

Engineering the *Escherichia coli* maltose binding protein malE for metal biosorption

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The discharge of heavy metals into the environment due to agricultural, industrial, and military operations and the effect of this pollution on the ecosystem and human health are growing concerns. Recent research in the area of heavy metal removal from wastewaters and sediments has focused on the development of materials with increased affinity, capacity, and selectivity for target metals. The use of microorganisms to sequester, precipitate, or alter the oxidation state of various heavy metals has been extensively studied. A gene coding for a peptide sequence containing a metal binding motif was chemically synthesized and expressed in *Escherichia coli* as a fusion with the maltose binding protein. Bacterial cells expressing the metal binding peptide fusion demonstrated enhanced binding of Cd^{2+} compared to bacterial cells lacking the metal binding peptide. The potential use of genetically engineered bacteria as biosorbents for the removal of heavy metals from wastewaters is discussed.