SPECIFIC INHIBITORY FACTORS OF CELLULAR IMMUNITY IN PATIENTS WITH SUBACUTE SCLEROSING PANENCEPHALITIS (SSPE). Russell W. Steele, David A. Fuccillo, Sally A. Hensen, Monroe M. Vincent, and Joseph A. Bellanti. Georgetown Univ. Sch. of Med., Dept of Ped., Washington, D.C., Microbiological Associates and NIH, NINDS, Infectious Diseases Branch, Bethesda, MD.

Employing a ^{51}Cr release cytotoxicity microassay,(J.Immunol. 110:1502, 1973) four patients with documented SSPE were evaluated for cellular and humoral immunity to both measles and SSPE viruses. Labeled target cells were derived from a WI-38 line persistently infected with Edmonston B measles virus, a MA-160 line persistently infected with SSPE virus and uninfected control cells.

Washed peripheral lymphocytes from SSPE patients and control donors exhibited comparable cytotoxicity to both infected cell lines. Serum and cerebrospinal fluid from SSPE patients inhibited the lymphocyte response to SSPE infected cells but did not significantly alter the response to measles infected cells for either SSPE or control lymphocytes. Moreover, fresh whole serum alone from control donors produced significant ^{51}Cr release from both cell lines while SSPE whole sera was effective only against measles infected target cells.

Preliminary characterization of the serum inhibitory factor suggested that it is associated with a high molecular weight IgM or antigen-antibody complex.

These data also suggest antigenic differences between the SSPE and measles viruses.

CELLULAR IMMUNE RESPONSES TO HERPES-SIMPLEX 1 (HSV-1) IN RECURRENT HERPES LABIALIS. Russell W. Steele, Monroe M. Vincent, Sally A. Hensen, Isodoro A. Chapa, and Luis Canales. Dept of Ped., Brooke Army Medical Center, Ft Sam Houston, TX and Microbiological Associates, Bethesda, MD.

Cellular immunity to HSV-1 in 10 children and adults with recurrent herpes labialis was evaluated with two microassays: (1) Blastogenesis: lymphocytes were incubated with tissue culture cells (MA-160) persistently infected with HSV-1. Uninfected MA-160 cells were used as controls with a blastogenic index (BI) calculated from cpm of C^{14} thymidine uptake for lymphocytes incubated with infected cells divided by uptake following incubation with uninfected cells. (2) Cytotoxicity: utilizing the same persistently infected cell line as target cells, release of ^{51}Cr from these cells or controls was used as the index of lymphocyte reactivity (Steele, R. W. et al. J. Immunol. 110:1502, 1973).

Blastogenesis for subjects with recurrent herpes labialis demonstrated a mean BI of 25.9(7.8-49). The mean BI in control donors was 17.6(5.3-40). In the cytotoxicity assay specific immune release attributable to HSV-1 averaged 2.8% (0-5.7%) in patients compared to 14.9%(8.0-31.5%) in controls. These data suggest a dissociation between the afferent and efferent mechanisms of cellular immunity with normal or enhanced lymphocyte blastogenesis but decreased cytotoxicity. Recurrent herpes labialis may therefore be a consequence of subtle cellular immune deficiency involving at least one of the efferent mechanisms.

"G" NEUTROPENIA AND MULTIPLE IMMUNOLOGICAL DEFECTS. James A. Stockman, Roger E. Spitzer, Russell H. Tomar, Marie J. Stuart and Frank A. Oski. State University of New York, Upstate Medical Center, Syracuse, New York.

A 4 month old male developed multiple infections including penile gangrene, repeated pneumonia, cellulitis, protracted oral monilia, and glottal and epiglottal inflammation. Persistent neutropenia was noted on day 4 of life. Absolute neutrophil counts ranged from 100-800/mm^3. Bone marrow aspirate was cellular with normal myeloid maturation. Urinary uric acid excretion was markedly elevated (3750 mg/m^2/24 hrs.). No rise in neutrophil counts occurred with normal plasma infusions. Bone marrow karyotype demonstrated a G group long arm deletion which was also noted in peripheral blood and skin fibroblast cultures. Leukocyte alkaline phosphatase was markedly diminished. Normal quantities of immunoglobulins, C_3 proactivator, C_3, and total hemolytic complement were found but properdin levels were consistently only 20% of normal. Candida and SK-SD skin tests were negative. There was diminished PHA in vitro stimulation and diminished T cells by rosette formation. There was no latex stimulation of NBT in polys and the patient's plasma with control polys supported the ingestion of latex and yeast poorly. The latter defect was corrected by 20% normal plasma but not by properdin alone. This case represents a unique combination of defects including non-cyclic neutropenia and diminished humoral and cellular immunity in a child with a long arm deletion of a G group chromosome.

