ABSTRACTS

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ERYTHROCYTES

On the Mechanism of Erythropoietic Action of Ultraviolet Radiation. E. Mietkiewski. Department of Physiology, Pomeranian School of Medicine, Szczecin, Poland. Pol Lyg Lek 28:1713–1716, 1973

The authors report on the influence of copper on the activity of human erythrocyte hexokinase. It was found that the inhibitory effect of copper against hexokinase is competitive. It affects both substrates of hexokinase (glucose and ATP). When crude hemolysates were used a concentration of copper of 15 μM results in complete inhibition. The purified enzyme is more sensitive to inhibition by copper. This sensitivity of hexokinase to copper at very low concentrations appears to be important, since it suggests an effect of copper in vivo on the rate of red cell glycolysis.—K.P.


In the previous investigations it has been found that prolonged irradiation of the depilated skin of rabbits with ultraviolet light led to a significant increase of erythrocyte count, reticulocyte percentage, and platelet count. Some decrease of erythrocyte mean diameter and prolongation of half-life were also observed. In the present work the author demonstrates an erythropoietic effect of plasma separated from blood withdrawn from ultraviolet irradiated rabbits. These infusions induced a pronounced reticulocytosis in the recipient rabbits, made polycythemic by transfusions.—M.K.
Acid-base status during extracorporeal transfusions in 92 patients undergoing cardiac study was studied in a comparison of various blood preservatives. A new anticoagulant solution containing less citrate but with added lactate proved to be less disturbing than the regular glucose-citrate solution (USSR Formula 7b) and was in every way as good as fresh heparinized blood. - J. V.

**The Effect of Transfusion Therapy on the Rheovasogram in Patients With Voluminous Blood Loss.** L. N. Nagarova. Laboratory for Experimental Physiology in the Living, Moscow, USSR. Probi Gematol Pereliv Krovi 18:16-20, August 1973

For 48 hr following the loss of from 1 to 2 liters of blood, 18 women were studied by observations of rheovasograms, blood pressure, hematocrit, etc. and by strict attention to hemotherapy and fluid balance. In patients with un-replaced blood loss, low blood filling of peripheral tissues was noted in the first 24 hr; a slight increase in the filling occurred in the second 24 hr, though peripheral resistance remained low. In patients receiving prompt blood replacement, blood filling of the peripheral system was normal after the transfusion, though low peripheral resistance was also noted. In both cases the peripheral circulation did not become normal for 8-10 days. - J. V.


A detailed outline is given of the technique of rapid freezing, thawing, and washing of red cells. A study of the morphology, biochemical properties, and functional activity of red cells stored showed few or no changes, and upon transfusion the retention of their therapeutic value was confirmed. - J. V.


Thawed frozen red cells were suspended in a medium containing albumin, reopolyglukin (or gelatin), bicarbonate buffer, electrolytes, and other substances such as vitamins, hormones, etc. This suspension was used to prime extracorporeal transfusion apparatus for operations on 92 patients undergoing heart surgery. By all criteria, acid-base balance, blood gas status, oxygen consumption, and immunohematologic and biochemical indices, the perfusion process was satisfactory. - J. V.


A report is given of the cases of four pregnant women with sickle cell disease: one with sickle cell anemia, one with sickle cell thalassemia, one with sickle cell hemoglobin C disease, and one with the sickle cell trait. Treatment with exchange transfusions is recommended for pregnant women with a severe form of sickle cell disease. This method was applied in the patient with sickle cell anemia: the pregnancy ran an uncomplicated course and the birth weight of the child was normal. Microscopic examination of the placenta of the four patients described always revealed the presence of sickle-shaped erythrocytes in the intervillous spaces; hemorrhages and infarctions were seen in a few placentas. Probably, the placenta is one of the organs in which sickling readily occurs. A review is presented of the literature dealing with the dangers threatening mother and child in the various forms of sickle cell disease during pregnancy, and with their treatment. - K. P.

