ABSTRACTS

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ABSTRACTS OF SPECIAL INTEREST


The reaction of activated PTA with DFP was investigated. The rate of reaction rose steadily from pH 4 to 11 and did not require calcium ions. In contrast, the reaction of activated PTA with Christmas factor had a pH optimum at 8.0 and required calcium ions. Both reactions were inhibited by heparin. Total and partial acid hydrolysis of activated PTA labeled with DFP indicated that the DFP binding site is the same as that in trypsin and thrombin: the hydroxyl group of serine in the peptide glycyl-aspartyl-seryl-glycine. The inhibition by heparin of the reaction between activated PTA and DFP demonstrates that heparin masks the DFP binding site of activated PTA and it appears probable that heparin plays a similar role in blocking the activation of Christmas factor by activated PTA.—R. G.

ERYTHROCYTES


If differences in fragility of erythrocytes exist, they might be detected more easily in a homogeneous population than in humans. Therefore, two inbred strains of mice were used: Fischer, a short-lived strain (half survive for 19 months); and the A x C, a longer-lived strain (half survive for 24 months). In Fischer rats of both sexes the osmotic fragility increased throughout adult life, but in the A x C strain, the fragility showed no change up to 700 days of age. The shape of these cells did not change appreciably with the age of the rat so that this could not account for the change in fragility with age. The volume of the red cells taken from both Fischer and A x C female rats showed no change throughout most of adult life, but those cells produced by rats over 650 days of age were usually larger than those of younger adults. The relation between age of rats and osmotic fragility of erythrocytes cannot be explained on the basis of any observations reported in this study.—O. P. J.


By utilizing the “fragiligram” method previously described by Danon and the present authors, two
populations of erythrocytes with different osmotic fragilities were observed in the blood of newborn sheep. The proportion of less resistant, adult-type erythrocytes increased, whereas that of the more resistant cells decreased as the lambs matured. Fetal-type hemoglobin decreased until its complete disappearance at 8 weeks of age. In contrast to the findings with bovine erythrocytes, no correlation between the osmotically resistant erythrocyte population and the percentage of fetal hemoglobin was found with lamb erythrocytes. It was concluded that the less osmotically resistant erythrocytes also contained fetal hemoglobin.—E. R. J.


Washed ghosts, prepared from human erythrocytes, were found to incorporate radioactive fatty acids almost entirely into the β-position of the lecithin of phospholipids, a pattern similar to that observed upon incubation of whole blood with labeled fatty acids. Incorporation required addition of ATP and was markedly stimulated by MgCl₂ and coenzyme A, but palmitic acid from labeled palmitoyl coenzyme A was incorporated without added cofactors. Ghosts of sheep erythrocytes, which contain little lecithin, incorporated little fatty acid into phospholipids and none into lecithin, whereas ghosts of rat erythrocytes incorporated linoleic acid at about the same rate as did ghosts of human cells. It was concluded that the major pathway for incorporation involved two reactions: fatty acid, coenzyme A and ATP to yield fatty acyl coenzyme A which reacts with lyssolecithin to yield lecithin. It was suggested that the lyssolecithin-lecithin conversion might influence membrane function and that these reactions may be responsible for the alterations in fatty acid composition of erythrocyte phospholipids which can be induced by altering dietary fat intake. Phospholipase activity could not be demonstrated in ghosts, so the source of lyssolecithin remains unknown.—E. R. J.


Fast and efficient separations and quantitative determinations of phosphate esters and nucleotides from perchloric acid extracts of erythrocytes after incubation with radioactive inorganic phosphate, with and without added inosine, were obtained with high voltage paper electrophoresis in a pyridine-acetic acid-water buffer, pH 3.9—E. R. J.


