●308 MODULATION OF BETA-RECEPTOR BINDING BY CORTISOL, TRH AND BETA- AGONIST IN FETAL LAMB LUNG. David Warburton, Sue Buckley, Lance Parton, and Terry Saluna. Dev. Lung Biology Research Center, Childrens Hospital of L.A., Univ. of Southern California, Los Angeles.

Beta-agonists enhance fetal lung maturation, but decrease lung beta-receptor binding capacity (Bmax). We studied the modulation of lung Bmax (fmol 3-H dihydroalprenolol/mg prot) by cortisol (450μg/h for 48 h) and TRH (25μg/h for 48 h) with and without beta-agonist stimulation (Ritodrine (1.4±.3 μg/kg/min, x̄±SD, for 24h) at 0.89 gestation in fetal lambs (Table).

	Without Beta-agonist n Bmax	With Beta-agonist n Bmax
Controls	(11) 149±30	(6) 68±26 - 54%**
Cortisol	(6) 128±25	(6) 79±9 - 47%**
TRH	(4) 170±35	- -
Cortisol+TRH	(4) 200±14 + 34%**	(5) 110±22 + 38%*

**P < 0.001 vs control; * < 0.025 vs control with beta-agonist. The KD was 3.6±1.4nM in controls and did not change. We conclude that cortisol+TRH elevated Bmax 34% without beta-agonist and inhibited the reduction of Bmax with beta-agonist. However, neither cortisol nor TRH acting alone changed Bmax, and cortisol did not significantly inhibit the reduction of Bmax by beta-agonist. We speculate that hormonal modulation of beta-receptor binding by cortisol and TRH together may play a role in the supra-additive effects of, cortisol, TRH and beta-agonist on fetal lamb lung maturation.

●309 SYNTHESIS AND PROCESSING OF PULMONARY SURFACTANT PROTEOLIPID SPL(Phe) IN FETAL LUNG. Timothy E. Weaver, Stephan W. Glasser, Thomas R. Korfhagen, Kathryn Kropp, Tami Mateos-Pilot, Jean C. Clark, Jeffrey A. Whitsett. Department of Pediatrics, University of Cincinnati, Cincinnati, OH and Abbott Laboratories, Abbott Park, IL.

Surfactant proteolipid, SPL(Phe), a small molecular weight hydrophobic protein isolated from pulmonary surfactant, has been associated with enhanced surface properties of surfactant phospholipids from various species. We have isolated cDNA's encoding SPL(Phe) and studies the induction of SPL(Phe) RNA and protein synthesis in human fetal lung tissue during explant culture using the labelled SPL(Phe) cDNA to probe SPL(Phe) RNA. SPL(Phe) synthesis was not detected after [^{35}S]methionine labelling and immunoprecipitation in fetal lung from 18-23 weeks gestation but increased markedly after 1-5 days in organ culture. Primary in vitro translation product of SPL(Phe) was a charge train of Mr=38-39,000, pI 5.0-5.4 processed in vitro to larger proteins of Mr=40,000. Hybrid selected and arrested translation of human lung RNA confirmed the relationship of the Mr=40,000 precursors to SPL(Phe). Synthesis of SPL(Phe) preprotein, Mr=40-41,000, pI 5.0-5.4, containing N-linked oligosaccharide, was enhanced between 0-4 days of fetal lung explant culture; Northern blot analysis of RNA of low abundance demonstrated a single 2.0 kilobase mRNA (in fetal lung), prior to explant culture and increased dramatically during 1-4 days of culture. Proteolytic processing of the SPL(Phe) to smaller peptides of Mr=6-14,000, which co-migrated with the peptides isolated from human surfactant was demonstrated in the fetal lung explants after organ culture. SPL(Phe) is a Type II cell surfactant-associated hydrophobic protein whose synthesis and RNA increased dramatically during organ culture of fetal lung in association with the morphologic maturation of the Type II epithelial cell.

●310 MEASUREMENT OF OXYGEN CONSUMPTION OF THE PELVIC LIMB IN FETAL SHEEP. Randall B. Wilkening, David W. Boyle, Giacomo Meschia (spon. by F. Battaglia) Depts of Pediatrics and Physiology, University of Colorado School of Medicine, Denver, Colorado 80262.

Accurate measurement of substrate uptake by fetal hindlimb tissues has been limited due to difficulties with simultaneous substrate sampling and blood flow measurement. We describe continuous ultrasonic blood flow measurement in 5 fetal sheep (8-14 days post-op) catheterized for sampling unobstructed blood flow to and from a pelvic limb. Each flow transducer (Transonics Systems, Inc) was calibrated in vitro, in vivo (zero flow) and compared with microsphere measurement. Six sample sets for O_2 content were drawn from the external iliac artery ($[O_2]a$, mM) and vein ($[O_2]v$, mM) while blood flow through the external iliac artery (F, ml/min) was measured continuously under control conditions and after pancuronium. O_2 uptake ($\dot{V}O_2$, μm/min) was calculated; results are expressed as mean ± sem for the five fetuses and mean coefficient of variation within sample sets:

	F	$[O_2]a$	$[O_2]v$	$\dot{V}O_2$
Control	53 ± 8 (7.7 %)	3.76 ± 0.18 (5.7 %)	2.84 ± 0.20 (7.8 %)	47.4 ± 6.7 (14.9 %)
Pavulon	46 ± 7 (5.2 %)	4.42 ± 0.11 (1.9 %)	3.51 ± 0.13 (2.1 %)	41.4 ± 6.8 (5.8 %)

The study limb blood flow ratio (ultrasonic/microsphere) = 1.033. The microsphere blood flow ratio (study limb/non-study limb) = 1.028. We conclude that 1) the described method for continuous blood flow measurement is accurate, and 2) the spontaneous variability of $[O_2]$, F, and $\dot{V}O_2$ can be decreased by neuromuscular blockade. Tissues with spontaneous changes in metabolic activity, such as the pelvic limb, require both continuous blood flow recording and multiple determinations of substrate arteriovenous differences to best describe their metabolism.

