Available online at www.ijrbp.net

DOI: http://dx.doi.org/10.18782/2322-0392.1301

ISSN: 2322 – 0392

Int. J. Rec. Biotech. (2021) *9*(2), 1-5

Review Article

International Journal of Recent Biotechnology

Peer-Reviewed, Refereed, Open Access Journal

Genetic Engineering – A World Revolutionizing Branch of Biotechnology

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Received: 18.04.2021 | Revised: 24.05.2021 | Accepted: 5.06.2021

ABSTRACT

Genetic engineering is considered the best technique that is boosting the world globe and hence this technique is practical on the many more plants, the animals and the microorganisms. It has well-considered wide uses in the fields of the Biology, the Medicine, Industries, Researches, Agriculture fields and so many other disciplines of the science. This new technique of the genetic engineering is produced the recent higher-ranking status to the Biotechnology field. So, the new technique produces a good chance to change genetics of the organisms via DNA incorporations. To obtain maximum result and successes in the genetic engineering, it is need of time to be well expertise in the processes and then here will good protocols. When we become able and we smear these techniques in a very attentive way, and so then we easily explain the solutions of problems of the Healthiness, Foods, Animal and Plant. Genetic engineering contains no boundary and limitation, it is considered a very vast discipline and then there is the road of the successes in it. So, in that review paper, progress in field of the Genetic engineering is to be discussed very briefly.

Keywords: *Genetic Engineering's role, DNAs, Biotechnology.*

INTRODUCTION

Everyone have knowledge to well understand the key point word 'Gene' so because they are very diverse and responsible for the numerous characters of living organisms. So, then question comes up that why we require genetic engineering? Then the answer is so much easier because via it we can do incorporation of our desired trait and the characteristics in to the living organisms. Genetic engineering has set of the different technologies that are utilized for the straight genetic alterations of organism or the different population of the living organism by utilizing of the recombination's of the DNA. It is so very possible to the direct insertion of the outer DNA particles into genomes or to expel the DNA particles for the benefits of the humans.

General Tools Being Utilized in the Field of Genetic Engineering:

According to the Zuker et al. (2016), there have many numerous technologies that are being utilized in the field of the genetic engineering. Some of the technologies are being expressed here.

Cite this article: Chaudhry, U.F., Khalid, M.N., Nadeem, M., Amjad, I., Saeed, M.S., Hussain, Z., & Awais, M. (2021). Genetic Engineering – A World Revolutionizing Branch of Biotechnology, *Int. J. Rec. Biotech.* *9*(2), 1-5. doi: http://dx.doi.org/10.18782/2322-0392.1301

Recombinant DNA Technology: that is considered a very old-fashioned methodology being utilized in the genetic engineering. So, in this technology, plasmid or vector is utilized to shift the genetic materials in the host cells. Normally, virus and bacterium are utilized for the vector purpose. Bacterium contains extra chromosomal DNA in the shape of the circular DNA that is so called the plasmid. In the recombinant DNA tool, gene of the interest creates a round shaped when gets incorporated in the plasmids. Then, the plasmid initiates multiplying inside of the bacterium and creates many genetic copies with in specific time and these plasmids live aside with the own genetic makeups. It has hence transferred in to host cells where it searches the nucleus moreover discharges its genes of interest in nucleus. These genes of the interest combine with its genetic material of the host cells and very easily depicts its belongings by the procedures of the transcriptions and translations. Normally, Insulin is synthesized via these techniques.

Bio-ballistics Technique: It is considered another important technology of genetic engineering in that technique metals like silver coated along with the desired genes are being used. These metals which are silver coated along with the genes which is so smaller than a cell is being loaded with the shot guns. These shot guns straightly target the desired cells and shifts its genetic materials into the host cells. It locates in the nucleus and then finds the genomes of the host cells and does perform its required function.

Microinjection Technique: In this technology, a glassy micropipette is hold to shift the desired genes into humans or animal cells. These techniques do not require any plasmids or vectors to shift the gene of the interests but in this methodology, genes of interest are inserted into the glassy micropipette that is in the size equal to animals, plants or human cells. Then, the DNA finds it's a way inside host cells and easily finds the nucleus where the foreign DNAs perform their functions.

Electro and Chemical Porations Methods: It is named as another very vital technology that is utilized in the discipline of the genetic engineering so that in which these cells are synthesized porous because by these genes can be shifted with very ease. These holes are prepared into the cells by bathing them into special chemicals or by completely bathing those with electric currents. Via these pores, genetic materials get injected into these holes of cells and searches the nucleus and so enhances with the host cells genome and thus, performs its functions and then expresses these desired characters in the matter of genetically engineered modified organisms.

Current Revolutions in the Field of the Genetic Engineering

There are much more advanced revolutions in the field of the genetic engineering. Certain of those revolutions are being expressed below:

There are many struggles made to shift the textile characteristics into microorganisms with in which textile characters are being transferred with in the microorganisms. So, those are very speedy reproduced via the fermentation processes. So, the DNA is being transferred within the bacteria that is the spider kind and enables the bacteria to create proteins with in the strength characters produced silks for the utilization in these vests.

According to the Montaldo Hugo (2010); Cystein is the amino acid that is the limiting factor for the wool manufacturing. So, there had made the first attempt to enhance the productions from shifting cysteine productions genes from the bacteria to sheep genomes then there it is modified into the wool of the sheep for obtaining the higher quality fibers.

Viruses are being engineered to synthesize infections and the alterations in the DNA of the special cells of the human body. Thus, it can be synthesized with their own medicines. Due to the abilities in the human bodies, every disorder may be treated very easily. Hemophilia can be easily treated via gene therapy that is a revolution in fields of the genetic engineering.

