# Utilization of genetically engineered *Escherichia coli* as a capacity enhanced adsorbent for charged pollutants

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The use of genetic engineering to increase the affinity and biosorptive capacity of bacterial cells for heavy metals is well known as a promising area of research for the development of bacterial biosorbents. In this study, different approaches involving the use of non-living bacterium, genetically engineered previously, was discribed. Huge amount of non-living bacterium has been produced during industrial amino acid production.
The maltose binding protein, *MalE*, from *Escherichia coli* was used to display metal-binding poly-histidine peptides on the surface of this bacterium. Selected oligomeric clones were expressed and targeted to the periplasm as a fusion with the maltose-binding protein. Living and non-living bacterial cells harbouring the expressed oligopeptides were characterized for their ability to bind $Cd^{2+}$, Methylene Blue, Reactive Red 4 and other pollutants. The binding characteristics were dependent to charge of the pollutants. The use of this strategy for the design and expression of polypeptides containing multiple functional domains for use in biosorption is discussed.