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Immunoglobulin Levels in Twins.

On the basis of studies in experimental animals and of certain findings in human beings the rate of the synthesis of immunoglobulins is supposed to be under a genetic control. Therefore we found it necessary to study serum immunoglobulin levels in monozygotic and heterozygotic twins. The study group consisted of 22 twin pairs of the same sex. The children were five to ten years of age. All twins lived at home; thus the environment of A and B twin in each twin pair was the same. Of the 22 pairs eight were monozygotic and 14 heterozygotic. The zygosity of twins was determined on the basis of conventional genetic markers. The serum levels of immunoglobulins IgG, IgA, IgM and IgD were measured by the single radial immunodiffusion method of Mancini using the commercially available antisera from Behringwerke. The concentration of IgE was determined by a radioimmunosorbent technique. The accuracy of the methods was about 10%. The levels of IgA and IgE were more similar between A and B twin in monozygotic than in heterozygotic twins ($p<0.05$). The IgA level was within the accuracy limit of the method in all of the monozygotic twins. A similar situation in IgE levels was seen in three of the eight monozygotic pairs. The levels of IgG, IgM and IgD were greatly varying between the A and B twins both in monozygotic and heterozygotic pairs. The total intrapair accordance of IgA levels and a clear trend towards a similar finfing of IgE in monozygotic twins clearly indicate that the synthesis of these two antibody classes is under a genetic control.

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Studies on hypoimmunoglobulinemia caused by unusual non-secretory plasmocytoma.

The studies performed concerned the cause of severe infections and hypoimmunoglobulinemia observed in a 14 year old boy. The non-secretory plasmocytoma was detected. Data of immunological and other investigations are the subject matter of the paper. There were very low concentrations of serum IgA, IgM, IgG, IgE, not detectable IgD, and very low levels of chosen antibodies. Monoclonal protein and Bence-Jones protein were not found. Microscopic picture of bone marrow (using also immunofluorescent and electron-microscopy methods) was typical of the disease. The parameters of cellular immunity were normal.
The investigations indicate the rare cause of acquired hypogammaglobulinemia in children and stress the necessity of its early diagnosis.

69 IMMUNOLOGICAL CONSEQUENCES OF NEONATAL SPLENECTOMY
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Splenectomy is a rare operative procedure in a newborn infant. There has been only 24 survivors reported in the literature, however, even in these cases no immunological studies have been done. We report here three children, splenectomized within two days after birth, whose immune functions have been studied 4-11 years later. One child had a subphrenic abscess at the age of four years, treated succesfully. Other two children have grown normally and there has been no susceptibility to infections.
The opsonic activity of the sera of all patients towards pneumococcus was decreased. The following immunological findings were normal: The number of T- and B-cells, the responses of peripheral blood lymphocytes to PHA, ConA and PPD, the amounts of serum IgG, IgM and IgA, the spesific antibodies for viral and bacterial antigens (measles, pertussis, diptheria, polio, tetanus, meningococcus A and C), isoagglutinins for blood group antigens, NBT-test. A slight leuko- and thrombocytosis were observed in two patients.

70 A. LEINO*, T. HIRVONEN*, E. SOPPI* and P. TOIVANEN* (Intr. by T.PELTONEN). Departments of Medical Microbiology, Obstetrics & Gynecology, and Anatomy, Turku University, SF-20520 Turku 52, Finland.
Effect of thymosin on PHA and Con A responses by human fetal lymphocytes.

The effect of thymosin fraction 5 (of calf origin) on the response to PHA and Con A by lymphocytes from different organs of human fetus was studied. The cells were isolated from the liver, thymus, spleen and bone marrow of 15 fetuses at 9-23 wks of gestation, and preincubated with different concentrations of thymosin. The increasing effect of thymosin on the mitogen responses was most obvious with thymus and spleen cells at 15-23 wks of gestation. Responses by fetal liver cells were only occasionally increased by preincubation with thymosin, and responses of fetal bone marrow were affected not at all. These results are different from the effects of thymosin on fetal lamb cells; our earlier work has indicated that, in the fetal lamb, the effect of thymosin is most pronounced on the early fetal liver cells. These findings led us to conclude that mitogen responses of fetal lamb lymphocytes or lymphocyte precursors can be induced by thymosin in the cells which have not yet reached those responses spontaneously. However, if the cells have already reached the stage where a response occurs naturally, it cannot be increased any more by preincubation with thymosin (Leino *et al.*, 1977). The present findings on human fetal lymphocytes are compatible with these conclusions if the findings on fetal liver cells are excluded. Whether differences between human and sheep cells are attributable to restrictions in the species specificity of thymosin remains at the present unknown.

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Is yolk sac the primary origin of lymphoid stem cells?

Development of lymphoid organs in the chick embryo is dependent on colonization by extrinsic stem cells which have been presumed to originate in the yolk sac blood islands. However, we have recently presented evidence to indicate that stem cells originally formed in the yolk sac play little, if any, role in the colonization of lymphoid organ rudiments. Our evidence was based on the use of chick yolk sac-embryo chimeras (Lassila *et al.*, Nature, in press). These results do not support the yolk sac origin of lymphoid stem cells in the chicken. In the present study we have been successful to grow the 'sex chimeras' through the hatching. For the chromosome analysis bursa cells and specifically stimulated B and T lymphocytes were used. The latter was achieved by stimulating thymus, spleen and bone marrow cells in vitro with anti-Ig and Con A. Only four out of 1510 cells analyzed belonged to the sex opposite to that of the birds as diagnosed from the gonads; eleven 5-8 week-old yolk sac-embryo chimeras were used for these analyses. Among the chimeras four birds were also marked for the IgG allotypes. At the age of six weeks all four showed serum IgG of the embryo allotype (Gl^a) and none of the yolk sac type (Gl^b). These results, based on the chromosome analysis of bursa cells and of specifically stimulated B and T lymphocytes in thymus, spleen and bone marrow as well as on IgG allotypes, indicate that lymphoid stem cells in the chicken are primarily derived rather from an intraembryonic source than from the yolk sac.

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Ontogenesis of calcitonin-containing cells (CT-cells) : immunocytochemical localization of CT-cells and measurement of calcitonin (CT) content in the thyroid glands from normal and anencephalic human fetuses.

There is indirect evidence that CT may play a role during the fetal life. However while the distribution of the CT-cells within the thyroid glands of adults and newborns has been well studied (Wolfe et al., J.C.E.M., 41, 1076, 1975), such information is not available in the human fetuses. Thyroid glands were obtained from 25 normal human fetuses (10.5 to 27w) and 3 anencephalic newborns (34 to 40w) ; immuno-cytochemical localization of CT-cells and CT content were studied. The distribution of the CT-cells was determined using both classical histochemical methods and indirect immunofluorescence technique (Goat antiserum against pure synthetic human CT) ; control reactions were performed in order to verify the specificity of the method. Thyroid tissues were extracted in 0.1N HCl and the extracts were assayed for CT content by radioimmunoassay. The first CT-cells were seen scattered within the unorganized thyroid cells in 14w foetuses and the presence of CT was confirmed by extraction procedure. After the generalization of the follicular organization of the thyroid, the CT-cells were seen in both inter and intra-follicular positions ; these cells were essentially restricted to a zone in the axial medium parts of each lateral lobes. This study confirms the early presence of CT-cells in the human fetus and suggests that CT might effectively be important during fetal life.