was measured and compared with those of the non-irradiated control. Charge activity was tested by formation of ^{14}C -Val-tRNA. It was found that 400 R did not cause significant mortality. However, 500 and 700 R resulted a mortality of 20 and 35% respectively. The charge activity of tRNA^{Val} decreased, depending on the doses delivered. In contrary, similar changes in isolated tRNA samples irradiated *in vitro* could be observed only after doses higher than 20,000 R. UV spectra of the irradiated tRNA samples shifted towards higher wavelengths.

RADIOPROTECTIVE EFFECTIVITY OF ALPHAMERCAPTOPROPIONYLGLYCINE (THIOLA, MEPRIN) AND STUDY OF ITS SH ACTIVITY.

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In connection with the study of the radioprotective effectiveness of a new type radioprotector with low toxicity, alpha-mercaptopropionylglycine (Thiola or Meprin), it has been established that this drug, as the sodium salt, is able to prevent all radiation damage in animals irradiated with lethal or supralethal doses of various radiation qualities if applied not only before but within 3–5 h after irradiation. By this means, this compound differs from all other sulphur containing radioprotectors. Within the scope of its active mechanisms, its SH activity has also been investigated. Compared with the SH group of isothioureia type compounds, the free SH group of Meprin seems extremely stable. One has to reckon on a decomposition of 14% within 144 h in a 10^{-3} molar solution while under the influence of a 50°C air flow there is only 3% within 2 h. Neutralization of the free carboxyl group enhances the SH activity: $\text{pK}'_{\text{SH}} = 8.47$. The highest SH activity was found between pH 6 and 9; below pH 5 and over pH 9, respectively there was a considerably lower activity. Heavy metal ions (Ag^+ , Hg^{2+}) react easily with the SH group of Meprin. SH investigations have been carried out with amperometric titration and polarographic methods respectively.

COMPARISON OF HAEMOPOIESIS AND BONE MARROW STEM CELL

CHANGES IN CONTINUOUSLY IRRADIATED MICE. M. PRASLIČKA, I. KALINA and L. MARKO, Institut of General Biology, Faculty of Sciences, P.J. Šafarik University, Košice.

The relationship between the changes of bone marrow stem cells, bone marrow cellularity and peripheral blood element count in mice continuously irradiated with low exposure rates 1, 3, 6 and 10 R/day were followed. No changes in colony forming units (CFU), bone marrow cellularity, in erythrocytes, granulocytes, agranulocytes and thrombocytes during 130 days of irradiation (23 h/day) with the exposure rate 1 R/day were found. After 30 days of irradiation, the exposure rate 3 R/day caused a temporary decrease in agranulocytes, bone marrow cellularity and CFU, a decrease in thrombocytes on the 100th day of irradiation and no changes in erythrocyte and granulocyte count. The decrease in agranulocytes, bone marrow cellularity, CFU and thrombocytes in mice irradiated with 6 and 10 R/day was deeper and at 10 R/day persisted until the 130th day of irradiation.

IDENTIFICATION OF THE SITES OF RADIATION INDUCED BREAKS IN HUMAN CHROMOSOMES.

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With the use of the new chromosome banding techniques, it is now possible to identify each chromosome pair and parts of chromosomes. Using these techniques, an analysis of the site of radiation induced breakage has been plotted in cells irradiated *in vivo* and *in vitro*. There is a suggestion that the majority of breaks occur in the pale G bands.

POST-RADIATION MODIFICATION OF DRUG ACTION DUE TO CHANGES IN DISTRIBUTION.

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The purpose of this work was to investigate the relationship between the post-radiation changes of central depressive action of chlorpromazine (Chl) and the changes of its concentration in the brain tissue. The experiments were performed on white rat

after acute and fractional irradiation with x-rays. It was found that acute irradiation with sublethal doses increases significantly the central psychodepressive action of Chl, increasing its concentration in the brain. Fractionated irradiation decreases the central effects of Chl, lowering slightly its brain concentration. The obtained results show the significant role of Chl distribution changes after irradiation in its pharmacological action, although there are also some other factors involved in it. It was found that pharmacokinetic analysis makes it possible to evaluate the drug concentration changes in the tissue.

