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Perspective

Techniques of Molecular Biology

Joachim Boldt*

Department of Applied Biotechnology and Food Science, Budapest University of Technology and Economics, Budapest, Hungary

DESCRIPTION

The study of biological systems at the molecular level, particularly DNA and RNA, is referred to as molecular biology. This field serves as a foundation for further research in the quickly developing fields of genomics, cell biology, biotechnology, microbiology, diagnostics, and therapies. Medical biotechnology (red), agricultural biotechnology (green), industrial biotechnology (white), marine biotechnology (blue), food biotechnology (yellow), and environmental biotechnology (green) are the key subfields of biotechnology. DNA cloning, cut-and-paste DNA, bacterial transformation, transfection, chromosome integration, cell screening, cell culture, DNA extraction, DNA polymerase DNA dependent, reading and writing DNA, DNA sequencing, DNA synthesis, and molecular hybridization are examples of molecular biology techniques.

Techniques of molecular biology

Cellular cloning: Isolating a DNA sequence (typically a gene) from any species and inserting it into a propagation vector without changing the original DNA sequence. Cloning any DNA fragment fundamentally requires four steps in the traditional restriction enzyme digestion and ligation cloning protocols: isolation of the DNA of interest (or target DNA), ligation, transfection (or transformation), and a screening/selection technique. A DNA sequence of interest is isolated during molecular cloning in order to produce several copies of it in vitro. Because of this technique's ease of use, cost-effectiveness, speed, and dependability, it has grown in importance as a tool in clinical microbiology.

Gel electrophoresis: A laboratory technique called gel electrophoresis is used to divide combinations of DNA, RNA, or proteins based on their molecular sizes. An electric current is used to draw DNA samples across a gel after they have been inserted into wells (indentations) at one end of the gel. Due to their negative charge, DNA fragments gravitate toward the positive electrode. The following four steps for doing gel electrophoresis are;

As the gel is poured, getting ready your samples, as users adds the gel, running (running the gel through an electric field). Gel electrophoresis uses buffer for two main causes. In order to make our gel conduct current, one must first add charged ions to water because it is a poor conductor of electricity. The buffer also maintains the samples at a biologically suitable pH that keeps their charge or structure intact.

Polymerase chain reaction: A specific DNA segment can be rapidly produced (amplified) in millions to billions of copies using the Polymerase Chain Reaction (PCR). In laboratories doing biological and medical research, PCR is frequently utilized. It is employed in the initial stages of DNA processing for sequencing, for determining whether a gene is present or absent to assist in the identification of pathogens during infection, and for producing forensic DNA profiles from minute DNA samples. For any DNA synthesis reaction, the PCR is based on three steps. Extension of the new DNA strands from the primers, Annealing of primers to each original strand for new strand synthesis, and Denaturation of the template into single strands. Numerous tasks can be accomplished with the PCR, such as the investigation of gene expression, the detection of pathogenic bacteria, the identification of genetic mutations, and the introduction of DNA alterations. One can also use the PCR to find out if a specific DNA fragment is present in a cDNA library.

Correspondence to: Joachim Boldt, Department of Applied Biotechnology and Food Science, Budapest University of Technology and Economics, Budapest, Hungary; E-mail: boldjoachim@123.com

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