

Essay on biotechnology products

[Science](#), [Biology](#)



1. 0 Biological Pacemaker

Pacemakers are electronic devices implanted in individuals with bradyarrhythmias (abnormal heart rhythms) to monitor and regulate heart muscle contractions. Biological pacemakers have been developed that will involve the injection of pacemaker genes from stem cells into damaged heart tissues to restore normal function and heart rhythm. The biological pacemakers are designed to down regulate the expression of the hyperpolarization activated cyclic nucleotide gated (HCN2) channels and the potassium current as well as up regulating the β 2 adrenergic receptors. The adoption of biological pacemakers over the electronic pacemakers offers various advantages. Electronic pacemakers require battery powering and maintenance while the biological option does not. Biological pacemakers are also advantageous because they can withstand and allow for greater physical exertion by the individual who has received the gene therapy. However there is need to undertake more long term studies on the potentials risks involved (infectiveness and carcinogenicity) as well as the durability of the pacemaker functions of the biological genes is also a major issue.

2. 0 SMaRT: Tooth Decay- fighting Microbes

Tooth decay results from the erosive action of lactic acid produced by oral bacteria upon conversion of sugar remnants present on teeth. ONI BioPharma(Oragenics) have developed SmaRT, a strain of bacteria that do not produce lactic acid but instead release antibiotics that kill the harmful lactic acid producing bacteria strain present on teeth. SMaRT is a brilliant and revolutionary idea as the particular bacteria strain used to antagonize

the tooth-decay causing bacteria is a modification of the natural occurring strain found in the buccal cavity which assures minimal possibility of an adverse reaction. The icing on the cake of SMaRT however is the fact that it requires only one application to the teeth by a dentist to be effective for the entirety of one's lifetime.

3.0 Goats with Spider Genes

Spiders produce silk that is the strongest and toughest fiber known to man. It is stronger, lighter and more flexible than steel. Nexia Biotechnologies has bred goats with spider silk producing genes that will be expressed in unlimited quantities in the goats' milk. The 'silk milk' will then be used to produce biosteel which will have application in aircraft and racing vehicle manufacture as well as in manufacture of bulletproof clothing. Biosteel is tough and compatible with humans and would be useful in fabrication of artificial limbs, ligaments and tendons. It is also thin enough to be used to make sutures suitable for eye and neurosurgery. The biosteel can also be woven into material useful for a variety of applications. The potential benefits of biosteel are clear and therefore it is a biotechnology product worth pursuing.

Biotechnology is a highly controversial issue in this age and raises a myriad of ethical issues. This particular scientific field is growing in leaps and bounds producing answers to a lot of the medical, agricultural, industrial and environmental problems currently assailing our generation.

Biotechnological advancements promise better health. Examples of these are gene therapies that correct natural occurring genetic defects that would

otherwise limit the quality of life of individuals that suffer from them.

Biotechnology promises food security with development of crop and animal strains with increased productivity and resistance to adverse climate as well pests. The environmental benefits are also clear with production of oil consuming bacteria that could reduce the deleterious effects of oil spills.

Biotechnology however also poses a number of risks such as the creation of new genetic strains that may eventually be harmful to our health or environment. The pushing and skirting around ethical boundaries by unscrupulous individuals could result in the production of biotech products that could devastate the human race if used wrongly. GMOs have been speculated to lead to diseases such as cancer. The most talked about disadvantage of biotechnology is associated with the unpredictable long-term effects of inserted genes. There is no certain way to determine what would result from consuming GMOs in the long term.

In conclusion I believe the potential advantages of various biotechnology innovations by far outweigh the disadvantages and would like to see a wider application of these innovations. Increased food security and advancements in healthcare are more important than what mostly consists of unsubstantiated claims and fears concerning the evils of biotechnology. Governments and policy making entities should however outline clear legislature and guidelines on the application of biotechnology and create ethics bodies charged with monitoring the same.

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