# Article information:

Expanding the chemical space for natural products by Aspergillus-Streptomyces co-cultivation and biotransformation | Scientific Reports
<https://www.nature.com/articles/srep10868>

# Article summary:

1. Co-cultivation of Streptomyces coelicolor and Aspergillus niger led to the discovery of novel natural products, with NMR-based metabolomics used to identify the chemical composition of the co-culture.

2. The addition of o-coumaric acid to the co-culture resulted in the production of a structurally novel molecule, (E)-2-(3-hydroxyprop-1-en-1-yl)-phenol, which was not produced in either monoculture.

3. This study highlights the potential for microbial co-cultures to elicit biosynthesis of novel metabolites and expand the chemical space for natural products.

# Article rating:

May be slightly imbalanced: The article presents the information in a generally reliable way, but there are minor points of consideration that could be explored further or claims that are not fully backed by appropriate evidence. Some perspectives may also be omitted, and you are encouraged to use the research topics section to explore the topic further.

# Article analysis:

The article "Expanding the chemical space for natural products by Aspergillus-Streptomyces co-cultivation and biotransformation" presents a study on the potential of microbial co-cultures to elicit the biosynthesis of novel metabolites, thus increasing the pre-existent chemical diversity. The authors focus on the interaction between Streptomyces coelicolor A3(2) M145 and Aspergillus niger N402, using NMR-based metabolomics to identify new molecules produced in their co-culture.

The article provides a comprehensive introduction to the importance of natural products in drug discovery, highlighting the need for new strategies to elicit their biosynthesis. The authors also acknowledge the limitations of high-throughput screening campaigns and emphasize the potential of microbial co-cultures as a promising approach.

The study itself is well-designed and executed, with clear methods and results presented. The use of NMR-based metabolomics is particularly effective in identifying molecules in complex biological mixtures, which facilitates direct biochemical analysis of community metabolism. The authors also provide evidence that compounds in the culture fluid derived from S. coelicolor allowed the production of secondary metabolites by A. niger without physical interaction between them.

However, there are some potential biases and limitations to consider. Firstly, while the study focuses on one specific microbial co-culture, it is unclear how generalizable these findings are to other microorganisms or environments. Additionally, while NMR-based metabolomics is an effective tool for identifying molecules in complex mixtures, it may not be able to detect all compounds present or accurately quantify them.

Furthermore, while the authors acknowledge that A. niger dominates biotransformation processes in co-cultures, they do not explore why this is the case or whether other microorganisms could play a similar role. Additionally, while they identify a novel compound produced from o-coumaric acid in their co-culture, they do not provide any information on its potential bioactivity or therapeutic applications.

Overall, this article presents an interesting study on microbial co-cultures and their potential for eliciting biosynthesis of novel natural products. However, further research is needed to fully understand how generalizable these findings are and what potential applications these newly identified compounds may have.

# Topics for further research:

* Microbial co-cultures in natural product biosynthesis
* Limitations of high-throughput screening in drug discovery
* NMR-based metabolomics for natural product analysis
* Biotransformation processes in microbial co-cultures
* Bioactivity and therapeutic potential of novel natural products
* Microbial interactions in natural product biosynthesis

# Report location:

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