A1

ETHANOL AND TISSUE PROTEIN SYNTHESIS. A. Perin and A. Sessa, Institute of General Pathology, and C.N.R. Center for Research in Cell Pathology, University of Milan, Milan, Italy.

Previous investigations showed that ethanol (ET) depresses protein synthesis in rat liver cells but not in liver polysome-translating endogenous mRNA. This was associated with the shifting of the redox level that was due to ET oxidation. However, other mechanisms may be involved in the inhibition of protein synthesis, since acetaldehyde, (0.1 and 0.5 mM) depressed protein synthesis in rat liver cells and amino acids that condense with acetaldehyde (glycine, serine, threonine, and cysteine) partly removed this inhibition which was due to ET or acetaldehyde. Moreover, acetaldehyde (0.1 - 0.5 mM) but not ET (10 - 100 mM) depressed protein synthesis in kidney, spleen, pancreas, and diaphragm. This inhibition seems to be due to an alteration of the intracellular pool of amino acids that is available for protein synthesis, since, as in the case of the liver, amino acids that condense with this aldehyde removed by various degrees the inhibition of protein synthesis. The results suggest that impairment of protein synthesis by ET in the liver and by acetaldehyde in several extrahepatic tissues may play a role in the pathogenesis of alcohol toxicity and that cosubstrates and amino acids can reduce the effects of ET and acetaldehyde on tissue protein synthesis.

A2

Morphologic Comparisons of Piglets from First and Second Litters in Chronic Ethanol Consuming Sinclair(S-1) Miniature Dams. J.D. Dexter, M.E. Tumbleson, J.D. Decker and C.C. Middleton, Sinclair Research Farm, Medicine and Veterinary Medicine, Univ. of MO, Columbia, MO 65212.

Piglets (EL-1) from 13 litters farrowed by 1-year-old, first litter dams were evaluated for altered morphologic characteristics. Each of the dams had ethanol ad libitum for at least 9 months prior to breeding. A second group of piglets (EL-2) farrowed by 6 second litter dams also was evaluated. The 3-year-old dams had access to ethanol for at least 2 years prior to breeding. During the study, a 20% (w/v) aqueous ethanol solution was available ad libitum. Water also was provided free choice. Each of the 19 litters was sired by one of two boars used randomly. All litters were farrowed within a 3-month period. Mean litter size and birth weight for EL-1 piglets were 4.84 and 602±152 g; whereas, mean litter size and birth weight for EL-2 piglets were 2.00 and 478±168 g. Fetal mortality rates for EL-1 and EL-2 piglets were 15 and 25%, respectively. Anomaly rates observed in fetal deaths were 11 and 100% for EL-1 and EL-2 piglets, respectively. EL-1 anomalies were macrocephaly, microphthalmia, necrosis of bowel, nonexternalization of penile tissue, unascended kidney and unilateral renal hypodevelopment. EL-2 anomalies were anencephaly, microcephaly, microphthalmia, nonfusion of mandibles, cleft palate, imperforate cloaca, syndactyly and polydactyly. Supported in part by a grant from the USBA.

A3

MODIFICATION OF HEPATIC ETHANOL AND ACETALDEHYDE METABOLIZING ENZYMES BY FEMALE HORMONES. F. S. Messiha and G. S. Tyner, Texas Tech University Health Sciences Center, School of Medicine, Lubbock, Texas.

Indirect evidence suggests that ethanol (ET) produced feminization in males is associated with abnormal metabolism and/or clearance rate of certain female hormones. Administration of estradiol (EST), 0.3 mg/kg, to male Sprague-Dawley rats, moderately decreased specific activity of liver aldehyde dehydrogenase (L-ALDH) by 14% ($p<0.1$) from controls without a concomitant change in liver alcohol dehydrogenase (L-ADH). Differencial localization of the inhibitory action of EST on mitochondrial L-ALDH indicate that it is confined to the enzyme with the high km value and amount to 45% ($p<0.05$) from controls. Daily administration of flutamide (FL), its hydroxylated metabolite SCH- 16243 (20 mg/kg), testosteron (2 mg/kg/day) for 8 days did not alter the enzymes studied. The results suggest possible relationship between EST and hepatic metabolism of ET-derived acetaldehyde which may be associated with the underlying mechanism(s) of ET-induced feminization.

A4

THE MEMBRANE VULNERABILITY IN LIVER AFTER CHRONIC ETHANOL ADMINISTRATION. A.Y.Sun, L. Foudin and C.C. Middleton, Sinclair Comparative Medicine Research Farm and Department of Biochemistry, University of Missouri, Columbia, MO 65201.

Evidence indicated that prolonged ethanol ingestion may induce liver dysfunction due to lipid peroxidation. One group of male adult Sprague Dawley rats was administered 30% (w/v) ethanol intragastrically (IG) twice daily starting with a dose of 6 g/kg/day and increasing to 12 g/kg/day daily within two weeks. Control rats were administered with the same volume of saline. Animals were sacrificed 24 hrs. after the last treatment and liver samples dissected. There is no difference in the endogenous peroxide content of liver homogenate between control and alcohol groups. However, the liver homogenates from alcohol rats are more labile to lipid peroxidation when incubated in the presence of Fe^{++} at 37°C for 30 min. The isolated mitochondrial membranes from alcohol rats were also more vulnerable to lipid peroxidation. Results from this study indicated changes in membrane structure after chronic ethanol administration which may result in alteration of metabolic activities in the liver. (Supported in part by AA 02054.)