

University of Groningen

Secondary metabolism by industrially improved *Penicillium chrysogenum* strains

Salo, Oleksandr

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:

2016

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

Citation for published version (APA):

Salo, O. (2016). *Secondary metabolism by industrially improved Penicillium chrysogenum strains*. University of Groningen.

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.

Secondary metabolism
by
industrially improved
Penicillium chrysogenum
strains

Oleksandr Salo

ISBN: 978-90-367-8461-0
ISBN: 978-90-367-8460-3 (electronic)

The research described in this thesis was carried out in the research group in Department of Molecular Microbiology in the Groningen Biotechnology and Biomolecular Sciences (GBB), University of Groningen in the Netherlands.

The work was supported by the Perspective Genbiotics program subsidized by Stichting toegepaste wetenschappen (STW) and (co)financed by the Netherlands Metabolomics Centre (NMC) which is a part of the Netherlands Genomics Initiative/Netherlands Organization for Scientific Research (NWO) and the Integration of Biosynthesis and Organic Synthesis (IBOS) programme residing under Advanced Chemical Technologies for Sustainability (ACTS) which is subsidized by NWO.

Cover design and layout of the book: Oleksandr Salo

Cover: “*A talk on how to cure the World*”

Clockwise from left: Alexander Fleming, Howard Walter Flore, Ernst Boris Chain and Norman Heatley.

The tree represents a genealogy of the improved β -lactam producing *Penicillium chrysogenum* strains.

© Copyright 2016 by O.Salo.

All rights reserved. No part of this book may be reproduced or transmitted in any form or by any means, without prior permission of the author.



rijksuniversiteit
 groningen

Secondary metabolism by industrially improved *Penicillium chrysogenum* strains

Proefschrift

ter verkrijging van de graad van doctor aan de
 Rijksuniversiteit Groningen
 op gezag van de
 rector magnificus prof. dr. E. Sterken
 en volgens besluit van het College voor Promoties.

De openbare verdediging zal plaatsvinden op

vrijdag 8 januari 2016 om 12.45 uur

door

Oleksandr Salo

geboren op 6 augustus 1985
 te Yampil, Oekraïne

Promotor

Prof. A.J.M. Driessen

Beoordelingscommissie

Prof. L. Dijkhuizen

Prof. D.B. Janssen

Prof. H. van Veen

*Поїдеш далеко,
Побачиш багато;
Задивишся, зажуришся,—
Згадай мене, брате!*

Т.Шевченко, 1840р.

Content

<i>Chapter 1</i>	Secondary metabolite production by <i>Penicillium chrysogenum</i>	3
<i>Chapter 2</i>	Genomic mutational analysis of the impact of the classical strain improvement program on β -lactam producing <i>Penicillium chrysogenum</i>	49
<i>Chapter 3</i>	Deregulated secondary metabolite production in a histone deacetylase mutant of <i>Penicillium chrysogenum</i>	103
<i>Chapter 4</i>	Identification of a polyketide synthase involved in sorbicillin biosynthesis by <i>Penicillium chrysogenum</i>	137
<i>Chapter 5</i>	Activation of two silent 6-methylsalicylic acid synthases in <i>Penicillium chrysogenum</i>	165
<i>Chapter 6</i>	Summary	183
	Samenvatting	189
	Резюме українською	197
	Acknowledgements	203