Title (tentative): Analysis of functional and metabolic imaging data in Parkinson's disease: correlation between the dopaminergic and noradrenergic system

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Motivation and application domain
PD is a degenerative disorder; it begins insidiously and gradually worsens in severity. Some symptoms are not correlated to the severity of the dopaminergic deficit and they do not necessarily worsen with disease progression. As motor impairment does not become apparent in PD until 60% of the nigrostriatal dopamine (DA) terminals degenerate, the existence of a compensatory mechanism, driven by the noradrenergic system (NE), in the earlier stages of the disease has been hypothesized.

General objectives and main activities
Aim of this study is to investigate the functional and metabolic brain activity and correlate the activity of DA and NE system in a group of PD patients and a group of healthy control subjects by means of resting state functional magnetic resonance imaging (fMRI), PET with (S,S)-[11 C]O-methyl reboxetine ([11 C]MRB), a new ligand selectively binding NE re-uptake transporters (NET), and SPECT with FP-CIT, a ligand specific for the dopamine transporter (DAT).

Training Objectives (technical/analytical tools, experimental methodologies)
Analysis of functional and metabolic imaging data (fMRI, PET and SPECT)
Devolopment of algorithms specific for the analysed data using dedicated toolbox (FSL, Freesurfer, MatLab)

Place(s) where the thesis work will be carried out: DIBRIS and Department of Neurology University Clinic Wuerzburg, Germany

Additional information
Maximum number of students: 1

Financial support/scholarship: Fondo giovani (subordinate to grant application and win)