University of Groningen

Lactococcus lactis bacteriophages: phage-host interaction and phage transduction

Marcelli, Barbara

DOI:
[10.33612/diss.118088081](https://doi.org/10.33612/diss.118088081)

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):

Marcelli, B. (2020). *Lactococcus lactis bacteriophages: phage-host interaction and phage transduction*. [Thesis fully internal (DIV), University of Groningen]. Rijksuniversiteit Groningen.
<https://doi.org/10.33612/diss.118088081>

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.

***Lactococcus lactis* bacteriophages:
phage-host interaction and
phage transduction**

Barbara Marcelli

2020

/ rijksuniversiteit
 groningen

The work described in this thesis was performed at the Department of Molecular Genetics, Groningen Institute for Molecular Biology and Biotechnology, Faculty of Science and Engineering, University of Groningen, The Netherlands. The research was carried out within the BE-Basic R&D Program, which was granted an FES subsidy from the Dutch Ministry of Economic Affairs.

Printing of this thesis was financially supported by the Graduate School of Science and the University of Groningen.

Cover design: Emanuela Gigliotti

Thesis design: Douwe Oppewal

Printed by: Ipskamp Drukkers B.V., Enschede, The Netherlands.

ISBN E-book: 978-94-034-2478-1

ISBN Printed book: 978-94-034-2477-4

rijksuniversiteit
 groningen

***Lactococcus lactis* bacteriophages: phage-host interaction and phage transduction**

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
 Friday 13 March 2020 at 14.30 hours

By

Barbara Marcelli

Born on 4 March 1989
 In Rome, Italy

Supervisors

Prof. O.P. Kuipers

Prof. J. Kok

Assessment committee

Prof. D. Van Sinderen

Prof. J.D. Van Elsas

Prof. L. Dijkhuizen

A mio padre

CONTENTS

Chapter 1	General introduction	9
Chapter 2	Analysing the genetic determinants of the host-range of 22 newly identified lactococcal bacteriophages	29
Chapter 3	The feasibility of phage-mediated horizontal gene transfer in <i>Lactococcus lactis</i>	55
Chapter 4	A specific sugar moiety in the <i>Lactococcus lactis</i> cell wall pellicle is required for infection by CHPC971, a member of the rare 1706 phage species	83
Chapter 5	Alternative phage-host interaction in <i>Lactococcus lactis</i> : the carrier state drives rapid evolution of phages	115
Chapter 6	Complete genome sequence of 28 lactococcal bacteriophages isolated from failed dairy fermentation processes	145
Chapter 7	Summary and general discussion	151
	Nederlandse samenvatting	161
	Acknowledgments	167