

Chapter 28

BTISNet: Biotechnology Information Network for Biological Scientific Community

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ABSTRACT

Bioinformatics plays an important role in speeding up the research in the field of biotechnology related to plant and animal science. A bioinformatics program under BTISNet has been catering to the information needs of ten-twelve thousand scientific personnel. The Apex Centre at the Department of Biotechnology, New Delhi, along with fifty-six centers and thirty-one Bioinformatics Infrastructure Facility Centres (BIFs) are engaged in this task to serve researchers, scientists, students, etc.

INTRODUCTION

Research and Development activities in Modern Biology and Biotechnology are very much information-dependent fields. In fact, the symbiosis between information technology and Biotechnology today is as intricately entwined as like the two strands of the DNA helix. Various Genome projects including the Human Genome Project (HGP) are producing enormous amounts

of Sequences data. The rate of growth of these data has been estimated to be more than 200 million bases per year. The content of the database itself is doubling in size approximately every year. The large amounts of data generated through various forms are serving as a source of knowledge to the scientists engaged in the field of Biotechnology. The whole paradigm shift in molecular biology towards data-intensive research in search of useful genes is basically due to the fact that the

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genetic data is becoming the major driving force in drug discovery, protein engineering, design of new molecules and other related areas. The impact of Bioinformatics on Indian Biosciences and Biotechnology can be seen both in tangible and non-tangible terms. R&D activities in these fields grew in quantity as well as quality as can be seen from research papers published from India.

The entire network has emerged as a very sophisticated scientific infrastructure for bioinformatics involving state-of-the-art computational and communication facilities. The computer communication network, linking all the bioinformatics centers, is playing a vital role in the success of the bioinformatics programme. Database development, R&D activities in bioinformatics, human resource development and a variety of services in support of biotechnology R&D programs and projects, has made this programme very popular and useful to the scientific community. With an excellent cooperation received from various agencies of the Government of India, in particular, the National Informatics Centre (NIC), who provided the communication support, initially for e-mail and subsequently for full Internet access as well as some value added services, made it possible for the network to assume the role of a closed user group representing a scientific grid in various inter-disciplinary subjects of biotechnology encompassing, agriculture, health, and environment, besides other related subjects of scientific importance. The contributions made by the scientists and academicians at the various universities and national laboratories and institutions of the CSIR and ICAR, in which our bioinformatics centers are located, have resulted in excellent capacity building for use of a variety of information resources on the Internet. More than 100 databases dealing with different aspects and of relevance to R&D efforts in biotechnology are now available on the network. A national node of EMBnet has been established at the Centre of DNA Fingerprinting and Diagnostics (CDFD), Hyderabad.

MAJOR ACTIVITIES

Growth of biotechnology has accelerated particularly during the last decade due to path breaking advancements in biology and new technologies that produce large high quality data. One such advancement is the high throughput full genome sequencing projects, including human genome, have produced very large data. The analysis of such large data and extraction of knowledge from this data is possible only with the help of new algorithms and compute intensive techniques. Thus, biologists need to use almost every new technical development in information technology, computer science, and intelligent application to solve complex biological problems leading the development of multi-disciplinary area called bioinformatics.

Bioinformatics has become a frontline applied science and is of vital importance to study new biology, which is widely recognized as the new scientific endeavor of the twenty-first century. The growth in full genomic sequencing, structural genomics, proteomics, micro-array, etc. will be very slow without application of bioinformatics. In fact, usefulness of these areas to solve complex biological problems will be limited without bioinformatics and thus it gives a high importance very high importance to Bioinformatics.

India was the first country in the world to establish in 1987 a Biotechnology Information System (BTIS) network to create an infrastructure that enables it to harness, biotechnology through the application of Bioinformatics. The Department of Biotechnology (DBT) has taken up this infrastructure development project and created a distributed network at a very low cost. BTIS is today recognized as one of the major scientific network in the world dedicated to provide the-state-of-the-art infrastructure, education, manpower and tools in bioinformatics.

The principal aim of the bioinformatics programme is to ensure that India emerges as a key

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