

EFFECT OF RADIATION ON SOME SENSITIVE ORGANS OF LABORATORY ANIMALS

THESIS

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CYTOGENETICS

BY

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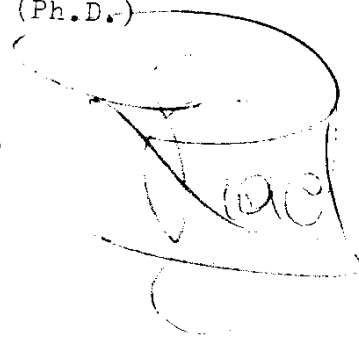
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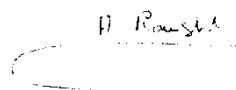
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INTRODUCTION

INTRODUCTION

The use of nuclear techniques in industry, medicine, and agriculture , as well as the generation and use of electric power from nuclear fission are becoming increasingly wide spread. Inspite of the fact that releases of radioactivity into the environment are controlled, yet certain rise in human exposures to ionizing radiation may occur. Attention must therefore, be focused on the potential biological effects of exposure to low doses of ionizing radiation . The approach for determining the possible genetic hazards of radiation in mammalian cells was questioned by many authors. Studies were carried out on meiotically and mitotically dividing cells. Considering the meiotic division of the cells, radiation studies have demonstrated that spermatogonia are a complex population of cells heterogeneous in sensitivity to both killing and mutation induction.

In 1959 , Oakberg studied the initial depletion and subsequent recovery of mice spermatogonia after exposure to gamma rays or X - rays .

Russell, in 1962 used the specific locus mutation test to follow the effect of repeated exposures to X-rays on mice spermatogonia. In 1982 , the same author and his associate Kelly determined the mutation frequencies in mouse stem cell spermatogonia at very low dose rates of gamma irradiation.

Ashwood Smith, et al ., (1965) , determined the chromosomal mutations induced by acute X-ray irradiation in mice spermatogonia.

Leonard, in 1965 also, followed the different sensitivities of various germ cell stages of male mice to radiation induced dominant lethal mutations and sterility. In 1966, Leonard & Deknadt, examined the chromosome rearrangements due to radiation exposure in mice spermatogonia. In 1967 and 1969, the same authors studied the relation between X-ray irradiation dose and the rate of chromosome rearrangements in spermatogonia of mice. Moreover, in 1970 , the same authors studied the persistence of chromosome rearrangements of pre-meiotic germ cells of male mice due to X-ray exposure . In 1971, they determined the rate of translocations in mice spermatogonia under various experimental conditions of X-ray exposure. The exposure was applied as a single or two fractionated doses of different magnitudes. The time interval between each two fractionated doses was also a factor of interest.

Sheridan, (1965) studied the induction of dominant lethal mutations in spermatogonia of mice by X-irradiation.