Gene Cloning Application in Medicine

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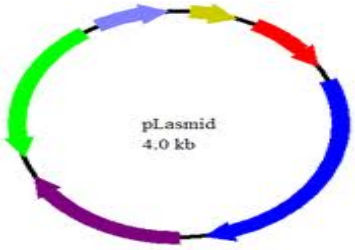
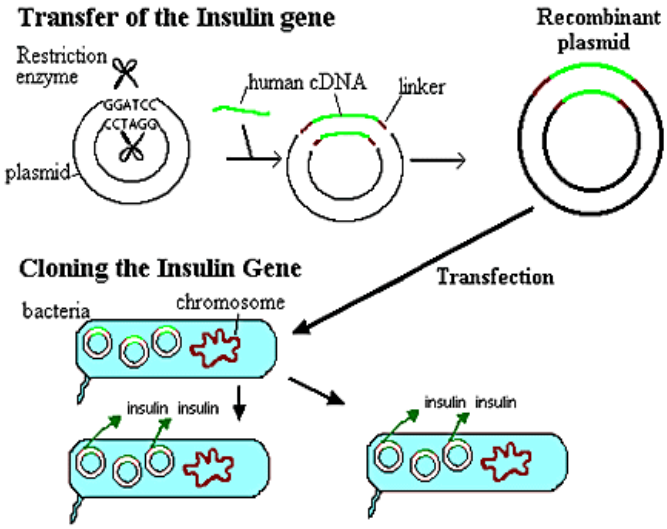
Gene Cloning



Advancement in the medical field has had its influence inDNA cloning experiments. Many human diseases and disorders can be easily traced out by the identification of the absence or presence of protein or the malfunctions of protein. Presence of extra proteins or absence of needed proteins in the body can be found out by researchers. If the patients are treated with the exact protein they can be cured.

To make it possible, we need the relevant protein in a large amount. It must be available continuously. So to treat humans animal proteins have been used. This can be done wherever possible but not all disorders can be treated with animal proteins. And some side effects have also been identified in patients like allergic symptoms to these proteins.

To produce animal proteins for human administration, a gene cloning process has been used. The best example is the insulin , Clotting Factor VIII, and interferon.



Transfer and cloning of the Insulin gene

These proteins are produced by using gene cloning. Examples for these recombinant proteins include insulin, growth hormones, clotting factor VIII, interferon, etc.. To illustrate this process, let us now discuss briefly the process of the recombinant insulin production.

Transfer of insulin gene

The transfer is done with the help of a bacterial plasmid. It carries the gene into a replicating bacterial cell which in turn produces human insulin. Let us now discuss the process.

First by using the restriction enzyme the plasmid is cut across both strands. It makes loose, sticky ends. And the DNA can then be inserted.

To fit properly into the loose ends of the opened plasmid DNA ring, special linking sequences are added to the human cDNA. That is complementary DNA. Theplasmid inserted with the human gene is termed as a recombinant plasmid can be now inserted to other organisms that are the bacterial cells being used. Now the bacterial cells and the plasmid vectors are mixed up in the organism.

Plasmids can make it entry into bacteria by thetransfection process. When the bacteria have been inserted with the rDNA molecule it will lose its uniqueness of replication. They lose the replication capacity. Only the inserted Human cDNA will start multiplying and yield number of copies.

Cells divide very quickly you know. So the human cDNA will multiply into a millions of cell soon. We can have millions of clones containing the same human gene.

Want to know more about Cloning?Click here to schedule live online session with e Tutor!

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Reference Links:

- http://en.wikipedia.org/wiki/Recombinant_DNA
- http://www.rpi.edu/dept/chem-eng/Biotech-Environ/Projects00/rdna/rdna.html
- http://en.wikipedia.org/wiki/Transfection
- http://en.wikipedia.org/wiki/Insulin

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