Bacterial Protein Production System

OTT ID# 1006

APPLICATION

The invention is a bacterial system uniquely suited for the expression of membrane proteins that takes advantage of an unusual attribute of the bacterium *Rhodospirillum rubrum. R. rubrum* can express foreign proteins where other common bacterial systems fail.

TARGET PROBLEM

Many membrane proteins and others are difficult to produce in systems like *E. coli*, often killing the host or yielding inactive, improperly folded proteins. *R. rubrum* which has an extensive intracytoplasmic membrane (ICM) that helps it to produce external proteins.

KEY BENEFITS

- Versatile – Can be used to express and purify multiple types of membrane proteins, including human membrane proteins
- High Yield – Potential for efficient, large-scale production for non-infectious vaccines, protein therapeutics, enzyme therapies, and basic research
- Simple Purification – ICM is readily separated from other cellular material, easing membrane protein purification
- Low Cost – System induced by reduced oxygen concentration, a simple, low-cost stimulus applicable to both laboratory and production scales
- Safe – *R. rubrum* is non-pathogenic to humans and grows on simple media

TECHNOLOGY

The mutant *R. rubrum* strain retains the ability to make ICM in response to the production of foreign membrane proteins. Thus, because the strain can produce ICM in the absence of its own membrane proteins, it can incorporate foreign and over-expressed membrane proteins into this "extra" membrane without disrupting normal cellular function. In addition, gene expression in this system is regulated by oxygen, allowing expression to be controlled by a simple means that does not require potentially toxic or costly chemical inducers. The result is a high-yield expression system that can be used to produce many active membrane proteins in a native conformation.

INTELLECTUAL PROPERTY

U.S. Patent 6,680,179 - Issued
U.S. Patent 6,951,741 - Issued
U.S. Patent 8,481,287 - Issued

ABOUT THE INVENTOR

Dr. Mary Lynne Perille Collins, PhD, Professor Emerita, Biological Sciences

For more information contact: Jessica Silvaggi, Ph.D. | Vice President