

Mapping the basal ganglia microstructural changes in normal aging and Parkinson's disease

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It is essential to map structural changes in subcortical brain regions to gain a better understanding of their function in both health and disease. We developed a method for quantifying microstructure profiles in vivo in a single human brain. Our results demonstrate that spatial profiles in the putamen, caudate globus pallidus, and midbrain are robustly reproduced across individuals, clinical conditions, and datasets. By exploiting multiparametric quantitative MRI, we identify distinct, spatially dependent, aging-related alterations in water content and iron concentration. In Parkinson's disease (PD) patients, we find abnormal profiles in the putamen, revealing changes in the posterior putamen that explain patients' dopaminergic loss and motor dysfunction.

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Session Classification: Networks and brain segregation