University of Groningen

Targeting the ileo-colonic region in inflammatory bowel disease

Gareb, Bahez

DOI:
[10.33612/diss.155874434](https://doi.org/10.33612/diss.155874434)

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:
2021

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

Citation for published version (APA):

Gareb, B. (2021). *Targeting the ileo-colonic region in inflammatory bowel disease*. [Thesis fully internal (DIV), University of Groningen]. University of Groningen. <https://doi.org/10.33612/diss.155874434>

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.

Targeting the ileo-colonic region in inflammatory bowel disease

Bahez Gareb

This research was conducted at the two departments Pharmaceutical Technology and Biopharmacy (University of Groningen) and Clinical Pharmacy and Pharmacology (University Medical Center Groningen) in collaboration with the department of Gastroenterology and Hepatology (University Medical Center Groningen). Financial support for printing this thesis was received from the University Library, Graduate School of Science and Engineering, and the department of Clinical Pharmacy and Pharmacology.

Layout: Douwe Oppewal, www.oppewal.nl

Printing: Ipskamp Printing, Enschede

© Copyright 2020, B. Gareb. All rights reserved. No part of this thesis may be reproduced in any form or by any means without prior permission of the author.

rijksuniversiteit
 groningen

Targeting the ileo-colonic region in inflammatory bowel disease

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

5 februari 2021 om 14.30 uur

door

Bahez Gareb

geboren op 24 maart 1988
 te Rezgari, Irak

Promotores

Prof. dr. J.G.W. Kosterink

Prof. dr. H.W. Frijlink

Prof. dr. G. Dijkstra

Beoordelingscommissie

Prof. dr. B. Oldenburg

Prof. dr. H.J. Guchelaar

Prof. dr. ir. K. van der Voort Maarschalk

Paranimfen

Barzi Gareb

Chawan Gareb

Voor mamma gian en pappa gian

Ik hoop dat je begrijpt,
Dat als je trots bent op mij,
Je trots op jezelf kan zijn

Een dag telt 24 uur. En dan is er nog de nacht.

Prof. Dr. D.J. Touw
Geleend van Dr. I.C. Dijkhuis

Table of contents

Chapter 1	General introduction	13
Chapter 2	Development of a zero-order sustained-release tablet containing mesalazine and budesonide intended to treat the distal gastrointestinal tract in inflammatory bowel disease	35
Chapter 3	Development of novel zero-order release budesonide tablets for the treatment of ileo-colonic inflammatory bowel disease and comparison with formulations currently used in clinical practice	61
Chapter 4	Review: Local tumor necrosis factor- α inhibition in inflammatory bowel disease	83
Chapter 5.1	Towards the oral treatment of ileo-colonic inflammatory bowel disease with infliximab tablets: development and validation of the production process	125
Chapter 5.2	Towards the oral treatment of ileo-colonic inflammatory bowel disease with infliximab tablets: formulation stability studies	151
Chapter 6	Towards mucosal application of infliximab in the therapy of enterocolitis (TOMATE): a proof of concept study	169
Chapter 7	General discussion	205
Appendices	i. Summary	216
	ii. Samenvatting	221
	iii. About the author	227
	iv. List of publications	228
	v. Dankwoord	229