A Guide to the Biocompare Antibody Search Tool

The Biocompare antibody database contains a wealth of antibody product data, including molecular specifications, target antigen information, and published citation data. Our search tool aims to provide functional search parameters that allow users to search the database, compare among suppliers, and discover the antibodies that will best fit their unique research applications. In this guide, we explain how each search parameter can be used in the search for specific antibodies.

Keyword

Searching for a term in the keyword search bar provides a fast and easy method of searching the database. Keyword search will search for the given term in all of the specification fields of the products, with a greater preference in the product name. Because of the broad and general nature of the search, this is best used with very unique and specific terms (for example, “caspase 3 FITC”). Shorter keyword terms, such as gene symbols, may produce results that include unrelated targets that use similar aliases.

Antigen

Selecting “antigen” when entering a search term in the text field will query the database for names of the target proteins or antigens. This search will prioritize the lookup of terms in the “target” specification of the product, as well as the product name. Compared to the keyword search, searching by antigen engages in a more focused query, providing more specific results. This function will provide the best results when entering the antibody target’s official gene name or symbol, followed by the use of additional search parameters.

Antibody Clone

Antibody clones are monoclonal antibodies produced from a single clone of hybridoma cells and are assigned a distinct clone number identifier. Because these antibodies arise from a singular source, they are essentially identical in form, function and quality. Thus, antibodies of a given clone number, regardless of the supplier, should act similarly. For example, the clone “RA3-6B2” is a rat monoclonal antibody for the mouse gene CD45R. Selecting “clone” when entering a search term will display a list of antibodies of the specified clone number, if available.

Products with Citations or Figures

Biocompare tracks antibodies that are cited in the scientific literature. These include citations provided by the antibody supplier and citations from open-access journals have referenced the antibody catalog number. Using the “Citations” parameter sets a filter to display antibodies that have been mentioned in the literature. Moreover, if there is a figure associated with a given antibody, that antibody will be displayed if the “Figures” parameter is selected. These options are a great way to explore how a given antibody may have been used by other researcher and its performance for certain applications.

Products with Reviews

Biocompare accepts user-generated reviews of antibodies from researchers, offering valuable first-hand accounts of real-world performance. These reviews typically document key experimental parameters (such as sample type, blocking conditions, incubation protocols) alongside candid assessments of what worked and what did not. For scientists evaluating a specific antibody, these unique personal insights can meaningfully complement technical datasheets and supplier-provided validation data.

Antibody Type

Antibodies can be categorized into different types based on their design, function, or product format. Explanations of various antibody types are listed below:

- **Biosimilar Antibody** - These are monoclonal antibodies that are highly similar to regulatory approved therapeutic antibodies. The biosimilar antibodies listed here are research-grade and are not intended for therapeutic use.
- **Primary Antibody** - Primary antibodies are a classification assigned to antibodies designed to bind directly to target proteins or antigens. This is in contrast to secondary antibodies, which are intended to bind primary antibodies. Primary antibodies are broad and can be monoclonal, polyclonal, conjugated, or unconjugated. Many other factors should be considered for the primary antibody, including the type of target immunogen, species of the target protein (reactivity), and the host species of the antibody.
- **Secondary Antibody** - Secondary antibodies specifically target immunoglobulins and are intended to detect and amplify the signal of primary antibodies. To facilitate detection, secondary antibodies are conjugated to enzymes (HRP or AP), fluorescent proteins and dyes, and other moieties, such as biotin and gold. The ideal secondary antibody should bind specifically to the primary antibody, determined largely by the latter's host species and antibody class or isotype (IgG, IgA, IgD, IgE, and IgM). For a more in-depth guide, visit our secondary antibodies page.
- **Isotype Control** - Isotype control antibodies are used as negative controls to determine background signals caused by nonspecific, non-epitope-driven binding. A proper isotype control must match the primary antibody in host species, isotype (e.g., IgG1), and conjugate, but must be raised against an antigen not present in the experimental sample.
- **Antibody Pair** - Pre-matched antibody pairs are a combined set consisting of a capture antibody and a detection antibody. This antibody format is useful in the development of immunoassay applications, such as ELISAs.
- **Antibody Panel** - Antibody panels contain a set of antibodies that detect different, yet related targets. This product format makes it easy for researchers who are studying multiple proteins, such as those involved a given pathway, disease, or biological process.

- **Recombinant Antibody** - Recombinant antibodies are genetically engineered and produced from stable cell lines. While they tend to be more expensive, these antibodies offer many advantages, such as being animal origin-free, less reliance on hybridomas, good reproducibility, and ease of scalability.
- **Antibody Sampler** - Antibody sampler kits are a prepackaged set of antibodies for unique, but related targets. Like panels, the targets are often involved in a particular research area. However, antibodies in sampler kits are often provided in smaller quantities.

Application

Antibodies perform differently depending on the experimental application. For example, antibodies that work well in immunoblotting may not work the same in flow cytometry. For this reason, antibody suppliers often specify what applications are suited for antibodies in their offerings. Selecting specific applications will display the corresponding antibodies as specified by the supplier. While the “Applications” parameter is a good way to filter antibody search results, users should also pay close attention to the supplier-provided antibody data. Antibodies properly validated for a given application can help save time and money.

