

Nanobodies® for Super-Resolution Microscopy: Partnership between Jackson ImmunoResearch and Abberior. | 1

Looking to enhance your achievable resolution for STED and SRM? Combining small polyclonal AffiniPure-VHH™ antibodies from Jackson ImmunoResearch and super bright STAR dyes from Abberior allows you to achieve the detail needed for high-impact results. Learn more about super-resolution imaging with JIR and Abberior...



Jackson ImmunoResearch and Abberior have combined expertise to offer the novel format AffiniPure-VHH™ Secondary Antibody conjugated to Abberior's super bright STAR dyes. The VHH (nanobody®) format, as seen in Figure 1, is a small heavy-chain-only antibody fragment that offers an exciting new opportunity to improve resolution by reducing the linkage error between the target antigen and the dye conjugate (Figure 2 A).

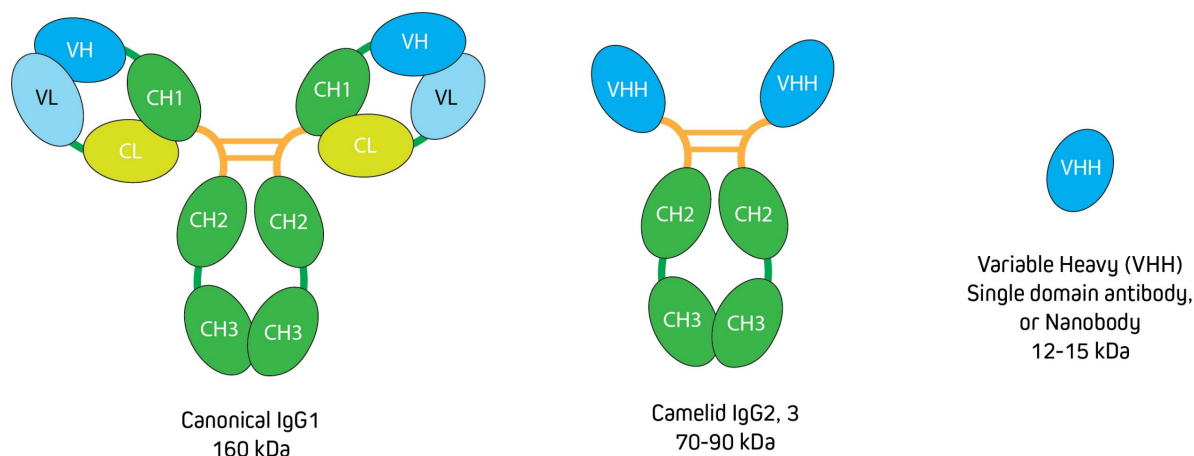


Figure 1: VHH fragments from Camelid heavy chain-only antibodies are much smaller than conventional

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IgGs.

Indirect immunostaining with polyclonal secondary reagents offers optimal signal generation due to the amplification created through the binding of multiple secondary reagents heterogeneously across the primary antibody, but linkage error can preclude their use in super-resolution microscopy (SRM) techniques (Figure 3 C).

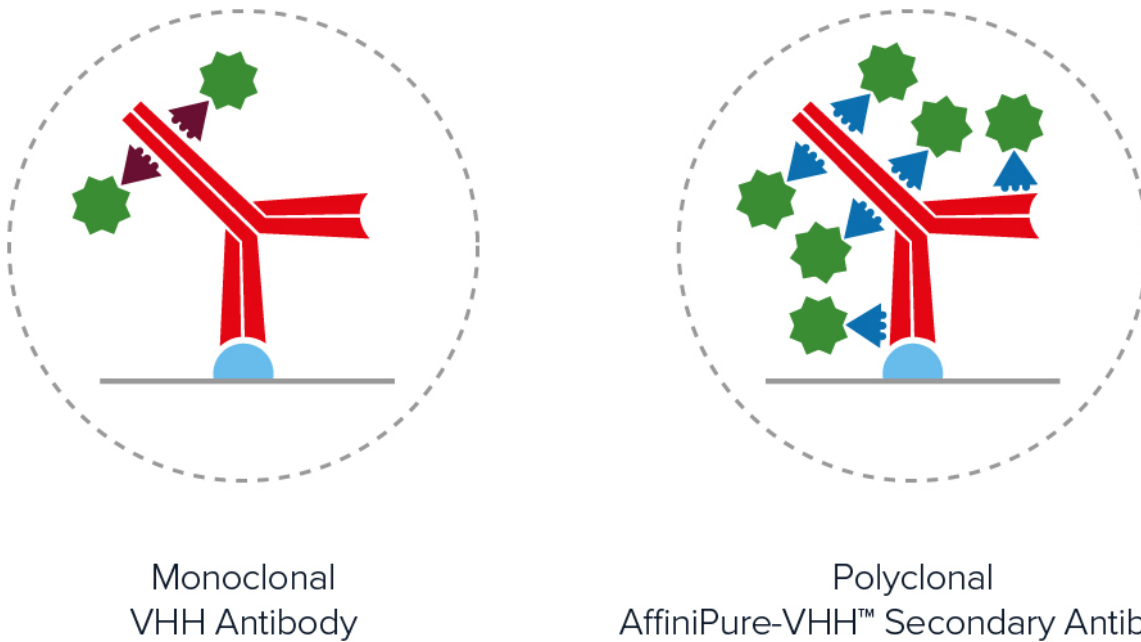


Figure 2: Polyclonal antibodies offer ultimate conjugate delivery for maximum signal: Schematic showing the increased number of conjugated polyclonal AffiniPure-VHH™ Secondaries able to bind a primary antibody compared to monoclonal nanobodies. Also, it can be seen that the diameter of the complex remains comparable, with the distance between the probe and target protein being similar.

