

Man and Mouse Linked

Hybrid cells synthesized from the cells of different animals, including man, are able to live and multiply—By Barbara Tufty

► LIVING CELLS that are part man, part mouse are offering remarkable new knowledge of the signals and mechanisms that control the activity of cells, building blocks of all living creatures.

About a year ago, two British scientists demonstrated that cells from different animals, including man, can be fused and that the new hybrid cells are able to live and multiply.

Dr. Henry Harris of Oxford University is one of the two scientists who demonstrated this. The other scientist is Dr. John F. Watkins.

Since then, living combinations of hybrid cells have been formed from species as diverse as hens and rabbits, and men and mice, Dr. Harris reported in *Discovery*, April 1966.

These hybrid cells are being closely studied to determine the synthesis and regulation of the molecules, DNA, which contain the coded heritable information passed on from generation to generation, and RNA, which is the "messenger" carrying these codes. The composite cells carry out functions of life in a perfectly integrated way, Dr. Harris said. There appear to be no incompatible mechanisms like those which result in the destruction of tissue or organ grafts exchanged between different individuals.

It appears that the instructions which the genes of one species in the hybrid cell transmit are understood and acted upon by the cytoplasm or cell material of the other species.

In fact, under certain conditions, some hybrid cells may grow more vigorously than their parent cells.

The signals, whatever they might be, are not specialized from one species to another but have a generalized code understood by a number of different species, said Dr. Harris.

Hybrid cells are formed by fusing different cells using virus killed with ultraviolet light or chemicals. When exposed to the dead virus, the cells of the different species clump together, their membranes rapidly dissolve at the points of contact and their cytoplasm merge. The nuclei, however, remain separate. The new cell containing several nuclei of different species is called heterokaryon. The cell remains alive and continues to function, synthesizing DNA and RNA. Sometimes the nuclei fuse to form a larger nucleus, and sometimes they divide to form several daughter cells.

One study of hybrid cells has been concerned with specialized cells that, in a growing animal, eventually become inactive and lose their ability to

synthesize RNA or DNA or both. The erythrocytes or red blood cells of birds, for instance, act this way, as do macrophages in rabbits and lymphocytes in mammals.

Strangely enough, when these inactive cells are fused with certain human cells to form hybrids, the genes of the inactive nuclei seem to be "turned on" by signals from human nuclei, and they start synthesizing RNA and DNA.

The stimuli which "turn on" a dormant nucleus may act by causing the nucleus to enlarge and hence open up its highly condensed chromosome material, believes Dr. Harris.

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PSYCHOLOGY

Psychologists Face Ethical Dilemma

► MUCH RESEARCH into the social behavior of human beings can only be done without the knowledge of the people under study. As a result psychologists continually face the issue of individual rights versus social good.

A private citizen, Samuel E. Miller of Abingdon, Va., raised this issue in a letter to *Science*, 152:15, 1966, attacking research done by Dr. Milton Rokeach, a professor of psychology at Michigan State University, East Lansing, Mich., and Louis Mezei, research director of the Michigan Civil Rights Commission.

Mr. Miller accused the two researchers of invading the right to privacy during their investigation of racial prejudice. Research was done on 50 white and Negro applicants for work in a hospital. None was aware that an experiment had been incorporated into the interview procedure and that he was a subject.

"It appears to me that one of the most fundamental aspects of a civilized culture is that the citizen may correctly assume that in ordinary day-to-day activity he will be treated with candor and dignity, and that, in general, he can trust the individuals with whom he deals," Mr. Miller wrote.

Dr. Rokeach answered in the same issue that "much of the research on behavior would be scientifically worthless if the subjects were to be first informed of its purpose."

The behavioral scientist faces a "moral dilemma" arising from his desire to advance knowledge for the betterment of human welfare while at the same time protecting individual rights, Dr. Rokeach stated.

"I know of no simple moral principle which will resolve in advance this oft-encountered conflict," he said.

Dr. Rokeach said that in weighing all the moral considerations he has himself rejected research he would have liked to pursue because the cost to human subjects would have been too great. However, he disagreed that the research project attacked by Mr. Miller constituted an invasion of human rights.

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Wm. S. Merrell Company

TAGGED IN A BAG—A technician from the Wm. S. Merrell Company, Cincinnati, observes a rat in an isolation tent in which everything it eats, drinks and breathes is controlled. Metabolic studies are being conducted on the rat which has received a test drug tagged with a radioactive element, carbon 14.