Imapct of biotechnology

Technology

On the engineering side it leans heavily on process chemical and biochemical engineering since large scale cultivation of microorganisms and cells, heir down stream processing are based on them. It comes to us as a great blessing. A branch of science that utilizes and manipulates microorganisms for the welfare of mankind Is biotechnology. It uses technique that can modify the products, Improve qualities of plants and animals and also products generated from microorganisms. Biotechnology Is the applicative part of biology that Is multidisciplinary In activity.

Everybody these days are aware of different vaccines, protocol foods, genetically modified foods, biotechnological vegetables, different enzymes and medicines but very few know the technology associated behind these products. Biotechnology utilizes the technique called genetic engineering or recombinant DNA technology where a microorganism is isolated; its genetic material is cut, manipulated, sealed, again inserted in an organism and allowed to grow in a suitable environment under controlled conditions to get the desired product.

It looks easy but is a very tedious Job and it takes years for a research to achieve its goal. Humbling, the human insulin is a good example of biotechnological product. Earlier insulin was isolated from pigs but now days Insulin is produced by genetic engineering where microorganisms are expansible for the production of insulin. That’s why today the rate to Insulin demand Is equaled the production rate. Biotechnology has contributed towards the exploitation of biological organisms or biological processes through modern techniques, which could be profitably used in medicine. Agriculture, animal husbandry and environmental cloning. History of

Biotechnology: For thousands of years human beings have used microorganisms to make products – and in so doing have practiced biotechnology. Just as in the past the development of beer, bread and cheese were major breakthroughs, another revolution is now about o overtake medicine: compounds produced using biotechnological methods are opening up entirely new possibilities in medical diagnostics and therapy, and In so doing are bringing about a major restructuring of markets. Biotechnology has led to the development of antibiotics.

In 1928, Alexander Fleming Alexander Fleming antibiotic by Howard Floret, Ernst Boris Chain and Norman Heathery penicillin infections in humans. Rising demand for befouls is expected to be good news for the biotechnology sector, with the Department of Energy Department of Energy estimating ethanol ethanol usage could reduce U. S. Trolled-derived fuel consumption by up to 30% by 2030. The biotechnology sector has allowed the U. S. Farming industry to rapidly increase its supply of corn and soybeans? the main inputs into befouls? by developing genetically modified seeds which are resistant to pests and drought.

By boosting farm productivity, biotechnology plays a crucial role in ensuring that befoul production targets are met. Impact of Biotechnology in Human welfare: Biotechnology has applications in four major industrial areas, including health care (medical), crop production and agriculture, non food (industrial) uses of crops and there products (e. G. Biodegradable plastic, vegetable oil, befouls) and environmental uses. A series of derived terms have been coined to identify several branches of biotechnology, for example: Red biotechnology is applied to medical processes.

Some examples are the designing of organisms to produce antibiotics, and the engineering of genetic cures through genomic manipulation. Green biotechnology is biotechnology applied to agricultural processes. An example is the designing of transgenic plants to grow under specific environmental conditions or in the presence (or absence) of certain agricultural chemicals. White biotechnology , also known as industrial biotechnology, is biotechnology applied to industrial processes. An example is the designing of an organism to produce a useful chemical.

Another example is the using of enzymes as industrial catalysts to either produce valuable chemicals or destroy hazardous/polluting chemicals. Blue biotechnology is a term that has been used to describe the marine and aquatic applications of biotechnology, but its use is relatively rare. Biotechnology in Medicine: Biotechnology is a very vast field and its applications are used in various fields of science such medicine. Medicine is using biotechnology techniques so much in diagnosing and treating different diseases. It also gives opportunities for the people to protect themselves from dangerous diseases.

The field of biotechnology, genetic engineering, has introduced techniques like gene therapy, recombinant DNA technology and polymerase chain reaction which use genes and DNA molecules to diagnose diseases and insert new and healthy genes in the body which replace the damaged cells. There are some applications of biotechnology which are playing their part in the field of medicine and giving good results: Pharmacologists Genetic testing cloning Pharmacologists: It is a word coined the word “

pharmacology” and “ genomics” comes from. Because of the relationship between pharmaceuticals and genetics study.

To design and said that each person’s genetic makeup to optimize the production of drugs is able to have their eyes pharmacologists. Pharmacologists results in following advantages: Custom development of drugs. Use pharmacologists, pharmaceutical companies of protein drugs, enzymes and specific genes and diseases associated with RNA-based molecules can. Especially this – not only drugs but also to maximize he therapeutic effects of surrounding healthy cells reducing the damage had been promised. Determination of appropriate medication doses and more accurate way.

