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Upstream bioprocessing of natural colchicine

Plant-based colchicine profoundly benefits human health. Demand for ultra-pure natural colchicine, however, is unlikely to be met through conventional production. A new bioprocessing platform has been established using specialized biorhizomes with comprehensive specific-enzymes that catalyze the construction of biogenic functionalized intermediates that convert to colchicine. Biorhizome is a type of compressed scale leaf-derived rhizome tissue, culturally persuaded *in vitro*. These asexually produced rootstocks, whose buds develop new lateral shoots and adventitious roots that serve as reproductive and storage organs as well as bio-factories, are used to biosynthesize high-value pharmaceuticals and others. Additionally, the sprouting biorhizome carries the same genetic code as its parent plant and is totipotent, and thus can be used to study plant metabolic processes. This presentation will focus on discovery of unique biorhizome platform that have evolved towards total biosynthesis of high-value natural colchicine drug.

Biography

Sivakumar's research is primarily focused on biotech implications and applications of high-value natural products. He has extensively studied the plant-based small molecules pathway biochemistry, synthetic biology and metabolic & bioprocess engineering. He is internationally recognized in the field of biopharmaceuticals and a pioneer in industrial-scale production of bioactive molecules. He has over 40 publications. He is also on the editorial board of several journals. He serves as an expert of grant proposals as well as numerous scientific journals. His laboratory focuses on metabolic and bioprocess engineering of colchicine pathway and developing potential anticancer medicine. In addition, his group is interested in developing biofuels to address energy and environmental problems

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