Development of new periplasmic fluorescent reporter protein and its application in high-throughput membrane protein topology analysis

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Until now there has been a paucity of fluorescent reporter proteins for exocytoplasmic locations in bacteria. The lack of such reporter systems has precluded the detection of protein localization in the cell envelope by fluorescence. We have developed the periplasmic fluorescent reporter protein suitable for protein localization in the bacterial cell envelope and also for high throughput membrane protein topology analysis in *Escherichia coli*. We have devised a rapid and exhaustive method for the detection of solvent exposed residues (periplasmic or cytoplasmic) in membrane proteins by using our novel periplasmic reporter protein in conjunction with GFP as a complementary cytoplasmic reporter. Its successful application in topology analysis of inner membrane proteins will be presented.