One patient of genetics and how well doctors know the body can process and metabolize medicine will be able to identify. Maximize the value of drugs and more likely to be less. To improve the drug discovery and is in the process. Possible treatments for easy searching of the target gene will be used. Many genes associated with diseases and disorders are. With modern biotechnology, these genes to develop effective new therapies in the form of an objective, which is an important drug coverer process can be used is small. Improving vaccines. Vaccines Safe and can be designed through genetic engineering organisms produced by the change.

Vaccines without the attendant risk of infection, the immune response should be brought to light. It is durable, easy to store, is cheaper and the potential of several strains of the pathogen at a time to engineer it. Genetic testing: Electrophoresis prison Genetic control of the direct examination of

the DNA molecule itself is involved. A scientist of the mutated sequences of DNA samples for scanning a patient. The probes of the genome of a person in the middle of the base pairs will complete their search. If the mutated sequence in the genome of the patient and the flag should check the barrier mutation is present.

Researchers in a second type of gene in a patient for the disease in healthy individuals or their descendants, by comparing the sequence of DNA bases of the gene can test. Genetic testing is now used for: carrier selection, or an illness that must receive a copy of the gene affected individuals appear to recognize the disease for two copies; Conformational diagnosis of symptomatic individuals Sex determination; Forensic / identity testing; Prenatal diagnosis of choice; – The principle of risk assessment of cancer in adults Parasympathetic testing; Adults – the beginning of the disturbances Parasympathetic testing for prediction.

However, most of those used in developed countries already have some genetic tests are available. The test is currently rare genetic disorders such as cystic fibrosis mutations, including sickle cell anemia, Huntington disease and to identify relevant information available. Recently, more complex test conditions, and a handful of breast, ovarian, such as changes to the detection and collaborate cancer has plopped. However, gene tests, and different people and different people may present a particular risk situation, because all the mutations are still too many to ignore them can not be identified.

Gene therapy: A new gene, the modified DNA in a human cell to implement an dinosaurs vector used is placed on. If treatment is successful, the new gene will make a functional protein. The gene therapy or even therapy, genetics and treatment of diseases such as cancer and AIDS, acquired to complement or replace defective genes or to enhance general immune function of the project using the usual Genes can be done. The natural (IEEE, to the body) may be used or gametes (IEEE eggs and sperm) cells. Natural gene therapy in the genome of the recipient, but has changed with the change this new generation did not pass.

Instead, gremlin gene therapy by parents of sperm and ova for their offspring for the purpose of the transmission change is change. Initially there is a gene therapy treatment are two ways to apply: East vivo, the “ body” from the waist – the cells of the patient’s blood or bone marrow are removed and grown in the laboratory. Then, a virus carrying the desired gene are in contact with. The virus and cells that enter the cells of the desired gene comes part of DNA. The cells in the laboratory to the patient by injection into a vein before being returned have been allowed to develop.

Vivo, which “ entity” within the meaning of – not the cells are removed from the body of the patient. Are used. Cloning: Cloning involves the removal of the nucleus from one cell and its placement in an unfertile egg cell whose nucleus has either been deactivated or removed. There are two types of cloning: 1 . Reproductive cloning. After a few divisions, the egg cell is placed into a uterus where it is allowed to develop into a fetus that is genetically identical to the donor of he original nucleus. 2. Therapeutic cloning.

The egg is placed into a Petri dish where it develops into embryonic stem cells, which have shown potentials for treating several ailments. In February 1997, cloning became the focus of media attention when Ian Willet and his colleagues at the Rossini Institute announced the successful cloning of a sheep, named Dolly, from the mammary glands of an adult female. The cloning of Dolly made it apparent to many that the techniques used to produce her could someday be used to clone human beings. This stirred a lot of controversy because of its ethical implications.

Biotechnology in Agriculture & Food: Genetic engineering can be used to modify the genetic compositions of plants, animals, and microorganisms. The number of genes that have been isolated and are available for transfer is growing daily. Some of the most important commercial application of biotechnology are discussed below. Crop yield: Using the techniques of modern biotechnology, one or two genes may be transferred to a highly developed crop variety to impart a new character that would increase its yield.

However, while increases in crop yield are the most obvious applications of odder biotechnology in agriculture, it is also the most difficult one. Engineered crops: The most widespread application of genetic engineering in agriculture by far is in engineered crops. Thousands of such products have been field tested and over a dozen have been approved for commercial use. The traits most commonly introduced into crops are herbicide tolerance, Insect tolerance, and virus tolerance. Herbicide tolerance: Herbicide tolerance allows crops to withstand otherwise lethal doses of herbicides, cannot be used on crops.

By offering crops tolerant to herbicides, chemical companies can expand the market for their products. Indeed, the major developers of herbicide-tolerant plants are companies that sell herbicides. The current set of commercially available herbicide-tolerant crops is tolerant to three herbicides based on three active ingredients: broiling, glasshouse, and agglutinates. Insect Tolerance: All of the commercially available insect-tolerant plants contain a version of the toxin Bacillus thirstiness (Bat), which is found in nature in soil bacteria.

