



Universiteit
Leiden
The Netherlands

Combinatorial prospects of nanoparticle mediated immunotherapy of cancer

Silva, C.G. da

Citation

Silva, C. G. da. (2021, June 24). *Combinatorial prospects of nanoparticle mediated immunotherapy of cancer*. Retrieved from <https://hdl.handle.net/1887/3191984>

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/1887/3191984>

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

Cover Page



Universiteit Leiden



The handle <https://hdl.handle.net/1887/3191984> holds various files of this Leiden University dissertation.

Author: Silva, C.G. da

Title: Combinatorial prospects of nanoparticle mediated immunotherapy of cancer

Issue Date: 2021-06-24

COMBINATORIAL PROSPECTS OF NANOPARTICLE MEDIATED IMMUNOTHERAPY OF CANCER

Cândido Geraldo da Silva

The research described in this thesis was performed at the departments of immunology and radiology at the Leiden University Medical Center, the Netherlands. The work described in this thesis was funded by a grant of the Netherlands Organization for Scientific Research (NWO) number 723.012.110 (Vidi).

ISBN: 978-94-6419-233-9.

Lay-out: Jeroen M.M. Heuts and ngchoyiu,seewhy

Cover design: Cândido G. da Silva and Jeroen M.M. Heuts

Thesis printing: GildePrint - The Netherlands

Copyright © 2021 by Cândido G. da Silva. All rights reserved. Nothing from this thesis may be reproduced or transmitted in any form or by any means without written and explicit permission from the author.

COMBINATORIAL PROSPECTS OF NANOPARTICLE MEDIATED IMMUNOTHERAPY OF CANCER

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

donderdag 24 juni 2021 klokke 13:45

door

Cândido Geraldo da Silva
geboren te Delft in 1981

Promotoren:

Prof. Dr. F.A. Ossendorp

Prof. Dr. C.W.G.M. Löwik

Co-promotor:

Dr. L.J. Cruz Ricondo

Leden promotiecommissie:

Prof. Dr. M.J. Jager

Prof. Dr. G.J. Peters (Amsterdam UMC, Nederland)

Prof. Dr. H. Zhang (University of Amsterdam, Nederland)

Dr. R. Arens

CONTENT

01	GENERAL INTRODUCTION	10
02	COMBINATORIAL PROSPECTS OF NANO-TARGETED CHEMOIMMUNOTHERAPY	36
03	THE EFFECT OF INJECTION ROUTE OF PLGA NANOPARTICLES ON THE BIODISTRIBUTION AND ICG BLOOD CLEARANCE RATE IN TUMOR BEARING MICE	84
04	EFFECTIVE CHEMOIMMUNOTHERAPY BY CO-DELIVERY OF DOXORUBICIN AND IMMUNE ADJUVANTS IN BIODEGRADABLE NANOPARTICLES	98
05	CO-DELIVERY OF IMMUNOMODULATORS IN BIODEGRADABLE NANOPARTICLES IMPROVES THERAPEUTIC EFFICACY OF CANCER VACCINES	142
06	COMBINING PHOTODYNAMIC THERAPY WITH IMMUNOSTIMULATORY NANOPARTICLES ELICITS EFFECTIVE ANTI-TUMOR IMMUNE RESPONSES IN PRECLINICAL MURINE MODELS	186
07	THE POTENTIAL OF MULTI-COMPOUND NANOPARTICLES TO BYPASS DRUG RESISTANCE IN CANCER	230
08	GENERAL DISCUSSION	266
	APPENDICES	280
	NEDERLANDSE SAMENVATTING	
	DANKWOORD	
	CURRICULUM VITAE	
	LIST OF PUBLICATIONS	