Tracing tremor: Neural correlates of essential tremor and its treatment
Buijink, A.W.G.

Citation for published version (APA):
Neural correlates of essential tremor and its treatment

Arthur W.G. Buijink
Tracing tremor

*Neural correlates of essential tremor and its treatment*

Arthur W.G. Buijink
This thesis was prepared at the Department of Neurology and Clinical Neurophysiology, Academic Medical Center, University of Amsterdam, Amsterdam, the Netherlands.

Work for chapters 3, 4, 5, 6 and 8 was supported by grants from the Prinses Beatrix Fonds (W.OR10-01) and the Hersenstichting Nederland (2012(1)-91). Work for chapter 9 was performed using the e-bioinfra platform developed at the e-bioscience group of the Bioinformatics Laboratory of the AMC, using resources of the Dutch e-Science Grid, BiGGrid project, which is financially supported by the Netherlands Organisation for Scientific Research (NWO).

The authors report no conflicts of interest.

Printing of this thesis was financially supported by the AMC Graduate School, the Department of Neurology of the AMC, Stichting Wetenschapsfonds Dystonie and the Benelux Neuromodulation Society.

Printed by Ipskamp Drukkers, Enschede, the Netherlands
Cover design and illustration by Tessa de Römph and Arthur Buijink


Copyright 2015 Arthur W.G. Buijink, Amsterdam. No parts of this thesis may be reproduced, stored or transmitted in any form or by any means without the prior permission of the author or publishers of the included scientific papers.
Tracing tremor

*Neural correlates of essential tremor and its treatment*

ACADEMISCH PROEFSCHRIFT

ter verkrijging van de graad van doctor

aan de Universiteit van Amsterdam

op gezag van de Rector Magnificus

prof. dr. D.C. van den Boom

ten overstaan van een door het College voor Promoties ingestelde commissie,

in het openbaar te verdedigen in de Agnietenkapel

op vrijdag 29 januari 2016, te 14.00 uur

door Arthur Willem Gerard Buijink

geboren te Amsterdam
## Promotiecommissie

<table>
<thead>
<tr>
<th>Promotor:</th>
<th>prof. dr. I.N. van Schaik</th>
<th>Universiteit van Amsterdam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copromotor:</td>
<td>dr. A.F. van Rootselaar</td>
<td>Universiteit van Amsterdam</td>
</tr>
<tr>
<td>Overige leden:</td>
<td>prof. dr. H.W. Berendse</td>
<td>Vrije Universiteit</td>
</tr>
<tr>
<td></td>
<td>prof. dr. C.B.L.M. Majoie</td>
<td>Universiteit van Amsterdam</td>
</tr>
<tr>
<td></td>
<td>prof. dr. Y.B.W.E.M. Roos</td>
<td>Universiteit van Amsterdam</td>
</tr>
<tr>
<td></td>
<td>prof. dr. C.I. de Zeeuw</td>
<td>Erasmus Universiteit Rotterdam</td>
</tr>
<tr>
<td></td>
<td>dr. J.H.T.M. Koelman</td>
<td>Universiteit van Amsterdam</td>
</tr>
<tr>
<td></td>
<td>dr. ir. A.J. Nederveen</td>
<td>Universiteit van Amsterdam</td>
</tr>
</tbody>
</table>

Faculteit der Geneeskunde
# Contents

1. General introduction and aims................................................................. 9

2. How to tackle tremor – systematic review of the literature and
diagnostic work-up..................................................................................... 23


**Part I: neural correlates of essential tremor**

3. Bilateral cerebellar activation in unilaterally challenged essential
tremor........................................................................................................... 47

4. Motor network disruption in essential tremor, a functional and
effective connectivity study....................................................................... 67


5. Rhythmic finger tapping reveals cerebellar dysfunction in essential
tremor.......................................................................................................... 101


6. Cerebellar atrophy in cortical myoclonic tremor and not in hereditary
essential tremor – a voxel-based morphometry study........................ 119

7. Decreased cerebellar fiber density in cortical myoclonic tremor but
not in essential tremor ............................................................................. 137

*Cerebellum 2013 Apr;12(2):199-204.*

**Part II: neural correlates of treatment of essential tremor**

8. Propranolol in essential tremor affects motor control in a pattern
fitting increased Renshaw inhibition..................................................... 149

9. Structural changes in cerebellar outflow tracts after thalamotomy in
essential tremor.......................................................................................... 169


10. Summary and discussion......................................................................... 183