

Toxicogenomic Analysis on Impacts of EDCs and Other Toxic Chemicals by Using Both Japanese Medaka Fish and Bacterial cDNA Microarrays

Man Bock Gu

Graduate School of Biotechnology, Korea University, Seoul, Korea

Cellular stresses caused by various environmental toxic chemicals on *Oryzias latipes* (Japanese Medaka fish) have been evaluated using both cDNA chip and real time PCR analyses. In this study, phenolics and more than three EDCs including 17-beta-estradiol, nonylphenol, and bisphenol A, have been used to study the toxicogenomic responses of Medaka fish using both a newly designed and fabricated fish cDNA chip containing more than 2000 random cDNA spots and real time PCR analyses. This DNA chip can also be used in stress analysis of fish for various functional stress responsive genes and is also considered to further implement in finding of stress specific biomarkers. All the studies indicate that both the DNA chip and real time PCR are appropriate tools to study and elucidate a global view of gene expression profiles, even do so quantitatively, in response to environmentally toxic chemicals. Furthermore, a few of biomarker genes have been selected from gene expression profile analysis with DNA chips.

In addition, as it has been recently progressed that not only the clustering analysis of gene expression, PCA and SOM analysis but also chemical-gene interaction profiling have been recently implemented in bacterial toxicogenomic analysis, it will be also discussed how it can be implemented in fish toxicogenomic research as well. Finally, the current research efforts will be discussed that more than 300 cDNAs are sequenced out of 2000 cDNA spots on the medaka cDNA chip, and their redundancy, and features of cDNA chip in terms of their expression signatures are validated.