

## DEVELOPMENT OF FUNCTIONAL cDNA CHIP OF JAPANESE MEDAKA FISH FOR CELLULAR STRESS ANALYSIS

Jiho Min, Kyeong Seo Park, Han Na Hong and Man Bock Gu\*

Kwanju Institute of Science and Technology (K-JIST)

TEL: +82-62-970-2454, FAX: +82-62-970-2434 E-mail : mbgu@kjist.ac.kr

### ABSTRACT

With the introduction of DNA microarrays, a high throughput analysis of gene expression is now possible as replacement to the traditional time-consuming Southern blot analysis. This cDNA microarray should be a highly favored technology in the area of molecular toxicology or analysis of environmental stresses. In this study, we have developed a new functional cDNA microarray chip for analyzing stress-specific responses in Japanese Medaka fish. In the design and fabrication of this stress specific functional cDNA microarray, 123 different genes in Medaka fish were selected from 18 different stress responsive groups. On a 2575 mm glass surface, 123 different cDNA genes, including one yeast and *E.coli* gene as a negative control, were spotted twice for statistical analysis of hybridization. After exposure of the fish to a well-known endocrine disrupting chemicals (EDCs) such as Nonylphenol, bisphenol A and non EDCs such as phenol over 1 or 10 days, the responses of the DNA chip were found to show distinct expression patterns according to the mode of toxic actions from environmental toxicants. Therefore, this chip can be used to monitor stress responses of unknown and/or known toxic chemicals using Medaka fish and can be used in findings of biomarkers from the gene expression analysis for known contaminants. As well, toxicogenomic analysis, using cDNA microarrays, holds considerable results for defining and characterizing the toxicological properties of EDCs and non-EDCs and their hazardous effects in Japanese Medaka..