

Biotechnology for a Better World

Nirav.R. Soni

Department of Quality Assurance,
A-One Pharmacy College, Anasan, Ahmedabad, Gujarat, India
nirav_sonic@yahoo.com



ABSTRACT

Pharmaceutical Biotechnology is not a source of energy, but a scientific method that provides tools to produce energy based entirely on modern biotechnological techniques, as to date encompass a wider range of altogether newer medicinal compounds, e.g., antibiotics, vaccines development and monoclonal antibodies (MABs) that may now be produced commercially using well-defined, optimized and improved fermentative methodologies. In fact, genetic engineering has brought in a sea change by virtue of the directed construction of microorganisms resulting in a plethora of newer life-saving drugs. Focus on a variety of research areas including health/medicine, food science, environmental science and agri- science and also bioenergy development.

Keywords: Biotechnology, Newer Medicinal compounds, Genetic Engineering

INTRODUCTION

Biotechnology is a huge part of our everyday lives. Biotechnology is the application to industry of advances made in the technique and instrument of research in the biological sciences to improve plants or animals or to develop microorganisms for specific uses.

What is biotechnology?

It is the manipulation of living organisms and organic material to serve **Human Needs**. e.g. yeast in bread making and alcohol production, use of beneficial bacteria (penicillin) to kill harmful organism, cloning of plant & animal, artificial insemination ^[1].

Biology +Technology =Amazing Innovations.

Biotechnology Strategy ^[2]:

- Simplicity/flexibility
- Excellent
- Lower grower cost
- Healthy environmental sciences
- Reduced herbicide residues

- Higher yields and quality of foods.
- Less acres used
- Longer shelf life
- Decreased molds
- Respecting society values
- Awareness
- Visionary & Pragmatic

Biotechnology Benefits and Risks ^[1-5]:

- Decreasing reliance on pesticides
- Insect resistance management
- Gene flow and out crossing
- Non-target organisms
- Human, wildlife and environmental health
- Preserving genetic diversity in plants and animals
- Economic impacts

Goal ^[3,5,8]:

The need for new technologies is great, as the various described below:

- "In Modern Era, there are some 900 million people who do not have access to sufficient

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food to meet their needs because of lack availability in Human population."

- "Renewable energy technology management promoting village project, also ICU ventilator, Evapotranspiration. HSR(Human source radiation reduency project), Bio diversity".

- "(Global Climate Change-GCC) and alterations in land use will exacerbate the problems of regional production and demands for food."

- "Malnutrition (e.g. Marasmus and kwashiorkor) plays a significant role in half of the nearly 12 million deaths each year of children under five in developing countries."

"In addition to lack of food, deficiencies in micro-nutrients (especially vitamin A, iodine and iron) are widespread^[4,6,7,9]."

- "Food infection and outside the environmental pollution as a major role for our health and also adulterated medicines, markers and herbal drugs to harmful our body and to came over our life."

- "To proper Guidance condition and situation according to need for farmer and at the same time, biotechnology can help farmers produce more nutritious crops, while sustaining the land's ability to support continued farming and may reduce the need for costly inputs such as fertilizer and non-renewable resources, such as oil and natural gas."

- "In developing countries about 750 million of the poorest people according to up to 2012 year live in rural areas where the local production of food is the main economic activity. Without successful agriculture, these people will have neither employment nor the resources they need for a better life Farming the land is the engine of progress in less developed countries^[15,16]."

INNOVATION^[11-17]:

Innovation benefits should be recommended are:

1. MEDICAL SCIENCE

- Biomedical KIT
- Neurosciences & Neurobiology

- Infectious Diseases of Humans

- Non-infectious Diseases of Humans

- Immunobiology

- Human Genetics/ Genome Analysis

- Bio-Medical Instrumentation

- Therapeutics & Posology

- Vaccines & Diagnostics

- Medicine adultred reducation

- Forensic medi bio technology

- Bio medico technology

- Bio anthropology –Human lineage

2. ENVIRONMENTAL BIOSCIENCE

- Plant Biodiversity

- Microbial Biodiversity

- Pollution Management

- Bio remediation

- Afforestation & Conservation

3. ANIMAL SCIENCES

- Breeding, Embryo transfer and related areas

- Genetic enhancement, transgenics

- Diagnostics & Vaccines (improved & recombinant)

