



Universiteit
Leiden
The Netherlands

Expanding the chemical space of antibiotics produced by Paenibacillus and Streptomyces

Machushynets, N.V.

Citation

Machushynets, N. V. (2024, September 5). *Expanding the chemical space of antibiotics produced by Paenibacillus and Streptomyces*. Retrieved from <https://hdl.handle.net/1887/4082475>

Version: Publisher's Version

[Licence agreement concerning inclusion of doctoral](#)

License: [thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/4082475>

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

**Expanding the chemical space
of antibiotics produced
by *Paenibacillus* and *Streptomyces***

Nataliia V. Machushynets

The work was supported by the NACTAR program of The Netherlands Organization for Scientific Research (NWO), Grant 16440.

Cover design: N.V. Machushynets, O.V. Podolets

Layout design: I.V. Zakharchuk

Printed by: Vezha Print, www.vezhaprint.com.ua

Expanding the chemical space of antibiotics produced by *Paenibacillus* and *Streptomyces*

Proefschrif

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 5 september 2024
klokke 13:00 uur

door

Natalia V. Machushynets

geboren te Litohoscha, Oekraïne
in 1993

Promotores:

Prof. dr. G.P. van Wezel

Prof. dr. N.I. Martin

Promotiecommissie:

Prof. dr. A.H. Meijer

Prof. dr. H.P. Spaink

Prof. dr. A.T. Kovács

Prof. dr. J. Masschelein (Katholieke Universiteit Leuven, België)

Prof. dr. M.R. Liles (Auburn University, USA)

Contents

Chapter 1.	Thesis outline	6
Chapter 2.	General introduction	12
Chapter 3.	Phylogeny and antibiotic producing potential of plant-associated <i>Paenibacillus</i>	26
Chapter 4.	Discovery of novel glycerolated quinazolinones from <i>Streptomyces</i> sp. MBT27	86
Chapter 5.	Discovery of actinomycin L, a new member of the actinomycin family of antibiotics	112
Chapter 6.	nanoRAPIDS as an analytical pipeline for the discovery of novel bioactive metabolites in complex culture extracts at the nanoscale	148
Chapter 7.	Discovery and derivatization of tridecaptin antibiotics with altered host specificity and enhanced bioactivity	182
Chapter 8.	Chimeric biosynthesis unveils diverse tridecaptin variants in the <i>Paenibacillus</i> genus	218
Chapter 9.	General discussion	250
Nederlandse samenvatting		260
References		270
Curriculum vitae		296
Publications		298