CELL-MEDIATED IMMUNITY IN RUBELLA ASSAYED BY A CYTOTOXICITY TEST AND BY LYMPHOCYTE STIMULATION. Timo Vesikari, Guler Y. Kanra, Elena Buimovici-Klein and Louis Z. Cooper, Columbia Univ. Col. of Physicians and Surgeons, The Roosevelt Hosp., Dept. of Ped., New York.

Preferential cytotoxic activity against rubella-infected target cells was discovered in the supernatants of rubella virus-stimulated human lymphocytes from rubella-seropositive but not seronegative donors. Supernatants from unstimulated lymphocyte cultures failed to show such activity. Assay of cytotoxic activity of lymphocyte culture supernatants against rubella-infected and uninfected human fibroblast cells, using cell counting in microplates, provided a method for studies of cell-bound immunity in rubella. This assay was more sensitive in detecting remote past immunity to rubella than was lymphocyte stimulation with rubella virus as measured by uptake of C-14-thymidine. Good correlation between the two methods was found when development of immunity was followed during the course of rubella infection and vaccination. By both tests, lymphocytes from rubella vaccinees became responsive to rubella antigen 4 weeks after vaccination. This late detection of specific cell-mediated immunity may be due to rubella virus-induced immunosuppression after vaccination, an early and transient phenomenon demonstrable by phytohemagglutinin-unresponsiveness of the lymphocytes.

INTESTINAL ANTIBODY FUNCTION: Role in control of antigen absorption in the small intestine. W. Allan Walker, Margaret Wu, Kurt J. Bloch, and Kurt J. Isselbacher. Harvard Medical School, Mass. Gen. Hosp., GI Unit and Clinical Immunology Unit, Boston. (Intr. by R. Talamo)

Secretory immunoglobulins may decrease bacterial proliferation in the gut and prevent uptake of ingested food antigens. Using a rat model, we have shown that protein antigens [horseradish peroxidase (HRP) and bovine serum albumin (BSA)] are taken up from the small intestine by pinocytosis and that immunization (oral>>parenteral) prevents absorption. To investigate the specific mechanism whereby immunization interferes with absorption, gut sacs from rats shown to have local antibodies (HRP or BSA) after repeated intraperitoneal injections were incubated with the corresponding radiolabelled antigen for intervals up to 3 hrs. In comparison to controls, gut sacs from immunized rats showed: a) rapid binding of labelled antigen to antibody on the intestinal cellular surface, b) enhanced (10X) breakdown of specific antigen, c) no breakdown of unrelated antigens, and d) decreased binding of antigen to intestinal cell membrane. These data suggest the following mechanism for intestinal antibody control of antigen absorption. Initial exposure of gut sacs to antigen leads to rapid association with antibodies on the mucosal surface which results in decreased pinocytosis of antigens by intestinal cells. Antigen-antibody complexes immobilized on the surface of the gut are then degraded by local proteases. The site of degradation is at the level of the glycocalyx or the cell surface membrane.

RECONSTITUTION OF CELLULAR IMMUNITY IN PATIENTS WITH SEVERE COMBINED IMMUNODEFICIENCY BY FETAL THYMUS TRANSPLANTATION AND TRANSFER FACTOR. Diane W. Wara, Gary Rachelefsky,* E.Richard Stiehm,* and Arthur J. Ammann. Univ.California San Francisco and Univ.California at Los Angeles*.

Reconstitution of cellular immunity in 3 infants occurred following intraperitoneal fetal thymus transplantation and Transfer Factor therapy. In all 3, the earliest evidence of reconstitution was a rash consistent with graft vs host reaction (GVHR) with onset 10 to 14 days following transplant. Mild GVHR occurred in the 1- and 4-mo old infants who were apparently free of infection at the time of thymus transplantation from 12- and 14-week fetuses. These 2 infants are alive and well at age 2-1/2 yr and 11 mos. Severe GVHR occurred in the 8-mo old infant following thymus transplant from a 16-week fetus; the infant was receiving therapy for pneumocystis carinii at the time of transplant. The child died 10 wks post-transplant with GVHR and pulmonary disease. The sequence of cellular reconstitution in all infants was lymphocyte response to allogenic cells, phytohemagglutinin, and T-cell rosette formation and occurred 3 to 12 wks following transplantation. Cell chimerism was detected by HL-A typing in 2 infants. Reconstitution of antibody-mediated immunity was not observed. Successful reconstitution in these patients, in contrast to earlier experience, was probably related to 3 factors: synergism between thymus and Transfer Factor, transplant of thymus within 1 hr after fetal abortion, and transplantation prior to severe infection.