

Difference Between Recombinant and Nonrecombinant

Key Difference - Recombinant vs Nonrecombinant

[DNA](#) is the genetic material of almost all organisms. It is composed of [nucleotides](#) arranged in long chains. There are natural mechanisms and [enzymes](#) which are able to change the nucleotide sequences and structures of DNA. Hence, DNA are frequently subjected to changes. Genetic recombination, which occurs during [sexual reproduction](#), it mixes two types of [genomes](#). Genetic engineering is an advanced technology in molecular biology which artificially changes the genomes of organisms with foreign DNA. The words recombinant and nonrecombinant are used in molecular biology to describe DNA. Recombinant DNA refers to a piece of DNA which combines with another foreign DNA to form a new DNA molecule. Nonrecombinant DNA refers to the parental DNA or original DNA which does not contain any foreign DNA. The key difference between recombinant and nonrecombinant is that **recombinant refers to the condition of combining two or more types of DNA (own DNA and foreign DNA)** while **nonrecombinant refers to the condition of having only inherent DNA**.

What is Recombinant?

The word recombinant refers to the DNA which is formed by combining DNA from multiple sources. It is a result of genetic recombination. Two different DNA are combined with each other to create a new DNA molecule which is not found in the original genome. It is known as recombinant DNA or chimeric DNA. Foreign DNA can be easily inserted into another organism genome to create a recombinant DNA molecule. The creation of recombinant DNA is done by [genetic engineering](#) and [recombinant DNA technology](#). Recombinant DNA is formed in laboratories by bringing together genetic material from different sources.

In molecular biology, desired genes are recombined with bacterial plasmids and expressed in bacteria. This process is known as molecular cloning. Using this technology, beneficial industrial products are produced in large scale. The proteins which result from the expression of recombinant DNA are known as recombinant proteins. Recombinant DNA has immense use in biotechnology, medicine, research, industry, food production, human and veterinary medicine, agriculture and bioengineering.

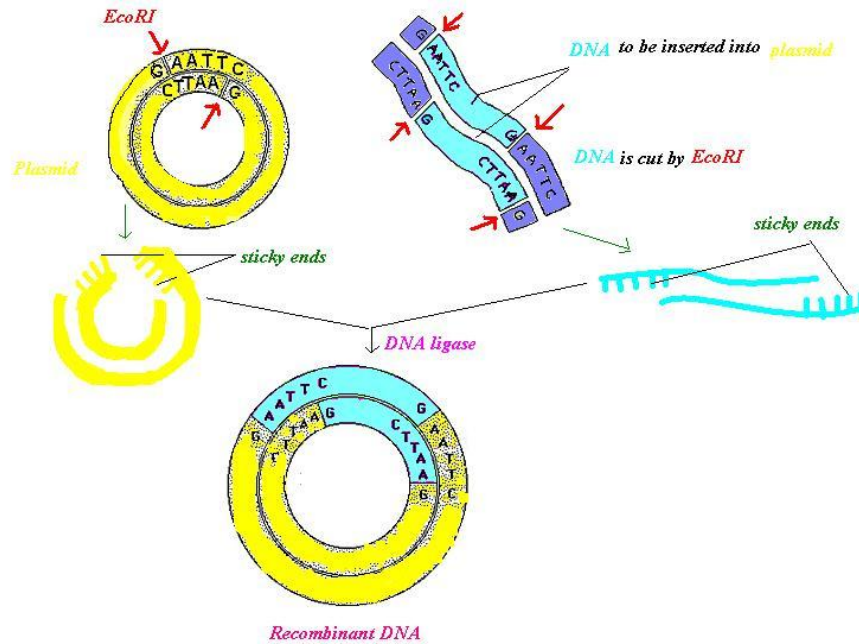


Figure 01: Recombinant DNA

What is Nonrecombinant?

Nonrecombinant refers to the status of not showing any genetic recombination. Nonrecombinant DNA is similar to that of parental DNA. The offspring show similar [alleles](#) arrangement as in the original parental DNA. As shown in figure 2, if there is no crossing over between chromosomes during the independent assortment, nonrecombinant DNA will be the result. If crossing over occurs, it results in recombinant DNA. The possibility of chromatid exchange is some kind of genetic recombination. It results in DNA which are different from the original DNA. Nonrecombinant DNA is genetically same with the parental type.

