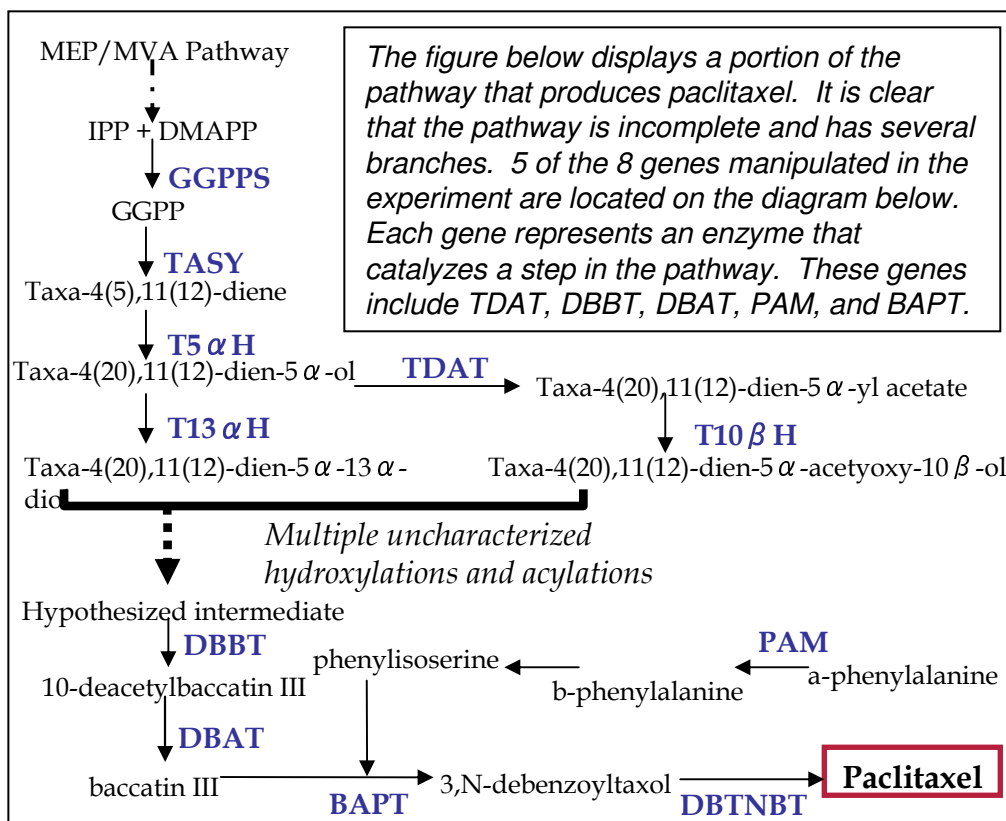


Understanding Regulation of Plant Secondary Metabolism

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Paclitaxel is a plant-derived anticancer agent that is produced in low yields. Compounding this issue is the fact that the pathway that produces this drug has yet to be fully discovered. In efforts to better understand regulation of the pathway DNA constructs are being made for putative regulatory genes to use in metabolic engineering over-expression and silencing studies. Eight constructs will be synthesized and each one codes for a different enzyme involved in the paclitaxel biosynthetic pathway. PCR was used to amplify genes which were then placed into circular DNA fragments called cloning vectors. The cloning vectors, along with the genes, were transferred to *E. coli* for replication. Eventually these genes will be placed into *Agrobacterium* strains for transformation of *Taxus* plant cell suspension cultures. Upon infection of *Taxus* with *Agrobacterium*, the genes will become stably integrated into the plants' DNA and become constitutively expressed. Understanding how the over-expression or silencing of each gene effects paclitaxel production will lead to a better understanding of how to upregulate the paclitaxel biosynthetic pathway leading to higher accumulation levels.