

Development of copper sensing bacteria by integration of two-component system with green fluorescence protein

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It is well known fact that E.coli adapts to several environmental changes for its survival. These microbial cells contain receptors in the cytoplasmic membrane for the detection of environmental signals called two component signaling system. The intelligent behavior of E. coli can be reprogrammed by the alteration of genetic parts, namely sensors, genetic circuits and actuators in the two component signaling system. Sensors transmit information to genetic circuits and it drives actuators in order to change the behavior of the microbial cell. Now day's researchers, combine genetic parts which is encoded on the DNA to create biological programs that command cells to perform a multiple tasks. Normally in metal efflux system in bacteria that can sense copper in the environment by NtrC family of two component system. These two-component system(TCS) consists of a membrane bound, periplasmic sensor protein-histidine kinase, CusS receives the environmental signal from copper by an extracellular sensory domain called sensor. This sensor passes the information to a corresponding cytoplasmic response regulator, CusR, which has DNA-binding domains directly regulate the gene expression of genetic circuit namely cusC for metal efflux system.