- Zoonotic diseases

- Immunobiology

- Feed and Nutrition

4. AQUACULTURE

- Breeding & Genetic Enhancement

- Feed, nutrition, pro biotics

- Culture/hatchery technologies in new and non-traditional species

- Vaccines, immune stimulants, diagnostics

- Genomics, genes of interest

5. MARINE SCIENCES

- Marine species other than Fish

- Marine Microbiology/ flora & fauna

- Extremophilic Organisms

- Genomics, genes of interest

6. FOOD SCIENCES

- Food Processing/ Packaging/ Preservation / safety

- Food Additives /Ingredients
- Food-borne diseases/ Diagnostics
- Quality Control/Assay Systems.

7. BIOTECHNOLOGY & SOCIETY

- SC/ST or Weaker Sections
- Women Oriented
- Rural Development
- Biovillage
- Enzymes Liquefying, proteolytic, maltogenic and isomeric enzymes
- Bio pesticides Nematodes, pheromones, natural products and derivatives, and insects
- Bio plastics Hospital fibers, straps, cutlery, straws, belts (natural/organic/functional), phyto-pharmaceutical
- Bio-fuels Electricity, fuel additives, methanol, ethanol *
- Bioreactors Mining, enzymes

8. BIOINFORMATICS, BIOCOMPUTING, STRUCTURAL / THEORETICAL BIOLOGY, DATABASE DEVELOPMENT, ALGORITHMS / SOFTWARE DEVELOPMENT, COMPUTER APPLICATIONS FOR GENOMICS/PROTEOMICS ETC

9. AGRICULTURE & ALLIED AREAS

- Field Crop
- Horticulture & Plantation Crops
- Forestry Species, Fuel Fodder, Biomass
- Plant Molecular Biology
- Biological Control of Plant Pests, Diseases and Weeds
- Biofertilizers
- Medicinal and Aromatic Plants
- Seri-Biotechnology / Sericulture – host plants
- Tissue Culture Plants
- Biodiversity Conservation & Bioprospecting

10. BASIC RESEARCH

TABLE :- Innovative ideas and their application.

Sr.no	Innovative Ideas	Application
1.	Biomass & Biodiversity	Material produced by or remaining after the death of organism (e.g. bacteria, animal, plant) ^[31]
2.	GM technology	Such type of oil is useful for health in human body like canola oil is versatile and healthy oil for every day cooking. In such type of Modern Generation 90% cases people suffering From Diabetes ,cancer and cholesterolemic etc...Also , GIT cancer, IBS (Irritable bowel Syndrome)-so these can be prevented by healthy oil and diet. Also, GM technology can provide such type of fruits /vegetables resistant to disease or viruses that have otherwise proven untreatable ^[18-21] .
3.	Enzymatic	It containing washing powders cleans clothes at lower temperatures resulting huge energy savings. Also made up of biotech cotton shirts. So resist attaching disease via bacteria, virus or other infectious organisms. Enzymes can help reduce the amount of bleaching needed for paper production and also remove inks for paper to be recycled. Also helpful in speedup fermentation in beer ^[23, 25, 45-49] .
4.	Agricultures	Biotechnology can convert agricultural residues into advance biofuels for cleaner and more efficient transport, which will give a new income to farmers. Genetic engineering of model plants like tomato, tissue culture of cereals & pulses, isolation and analysis of genes would emerge as important items in the area of agricultural applications. To develop varieties of cassava that more efficiently absorb trace metals and micronutrients from the soil, have enhanced starch quality and contain