Human erythrocyte membranes, largely freed of adenylate kinase activity, and reconstituted erythrocytes rich in MgATP were employed to demonstrate that hydrolysis of the terminal phosphate group of one MgATP molecule at the inner surface of the erythrocyte membrane was coupled to the transport of three sodium ions outward and two potassium ions inward across the membrane. Electrical neutrality would be maintained by the transport of one hydrogen ion with each pair of potassium ions. Lactate was shown to come most probably from the catabolism of the ribose moiety of AMP. The ratio of active transport cycles to the calculated hydrolysis of ATP was 1.2 and this deviation from unity and the differences between the present results and those reported by others were discussed.—E. R. J.


Intact erythrocytes were utilized to demonstrate that overall glycine transport was sodium dependent, that sodium governed binding of glycine to the transport mechanism rather than the actual transit process and that in the entry process two sodium ions acted as cosubstrates with glycine. Accumulation of glycine appeared to be an energy-utilizing process and internal glycine was not bound. In addition, glycine entered cells by passive diffusion which was independent of sodium.—E. R. J.


Utilizing lyophilized intact erythrocytes, purified coenzymes and a manometric method for the
determination of reduction of methemoglobin to hemoglobin, rabbit erythrocytes were found to contain both DPNH- and TPNH-linked methemoglobin reductases. The two systems appeared to be independent and did not involve a transhydrogenase reaction. The TPNH-dependent reaction was inhibited by carbon monoxide; the DPNH-linked activity could be inhibited by pCMNB. It was concluded that the reductases of rabbit erythrocytes resembled those of human erythrocytes.—E. R. J.


The results obtained upon starch gel electrophoresis of hemolysates prepared from erythrocytes from unrelated British adults (367), Tristan da Cunha Islanders (140) and 23 Negroes living in London were interpreted as supporting the hypothesis that the five distinct phenotypes of human erythrocyte acid phosphatase are determined by three allelic autosomal genes. Significant differences in the levels of activity between phenotypes were observed and it was suggested that the three alleles have different, but additive, quantitative effects. The increased activity in erythrocytes of patients with megaloblastic anemia appeared to occur in each phenotype. The striking genetic polymorphism of this erythrocyte enzyme was emphasized and future investigations were outlined.—E. R. J.


Rabbit anti-bovine-liver catalase sera, prepared by Freund’s adjuvant method, cross-reacted with equine-liver, equine-equine catalase and human-erythrocyte catalase, but very little with rabbit-erythrocyte or liver catalase. Chicken anti-bovine-liver catalase sera cross-reacted with rabbit-liver and erythrocyte catalase. Cross-precipitation reactions indicated the existence of some similarities in the antigenic structure of the catalases. Differences in the degree of reactivity may have reflected differences in individual antigenic determinants or in stereochemical specificity in individual antigenic determinants. Loss of enzymatic activity without loss of antigenic capacity was observed after catalase was treated with high concentrations of salt.—E. R. J.


Electrophoresis on cellulose acetate strips and chromatography on DEAE-Sephadex both revealed 5 fractions with lactic dehydrogenase activity in whole lysates of washed normal human erythrocytes; similar studies with hemoglobin-free erythrocyte protein revealed only three fractions. —E. R. J.


Two distinct components with carbonic anhydrase activity were isolated from water hemolysates of washed human erythrocytes, by chromatography on hydroxylapatite columns, after removal of hemoglobin with ethanol and chloroform or with Sephadex G-75 dextran gel. The two components, designated B and C in a newly agreed upon nomenclature, differed in concentration, specific activity, mobility on starch gel electrophoresis and isoelectric point. Both enzymes had molecular weights near 30,000, each contained one atom of zinc per molecule, and no free amino-terminal group was detected in either. Data on amino acid composition of enzyme B were presented, and there was evidence that its carboxy-terminal group was phenylalanine. Data from studies of 10 individual samples were identical with those obtained from pooled samples of erythrocytes from many donors, thereby excluding the hypothesis that the two enzymes were present in cells of different individuals.—E. R. J.


