Analysis of expression of *Escherichia coli* stress genes due to environmental toxic chemicals using real time PCR

Han Na Hong, Yeon Seok Kim, Ji Hyun Park, Keong Seo Park, Jiho Min, and Man Bock Gu*,

National Research Laboratory on Environmental Biotechnology

Kwangju Institute of Science and Technology (K-JIST)

e-mail: mbgu@kjist.ac.kr

Abstract

Real time RT-PCR is a widely used method to estimate the expression level of genes of interest quantitatively. The *E. coli* stress genes such as *recA*, *katG*, *fabA* and *grpE* were known to respond to toxicants, and each gene is representative as a DNA, oxidative, membrane and protein damage due to the toxicants. In this study, with the use of real time PCR technique, the expression of four different stress responsive genes were estimated under stressful conditions caused by the exposure of three different groups of chemicals; general toxicants such as mitomycin C (MMC), hydrogen peroxide (H2O2), and phenol; polyaromatic hydrocarbons (PAHs) such as phenanthrene, naphthalene and benzo[a]pyrene; and endocrine disrupting chemicals (EDCs) like 17-estradiol, bisphenol A and styrene. It was found that each chemical could be characterized according to the expression level of genes from the analysis of expression fingerprints. In addition, the extent of toxicogenomic effects by these toxic chemicals could be also evaluated based on the comparison of expressed levels of three selected genes.

References

1. Man Bock Gu and Jiho Min (2000), Bacterial bioluminescent emissionfrom recombinant Escherichia coli haboring a recA::luxCDABE fusion, *J. biophys. & biochem. method.* **45**, 45-56.
2. Man Bock Gu, Jiho Min and Eun Jin Kim (2002), Tocixity monitoring andclassification of ocrine-Disrupting Chemicals (EDCs) sing recombinant bioluminescent bacteria, *Chemosphere.* **46**, 289-29.