

Editorial Note on Bioinformatics

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Editorial Note

Bioinformatics has become an important role of many field of biology. In experimental molecular biology, bioinformatics techniques such as image and signal processing allow extraction of useful results from large amount of raw data. In field of genetics and genomics, it aids in sequencing and annotating genomes and their observed mutations. It plays a very important role in the text mining of biological data. It also plays a role in analysis of gene and protein expression and regulation.

Bioinformatics tools aid in the comparison of genetics and genomics data and more generally in the understanding of evolutionary aspects of molecular biology. At a more integrative level, it helps analyze and catalogue the biological pathways and networks that are an important part of systems biology. In structural biology, it aids in the simulation and modeling of DNA, RNA, proteins as well as biomolecular interactions.

Bioinformatics is an interdisciplinary field that develops methods and software tools for understanding biological data. As an interdisciplinary field of science, bioinformatics combines Computer science, Biology, Mathematics, and Engineering to analyze and interpret biological data. Bioinformatics has been used for in silico analyses of biological queries using mathematical and statistical techniques. More broadly bioinformatics is applied statistics and computing to biological science.

Bioinformatics is term for the body of biological studies that use computer programming as part of their methodology, as well as a reference to specific analysis "pipe lines" that are repeatedly used, particularly in field of genomics. Common uses of bioinformatics include the identification of person genes and single nucleotide polymorphisms. Such identification is made with the aim of better understanding the genetic basis of diseases, unique adaptations, desirable properties or difference between populations. In a less formal way, bioinformatics also tries to understand the

organizational principles with nucleic acid and protein sequence called proteomics.

Goals of bioinformatics

The goal of bioinformatics is to increase the understanding of biological processes. It's a apart from other approaches, however, is its focus on developing and applying computationally intensive techniques to achieve this goal. For example: pattern recognition, data mining, machine learning algorithms, and visualization. Major research efforts in the field include sequence alignment, gene finding, genome assembly, drug design, drug discovery, protein structure alignment, protein structure prediction, prediction of gene expression and protein-protein interactions, genome-wide association studies, the modeling of evolution and cell division/mitosis.

Bioinformatics now involves the creation and advancement of databases, algorithms, computational and statistical techniques, and theory to solve formal and practical problems arising from the management and analysis of biological data.

From the past few decades, rapid developments in genomics and other molecular research technologies and developments in information technology have combined to produce a tremendous amount of information related to molecular biology. Bioinformatics is the name given to these mathematical and computing approaches used to glean understanding of biological processes.

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