



Universiteit
Leiden
The Netherlands

The sharpest tool in the shed: question-based clinical development of vaccines to address global health priorities

Roozen, G.V.T.

Citation

Roozen, G. V. T. (2025, November 7). *The sharpest tool in the shed: question-based clinical development of vaccines to address global health priorities*.

Retrieved from <https://hdl.handle.net/1887/4282185>

Version: Publisher's Version

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/4282185>

Note: To cite this publication please use the final published version (if applicable).

The Sharpest Tool in the Shed

**Question-Based Clinical Development of Vaccines
to Address Global Health Priorities**

Geert Roozen

Colofon

ISBN: 978-94-93289-90-1

Copyright 2025 © Geert Roozen

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 permission of the author.

Layout and design: Ninke van Wiggen, persoonlijkproefschrift.nl

Printing: PrintSupport4U, www.printsupport4u.nl

Financial support for the printing of this thesis was kindly provided by ChipSoft and the Wetenschaps- en Onderzoekscommissie of HagaZiekenhuis.

The Sharpest Tool in the Shed

Question-Based Clinical Development of Vaccines to Address Global Health Priorities

Proefschrift

ter verkrijging van

de graad van doctor aan de Universiteit Leiden,

op gezag van rector magnificus prof.dr.ir. H. Bijl,

volgens besluit van het college voor promoties

te verdedigen op vrijdag 7 november 2025

klokke 11:30 uur

door

Geert Vincent Tafadzwa Rozen

geboren te Sanyati, Zimbabwe

in 1993

Promotor

Prof. dr. M. Roestenberg

Co-promotor

Dr. A.H.E. Roukens

Leden promotiecommissie

Prof. dr. A. Geluk

Prof. dr. T. van Gelder

Prof. dr. N.H. Chavannes

Prof. dr. D. van Baarle, UMC Groningen

Dr. S.J. de Visser, Amsterdam UMC

Dr. P.F. Billingsley, The Vital Narrative (USA)

Table of Contents

Chapter 1.	General Introduction	7
Part I - Vaccine Development for Low- and Middle-Income Countries		
Chapter 2.	Single Immunization with Genetically Attenuated <i>PfΔmei2</i> (GA2) Parasites by Mosquito Bite in Controlled Human Malaria Infection: a Placebo-Controlled Randomized Trial	21
Chapter 3.	Safety, Tolerability, and Immunogenicity of the Invaplex _{AR-Detox} <i>Shigella</i> Vaccine Co-Administered with the dmLT Adjuvant in Dutch and Zambian Adults: Study Protocol for a Multi-Center, Randomized, Double-Blind, Placebo-Controlled, Dose-Escalation Phase Ia/b Clinical Trial	37
Part II – Dose-Optimization Strategies During a Pandemic		
Chapter 4.	COVID-19 Vaccine Dose Sparing: Strategies to Improve Vaccine Equity and Pandemic Preparedness	55
Chapter 5.	Safety and Immunogenicity of Intradermal Fractional Dose Administration of the mRNA-1273 Vaccine: A Proof-of-Concept Study	67
Chapter 6.	Immunogenicity and Reactogenicity of Intradermal mRNA-1273 SARS-CoV-2 Vaccination: a Non-Inferiority, Randomized-Controlled Trial	75
Chapter 7.	Intradermal Delivery of the Third Dose of the mRNA-1273 SARS-CoV-2 Vaccine: Safety and Immunogenicity of a Fractional Booster Dose	95
Chapter 8.	Intradermal Fractional Dose Vaccination as a Method to Vaccinate Individuals with Suspected Allergy to mRNA COVID-19 Vaccines	113
Chapter 9.	Discussion	127
Chapter 10.	Appendices	145
	English summary	146
	Nederlandse samenvatting (Dutch summary)	150
	List of publications	152
	Curriculum vitae	154
	Dankwoord (acknowledgements)	158