HISTOLOGICAL CHANGES OF THE ORGANS OF RATS AFTER CHRONIC GAMMA IRRADIATION. E. UNGER, "Frédéric Joliot-Curie" National Research Institute for Radiobiology and Radiohygiene, Budapest.

The testicles, small intestine, spleen, liver, bone marrow, kidneys and lungs of rats irradiated with 10 rad/day continuous gamma irradiation for 20, 40 and 60 days respectively were studied histologically 7 days and 10–16 days after finishing the irradiation. There was a severe radiation induced damage, depending on the total dose in the testicles; this damage diminished at the later date after finishing the irradiation as a sign of regeneration. There were slight changes in the small intestine, spleen and liver as well. The bone marrow, kidneys and lungs showed no histological differences from the normal ones.

DIFFERENCES IN SENSITIVITY AND INTERACTION OF DAMAGE INDUCED BY HYPERTHERMIA, UV RADIATION AND γ -RAYS ON CULTURED CELLS OF MALIGNANT AND NON-MALIGNANT ORIGIN. D. S. JOSHI, E. VAN DER SCHUEREN, B. F. DEYS and G. W. BARENDSEN, Biology and Agriculture Division, Bhabha Atomic Research Centre, Bombay.

For induction of reproductive death, cultured cells from a rat ureter carcinoma (RUC) and a mouse mammary carcinoma (M8013) are more resistant to hyperthermia (42°–45°C) than V79–589 cells from Chinese Hamster lung. By contrast, RUC cells are much more resistant to γ -rays than M8013 and V79. Finally, RUC and V79 cells have similar sensitivities to UV radiation while

M8013 is more sensitive. Combined treatments with hyperthermia and γ -rays induce more lethality in RUC and V79 than expected from simple addition. This interaction depends on the temperature, duration of exposure and sequence of treatments.

Hyperthermic treatment at 41°C is more effective after irradiation than before, while no such difference exists at 43°C but at 45°C hyperthermia is more effective before irradiation. Hyperthermia at 41°C does not interact with UV radiation while at 43°C definite interaction is observed. These results point to differences in basic mechanisms involved in damage caused by hyperthermia at 41°C and 43°C respectively.

THE RADIOPROTECTIVE EFFECT OF ALPHA-MERCAPTOPROPIONYLGLYCINE AND ITS COMBINATIONS ON ANIMALS. A. SÁNTA, E. MÁNDI, G. BENKÓ and K. SZ. BODÓ, "Frédéric Joliot-Curie" National Research Institute for Radiobiology and Radiohygiene, Budapest.

We have examined in animal experiments (mice, rats, guinea-pigs, pigeons) the radioprotective effect of a new-type compound, the alpha-mercaptopropionylglycine (Thiola) and its combinations with aminothiols (AET, MEA, cysteine) against sublethal, lethal and supralethal doses of x-ray, gamma and mixed neutron-gamma radiation from an atomic reactor. It has been established that Thiola has a very low toxicity ($LD_{50} = 3020$ mg/kg b.w. on mice, i.p.) and a high protective activity ($DRF = 1.40$ – 1.65), being effective when applied both before and 1–5 h after irradiation. Combined with the mentioned drugs, it moderates the toxicity of aminothiols and potentiates synergistically their protective activity ($DFR = 1.72$). The mechanism of action manifests in enhancing the mitosis rate and, thus, in regenerating the damaged tissues.

EFFECT OF CAFFEINE ON DNA REPAIR OF IRRADIATED MAMMALIAN CELLS. E. MAGDON and E. SCHRÖDER, Central Institute of Cancer Research, Berlin–Buch.

The influence of caffeine on DNA sedimentation from normal and ^{60}Co -irradiated HeLa cells (10 krad) has been investigated. In a concentration range from 10^{-3} to 10^{-2}