Considerable differences in amino acid composition were noted between purified bovine and
human enzymes, as well as between different forms of the enzyme obtained from human erythrocytes. Some of the forms which could be separated by electrophoresis, however, had identical amino acid compositions. Disulfide bridges were not found in any of the forms studied, and only a single thiol group was observed in the human enzymes. The absence of cysteine from bovine carbonic anhydrase appeared to exclude a sulphydryl group as the ligand for binding zinc, and it was suggested that the cysteine residue in the human enzyme does not partake directly in zinc binding. Differences in gene loci can account for at least part of the difference in the primary structure of two forms of the human enzyme, and sterochemical differences may explain different electrophoretic mobilities with identical (within experimental error) amino acid compositions of two of the human forms.—E. R. J.


A previous investigation revealed only six nonhemoglobin protein (NHP) zones upon electrophoresis of whole hemolysates. After removal of hemoglobin (with CM cellulose or Sephadex, IRC-50 resin, or DEAE cellulose) and concentration of NHP (by evaporation under reduced pressure, lyophilization, dialysis against dextran or solid polyethylene glycol, or ultrafiltration), six additional zones which stained with Amido black and several zones detected by specific histochemical reactions for enzymes were observed. Five zones with lactic dehydrogenase, numerous zones with esterase (α-naphtyl acetate substrate) and one to four lines with G-6-P dehydrogenase activity were noted. Electrophoretic patterns were not altered when washed erythrocytes or NHP solutions were stored frozen for three weeks, but were changed when samples aged in the refrigerator. Correspondence between NHP zones determined by staining and enzymatic activities could not be established. Significance of slight differences in the patterns between individuals could not be evaluated.—E. R. J.


Heifers were fed a balanced ration and sufficient sodium nitrate to maintain methemoglobin concentrations of 40 to 50 per cent or 20 to 30 per cent, sodium nitrite to maintain levels of 40 to 50 per cent and hydroxylamine to depress the packed erythrocyte volume to 25 to 30 per cent. Although wide variations in each heifer in the range of methemoglobin concentrations and diurnal variations did occur, the desired concentrations were usually maintained after the first few weeks. Total hemoglobin concentrations and packed cell volumes, as well as serum nitrate values, were significantly higher in the group with the highest concentrations of methemoglobin, but nitrate values were not significantly different. Calves of heifers with high methemoglobin concentrations had higher than normal hemoglobin concentrations and packed cell volumes; nitrite could not be demonstrated in serum, while nitrate was present, and methemoglobin concentrations were between 1 and 7 per cent. Although three abortions occurred and two heifers died from acute nitrate poisoning, the other calves and heifers survived and it was concluded that the abortions were from unrelated causes. Degenerative changes in coronary arterioles and focal necrosis of glomeruli were observed in the heifers, but their significance could not be evaluated. The authors concluded that maintenance of methemoglobin concentrations of 40 to 50 per cent could be tolerated by heifers given an adequate diet and that hydroxylamine in dosages sufficient to produce anemia did not affect pregnancy.—E. R. J.


The results of these studies revealed no significant differences between erythrocytes of sheep maintained at an altitude of 10,150 feet for eight months and those kept at an altitude of 52 feet, even though the erythrocytes of sheep have much lower G6PD activity and less capacity to reduce methemoglobin in the presence of methylene blue than do erythrocytes of normal human subjects.—E. R. J.

G6PD was partially purified from erythrocytes of five apparently unrelated Caucasian males in the presence of TPN and mercaptoethanol. All subjects had variable anemia, reticulocytosis, jaundice and, with one exception, splenomegaly; their erythrocytes had G6PD activities 10 to 25 per cent of normal. The pH optima, Michaelis constants for G-6-P and TPN, mobility on vertical starch gel electrophoresis, utilization of other sugar phosphates, effects of assay temperatures, and failure to show increased activity when mixed with stroma from normal erythrocytes of the enzymes isolated from the cells of these patients, did not differ from that of enzymes isolated in parallel from normal erythrocytes. The G6PD from the patients’ erythrocytes, however, was extremely unstable and the results of experiments in which control and patient’s enzyme were mixed led to the suggestion that the instability was an intrinsic characteristic of the abnormal enzyme. In contrast to the findings with enzymes previously isolated from two other patients (Oklahoma I), these enzymes had normal catalytic activity. Although it was suggested that Chicago I G6PD represents a newly described mutant, it was emphasized that all Chicago I s may not be identical.—E. R. J.


