DANDRITE
Danish Research Institute of Translational Neuroscience
Nordic EMBL Partnership for Molecular Medicine

AARHUS UNIVERSITET

Stem Cells and Translational Neurobiology lab

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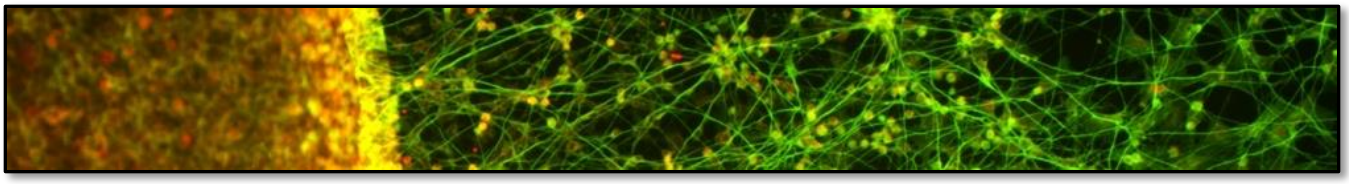

Interests: The Denham lab pioneered the development of lineage restriction technology. Specifically, we engineer stem cells to control their differentiation and generate highly pure populations of specific cell types, particularly dopaminergic neurons, for Parkinson's disease therapy. Our research combines cutting-edge genetic engineering with developmental biology to advance both regenerative medicine and our understanding of brain development.

Background: The major challenge in the stem cell field is generating pure populations of desired cell types. Current methods produce heterogeneous cell populations with low purity, limiting therapeutic efficacy and raising safety concerns. Lineage restriction can overcome these issues by preventing cells from making the wrong choices.

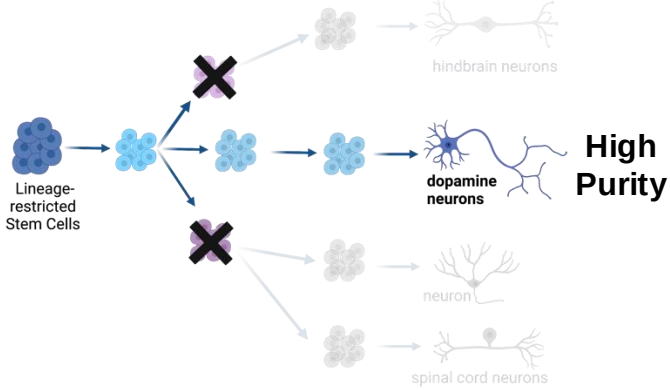

Figure 1: Lineage restriction prevents undesired cell fates through gene knockout of alternative developmental pathways, ensuring differentiation exclusively towards dopaminergic neurons while suppressing contaminating cell types.

Techniques:

- CRISPR gene-editing.
- Stem cell differentiation.
- Single-cell RNA sequencing
- In vivo transplantation and behaviour

Available projects:

1) Investigating GMP-compatible gene editing methods for producing gene knockouts.
2) Single-cell characterisation of lineage-restricted stem cell lines.

https://dandrite.au.dk/people/research-groups/denham-group

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