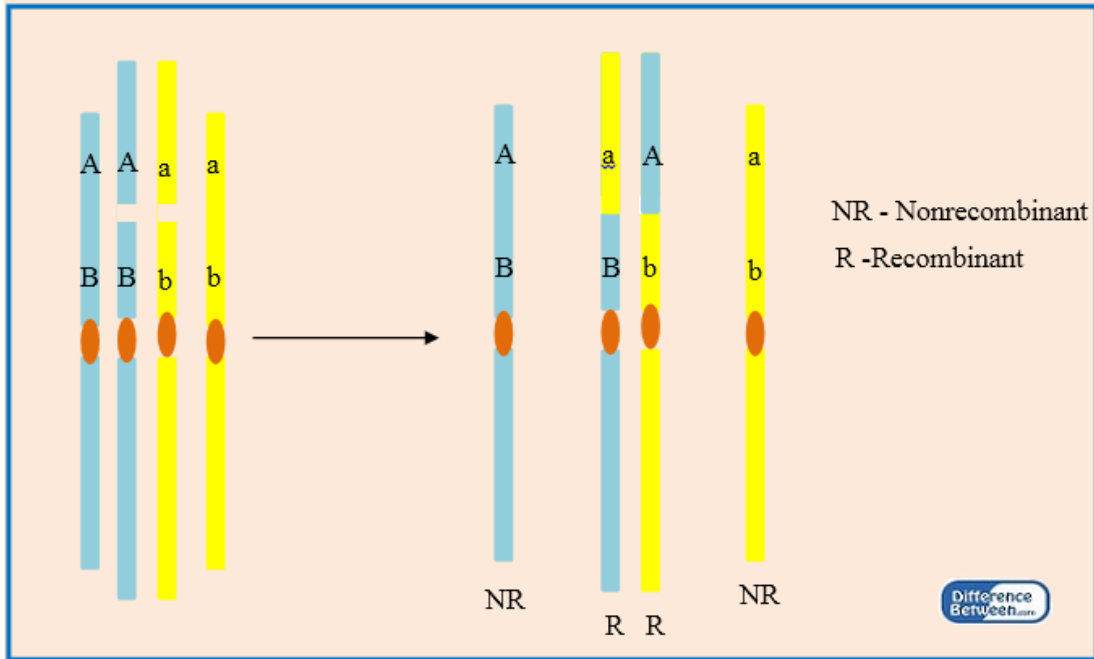


Figure 02: Recombinant and Nonrecombinant DNA

What is the difference between Recombinant and Nonrecombinant?

Recombinant vs Nonrecombinant	
Recombinant DNA is a piece of DNA that has been created by the combination of at least two strands.	Nonrecombinant is DNA which has not been subjected to genetic recombination.
Inserts	
There is an insertion of foreign DNA into recombinant DNA.	There is no foreign DNA inserted into nonrecombinant DNA.
Similarity to Parental DNA	
Recombinant DNA is different from parental DNA.	Nonrecombinant DNA is the same as parental DNA.
Genetic Variation	
Recombinant DNA shows genetic variation.	Nonrecombinant DNA does not show genetic variation.

Summary - Recombinant vs Nonrecombinant

The terms recombinant and nonrecombinant describes whether genetic recombination has occurred or not in DNA sequences. When DNA from multiple sources are combined, and a new DNA is formed, it is known as recombinant DNA. Genetic recombination is not possible all the time. When it genetic recombination doesn't take place, it produces nonrecombinant DNA. Nonrecombinant DNA shows a similar genetic makeup to the parental DNA. This is the difference between recombinant and nonrecombinant DNA.

References:

1. "Recombinant DNA." Wikipedia. Wikimedia Foundation, 16 May 2017. Web. [Available here.](#) 10 June 2017.
2. Alberts, Bruce. "General Recombination." *Molecular Biology of the Cell*. 4th edition. U.S. National Library of Medicine, 01 Jan. 1970. Web. [Available here.](#) 10 June 2017

Image Courtesy:

1. "Recombinant DNA" By Tinastella - Own work (Public Domain) via [Commons Wikimedia](#)

How to Cite this Article?

APA: Difference Between Recombinant and Nonrecombinant. (2017, June 16). Retrieved (date), from <http://www.differencebetween.com/difference-between-recombinant-and-vs-nonrecombinant/>

MLA: " Difference Between Recombinant and Nonrecombinant." *Difference Between.Com*. 16 June 2017. Web.

Chicago: " Difference Between Recombinant and Nonrecombinant." *Difference Between.Com*. <http://www.differencebetween.com/difference-between-recombinant-and-vs-nonrecombinant/> (accessed [date]).



Copyright © 2010-2017 Difference Between. All rights reserved.