Shibaura and the homologous antiserum, which suggests that the NDTM antigen contained an antigenic determinant. The NDTM antigen of *copenhageni* Shibaura contained 10 amino acids, whereas the NDTM antigens of *kremastos* Kyoto and *hebdomadis* Hebdomadis (variant) contained 16 amino acids. There was an extremely large amount of Alanine in the NDTM antigen of *copenhageni* Shibaura. Lysine was not detectable in the NDTM antigen of *copenhageni* Shibaura ; however, there was a large amount in the NDTM antigens of *kremastos* Kyoto and *hebdomadis* Hebdomadis (variant). The amino acid compositions of *kremastos* Kyoto and *hebdomadis* Hebdomadis (variant) were similar. There were remarkable differences in amino acid compositions noticed between the NDTM antigen of *copenhageni* Shibaura and those of *kremastos* Kyoto and *hebdomadis* Hebdomadis (variant). In these strains the difference of amino acid compositions of NDTM antigens was correlated with the difference of their serologic behavior.

The NDTM antigens were found to inhibit specific leptospiral microscopic agglutination. The 50% agglutination of the leptospiras was inhibited in the presence of about 200–250 μg/ml of the NDTM antigens. This inhibitory effect of NDTM antigens was lost by treating the antigen with proteolytic enzymes, protease and trypsin.

These findings reveal the significant role of protein as the antigenic determinant of the NDTM antigens.

RADIOSENSITIZATION OF MOUSE L CELLS BY THE ELECTRON AFFINIC RADIOSENSITIZER, RO-07-0582

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The present investigation was undertaken to elucidate the effect of a radiosensitizer on mouse L cells in culture following X-irradiation.

It is well known that the radiosensitivity of cells irradiated in the presence of oxygen is higher than in those irradiated without oxygen. Under an aerobic condition, the survival curve of irradiated cells showed a shoulder region with an extrapolation number of 6.4 and a mean lethal dose (D_0 value) of 126 rad. On the other hand, under an extremely hypoxic condition prepared with nitrogen gas using a stainless steel apparatus, the survival curve was found to have no shoulder region, and there was an extrapolation number of 1.1 and a D_0 value

of 629 rad. Thus, the oxygen enhancement ratio (o. e. r.) was calculated to be factor 5.

An electron affinic radiosensitizer, Ro-07-0582, revealed a pronounced sensitizing effect under an extremely hypoxic condition by an enhancement ratio of 3.9 at a concentration of 10 mM. The sensitizer reduced the D_0 value with an increasing concentration of the reagent. This evidence suggests that Ro-07-0582 acts as an ozygen-mimic, although the reagent shows no radiosensitizing effect at low concentrations and at low irradiation doses.

A supplemental study was undertaken to show the effect of a superoxide anion redical, O_2^-, which was known as a component of the oxygen effect on cell killing. No remarkable change of survival was observed in the X-irradiated aerobic cells, although O_2^- was inactivated by superoxide dismutase. This result suggests that O_2^- is not a component of the oxygen effect on mouse L cells.

E. S. R. SPECTROSCOPY OF RADIATION-INDUCED FREE RADICALS IN IRRADIATED DNA-RO-07-0582 COMPLEXES

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The present study was carried out to elucidate the effect of an electron affinic radiosensitizer, Ro-07-0582, on the radical formation in irradiated DNA.

DNA-Ro-07-0582 complex was γ-irradiated in dry state at 77°K, and free radicals produced in the complex were recorded on an electron spin resonance (E. S. R.) spectrometer at 77°K. The main component of the E. S. R. spectrum was derived from the Ro-07-0582 anion radical. The result seems to indicate that electrons liberated in the complex by ionizing radiation were localized preferentially on Ro-07-0582.

To obtain further information, the binary complexes between each of the four DNA nucleotides and Ro-07-0582 were employed as samples. The TMP- and dAMP-Ro-07-0582 complexes showed that the spectrum due to the Ro-07-0582 anion radical could be observed, and that the radical yield was higher than that of pure TMP or dAMP. The mechanism of radical formation in TMP and dAMP involves an electron transfer process from sugar moiety to base moiety. The above phenomenon was explained by assuming that electrons liberated from sugar by ionization were transfered to the Ro-07-0582. The considerable increase