Employing methods described in the preceding paper, G6PD was partially purified from erythrocyte lysates of 3 Sephardic Jewish and 5 Sardinian males whose hemolysates had only 2 to 7 per cent of the activity of control lysates. All subjects were apparently healthy and not anemic. Thermal lability of the Mediterranean variant G6PD was less than that of the Chicago I variant, similar to that of Oklahoma I, and more than that of enzyme prepared from cells of deficient Negroes, the latter having relatively normal lability. Deficient preparations from Sephardic and Sardinian subjects exhibited a bimodal pH optimum curve which fell outside of the range of normal enzymes at several pH’s, the Michaelis constants for both G-6-P and TPN were lower than normal, and they utilized 2 deoxy-G-6-P and galactose-6-P 8 to 10 times more rapidly than did control preparations. The mobility on vertical starch gel electrophoresis of the deficient preparations did not differ from that of normal enzymes, and activity was not stimulated by the addition of stroma from normal erythrocytes. The peculiar characteristics of the enzyme from deficient Sephardic and Sardinian subjects could represent genetic alterations in structure or more complex effects on the enzyme and they represent further evidence for the heterogeneity of G6PD deficiency.—E. R. J.


Blood, obtained from a fingerstick, was added to a reaction mixture (phosphoenolpyruvic acid, ADP, KCI, MgSO4, digitonin, water and an indicator, o-cresol red), incubated for 30 minutes at 37 C., heated in boiling water and the protein precipitated by centrifugation. In the presence of normal pyruvate kinase activity, the pH rose from 6.5 to 8.5 and the supernatant solution showed a change in the color of the indicator towards violet-red. Blood from two patients with hemolytic anemia and pyruvate kinase deficiency failed to alter the yellow color of the indicator, whereas blood from 25 presumed heterozygous subjects produced an intermediate degree of color change, usually reddish-yellow. The color change appeared to be proportional to the concentration of enzyme and agreed with enzymatic activities determined with a spectrophotometric method. Correction of anemia, by adjusting the packed cell volume, was advisable when the initial erythrocyte volume was less than 30 per cent.—E. R. J.


A 68-year-old white man with chronic renal failure developed hemolytic anemia and 32 per cent methemoglobin after 3 weeks of therapy with sulfamethizole. During the acute phase, concentration of erythrocyte GSH was low and fell to zero after one hour of incubation with acetyl-
phenylhydrazine, autohemolysis was markedly increased and was not corrected by the addition of glucose, adenosine or ATP, ascorbic acid concentration was low and the activity of erythrocyte 6PGD was low normal. After discontinuing sulfonamide therapy, the biochemical abnormalities of the erythrocytes reverted to normal, but the patient apparently also received numerous transfusions. Unfortunately, the mechanism of the hemolytic anemia and methemoglobinemia could not be determined from the available data.

—E. R. J.


Mucosal uptake and transfer of iron to plasma were measured in the Albino rat, by means of a closed duodenal loop technic and a whole body counter. Mucosal uptake was measured by counting the duodenal loop after radioiron administration; mucosal transfer was calculated by subtracting mucosal uptake from whole body (carcass) absorption. Iron appears to be absorbed and then transferred by an enzymatic active transfer mechanism. Both phases, but especially the transfer phase, are influenced by body iron stores, prefeeding of iron, the exact site from which iron is absorbed.

—R. O. W.


Three hundred patients with varying degrees of iron depletion were studied. Red cell indices, serum iron and binding capacity, sideroblast counts, and marrow hemosiderin were determined. Iron deficient erythropoiesis develops when the iron supply is inadequate for optimal red cell production; this occurs when transferrin saturation is very low (<16 per cent), either in association with absent marrow hemosiderin (iron deficiency anemia) or with infections. These data give clinical confirmation to in vitro studies by Jandl et al. (J. Clin. Invest. 38:181, 1959), demonstrating that transferrin (at below 20 per cent saturation) competes successfully with the marrow for iron. Sideroblasts, which vary closely with transferrin saturation, are more labile than hemosiderin and are a good indicator of immediately available iron (see also Weinfeld et al. Acta Med. Scandinav. 171:23, 1962). The data again show that marrow hemosiderin determinations are superior to red cell indices, serum iron and binding capacity in the diagnosis of iron deficiency anemia.—R. O. W.


