

University of Groningen

Tracer development for detection and characterization of neuroendocrine tumors with PET

Neels, Olivier Christiaan

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version

Publisher's PDF, also known as Version of record

Publication date:

2008

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Neels, O. C. (2008). *Tracer development for detection and characterization of neuroendocrine tumors with PET*. [s.n.].

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

**Tracer development for detection and characterization of
neuroendocrine tumors with PET**

Oliver Christian Neels

This thesis was supported by grant 2003-2936 of the Dutch Cancer Society.

Financial support for printing this thesis was provided by:

Von Gahlen B.V.

Siemens Nederland N.V.

Veenstra Instrumenten B.V.

ISBN: 978-90-367-3314-4

Cover and lay-out designed by Henriette Kiss

Printed by Ponsen & Looijen, Wageningen

©2007 by Oliver Christian Neels. All rights are reserved. No parts of this book may be reproduced or transmitted in any form by any means without the permission of the author.

RIJKSUNIVERSITEIT GRONINGEN

**Tracer development for detection and characterization of
neuroendocrine tumors with PET**

Proefschrift

ter verkrijging van het doctoraat in de
Medische Wetenschappen
aan de Rijksuniversiteit Groningen
op gezag van de
Rector Magnificus, dr. F. Zwarts,
in het openbaar te verdedigen op
maandag 21 januari 2008
om 16.15 uur

door

Oliver Christian Neels

geboren op 22 november 1975
te Nordenham, Duitsland

Promotores:

Prof. dr. E.G.E. de Vries
Prof. dr. P.L. Jager
Prof. dr. R.A.J.O. Dierckx

Copromotores:

Dr. P.H. Elsinga
Dr. I.P. Kema

Beoordelingscommissie:

Prof. dr. ir. M. de Jong
Prof. dr. J. Martens
Prof. dr. P.H.B. Willemse

ISBN: 978-90-367-3314-4

Paranimfen:

Bram Maas
Klaas Pieter Koopmans

Contents

	Introduction and outline of this thesis	1
Chapter 1	Molecular imaging in neuroendocrine tumours: molecular uptake mechanisms and clinical results. Klaas P. Koopmans, Oliver C. Neels, Ido P. Kema, Philip H. Elsinga, Thera P Links, Elisabeth G.E. de Vries, Pieter L. Jager. <i>Submitted for publication</i>	7
Chapter 2	Development of a reliable remote-controlled synthesis of β-[^{11}C]-5-hydroxy-<i>L</i>-tryptophan on a Zymark robotic system. Oliver C. Neels, Pieter L. Jager, Klaas P. Koopmans, Elisabeth Eriks, Elisabeth G.E. de Vries, IP Kema, Philip H. Elsinga. <i>J Label Compd Radiopharm 2006; 49: 889–895</i>	33
Chapter 3	Manipulation of [^{11}C]HTP and [^{18}F]FDOPA accumulation in neuroendocrine tumor cells. Oliver C. Neels, Klaas P. Koopmans, Pieter L. Jager, Laya Vercauteren, Aren van Waarde, Janine Doorduyn, Hetty Timmer-Bosscha, Adrienne H. Brouwers, Elisabeth G.E. de Vries, Rudi A. Dierckx, Ido P. Kema, Philip H. Elsinga. <i>Submitted for publication</i>	41
Chapter 4	Staging of carcinoid tumours with ^{18}F-DOPA PET: a prospective, diagnostic accuracy study. Klaas P. Koopmans, Elisabeth G.E. de Vries, Ido P. Kema, Philip H. Elsinga, Oliver C. Neels, Wim J. Sluiter, Anouk N.A. van der Horst-Schrivers, Pieter L. Jager. <i>The Lancet Oncol 2006; 7: 728-734</i>	59

Chapter 5	Improved staging and characterization of lesions in patients with carcinoid and islet cell tumors with 18F-DOPA and 11C-5-HTP positron emission tomography.	73
	Klaas P. Koopmans, Oliver C. Neels, Ido P. Kema, Philip H. Elsinga, Wim J. Sluiter, Koen Vanghillewe, Adrienne H. Brouwers, Elisabeth G.E. de Vries, Pieter L. Jager.	
	<i>In press for J Clin Oncol</i>	
Chapter 6	5-Fluorotryptophan as potential PET tracer for neuroendocrine tumors.	87
	Oliver C. Neels, Klaas P. Koopmans, Pieter L. Jager, Laya Vercauteren, Hetty Timmer-Bosscha, Adrienne H. Brouwers, Elisabeth G.E. de Vries, Rudi A. Dierckx, Ido P. Kema, Philip H. Elsinga.	
	<i>Submitted for publication</i>	
	Summary and Future Perspectives	99
	Samenvatting / Zusammenfassung	105
	Dankwoord	113
	Appendix full-color figures	119

