

**ABSTRACT**

Copper is known as essential whereas gold is non-essential metal for both prokaryotes and eukaryotes. Gold has toxic behavior while copper in high concentration only is known to be toxic for living organisms. One of the operons known for maintaining homeostasis of copper is *cus* regulon. This operon is regulated by two components *i.e.*, *cusS* (sensory) and *cusR* (regulatory). Promoter of *cus* regulon is bidirectional and regulates both structural and regulatory operons. Promoter *cusRS* from *Klebsiella pneumoniae* was transcriptionally fused with pSL-LacZ vector that was used to transform DH5 α . Activation of promoter *cusRS* against gold and copper was studied through the expression analysis of β -Galactosidase; a reporter gene in pSL-LacZ vector. β -Galactosidase expression was confirmed by SDS-PAGE as well as enzyme assay in terms of Miller Units using ONPG as substrate. Promoter *cusRS* was found to be activated in the presence of both copper and gold. Though, it was more activated against copper than gold. Additionally, expression analysis was also correlated with intracellular copper and gold concentrations. Initially, increased concentration of each metal resulted in more activation of promoter *cusRS*, however, concentration near MIC resulted in deactivation of promoter *cusRS*. Sequence of promoter *cusRS* was analyzed on homology basis for the presence of CusR binding box among different species belonging to family Enterobacteriaceae.