Note on protein microarray

- ➔ Protein microarrays, also known as protein chips, are miniaturized and parallel assay system
- ➔ It contains small amounts of proteins in a high-density format
- ➔ Allows simultaneous determination of a great variety of analytes from small amounts of samples within a single experiment
- ➔ Typically prepared by immobilizing proteins onto a microscope slide using a standard contact spotter
- ➔ Popular types of slide surfaces include aldehyde and epoxy derivatized glass surfaces for random attachment through amines
- ➔ Methods of arraying proteins are:
  - ➔ Robotic method
  - ➔ Ink jetting method
  - ➔ Piezoelectric spotting
  - ➔ Photolithography
- ➔ There are three types of protein microarrays
  - ➔ Analytical protein microarray
  - ➔ Reverse phased protein microarray
  - ➔ Functional protein microarray

Write a short note on types of protein microarrays

- ➔ There are three types of protein microarrays
  - ➔ Analytical protein microarray
    - ➔ The most representative class of analytical microarrays is the antibody microarray
    - ➔ First model to demonstrate the application of antibody arrays was the analyte labeled assay format
    - ➔ In this format proteins are detected after antibody capture using direct protein labeling
    - ➔ Uses:
      - ➔ To understand expression levels
      - ➔ Binding affinities and specificities
      - ➔ Response of the cells to a particular factor
      - ➔ Identification and profiling of diseased tissues
    - ➔ Limitations
      - ➔ Antibodies are the most popular protein capture reagents, although their affinity and/or specificity can vary dramatically
      - ➔ Antibodies may cross react with proteins
      - ➔ Highly specific antibodies are required
    - ➔ Functional protein microarray:
      - ➔ Known as Target protein array
      - ➔ Purified recombinant protein are immobilized
      - ➔ Applied to:

- ➔ Protein-protein
- ➔ Protein-lipid
- ➔ Protein-DNA
- ➔ Protein-drug
- ➔ Protein-peptide

➔ Can also detect antibodies in biological specimen

➔ Reverse phase microarray

➔ Involves complex samples

➔ Tissue lysates

➔ Lysate is arranged and probed

➔ Detected with chemiluminescent, fluorescent or colorimetric assays

➔ Used for determination of the presence of altered proteins

➔ Post translational modifications can be detected

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