



FOUNDATIONS OF IMMUNOTOXICOLOGY

14th Annual Conference

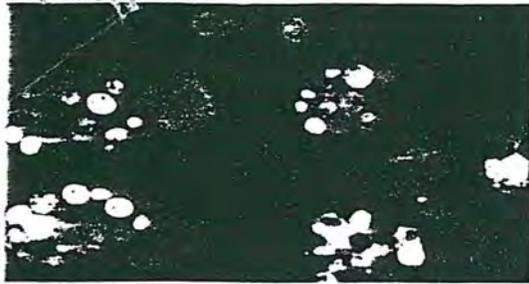
“DEVELOPMENTAL IMMUNOTOXICOLOGY: RESEARCH AND RISK ISSUES”

September 8-10, 1999

ELEVATED OXIDATIVE STRESS IN SKIN OF B6C3F1 MICE AFFECT DERMAL EXPOSURE TO MACHINE WORKING FLUID

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Metal Working Fluids (MWFs) are widely used in industry for metal cutting, drilling, shaping, lubricating and milling. Potential for dermal and inhalation exposure to MWFs exists in a large number of workers via aerosols, splashing during machining process, and other industrial operations. Both female and male are involved in industrial operations. It has been reported earlier that occupational exposure to MWFs causes health problem e.g. allergic and irritant contact dermatitis. Previously, we showed that dermal exposure of B6C3F1 mice (female and male) to 5% MWFs for 3 months resulted in an increase in skin histamine and mast cell counts. Topical exposure to MWF has also resulted in depletion of two major water soluble antioxidants, e.g. ascorbate and glutathione in the liver of both genders. The level of lipid peroxidation (MDA) in the liver of both sexes and the testes in males was concomitantly increased. The goal of this study was to evaluate interaction between oxidative stress in the skin and topical application of MWF. To create acute skin inflammation, H₂O₂ producing enzyme glucose oxidase conjugated to polyethylene glycol (GODPEG) was injected intradermally. Intradermal administration of GODPEG to B6C3F1 mice (female and male, 8-12 weeks old) resulted in inflammation and muscle fiber necrosis in skin. The level of GSH in skin was reduced after GODPEG treatment of B6C3F1 mice. To determine whether oxidative stress influences the dermal response to MWF, mice were injected with GODPEG 24 h prior to topical exposure to unused MWF (200 ml 30%). This resulted in an increased inflammatory response in skin, reduced GSH and protein thiols, and increased level of peroxidative products. Further study is necessary to delineate the role of oxidative stress in enhancing of contact/irritant dermatitis triggered by occupational exposures to MWF.

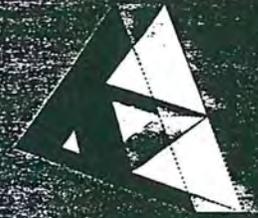


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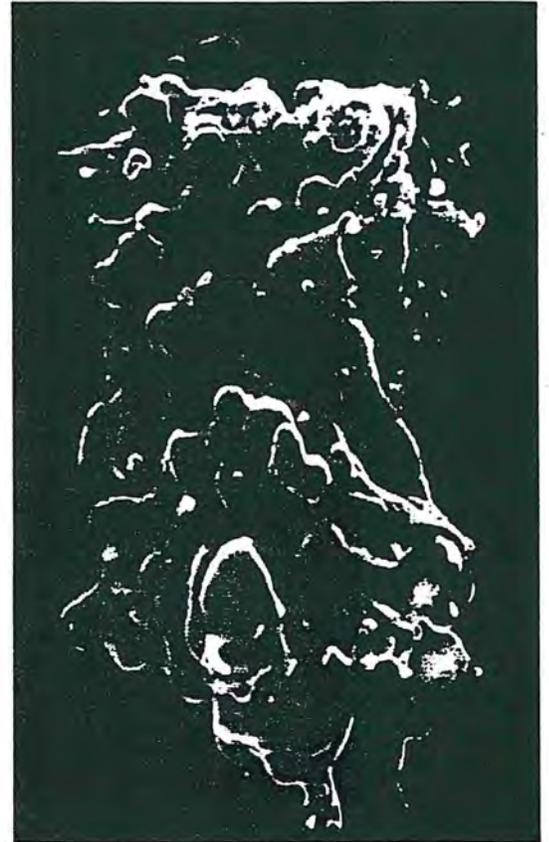
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ABSTRACTS

