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Development of Biomarkers for Cadmium Using Toxicogenomic Technique

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Cadmium is a widespread environmental pollutant and a cigarette smoke constituent, which has been classified as a human carcinogen. Examining global effects of cadmium on gene expression can be useful for elucidating patterns of biological response, discovering underlying mechanisms of toxicity, and identifying candidate cadmium-specific biomarkers. Using a human 8k cDNA microarray (which contains 8000 human genes.) we examined global changes in gene expression following low doses, acute exposure of cadmium to human lung fibroblast wi-38 cell (1%FBS, 10uM cadmium, 4h and 24h). Expression of cadmium responsive genes were verified by RT-PCR. We select 144 genes from human 8k microarray data. The clones were amplified and printed onto amino-alkyl silane glass slides. Specificity was examined using cadmium, nickel, arsenite and benzo(a)pyrene. Sensitivity was tested between 0.5-25uM cadmium. The expression of the candidate biomarkers was confirmed by RT-PCR.

Keyword : cadmium, biomarker, microarray, RT-PCR