FAMILIAL IMMUNE DEFICIENCY AND LEUKODYSTROPHY: RECONSTITUTION WITH FETAL THYMUS IN A MILLIPORE CHAMBER. Lawrence D. Frenkel, Y.H. Thong, Russell W. Steele, and Joseph A. Bellanti. Georgetown Univ. Sch. of Med., Dept. of Ped., Washington, D.C.

A 2 1/2 year old male child (D.E.) with multiple congenital anomalies, severe psychomotor retardation, generalized seizures, chronic herpetic gingivostomatitis, overwhelming pneumococcal meningitis and sepsis was found to have a partial combined immunodeficiency. His female sibling (J.E.) who followed a similar course and who died at 4 1/2 years of age was found to have sudanophilic leukodystrophy. During the course of his hospitalization, D.E. developed intractable diarrhea and was noted to have a decreased lymphoproliferative response to PHA, decreased T-cell rosette formation, a persistent lymphopenia and normal erythrocyte adenine deaminase (ADA) activity. Immunoglobulin therapy and parenteral hyperalimentation failed to alter his clinical course. Following transplantation of a 16-week fetal thymus enclosed in a millipore chamber there was prompt clearing of the herpetic lesions and cessation of the diarrhea within a few days after transplantation and an appearance of lymphocyte responsiveness to PHA one month later. Nine months after transplantation the patient remains infection-free and continues to display an intact cellular immunity. This report describes a previously unrecognized presentation of combined immune deficiency and suggests a new approach to therapy.

SERUM IgE LEVELS IN PARENTS AND CHILDREN. John W. Gerrard, Sandra Horne, Peggy Vickers, John W. MacKenzie, Nathan Goluboff, John Z. Garson, Carlos S. Maningas. Col. of Medicine, Univ. of Saskatchewan, Dept. of Pediatrics, University Hosp., Saskatoon, Sask., Canada.

Serum IgE levels have been studied in 80 families. Levels less than 150 u/ml were considered low, levels of 150 u/ml or above were considered high. Fifty-one matings were between parents with low levels of IgE; 19% of their offspring had high levels. Twenty-two matings were between parents one of whom had a low level of IgE and one of whom had a high level; approximately half (43%) of their children had high levels. Seven of the matings were between parents with high levels, approximately three-quarters (77%) of their children had high levels. The results are consistent with low IgE levels being determined by the presence of two dominant genes, the absence of one or the other permitting high levels to occur. The ultimate levels of IgE are probably also influenced by age and environmental factors such as exposure to helminth and other antigens.

THE SELECTIVE TRANSPORT OF MATERNAL PLASMA PROTEINS ACROSS THE MAMMARY GLAND. Jonathan D. Gitlin and David Gitlin, Univ. of Pittsburgh School of Medicine.

Colostrum and milk are relatively rich in antibodies, frequently in higher titers than are present in the maternal circulation. To study the selectivity and the mechanisms of protein transport across the mammary gland, purified proteins were labeled with ^{131}I, and injected intravenously into non-lactating mice and into lactating mice after parturition. All animals including the sucklings were assayed at intervals for total body radioactivity. The transmammary transfer rate of a given protein was measured as the difference in the disappearance rates for that protein between lactating and non-lactating mice, and confirmed by the uptake of labeled protein via milk by the sucklings. Of the proteins studied, human IgA with and without attached secretory piece, human IgG and bovine IgG were most actively transported. Mouse IgG and human transferrin were also transferred into milk, but to a lesser degree than human IgG. There was little transmammary passage of human albumin or human IgG light chains. The data indicate that the selectivity of the mammary gland in its permeability to maternal plasma proteins is quite different from that exhibited by the placenta. In addition, although some investigators attribute transport properties to the "secretory piece" found attached to IgA in various secretions including milk, this is not supported by the present data, since IgA without secretory piece traversed the mammary gland as readily as did IgA with secretory piece.

TUBULAR RETICULAR STRUCTURES IN PERIPHERAL MONONUCLEAR CELLS OF MALES WITH CHRONIC GRANULOMATOUS DISEASE, THEIR MOTHERS, AND SISTER CARRIERS. Joseph R. Goodman, Diane W. Wara, Hans D. Oche,* and Arthur J. Ammann. Univ. Calif. San Francisco, Vet. Adm. Hosp. San Francisco, and Univ. Wash. Med. Ctr.*, Seattle.

