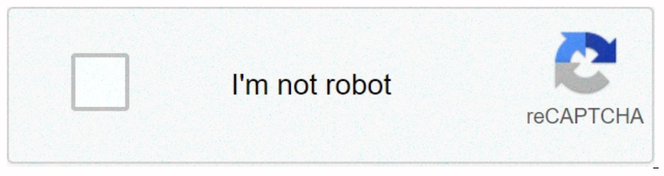

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Biotechnology and genetic engineering project pdf

Science Friends will perform maintenance on Tuesday November 24, 2020 at 10pm PST for two hours. During this time, our site and services will not be available until we improve your future experience. Thanks for the patience! Experiment in genetic engineering by changing DNA with the purpose you choose, or test foods that have been genetically modified. Free science fair projects. Genetically Engineer Yeast is a Fluorescent Science Fair Project Idea Genetically Modified Organisms: Create Glowing Bacteria! Science Fair Project Idea CRISPR Gene Editing Escherichia coli Science Fair Project Idea Science Fair Project Idea No Genes for Genetic Diseases: What Kind of Mutations Matter? Science Fair Project Idea Sweet Sequence: Cocoa Genome Science Fair Project Idea Science Fair Project Idea Science Fair Project Idea Genetically Modified Foods Science Fair Project Idea The term biotechnology dates back to 1919, when Hungarian engineer Karl Ereky first used it as any product produced from raw materials with the help of living organisms. Using the term in the broadest sense, biotechnology can be traced back to prehistoric times when hunters began to settle down, plant crops, and breeds for food. Ancient civilizations even found that they could use microorganisms to make useful products, although of course they had no idea that they were microbes that were active agents. On B.C E 7000, Sumarians and babylonies discovered how to use yeast for beer, and oenation dates from biblical times. About B.C.E. 4000, the Egyptians found that the addition of yeast produced mild, fluffy bread rather than a thin, hard waffle. At the same time, the Chinese added bacteria to milk to produce yogurt. Genetic Engineering versus BiotechnologyFor much, the term biotechnology often equates to manipulation of genes, but, as Ereky's definition suggests, this is just one aspect of biotechnology. For more specific gene manipulation techniques, the term genetic engineering is more appropriate. Genetic engineering was built in the 1970s. At that time, molecular biologists developed methods to isolate, identify, and clone genes, as well as mutate, manipulate, and insert them into other species. One of the key elements of such research was the detection of restriction enzymes . These enzymes are able to break DNA in a limited sequence in specific places and often leave sticky ends. Isolated DNA from any organism can be cracked by a restriction enzyme and then mixed with a vector preparation that is cracked with the same limit of endonuske. Under a sticky ending, a hybrid molecule could be created containing a gene of interest that could then insert such a cloning vector. The importance of limit endonucleases was recognized in 1978 by awarding the Nobel Prize in Physiological or Medicine to Werner Arber, Daniel and Hamilton Smith for discovering these enzymes. Further advancements and ethical concernsSure experiment to combine various DNA molecules was conducted in 1972 in the laboratory of Paul Berg (who shared the 1980 Nobel Prize in chemistry for this work). The following year Stanley Cohen and Herbert Boyer combined viral DNA and bacterial DNA into plasma to form the first recombinant DNA organism. Understanding the potential dangers of moving genes from one organism to another, about ninety important scientists whose laboratories were ready to begin cloning experiments met in 1975 at the Asilomar Conference Center in California to discuss possible threats to gene manipulation. This meeting, in which scientists acknowledged and openly discussed the consequences and potential threats of their research before this research was actually launched, was unprecedented. The result of the Asilomar conference was to call and agree on a one-year moratorium before cloning experiments were conducted. It was time to develop guidelines for the physical and biological isolation of recombinant organisms to ensure that they do not enter the environment, and if they did so, to ensure that they would be weakened so that competition with naturally occurring organisms would not survive. By 1976, then, gene cloning was in full swing around the world. The main technical achievements in diapers in biotechnology were marked by the development of the main research methods. In 1976, Herbert Boyer and Robert Swanson founded Genentech, the first biotechnology company to use recombinant DNA technology in developing commercially useful products such as drugs. The year 1977 is considered the dawn of modern biotechnology, as it was this year that the first human protein was cloned and produced using genetic engineering technology: Genentech reported cloning of the human hormone somatostatin. This year it was also important to develop the technique of DNA sequences achieved by Fred Sanger and Walter Gilbert (who shared with Paul Berg the 1980 Nobel Prize in Chemistry). In 1978 Genentech was able to isolate the genes of human insulin and begin clinical trials leading to the validation and marketing of the first genetically engineered drug for human use. It was a great achievement. Diabetes, the seventh leading cause of death in the United States, affects millions of Americans. In the past, insulin was extracted from the pancreas of cows or pigs and was then used to treat diabetic diseases. Although insulin in these species is very similar to human insulin and was effective in humans, the small differences between human and animal insulin were sufficient to cause problems in some patients. Often patients developed immunological reactions to foreign proteins, reducing its