**LEUKOCYTES**

**Impaired Recirculation of Autotransfused Blood Lymphocytes via Thoracic Duct Lymph in Patients with Chronic Lymphoid Leukemia.** K. Bremer, O. Wack, and P. Schick. Department of Clinical Physiology, Center of Basic Clinical Research, Ulm/Donau, Germany. Biomedicine 18:393, 1973

The recirculation of lymphocytes was studied in six untreated patients with lymphoid neoplasm, including five classified as chronic...
lymphoid leukemia (CLL) and one as lymphosarcoma (LSA). Blood lymphocytes were autotransfused after in vitro labeling with $^3$H-cytidine, and thoracic duct lymph was collected during a period of 2–8 days. Labeled lymphocytes were seen in the first samples from each patient 1–5 hr after autotransfusion. In the LSA patient with a near-normal blood lymphocyte count, 4.8% of the autotransfused labeled lymphocytes were recovered in the lymph within 2 days, indicating a normal recirculation of lymphocytes. In the other five patients only 0.4%–1.0% of the autotransfused lymphocytes appeared in the lymph in the first 2 days without correlation to the degree of blood lymphocytosis ranging from 8500 to 418,000 per cu mm. Thus, even before the appearance of severe lymphocytosis the recirculation of lymphocytes in the CLL patients was impaired. CLL lymphocytes seem to accumulate in the peripheral blood and are disproportionately scarce in the lymph.—G.M.


Prophylactic craniospinal irradiation in acute lymphoblastic leukemia is associated with increased incidence of infection. The authors studied intracellular kill and metabolism during phagocytosis in peripheral blood neutrophils before, during, and after administration of 2400 rads to the craniospinal axis in leukemic children. All children were in hematologic remission. Maintenance chemotherapy of 6-MP, methotrexate, and cyclophosphamide started 1 wk after irradiation. Results of patients were compared with those of young adult volunteers. Intracellular kill was assessed as ability to kill *Staphylococcus aureus*, *Diplococcus pneumoniae* and *Pseudomonas aeruginosa* over 2 hr. Oxygen consumption, myeloperoxidase assay, and hexose monophosphate shunt activity were determined. Neutrophil kill capacity was normal prior to and 2 or more wk after irradiation, but there was significant decrease in kill during the irradiation phase. The diminished kill persisted into maintenance phase for *D. pneumoniae*. Phagocytosis was normal. Stimulation of respiration, hexose monophosphate shunt activity, and myeloperoxidase activity was similar in cells of patients and controls. Iodination of zymosan was decreased in neutrophils of patients. The defect was not observed in patients receiving intrathecal methotrexate and cranial irradiation without spinal irradiation.—P.F.

**Reduced Bactericidal Capacity of Polymorphs in Iron Deficiency.** R. K. Chandra. Department of Paediatrics, All India Institute of Medical Sciences, New Delhi, India. Arch Dis Child 48:864, 1973

Ability of neutrophils from 12 children with iron deficiency anemia to kill *Staphylococcus aureus* in an in vitro system was investigated. Phagocytosis and plasma opsonin capacity were normal. Intracellular kill was reduced in the iron-deficient patients, as was quantitative Nitro-Blue tetrazolium reduction in stimulated neutrophils. NBT reduction failure correlated with serum iron concentration. Iron therapy resulted in normalization of these parameters, within 1 wk. The mechanisms involved are unknown.—P.F.


Impaired neutrophil motility is described in a male child presenting with staphylococcal infection, cytomegalovirus infection, and autoimmune manifestations. Phagocytosis and bactericidal activities of neutrophils were normal. Random motility was impaired in the patient’s serum. There was evidence for an inhibitor in serum, but not in plasma. The basic defect is presumed to be a absence of a normal antagonist to a serum inhibitor of neutrophil motility. Transfusion of normal blood or plasma resulted in improved neutrophil function.—P.F.

One hundred and seventy-eight patients with stages III and IV Hodgkin’s disease were treated with combination chemotherapy (mechlorethamine, vincristine (Oncovin), procarbazine, and prednisone (MOPP). The complete remission rate for all patients was 66%. After 6 mo of MOPP treatment, patients in complete remission were randomly allocated either to continued MOPP treatment every 2 mo for a total of 18 mo (maintained remission) or to no further treatment (unmaintained remission). The relapse rate was significantly less in the patients in maintained remission, whether plotted from time of randomization or from end of MOPP treatment. Thus 75% of the maintained patients were in complete remission 3 yr after the start of the study, compared with 46% for the unmaintained patients. Eighty per cent of patients entering complete remission were alive at 4 yr, and there was no difference between the maintained and unmaintained groups. This lack of difference was caused largely by more effective secondary treatment in patients receiving only six courses of MOPP. The anatomic distribution of sites of relapse correlated highly with the anatomical distribution of major pretreatment sites of involvement.