		more beta-carotene and other beneficial vitamins and minerals. A strain of "golden rice" that packs more and iron and beta carotene, a precursor of Vitamin A, could be on the world market within a few years - helping the more than 100 million children worldwide who suffer from vitamin A deficiency, the developing world's leading cause of blindness, as well as some 400 million women of childbearing age who are iron-deficient, placing their babies at risk of physical and mental retardation, premature births and natal mortality. fruits and vegetables that could one day deliver life-saving vaccines such as a banana that could soon deliver the vaccine for Hepatitis B, and a potato that provides immunization against the Norwalk virus - making it possible to inoculate against deadly diseases with locally grown crops that are easy to handle, distribute and administer [24,28,32]
5.	Medicines	Use of predictive biomarkers, support the identification of most effective medicines to the patient's. Orphan Medicinal Products (OMPs) only treatment for rare disease, chronicle and life threatening. Also Modern biotech medicines help multiple sclerosis patients recover a high mobility of patients. Vaccine development for infectious and vector borne diseases, e.g. Insulin is a life saving biotech medicine for patients with diabetes [27-35].
6.	Nano Biotechnology	For useful for IBS-prevented by made nanocrystals. Also stem cell treatment. In AIDS and swine flu prevented by made up of macromolecule bio-merge medicines. Also useful for Lipid nano bio technology [29-31]. Also useful in asthma –Thymol in thymus vulgarize to make (virtual crystallography suspension as well as i.v administration drug.) [50-56].
7.	Industrial biotechnology	Effective treatment technologies for water, land and air pollution, waste management and recycling, reclamation/ remediation, conservation of biodiversity emerge as life science and biotechnological applications to environmental preservation [34-42]. Medical and Scientific Devices, scientific and hospital industry such as ultra low freezers for sperm and eggs storage, thermal cyclers for biotechnology research and imaging systems such as lithotripter and magnetic resonance imager (MRI) for hospital use [49-56].

* **Biosensors** or **Enzyme Electrodes** invariably refer to such devices that sense and analyze biological information(s), namely ; blood pressure (BP), temperature, heart rate, sophisticated determination of chemical and enzymes in body fluids.

Types of innovative ideas listed below:

Sr.no	Innovations	Sr.no	Innovations
1.	Health care	2.	Human Life styles & mental fertility
3.	Genetic- modification(GM)	4.	Biomass and bioremediation
5.	Enzymatic	6.	Industrial
7.	Human source radiation reduced	8.	Waste water treatment

9.	Nano biotechnology	10.	Forensic biotechnology
11.	House treatment biotechnology	12.	Wear (clothes) biotechnology
13.	Food & agriculture Biotechnology	14.	Industrial biotechnology
15.	Cosmetic biotechnology	16.	Wireless biotechnology
17.	Waste paper treatment	18.	Fuels and carbo gas treatment
19.	Cloth washing powder	20.	GCC-global climate changes
21.	Turn bioplant technology(BPT)	22.	Marine sources
23.	Bio gas	24.	Vermiculture &vermicompost
25.	Biofertilizer from cow's dung & Birds Excreta	26.	Organic farming
27.	Municipal garbage treatment	28.	Bio –flavour technology
29.	Cosmo biotechnology	30.	Pharmacogenomics
31.	Reduced ultraviolet rays	32.	Phytoremediation
33.	Transgenic plant Horticulture	33.	Animal insemination
34.	Herbicides resistant crops	35.	Vioextractive metallurgy

Expected Results:

Biotechnology

- To be the basis for the knowledge based economy.
- To create a jobs and wealth.
- To clean up toxic wastes.
- To capture excess carbon to help reduce GCC(Global Climate Change)
- Generate clean energy sources (e.g. Hydrogen)
- To cure and prevent diseases.
- To increase survival.
- To improve patient's quality of life.
- To help the environment
- To feed the world
- To develop more efficient industrial processes.
- To make crops and animals more resistant to disease , pests and environmental conditions.
- To grow more nutritious and abundant produce.
- Incorporate vaccines into food products.
- To improve inside as well as outside environment

- To return to the plant based economy.
- Reduces impact from pesticides.
- To optimize renewable resources
- To be competitive

Innovation for the benefit of patients e.g. Human insulin – for treatment of Diabetes, Monoclonal antibody (**MABs**)–for treatment of cancer.

CONCLUSION

In innovation various types of application under biotechnology are: food & environment security, improveness of biological product safety and greeny biology and Discard biomass and convert into bio-diversity. The main purpose of the advance technology produces health safety and keep maintain environmental condition and minimization risk of hazards and clean up to toxic wastes, enhancing modern technology which is useful to safety and maintaining life sciences. This all are effort send to our government.

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