BIOCHEMISTRY

# Predict Transplant Result

**Hope for solving the rejection problem in organ transplants is seen in a new technique using radioactive tritium that evaluates the intensity of rejection—By Faye Marley**

➤ A NEW TECHNIQUE that has accurately predicted success or failure of organ transplants in animals has raised hopes for overcoming the rejection problem in such transplants.

For the first time it is possible to measure the intensity of the tissue rejection phenomenon that nearly always causes kidneys and other organs to be sloughed off after what looks at the beginning like a big success. Only in identical twins is the danger not present.

The new technique uses tritium, a heavy, radioactive form of hydrogen, which is injected into mice and allowed to concentrate in the spleen. After the spleen is removed, it is minced to provide radioactive spleen cells for injection into test mice.

Spleens of the test mice are later placed in a combustion chamber where a high-voltage spark coil instantaneously converts all the remaining tritium into gas.

This gas, in turn, is exposed to a phosphoscintillator, a substance that translates radioactivity into flashes of light that are recorded in a scintillation counter. In this way the scientists can record the half-life of the transplanted spleen cells, the time it takes half of the radioactivity to disappear.

The technique, reported by Dr. John S. Najarian of the University of California Medical Center, San Francisco, is in use at the University to evaluate X-rays, drugs and other agents that may be used to force transplants to take and to survive.

General Telephone & Electronics

*AID TO CANCER STUDY — A closed-circuit television system is used by the British Columbia Cancer Institute as an aid in diagnosing cancer. The TV picture is shown simultaneously during final diagnosis by Dr. H. K. Fidler (left), director of pathology. Denys R. Lock, chief technician, looks on.*

Dr. Joseph Feldman of the Scripps Clinic and Research Foundation, La Jolla, Calif., where development of the new procedure first began, collaborated in the report to the Federation of American Societies for Experimental Biology in Chicago.

Typical results of the new technique have shown that when both donor and test mice belong to the same highly inbred strain, the number of surviving cells is halved approximately every 92 hours—the average normal lifetime of mouse spleen cells.

If donor and test mice are of different strains, the half-life of transplanted cells is reduced sharply, to about 36 hours. But if the rejection phenomenon is deliberately enhanced by first sensitizing the recipient mice with skin grafts from the spleen cell donors, the half-life is further shortened to about 18 hours.

An important goal of transplantation research is to find chemicals that will permit tissue survival without severely suppressing all other phases of the immune process. With this laboratory procedure, which can specifically and accurately evaluate tissue rejection, the search for such chemicals can be speeded up.

Another helpful effect of the new technique could be to permit lower dosages of drugs than are now considered effective, thus making them safe for long periods. In giving drugs to suppress tissue rejection, physicians must also suppress the patient's defenses against viruses and bacteria to prevent infection.

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## Drug for Asian Flu

➤ ASIAN FLU and other forms of influenza are responding to a new experimental drug, the first known synthetic compound given by mouth that has been effective against influenza virus infections.

Experiments with 850 human volunteers given 200 milligrams a day of 1-adamantanamine hydrochloride worked well, a team of scientists from E. I. du Pont de Nemours and Company, Wilmington, reported.

Speaking before a session of the Federation of American Societies for Experimental Biology in Chicago, Dr. Herbert A. Wendel, of du Pont's industrial and biochemicals department, said further laboratory and clinical studies are going on.

The new compound is the hydrochloride salt of a unique synthetic organic molecule, 1-adamantanamine.

Five species of animals were included in the laboratory investigations. One good result, reported by Dr. R. R. Grunert, was that the treatment did not stop the normal development of antibodies in the blood of infected mice.

Dr. C. E. Hoffmann, who reported tissue culture studies, said the drug appears to act by interfering with virus penetration of the cells rather than by inactivating the virus.

About 90% of the dosage given to the human volunteers was recovered unchanged from the urine after attacking the virus, Dr. W. E. Bleidner reported.

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## Hope for Diabetes Drug

➤ HOPE for developing a drug to prevent diabetes has been raised with the announcement of the first known isolation of a human live enzyme that promotes the destruction of insulin.

The report on the isolation was made at a meeting of the Federation of American Societies for Experimental Biology in Chicago. Up to now, the cause of diabetes has not been known.

Dr. Henry H. Tomizawa of the Fels Research Institute, Yellow Springs, Ohio, told SCIENCE SERVICE that his isolation of glutathione-insulin transhydrogenase, the human liver enzyme, could lead not only to prevention of the disease in those now destined to have it, but also to a lessening or abolishment of diabetics' present dependence on insulin. It would depend on the finding of a suitable drug or inhibitor of the enzyme, he said.

The human liver enzyme is identical to a beef liver enzyme isolated earlier by Dr. Tomizawa and his coworker Dr. P. T. Varandani. In isolating the human enzyme, they have discovered the cause of synalbumin, a natural enemy of insulin found in abnormally high concentrations in the blood of prediabetics and diabetics.

In future blood tests where this high concentration is found, it is hoped that a controlling drug for the rampant enzyme could prevent the lack of balance in insulin level that is responsible for diabetes.

Insulin is produced in the pancreas and goes out in the blood stream in the pancreatic vein to the liver where it is trapped. Insulin is made up of an A- and B-chain, and the human liver enzyme promotes the separation of the chain. The reduced B-chain is synalbumin.

Overactivity of the insulin-destroying enzyme could increase the production of synalbumin, thus causing diabetes. It also could destroy so much insulin that blood levels of the protein hormone could become subnormal.

Forty years ago, before the isolation of insulin as a treatment for diabetes mellitus, the disease meant death. Since then, injections of insulin have kept many thousands fairly normal.

Symptoms of the disease include excessive amounts of sugar in the blood, later found in the urine, without being properly burned for body energy.

The word mellitus comes from a word that means honey but "flowing with honey" in this case is a bad omen.

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