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Fungal Drug Discovery Platform based on Automated Recovery of Mycelial Exudate Compounds (MECs) in Mycoponic Bioproduction

Purdue researchers have developed a method for obtaining and identifying mycelial exudate compounds (MECs) with antimicrobial properties. MECs offer great promise to address multi-drug resistant (MDR) bacteria. Though MECs, until now, have largely remained an untapped resource due in part to their current cultivation methods. The approach developed at Purdue enables the development and acquisition of previously untapped MECs by leveraging automated mycoponic cultures and chemical genomics screening to identify new antimicrobial agents for various conditions including cancer and MDR bacteria. This technology addresses the primary challenge in our healthcare today: the failure of current antibiotics to combat resistant bacteria and instead provides a novel source for new antibiotic production.

Technology Validation:

The mycelium culture chamber comprising of hollow body and porous walls was developed, and collection flange was incorporated into the culture chamber for extraction of MECs.

Computational screening will be utilized to apply machine learning models that predict the pharmacological profiles of the identified MECs, focusing on their efficacy against multi-drug resistant bacterial strains. This will enable faster identification of promising drug candidates.

Advantages:

-Access to mycelial exudates that are lost in substrate and soil systems

-HTS for rapid screening and identification of MECs with antimicrobial activities

-New microbial agents identification

Technology ID

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Category

Biotechnology & Life Sciences/Bioprocessing & Biomanufacturing

Pharmaceuticals/Drug Discovery & Development

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Applications:

-Production of pharmaceutically active compounds and ingredients

TRL: 3

Intellectual Property:

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Keywords: Mycelial exudate compounds,Antimicrobial discovery,Chemical genomics screening,Multi-drug resistant bacteria,Fungal metabolite extraction,Automated mycoponic culture,Novel antibiotic production,High-throughput screening,Pharmaceutical compound development,Machine learning drug screening