

Restriction Enzymes

Introduction:

These are enzymes that cut DNA at specific sites. They are properly called restriction endonucleases because they cut the bonds in the middle of the polynucleotide chain. Most restriction enzymes make a staggered cut in the two strands, forming sticky ends.

The cut ends are "sticky" because they have short stretches of single-stranded DNA. These sticky ends will stick (or anneal) to another piece of DNA by complementary base pairing, but only if they have both been cut with the same restriction enzyme. Restriction enzymes are highly specific, and will only cut DNA at specific base sequences, 4-8 base pairs long.

Restriction enzymes are produced naturally by bacteria as a defense against viruses (they "restrict" viral growth), but they are enormously useful in genetic engineering for cutting DNA at precise places ("molecular scissors"). Short lengths of DNA cut out by restriction enzymes are called restriction fragments. There are thousands of different restriction enzymes known, with over a hundred different recognition sequences. Restriction enzymes are named after the bacteria species they came from, so EcoR1 is from *E. coli* strain R.

Take a look at the video below to learn more:

https://www.youtube.com/watch?v=0iwWCFG4fHs&feature=emb_logo