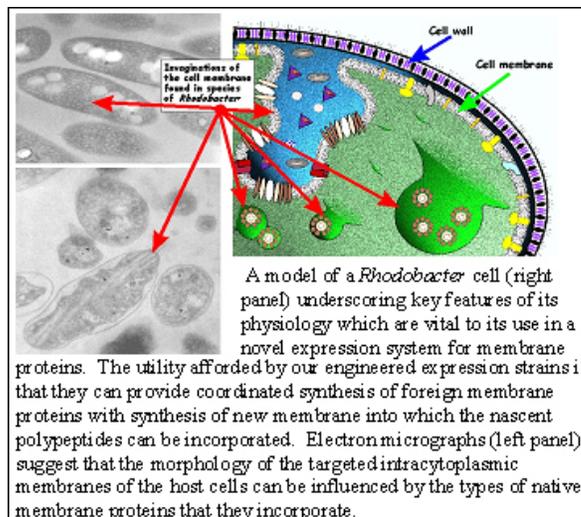


## Cellular Compartmentalization of Foreign Membrane Proteins Overexpressed in Rhodobacter Cells

Philip Laible, Marc Wander, Deborah Hanson

Membrane proteins present unparalleled challenges for structural biology. They are notoriously difficult to produce in the quantities and qualities necessary for functional and structural studies. Here, we demonstrate the successful overexpression, membrane compartmentalization, and subsequent purification of a large number of target prokaryotic membrane proteins in an expression system based upon the photosynthetic bacterium *Rhodobacter sphaeroides*. Target genes were selected from a set of 444 unique membrane proteins encoded by the *E. coli* genome that have no homology with deposits in the Protein Data Bank. Fifty-five of these target membrane proteins that are produced in *Rhodobacter* at levels higher than 1 mg/L of cell culture were studied. Unlike *E. coli* overexpression systems, we have very little evidence for inclusion body formation. In addition, our data suggest that 47% of the expressed proteins can be purified – while retaining structural integrity – with the zwitterionic detergent LDAO. This dataset is large, most unique, unbiased, and provides compelling support for the use of *Rhodobacter* as a general expression host for membrane proteins. Supported by the National Institutes of Health (R01 GM61887 and P50 GM62414).



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