Bat toxins are highly effective for many pest organisms, like beetles and moth larva, but not toxic to mammals and most other montage organisms. A major concern among farmers and environmentalists is that wide use of Bat crops will lead to the rapid development (over the course of perhaps as few as three to five years) of resistance to the toxin. If resistance develops, the Bat toxin will be useless as a pesticide. In this case, the environmental benefits of the product will be short lived. Virus tolerance: The third major application of biotechnology to crops is virus tolerance.

These crops contain a gene taken from a virus. By a process that is not well understood, plants that produce certain viral proteins are able to fend off infections by the viruses from which the proteins were taken. Two virus-tolerant crops are currently approved for commercial use, papaya and squash. The squash, which is resistant to two viruses, is currently off the market. Although it is difficult to get information on why products are not on the market, it is possible that the squash did not perform well enough in the field to capture market share..

The Benefits: The potential benefits include solving world food shortages, and improvements in medicine, agriculture, and veterinary sciences. We can confidently expect biotechnological solutions to many essential industrial processes that currently reduce toxic effluents. An increasing role for biotechnology in environmental management will undoubtedly follow. Because the prospect of serious baseboards appears to be receding, it does not mean that strict regulation of the new technology should be relaxed. Provided such vigilance is maintained, mankind can look forward to a wide range of exciting prospects that stem from biotechnology.

Negative Impacts of Biotechnology: The Environment: One of the most prominent dangers of genetic engineering is the loss of biodiversity. Even if the introduction of genetically modified organisms would not dramatically increase the loss of diversity that is currently caused by humans around the world, it would certainly not help to protect biodiversity either. Throughout history farmers have always selected the most productive, resistant and superior varieties of crops, thereby diminishing the diversity of plants that are being cultivated.

The biggest part of biodiversity loss is due to the deforestation and pollution of biodiversity rich fungicides and herbicides that are the main issue we should be concerned about. It is the major selling point of some engineered crop varieties that is the major problem for biodiversity as well. Some genetic modifications have been made on cotton varieties, making them resistant to very effective herbicides. These cotton plants are wanted since they minimize the cost and maximize the efficiency of the herbicide at the same time.

But this efficiency is what is worrisome from an ecological perspective since those herbicides kill every single plant they reach which in turn impoverishes the biodiversity on cultivated fields. The Economy: The use of genetically engineered crops has raised much concern from an economic perspective. Since the research and development of genetically engineered organisms is a very costly process, companies developing those products need to cover their endured costs by ensuring that their technology is patented and protected from illegal appropriation.

Monsanto, the world’s biggest agricultural and chemical corporation, constantly faces this problem. Since the reproduction of plants is a natural process, it is a rather challenging task to invent a method that would only confer the benefits of genetically modified organisms to the buyer of the product. However, Monsanto has found a way to protect its technology. Indeed, it has created seeds that produce infertile crops. The introduction of this “ terminator” or “ suicide” gene (a seed type which can only be used because of its self destructive features) into the genome of the seeds has been widely criticized by many different interest groups.

The suicide makes gene it necessary for farmers to buy seeds annually from the biotech company. This is a step away from the traditional seed saving practices used in most African agriculture. It creates a dependency upon biotech companies which is not in line with Africans wish to become self sufficient. The overall economic effect of biotechnology it that is creates larger farmers and therefore more fewer people are in charge and profiting from Agriculture.

In other words, biotechnology invites the transition from small farms which serve as a lively hood to large farms, concentrated wealth and agribusiness. Conclusion Some of the key contributions of biotechnology to the human welfare are monoclonal antibodies, DNA probes, recombinant vaccine, valuable drugs like insulin, gene therapy, authentication, fingerprinting in the field of medicine, transgenic plants through genetic engineering, molecular markers, germless conservation, rapid clonally multiplication through merriest culture, rapid isolation of homozygous line in he field of plant biotechnology.

Hormone induced super ovulation and/or embryo splitting in farm animals for multiplication of animals of superior genotypes and production of transgenic animals are to name a few in animal biotechnology. Efficient sewage treatment, degradation of petroleum and management of oil spills, insect pests are the fancied areas of research in environmental biotechnology.

Production of useful compounds like ethanol, lactic acid, glycerin, citric acid, cloning acid, acetone etc. , production of antibiotics like penicillin, streptomycin, orthorhombic and mineral extraction through leaching from low grade ores are some of the areas in industrial biotechnology in which extensive works are going on.

Biotechnology for Human Welfare are to provide a major interdisciplinary forum for presenting new approaches from relevant areas of bio science and technology, to foster integration of the latest developments in scientific research into engineering applications and to facilitate technology transfer from well tested ideas to practical products and remedial processes. This

conference will bring forth the latest developments in bio science and technology.