—J.E.U.

**Presumable Role of Milk of AKR Mice in the Transfer of Gross Leukemia.** A. Harlbziszka and J. Salwa. Department of Tumors Immunology, Institute of Immunology and Experimental Therapy, Polish Academy of Sciences, Wroclaw, Poland. Pathol Pol 24:281-288, 1973

To ascertain whether the oncogenic virus of Gross leukemia can be transferred with the maternal milk to the offspring, the following experiments were performed: The mothers of high-leukemia inbred AKR strain fed newborns of low-leukemia C57BL strain and vice versa, the mother of C57BL strain fed newborn AKR mice. In newborn mice of inbred AKR strain fed by mothers of C57BL strain leukemia of the Gross type developed spontaneously. In newborn mice of the C57BL strain fed by mothers of AKR strain leukemia was not observed in any period of life. These results indicate that the Gross virus is not transmitted with the mother’s milk to the offspring.—M.K.

**Exudative Pericarditis With Cardiac Tamponade as the First and Principal Manifestation of Leukemia.** D. R. Siewertszt van Reesema and R. Bieger. Department of Hematology, University Hospital, Leiden, The Netherlands. Ned Tijdschr Geneeskd 118:48-52, 1974

Case report of a 24-yr-old male with exudative hemorrhagic pericarditis and cardiac tamponade as the first and most evident manifestation of acute lymphocytic leukemia. Treatment, consisting of partial pericardiectomy, local radiotherapy, and cytostatic drugs was followed by a complete remission of the leukemia. Microscopically the pericard showed fibrinous pericarditis and infiltration with leukemic cells. On the basis of the literature this unusual complication is discussed in detail.—K.P.

**HEMOSTASIS**

**Release of Plasminogen Activator into Blood and Urine by Rabbit Kidneys.** T. Januszko, A. Zuch, K. Buluk, and T. Bielecki. Faculty of General and Experimental Pathology, School of Medicine, Białystok, Poland. Acta Haematol Pol 4:223-230, 1973

The release of plasminogen activator from the kidney of rabbit was investigated in two systems: in vitro, the amount of the activator excreted into the renal vein and urether was compared during perfusion of the kidney; in vivo, the concentration of activator was determined in the samples of blood taken from the renal vein and artery as well as in the urine. It was found that in both systems 80-90% of plasminogen activator was released into the blood and only 10%-20% was excreted into the urine. The approximate molecular weight of plasminogen activator isolated from the kidney tissue or urine was determined by Sephadex filtration and appeared to be 50,000-60,000 daltons, a value closely similar to the molecular weight of urokinase. According to the authors’ opinion the kidneys are probably the main source of plasminogen activator in the plasma, changes of immunologic properties of urokinase during its passage into circulation being a possible explanation for the lack of cross-reactivity of plasma activator and urokinase.—M.K.

**Fibrinolytic Activity of Plasma Euglobulins in Patients after Trauma of Central Nervous System.** A. Cencora and A. Guruk. Laboratory for Transplantation Immunology of 3rd Department of Surgery, School of Medicine, Kraków, Poland. Przegl Lek 30:298-302, 1973

Fibrinolytic activity of plasma euglobulins was determined repeatedly in 36 patients after...
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trauma of central nervous system. The patients were divided into two groups. In the first group, cases with brain concussion were included; in the second group, those with anatomical damage of brain. In the patients with brain concussion no changes in fibrinolytic activity were found. In a group with anatomic damage of brain, fibrinolytic activity of euglobulins inhibited at early periods after trauma, increased together with the functional normalization of central nervous system. In five fatal cases with severe brain damage fibrinolytic activity remained inhibited until death. — M. K.


Circulating anticoagulants of the type of antibodies anti-AHG were detected in 11 out of 121 patients, that is in 9% of cases of hemophilia A. Serial investigations confirmed the commonly stressed connection between the supportive therapy and the presence of anticoagulants, a possibility of their disappearance after termination of treatment, and reappearance after resuming transfusions of plasma or factor VIII concentrates. No correlation was observed between the development of anticoagulants and the type of the transfused preparation, frequency of transfusions, and magnitude of doses. The appearance of anti-AHG anticoagulants has been observed in a pair of dizygotic twins. — M. K.

