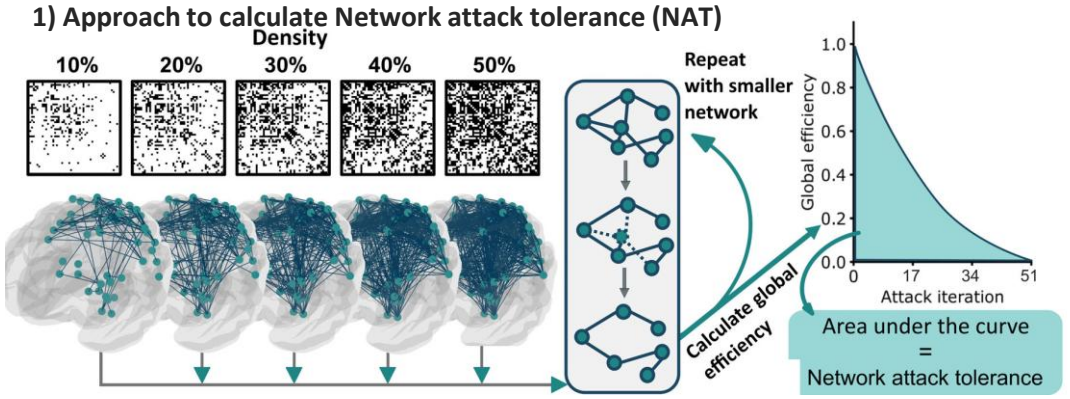

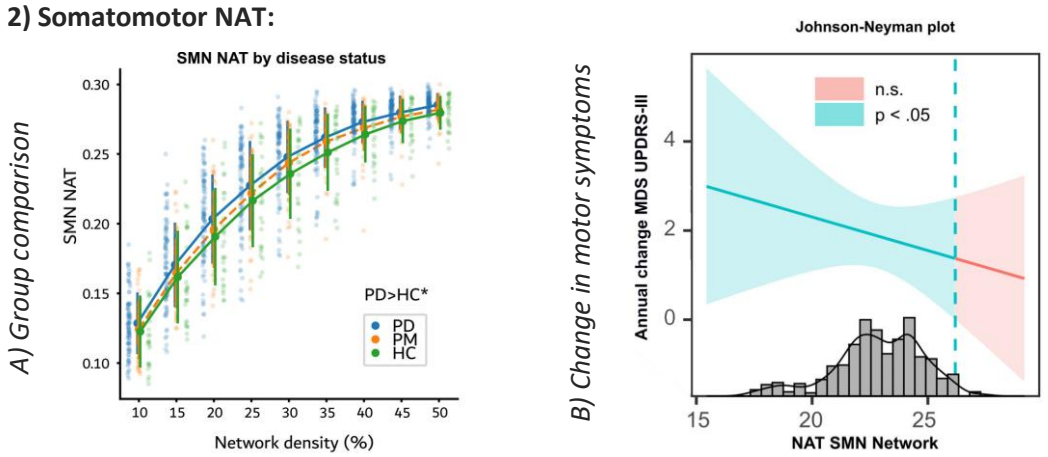

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