### **Biological terms**

This **glossary of biology terms** is a list of definitions of fundamental terms and concepts used in <u>biology</u>, the study of life and of living organisms. It is intended as introductory material for novices; for more specific and technical definitions from sub-disciplines and related fields

1-Biology is the scientific study of life and of living organisms .

**2-Zoology** The branch of biology that studies the animal kingdom, including

the <u>structure</u>, <u>embryology</u>, evolution, <u>classification</u>, habits, and geographical distribution of all animals, both living and extinct, and how they interact with their ecosystems .

**3-Pathology** A medical specialty that is concerned with the diagnosis of disease based on the

laboratory analysis of bodily fluids such as blood and urine, as well as tissues, using the tools of

chemistry, clinical microbiology, hematology, and molecular pathology.

**4-Physiology** The branch of biology dealing with the functions and activities of living organisms and their parts, including all physical and chemical processes.

**5-Microbiology** The study of microscopic organisms, such as bacteria, viruses, archaea, fungi and protozoa. This discipline includes fundamental research on the biochemistry, physiology, cell biology, ecology, evolution and clinical aspects of microorganisms, including the host response to these agents.

**6-Ecology** The scientific analysis and study of interactions between organisms and their environment. It is an interdisciplinary field that combines concepts from biology, <u>geography</u>, and <u>Earth science</u>.

7-Entomology The science that studies insects.

**8-Environmental Biology** The branch of biology concerned with the relations between organisms and their environments.

**9-Pathogen** In the broadest sense, anything that can produce disease, though the term is most commonly used to refer specifically to an infectious microscopic organism such as a virus, bacterium, protozoan, or another microbial agent which causes disease for a host organism by invading the host's tissues.

**10-Eukaryote** A type of organism consisting of cells which have a nucleus enclosed within a distinct <u>nuclear membrane</u>, unlike prokaryotes. Eukaryotes include all organisms except the bacteria and archaea (i.e. all plants, animals, fungi, and protists are eukaryotes).

**11-Bacteria** An enormous and diverse clade of microscopic, prokaryotic, single-celled organisms which lack a true nucleus. They represent one of the three fundamental biological domains.

**12-Binomial nomenclature** A formal system of classifying species of living things by giving each a name composed of two parts, both of which use Latin grammatical forms, although they can be based on words from other languages.

13-Aerobic Capable of surviving and growing in the presence of <u>oxygen</u>.

**14-Anaerobic** Any organism that does not require molecular <u>oxygen</u> for growth.

**15-Animal** Any member of a clade of multicellular eukaryotic organisms belonging to the biological kingdom <u>Animalia</u>. With few exceptions, animals consume organic material, breathe oxygen, are able to move, reproduce sexually, and grow from a <u>blastula</u> during embryonic development. An estimated 7 million distinct animal species currently exist.

## **Nutrition**

1- **Metabolism**: Sum of all the chemical reactions in an organism. **Characteristics of life**: The common features shared by living organisms.

2- Organization: Living things are composed of cells, tissues, organs and organ systems.

3- Nutrition: Process by which an organism obtains and uses food.

4-Excretion: Removal of waste products of metabolism.

5-Response: The reaction of organisms to stimuli in their environment.

6-Reproduction: The production of new individuals.

7-Biomolecules: Molecules found in living things are composed of atoms where elements

bonded together in different ratios to form biomolecules. Such as Carbohydrates, Lipids,

Proteins and Vitamins.

**8-Organic Compounds**: Carbon atoms bonded together make up most of the chemical compounds in living things.

9-Monosaccharides: Single sugar molecules such as Glucose.

**10-Disaccharides**: 2 sugar molecules bonded together such as Sucrose, Lactose and Maltose.

**11-Polysaccharides**: Made up of many sugar molecules bonded together. E.g. - Starch, Glycogen and Cellulose

**12-Phospholipids**: Fat-like substances where one of the fatty acids is replaced/added a phosphate group.

13-Anabolic reactions: Convert smaller molecules into larger ones. (Using energy)

**14-Catabolic reactions**: Complex molecule is broken down to simple molecules. (Releasing energy)

# **Ecology**

**1-Ecology**: The study of the relationships of living organisms with one another and with the environment.

2-Population: All the member of the same species living in an area.

**3-Community**: Plants and animals sharing the resources of a particular habitat.

4-Producers: Autotrophs that carry out photosynthesis.

5-Consumers: Organisms that take in food from another organism.

**6-Adaptations**: Ways in which organisms are specialized in structure/behavior to survive competition.

**7-Symbiosis**: Relationship between 2 organisms of different species that live in close association to the benefit of both organisms.

8- Saprophytes: Lives on dead organisms.

### **Parasites**

**1-Parasitology** The study of parasites, their hosts, and the relationship between them. As a biological discipline, the scope of parasitology is not determined by the organism or environment in question, but by their way of life

**2-Acoelomate** A type of animal, such as a <u>flatworm</u>, with a body plan that lacks a fluidfilled cavity between the body wall and the <u>digestive tract</u>. Rather, semi-solid <u>mesodermal</u> tissues between the gut and body wall hold the animal's organs in place. Contrast *coelomate* and *pseudocoelomate*.

