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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