

Multiplexing Encyclopedia Article

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Multiplexing

Multiplexing is an approach to the **sequencing** of **DNA (deoxyribonucleic acid)** that uses several pooled samples simultaneously. This greatly increases the speed at which sequencing can be accomplished. The method was described in 1998.

For multiplexing, the different DNA molecules to be analyzed are linked to a set of identifier tags before the analysis begins. The tagged DNA molecules are then pooled together, their numbers are chemically increased, and then they are chemically fragmented. The resulting reaction products are separated on the basis of size on electrophoretic gels, and then are transferred to another support. This support can then be probed, as many times as there are tags in the original pooled sample, to extract information on the identity of the DNA fragments.

Another application of multiplexing involves the use of fluorescent compounds. The multiplex multifluor technique employs laser light to scan DNA-containing material as the material flows through a thin tube. The DNA tag contains a molecule that can fluoresce when excited by the laser light. Analysis of the patterns of fluorescence enables the chemical content of the sample.

The ability to rapidly sequence different areas of a **genome** at the same time greatly reduced the time required to sequence the genetic material. This was one of the reasons that the human genome could be sequenced in little over a decade.

Multiplexing has also been instrumental in elucidating the genomic sequence of other organisms, such as *Arabidopsis thaliana*, a model plant sequenced by the international *Arabidopsis* Genome Initiative (AGI) group in 2000.