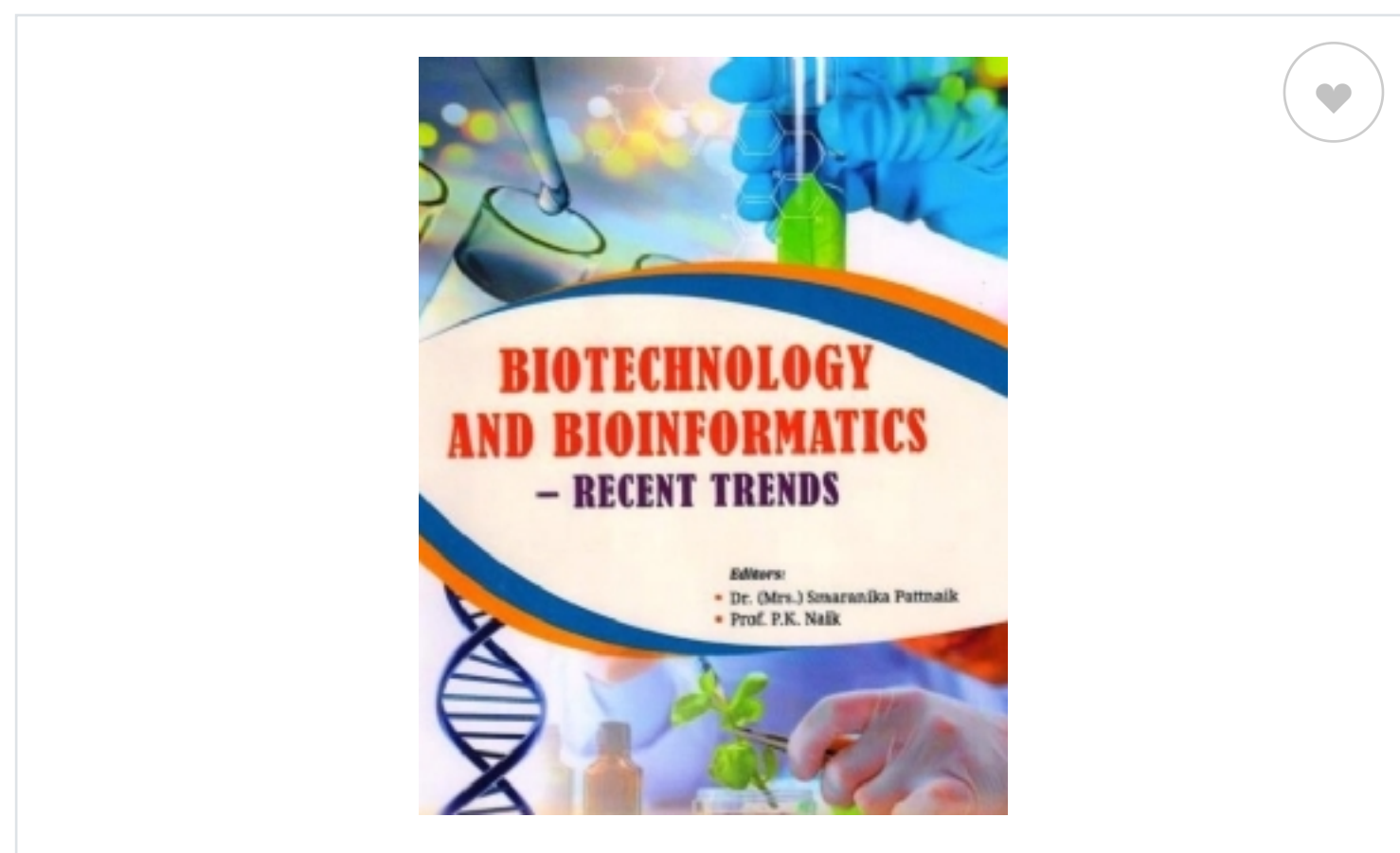


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Biotechnology and Bioinformatics: Recent Trends

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Description

Biotechnology, being the most promising area of research, has created footprints in therapeutics, diagnostics, genetically modified crops for agriculture, processed food, bioremediation, waste treatment and energy production. Designated as a central branch of applied science that utilizes living organisms and their derivatives to produce products and processes, Biotechnology ventures, applications in all most all sectors for sustainable development. In this context, Plant biotechnology is betrothed with tremendous applications. The genetically modified plant materials, tissue culture techniques, transfer of desired genes through tumor-inducing plasmids (Ti plasmid), use of transformation protocols, use of gene gun, electroporation, microinjection, calcium phosphate, poly ethylene glycol (PEG) for production of hybridomas and chloroplast engineering are proven to be most applicable biotechnology approaches made in the past and the subsequent developments are in pipeline. While the term Medical Biotechnology refers to use of living systems or molecular engineering to create and manufacture biologic therapies and products for patient care, major product categories include large-molecule proteins; peptides; monoclonal antibodies; cell, tissue, and genetic therapies; liposomes; polymers; and molecularly engineered vaccines. Likewise, the pharmaceutical industry has a demanding scenario on the production of Recombinant DNA (r-DNA) production, r-Vaccines, r-monoclonal antibody production, stem cells and target-oriented advanced drug delivery systems are possible due to Biotechnology. In addition, clonal selection, identification of marker and reporter genes, promoter tagging, activation tagging, terminator seed technology, transgene stability and gene silencing, chloroplast transformation - advantages sectors success with tobacco and potato are the most valuable gifts from Biotechnology. Microbial Biotechnology is considered as a promising implement for sustainable development of agriculture through enhanced N₂, an increase of nutrition uptake, management of biotic and abiotic stress, improved biomass-derived techniques and more overvalue addition in crops. Biotechnology has also a much impact upon environment. Soil and water remediation is in progress because of biotechnology. Further, the degradation of criterion and non-criterion air pollutants was observed to be the most applicable venture of Biotechnology. Considering Industrial Biotechnology, the total human population is supplemented with biotechnologically produced enzymes, bioenergy, biofuel, beverages and food. The gathering, archival, dissemination, modeling and analysis of biological data falls within a relatively young field of scientific inquiry, currently known as 'bioinformatics'. Now, Bioinformatics is considered as a super trending subject. The advancements in molecular modeling, disease characterization, pharmaceutical discovery, clinical healthcare, forensics and agriculture fundamentally influence economic and social issues worldwide. There exist several applications of bioinformatics for accelerating research in the area of biotechnology that includes automatic genome sequencing, gene identification, prediction of gene function, prediction of protein structure, phylogeny, drug designing and development, identification of organisms, vaccine designing, understanding the gene and genome complexity, understanding protein structure, functionality and folding. By using bioinformatics in research, many long-term projects are turned up so fast like genome mapping of humans, plants and microbes. Contents - 1. Carbohydrase - Subhadeep Mondala, Suman Kumar Halder, Nagendra Thakur and Keshab Chandra Mondal 2. 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