

BIOCHEMISTRY

'Triplets' Unlocking Code

World research has identified 46 of the 64 possible combinations of bases in the nucleic acids that determine the body's synthesis of proteins—By Walter Wingo

► SCIENTISTS so far have tallied 46 of a possible 64 in the fascinating "genetic code" game of triplets in which the "counters" are the basic molecules of life.

The stakes in the triplets game include the possible eradication of some of man's most frightful diseases.

Progress reports on world research on the triplets effort were given to the International Congress of Biochemistry in New York by Dr. Severo Ochoa, a Nobel Prize winner from New York University, and Dr. Marshall W. Nirenberg of the National Institutes of Health, Bethesda, Md. Dr. Nirenberg was one of the men who in 1962 scored the first triplet triumph.

A triplet is a combination of three chemical bases found in DNA or RNA, the nucleic acids in cells that determine the types of proteins the body will make.

It had long been thought that the bases had something to do with selecting the amino acids in a protein's chain. But while only four types of DNA bases are known, there are some 20 amino acids.

If one base in a DNA chain were to determine an amino acid, there could be no more than four amino acids. If two bases were necessary, the amino acids would be limited to 16. But a triplet of bases makes 64 combinations, more than enough to account for the 20 known amino acids.

The first triplet linked to a specific amino acid was called poly-U, because it combined three uracil base units of RNA. Poly-U was found to "express itself" on the protein chain as the amino acid phenylalanine.

The flurry of attempts to identify the amino acids corresponding to the other 63 combinations is similar to the mass effort by chemists a century ago to fill in the blank boxes in the periodic table of elements.

The biochemists' technique is to assemble artificial strands of RNA whose content of bases is known and allow them to serve as the blueprint for the construction of amino acid chains.

Most of the 20 amino acids appear to be coded by two or more of the 46 triplets already identified. Dr. Ochoa said this indicates that the code is "extensively degenerate."

The next big job will be studying the triplets to determine the sequence of the bases on nucleic acid chains. Some proposals for doing this were described at the week-long congress.

If any of the proposals succeeds, the framework of life's master molecule will be known and a myriad of achievements could follow in the control of cell-connected diseases such as cancer.

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BIOLOGY

Most Abundant Living Creature Found in Soil

► A MICROSCOPIC FORM of life, ten to a hundred times more abundant than any living creatures known, has been discovered in soil by Dr. Lester E. Casida Jr., department of microbiology, Pennsylvania State University.

The new organism is "bacteria-like," but appears not to be pathogenic. The new form, known as the "Q-form," was isolated from soil by a completely new separation and cultivation technique developed by Dr. Casida.

Roughly 28 billion of these tiny, round organisms can be found in an ounce of soil. Until now, more conventional soil bacteria were believed to be the most abundant forms of life on earth, at somewhat less than a billion bacteria per ounce of soil.

At certain stages in their life cycle, the new organisms look much like streptococcal bacteria. They are round and form chains like a bead necklace. They reproduce somewhat like bacteria. But here the resemblance apparently stops.

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BIOLOGY

Weightlessness Obstacle To Space Survival

► ASTRONAUTS cannot survive adequately in space beyond 14 days, Soviet scientists in charge of the Russian cosmic program believe.

Inability of the heart and blood vessels to adapt during weightlessness is the big problem, Dr. Bernard M. Wagner of New York Medical College said, following his third trip to Moscow at the invitation of Dr. Vassili V. Parin, top official in Russia's space program.

Since weightlessness is apparently the big obstacle, the Soviets have an extensive research program underway, Dr. Wagner reported. The establishment of artificial gravity may become a requirement for prolonged space flights, although there are no definite data to prove this.

The Russians plan to continue the use of animals, preferably dogs, as their experimental models in exploring the far reaches of space.

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MEDICINE

Contact Lens Without Examination Dangerous

► WEARING CONTACT LENSES can be disastrous if a thorough eye examination has not preceded their use, the meeting of the National Medical Association in Washington, D. C., was told.

Dr. H. Phillip Venable, director, department of ophthalmology, Homer G. Phillips Hospital, St. Louis, said although contact lenses are useful in correcting many eye defects, some persons have eyes that would be hurt by wearing them.

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Weizmann Institute of Science

POLLEN BRUSH—In a plant genetics study conducted by the Weizmann Institute of Science in Rehovoth, Israel, Dr. Karl M. Jakob uses a brush to apply "father" pollen to a female plant. The researchers hope to discover how natural plant hormones determine the sex of flowers, in order to develop more productive plant varieties.