Chronic granulomatous disease (CGD) is an intrinsic defect of phagocytic cells resulting in decreased capacity to kill certain bacteria and is a consistent clinical syndrome. Defective phagocytosis is present in a milder form in female carriers who are, in general, asymptomatic. Tubular reticular structures (TRS) have been demonstrated in peripheral lymphocytes and monocytes in patients with discoid lupus erythematosus (DLE). Recently we became aware of 4 boys with CGD who had mothers with DLE. Therefore, we examined the peripheral mononuclear cells by electron microscopy from a series of males with CGD, their carrier sisters, and their mothers, both with and without DLE, to ascertain the significance of TRS in these two disease states:

	CGD males	Mothers with DLE	Mothers without DLE	Sister Carriers	Normal Controls
#studied	10	3	4	3	12
#positive for TRS	5	2	1	1	0

These studies suggest that patients with CGD and DLE share an abnormality, which may be an additional abnormality to the established phagocytic defect in CGD. The CGD carrier state may predispose to DLE. Further investigation of phagocytosis in patients with DLE and electron microscopic examination of peripheral mononuclear cells in CGD should be performed.

METABOLIC AND FUNCTIONAL DEFECTS IN NEONATAL GRANULOCYTES (PMN). Michael B. Harris and Richard K. Root (Intr. by Elias Schwartz), Dept. of Ped. and Med., Univ. of Pa. Sch. of Med., and Children's Hosp. of Philadelphia, Phila., Pa.

Newborns (N) have an increased susceptibility to infection. Because of conflicting previous data on the functional capabilities of their PMN metabolic, phagocytic and bactericidal activities of normal full term N were studied and compared to normal adult controls. Phagocytosis of ^{14}C S. aureus 502A at 20 min. and myeloperoxidase mediated protein iodination at 60 min. were not depressed. Resting ^{14}C-1-glucose oxidation was equivalent, however 60 min. after phagocytosis of yeast N-PMN exhibited significant depressions in activity when compared to the controls (783±132 cpm $^{14}CO_2/1x10^6$ PMN v.s. 1545±179, P<0.01). This was paralleled by reduced rates of O_2 consumption by N-PMN after 10 min. of phagocytosis (10-15 min. 2.89±0.19 μmoles/$15x10^6$ PMN/min. v.s. 3.66±0.20, P<0.02; 15-20 min.; 1.76±0.11 v.s. 2.30±0.11, P<0.02), while initial rates were similar. These defects may reflect decreased H_2O_2 production. These observations were paralleled by a mild but significant reduction in the killing of S. aureus 502A by N-PMN evident only on prolonged incubation (60 min.; 92.8% killed v.s. 95.7%, P<0.02, 120 min.; 95.1% v.s. 97.2%, P<0.05). These studies suggest that N-PMN have diminished H_2O_2 production reflected in a mild impairment of bactericidal activity. When coupled with previously documented opsonic and chemotactic defects these findings may have pathogenetic significance in the increased susceptibility of the N to infection.

PULMONARY COMPLICATIONS OF HYPOGAMMAGLOBULINEMIA. Nancy N. Huang, Lourdes Laraya-Cuasay, Dale S. Huff, Adamadia Deforest, Judy Palmer, Nasira Yasmin, Harold W. Lischner. Temple Univ. Sch. Med. and St. Christopher's Hosp. for Children, Phila., Pa.

Ten boys with congenital hypogammaglobulinemia from 4 families have been followed for 7-18 years. Five were diagnosed in infancy. Serum IgG was below 1 mg/ml in all but one (2.1 mg/ml after therapy), IgA below 0.05 mg/ml in all and IgM below 0.1 mg/ml in all but one (0.2 mg/ml). All received gammaglobulin from diagnosis and 5 plasma for ½ to 4 years. All had multiple episodes of acute bronchitis and pneumonia beginning early. H. influenzae (non-typeable) and Staph. aureus were the major pathogens, viruses were not found. One child age 10, died of bronchopneumonia and sepsis complicating adrenocorticosteroid treated chronic myositis. He and 3 of the 7 surviving children aged 7, 9 and 13 years, have no definite chronic pulmonary disease, though acute infections were often followed by a persistent cough in spite of intensive antibiotic therapy. This phenomenon led to bronchiectasis in the other 6. Two died of pulmonary insufficiency at ages 15 and 20. Among those surviving with bronchiectasis, 2 have severe restrictive and obstructive patterns in pulmonary function and 3 aged 16-21 had lobectomy. Pathological examination revealed severe bronchiectasis and sclerosis of bronchial arteries. The severity of pulmonary disease could not be correlated with initial serum immunoglobulin levels, proportion of B lymphocytes in peripheral blood, age at onset of gammaglobulin therapy, serum immunoglobulin levels during therapy or antibiotic therapy.