THE USE OF ANTIBODIES TO STUDY THE HUMAN PROTEOME

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THE POWER OF ANTIBODIES

Antibodies, also known as immunoglobulins, are Y-shaped proteins, which are used by the immune system to identify and destroy foreign objects such as bacteria and viruses. The antibody recognizes a unique part of the foreign target, the antigen. The unique properties of antibodies are used in a wide range of therapeutic and research applications. This poster describes some of the most common techniques.

WESTERN BLOT

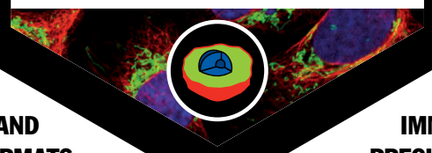
Western blot is an analytical technique used to detect specific proteins in a sample. Proteins are separated on a gel and the result visualized on a membrane using labeled antibodies. It is a common method and almost all available commercial antibodies are validated using this method.

IMMUNOHISTOCHEMISTRY

Immunohistochemistry is a microscopy based technique for visualizing cellular macromolecules, such as proteins, in complex tissues. By using specific antibodies to generate a colored precipitate in the tissue, a visual output of the existence and localization of the target molecule is generated.

IMMUNOCYTOCHEMISTRY

Immunocytochemistry (ICC) is a technique for the visualization of proteins and peptides in cells. In ICC the extracellular matrix around the cells is removed and, by using an antibody linked to a reporter (e.g., a fluorophore), the sub-cellular localization may be seen through a microscope.



FLOW CYTOMETRY

Flow cytometry is a laser-based, biophysical technology used to count, measure size, and detect properties of particles in suspension. A sample of suspended particles is separated through a narrow nozzle, and a laser enables detection of properties of individual particles in the sample.

ANTIBODYPEDIA

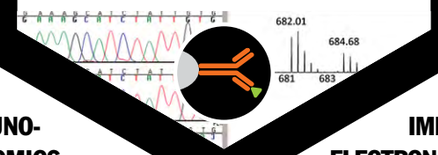
Antibodypedia is a web-based knowledge resource with annotated and scored antibodies from commercial and academic providers. All information is free and accessible in the database. With the knowledge in Antibodypedia you have the power to select the right antibody for the right application.

ELISA AND ARRAY FORMATS

Immunosorbent methods use antibodies and reporters to detect a substance. A common technique is the “enzyme-linked immunosorbent assay” (ELISA) that uses an enzymatic reaction as reporter. The immunoassay format may be miniaturized on microarrays to allow multiplexing for multi-parameter analysis.

IMMUNO-PRECIPITATION

Immunoprecipitation uses antibodies to isolate and concentrate a protein out of a solution containing thousands of proteins. A solid support is used to allow precipitation of the antibody-protein complex. An advantage is that the natural functionality of the native protein is preserved.

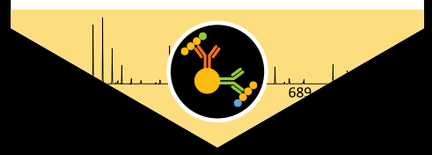


PROXIMITY LIGATION ASSAY

A proximity ligation assay uses a pair of oligonucleotide labeled antibodies binding to different epitopes on a protein, or to epitopes in close proximity on two proteins in a complex. Used for detection, visualization and quantification of single proteins or protein-protein interactions.

IMMUNO-PROTEOMICS

Immunoproteomics combines the use of antibodies and mass spectrometry to study large sets of proteins. Immuno-affinity enrichment may be used to reduce the large dynamic range in biological samples before MS-analysis. Immunoproteomics is a useful tool within quantitative proteomics.



IMMUNO-ELECTRON MICROSCOPY

Immunoelectron microscopy combines the ability of an antibody to specifically bind a protein with the high spatial resolution of an electron microscope. Detection of the antibody’s sub-cellular localization in the sample is made by conjugating the antibody with colloidal gold particles.