

CYCLIN-B1/2 and CYCLIN-D1 act in opposition to coordinate cortical stem cell self-renewal and lineage commitment

June 5 2020



Jonas Muhr Department of Cell and Molecular Biology and Daniel Hagey Department of Cell and Molecular Biology. Credit: Idha Kurtsdotter

The capacity of a stem cell population to generate several distinct cell

types in a temporally defined manner is fundamental to both organ development and homeostasis. To achieve this, stem cells must carefully balance self-renewal and commitment to cellular differentiation, but how this is regulated at the genetic level has remained unclear.

Addressing these questions in the developing cortex, Jonas Muhr's lab now provide evidence for a novel mechanism by which the cell-cycle regulators Cyclin-B1/2 and Cyclin-D1 act in opposition to coordinate self-renewal and lineage commitment of cortical [stem cells](#).

Interestingly, the researchers also discovered that the opposing functions of CYCLIN-B1/2 and CYCLIN-D1 appear to be achieved by their antagonistic control of core stem cell differentiation pathways, including the NOTCH [pathway](#).

Daniel Hagey at the Department of Laboratory Medicine, shared first author of the published paper says "By combining two powerful techniques, single cell sequencing and cortical electroporation, we have been able to provide evidence for a mechanism linking cell-cycle regulators and molecular programs controlling cortical stem cell maintenance".

Jonas Muhr adds "The wide spread usage of CYCLINs and the molecular pathways we find the to regulate, argue that our findings may have implications in stem cell populations outside the developing cortex."

More information: CYCLIN-B1/2 and -D1 act in opposition to coordinate cortical progenitor self-renewal and lineage commitment. *Nature Communications*, online June 09 2020, [DOI: 10.1038/s41467-020-16597-8](#)

Provided by Karolinska Institutet

Citation: CYCLIN-B1/2 and CYCLIN-D1 act in opposition to coordinate cortical stem cell self-renewal and lineage commitment (2020, June 5) retrieved 18 April 2024 from <https://phys.org/news/2020-06-cyclin-b12-cyclin-d1-opposition-cortical-stem.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.