voir, about 3.7% of the dose was associated with the tissue component of the intestines 18 hours after the injection of mercury. Only about 2.1% of the dose was present in the same tissure of control rats. About 2.5% of the dose was present in the luminal contents of the intestines of the biliary cannulated animals. Interestingly, only about 0.6% of the dose of mercury was present in the bile that was collected for 18 hours. The hepatic content of mercury was almost twofold greater in the animals whose bile duct had been cannulated than in control rats. Furthermore, diversion of biliary outflow caused an approximate 20% decrease in the renal content of mercury. These findings support the hypothesis that intestinal secretion of mercury plays a significant role in the fecal excretion of inorganic mercury.

945 TWO-DIMENSIONAL ELECTROPHORETIC ANALYSIS OF MYOCARDIAL PROTEINS FROM LEAD-EXPOSED RABBITS.

M Toraason[1], W Moorman[1], PI Mathias[1], C Futz[2], F Witzmann[2]. [1]*CDC/NIOSH, Cincinnati, OH; Indiana University-Purdue University, Columbus, IN.*

Numerous animal and epidemiological studies support a causal relationship between lead exposure and hypertension. Cardiovascular effects other than elevated blood pressure have been observed in individuals occupationally exposed to lead and in children with histories of pica. Mechanisms proposed for lead's effect on the cardiovascular system include alterations in adrenergic receptor density, membrane cation transport, calcium binding proteins, and enzymes ranging from phosphodiesterase to protein kinase C. Despite reported adverse effects, the cardiovascular toxicity of lead remains controversial due a significant number of negative studies. The purpose of the present study was to determine if low-level exposure of rabbits to lead would produce concentration-dependent changes in myocardial proteins. Male Dutch Belted rabbits (n = 60) were randomized into four dose groups. Lead was administered as a lead acetate solution in sterile 5% dextrose via subcutaneous injection 3 times per week for 20 weeks. Dosing was adjusted weekly to achieve and maintain the target blood lead levels of 0, 20, 40, and 80 ug/dl for 15 weeks. Rabbits were killed by lethal injection. Hearts were removed into iced Hanks' buffer without perfusion, blotted and weighed. Lead exposures did not affect heart or body weights. Left ventricals were dissected away, quartered and frozen in liquid nitrogen. Blood and myocardial lead analyses were by graphite furnace atomic absorption spectroscopy. Myocardial concentrations of lead at sacrifice were 58 ± 25, 69 ± 23, 102 ± 62, and 105 ± 37 ng/g. Ventricular homogenates were prepared for 2D electrophoresis, the resulting gel patterns stained, and image analyzed. 808 individual proteins were resolved, 162 of which had coefficients of variation <20%. A number of proteins were tentatively identified based on coordinate positions homologous to other established 2D patterns. Despite variable expression of some protein spots, none of the protein abundances analyzed were consistently altered ($P < .001$) by the lead exposures studied. Results support the conclusion that a low-body burden of lead does not affect the myocardium of the rabbit. Supported in part by AFOSR Grant #F49620-96-1-0156.

946 EFFECTS OF ACUTE AND SUBCHRONIC ORAL ADMINISTRATION OF MERCURIC CHLORIDE ON BLOOD CHEMISTRY PARAMETERS IN RATS.

S J Thompson, A T Khan, A Atkinson, T C Graham, J E Webster, S Ali, C D Shannon, and J A Ferguson. *School of Veterinary Medicine, Tuskegee University, Tuskegee, AL.* Sponsor: R R Dalvi.

The effects of acute (14 days) and subchronic (82 days) oral administration of mercuric chloride on the blood chemistry parameters of Sprague-Dawley rats (SDR) were studied. After two weeks of acclimation, male rats (45–50 days old) were administered 0.0, 2.0, 4.0, 6.0, 8.0 and 10.0 mg/kg/day mercuric chloride for 14 days or 0.00, 0.50, 1.00 and 1.50 mg/kg/day mercuric chloride for 82 days. The effects of mercuric chloride on creatinine kinase (CK), alanine amino transferase (ALT), aspartate amino transferase (AST), alkaline phospatase (ALK) gamma glutamyl transferase (GGT), sodium (Na), potassium (K), chloride (Cl), calcium (Ca), albumin (Alb), glucose (Glu), cholesterol (Chol), total protein (TP), billirubin (Bil), blood urea nitrogen (BUN), phosphorus (Phos) and creatinine (Crea) were evaluated. Acute exposure to mercuric chloride did not result in any significant change in any of the blood chemistry parameters examined. Subchronic exposure showed a significant difference in Crea, Bun, Chol, Bil, Na, K, Cl, Phos and TP at 1.0 and 1.5 mg/kg/day compared to control (0.0 mg/kg/day). However, other blood chemistry parameters did not show any significant difference compared to controls. These data indicate that subchronic exposure to mercuric chloride resulted in renal and hepatic dysfunction in SDR (Supported by MHPF/ATSDR Cooperative Agreement # 5R51/ATR398004-05).

