

Stem Cell and Developmental Neurobiology Group

Associate Professor Morten Meyer

The group's research interests

The stem cell and developmental neurobiology research program is focused on identifying molecular and biochemical signals regulating cell fate decisions.

We place particular emphasis on formation of functional dopaminergic neurons with midbrain identity - the cell type that degenerates in Parkinson's disease.

Using stem cells derived from developing human brain tissue (neural stem cells) and patients with Parkinson's disease (induced pluripotent stem cells), we pursue investigating the following topics:

- ◆ influence of oxygen on stem cell differentiation
- ◆ effect of carbon monoxide on cell fate and neuronal survival
- ◆ fate of stem cells exposed to levodopa (therapeutic drug, dopamine precursor)
- ◆ interaction between stem cells and microglia secreted factors
- ◆ the pathogenesis of Parkinson's disease by molecular and functional characterization of dopaminergic neurons produced from patient-derived pluripotent stem cells

Our general ambitions are to advance the understanding of the molecular mechanisms underlying Parkinson's disease and to contribute to the development of a potential future stem cell therapy.

To achieve our goals we use cell cultures and animal models of Parkinson's disease. Our methods include biochemical/molecular assays (e.g. Western blotting, enzyme assays, HPLC analysis), stereotactic cell transplantation, behavioral analyses (motor assessment) and histological techniques (e.g. cytochemistry, immunocytochemistry).



Contact:

mmeyer@health.sdu.dk

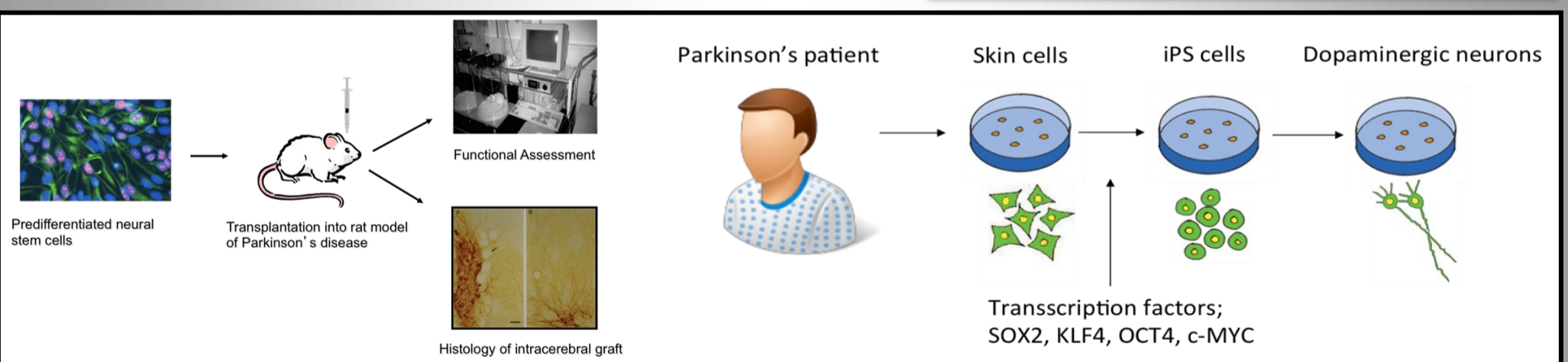
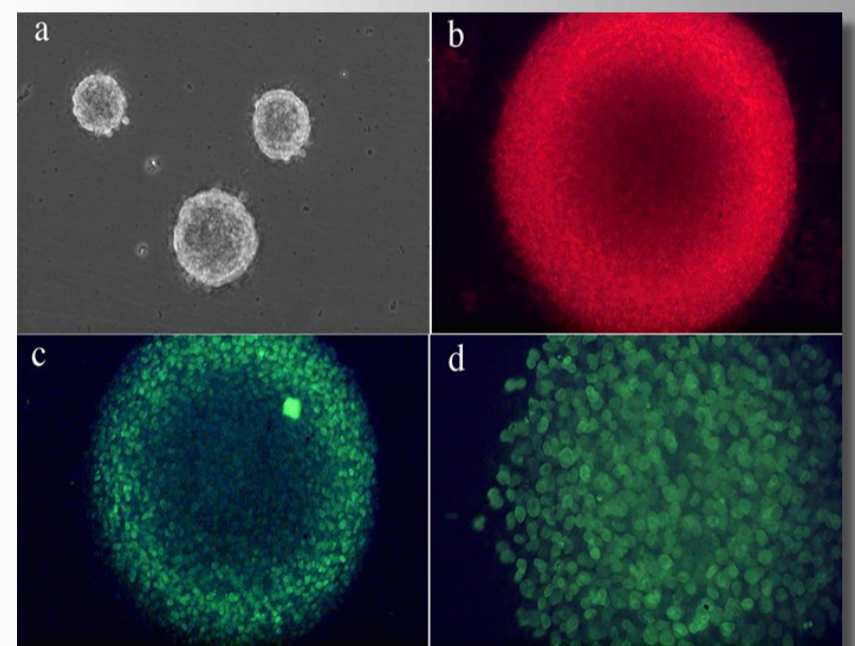
Contact present / former students

Helle Bogetofte Thomasen (Ph.D.-student) - hthomasen@health.sdu.dk

Pia Jensen (bachelor, master and Ph.D.-student) - pjensen@bmb.sdu.dk

Nanna Dreyer-Andersen (undergraduate research student)

- nknudsen@health.sdu.dk



Project examples

- ⇒ Pharmacological stabilization of Hypoxia Inducible Factor 1 α : Effects on survival and dopaminergic differentiation of human neural stem cells.
- ⇒ Effect of carbon monoxide preconditioning on dopaminergic differentiation of human neural stem cells.
- ⇒ Identification of factors and microenvironments stimulating dopaminergic differentiation of human neural stem cells.
- ⇒ Effect of L-dopa on differentiation of neural stem cells and functional capacity and survival of midbrain dopaminergic neurons.
- ⇒ Propagation and intracerebral transplantation of progenitor cells from ventral mesencephalon to a rat model of Parkinson's disease.
- ⇒ Comparative proteomic and lipidomic analysis of iPS cell-derived dopaminergic neurons from patients with sporadic and familial Parkinson's disease.