

Gene technology

What is recombinant DNA?

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What does a restriction endonuclease do?

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What are sticky ends?

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What does DNA ligase do?

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Why is cDNA used to make a gene for expression in bacteria?

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How do bacteria take up plasmids?

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How can a gene be put into a plant?

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How can a gene be put into an animal?

Cuts DNA at a specific recognition sequence, often leaving sticky ends.

DNA made by joining DNA from two different sources, such as a gene and a plasmid vector.

Joins sugar-phosphate backbones by forming phosphodiester bonds.

Short single-stranded overhangs at a cut that can base-pair with complementary sticky ends.

Treatment with calcium chloride and a brief heat shock makes the membrane permeable.

It is made from mRNA by reverse transcriptase and has no introns.

Microinjection into the nucleus of a fertilised egg, or viral vectors.

Agrobacterium tumefaciens (Ti plasmid) or a gene gun.

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What is the purpose of a marker gene?

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Give an example of a drug made by a GM microorganism.

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How can an animal make a human protein as a drug?

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What is a microarray?

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What does fluorescence at a microarray spot show?

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Define bioinformatics.

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State two benefits and two risks of GMOs.

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Why are patents on GM seeds a concern?

Human insulin made by bacteria or yeast.

It identifies the cells that have taken up the recombinant DNA, for example antibiotic resistance or GFP.

A slide with thousands of single-stranded DNA probes used to find which genes are active.

The gene is joined to a mammary gland promoter, so the protein is secreted in the milk.

Using computer science and statistics to store, analyse and interpret biological data.

mRNA from that gene was present, so the gene was being transcribed.

Seeds are costly for farmers and may have to be bought each year.

Benefits: higher yield, better nutrition.
Risks: gene transfer to wild plants, harm to biodiversity.