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A STUDY ON BIOLOGICAL MARKERS FOR THE ASSESSMENT OF GENOTOXICITY AND OXIDATIVE DAMAGE IN CHROMIUM EXPOSED WORKERS.

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According to the epidemiological studies in chromium workers, hexavalent chromium is associated with the risk of lung cancer. Genotoxicity such as chromosome aberration, and cellular oxidative damages by reactive oxygen species produced by hexavalent chromium exposure may play an important role in the carcinogenesis process. We investigated the availabilities of several kinds of biological markers to assess the genotoxicity and oxidative damages from chromium exposure in Korean chromium plating workers. With the conventional Giemsa staining for chromosome aberration, the frequencies of chromatid exchange showed statistical correlation with blood chromium concentration, and the total chromosome aberration frequencies were correlated with blood chromium and hexavalent chromium levels in the air. However these structural chromosome aberration types were not proper indicator for the chromium induced genotoxidity due to their extremely low frequencies in chrome platers. By FISH (fluorescence in situ hybridization) techniques, the frequencies of chromosome aberration in chromium exposed workers was significantly higher than those of the control with clear dose-dependent manner. Especially translocation was so strongly correlated with the

blood chromium level that it might be better biological indicators in chromium exposed workers. Lipid peroxidation, one kind of cellular oxidative damage, was measured n blood plasma of the chromium exposed workers. The concentrations of malondialdehyde (MDA), the metabolite of lipid peroxidation, in chromium exposed workers were higher than those controls. However there was no statistical correlations between MDA and blood or urine chromium levels. From the above findings, translocations by FISH technique could be the proper biological markers for the assessment of genotoxicity from chromium exposure.