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**Systematic Study of the Effects of Protein Characteristics and Expression Conditions on Recombinant Expression of Transmembrane Proteins.** Vidya Madhavan, Ryo Kawamura, Crystal Deberry, Constance J. Jeffery, Univ. of Illinois at Chicago.

Transmembrane [TM] proteins make up over 25% of known proteins and perform many vital cellular activities, including ion transport, cell-cell communication, vesicle transport, maintenance of cellular structure, drug resistance, and host-pathogen interactions. TM proteins are the targets for the majority of pharmaceuticals in use today, and their improper folding or activity leads to important genetic diseases, including cystic fibrosis. In spite of the vast importance of TM proteins, there is far less known about their structures and molecular mechanisms than for soluble proteins, in part because the presence of hydrophobic sequences can make it difficult to express and isolate sufficient amounts for crystallographic studies or biochemical characterization. We have begun a systematic study to test the recombinant expression and membrane localization of dozens of transmembrane proteins with a variety of physical characteristics and under several growth conditions in order to identify factors that affect expression. The results of this project will help in the development of improved methods for obtaining sufficient amounts of purified transmembrane proteins for crystallization trials and other studies.