



Universiteit
Leiden
The Netherlands

Doublecortin-like knockdown in the adult mouse brain: implications for neurogenesis, neuroplasticity and behaviour

Saaltink, D.J.

Citation

Saaltink, D. J. (2014, June 5). *Doublecortin-like knockdown in the adult mouse brain: implications for neurogenesis, neuroplasticity and behaviour*. Retrieved from <https://hdl.handle.net/1887/25884>

Version: Corrected Publisher's Version

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/25884>

Note: To cite this publication please use the final published version (if applicable).

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/25884> holds various files of this Leiden University dissertation.

Author: Saaltink, Dirk-Jan

Title: Doublecortin-like knockdown in the adult mouse brain: implications for neurogenesis, neuroplasticity and behaviour

Issue Date: 2014-06-05

Doublecortin-like knockdown in the adult mouse brain

implications for neurogenesis, neuroplasticity and behaviour

Dirk-Jan Saaltink

Dirk-Jan Saaltink

Doublecortin-like knockdown in adult mouse brain
implications for neurogenesis, neuroplasticity and behaviour

Thesis, Leiden University

June 5, 2014

ISBN: 978-90-8891-870-4

Cover design & layout: Dirk-Jan Saaltink

Printed by: Proefschriftmaken.nl || Uitgeverij BOXPress

© 2014 Dirk-Jan Saaltink

No part of this thesis may be reproduced or transmitted in any form or by any means,
without written permission of the author.

Doublecortin-like knockdown in the adult mouse brain

implications for neurogenesis, neuroplasticity and behaviour

Proefschrift

ter verkrijging van
de graad van Doctor aan de Universiteit Leiden,
op gezag van Rector Magnificus prof.mr. C.J.J.M. Stolker,
volgens besluit van het College voor Promoties
te verdedigen op donderdag 5 juni 2014
klokke 13:45 uur

door

Dirk-Jan Saaltink

geboren te Heerenveen in 1980

Promotiecommissie

Promotor: Prof. Dr. E.R. de Kloet

Co-promotor: Dr. E. Vreugdenhil

Overige leden: Prof. Dr. J.H. Meijer

Prof. Dr. J.N. Noordermeer

Prof. Dr. C.J. ten Cate

Dr. S. Verbeek

Prof. Dr. A. Kalsbeek (Amsterdam Medical Center)

Prof. Dr. P.J. Lucassen (University of Amsterdam)

The research described in this thesis was performed at the Division of Medical Pharmacology of the Leiden/Amsterdam Center for Drug Research (LACDR) and the Leiden University Medical Center (LUMC). This work was performed within the framework of Dutch Top Institute Pharma, project “Rapid *in vivo* CNS drug target validation and therapeutic potential by RNA-interference” (T5-210).

Printing of this thesis was kindly supported by the Leiden/Amsterdam Center for Drug Research (LACDR) and Noldus Information Technology BV.

Voor Isabel, Olivia & Liselot

Table of contents

List of abbreviations	8
Chapter 1 General introduction	11
Chapter 2 Doublecortin and Doublecortin-like are expressed in overlapping and non-overlapping neuronal cell population: implications for neurogenesis.	45
Chapter 3 Doublecortin-like is implicated in adult hippocampal neurogenesis and in motivational aspects to escape from an aversive environment.	67
Chapter 4 Blockade of adult neurogenesis by Doublecortin-like knockdown does not affect contextual fear memory formation.	87
Chapter 5 Doublecortin-like knockdown in hypothalamic tanycytes induce subtle effects on bodyweight and Deiodinase 2 activity.	99
Chapter 6 General discussion	113
Chapter 7 Summary/Samenvatting	135
Chapter 8 Dankwoord	143
Curriculum vitae	146
Publication list	147
Chapter 9 References	149

List of abbreviations

ADX	adrenalectomy
ARC	Arcuate nucleus
AVP	arginine vasopressin
BrdU	Bromodeoxyuridine
CARP	CaMK-related peptide
CFC	Contextual Fear Conditioning
CHB	Circular Hole Board
D2	Deiodinase 2
D3	Deiodinase 3
DCL	Doublecortin-like
DCLK	Doublecortin-like kinase
DCX	Doublecortin
DG	Dentate gyrus
dox	Doxycycline
EC	Entorhinal cortex
GC	Granule cell
GCL	Granule cell layer
GFAP	Glial fibrillary acidic protein
GR	Glucocorticoid Receptor
HPA-axis	Hypothalamic pituitary adrenal axis
HPT-axis	Hypothalamic pituitary thyroid axis
ICj	Islands of Calleja
KD	Knockdown
MAP	Microtubules associated protein
ME	Median Eminence
ML	Molecular layer
MR	Mineralocorticoid receptor
mRNA	Messenger RNA
NPC	Neuronal progenitor cell
NPY	Neuropeptide Y
NSC	Neuronal stem cell
OB	Olfactory bulb
PE	Periventricular area
PGC	Periglomerular cell
PVN	Paraventricular nucleus
RG	Radial glia
RMS	Rostral migratory stream

List of abbreviations

SCN	Suprachiasmatic nucleus
SGZ	Subgranular zone
shRNA	Short hairpin RNA
siRNA	Short interference RNA
SVZ	Subventricular zone
TRH	Thyroid Releasing Hormone
TSH	Thyroid Stimulating Hormone

Nomenclature of the brain regions depicted in figures and text was based on the atlas of Paxinos and Franklin (Paxinos and Franklin, 2001).