IMMUNOHEMATOLOGY


The authors present the results of a retrospective study of 100 patients with acute lymphoid leukemia treated between 1964 and 1971 by active immunotherapy (BCG and irradiated tumor cells). They were led to distinguish, from the morphologic point of view, four varieties of acute lymphoid leukemia, known respectively as prolymphoblastic, macrolymphoblastic, microlymphoblastic, and prolymphocytic. The actuarial curves of the cumulative duration of the first remission fall and then level out at the 134th month in the case of two varieties, acute microlymphoblastic leukemia (62%, of patients aged less than 15 yr and 57%, of patients of all ages belong to this group) and, in the case of acute prolymphocytic leukemia (51%, of the patients aged less than 15 yr and 46%, of patients of all ages belong to this group). The point at which the graph levels out is considered to be the time at which there is cure expectancy. The remission curves of the other two varieties do not have this leveling out effect. The toxicity was nil. The authors deduce that active immunotherapy is the treatment of choice in these two types of acute lymphoid leukemia. — G. M.


Three series of recent data appear useful for the genetic understanding of the ABO system: (1) Thermodynamic analysis of the locus products can distinguish, in addition to a wild-type B antigen, some rare reactive structures differing from one family to another: the accepted appellations for weak B antigens, B3, Bx, Bm, Bw, etc., or B60, B20, BO in this series now appear to be artificially gathered, without actual value of genetic definition. Then, one can expect among so-called B60 families to observe parallel differences in the properties of the enzymes capable of transferring specific sugars. (2) Enhancement of a weak A or a weak B antigen unexpectedly observed in the AB heterozygote has been proved to reflect at least a difference in the number of sites, but, up to now, there is no evidence for structural differences between the product of one weak B gene according to its being paired with an O or with an A gene. If such a qualitative difference could safely be defined, the hypothesis of complementation would be strongly supported and the enzymes would be found to be polymeric. (3) Both the A and B structures being carried by one gene complex, termed "cis-AB," may be accounted for by a mutation resulting in one enzyme which transforms the H substrate inadequately, thus leading to an A antigen with a cross-reaction with the anti-B. Here again thermodynamic analysis demonstrates the
heterogeneity of B-reactive structures from one family to another, suggesting that several different mutations are involved. The various enzymes produced by the various cis-AB types up to now recognized should thus, on the hypothesis of mutation, be capable of either transferring properly N-acetyl galactosamine, and galactose very inadequately (and this reflects a loss of specificity as compared to the wild enzyme), or transferring preferentially the nonacetylated galactosamine. According to this hypothesis it would be expected that galactose-transferring activity be lacking, or very weakly active, in the serum of cis-AB subjects.—G.M.


In the mixed lymphocyte reaction (MLR) in mice, studies have established that one of the two components of the H-2 system, the H-2K region, is more efficient in stimulating MLR than is the H-2D region. In the present study the stimulating capacity of H-2D incompatibility was tested using F1 hybrid mice which differ at three or four H-2D alleles simultaneously, but are identical at both H-2K and non-H-2 loci. Positive MLR observed in these tests indicates that H-2D incompatibility is capable of eliciting MLR, but definitely to a lesser degree than H-2K incompatibility. To ascertain the genetic requirements for MLR between H-2 identical mice, 13 pairs of H-2 identical strains were tested. The same non-H-2 incompatibility was capable of eliciting MLR when both members of the H-2 identical pair carried the H-2 alleles a or k, but not when they carried H-2 alleles b, d, f, or p. Similarly, positive MLR is seen between H-2 identical (A x B10)F2 mice when they carry the H-2a allele, but not when they carry H-2b allele, although the non-H-2 incompatibility in both cases is the same. It is concluded that at least two different genetic factors determine the outcome of the MLR between H-2 identical mice. The MLR-stimulating gene(s) provide the non-H-2 antigenic stimulus for transformation, while the MLR-capacitating gene affects the intensity of transformation elicited by the stimulus. The MLR-capacitating gene appears to be identical or closely linked with H-2. Thus, the H-2 system can be involved in MLR in two different ways: the H-2 incompatibility itself can stimulate MLR, and in absence of an H-2 incompatibility the H-2 alleles or a closely linked gene may determine the intensity of the MLR against the non-H-2 stimulus.—G.M.