**3-Asexual reproduction** A type of reproduction involving a single parent that results in offspring that are genetically identical to the parent

**4-EGG** The organic vessel containing the zygote in which an animal embryo develops until it can survive on its own, at which point the developing organism emerges from the egg in a process known as *hatching*.

5-Hermaphrodite A sexually reproducing organism with both male and female reproductive organs.

**6-Host** Any living organism that harbors another living organism (known as a "guest" or symbiont), whether the guest is parasitic, <u>mutualistic</u>, or <u>commensalist</u> in its interactions with the host. The guest typically receives shelter and nourishment from the host.

**7-Infection** The invasion of an organism's cells or tissues by a disease-causing pathogen, its growth and/or multiplication, and the reaction of the host organism to the infectious agent and the toxins it produces. The variety of biological pathogens capable of causing infections includes certain bacteria, viruses, fungi ,,

**8- Insects** are <u>hexapod invertebrates</u> of the <u>class</u> **Insecta**. They are the largest group within the <u>arthropod phylum</u>.

**9-Invertebrate** A group of animals that have no backbone, unlike animals such as reptiles, amphibians, fish, birds, and mammals, which all have a backbone. Among the many extant invertebrate phyla are the <u>Cnidaria</u>, <u>Mollusca</u>, <u>Annelida</u>, <u>Nematoda</u>, and <u>Arthropoda</u>.

**10-Larvae** A distinct juvenile form many animals undergo before metamorphosis into adults. Animals with indirect development, such as insects, amphibians, or cnidarians, typically have a larval phase of their life cycle

**11- Parasites**: Organisms that take in food from a live host and cause harm. E.g. – Disease-causing bacteria

**12-Parasitism**: Living organism that feeds on another living organism of a different species knows as host, generally causing harm to the host.

13-Ectoparasites Live on the body of the host. E.g. - tick, lice.

**14-Endoparasites**: Live on the inside of the body of the host. E.g. – Disease causing bacteria in the human body (Streptococcus) and worm .

#### **Cell Division**

**1-Cell** The basic structural and functional unit of all living organisms, and the smallest functional unit of life. A cell may exist as an independent, self-replicating unit (as in the case of unicellular organisms), or in cooperation with other cells, each of which may be specialized for carrying out particular functions within a larger multicellular organism. Cells consist of cytoplasm enclosed within a cell membrane and sometimes a cell wall, and serve the fundamental purpose of separating the controlled environment in which biochemical processes take place from the outside world. Most cells are visible only under a <u>microscope</u>.

**2-Cell division** Any process by which a parent cell divides into two or more daughter cells. Examples include binary fission, mitosis, and meiosis.

**3-Mitosis** and cytokinesis together define the mitotic (M) phase of an animal cell cycle – the division of the mother cell into two daughter cells, genetically identical to each other and to their parent cell.

**4-Meiosis** A specialized type of cell division in which a dividing parent cell proceeds through two consecutive divisions, ultimately producing four genetically unique daughter cells in each of which the chromosome number is half of that in the original parent cell. This process is exclusive to cells of the sex organs in sexually reproducing eukaryotes, where it serves the purpose of generating gametes such as eggs, sperm, or spores.

5-Embryo A developing stage of a multicellular organism.

6- cell membrane The semipermeable membrane surrounding the cytoplasm of a cell.

**7- Cell wall** A tough, often rigid structural barrier surrounding certain types of cells (such as in fungi, plants, and most prokaryotes) that is immediately external to the cell membrane

**8-Flagellum** A lash-like appendage that protrudes from the cell body of certain bacterial and eukaryotic cells.

### <u>Cells</u>

1-Protoplasm: Is all the living parts of a cell.

2-Chromatin: Name given to chromosomes when they are not dividing.

3-Ribosomes: Very small organelles made of protein and RNA. Function is to make proteins.

4-Organelles: Distinct structures suspended in cytoplasm.

**5- Prokaryotic cells**: Cells do not have a nuclear membrane surrounding their DNA. E.g. – Monera

5- Eukaryotic cells: These cells have a membrane bound nucleus and organelles.

**7-Chromosome**: Coiled threads of DNA and protein that become visible in the nucleus at cell division.

8- Haploid cell: A cell which contains one of every chromosome type or pair.

9- Diploid cell: A cell which contains two of each type of chromosome (in homologous pairs).

**10-Interphase**: The phase in the cell cycle when the cell is not dividing.

11- **Mitosis**: A form of cell division that produces two daughter cells, genetically identical to each other and to the parent cell.

**12-Meiosis**: A form of cell division that produces four genetically different daughter cells, each of which has half the number of chromosomes of the parent cell.

**13-Phagocytosis**: Process where large particles are engulfed by the cell and become incorporated into a vacuole within the cell.

