

# Biology: A Note on Forms of Life

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## Commentary

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## DESCRIPTION

Biology is the study of life from the scientific point of view. It is a wide ranging natural science with various unifying themes that unite it as a single, coherent topic. Cells in all organisms, for examples, process hereditary information encoded in genes, which can be transmitted down to the next generation. Life depends on energy processing since it permits organisms to move, grow, and reproduce. Finally, each organism has the power to control its own internal environment. Biologists can study life at many different organizational levels. As a result, biology is divided into several sub disciplines, which are defined by the nature of its research questions and the methods it employs. Biologists, like other scientists, use the scientific method to make observations, ask any questions, generate hypotheses, conduct experiments, and make conclusions about the world.

The variety of life on Earth, which started more than 3.7 billion years ago, is enormous. From prokaryotic species like *Archaea* and bacteria through eukaryotic organisms like protists, fungi, plants, and animals, biologists have attempted to explore and classify the various forms of life. These species contribute to an ecosystem's biodiversity by performing specialist functions in nutrition and energy cycles through their biophysical environment.

Cell theory states that cells are the fundamental units of life, that all biological entities are made up of one or more cells, and that all cells are created through cell division from existing cells. Most cells are very small, ranging in diameter from 1 to 100 micrometres, and can only be seen under a light or electron microscope. Eukaryotic cells, which have a nucleus, and prokaryotic cells, which do not, are the two main types of cells. Eukaryotes can be single-celled or multicellular, whereas prokaryotes are single-celled organisms like bacteria. Every cell in a multicellular organism's body is derived from a single cell in a fertilized ovum.

Every cell does have a cell membrane that separates its cytoplasm from the extracellular space. A cell membrane is made up of a lipid bilayer that includes cholesterol that sits between phospholipids to keep the fluidity of the membrane at different temperatures. Semi permeable cell membranes allow tiny molecules like oxygen, carbon dioxide, and water to pass through while blocking larger molecules and charged particles like ions from using it.

Membrane proteins have been found in cell membranes, including integral membrane proteins that cross the membrane and act as membrane transporters, as well as peripheral proteins that loosely adhere to the cell membrane's outer side and act as enzymes that shape the cell. Cell membranes play a role in cellular activities such as cell adhesion, power storage, and signalling, as well as serving as the attaching surface for extracellular structures like the cell wall, glycocalyx and actin.

Many biomolecules, including such proteins and nucleic acids, are found in the cytoplasm of a cell. Eukaryotic cells have special structures called organelles that have their own phospholipid bilayer or are spatially separated in addition to biomolecules. The cell nucleus, which holds the majority of the cell's DNA, and mitochondria, which produce ATP molecules to fuel cell operations, is example of these organelles. Other organelles involved in protein production and packaging include the endoplasmic reticulum and the golgi apparatus.

Lysosomes, another specialized organelle, can engulf biomolecules such as proteins. Plant cells have extra organelles that differentiate them from animal cells, such as a cell wall that supports the plant tissues, chloroplasts that harvest light from the sun energy to create sugar, and vesicles that would provide space and structural strength including being involved in plant seed reproduction and breakdown. Microfilaments, intermediate filaments, and cytoskeleton, which all provide stability for the cell and are essential in the motion of the cell and its organelles, make up the cytoskeleton of eukaryotic cells. Actin filaments are composed of tubulin (e.g., tubulin) while intermediary fibres are made up of protein filaments. Actin molecules form microfilaments, which interact with other protein strands.