Host Species

The host species of an antibody is the animal species that had produced the antibody. For example, a polyclonal antibody raised in rabbits will list rabbit as the host species. For monoclonal antibodies, the animal producing the hybridoma B-cell is described as the host species. The host species of the primary antibody determines the reactivity of the secondary antibody. When selecting a given host species parameter, it is important to also avoid cross-reactivity. Ideally, the host species of the primary antibody should be different than that of the test sample.

Reactivity

The reactivity attribute refers to the species of the immunogen used to generate the antibody. This is an important distinction as protein orthologs are not identical across different species. Differences in amino acid sequence, folding structure, and post-translational modifications will affect antibody binding affinities. For optimal results, users should filter for the reactivity matching the species of the protein of interest.

Clonality

Use the clonality parameter to filter for monoclonal or polyclonal antibodies.

- Monoclonal antibodies - These are produced from hybridomas, a single B cell clone fused with an immortalized cell line. Monoclonal antibodies are homogenous and exhibit monovalent affinity, specific for only one epitope of a given target antigen.
- Polyclonal antibodies - Derived from animal blood, polyclonal antibodies are a heterogeneous mixture of antibodies that recognize multiple epitopes of one target antigen.

Modification Type

This parameter can be used to filter for antibodies that recognize protein antigens with specific post-translational modifications. Common modification types are highlighted below:

- Acetylated - The addition of acetyl groups to proteins is commonly found in histones, whose acetylation is linked to transcriptional activation. Other acetylated proteins include transcription factors, effector proteins, molecular chaperones, and cytoskeletal proteins.
- Methylated - The addition of methyl groups to proteins can occur at the N-terminus and arginine and lysine residues. Histone protein methylation can be associated with either transcriptional repression or activation. Di-methylated and tri-methylated proteins can also be detected by specific antibodies.

- Phosphorylated - The protein phosphorylation modification is involved in many biological pathways, such as enzyme regulation, protein transport, and signal transduction. Antibodies can be used to detect phosphorylated proteins at specific residues, commonly, serine, threonine, tyrosine, and histidine.
- Cleaved - Antibodies raised against immunogens of the cleaved version of a protein can be used in the detection of protein cleavage events.

Fluorophore/Reactive Dye

If an antibody is conjugated to a fluorophore or dye, which is often the case for secondary antibodies and conjugated primary antibodies, these filters can be used to select for antibodies labeled with specific fluorophores. Common fluorophores include the following:

- FITC (Fluorescein Isothiocyanate) - This is a classic dye that emits in the green light range.
- Cyanine Dyes (Cy3, Cy5, Cy7) - These are common fluorophores with Cy3 emitting orange-red light (~570 nm), Cy5 far-red light (~670 nm), and Cy7 near-infrared (~780 nm).
- Phycoerythrin (PE) - a bright phycobiliprotein with high quantum yield, and distinct orange-red emission at approximately 575 nm.
- Allophycocyanin (APC) - a bright phycobiliprotein high quantum yield and far-red fluorescence with an emission range at ~660 nm.
- Tandem Dyes - these fluorophores combine two fluorophores (such as PE-Cy7, APC-Cy7) for a large Stokes shift and multi-parameter analysis.

Conjugate/Tag

Antibody conjugates, also known as tags or labels, are molecules covalently attached to antibodies that facilitate target detection. Common conjugates are highlighted below:

- Alkaline phosphatase (AP) - AP, an enzyme with a mass of 86 kDa, reacts with substrates to generate measurable signals in immunodetection. Common AP substrates include BCIP/NBT, pNPP, and Fast Red.

- Horseradish peroxidase (HRP) - The HRP enzyme has a molecular weight of approximately 44 kDa. Common HRP substrates include ABTS, AEC, DAB, ECL, TMB, and Amplex Red.
- Blue emitters - These are fluorescent conjugates that emit in the ≤499 nm wavelength range and generally exhibit blue fluorescence.
- Green emitters - Fluorescent conjugates that emit light in the 500–529 nm wavelength range are considered green fluorescent emitters.
- Yellow emitters - Conjugates that emit light in the 530–559 nm wavelength range are included in the yellow fluorescent emitters search parameter.
- Orange emitter - Fluorescent conjugates that emit light in the 560-589 nm wavelength range are included in the orange fluorescent emitters.
- Red emitters - Conjugates that emit light in the 590–629 nm wavelength range are included in the red fluorescent emitters search parameter.
- Far-Red emitters - Fluorescent conjugates that emit light in the 630–700 nm wavelength range are considered far-red fluorescent emitters.

Isotype

There are five main antibody isotypes, also known as antibody classes, which are determined by the constant regions of the heavy chains. They consist of IgD, IgE, IgG, IgA, and IgM. The light chains can also be divided into two classes, kappa and lambda. In humans, IgG can be further categorized into subclasses in humans (IgG1, IgG2, IgG3 and IgG4) and mice (IgG1, IgG2A, IgG2B, IgG2C and IgG3). Isotype selection is important when using isotype controls or when pairing a primary antibody with a secondary antibody.

Companies

Biocompare's antibody database aggregates products from a wide range of manufacturers and distributors, with built-in filtering that allows users to narrow results by supplier. When comparing antibodies across companies, it is worth scrutinizing any supplier-provided validation data carefully, as the scope of that data can vary considerably. Where available, validation experiments can offer meaningful insight into how an antibody is likely to perform across specific applications, sample types, and experimental conditions.