## **Genetics**

**1-Species**: A group of similar organisms capable of interbreeding and producing fertile offspring.

**2-Heredity**: The transmission of traits from parents to offspring.

# 3- Mutation: Is a spontaneous inheritable change in the structure of the genetic material.

**4-Translation**: Conversion of a sequence of genetic bases on mRNA into a sequence of amino acids.

**5- Chromosome**: Found in the nucleus, made of DNA and protein and contain genes along their length.

# 6-Genotype: The genotype is the kind of genes present in the cell.

**7-Phenotype**: This is the expression of the gene in the environment. This is how genes affect the appearance of the organism.

8-Progeny: Refers to offspring that are produced.

**9-Ribonucleic acids** (**RNA**) A nucleic acid polymer composed of a series of <u>ribonucleotides</u> which incorporate a set of four <u>nucleobases</u>: adenine (A), guanine (G), cytosine (C), and uracil (U). Closely related to DNA, RNA molecules serve in a wide variety of essential biological roles, including coding, decoding, regulating, and expressing genes, as well as functioning as signaling molecules.

**10-Deoxyribonucleic acids (DNA )** A nucleic acid polymer that serves as the fundamental hereditary material in all living organisms. Each DNA molecule is composed of long sequences of <u>nucleotides</u>, each of which includes one of four <u>nitrogenous bases</u> – <u>adenine</u> (abbreviated

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A), cytosine (C), guanine (G), and thymine (T) – attached to a sugar-phosphate complex which acts as a "backbone" for the long-chain polymer. DNA most commonly occurs in "double-stranded" form, i.e. as a pair of nucleotide polymers bound together by complementary base pairing

Other terms is :

**Disease** : Any particular abnormal condition that negatively affects the structure or function of all or part of a living organism and that is not the result of any immediate external injury. Diseases are medical conditions that are often identifiable by specific signs and symptoms. They may be caused by external factors such as infectious pathogens or by internal dysfunctions such as immune deficiency or senescence.

Saprophytes: Organisms that take in food from dead organic matter. E.g. - Bacteria of decay

Antibiotics: Chemicals produced by some bacteria and fungi that inhibit the growth or reproduction of other bacteria and fungi.

## **Body components**

**1-Blood** A body fluid that circulates in humans and other vertebrate animals and is generally responsible for delivering necessary substances such as oxygen and nutrients between the cells and tissues of the body and transporting metabolic waste products away from those same cells and tissues.

**2-Lipids** A substance that is insoluble in water and soluble in alcohol, ether, and chloroform. Lipids are an important component of living cells. Together with carbohydrates and proteins, lipids are the main constituents of plant and animal cells. Cholesterol and triglycerides are lipids.

accelerating **3-Enzyme** A protein that acts as a biological catalyst by chemical reactions. Metabolic pathways depend upon enzymes to catalyze their individual steps, and almost all metabolic processes require enzyme catalysis in order to occur at rates fast enough to sustain life

**4-Hormones** Any member of class of signaling molecules a produced by glands in multicellular organisms that are transported by the circulatory system to target distant organs to regulate physiology and behaviour

5- Vitamins : are organic compound that people need in small quantities .

6- Granulocytes: Formed in the red bone marrow. They are phagocytic (Actively seek out and engulf bacteria)

7-Monocytes: Non granular and are also phagocytic. They often leave the capillaries in search of foreign material.

8- Lymphocytes: Formed in the bone marrow and matured in the lymph nodes. They recognise proteins(antigens) on the cell membranes of invading organisms and respond by making antibodies which kill the invaders.

9-Protein A polypeptide chain of amino acids. It is a body-building nutrient.

Biological terms

### **Reproduction**

**Reproduction** The biological process by which one or more new individual organisms (known as offspring) is produced from an existing parent organism. Reproduction is a defining characteristic of all life, and every individual organism exists as the result of a reproductive event. There are two general methods by which reproduction takes place: sexual or asexual.

1-Zygote A eukaryotic cell formed by a fertilization event between two gametes.

**2-Regeneration:** the process of renewal, restoration, and growth that makes genomes, cells, organisms, and ecosystems resilient to natural fluctuations or events that cause disturbance or damage. For example, many organisms are capable of regenerating tissues and even entire body parts if they are lost or destroyed.

**3-Mitosis** :and cytokinesis together define the mitotic (M) phase of an animal cell cycle – the division of the mother cell into two daughter cells, genetically identical to each other and to their parent cell.

**4-Species :** the basic unit of biological classification and the narrowest of the canonical taxonomic ranks, as well as a unit of biodiversity. Species are traditionally distinguished on the basis of reproductive compatibility, though achieving a satisfactory definition that is universally applicable to all life has proven difficult, since many organisms classified as distinct "species" are capable of interbreeding with different (albeit closely related) species, generating hybrids.

5-Organ A collection of tissues joined in a structural unit to serve a common function.

6-Binary fission The process by which one prokaryotic cell divides into two identical daughter cells.

**7-Phylum** A taxonomic rank or level of classification below kingdom and above class; in botany, the term division is commonly used in place of phylum.