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for gamma rays [Rad. Res. 15(6), 754-760 (1961)]. In these studies, the acute LD_{50} for 1.4-Mev neutrons was 205 rads, and the MLD for 120-rad fractions at 14-day intervals was 605 rads. When the MLD (605 rads) was reduced to the EAD (205 rads), using 15 per cent irreparable damage as a constant, the RT_{50} for fission neutron-induced damage was between 4 and 5 days.

Spalding, J. F. W-7405-ENG-36

A1A871 RADIATION SENSITIVITY AS A FUNCTION OF AGE.

Los Alamos Scientific Lab., N. Mex. MYr 0.6.

Radiosensitivity has been shown to vary somewhat with the age of the animal in question. Earlier studies from this Laboratory showed a period of relative stability in resistance to acute gamma rays (delivered by the fractionation method), which extended through the first half of the adult life of the mouse. Studies are now being done to determine the relative radioresistance (in terms of acute LD_{50}) of RF strain female mice at 3, 6, and 8 weeks of age and at 2-month intervals thereafter throughout the entire life span of the RF strain (approximately 24 months). LD_{50}^{30}'s have been completed on the age range from 12 to 24 months, and the data show a decreased resistance to acute X-ray exposure with increased age over this age range. These studies will provide essential to radiation effect and aging studies.

Gengozian, N. AT(40-1)-GEN-33

A1A881 RADIATION IMMUNOLOGY.

Oak Ridge Inst. of Nuclear Studies, Inc., Tenn.

SP 5; MYr 3.5.

Alteration of the immune response by total-body irradiation is an important lesion in the radiation syndrome. Impaired immune responses contribute to mortality from infections but at the same time make possible the acceptance of tissue grafts that would be otherwise rejected. The objective of the program is to define the immunologic changes produced by radiation and to exploit the knowledge in treating radiation damage. Initially, patients will be tested for antibody formation after total-body irradiation and toxoid antigen injection and subsequent analysis of the serum proteins made utilizing a microimmunoelectrophoretic technique. In addition to the in vivo patient studies, a diffusion chamber technique for the cultivation of human cells has been developed. This makes possible the propagation of human tumor and normal cells for the study of their antibody forming ability. Antibody production by human lymphocytes has been obtained following antigenic stimulation and the serum-agar diffusion technique has been used to identify the synthesis of human serum proteins in the chambers. The technique is being employed to test differences in soluble and particulate antigens used for stimulus of antibody production by various types of normal human tissues such as lymph nodes, spleen, bone marrow, and peripheral leucocytes. Storage of viable cells by slow-freeze liquid N_2 technique will be initiated and tritiated thymidine used in the assay of viability and propagation of the cells in chambers. It is hoped that the diffusion chamber technique may in the future provide a total for studying outside the body the many diverse immune reactions of human cells.

Kniseley, R. M. AT(40-1)-GEN-33

A1A882 STUDIES OF TOTAL BODY IRRADIATION IN PATIENTS (DOSES OF 200 R AND ABOVE); INVESTIGATIONS OF MARROW GRAFT TECHNIQUES.

Oak Ridge Inst. of Nuclear Studies, Inc., Tenn.

SP 14; MYr 11.0.

Doses of total body irradiation of 200 r and above are given to a small number of selected patients. Most of these have acute leukemia; a few have disseminated radiosensitive neoplasms. Effects of autogenous and homologous marrow grafts are studied: in some no marrow therapy is given. Methods of separating and storing white blood cells and marrow are studied. General medical management of the acute radiation syndrome is being investigated. Extensive hematologic, biochemical, and bacteriologic studies are carried out and cytogenetic studies will be done. Autopsies are performed to collect histologic data on radiation effects in normal and neoplastic tissue.

The objective of this program is to determine the possibilities of treatment, including marrow graft therapy, the effects of high dose radiation in the human being, and the potential therapeutic effects in fatal diseases.

White, D. A. AT(40-1)-GEN-33

A1A888 STUDIES OF TOTAL BODY RADIATION IN PATIENTS: DOSES OF 50 AND 100 R.

Oak Ridge Inst. of Nuclear Studies, Inc., Tenn.

SP 14; MYr 11.0.

Patients with chronic leukemia and lymphoma are treated with single doses of either 50 or 100 r (measured in air) delivered in an 8-source Cs^{137} whole body irradiation facility. Detailed and systematic studies are made using blood cell values, bone marrow, clinical effects, and selected additional laboratory tests. Approximately 15 patients are treated per year.

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