

## REVIEW ARTICLE

# The Rapid Advancement of Biotechnology and its Applications: A Review

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### ABSTRACT

*The word 'Biotechnology' is not a retiring technology. to a definite extent it is a collection of technologies that allocate two (common) distinctiveness working with living cells and their molecules and having a extensive range of practice uses that can enhance our lives. This paper gives a brief depiction of biotechnology, and how it is connected to human being daily life. In addition of to this the importance of biotechnology and its contemporary applications has been discussed in detail.*

**Keywords:** *Biotechnology, Scalability, Genetic Engineering, Protein Engineering*

Received 10.01.2020

Revised 19.02.2020

Accepted 30.03.2020

### INTRODUCTION

The usage of organism's, biological processes or systems to produce the products that are probable to progress human lives is termed as biotechnology[1]. Normally, this can also be known as the engineering of organisms for the intention of human practice. Currently, biotechnology plays more eminence on the establishment of hybrid genes followed by their transfer into organisms in which a few, or all, of the gene is not frequently present [4]. In primeval times, a primeval form of biotechnology was proficient by agriculturalists who recognized improved-quality species of plants and animals by techniques of cross-pollination or cross-breeding[5]. The previous forms of biotechnology includes selective and training breeding of animals, cultivation of crops and the consumption of micro-organisms in order to yield the foodstuffs such as cheese, and yogurt, bread, wine and beer[3].

The most primeval type of biotechnology is guiding (in specific the domestication) of cultivation of plants and animals. The localization of animals extends back to 10000 years, when our acquaintances also began maintaining plants as a reliable basis of food. The first round examples of such domesticated plants are barley, rice and wheat. The wild animals were also controlled to yield milk or meat [2]. The primeval creation of cheese, bread and yogurt from micro-organisms were also revealed[30]. When the practice of fermentation was first exposed, an wide sequences of intoxicating drinks like beer and wine were emerged in this period [10].

The Biotechnology at present is used in many disciplines inclusive of energy production, food processing, bioremediation and agriculture [6]. The DNA fingerprinting is frequently accomplished in forensics [8][11]. The additional biotechnology-based insulin and medicines production are formed all the way via cloning of vectors with genes of attention[28]. Immunoassays are regularly used in medicine for drug efficiency and pregnancy testing [7]. This immunoassays are also used by farmers to identify harmful levels of herbicides, pesticides, toxins in animal-based products and crops [9][12][24]. The biotechnology also has huge measure in agriculture for the creation of plants that are divergent to plant diseases, weeds and insects. This may be proficient by the preamble of genes of interests using genetic engineering [15].

The Biotechnology comprises of controlled application of biological agents such as cellular components or micro-organisms for complimentary use [14].

### DIVERSE DEFINITIONS OF BIOTECHNOLOGY

In general, the term 'Biotechnology' is said to be the built-in usage of engineering sciences, microbiology and biochemistry in production [13].

1. Biotechnology is called as the very profitable service for living animal & plant and cells, micro-organisms to make substances or things helpful to people[22]. It further consists of the production of, vitamins, vaccines, antibiotics, plastics, etc.

2.'Bio' refers to life and 'technology' refers to the application of information for practical use, i.e. the application of living organisms to create or improve a product [18].

The word biotechnology is erratically also useful to processes in which micro-organisms such as yeasts and bacteria are refined under rigorously controlled ecological circumstances[21][16]. Because of this cause, the fermentation is hardly ever said to be the elderly form of biotechnology[23]. The genetic engineering approaches/techniques are often, but not constantly used in biotechnology.

It is obvious from the above mentioned definitions that biotechnology consists of dissimilar technologies that depend on information gained by modern findings in molecular biology, biochemistry and cell biology [17]. These approaches are previously having a immense cause on diverse areas of life, counting waste treatment, agriculture & food processing and medical technology.

As abstracted, biotechnology is the application of the theory of engineering and biological science to make fresh and original products from raw materials of biological source [19].

### SCALABILITY AND IMPLICATION OF BIOTECHNOLOGY

The term biotechnology is called as the science of the restricted application of biological agents for flattering use[27]. As biotechnology is not an self-regulating discipline, its renowned integration with associated fields such as, molecular biology[20], biochemistry and microbiology facilitates the technological application of biological agents. As a result, modern biotechnology has developed as a science with massive potential for human welfare in areas ranging from food processing to human health and ecological protection[26]..

#### Divisions of biotechnology

The definition of biotechnology can be further more divided into diverse regions/areas such as white, red, green and blue.

**White biotechnology:** This white which is said to be gray biotechnology and it consists of industrial processes like the production of novel chemicals or the improvement of new fuels for vehicles[27].

**Red biotechnology:** This area includes medical actions such as utilizing organisms for the creation of new drugs and this biotechnology is also known as medical biotechnology.

**Green biotechnology:** This biotechnology applies to agriculture and involves the development of accelerated evolution of pest-resistant grains and disease-resistant animals[24].

**Blue biotechnology:** This biotechnology are established hardly ever mentioned, encompass processes in the marine and aquatic surroundings.

#### Techniques of Biotechnology

Some of the basic techniques used in biotechnology are as listed below:

Techniques	Usage
Genetic engineering	The employment of cellular enzymes to influence DNA; transferring DNA between distinct organisms
Protein engineering technology	Used to enhance accessible/create new proteins to create valuable products[29]
Bioinformatics technology	Computational study of biological data, for example., series investigation of , larger -throughput profiling data analysis and macromolecular structures[25].
Protein isolation and detection methods	Contour- clamped uniform electric field gel electrophoresis

#### Various applications of biotechnology

The various applications of biotechnology are as follows:

- Biotechnology in environment
- Biotechnology in industry
- Biotechnology in food processing
- Biotechnology in medicine
- Biotechnology in biomaterials

## CONCLUSION

The present biotechnology finds endowed applications in diverse ways in atmosphere protection, production of food and drug and isolation of criminals. Its application are held in , protein engineering, genetic engineering, cloning, gene therapy, recombinant DNA technology, biobanks ,nanotechnology, biofuels, biotechnological industries, and in embryonic stem cell study. Biotechnology and bioindustries are tending to be an essential part of the knowledge-based economy, as they are strongly connected with development in life and applied sciences and to the technologies linked to them. Today it is well proven that the world economy is tremendously grown by the application of the most recent biological technologies.

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**CITE THIS ARTICLE**

Thamaraiselvan.A. The Rapid Advancement of Biotechnology and its Applications: A Review. Res. J. Chem. Env. Sci. Vol 8 [2] April 2020. 49-52