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Short Communication

Advancement in Applications of Bioinformatics in Different Medical Science Field

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ABOUT THE STUDY

Bioinformatics is a health science field that integrates biology and information technology. Its applications include molecular sequence analysis and genomics data analysis. Bioinformatics to put it in the other way is the use of computer technology to manage enormous amounts of biological data. It is a multidisciplinary field of study that combines aspects of Computer Science, Statistics, and Biology to create software applications for evaluating biological data such as DNA sequencing, protein analysis, and evolutionary genetics. Bioinformatics is used in a variety of fields majorly in medicine area.

Some of the applications of bioinformatics in the medicine field includes:

Drug discovery: One of the most common issues is the production of inexpensive and effective medications for a condition, which can be tackled utilizing bioinformatics and rational drug design; Personalized medicine: The genetic profile of a patient can help a doctor determine susceptibility to specific diseases, prescribe the right treatment at the right dose, and limit side effects. It's used in the treatment of personalized cancer therapy, diabetes and HIV/AIDS; Preventive medicine: Individuals, communities, and defined groups are the focus of preventive medicine. It employs a variety of research approaches, such as biostatistics, bioinformatics, and epidemiology, to better understand the patterns and causes of health and disease and to turn that knowledge into programmes that prevent disease, disability, and death; Veterinary Sciences: The application of Bioinformatics in this discipline focuses on sequencing studies involving animals such as cows, pigs, and sheep. This has resulted in an increase in overall production as well as improved livestock health; Crop Improvement: Crop improvement is another key application of bioinformatics. To generate powerful, more drought-resistant and insect-resistant crops, it makes good use of proteomic, metabolomic, genetic and agricultural crop production. As a result, cattle quality and disease resistance will improve; Evolutionary Studies: Using bioinformatics, one may compare genetic data from several species to determine their families, functions, and traits; Gene therapy: Gene therapy is the process of replacing a patient's faulty genes with a functional one in their cells. Gene therapy isn't frequently employed since creating a general gene therapy approach is difficult due to the fact that everyone's genetic makeup is unique. Bioinformatics could assist in determining the appropriate gene target site for each individual based on their genetic profile. Waste Clean-up: Bacteria and microorganisms are useful in bioinformatics for environmental waste clean-up. Climate Change Studies: bioinformatics may be helpful in reducing carbon dioxide and other greenhouse gases by sequencing microbial genomes. This contributes significantly to the stabilization of global climate change. Bioinformatics has also aided scientists in the development of new technologies for identifying vaccination targets. Bioinformatics software tools range from simple command-line tools to more complicated graphical programmes and standalone web services, all of which are available from bioinformatics enterprises or public organizations. Basic Local Alignment Search Tool (BLAST) is an algorithm for comparing biological sequences information, such as amino acid sequence of different proteins or the nucleotides of DNA sequences. BLAST is used to identify library sequences that resemble the query sequences [1-4].

CONCLUSION

The main work of bioinformatics includes creation of novel algorithms and statistics for analyzing relationships between individuals in massive data sets. Nucleotide and amino acid sequences, protein domains, and protein structures are all examples of data that may be analyzed and interpreted. Creation and deployment of technologies allow for the efficient access and administration of various forms of data in this field. Bioinformatics is an interesting area that allows you to find, assess, store, and retrieve biological data. Bioinformatics has a broad scope and is always evolving as it transforms more fields of life sciences.

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