The specificity of nine eluates of red cells from a patient with acquired “auto-immune” hemolytic anemia was studied against normal red cells, the deleted cells --D--/--D--, and the cells of a Negro woman (Nou.) which lacked the locus corresponding to Ee. Although the patient’s eluates were active against normal red cells, they failed to agglutinate the --D--/--D-- or Nou. cells, suggesting the presence of the corresponding antigen on the Ee locus.—G. M.

LEUKOCYTES


This study was undertaken to determine the relationship between the metalophils in the nodular regions of the rat spleen to cells in this region possessing activity for the enzymes acid phosphatase and non-specific esterase. The results suggest that Marshall’s metalophils are cells of the reticuloendothelial system in various stages of maturation and that, following stimulation, they may differentiate into mature phagocytes.—O. P. J.


Intravenous administration of methyl palmitate produced marked depression of the phagocytic activity of the RES, due to interference with the phagocytic activity of Kupffer cells, and profound
inhibition of antibody formation during the primary and secondary immune response.—H. H. F.


Streptolysins O and S from hemolytic streptococi injure not only the membranes of red cells, but also to intact leukocytes. An optically uniform suspension of granules, prepared from the peritoneal leukocytes of rabbits proved susceptible to several hemolytic agents and procedures: streptolysins O and S, lysolecithin, vitamin A, ultraviolet irradiation and Triton X-100. The isolated granules behaved somewhat like erythrocytes; the membranes bounding both leukocyte granules and red cells were susceptible to lysis by similar means and may indeed share other surface properties.—O. P. J.


Structural chromosome changes induced by 8-ethoxycaffeine (EOC) have been demonstrated in plants; a reduction of mitotic activity has been observed in human fetal kidney cell cultures and in embryo skin cultures, and an increase in abnormal metaphases in treated cultures of Sarcoma-180. Human peripheral blood leukocytes were cultured in vitro and were treated with EOC to determine chromosome aberrations that might have some bearing on the mechanism of human chromosome translocation. Further observations may determine whether they are localized areas of susceptibility to breakage by EOC in human chromosomes similar to the preferential breakage of the satellite fiber in plant chromosomes. —O. P. J.


Cultures of lymph glands from rabbits immunized according to the modified method of Trowell seem to yield a better formation of antibodies than do cultures in coagulated plasma, Hanks’ liquid added to lactalbumen and serum, and atmosphere enriched in carbon dioxide. Re-injection of immunizing antigen into the skin drained by the gland a few days before the culture of the gland lead to an increase in the “in vitro” production of antibody. The same re-injection into skin not drained by the gland, or injection of an unrelated antigen often had no effect. The sera of rabbits injected with extracts of organs or of serum from another rabbit, modified by Streptococcus pyogenes of group A type 12, contained precipitins active against these antigens. The same precipitins were actively secreted in culture by the lymph glands or the spleen of the immunized rabbit. Not all the cultures contained anti-organ or anti-serum modified antibodies of the rabbit. But those that did contain them, were similar to the antibodies from the serum of the rabbit from which the lymph glands and the spleen were obtained.—G. M.


This investigation describes and documents the process of lymphocytopenia in the thymus during the early development of the chick embryo. Over 150 chick embryos were examined between 5 and 18 days of incubation. The evidence at present is not sufficient to conclude that all lymphocytes are derived only from the lymphoepithelial organs but sufficient evidence has been accumulated to show that not all lymphocytes are mesenchymal in origin. There is perhaps a tendency especially in the field of hemopoiesis to apply the principles of specificity of the germ layers and uniformity of origin too vigorously.—O. P. J.


