

University of Groningen

Fluorescently labelled monoclonal antibodies for real-time molecular imaging

Linssen, Matthijs

DOI:
[10.33612/diss.566494449](https://doi.org/10.33612/diss.566494449)

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:
2023

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

Citation for published version (APA):

Linssen, M. (2023). *Fluorescently labelled monoclonal antibodies for real-time molecular imaging: pharmaceutical development of near-infrared tracers and their application in clinical settings*. [Thesis fully internal (DIV), University of Groningen]. University of Groningen. <https://doi.org/10.33612/diss.566494449>

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).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

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.

Fluorescently labelled monoclonal antibodies for real-time molecular imaging

Pharmaceutical development of
near-infrared tracers and their
application in clinical settings

Matthijs David Linssen

LINSSEN, M.D.

FLUORESCENTLY LABELLED MONOCLONAL ANTIBODIES FOR REAL-TIME MOLECULAR IMAGING

Pharmaceutical development of near-infrared tracers and their application
in clinical settings

Thesis, University of Groningen, the Netherlands

Chapters in this thesis were supported by Dutch Cancer Society (Grants: RUG2010-4603, RUG2012-5415, RUG2012- 5416, RUG2014-7290); Center for translational medicine (CTMM) project Mammoth (grant 030-201), Advanced Investigator ERC grant (OnQview); unrestricted research grants from SurgVision B.V. and Boston Scientific; FP-7 Framework Programme BetaCure grant no. 602812 and an Academy Professor Prize to Prof. E de Vries by the Royal Netherlands Academy of Arts and Sciences (KNAW),

Printing of this thesis was financially supported by the University of Groningen and the Graduate School of Medical Sciences (GSMS).

Cover design and text layout by Bor Smulders

This thesis was printed by Gildeprint

Copyright © M.D.Linssen 2022

All rights reserved. No part of this thesis may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, without prior written permission of the author, or when appropriate, of the publishers of the publications included in this thesis



rijksuniversiteit
 groningen

Fluorescently labelled monoclonal antibodies for real-time molecular imaging

Pharmaceutical development of near-infrared tracers
 and their application in clinical settings

Proefschrift

ter verkrijging van de graad van doctor aan de
 Rijksuniversiteit Groningen
 op gezag van de
 rector magnificus prof. dr. C. Wijmenga
 en volgens besluit van het College voor Promoties.

De openbare verdediging zal plaatsvinden op

woensdag 8 februari 2023 om 16:15 uur

door

Matthijs David Linssen

geboren op 28 april 1989
 te Utrecht

Promotores

Prof. dr. W.B. Nagengast

Prof. dr. G.M. van Dam

Prof. dr. G. Dijkstra

Copromotor

Dr. A. Jorritsma-Smit

Beoordelingscommissie

Prof. dr. H.W.Frijlink

Prof. dr. M.J.H.Witjes

Prof. dr. C.W.G.M. Löwik

Paranimfen

Sophie Linssen

Anet Veringa

Chapter 1	General introduction and outline of the thesis	9
Chapter 2	Tyrosine kinase inhibitor induced growth factor receptor upregulation enhances the efficacy of near-infrared targeted photodynamic therapy in esophageal adenocarcinoma cell lines <i>Oncotarget</i> . 2017; 8(18): 29846 – 29856	19
Chapter 3	Development, preclinical safety, formulation, and stability of clinical grade bevacizumab-800CW, a new near infrared fluorescent imaging agent for first in human use <i>European Journal of Pharmaceutics and Biopharmaceutics</i> . 2016; 104: 226 – 234	41
Chapter 4	Roadmap for the development and clinical translation of optical tracers cetuximab- 800cw and trastuzumab-800cw <i>Journal of Nuclear Medicine</i> . 2019; 60(3): 418 – 423	67
Chapter 5	Implementation and benchmarking of a novel analytical framework to clinically evaluate tumor-specific fluorescent tracers <i>Nat Commun</i> . 2018; 9(1): 3739	89
Chapter 6	Quantitative fluorescence endoscopy: an innovative endoscopy approach to evaluate neoadjuvant treatment response in locally advanced rectal cancer <i>Gut</i> . 2019; 69(3): 406 – 410	127
Chapter 7	Complementary near-infrared antibody probes for simultaneous dual wavelength imaging of the PD-1/PD-L1 checkpoint inhibition axis. <i>Manuscript in preparation</i>	143
Chapter 8	Development and characterisation of antibody-based optical imaging probes for inflammatory bowel disease <i>Pharmaceutics</i> . 2021; 14(9): 922	167
Chapter 9	Vedolizumab-based fluorescent molecular imaging to elucidate drug distribution and pharmacodynamics in patients with inflammatory bowel disease. <i>Manuscript in preparation</i>	199
Chapter 10	Summary, discussion and future perspectives	227
Chapter 11	Nederlandse samenvatting	247
Appendices		
Appendix A	Over de auteur	261
Appendix B	List of publications	263
Appendix C	Dankwoord	265