effectiveness. With the availability of genetically engineered human insulin, these problems were eliminated. Patents and rise of biotechnology companies1980 The U.S. Supreme Court provided an important impetus to the development of biotechnology companies. In diamond v. case chakrabarty, the court ruled that biological materials can be patented. Thus, private companies could expect significant profits from the therapies they developed using genetic engineering techniques. Among the new companies to take advantage of the court ruling was the Chiron corporation, which cloned the protein that formed the outer coat of the human hepatitis B virus. This protein, which can now be produced without the virus it normally adds, provided material for the development of the first human vaccine using recombinant DNA technology. The hepatitis vaccine has been available 1987.In the same year, the Food and Drug Administration (FDA) approved the Genentech drug tPA (tissue plasminogen activator). It is a human blood protein that helps dissolve fibrin, the main protein involved in the formation of blood clots at the site of the injury. Once the healing process is complete and clotting is no longer required at the site of the injury, the body usually releases a tPA to activate an enzyme called plasmin that dissolves fibrin. However, it was found that tPA can also be used as a powerful drug in the treatment of certain heart attacks. Sometimes a blood clot forms spontaneously in the body. When a clot forms or submits to the coronary artery of the heart, the clot blocks blood flow to the heart muscle as a result of what is commonly called a heart attack. If tPA is given to such patients within four hours of starting, recovery is truly remarkable. Such patients can leave the hospital the next day with little or no postexermism of a heart attack. A patient who is not treated with tPA often stays in the hospital for a week or more and cannot resume normal operations until after a long recovery period. The drug is then approved for use in patients suffering strokes from a blood clot in the brain with similar success. Biotechnology has also been successful in the development of other useful products. Today, many laundry detergents contain protease, enzymes that remove stains by digesting stain protein ingredients. However, such enzymes are inactivated by bleach. In 1988, the biotechnology company Genecor received approval for a bleach-resistant protease. This was done by isolating the gene for protease and then using spot-oriented mutgenesis, changing the gene so that the corresponding protein was no longer susceptible to bleach inactivation. Biotechnology has also had a major impact on agriculture. The first genetic engineering company was patented in 1983. The first genetically engineered food was produced by a company called Calgene, in 1987. Calgene, which is now part of Monsanto, produces tomatoes that could be matured on vines and transported to the ripe market. Tomatoes are usually sent green to the market and left to ripen during it because they are easily bruised and damaged when shipped when fully ripe. Today, a new green revolution is taking place in which genetically modified food will provide more food and higher yields, while reducing the use of fertilisers and herbicides. Although there is considerable controversy around these foods (sometimes referred to as Frankenfood), there have been no documented cases of anyone being hurt while eating them. In 1990, the biotechnology company GenPharm created a transgenic dairy cow in which human milk protein genes were inserted. Milk from such cows will be used for the manufacture of infant formula. Biotechnology and LawBiotechnology have also made a significant contribution to law. In particular, scientists have developed sophisticatedly sensitive methods for identifying DNA. Indeed, with the invention of the polymerase chain reaction in 1988, enough DNA can be obtained from a drop of blood, a tiny shred of skin, a single hair, or a small semen sample to identify the person from which it originated. This genetic fingerprinting was developed in 1984 and was first used in the trial in 1985. However, during the 1990s, the genetic evidence of the courtroom became commonplace and the court's lawyers, judges and juries accepted. In fact, several innocent people were released from prison, which resulted in the repeated transfer of evidence using DNA fingerprints. The human genome ProjectIn in 1990 molecular biologists around the world began working on what ranks as perhaps the greatest breakthrough in biotechnology, the Human Genome Project, in which more than 3 billion nucleotide DNA in the human nucleus was eventually sequenced. Although DNA sequencing began in 1977, it was the development of automated DNA sequences and powerful computers in the 1990s to store and analyse the data that made the project possible. The first human genome project was completed in 2001. With the complete sequence available, scientists will be able to mine genomes to find important gene products and develop specific drugs to target gene products. The twenty-first century will see huge new developments through biotechnology.see also Agricultural Biotechnology; Bioinformatics; Biotechnology; Biotechnology entrepreneur; Cloning genes; Cloning organisms; genetically modified food; Genomics industry; Human genome project; Mutagenaze; Patenting Genes; Genetic engineer of plants; restriction enzymes; Sangers, Fred.Ralph R. MayerBibography Alkamo. DNA Technology: Awesome Skill, 2nd ed. Life exploits: a history of Biotechnology. Cambridge, United Eighth University Press, 1983.Weaver, Robert F. Molecular Biology, 2nd ed. New York: McGraw-Hill, 2002.