T and B cell markers were used to investigate the nature of the atypical lymphocytes in infectious mononucleosis (IM) and the origin of lymphoblastoid cell lines established from IM blood leukocytes. Atypical lymphocytes had T cell characteristics, whereas the derived cell lines showed surface properties of B cells. This suggests that the established lines do not represent the progeny of atypical lymphocytes observed in the peripheral blood of IM patients, but may derive from the B cell population of the circulating lymphocytes.—G.M.


MIF production by sensitized lymphocytes occurs earlier than the proliferative response. Normal human blood lymphocytes from individuals sensitive to streptokinase-streptodornase were cultured in presence of 50 U SK-SD/ml. Lymphocyte proliferation in response to antigen was eliminated by treatment with light and 5-bromo-2-deoxyuridine (BUdR). MIF was subsequently produced by the nondividing cell population, in response to antigen. The results suggest the presence of two populations of sensitized lymphocytes responding in vitro to the same antigen: one producing mediators, and one capable of proliferation.—P.F.


There has been controversy about the presence of IgG on the T cell surface. The authors measured effects of antisera directed against human Ig fragments on migration inhibition ability of human lymphocytes in the presence
LYMPHOCYTES TO INCORPORATE 3H LEUCINE AFTER TREATED TO DNCB, AND ABILITY OF PERIPHERAL BLOOD HYPERSENSITIVITY RESPONSE, ABILITY TO BE SENSITIZED TO DNCB. ABILITY OF PERIPHERAL BLOOD LYMPHOCYTES TO INCORPORATE 3H LEUCINE AFTER 20 HR INCUBATION IN THE PRESENCE OF PHYTOHEMAGGLUTININ. THIRTY-SEVEN NORMAL CONTROLS WERE TESTED. LYMPHOCYTES FROM THE HODGKIN'S DISEASE PATIENTS SHOWED PEAK STIMULATION WHICH WAS DIMINISHED COMPARED TO NORMAL CONTROLS, AND A HIGHER PHA CONCENTRATION WAS REQUIRED FOR MAXIMAL STIMULATION IN THE DISEASED SUBJECTS. SOME ORDER OF ABNORMALITY IN RESPONSE WAS EVIDENT IN STAGES I AND II, AS WELL AS IN MORE ADVANCED STAGES. RESPONSE TO PHA STIMULATION DID NOT CORRELATE WITH PRESENCE OF SYSTEMIC SYMPTOMS OR ABSOLUTE LYMPHOCYTE COUNTS. LYMPHOCYTE STIMULATION RESULTS DID NOT CORRELATE WITH REACTION TO INTRADERMAL ANTIGENS OR ABILITY TO UNDERGO DNCB SENSITIZATION. PATIENTS IN LONG-TERM REMISSION SHOWED MARKED DEFICIT IN LYMPHOCYTE STIMULATION.—P.F.


NORMAL HUMAN ADULT LYMPHOCYTES WERE DEXTRAN SEDIMENTERED AND PURIFIED BY GLASS-BEAD COLUMN PASSAGE, OR BY FICOLL-HYPAQUE GRADIENT. THEY WERE SEPARATED INTO NINE FRACTIONS BY DISCONTINUOUS GRADIENTS OF BOVINE SERUM ALBUMIN. THREE SUBPOPULATIONS WERE OBTAINED. THE FIRST SUBGROUP CONSISTED OF MEDIUM OR LARGE-SIZE LYMPHOCYTES, WITH A HIGH INITIAL RATE OF DNA SYNTHESIS, IN ABSENCE OF MITOGEN. THESE
cells gave rise to colonies in semisolid medium. The second subgroup, from the middle portion of the gradient, consisted of T lymphocytes which responded to PHA, PWM, and tetanus toxoid; these cells formed rosettes with sheep erythrocytes. The third subpopulation of B lymphocytes at the bottom of the gradient showed staining with fluorescent antiamo- globulin antisera, and formed rosettes with EAC 1423. In five of six cases of X-linked agammaglobulinemia, less than 1% of cells sedimented in the bottom portion of the gradient; these few cells failed to stain with fluorescent antisera or to form rosettes with EAC3. — P. F.

