

# RESPONSE OF *Daucus carota* BIOSENSOR WITH DIFFERENT NUMBERS OF IMMOBILIZED CELLS FOR HEAVY METAL DETECTION

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## ABSTRACT

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The increase of heavy metals pollution leads to serious damage to the earth. As current approaches in heavy metals detection are expensive and time consuming, an alternative approach to detect the presence of heavy metal contaminants using whole cell biosensor with immobilized *D. carota* cells is therefore being developed. Whole cell biosensor has better stability towards environmental changes while reflecting the real physiological effects of heavy metals on living organisms compared to nucleic acid based and enzyme based biosensor. In this research paper, the responses of carotenoids in *D. carota* cell to copper and lead were studied. The conditions for the immobilization of cells were carried out with 0.5% of agarose at 45°C. The responses were measured using spectrophotometer with wavelength set at 450 nm. The effect of the number of cells to the response of biosensor towards Cu has been studied to identify the optimum number of cells to be used in the biosensor. According to the result obtained,  $8 \times 10^5$  cells/cuvette gave the optimal absorbance reading. In the test of biosensor with optimal conditions towards lead (Pb) with pH 7.5, the results determined that absorbance at 450 nm increased proportionately to the increase of Pb concentration.