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The Chronic Effects on JP-8 Jet Fuel Exposure on the Lungs

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Abstract:

There are four major findings from the three years of work devoted to the effects of chronic JP-8 jet fuel exposure on the lungs and secondary organs. These findings are the following chronic exposure to JP-8 jet fuel alters pulmonary function and lung structures with an acute response with as little as seven days of low dose, approximately 500 mg/m³, exposure to JP-8 jet fuel; chronic exposure to JP-8 jet fuel increased liver, spleen, and kidney weights compared to controls. Microscopic evaluation of liver sections were normal; however, kidney and spleen had histological changes consistent with organic solvent exposure. There is a correlation between JP-8 jet fuel exposure-induced decreases in lung Substance P levels and lung neutral endopeptidase levels. Chronic exposure to JP-8 jet fuel caused a decrease in lung Substance P levels with a corresponding increase in lung neutral endopeptidase levels; and, there is a recovery process in the 56 day low dose JP-8 jet fuel-exposed lungs as marked by a return to baseline and longitudinal control 99mTcDTPA values. The 99mTcDTPA data was very consistent with our pathologic findings of very little lung injury in the 56 day low dose JP-8 jet fuel-exposed rats. We speculate that this finding indicates that there is a 'threshold' level of JP-8 jet fuel exposure that the lungs' defense mechanism(s) can tolerate.

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