# Amplified Fragment Length Polymorphism Encyclopedia Article

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# Amplified Fragment Length Polymorphism

Amplified fragment length **polymorphism** (AFLP) is a molecular biology technique that combines the accuracy of restriction **nuclease** digest with the precision of the **polymerase chain reaction**. The technique generates hundreds to hundreds of thousands of pieces of **DNA**, depending upon the **enzymes** used to cut the genetic material.

The technique relies on a series of enzymes collectively referred to as restriction nucleases. Since the discovery of the first restriction nuclease in 1968, hundreds more have been isolated from over 230 strains of **bacteria**.

The restriction nucleases used for AFLP each recognize a specific target or sequence in the building blocks that make up the DNA. The enzyme will cut the DNA at a precise location within this recognized sequence, analogous to scissors cutting paper, generating fragments of DNA. The simultaneous application of several different **restriction enzymes**, recognizing different target sequences, can produce hundreds of fragments of varying length from the DNA sample. The fragments can then be screened in a process called pre-selective amplification to enrich for the fragments of interest. Then, using the technique of **polymerase** chain reaction, the number of the fragments of interest are increased thousands of times until there enough of them that they can be visualized based on their size in the technique of gel electrophoresis.

The pattern of fragments obtained by electrophoresis can be used to reveal DNA differences between individuals. The AFLP pattern produced by the DNA from one individual can be unique, analogous to a fingerprint. The DNA of another individual processed using the same restriction nuclease enzyme(s) will yield a different pattern. The presence or absence of bands in the second sample is referred to as a polymorphism. The polymorphic bands can subsequently be identified.

AFLP has several advantages over other DNA screening techniques. The amount of DNA required for the analysis is far less, while the information obtained can be more. No knowledge of the sequence of the DNA is needed prior to analysis. Lastly, the reproducibility of AFLP is greater than other techniques, increasing the confidence of the results from experiment to experiment.