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Biomarkers Toxicant Exposure

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Abstract: The goal of this study was to develop biomarkers of toxicant exposure, in rodent models, with a focus on lead a and the military jet fuel JP8. Our results demonstrated that these toxicants caused significant alterations in the levels of specific detoxication enzymes. These affected enzymes are members of the family of glutathione S-transferases (GSTs) enzymes which detoxify many environmental toxicants and drugs. Studies on lead effects on kidney found that large increases in these enzymes occurred at lead levels seen in the environment of exposed persons and they preceded pathobiological changes in kidney structure and function in lead-treated rats, suggested that changes in GSTs are a sensitive tissue marker of toxicant exposure. Studies on mechanisms demonstrated that the observed changes in GSTs reflected changes in gene expression, and contrary, to prevailing dogma, did not result from oxidative stress. Inhalation exposure of JP8 was shown to affect other members of the GST family in the nervous system, with cerebellum and retina affected These results suggest that these regions of the nervous system are targets of JP8 toxicity; this is of Air Force significance since visual and motor functions are controlled by retina and cerebellum.

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