Northwestern blot:

- Also known as northwestern assay, is a hybrid analytical technique of the western blot and the northern blot.
- Used to detect interaction between RNA and protein.
- In this techniques involves the identification of labeled RNA that interact with protein that are immobilized on a similar nitrocellulose membrane.

Steps of northwestern blot

1. Isolation of protein sample.
2. Seperation of RNA binding proteins by gel-electrophoresis.
3. Proteins are transferred into a nitro-cellulose membrane.
4. Blots are then soaked in a blocking solution(BSA).
5. Aspecific RNA is applied and given time to incubate at room temperature.
6. Develop x-ray film. And analysis band.

Southwestern blotting:

- First described by B. Brown, J. Steinberg in 1980.
- Used to detect DNA-protein interaction.

Steps of southwestern blot:

- Proteins are separated by gel-electrophoresis (non-reducing SDS)
- Treated with urea, to remove SDS and renature the proteins.
- Transfer into nitrocellulose membrane.
- Apply specific DNA(end labeled) to interact with the proteins.
- Develop X-ray film. And analysis.

History of blotting

	Year	Inventors
Southern blot	Edwin southern	1975
Western blot	George stark	1977
Northern blot	James Alwinw & George stark	1979
Eastern blot	Towbin	1979
Far eastern blot	Taki	1994
Far western blot		
Northwestern blot		
Southwestern blot	B. Brown, J. Steinberg	1980

	Nitrocellulose	PVDF
Protein binding capacity	Low (80-100µg/cm2)	High (170-200µg/cm2)
Background noice	Low	High
Binding interaction	Hydrophobic interaction	Hydrophobic and dipole interaction
Transfer Buffer	Contain methanol(which may precipitate large size proteins)	Do not contain methanol
Physical character	Fragile and non-durable	Durable , ideal for sequencing (reprobing)
Ideal	For low MW protein	For high MW protein