University of Groningen

Positron emission tomography in infections associated with immune dysfunction

Ankrah, Alfred

DOI:
[10.33612/diss.144628960](https://doi.org/10.33612/diss.144628960)

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:
2020

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

Citation for published version (APA):

Ankrah, A. (2020). *Positron emission tomography in infections associated with immune dysfunction*. [Thesis fully internal (DIV), University of Groningen]. University of Groningen.
<https://doi.org/10.33612/diss.144628960>

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.

Positron Emission Tomography in infections associated with immune dysfunction

Alfred O. Ankrah

The printing of this thesis was financially supported by the University Medical Center Groningen.

Cover: Johnson Kofi Oppong

Cover image: 3D volume rendered PET/CT of the lung of a patient with TB/HIV coinfection

Printing: Ridderprint , www.ridderprint.nl

ISBN: 978-94-6416-252-3.

© A.O. Ankrah, 2020

Copyright of the published articles is with the corresponding journal or otherwise with the author. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, without the permission in writing from the author or the copyright-owning journal.

Positron emission tomography in infections associated with immune dysfunction

PhD thesis

to obtain the degree of PhD at the
University of Groningen
on the authority of the
Rector Magnificus Prof. C. Wijmenga
and in accordance with
the decision by the College of Deans.

This thesis will be defended in public on

Monday 30 November 2020 at 16:15 hours

by

Alfred Otoe Ankrah

born on 8 September 1974
in Kumasi, Ghana

Supervisors

Prof. A.W.J.M. Glaudemans

Prof. M.M. Sathekge

Prof. R.A.J.O Dierckx

Co-supervisor

Dr. H.C. Klein

Assessment committee

Prof. A.W. Friedrich

Prof. L.F. de Geus-Oei

Prof. A. Signore

Contents

Chapter 1	General introduction	7
Part 1		17
Chapter 2	PET/CT in immunodeficiency disorders	19
Chapter 3	Radiopharmaceuticals for PET imaging of infection	33
Chapter 4	The role of nuclear medicine in the staging and management of Human immune deficiency virus and associated diseases	51
Chapter 5	Arterial inflammation in young patients with human immunodeficiency virus infection: a cross-sectional study using FDG-PET/CT	71
Part 2		83
Chapter 6	Imaging fungal infection in children	85
Chapter 7	The role of PET in monitoring therapy in fungal infections	109
Chapter 8	Added value of FDG PET/CT in the management of invasive fungal infections	131
Chapter 9	Role of FDG PET/CT in monitoring treatment response in patients with invasive fungal infections	145
Part 3		161
Chapter 10	Tuberculosis	163
Chapter 11	PET/CT imaging of <i>Mycobacterium tuberculosis</i> infection	195
Chapter 12	Imaging latent tuberculosis infection with radiolabeled nitroimidazoles	215
Chapter 13	Monitoring response to therapy	221
Chapter 14	Comparison of Fluorine(18)-fluorodeoxyglucose and Gallium(68)-citrate PET in patients with tuberculosis	245
Chapter 15	Discussion, future perspectives and conclusion	261
Chapter 16		273
Chapter 16.1	English summary	275
Chapter 16.2	Dutch summary	277
Chapter 16.3	Acknowledgements	281
Chapter 16.4	Curriculum vitae	282
Chapter 16.5	Publications	283