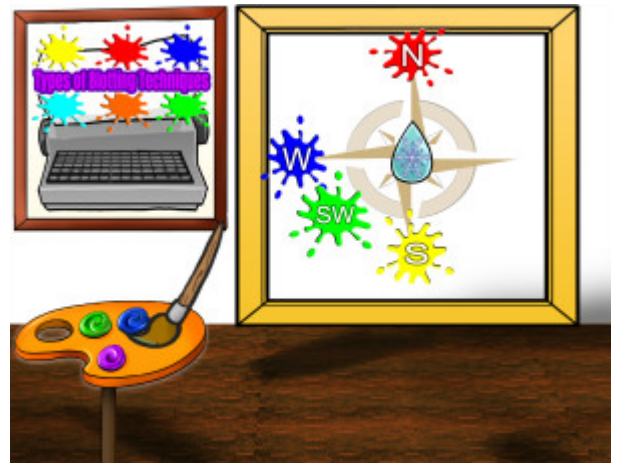


## Types of Blotting Techniques



PLAY PICMONIC

### Definition

#### Blotting Techniques

##### Paint-blot Techniques

Blotting techniques are able to separate, immobilize, and make visible fragments of protein, DNA, and RNA sequences for their identification in a determined sample.

Blotting technique processes are fairly standard, consisting of a sample preparation and separation phase, where the protein or nucleic acid fragments in the sample are separated by electrophoresis. Next, there is an immobilization step where these separated fragments are immobilized into a blotting membrane to be identified and visualized using pre-fluorescent or radioactively labeled complementary probes (DNA/RNA) or antibodies (proteins) that reveal the presence of the targeted molecule in the sample processed.

#### SNOW-DROP

##### SNOW-DROP Blot Compass

The name of each blotting technique varies according to the targeted molecule. This can be easily remembered with the corresponding acronyms SNOW-DROP.

S for Southern Blot corresponds to D for DNA. N for Northern Blot for R of RNA and W for Western Blot for P for Proteins.

### Types of Blotting Techniques

#### Southern Blot

##### Southern Paint-blot

Southern blotting allows for the identification of specific DNA sequences of interest as well as the whole genome. This method was first described by Edward Southern and was named after him.

Southern blotting may be used as a diagnosis technique for genetic diseases caused by DNA tandem repeat expansion disorders like myotonic dystrophy type 1. Likewise, it may be used for the characterization of methylation processes like in the full mutation of Fragile X Syndrome.

## Northern Blot

### Northern Paint-blot

Northern blotting detects specific RNA fragments, providing information on their size and abundance. This blotting technique is able to measure gene expression in the targeted sample through mRNA expression level detection as well as splicing errors.

Northern blot analysis has numerous clinical applications describing gene expression in developmental stages, pathological stress conditions, cancerous cells, and more. This method is named as it is due to its similarity to southern blotting.

## Western Blot

### Western Paint-blot

Western blotting is a standard, widely used method for protein identification and characterization (size, expression, and relative abundance) analysis. Although it is not a quantitative method, Western blotting allows the identification of targeted proteins in a sample containing a diverse number of proteins. This technique serves as a common diagnostic biomarker in autoimmune diseases, as well as a diagnostic tool for diseases like HIV and MTB.

## Southwestern Blot

### Southwestern Paint-blot

The Southwestern blotting technique, as implied by its name, combines the detection of DNA and protein fragments of the Southern and Western blot. Southwestern blotting identifies and characterizes DNA-binding proteins using labeled double-stranded DNA probes.