

### **Abstract**

Heavy metal pollution in the environment is mainly caused by illegal disposal of industrial wastes. These ions include lead, cadmium, zinc, mercury, manganese, copper (II) and iron (III). This project explores the effectiveness of using the Gram-negative bacterium, *Citrobacter freundii*, in biosorption of these ions. It was found that *C. freundii* was most efficient at adsorbing copper (II) and iron (III) ions. Alginate immobilized *C. freundii* was able to adsorb copper (II) ions from contaminated water samples, while *C. freundii* exposed to UV light for 40 s showed greatest efficiency of adsorption. Furthermore, *C. freundii* killed by freeze thaw cycles could also adsorb copper (II) ions. Thus adsorption could take place without the introduction of cells into a polluted environment, thus maintaining a balance in the ecosystem. *C. freundii* lysate containing soluble cell components showed significant adsorption of copper (II) ions. This suggested the involvement of an intracellular protein which chelated the copper (II) ions.