

Studies of Benzophenanthridine Alkaloids Production by Poppy Cell Culture

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Predicting the behavior of metabolic networks in plant cells presents several major challenges due to our inadequate knowledge on metabolic profiles and genetic information. This study was conducted to investigate metabolic flux change in poppy cell with cultural time and elicitation. An important puzzle in metabolic engineering is how to increase the flux into target compound production. In sanguinarine biosynthetic pathway, the branch point on dihydrosanguinarine to sanguinarine and other derivatives is a very good candidate as the "bottleneck" because this step is a junction of target compound production and unwanted compound production. Our cell line can produce over 250mg/L dihydrosanguinarine but only around 50~100mg/L sanguinarine without elicitation. However, elicitation couldn't be expected to convert all of the dihydrosanguinarine to sanguinarine, even if many factors were varied. To overcome the bottleneck, we invented an alternative method for converting dihydrosanguinarine to sanguinarine. Our results will allow us to understand how the pathway from dihydrosanguinarine to sanguinarine and other benzophenanthridine alkaloids can change with elicitation and heat.