MonoRab™
Anti-Camelid VHH Antibodies
Unique Tools for Detecting Camelid Single Domain Antibodies
Humanization, miniaturization and dual function are the trends for antibody drug development. Since camelid single domain antibodies (sdAbs or VHHs) are so small, they do not need to be humanized, but still have a high affinity. They are an ideal option for antibody drug discovery and are also being developed for CAR-T therapies.

GenScript now offers the only recombinant rabbit monoclonal (MonoRab™) Anti-Camelid VHH for identifying target-specific sdAbs. It’s not necessary to add a tag to VHH for detection anymore.

**What is sdAb or VHH**

- Most antibodies are composed of two heavy and two light chains and both chains contribute to the antigen-binding site.
- In addition to these conventional antibodies, llamas, camelids, and sharks also produce antibodies composed only of heavy chains.
- The antigen-binding site of these unusual heavy chain antibodies (hcAbs) is formed only by a single domain, designated as single domain antibodies (sdAbs) or variable domain of heavy chain of hcAbs (VHHs).

![Diagram showing the composition of different types of antibodies](image)

**Applications of MonoRab™ rabbit anti-camelid VHH antibodies**

- VHH antibody screening or titer determination
- Selection of heavy chain antibody-expressing B cells in peripheral blood mononuclear cells (PBMC)
- Expression evaluation and sorting of CAR-T cells harboring a camelid single domain antibody
### Products selection guide

**MonoRab™ Rabbit Anti-Camelid VHH Antibody**

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<th>Product Type</th>
<th>Species Specificity</th>
<th>Unconjugated</th>
<th>Conjugated</th>
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<td>HRP</td>
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<tr>
<td>Anti-VHH, mAb</td>
<td>Llama, Camel</td>
<td>A01860</td>
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<td>Anti-VHH, mAb Cocktail</td>
<td>Llama, Camel, Alpaca</td>
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**Binding compatibility comparison**

- **Anti-VHH:** ★ ★ ★
- **Anti-VHH cocktail:** ★ ★ ★ ★

Binding compatibility comparison of MonoRab™ Rabbit Anti-Camelid VHH Antibody, mAb (Cat.No A01860) and MonoRab™ Rabbit Anti-Camelid VHH Cocktail (Cat.No A02014). The performance of cocktail antibody is better. It is ideal to be used for VHH antibody screening.

### Key Features

- **MonoRab™** technology guarantees high affinity: $K_d \approx 10^{-11} M$
- No cross reactivity with other species
- Recognizes the variable domain of the camelid antibody
- Specific to camelid IgG2 & IgG3
- Recognizes conformational epitope
**Cross reactivity**

A01860 and A02014 are specific to Camelid IgG and have no cross-reactivity with mouse, rat, rabbit, goat and human immunoglobulins.

**Specificity**

A01860 and A02014 are specific to the variable domain of cameld heavy chain antibodies (IgG2&3). It’s ideal for isolation of heavy chain antibody expressing PBMC cells or B cells. Hence, a specific VHH gene library can be generated for Nanobody development.
**Affinity**

The affinity of MonoRab™ Rabbit Anti-Camelid VHH Cocktail (Cat.No A02014) with 15 random VHHS is measured by Biacore. The cocktail antibody shows comprehensive binding activity and high affinity with all of the 15 VHHS. Instead of using anti-VHH polyclonal antibodies which have a potential lot-to-lot consistency issue, anti-VHH cocktail antibody is your best choice for VHH direct detection. It’s also not necessary to add a tag to VHH for detection any more.

**FACS validation**

The following data shows FACS binding of a series of dilution of MonoRab™ Rabbit Anti-Camelid VHH Cocktail [PE] (Cat.No A02018) with Jurkat cells and VHH-based Jurkat-CAR cells. With the development of CAR-T therapy, VHH is used more and more frequently in the CAR generation. A02018 shows excellent binding activity on VHH-based Jurkat-CAR cells. It can be used in CAR-T cell verification and determination.
**MACS validation**

VHH-based CAR-T cells were sorted by MACS with MonoRab™ Rabbit Anti-Camelid VHH Cocktail [Biotin] (Cat.No A02015) and anti-Biotin magnetic nanobeads (Miltenyi) where naïve T cells serves as negative control. Then, the CAR- T cells were stained with MonoRab™ Rabbit Anti-Camelid VHH Cocktail [iFluor 555] (Cat.No A02020) and analyzed by FACS.

As shown in the figure, the ratio of positive CAR-T cells grows from about 10% to 90% after MACS cell separation. A02015 is ideal to be used for CAR-T cell MACS separation.

**Citations:**