

## **The Tree of Life and Its Applications**

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Biologists are working to understand the evolutionary relationships among all species of life on Earth. This research area, known as phylogenetics, has many practical applications, in addition to providing a framework for understanding all of comparative biology. For example, many modern diseases are evolving rapidly, and our understanding and control of these diseases requires an evolutionary perspective. Phylogenetic analyses are useful for understanding the origin of diseases, their spread through populations, their adaptation to treatments, and in the design of vaccines and vaccination programs. Phylogenetic analysis has also become important for forensic investigations involving pathogens. In addition, phylogenetic analyses are useful for reconstructing gene sequences from long-extinct organisms. The Tree of Life database has also become important in efforts to automate species identification and discovery, and to formulate a framework for organizing biological databases such as the Encyclopedia of Life effort.