**Colors of Biotechnology**

Biotechnology is the technology based on biology, harnesses cellular and biomolecular processes to develop new products, methods and organisms intended to improve human health and society. For some 10,000 years, biological processes are used to improve the quality of life, beginning with the first agricultural communities. Humans began to work with microorganisms around 6,000 years ago for making bread, alcoholic beverages, cheese production, etc. The new era of biotechnology started when the molecular and cellular technologies were developed.

Now the biotechnology industry had advanced with development of traditional pharmaceuticals and monocolonal antibodies that stops disease progression, production of genetically modified organisms and their presence in food, refining of industrial processes through discovery and production of enzymes, exploring microscopic equipment that can enter human body (nanotechnology), techniques of stem cell research and cloning to replace dead and defective cells and tissues (regenerative medicine) and merging of biological information with computer technology (bioinformatics).

Based on common uses and applications, biotechnology has been divided into subdisciplines which are color-coded as:

* **Red** biotechnology: This is the medical branch of the field, include discovery of new drugs and vaccines, development of diagnostic tests, advancement of gene and regenerative therapies and use of stem cells to regenerate damaged human tissues and grow and regrow entire organs.
* **White** biotechnology: This refers to the manufacturing or industrial branch of the field, where new products such as chemicals, plastics, pharmaceuticals, foods and energy carriers are developed using living cells or parts of living cells from organisms like bacteria, yeast, molds and plants.
* **Grey** biotechnology: It is dedicated to the environmental applications of the fields such as removal of pollutants and contaminants using plants and other microorganisms, preservation of biodiversity and genetic diversity, creation of industrial processes requiring fewer resources and development of alternative energies.
* **Green** biotechnology: It covers all about plants and agricultural techniques, together with generating pest-resistant vegetation, disease resistant animals and environmental friendly agricultural practices. Many different techniques are utilised here, from tissue cultivation, micropropogation, marker-assisted selection, and reverse breeding to genetic engineering.
* **Gold** biotechnology: Also called bioinformatics, is the pass between organic tactics and informatics. Here the biological processes are addressed using computational techniques, particularly these which can rapidly organize and analyse very large data sets.
* **Blue** biotechnology: It encompasses the approaches in marine or aquatic environments, which includes converting aquatic biomass into fuels and prescription drugs. The biggest areas in the field is production of biofuels from algae. Other inventions range from anti-aging creams to research tools like GFP to powerful painkillers and anti-cancer drugs.
* **Yellow** biotechnology: This field refers back to the approaches that resource meals production, the most famous is the fermentation of cheeses and alcohol. It's far focused on improving food manufacturing practices, along with by way of doing away with the use of antibiotics and hormones at some point of meat manufacturing. Using genetically engineered crops to encourage healthier, extra effective harvests, additionally forms part of it.
* **Purple** biotechnology: This field ensures that the biotechnology practices are in compliance with laws and ethical standards. It includes intellectual property rights, biotech related policies such as those that protect patient’s data and those that limit the applications of gene editing.
* **Dark** biotechnology: This is known as the black sheep of the biotechnology own family. It is an example of using these scientific advancements for nefarious purposes such as biowarfare and bioterrorism. It is right technology that has ended up inside the incorrect palms used to damage rather than heal.

The use of colors to explain biotechnology constitutes a brand new mechanism in:

* attracting school children to the microbial world in different environments;
* teaching biotechnology in graduated and medical schools; and
* providing soundbytes for use by non-technical policy makers promoting the biotech powerhouse for sustainable development.

There are definite benefits to this color coded system but different authors and institutions may use slight variations. To be most effective, it would be beneficial to support an official color code, with properly defined categories to minimize confusion caused by different adaptations of the codes. If this could be more widely agreed on and made uniform across different organizations, the color-coding system could become an increasingly valuable tool.