

# Cerebellar Impact on Thalamocortical Networks in Epilepsy

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Oscar Eelkman Rooda

## **Colofon**

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# Cerebellar Impact on Thalamocortical Networks in Epilepsy

Cerebellaire impact op thalamocorticale netwerken

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*Een beetje zeiler wordt niet  
bang van harde tegenwind*



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## **Preface**

The communication between cerebellum and cerebrum in non-motor forms of neurological disease is poorly understood. One of these diseases is epilepsy and still lacks understanding and control. Epileptic attacks typically originate in thalamocortical pathways, which are influenced by cerebellar output. This output is particularly known during various forms of motor behavior and coordination, but has also been implicated in (daily) cognitive functioning. This thesis primarily focuses on how cerebellar output contributes to thalamocortical communication and the potential therapeutic benefits of manipulation of cerebellar output in disease. I used epileptic mouse models and their wild type littermates which are well characterized and perfectly suited to study cerebellar impact on (epileptic) processes in a preclinical setting. To do so I have made use of multiple techniques, including optogenetics, (single-unit) electrophysiology, neuro-anatomical tracing and imaging, both in freely moving and head-fixed animals. Overlooking all the results I do believe my thesis fuels further research of cerebellar impact on thalamocortical networks but also revealed new questions and (pre)clinical possibilities.

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