1. Wasting disease which developed following neonatal thymectomy in three mouse strains was studied histologically. 2. In thymectomized mice
lymphatic tissue initially developed with formation of lymphatic follicles and maturation of lymphocytes. This development seemed to precede secondary disintegration and atrophy of the lymphatic follicles. 3. Although severe lymphatic atrophy was not seen in many animals, they manifested clinical symptoms of a wasting disease. 4. Extensive plasma cell production and a reticulo-histiocytic reaction suggested an intense immunologic reactivity. 5. The nature and the distribution of the lesions found in these mice had many characteristics in common with those known to occur in various graft versus host reactions. In addition, the pathologic changes had some features in common with a human autoimmune disease, lupus erythematosus: In four animals “wire-loop” changes were present in the renal glomeruli. 6. Infections alone could not explain findings in these mice. 7. On the basis of the results it is postulated that the post-thymectomy wasting syndrome is caused primarily by the lack of self-recognition of the immunologically competent cells and that the syndrome represents an experimentally induced autoimmune disease.—G. M.


The authors cite conflicting evidence as to the effects of estrogen in lethally irradiated animals. Pharmacological doses of estrogen and testosterone were administered to lethally irradiated mice given syngenic or allogenic bone marrow. Estrogen administration produced accelerated deaths in both groups, whereas testosterone had no effect on survival. The authors interpret this effect to be due to the failure of the grafted cells to survive. Whether this was a direct effect on the donor cells or whether this effect was mediated by an effect on other organ systems could not be ascertained from this study.—I. G.


A female patient with severe systemic lupus, under treatment with large doses of prednisolone, died of a cerebral hemorrhage. At autopsy, the thymus was smaller than normal, and revealed focal epithelial hyperplasia and atypical germinal centers. Such features were not seen in other patients of comparable age undergoing cardiac surgery and in other patients dying of chronic illnesses. The authors suggest that in patients with lupus the “censorship” mechanism of the thymus fails, and lymphoid cells which can react to self-components escape. (abstractor’s note: Interesting hypothesis. However, more detailed and perhaps double-blind studies of thymic pathology in a variety of illnesses is needed.)—I. G.


Author points out the known delayed type immunologic deficiencies in patients with sarcoidosis. Split skin from one donor was grafted to the back of the ear of five patients with sarcoidosis. The skin grafts on all five patients were rejected in normal fashion in 14 to 17 days. Conclusion: These five patients with sarcoidosis had no impairment of their ability to reject skin homograft.—I. G.


1-methyl-2-p (isopropylcarbamoyl) benzyl-hydrazine is a member of a new chemotherapeutic group, the methyl-hydrazines. Their mechanism of action is different from the chemotherapeutic substances presently in use; they simulate the indirect mode of action of ionizing radiation and they show promise in the treatment of Hodgkin’s disease. In 51 courses of therapy, the authors have obtained 14 apparently complete and 25 incomplete remissions, with 7 relative and 5 complete failures. Remissions were produced in patients at an advanced stage of the disease, and in some cases resistant to x-ray therapy, alkylating agents and vincleuko-blastine; patients at early stages of the disease and not yet treated, also responded. There were 3 apparently complete and 4 incomplete remissions in 11 patients with reticulosarcoma. In addition, there were some incomplete remissions in other leukemias, particularly in chronic lymphocytic variety.—G. M.
HEMOSTASIS


Preparation of purified factor V from bovine plasma and serum was achieved by chromatography on Sephadex G200. Evidence is presented in support of a molecular weight and activity difference between factors V from the two sources. Factor V from plasma was eluted as a single peak with a distribution coefficient of 0.05, whereas that from serum was eluted in two separate fractions, one with the same distribution coefficient as that in plasma and the other with a distribution coefficient of 0.18. This latter component of activity was present in a significantly greater amount in 2-day-old serum than in fresh serum. Density gradient centrifugation confirmed that the factor V activity in this component had a smaller molecular weight than plasma factor V. Purified factor V from plasma when treated with thrombin gave rise to a factor V activity with a smaller molecular weight and a distribution coefficient of 0.18. Treatment of plasma factor V with thrombin resulted in a tenfold increase in factor V activity. It was concluded that thrombin split the molecule of factor V with the production of a new factor V with a smaller molecular weight.—R. G.


