Regulation (ros) level produced by living organisms

Environment

Regulation of gene expression is essential for unicellular as well as complex, higher organisms. Controlling of the specific gene or cluster of genes can leads to phenotypic difference within and between species (Georg Fritz, 2012). Gene expression mechanism in higher organisms are regulated by complex network consist of transcription factors, cell signalling, polyadenylation and localization, chromatin modifications, mRNA splicing and much more.

Furthermore prokaryotes (unicellular) have less complicated gene regulatory system in response to intra and extracellular factors (Chen and Rajewsky, 2007). That’s why it turned as very suitable model organism to study gene expression. In bacteria, response will induce to acclimatize to stressful environment after receiving signals at periphery or intracellular (Skript). The induced specific response as well as defence mechanisms of bacteria is important for their survival in harsh conditions. And it also relies on environmental factor such as absence of inhibitors and substrate availability (Georg Fritz, 2012).

Bacterial don’t have any nuclei, therefore transcription and translation event can occur simultaneously in same compartment (cytoplasm) (Berg JM et al, 2002). Hence large amount of gene response are encountered in transcriptional level. Oxidative stress is occurred by chemical imbalance between the production and elimination of reactive oxygen species (ROS) level produced by living organisms (Lushchak VI, 2011). Reactive oxygen species can damage DNA, lipids and proteins of E. coli bacteria cells, hence its build-up mechanisms to encounter oxidative stress condition (Cabiscol E

et al, 2000). During the oxidative stress and the presence of hydrogen peroxide, superoxide radicals; major regulators of E.

coli bacteria cells undergo conformational changes and control the gene expressions (Chiang SM et al, 2012). Quantitative real time PCR are performed to understand the gene expression on mRNA level. Expression of target genes sufA and ahpC (both helps to reduce oxidative stress) are observed under stressed conditions through Real time PCR and Fluorescence Microscopes (with fluorescence reporters).