

Duan, H. and Schuler, M.A. 2006. Heterologous expression and strategies for encapsulation of membrane-localized plant P450s. *Phytochemistry Reviews*, 5:507–523.

Abstract:

Heterologous expression of plant P450 proteins is critical for functional definitions of their enzymatic activities as well as for producing natural products whose biosyntheses involve P450s. Over the past decade and a half, several expression systems, using bacterial, yeast and insect cells, have been utilized successfully for expression of P450s from different plant species. Extensive optimizations in each system have focused on the improvement of expression levels, and the enhancement of the redox environment for catalytic activity. In this review, we discuss the strengths and limitations of each system, as well as recent developments and applications of each system. We also discuss the principles behind Nanodisc technology, which utilizes an amphipathic “membrane scaffold protein” (MSP) to stabilize the soluble membrane protein-containing nanometer diameter phospholipid bilayers, and its potential applications in plant P450 research.