Display of Lipase on the Cell Surface of *Escherichia coli* using OprF

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We have developed a new cell surface display system using a major outer membrane protein of *Pseudomonas aeruginosa* OprF as an anchoring motif. *P. fluorescens* SIK W1 lipase gene was fused to the truncated oprF gene by C-terminal deletion fusion strategy. The truncated OprF-lipase fusion protein was successfully displayed on the surface of *Escherichia coli*. Localization of the truncated OprF-lipase fusion protein was confirmed by western blot analysis, immunofluorescence microscopy and whole cell lipase activity. To examine the enzymatic characteristics of the cell surface displayed lipase, whole cell enzyme activity and stability were determined under various conditions. Cell surface displayed lipase showed the highest activity at 37°C and pH 8.0. It retained over 80% of initial activity after incubation for a week in both aqueous solution and organic solvent. These results suggest that *E. coli* cells displaying lipases using OprF as an anchoring motif can be employed for various biotechnological applications both in aqueous and non-aqueous phases. (This work was supported by MOCIE grants from the Intelligence Bioinformatics and Application Center (TGW10011093) at the KRIBB)