947 MURINE STRAIN DIFFERENCES IN CADMIUM-INDUCED TESTICULAR TOXICITY.

L M King, M B Anderson, S C Sikka, and W J George. *Tulane University School of Medicine, New Orleans, LA.*

Cadmium is associated with decreased fertility in humans and animals and has also been shown to cause a rapid hemorrhagic necrosis in the testes. However, some strains of mice are resistant to this testicular toxicity. Zinc has been shown to be protective in the testes. The present study was designed to elucidate the mechanisms involved in the protection and strain resistance to cadmium-induced testicular necrosis. Eight-week old male mice of a sensitive strain (129/J) and a resistant strain (A/J) were given 20 μmol cadmium chloride ($CdCl_2$)/kg sc. Sensitive mice (129/J) were also given 250 μmol zinc acetate (ZnAc)/kg sc. alone, or 24 hr prior to $CdCl_2$. Animals were sacrificed after 24 hours. Sensitive mice showed a significantly increased concentration of cadmium in testes (0.43 vs. 0.14 μg Cd/g), seminal vesicles (0.77 vs. 0.33 μg Cd/g), and epididymides (1.36 vs. 0.72 μg Cd/g), as compared to resistant mice. Following ZnAc treatment, cadmium levels in the testes (0.34 μg Cd/g), seminal vesicles (0.36 μg Cd/g), and epididymides (0.67 μg Cd/g) of sensitive mice were significantly reduced. Cadmium levels in the liver were not significantly different between the two strains (11.44 μg Cd/g), but were significantly higher in the ZnAc-treated group (22.53 μg Cd/g). ZnAc prevented the decrease in the epididymal sperm count and motility seen in sensitive mice after exposure to $CdCl_2$. These data suggest that strain resistance and the protective effect of zinc are associated with a decreased accumulation of cadmium in the testis and other reproductive tissues.

948 EFFECT OF CADMIUM ON PROLIFERATION AND DIFFERENTIATION OF HUMAN EXTRAVILLOUS TROPHOBLAST (EVT).

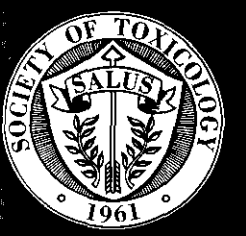
S S Powlin and R K Miller. *Departments of OB/GYN and Environmental Medicine, Environmental Health Sciences Center, University of Rochester, Rochester, NY.*

During implantation, differentiation and proliferation of cytotrophoblast (CT) cells are both important. CT cells undergo two differentiation pathways: they either fuse and form syncytiotrophoblast (ST) or proliferate and become invasive extravillous trophoblast (EVT). EVT migrate into the maternal endometrium and uterine vasculature, establishing fetal-maternal contact. This process is crucial for a normal gestation. We examined the effect of cadmium (Cd), a known placental toxicant, on EVT proliferation and differentiation. First trimester (5–10 weeks of gestation) human placental explants were cultured for 6 days, and exposed to Cd for 6 hours on day one. Cultures were inspected via phase contrast microscope for the appearance of EVT outgrowth. Cd (0.5 to 40μM) inhibited EVT outgrowth in a dose-dependent manner. Toxicity was also manifested through lysis of the placental villous tips. We hypothesized that Cd may inhibit proliferation through interactions with calmodulin (CaM). CaM inhibitors have been shown to reverse select toxic effects of Cd. Zaldaride maleate, a CaM inhibitor, was used to study the interactions of Cd and CaM. Explants exposed to zaldaride (100μM) and Cd (40μM) had more CT proliferation than Cd alone. Interestingly, the lysis noted in Cd exposed explants was absent. These data suggest that CaM may be important in mediating the toxicity of Cd in the early human placenta. (Supported by ES02774, ES01247).

949 IRON DEPOSITION AT MINERALIZATION FRONTS AND OSTEOID FORMATION BY CHRONIC CADMIUM EXPOSURE IN OVARI-ECTOMIZED RATS.

H Hiratsuka[1], O Katsuta[1], M Tsuchitani[1], T Umemura[2]. [1]*Mitsubishi Chemical Safety Institute Ltd., Kashima, Ibaraki, Japan.* [2]*Department of Veterinary Pathology, Tottori University, Tottori, Japan.*

To investigate whether chronic exposure of cadmium (Cd) chloride induces osteomalacic lesions similar to Itai-itai disease in Japan, ovariectomized rats were injected intravenously with the compound at doses of 0.05 and 0.5 mg/kg/day, 5 days a week, for 50 weeks. In a part of rats in the 0.5 mg/kg group, the administration was continued for up to 70 weeks. The plasma concentration of calcium was similar in the treatment and control groups throughout the treatment period. In the 0.5 mg/kg group, the urinary excretion of calcium increased from 20 weeks and the increase became marked from



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Preface

This issue of *The Toxicologist* is devoted to the abstracts of the presentations for the symposium, platform, poster / discussion, workshops, roundtables, and poster sessions of the 36th Annual Meeting of the Society of Toxicology, held at the Cincinnati Convention Center, Cincinnati, Ohio, March 9-13, 1997.

An alphabetical Author Index, cross referencing the corresponding abstract number(s), begins on page 371.

The issue also contains a Keyword Index (by subject or chemical) of all the presentations, beginning on page 395.

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