Lighting *E. coli* cells as biological sensors for Cd$^{2+}$

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Abstract

Whole cells of *E. coli* expressing a chimeric cadmium-binding peptide fused to green fluorescent protein (CdBP4GFP) were prepared and applied for the determination of cadmium. Construction of the structural gene was performed by inserting two synthetic oligonucleotides coding for four repeats of a Cd-binding peptide (His-Ser-Gln-Lys-Val-Phe) into the 5'-end of the GFPuv gene. Similarly, a hexahistidine-green fluorescent protein (his6GFPuv) was prepared and used as a reference in the determinations of heavymetals. The lowest concentrations of Cd, which activated the fluorescence, were 0.5 μM, 50 nM, and 0.5 mM for cells carrying CdBP4GFP, his6GFP and native GFP, respectively.

Key words: cadmium determination, chimeric protein, green fluorescent protein, metal binding peptide

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