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## Biotechnology and its Scope in Today's Era

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### INTRODUCTION

Biotechnology is a term that we are all extremely familiar with! A discipline of applied science that makes use of living and biological systems to create various processes and products. R and D in Biological Science and Industrial Processes are the two most common categories. Biotechnology approaches include fermentation and baking bread to make desired goods such as wine, ethanol, and other foods. In 1919, "Karl Ereky" coined the phrase "biotechnology."

### WHAT IS BIOTECHNOLOGY?

Biotechnology is not a single technique, despite its name. Rather, it is a collection of technologies with two (similar) characteristics: they operate with living cells and their molecules, and they have a wide range of practical applications that can help us live better lives.

"Using organisms or their products for commercial reasons" are a broad definition of biotechnology. As a result, (traditional) biotechnology has been used since the beginning of time. (It's been used to make bread, brew alcoholic beverages, and breed food crops and domestic animals). However, recent advances in molecular biology have given biotechnology a fresh lease on life and a new significance.

Genetic engineering is an example of modern biotechnology. The practice of transferring individual genes across organisms or changing the genes of an organism to remove or add a desired trait or attribute is known as genetic engineering. Later in this document, examples of genetic engineering will be discussed. Genetically modified crops or organisms are created through genetic engineering. GMOs or genetically modified crops are utilized to make biotech foods. Genetic engineering, a specific sort of modern biotechnology, appears to be attracting the most attention and concern from consumers and consumer groups.

### WHY IS BIOTECHNOLOGY BECOMING MORE POPULAR IN INDIA?

Biotechnology has proven to be one of Young India's fastest-growing industries. Biotech giants such as Biocon, Novozymes, Panacea Biotec, and others are extending their operations globally. This increase and the emergence of biotechnological start-ups alone need the hiring of bio-professionals, creating better and more attractive possibilities for young people.

India's biotech industry accounts for 2.4% of the global market. Bio-services, bio-Agri, biopharma, bio-industrial, and bioinformatics are the five primary segments in this industry. The biopharmaceutical industry accounts for the highest share of the biotechnology sectors among these five. Biotechnology is now increasing at a rate of 20.33% in India, with the government aiming to make it a \$100 billion industry by 2025.

### APPLICATIONS OF BIOTECHNOLOGY

Biotechnology is frequently used to switch and generate a useful product for human benefit in a variety of industries. These are some of the applications:

- The use of biotechnology has tripled production and, as a result, food supply. Aside from ordinary crop production, pest-resistant plants and genetically engineered crops are being introduced to increase food output and feed the expanding human population. Crops that have been genetically engineered have had their genes altered by adding genes that contain the desired properties. Bt cotton, Bt brinjal, and Bt peas are all Bt varieties
- The recombinant deoxyribonucleic acid technology has added to the advancements within the field of healthcare by permitting production of safe and simpler therapeutic drugs

- Transgenic animals are those in which a replacement or modified gene has been artificially inserted into the genome via a gene-splicing approach. Rats, rabbits, pigs, sheep, cows, fish, and other transgenic animals are a few examples. The mouse is the only existing transgenic animal among all other transgenic animals
- Biotechnology applications aid in the enhancement of fish quality and quantity. The gonadotropin-releasing hormone is given to the fish to help them reproduce. This aids in their development and improves their genetic traits. It also helps to avoid a variety of disorders
- Using plants, biotechnology aids in the creation of vaccinations, antibiotics, and artificial hormones. To produce the encoded proteins, genes with the desired properties are introduced into the plants. Edible vaccinations are inexpensive, because they may typically be stored and delivered in the body. These are commonly used to treat diseases such as measles, hepatitis, and cholera

Biotechnology application could be a crucial development tool for all countries. Biotechnology, which is entwined with culture and socio-ethical principles, could be used to solve future problems such as food and water shortages, which obstructs national progress and threatens peace in emerging countries.