

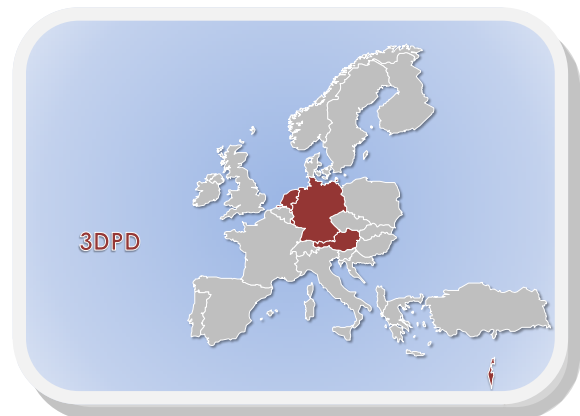
3DPD

Advanced modelling of Parkinson's disease with three-dimensional human midbrain organoids

One of the main limitations in neuroscience and in the modeling of neurodegenerative diseases is the lack of advanced experimental *in vitro* models that truly recapitulate the complexity of the human brain. Therefore, it is the aim of this research project to generate brain-like structures, so called organoids, that resemble the human midbrain. These organoids will be developed in a multifunctional lab-on-a-chip device. We call this a midbrain-on-a-chip approach.

We will focus on Parkinson's disease, which is the second most common neurodegenerative disease. The midbrains-on-a-chip will be generated from induced pluripotent stem cells derived from Parkinson's disease patients. This will allow us to elucidate how Parkinson's disease imparts architectural remodelling, dopamine release and network formation of the midbrain tissue. The successful cultivation of *in vitro* midbrain organoids in a micro-analytical analysis platform will yield substantial insights and open new avenues for exploring the mechanisms of onset and progression under physiologically relevant measurement conditions. Moreover, with the usage of microfluidics devices, the whole approach is cost-effective and suitable for screening purposes.






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