311 IMMUNOREACTIVE ATRIAL NATRIURETIC POLYPEPTIDE (IRANP) CONCENTRATION IN ATRIA FROM DEVELOPING SALT-SENSITIVE (S/JR) AND SALT-RESISTANT (R/JR) DAHL RATS. T.A. Wilson, L.M. Dolan, D.J. Dobrozsi, J.M. McCaughran and C.J. Juno from Dept. of Pediatrics and Psychiatry, SUNY, Stony Brook, and Dept of Pediatrics University of Cincinnati, Cincinnati (Spon. by L.I. Kleinman)

Atrial natriuretic polypeptide (ANP), a substance secreted by mammalian atria in response to increased atrial pressure or volume, has potent natriuretic, diuretic and vasodilatory properties. As measured by bioassay, the ANP content in atria from adult hypertensive S/JR rats has been reported to be increased in comparison to that of adult nonhypertensive R/JR rats. In addition, the S/JR rat has been reported to be less sensitive than the R/JR rat to atrial extracts injected intravenously (Snajdar & Rapp, 1985). However, we are unaware of any data on atrial IRANP concentrations in Dahl rats of any age. Because of the potential role that ANP might play in the development of salt-sensitive hypertension, we examined the ontogeny of IRANP concentrations in S/JR and R/JR rats from 5 to 51 days of age. Atria were extracted and ANP concentrations were measured by RIA. Lactating dams consumed a diet containing 0.15% NaCl and the rat pups were weaned to the same diet. Analysis of our results to date demonstrate a significant effect of age on IRANP concentration ($p<0.01$) with peak concentrations occurring at 15 days of age, but no significant influence of strain. These results suggest that: 1) atrial IRANP concentrations in both strains of Dahl rat increase between 5 and 15 days of age and then decline, and 2) no difference in atrial IRANP concentration is seen between the immature S/JR and R/JR Dahl rat.

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●312 FETAL VARICELLA SYNDROME. Arie L. Alkalay, Jeffrey J. Pomerance, and David L. Rimoin, UCLA School of Medicine, Cedars-Sinai Medical Center, Division of Neonatology, Department of Pediatrics and Medical Genetics-Birth Defects Center, Los Angeles, CA

A great deal of controversy has existed concerning the effects of maternal varicella infection on the fetus. The purpose of this study was to establish a firm association between congenital anomalies of infants and maternal varicella infection (VI) in pregnancy. To date, prospective studies have failed to establish this association due to the rarity of index cases. The infant population in the present study is derived from a retrospective analysis of cases reported in the English language literature, as well as a personal case. The criteria used for the fetal Varicella Syndrome (FVS) were: 1. evidence of maternal VI during pregnancy, 2. presence of congenital skin dermatome lesions characteristic of VI and 3. immunologic proof of in-utero VI of the infants. Eighteen children who fulfilled the above criteria constituted the patient population identified as having fetal varicella syndrome (FVS). These children had a characteristic spectrum of anomalies which included: maternal VI at ≤ 20 weeks' gestation (8-20), all had skin lesions corresponding to dermatomes, 81% were female, 50% small for dates, 47% preterms, 89% had neurologic anomalies, 78% had eye anomalies, 72% had skeletal hypoplasia, 28% had gastrointestinal anomalies and 28% had urologic anomalies. Thus, it is apparent that maternal and subsequent fetal varicella infection during early pregnancy can result in a characteristic spectrum of anomalies which can be referred to as the "fetal varicella syndrome."

†313 FRYNS SYNDROME: FURTHER DELINEATION AND ANTENATAL DIAGNOSIS. Steven J. Bamforth, Jan M. Friedman, Tapio P. Pantzar, David A. Chitayat, Beth A. Keena, Judith G. Hall, University of British Columbia, Department of Medical Genetics and Pathology Vancouver, B.C. Canada

Fryns syndrome has a clinically distinct pattern of abnormalities which appears to be inherited as an autosomal recessive trait. In the six previously reported cases, the syndrome has been characterized by diaphragmatic hernia or eventration, hypoplasia of the distal phalanges and nails and dysmorphic facial features including fronto-nasal broadening, macrostomia, coarse facies and abnormal ears. All previously reported cases have been stillborn or have died in the neonatal period.

We report two siblings with features consistant with Fryns syndrome. Previously undescribed features found in both infants include omphalocele and imperforate or anteriorly displaced anus. Previously undescribed radiological abnormalities include broadening of the ribs and clavicles.

The first case was stillborn at 27 weeks gestation. During the second pregnancy, ultrasonographic demonstration of omphalocele, facial cleft and diaphragmatic hernia, together with a raised maternal serum alpha fetoprotein allowed accurate prenatal diagnosis at 18 weeks gestation. Cytogenetic studies on both cases were normal. Recognition of this syndrome is important for obstetrical and pediatric management and for genetic counseling.