Specific Depression of Delayed Hypersensitivity to Purified Proteins, With Relation to Production of Circulating Antibody. R. Neta and S. B. Salvin. Department of Microbiology, School of Medicine, University of Pittsburgh, Pittsburgh, Pa. Cellular Immunology 9:242-250, 1973

Delayed hypersensitivity precedes appearance of detectable circulating antibody, in intra-dermal systems where small quantities of purified protein are injected as challenge. Guinea pigs were sensitized in footpads with diphtheria toxoid or hen egg albumin. They were skin tested for delayed hypersensitivity reactions at intervals. Just before appearance of detectable circulating antibody, there was a depression in the delayed hypersensitivity reaction to specific antigen. A property of the decreased response state could be transferred, and could suppress expression of delayed hypersensitivity in sensitized recipients. Delayed response depression was antigen specific. — P. F.


Seventeen normal male adult volunteers received 96 mg of methylprednisolone daily for 3-5 days, and test parameters were compared with those of 12 untreated control subjects. Lowered serum immunoglobulin levels were found in the steroid-treated group after 2-4 wk; the time required for maximum effect was dependent on duration of steroid treatment. The levels of IgG showed a mean decrease of 22%. Incidence of significant immunoglobulin decrease in the treated group was 86% for IgG, 43% for IgA, and 14% for IgM. The plasma clearance rate of IgG was increased during the period of steroid administration. After drug treatment, there was evidence for decreased immunoglobulin synthesis. The lag phase between treatment and greatest fall in serum IgG suggests that methylprednisolone may effect a precursor cell of the immunoglobulin-synthesizing population. The authors propose that periodic pulse treatment with steroids could be an effective and desirable alternative to continuous treatment, in circumstances in which the aim is to reduce immunoglobulin production. — P. F.


A method of separating human lymphocytes which spontaneously form rosettes with sheep erythrocytes was devised. More than 90% of blast cells were observed in the rosette-forming cell population (RFC) after 72 hr of culture with phytohemagglutinin (PHA) and less than 1% of RFC showed any surface immunoglobulin by immunofluorescence. In contrast, RFC depleted population had low PHA responsiveness and 20%-50% of the cells exhibited surface immunoglobulin. The authors estimated that RFC population contained more than 95% T cells. — G. M.


The leukocyte migration test has been studied in 81 patients on chronic hemodialysis. Spleen or kidney extracts were used as antigens in the incubation medium. Leukocyte migration inhibition was found in only 11% of the cases. This is in contrast to the authors’ previous findings of 85% cases with inhibition during rejection episodes after kidney grafting. Hence, migration inhibition after kidney grafting can be considered in the majority of cases as a modification of reactivity of patients’ leukocytes presumably due to transplantation immunity. Since anti-HL-A antibodies were found in 25%
of patients on hemodialysis, the possible role of these antibodies was evaluated in vitro. It was found that HL-A and anti-HL-A complexes did not produce inhibition or stimulation in the leukocyte migration test. Leukocyte migration stimulation in the presence of spleen extracts was found in a large number of cases. A significant reverse correlation was demonstrated between the number of blood transfusions given to the patients and the presence of migration stimulation. Hence stimulation is probably not related to hypersensitivity but may be considered as a physiologic response in hemodialyzed patients, whereas in heavily transfused patients the finding of migration results identical to controls could be a reflection of hypersensitivity produced by repeated transfusions. —G. M.

MISCELLANEOUS


When explanted into monolayer cultures, hematopoietic and lymphoid tissues (bone marrow: man, rabbit, guinea pigs; spleen: guinea pig; thymus: rabbit, guinea pig; lymph nodes: guinea pigs) form colonies of cells resembling fibroblasts. Such colonies are found when cells are present above a certain population density (variable for each tissue) or when irradiated bone marrow cells are added. The fibroblasts can readily be subcultured in vitro (passage). On retransplantation of bone marrow cultures into the source animal, after several passages, there forms at the site of transplant bone marrow cells with bone; retransplants of lymphoid cells develop and reticular tissue. This suggests that colony-forming cells and cells in the cultures represent precursors of both stromal and tissue elements capable of developing all the characteristics of the transplanted tissue or organ. —J. V.


