



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

License: [Licence agreement concerning inclusion of doctoral 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).

# Stellingen

Behorende bij het proefschrift

## Expanding the chemical space of antibiotics produced

### by *Paenibacillus* and *Streptomyces*

1. For the discovery of bioactive natural products, molecular networking should be enriched with substructural information, bioactivity data, and taxonomic insights. (Chapter 3).
2. Microbes exhibit exceptional environmental reactivity and adaptability, which can be leveraged to diversify their metabolite production and discover novel molecules (Chapter 4).
3. Bacteria use chimeric biosynthesis as a strategy to dynamically produce compounds with diversified chemistry (Chapters 5 and 8).
4. Combining nanofractionation and molecular networking represents a transformative approach enabling fast and efficient identification and dereplication of bioactive metabolites and their structural analogs (Chapter 6).
5. Congeners from the same family of molecules shouldn't be treated as the compounds with the same mode of action and bioactivity spectra, as a single amino acid substitution can change the bioactivity significantly (Chapter 7).
6. The continued search by microbiologists in soil for new antibacterial agents, underscores the enduring value of soil as a source for discovering novel antimicrobial compounds (Adapted from Waksman, 1952).
7. The dogma of one cluster—one compound should be approached with great caution.
8. The integration of metabolomics and genomics is crucial for unlocking the full diversity of natural products and preventing the repeated discovery of “low hanging fruits”.
9. Much like in the forest where nothing is ever mute (Lesia Ukrainka, Forest Song, 1911), bacterial fermentation *is a dynamic process with continuous biochemical reactions and cell-to-cell communication*.
10. Collaboration between microbiologists, bioinformaticians and chemists is essential to bridge the gap between genomic potential and the actual identification of specialized metabolites.
11. A jack of all trades is a master of none, but oftentimes better than a master of one. This concept is particularly relevant to PhD students, who benefit from developing a broad skill set and interdisciplinary knowledge.
12. The efforts of scientists and society should focus on ensuring that microbes, both of the soul and the body, gradually disappear. Therefore, the only war humanity wages in the future should be against these microbes (Adapted from Alfred Nobel).

Nataliia V. Machushynets  
Leiden, 5 September 2024