

# Green Biotechnology

**R&D Project Title:** Advancement of a method for enhancing plant growth through fungal secondary Metabolites

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## Summary :

Endophytic fungi, closely associated with plants, harbor diverse biosynthesis gene clusters responsible for secondary metabolism within their genomes. However, the activation of the majority of these clusters typically remains quiescent under standard experimental conditions. Within the framework of this research endeavor, we are embarked upon the quest to unearth plant-microbe communities capable of activating the dormant secondary metabolism gene clusters within beneficial *Colletotrichum* fungi. Simultaneously, we aspire to decipher the fungal secondary metabolites synthesized from these dormant biosynthesis gene clusters, which play indispensable roles in establishing beneficial interactions with their host plants. This exploration entails the utilization of a heterologous expression system ingeniously established in *Aspergillus*. The novel secondary metabolites unveiled through this research promise to serve as invaluable assets, finding application in the realms of medicine and pesticide development. Furthermore, our efforts are directed towards unraveling the intricate interplay between these secondary metabolites and the biological pathways within plants and microbes they target. In light of this understanding, we endeavor to engineer microbes with heightened proficiency in producing these advantageous secondary metabolites. Additionally, we strive to modify plants, bolstering their capacity to respond. These innovative strains of microbes and enhanced plant varieties hold the potential to make substantial contributions within the agricultural sphere.

