

[Toxicology, 66, 271-278 (1991)]

[Lab. of Public Health]

Dose-response relationship between dietary cadmium intake and metallothioneinuria in a population from a cadmium-polluted area of Japan.

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An epidemiological study to examine the dose-response relationship for environmental cadmium exposure was performed in 1843 Cd-exposed and 240 non-exposed inhabitants. Metallothioneinuria was used as an index of renal tubular dysfunction produced by the chronic exposure to Cd in rice. The chronic total Cd intake resulting in metallothioneinuria in this population was calculated to be approximately 2 g for both men and women. The cumulative lifetime dose of 2 g Cd over a 50-year period, means an average daily intake of 110 μ g. Thus, these values may be regarded as the maximum allowable lifetime and daily intake limits, respectively for chronic dietary exposure to Cd.

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[Lab. of Public Health]

Dose-response relationship between urinary cadmium and metallothionein in a Japanese population environmentally exposed to cadmium.

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The dose-response relationship between Cd exposure and renal dysfunction, as measured by urinary Cd and MT, was evaluated in a population living in a Cd-polluted area. Probit linear regression analysis showed significant dose-response relationships between MT and Cd. Based on the prevalence rates of MT-uria in the control population, the upper limits for the urinary Cd concentrations were calculated from the slopes of the regression lines to be 4.2 and 4.8 μ g/g creatinine for men and women, respectively. These values may be of use in establishing the biological threshold, i.e. maximum allowable concentration, for urinary Cd in the environmentally exposed Japanese population.

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[Lab. of Biochemistry]

Aldehyde Dismutation Catalyzed by Pulmonary Carbonyl Reductase: Kinetic Studies of Chloral Hydrate Metabolism to Trichloroacetic Acid and Trichloroethanol.AKIRA HARA*, HIDETAKA YAMAMOTO, YOSHIHIRO DEYASHIKI,
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The kinetics of the NAD(P)-linked aldehyde dismutation by guinea pig pulmonary carbonyl reductase were studied using chloral hydrate. The enzyme converted the substrate into trichloroacetic acid (TCA) and trichloroethanol (TCE) in the presence of the reduced or oxidized cofactors, of which NAD(P) gave a higher reaction rate than did NAD(P)H. In the NAD(P)-linked reaction TCA was the predominant product and its amount was compatible with that of TCE plus NAD(P)H produced, whereas in the NAD(P)H-linked reaction equal amounts of TCA and TCE were formed.