Crops can be genetically engineered for the drought environment. According to the

Ortiz et al. (2012); with the successfully engineered plants likewise maize, rice, cotton and the wheat etc. may be produced by genetic engineering via utilizing the *DREB* likes genes. Then there is the good news for the futures of the cereals crop because by genetic engineering researchers will be able to create such varieties of the cereals that will be utilized highly drought resistant varieties and the farmers will be capable to create them in the drought environments. It will become highly attractiveness for the farmers because that is certain a character that is very tough to do the shifting in the plants because of the genic natures because it is systemized by the polygenes.

Human Embryo Stem Cells may be easily genetically modified via utilizing the Lentiviral vectors. The *hES* present in it has very valuables Human Embryonic Cells has stronger roles in the disease treatments. They are these cells that are utilized in the body of humans when those cells or the tissues of the body get destroyed, and then these are utilized as repairing sources. The cell has the abilities to generate and to make differentiated in vitro for to manufacture the hematopoietic, neurals and endothelial, cardiac and trophoblasts cells. A major obstacle in the consumption is this there are slower efficacy of sites directed differentiations into the differentiated cells.

There is the revolution in field of the Livestock due to the genetic engineering. Laible (2009) researched those expressions of these monoclonals antibodies identifying the special pathogens can be easily used to shift diseases tolerant character into livestock. By utilizing those antibodies, there is the good way for to conserve the immunities of the livestock and by these methodologies we are capable to cure different disorders in livestock like neurological diseases etc.

Another disease is Mastitis, the infections via bacteria in the mammary glands is considered one of devastating disease and is highly severe in the agricultural industries. These animals are greatly infected and so are died in time. That is caused through *Staphylococcus aureus* in the dairy cattle. It is considered very dangerous pathogen attack and is tough to overcome it via antibiotic treatment as it survives in the intracellular ways. Laible (2009) searched that Lysostaphin is the enzyme that occurs naturally in the Staphylococcus simulants that is endopeptidase it cuts or cleaves the cell walls part of the Staphylococci. It has numerous characteristics of the antimicrobial effect and may be utilized for the treatment of Mastitis. These enzyme applications tests were first adopted in the mouses successfully. By the genetic engineering, the cattle are able to produce Lysostaphin in the milks and there are observed increased degrees of the safety against the *S. aureus*.

Trees are genetically engineered too to produce environments as well as economics benefits. According to the Pena and Seguin (2015); viral sequences may be easily presented in the trees via those plants are ready against the viral infection and these have stronger immunity against the viral infection. We shall pick example here about coat proteins genes of the Plum Pox virus *PPV* that are utilized in the Prunus plant give higher level of the tolerant against that virus. This is so called because of the posttranscriptional genes silencing. There are many more technologies that are being utilized in that regard.

Chen et al. (2005) studied that the defense systems of the antimicrobial peptide that are normally over expressing in the insects, plant and mammal. Those are important parts of the human immune systems. Getting peptide is expensive and their presence is also highly limited. Human defensins are synthesized via genetic engineering. This methodology is preferred for the manufacturing of the defensins. There is a lot of the effort to produce improvement in expressions efficacies of the human defensins.

Genetic engineering is also being utilized to alter the biomass characteristics. Their efforts are made to create more bioethanol from *Zea mays* (Maize). According to Torney et al. (2007); 2 main portions of the maize plant may be transferred towards the bioethanol. These

portions are kernels and stover. Kernels are composed of the starches and stovers is containing of celluloses or lignin. To get the ethanol, these portions are being converted into the fermentable sugars. For this best work and research, there are much more efforts which are being made to utilized genetic engineering to obtain more bioethanol. One method is to change the characteristics of the cellulose and the lignin or starch. By this way, we are able to get much by-products rapidly. Other way can be introducing these biomass conversions enzymes into the plants, then these easily help the conversions processes very well.

Abiotic stress causes increased level of the salty soils, lesser amounts or higher amounts of the water availabilities and the different temperatures systems. Those abiotic stresses may cause great losses of the plant biomasses. It heavily impacts the plant yields as well as when we shall obtain reduced plant biomasses, then direct we shall get decreased yields. According to Grover et al. (1999); transgenic tobacco crop plants were being cultivated for combating with these abiotic stresses like boosted cold and salt stresses. Now, these transgenic plants are produced that are very resistive to the water stresses, drought stresses and temperatures stresses. By genetic engineering, we may also enhance the osmolytes quantities inside the cells to encounter with abiotic stresses situations.

Milk is much useful dietary part for the human fitness and is being utilized in the body functioning. There are many components that are presently in the dairy milks. Those components are heavily modified via genetic engineering to boost up the qualities of the milk. In adults, the milk sugar root to the intestinal disorders because of the lacking of the enzyme called intestinal lactose hydrolyzing enzymes to dissolve milk after milk drinking. Laible (2009) studied that there may have two systems to combat these matters. One is the gene knockouts and other are gene knockdowns. In genes knockouts strategy, expressions of α-lactalbumin are completely disrupting that is causal agent for lactose free milks but in other strategies, its expressions are decreased by the RNA interferences *RNAi* resulting in the lack of the lactose but some lactose are present in the milk. This all are done through genetic engineering procedures which is a well-practiced technology by humans.

CONCLUSION AND FUTURE VIEWPOINT

Genetic engineering has both facts because it has advantages and disadvantages also. We know well that the misuses of genes are very terrible so at the same time its implications in foods, sciences and industries are so much amazing. Making clones can create issue of culture, about ethics and governments policies but we would be well-known to these facts.

The only need of time in genetic engineering's arena is to empower powerful tools and technologies. Once this issue will be clearly solved, the life of humans will be beyond the imaginations. Our lifestyles will get change and will become enabled to enjoy happy life. No doubt this is only possible via genetic engineering.

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