49d Characterization of the Ecdysone Agonist-Inducible Promoter and the Ethanol Inducible Promoter in *Catharanthus Roseus* Hairy Roots

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Catharanthus roseus produces two valuable anticancer drugs, vinblastine and vincristine, in small quantities within the plant. Their commercial importance in fighting lymphoma and leukemia has led researchers to study the enzymes and genes necessary for the production of the terpenoid indole alkaloids (TIAs). Our laboratory is interested in the metabolic engineering of the pathways leading to the TIAs and the effects in *C. roseus* hairy roots. The TIA pathway involves the coupling of secologanin from the terpenoid pathway with tryptamine from the indole pathway by strictosidine synthase.

Previously in our laboratory we have characterized the glucocorticoid inducible promoter in *C. roseus* hairy roots. This promoter demonstrated activity with low basal expression, high inducibility, and a dose-dependent response. The availability of this inducible promoter has facilitated improved metabolic engineering studies by allowing for the investigation of temporal effects, providing an improved negative control against clonal variation, and avoiding potentially deleterious effects of constitutive expression.

The need to study the individual and combined effect of multiple gene manipulations within *C. roseus* hairy roots has led us to explore the use of other inducible promoters within our system. This presentation will discuss the use of the ecdysone agonist-inducible promoter and the ethanol inducible promoter in *C. roseus* hairy roots.