

5 kingdoms of life essay sample

[Science](#), [Genetics](#)



1. The Monera

The five-kingdom system of classification for living organisms, including the prokaryotic Monera and the eukaryotic Protista, Fungi, Plantae and Animalia is complicated by the discovery of archaeobacteria. The prokaryotic Monera include three major divisions: The regular bacteria or eubacteria; the cyanobacteria (also called blue-green algae); and the archaeobacteria. Lipids of archaeobacterial cell membranes differ considerably from those of both prokaryotic and eukaryotic cells, as do the composition of their cell walls and the sequence of their ribosomal RNA subunits. In addition, recent studies have shown that archaeobacterial RNA polymerases resemble the eukaryotic enzymes, not the eubacterial RNA polymerase.

Archaeobacteria also have introns in some genes, an advanced eukaryotic characteristic that was previously unknown among prokaryotes. In eukaryotic cells, the initial messenger RNA (M-RNA) transcribed from the DNA (gene) is modified (shortened) before it leaves the nucleus. Sections of the M-RNA strand called introns are removed, and the remaining portions called exons are spliced together to form a shortened (edited) strand of mature M-RNA that leaves the nucleus and travels to the ribosome for translation into protein. This process is known as "gene editing." Some authorities hypothesize that eukaryotic organisms may have evolved from ancient archaeobacteria (archae = ancient) rather than from the common and cosmopolitan eubacteria. The archaeobacteria could have flourished more than 3 billion years ago under conditions previously thought to be uninhabitable to all known life forms.

2. The Protista (Protoctista)

The kingdom Protista includes a diverse array of organisms, from minute flagellated cells to macroscopic kelp. The smallest microscopic organisms are termed protists, consequently some biologists prefer to call this kingdom the Protoctista rather than Protista. All members of this vast phylum have nucleated cells and live in aquatic habitats (freshwater and marine).

According to Lynn Margulis, K. V. Schwartz and M. Dolan (1994), the cells of all Protoctista originally formed by bacterial symbioses (symploysis).

Members of the kingdom Protoctista are not animals, which develop from an embryo called a blastula; they are not plants, which develop from an embryo that is not a blastula but is retained in the mother's tissue; they are not fungi which develop from spores and lack cilia and flagella (called undulipodia) at all stages of development; they are not monerans, which have prokaryotic cells.

3. The Fungi

Some members of the Kingdom Fungi (in the fungal classes Ascomycetes and Basidiomycetes) are associated with algal cells of the Kingdom Protista (in the algal division Chlorophyta) and/or prokaryotic cyanobacteria of the Kingdom Monera. This complex symbiotic, mutualistic relationship is called lichen. Lichens are essentially lichenized fungi containing unicellular monerans and/or protists.

4. the Plantae

There are approximately 1.6 million species of living organisms on earth.

This number may be much higher because new species are continually being discovered each day, particularly insects and nematodes in remote tropical

regions. However, at the present rate of destruction, most of the virgin tropical rain forest will be annihilated by the end of the 20th century, so many species will never be known to humans. It is estimated that 99 percent of all the species that have ever lived on earth were already extinct before humans ever walked on this planet. Although humans have a phenomenal impact on the ecology of earth, they are relative newcomers on this great planet. It is estimated that the earth is over 4.5 billion years old, and ancient life forms (such as the cyanobacteria) appeared about 2-3 billion years ago. If the geologic history of the earth is compared to a 24-hour time scale, the first multicellular organisms do not appear until just after 8:00 P. M. and humans are not on the scene until less than a minute before midnight.

5. the Animalia

There are more than one million species of animals (Kingdom Animalia), more than all the other kingdoms combined. More than half of all animal species are insects (800,000 species), and beetles (300,000 species) comprise the largest order of insects (one fifth of all species—using a total of 1.5 million). In fact, if all the species of plants and animals on earth were lined up at random, every 5th species would be a beetle.

Viruses: Viruses do not belong to the above 5 kingdoms of life. They are much smaller and much less complex than cells. They are macromolecular units composed of DNA or RNA surrounded by an outer protein shell. They have no membrane-bound organelles, no ribosomes (organelle site of protein synthesis), no cytoplasm (living contents of a cell), and no source of energy production of their own. They do not exhibit autopoiesis—i. e. they do not

have the self-maintenance metabolic reactions of living systems. Viruses lack cellular respiration, ATP-production, gas exchange, etc. However, they do reproduce, but at the expense of the host cell. Like obligate parasites, they are only capable of reproduction within living cells.

In a sense, viruses hijack the host cell and force it to produce more viruses through DNA replication and protein synthesis. Outside of their host cells, viruses can survive as minute macromolecular particles. Viruses may attack animals and plants. Infectious human viruses can be dispersed through the air (airborne viruses) or body fluids (HIV virus). Epidemic viruses (such as HIV) that are passed from person to person via sexual conjugation are remarkably similar to computer viruses. Unfortunately in humans there is no resident antivirus program to alert you of a potential infection, or to quickly scan your body and delete the invader once it has entered your system. Humans must rely on their amazing antibody and cell-mediated immune response, one of the most complex and remarkable achievements in the evolution of living systems.