

PhD Project Description

School/Department:	Department of Neuroscience Erasmus MC
Supervisor information:	<p>Dr. Martijn Schonewille, m.schonewille@erasmusmc.nl https://neuro.nl/research/schonewille Prof. Dr. Chris I. De Zeeuw c.dezeeuw@erasmusmc.nl</p> <ul style="list-style-type: none"> • Personal Grants: <ul style="list-style-type: none"> - ERC Starting Grant (ERC-Stg), 2015 - Dutch Scientific Organization (ALW-Open) Grant, 2014 (co-appl.) - Dutch Scientific Organization (ALW-Veni) Grant, 2011 - Erasmus University Fellowship, EUR, 2010 • Most important publications: <p>Nat Neurosci. 9(4):459-61 Neuron. 12;58(5):655-8. Nat Neurosci. 12(8):1042-9. Neuron. 26;67(4):618-28. Neuron. 14;70(1):43-50. Nat Rev Neurosci. 12(6):327-44. Review. EMBO J. 7;31(5):1217-30. Neuron. 22;78(4):700-13. eLife; 10.7554/eLife.02536 Nat Commun. 2016 Sep 1;7:12627 eNeuro 2018 Feb 12 ; 5(1) eLife; 10.7554/eLife.45590.001</p>
Project Title:	Cerebellar differentiation in development of motor functions and neurodevelopmental disorders
Abstract:	<p><i>The perfect execution of a voluntary movement requires the appropriate integration of current bodily state, sensory input and desired outcome. To assure that this motor output becomes and remains appropriate, the brain needs to learn from the result of previous outputs. The cerebellum plays a central role in sensorimotor integration, yet -despite decades of studies- there is no generally accepted theory for cerebellar functioning. We recently demonstrated that cerebellar modules, identified based on anatomical connectivity and gene expression, differ distinctly in spike activity properties. It is the lab's long-term goal to identify the ontogeny of anatomical and physiological differences between modules, and their functional consequences.</i></p> <p><i>To achieve this goal, we make use a variety of techniques including molecular biological approaches, anatomical reconstruction, in vitro and in vivo electrophysiology and behavioral evaluations. We aim to determine how differential gene expression patterns control the development of distinct physiological properties and anatomical connection patterns of the types of neurons in different cerebellar modules. We will determine the impact of the genetic differentiation in cerebellar input, processing and output. Ultimately, the combined results of these studies will reveal how distinct differences between cerebellar modules develop, and how the modular ensemble ensures proper cerebellar information processing for optimal coordination of timing and force of movements. Combined with the growing body of evidence for a cerebellar role in higher order brain functions and neurodevelopmental disorders, this knowledge will be fundamental for understanding how the juvenile brain develops.</i></p>
Requirements of candidate:	<ul style="list-style-type: none"> • We are looking for a highly motivated, hardworking student to join our very international team. Our strength is in using team work to tackle large scientific questions and thus requires a student with good communication skills. • Master degree or MD • Scholarship that will, at least, cover subsistence allowance and international air plane ticket (we could help with the scientific part of your scholarship proposal) • English language requirement: • <i>English speaking countries & Netherlands:</i> no requirement • <i>Other countries:</i> IELTS 7.0 (min 6.0 for all subs), TOEFL 100 (min 20 for all subs)

Application requirements & Deadlines:

<https://www.eur.nl/en/about-eur/erasmus-university-china-centre/csc-scholarship>

Erasmus MC, ranked world

* No.32 for Clinical Medicine US News 2020:

<https://www.usnews.com/education/best-global-universities/clinical-medicine?page=3>

* No. 30 Nature Index for Biomedical Sciences 2019:

<https://www.natureindex.com/supplements/nature-index-2019-biomedical-sciences/tables/healthcare>