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MOLECULAR BIOMARKER OF CADMIUM EXPOSURE IN FRESHWATER FISH : SENSITIVITY AND SPECIFICITY

Kwangsik Park*, Heekyung Bae, Seong-Sook Nam and Enkyoung Kim

*College of Pharmacy, Dongduk Women's University, 23-1, Wolgok-dong, Seongbuk-gu, Seoul 136-714, Korea, Environmental Risk Assessment Division, NIER, Gyeongseo-dong, Seo-gu, Incheon 404-170, Korea

Metallothioneins (MTs) are known to be induced by heavy metals in various organs of different species and represent a potential biomarker of aquatic contamination by heavy metals. In this work, cloning and sequencing of a metallothionein gene in crucian carp (Carassius auratus) was done and sensitivities and specificities of the gene expressions were compared. Metallothionein gene, lacking 5 promoter region, is 405 bp long and has a tripartite structure consisting of three exons and two introns. The mRNAs were induced after one-day exposure of cadmium in liver, kidney and gills, and the gill was observed as the most specific tissue for the metallothionein gene expression. In comparative study with the histopathological changes of gills and metallothinein mRNA induction, we could not observe any distinct histopathological changes in gills in the exposure concentration of cadmium in which metallothionein mRNA was induced. These results suggested that metallothionein gene expression in the gills of crucian carp, Carassius auratus could be used as a sensitive molecular biomarker to monitor the heavy metal conntamination

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