

BIOCHEMISTRY

Study Radiation Immunity

Laboratory experiments with mice indicate that an individual's sensitivity to radiations can be made greater or less. This may be significant in cancer treatment.

► IT MAY be possible in the future to make a person more resistant to radiations such as X-rays or even the potent radiations of an atomic bomb blast.

Scientific research holding out the possibility of some day giving humans at least some degree of immunity to radiations has been reported to the National Academy of Sciences in Washington.

The new findings, so far limited to experiments with laboratory mice, may also lead to more effective treatment of cancer. The study was made by a husband-wife team of scientists, Dr. John B. and Ruth M. Graham, formerly of the Vincent Memorial Laboratory at the Vincent Memorial Hospital in Boston and now at the University of Oregon Medical School, Portland.

Scientists have generally assumed that a person's response to radiations was unchanging and could not be altered.

"We believe this assumption is erroneous," declare Dr. and Mrs. Graham.

To test their theory, they injected Swiss mice with certain chemical compounds and then exposed them to radiation. Some groups of treated mice showed markedly higher casualties than the controls which had not had any of the compounds. Other groups which had been given different chemicals had more survivors than the controls.

In a preliminary report of their work, the scientists conclude that an individual's sensitivity to radiation can be made greater or less. Either greater or lesser sensitivity to radiations would be useful and perhaps life-saving.

Some immunity might help protect atomic age workers who may be exposed to radiations in industry and scientific laboratories, and even, perhaps, some persons at a distance from the center of an atomic bomb blast.

Greater sensitivity to radiation might prove useful in cancer treatment with radiation.

A theory on the varying effectiveness of radiation treatments on different cancer victims led the Grahams to their present research. They believe that in radiation treatment of cancer the reaction of normal tissue to the treatment "is at least as important" as the sensitivity of the tumor.

They found radiation reaction in both normal and malignant cells of many patients who improved under treatment. The normal cells showed no response to the radiation in many of the patients who did not improve. Thus, they suggest, tests on normal cells, rather than tumors, may tell the physi-

cian most reliably whether his patient is likely to improve.

Laboratory mice were given various substances, some 10 days before radiation and others immediately after radiation. Results in terms of mouse mortality varied not only between the substances and the time when given but also by the sex of the mice.

Horse serum administered 10 days before the radiation treatment cut mortality in 40 days to zero, compared with 21% and 28% losses among male and female controls which were exposed to the same amount of

radiation. But when the serum was given immediately after radiation, deaths more than doubled in comparison with the controls.

Other substances given the mice which produced varying differences from controls in the radiation experiments were male and female hormones and adrenal gland cortical hormone.

From their experiments, Dr. and Mrs. Graham said, "We conclude that an individual's sensitivity to ionizing radiation may be either enhanced or diminished by the administration of certain steroids or foreign protein before or after radiation.

"It is possible that this observation may have some bearing on survival from total body radiation and on the effectiveness of radiation treatment of cancer."

If other scientists confirm the Grahams' findings, a new approach to radiation problems may be opened for the much-heralded atomic age.

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ELECTRONICS

Tiny Electronic Assembly

► PLUG-IN units containing the entire assembly used with delicate tiny electronic devices, such as broad-band, high-gain, intermediate-frequency amplifiers for aircraft and missiles, have been developed by the National Bureau of Standards. The objec-

tive is to obtain the smallest possible volume for the equipment, and a unit easily handled.

Such electronic assemblies are known as subminiature electronic devices when their volume is compacted to a dimensional



SUBMINIATURE ELECTRONIC TUBES—These will be used for plug-in units with other tiny electronic devices in aircraft. The objective for the packaging is to obtain the smallest possible volume for the equipment and a unit easily handled.