

## Quest for a Creatorless Origin of Life - 12

Some of those in the quest believed that the earth, with the whole solar system was formed by the collapse of a molecular cloud to first produce the sun at the centre. Around this fiery mass, they believe, an aggregation of pebbles, boulders and multi-kilometer masses circled, which pulled together to form planets. They imagine the earth being peppered with meteorites, etc, which would provide the biochemicals to eventually produce life.

Scientists at NASA worked to simulate conditions in molecular clouds of deep space. They managed to produce some larger molecules in this way. They also found organic compounds in some meteorites, so they concluded that it could have been the meteorites which provided the chemicals to get life going on earth.

Although the researchers believed they might have some possible explanations of how the chemical building blocks of living organisms might have been formed, they were still faced with a huge challenge. For the emergence of a living organism, the smaller chemical building blocks had to be brought together in the needed proportion of the various kinds, and concentration.

There was only one possible combination of molecules which had to not only come into contact with each other, but also be assembled together in the right order into the very complex macro-molecules which compose the simplest forms of life. How could this have occurred?

The simplest existing single celled organisms are composed of macro-molecules made from much simpler biomolecules. Yet these microscopic living things contain the chemical complexity which enables them to ingest food and expel waste, grow, reproduce and react to external conditions. In pursuit of answers, biochemists have made a lot of progress in understanding the chemical structure of the complex molecules in organisms.

They have noted the “modular design” of the molecules in living things. Most of their structures are built up from only four kinds of molecules - sugars, amino acids, nucleic acids, and hydrocarbons -

Sugars, composed of carbon, hydrogen and oxygen, are the building blocks which are combined to form carbohydrates such as starch.

Amino Acids are a combination of carbon, hydrogen, oxygen and nitrogen atoms, with a side chain of differing sequences of atoms, to make up about five hundred naturally occurring kinds.

Nucleotides are a combination of a five-carbon sugar, a ring-shaped base molecule, and a phosphorus atom with four oxygen atoms, called a phosphate group. The nucleotides are then linked together in long polymers to form RNA in single chain, and DNA in two intertwined chains which form the famous double helix.

Hydrocarbon molecules, made of hydrogen and carbon atoms, are elongated to form lipids, which include various fats and oils. These are used to form membranes, to store energy and perform other roles.

The plethora of possible forms of these biochemicals, particularly of the sugars and amino acids, introduces another huge problem for those seeking a spontaneous origin of life. Many of these complex chemicals occur in more than one form, even though they have the same formula.