Cultures were made of regenerating bone marrow from early radiation chimerae or sublethally irradiated adult mice. After reinjection of the cultures, the number of colony forming units in the spleen and the level of proliferative activity were studied. While proliferative activity was well maintained, the number of CFU decreased sharply. A more sustained proliferation and less rapid fall of CFU numbers was noted in explants from sublethally irradiated mice than in cultures from radiation chimerae or normal intact mice. —J. V.


The author draws up reasons, with regard to oncostatic effectiveness and respect for the hemopoietic system, why chemotherapy at weak daily dosage should give way to intermittent chemotherapy consisting of cycles composed of strong doses and free intervals to facilitate recovery of hemopoiesis, which seems to be shortened by BCG. —G. M.


Trials of combination chemotherapy for solid tumors are presented. The combinations are based on the knowledge of vincristine induced modifications of cell kinetics. This is that the injection of a dose of vincristine, which alone is without effect on the tumor, leads to an increase in the number of cells in a phase of the cellular cycle sensitive to chemotherapy about 36 hr afterwards. This increase in the fraction of cells sensitive to the action of a second drug involves both a partial synchronization of the cellular population and a recruitment in this same phase of the cycle, of an initially quiescent cellular population. —G. M.


Two patients aged 77 and 89 developed agranulocytosis and one aged 12 developed reversible pancytopenia following administra-
tion of trimethoprim sulfamethoxazole in normal dosage for 6, 21, and 7 days, respectively. Bone marrows were hyperplastic, with "maturation arrest." Contrary to previously expressed opinions, it would seem that this drug combination can give rise to the same hematologic side effects as other sulfonamides, and it should therefore not be regarded as "safe" for patients who already have drug-induced marrow depression.—F.W.G.


The possibility of the Langerhans cells being the origin of histiocytosis X is reviewed. The main arguments in favor of this hypothesis are the morphologic similarities of Langerhans cells and the abnormal cells in histiocytosis X.—G.M.

BOOK REVIEWS


The first edition of the Sandoz Atlas has been highly regarded for twenty years for its full-color plates illustrating blood and bone marrow cells. This second edition is hard bound instead of loose-leaf and contains twice as many illustrations. The book is divided into three parts. Part I contains a discussion of the classification and origin of blood cells. The text makes frequent reference to the illustration to be found in Part III. There is also a section on techniques of morphologic study of blood and bone marrow, with full direction for special staining methods. The section on preparation of blood and bone marrow films should be useful in teaching medical technologists. The few pages devoted to recording the results of blood and bone marrow examinations and the section on normal blood and bone marrow values are not helpful, and some of the statements are not authoritative or up to date; e.g., "the various methods of determination (of blood platelets) yield widely varying results ...." Part II consists of 40 pages of text describing the development of the different blood cells and the abnormalities that they may present in disease. There is frequent reference to the color photographs. This section also includes discussions of nonhematopoietic cells in the bone marrow, degenerative changes, artifacts, hereditary morphologic abnormalities of blood cells, and blood parasites. The discussions of individual abnormalities are brief and do not involve techniques other than light microscopy. This section is, therefore, of limited value.

Part III is what this Atlas is all about. It includes 1228 individual color photographs, all in a uniform magnification of x 1200. Each photograph is accompanied by a short text which identifies the cells and the stain used. In addition, many of the photographs are accompanied by a short discussion which is denoted by a vertical line at the margin of the page. The photographs themselves are superb. The number and variety of conditions illustrated are encyclopedic. Any hematologist would wish to have these photographs in his library. However, he will have one devil of a time finding the picture he needs to refresh his memory or to illustrate a point for a student, because there is no index! In using the Atlas for several weeks, I found the omission of an index to be a great handicap. Such an omission is unforgivable, but understandable, since the Atlas also appears in German and French editions. In sum, this second edition of the Sandoz Atlas represents a comprehensive collection of superb full-color illustrations of blood and bone marrow cells. It is easily worth the nominal cost. The Atlas is highly recommended to any hematologist who is willing to make up his own index. Geoffrey M. Brittin, M.D.