In 9 patients with congenital cyanotic defects, most frequently found was a decline of "prothrombin complex" factors, shortening of euglobulin lysis time, and reduced thromboplastin function of the platelets. In no instance did the authors find thrombocytopenia, and a mild decrease of fibrinogen was observed only once. Three patients were normal, in 4 the changes were slight, and only 2 gave severely abnormal values. The authors found a statistically significant relationship between the increase of the hematocrit and the decreased activity of the complex of factor VII, factor V, antithrombin III and the shortening of fibrinolysis.—L. D.

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The clinical and pathologic findings and blood coagulation studies in a patient with pseudomonas septicemia are described. The clotting studies revealed a marked decrease in platelets and low levels of fibrinogen, prothrombin, factor V and VIII. These findings in the absence of any evidence of fibrinolysis are compatible with intravascular coagulation, since these are the factors that are consumed when human blood clots in glass. The low levels of factors XI, X, IX, and VII found are less readily explained, although the authors point out that a fall in the so-called serum factors has been reported in rabbits given two injections of endotoxin. They therefore conclude that their findings indicated extensive intravascular coagulation. Histologic examination of the kidneys of the patient disclosed the widespread deposition of material staining like fibrin within the glomerular vessels. These findings, the authors believe, demonstrate that bacterial endotoxin may induce a generalized Shwartzman reaction in man.—R. G.


A patient with acute myelogenous leukemia associated with severe hemorrhage is reported. Studies revealed thrombocytopenia in the presence of a normal number of megakaryocytes in the bone marrow, normal clotting time, somewhat prolonged prothrombin time, fibrinogen 50 mg. per cent, prothrombin 95 per cent, factor V 50 per cent, factor VII 68 per cent, factor VIII 50 per cent, and factor X 90 per cent. Plasma euglobulin lysis time was within normal limits, plasminogen was reduced but antiplasmin levels were normal, as was antithrombin activity. EACA and fibrinogen failed to correct any of the parameters of the coagulation defect. Heparin resulted in a rise in levels of fibrinogen, plasminogen and factor V.
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with some temporary clinical improvement. A second course of heparin was without benefit. Autopsy findings revealed evidence of intravascular coagulation. The authors point out the difficulties of differentiating fibrinogenopenia due to intravascular coagulation from that due to fibrinolysis. They point out that the low values of factor V, VIII, and fibrinogen in this case were consistent with either primary difibrination (intravascular coagulation) or primary fibrinolysis. The thrombocytopenia, normal lysis time, normal antiplasmin levels and normal antithrombin activity favored defibrination, but the normal prothrombin level and decreased plasminogen values were more in accord with primary fibrinolysis.—R. G.


This article concerns the numerous aspects of the ultrastructure of megakaryocytes and platelets including the distribution of ribosomes, the origin and structure of platelet granules, the structure of mitochondria and the structure and distribution cytoplasmic organelles are present in platelets, of the Golgi apparatus. Since most of the common cytoplasmic organelles are present in platelets, the platelet can be regarded as a structure potentially capable of all cellular functions except those immediately dependent on the nucleus.—O. P. J.


The authors have measured the total magnesium and calcium content of human platelets after collection with heparin and double washing. Determinations done in platelets in five cases of thrombasthenia (1 with type I: low level of ATP; 4 with type II: normal level of ATP) gave normal results excepted in one case with type II in which both ions were 25–33 per cent of normal levels.—J. C.

MISCELLANEOUS


A 58-year-old male patient is presented who, after taking methylthiouracil (maximum dose 400 mg. minimum 100 mg./day) for three years for hyperthyroidism, developed symptoms suggesting systemic lupus erythematosus. The disease was confirmed by the finding of LE cells.—L. D.