BIOLOGY

Virus Genes Identified

Many genes of a microscopic virus have been identified by a California scientist, an important achievement toward the understanding of embryonic development.

➤ THE ELUSIVE genes of a microscopic virus have been identified by a California scientist in search of life's secrets.

No one has yet succeeded in pinpointing the position of all of the tiny hereditary units in an organism or identifying their exact use, but Dr. Robert S. Edgar of the California Institute of Technology at Pasadena believes he has nearly done it on T4D, a tiny virus which often lives in man.

The human cell, he told the American Institute of Biological Sciences in Corvallis, Ore., could have as many as 50,000 genes while T4D has only 100. Still, a special method of making the viruses mutant or different from normal is the only way known to permit mapping of the gene system.

T4D looks somewhat like a tadpole with a six-sided head. The various parts, including the tail, are developed under genetic control. Understanding how a gene regulates the formation of a virus head, for example, may help explain how similar structures are produced in many and other animals.

It is known that a number of serious deformities in humans are caused by some abnormality in a gene.

Dr. Edgar's description of genetic mapping closely follows an announcement that a virus had been created in two U.S. laboratories from chemicals, completely outside a living cell.

There is yet no simple method of coaxing genes to reveal the secrets of how they direct the life-building process, Dr. Edgar said. Trying to match each gene with a characteristic is a knotty problem.

Making a particular gene mutate or change its function can show what it would do normally, Dr. Edgar found. He causes mutations with chemicals and then selects only those changes that are "temperature sensitive," or will develop only at a certain temperature.

Through painstaking studies, Dr. Edgar has pinned down about half of the 100 genes in the T4D virus and determined their roles. He hopes to identify the rest soon.

He has found, however, that certain groups of genes have special functions. Four genes, for example, work together to make up the virus head. Only one masterminds the production of a special protein, while the other three put the head together.

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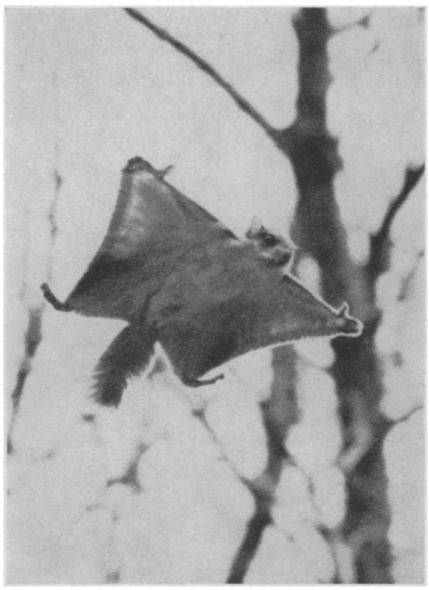

FLYING SQUIRREL — The flying squirrel is shown in full daytime flight with its gliding membrane fully extended. A special cartilage extends the squirrel's "wingspan" beyond his tiny front feet. While fairly common in the U.S., this nocturnal animal is seldom seen in the daytime. The unusual photograph was made by John W. Alley, University of Michigan technical photographer.

Pears From Own Roots

➤ A TRUE BARTLETT pear growing on its own roots, a type of fruit tree rarely seen, can now be mass produced, according to University of California scientists.

Such a tree has no graft union where the trunk meets the roots. Since Bartlett wood is resistant to pear decline, the plant disease that has devastated Pacific Coast pear orchards in recent years, these trees are not likely to be affected.

Hudson T. Hartmann, of the University's department of pomology at Davis, told the American Society for Horticultural Science in Corvallis, Ore., that he and two other U. C. pomologists, William H. Griggs and Carl J. Hansen, produced the all-Bartlett pear trees by growing roots on Bartlett cuttings.

Bartlett trees have been propagated by grafting them onto seedling pear trees. A true Bartlett cannot be produced from its own seed, since the genetic character of the seeedling is different from its parent.

The Davis pomologists produced roots on dormant, hardwood Bartlett cuttings by soaking them in a solution of a growth hormone (indolebutyric acid), packing them in moist peat moss and keeping the lower ends warm while the upper ends were exposed to normal winter temperatures.

This combination was successful although previous efforts, without the strict temperature controls, failed. After a few weeks, just as the roots gave evidence of sprouting, the cuttings were carefully transplanted to the ground. Almost half of the cuttings planted produced vigorous young trees, large enough to plant in the orchard within a year.

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Bacteria Stay in Clothes

➤ SOAP or detergents and hot water fail to rid laundry of disease-causing bacteria, scientists revealed in Corvallis, Ore.

Ear infections, skin sores and respiratory and stomach ailments were among the illnesses reported by families laundering their clothes with small amounts of infectious bacteria attached by U.S. Department of Agriculture experts. Even "sanitizing" with disinfectants did not destroy all bacteria, although it reduced their numbers.

Tests were made by attaching swatches of fabric containing only 50 bacteria per square inch to clothing just before laundering. At the end of the cycle as many as 21,000 bacteria were found in the same area, indicating that the organisms were multiplying during laundering.

Nine families volunteered to be "guinea pigs" in the laundering tests, Dr. Ethel McNeil reported to the American Institute of Biological Sciences. All of the families were infected by one or more of the bacteria species used in the tests.

Occasionally three of the most common bacteria were isolated from rinse water even when ammonia or phenolic disinfectants were used, although greatly reduced in number. None of these were recovered from the fabric following the use of chlorine bleach. This bleach cannot be used on all fabrics, however, she noted.

More than 1,500 colonies of bacteria were examined during the disinfection evaluation of home laundering products and techniques.

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Heart, Blood Flow Link

➤ HEART DEFECTS may be related to the way blood pulses through a body.

Dr. Oscar C. Jaffee of the University of Buffalo demonstrated to the American Society of Zoologists in Corvallis, Ore., how the mechanical action of the blood stream appears to determine position of the septum, or thin wall, separating chambers of a frog's heart. Motion pictures showed the incomplete heart structure of frog larvae, or tadpoles, up to one month of age, when the blood is circulating through still-developing veins and arteries.

By experimentally changing the flow pattern of parallel blood streams at this early stage of development, Dr. Jaffe showed, the position of the septum can be shifted. The septum is formed of a jelly-like, non-cellular material. As the tadpole heart develops, streams of blood spiral and fuse, flowing into the right and left sides of the atrium, or heart chamber. At about the same time, the septum develops, separating the two streams and creating two chambers or auricles, found in adult frog hearts.

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