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Poster abstract submission

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Poster title
High-throughput discovery of natural product antimicrobials from previously uncultured bacteria: identification of novel hits active against Mycobacterium abscessus

Poster abstract

Combating antimicrobial resistance demands new chemical matter and discovery strategies that reach beyond synthetics or natural products from well-mined taxa. Bactobio has built a scalable discovery platform to access valuable metabolites from previously uncultured bacteria and translate this biodiversity into antimicrobial leads.
Our platform integrates (i) systematic cultivation of environmental isolates and multi-condition fermentation, (ii) high-throughput screening, and (iii) AI-assisted compound dereplication, isolation, and structural elucidation. The platform is underpinned by technological advances in next generation sequencing, bioengineering, and machine learning.
Since 2020, we have generated a library of ~5,000 novel and unexplored bacterial species and screened >40k crude extracts against six pathogens to generate ~2k primary hits. Whole extract hits undergo secondary screening and hit validation before processing through automated dereplication and isolation pipelines. We link metabolomic data through molecular networking to biosynthetic gene clusters (BGCs) responsible for production of active compounds to accelerate identification of novel and bioactive compounds for further testing.
Our end-to-end discovery platform now routinely delivers 3+ novel antimicrobial compounds per quarter. Our proof-of-concept work successfully delivered a portfolio of novel antimicrobials in agriculture (11+ compounds from 5 classes). We are now focussing on healthcare and have novel compounds with confirmed activity against the non-tuberculous mycobacterium M. abscessus and the fungal pathogen Aspergillus fumigatus, with additional novel actives progressing through structural elucidation and downstream development.
Together, these results demonstrate that systematic access to previously uncultured microbes, combined with high-throughput screening and condition diversification, can generate scalable antimicrobial discovery and yield novel chemistries against clinically relevant AMR pathogens.

Figure 1: An overview of Bactobio's antimicrobial discovery platform

Research topic Biological therapeutics

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