

This glossary was adapted from definitions in the DOE *Primer on Molecular Genetics* (1992).

<http://www.ornl.gov/hgmis/publicat/primer/intro.html>

## A

**Adenine (A):** A nitrogenous base, one member of the base pair A-T (adenine-thymine).

**Allele:** Alternative form of a genetic locus; a single allele for each locus is inherited separately from each parent (e.g., at a locus for eye color the allele might result in blue or brown eyes).

**Amino acid:** Any of a class of 20 molecules that are combined to form proteins in living things. The sequence of amino acids in a protein and hence protein function are determined by the genetic code.

**Amplification:** An increase in the number of copies of a specific DNA fragment; can be *in vivo* or *in vitro*. See cloning, polymerase chain reaction.

**Arrayed library:** Individual primary recombinant clones (hosted in phage, cosmid, YAC, or other vector) that are placed in two-dimensional arrays in microtiter dishes. Each primary clone can be identified by the identity of the plate and the clone location (row and column) on that plate. Arrayed libraries of clones can be used for many applications, including screening for a specific gene or genomic region of interest as well as for physical mapping. Information gathered on individual clones from various genetic linkage and physical map analyses is entered into a relational database and used to construct physical and genetic linkage maps simultaneously; clone identifiers serve to interrelate the multi-level maps. Compare library, genomic library.

**Autoradiography:** A technique that uses X-ray film to visualize radioactively labeled molecules or fragments of molecules; used in analyzing length and number of DNA fragments after they are separated by gel electrophoresis.

**Autosome:** A chromosome not involved in sex determination. The diploid human genome consists of 46 chromosomes, 22 pairs of autosomes, and 1 pair of sex chromosomes (the X and Y chromosomes).

## B

**BAC:** See bacterial artificial chromosome.

**Bacterial artificial chromosome (BAC):** A vector used to clone DNA fragments (100- to 300-kb insert size; average, 150 kb) in *Escherichia coli* cells. Based on naturally occurring F-factor plasmid found in the bacterium *E. coli*. Compare cloning vector.

**Bacteriophage:** See phage.

**Base pair (bp):** Two nitrogenous bases (adenine and thymine or guanine and cytosine) held together by weak bonds. Two strands of DNA are held together in the shape of a double helix by the bonds between base pairs.

**Base sequence:** The order of nucleotide bases in a DNA molecule.

**Base sequence analysis:** A method, sometimes automated, for determining the base sequence.

**Biotechnology:** A set of biological techniques developed through basic research and now applied to research and product development. In particular, the use by industry of recombinant DNA, cell fusion, and new bioprocessing techniques.

**bp:** See base pair.

## C

**cDNA:** See complementary DNA.

**Centimorgan (cM):** A unit of measure of recombination frequency. One centimorgan is equal to a 1% chance that a marker at one genetic locus will be separated from a marker at a second locus due to crossing over in a single generation. In human beings, 1 centimorgan is equivalent, on average, to 1 million base pairs.

**Centromere:** A specialized chromosome region to which spindle fibers attach during cell division.

**Chromosome:** The self-replicating genetic structure of cells containing the cellular DNA that bears in its nucleotide sequence the linear array of genes. In prokaryotes, chromosomal DNA is circular, and the entire genome is carried on one chromosome. Eukaryotic genomes consist of a number of chromosomes whose DNA is associated with different kinds of proteins.

**Clone bank:** See genomic library.

**Clone:** A group of cells derived from a single ancestor.

**Cloning:** The process of asexually producing a group of cells (clones), all genetically identical, from a single ancestor. In recombinant DNA technology, the use of DNA manipulation procedures to produce multiple copies of a single gene or segment of DNA is referred to as cloning DNA.