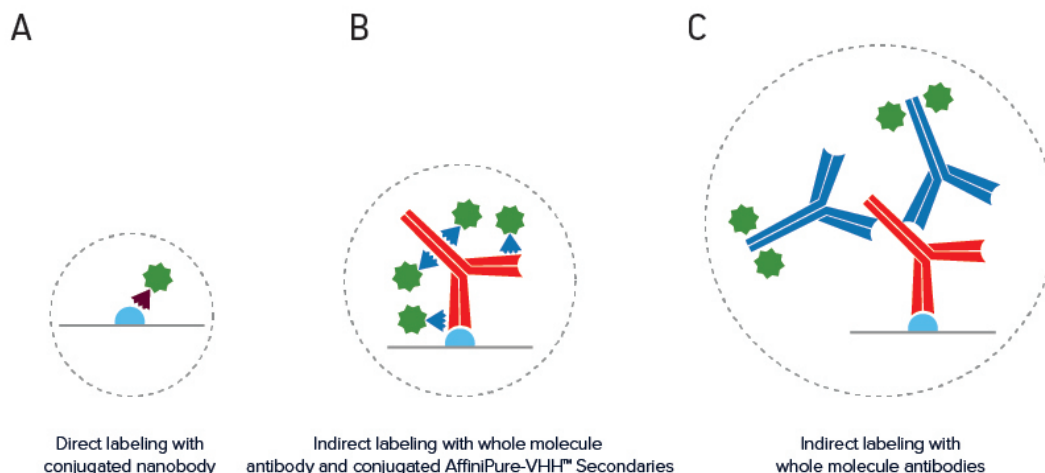


Figure 3: Reduced linkage error of indirect staining using IgG+AffiniPure-VHH™ Secondary Antibody compared to indirect staining using conventional whole IgG primary and secondary antibodies.

At 15 kDa, **AffiniPure-VHH™ polyclonal antibodies** offer excellent **tissue penetration** with **superior**

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conjugate delivery and **decrease the linkage error** considerably (Figure 3 B), bringing the conjugate much closer to the target antigen when compared to the conventional indirect immunostaining with whole IgGs. AffiniPure-VHH™ antibodies are **cross-adsorbed** for exquisite specificity against target species with minimal cross-reactivity to other commonly used species, making AffiniPure VHH™ format an excellent choice for high-resolution multiple labeling experiments. (Figures 4 and 5)

[Read more about Jackson ImmunoResearch AffiniPure-VHH™](#)

Although JIR AffiniPure VHH™ are available conjugated to a wide range of fluorescent dye conjugates, including AlexaFluor®, SRM techniques such as STED (Stimulated Emission Depletion Microscopy) and STORM (Stochastic Optical Reconstruction Microscopy) need dyes with specialized spectral characteristics and behaviors. Abberior is well known for the superior chemistry of its dyes and their commitment to providing exceptionally bright dyes for SRM imaging.

The brightest dyes for SRM: Abberior STAR dyes

Abberior STAR dyes have been designed and manufactured by Abberior's chemists for the best performance in STED and confocal microscopy. They offer high brightness and photostability, while the dye conjugates also show excellent solubility in aqueous buffers such as PBS, allowing for background-free labeling in cells or tissue.

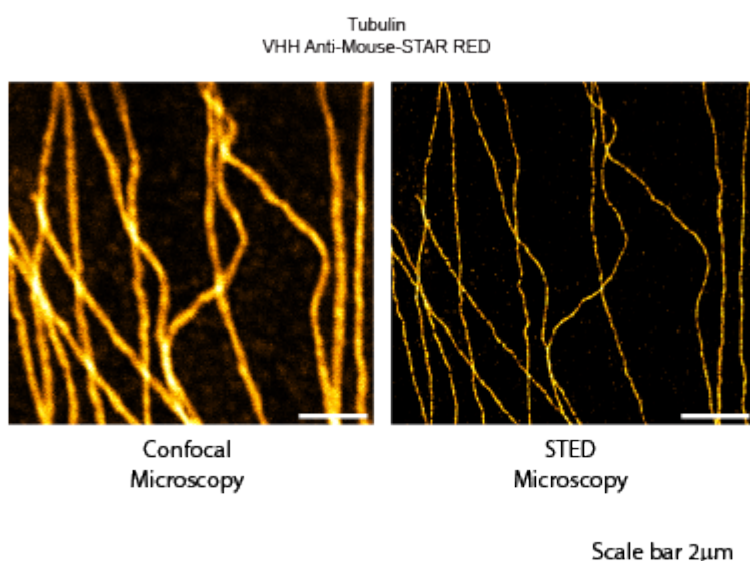


Figure 4: Single color microscopy. Indirect immunostaining was performed with JIR AffiniPure VHH™ Anti-Mouse antibodies conjugated to Abberior STAR RED. Clear improvements in resolution can be seen when comparing confocal to STED microscopy.

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Abberior offers AffiniPure-VHH™ antibodies conjugated to three Abberior STAR dyes.

- abberior STAR RED
- abberior STAR 580
- abberior STAR 460L

[Learn more about Abberior STAR dyes](#)

Available with specificity to Rabbit or Mouse, they are cross-adsorbed for exquisite specificity against target species with minimal cross-reactivity to other commonly used species, making them suitable for application in multiple labeling experiments.

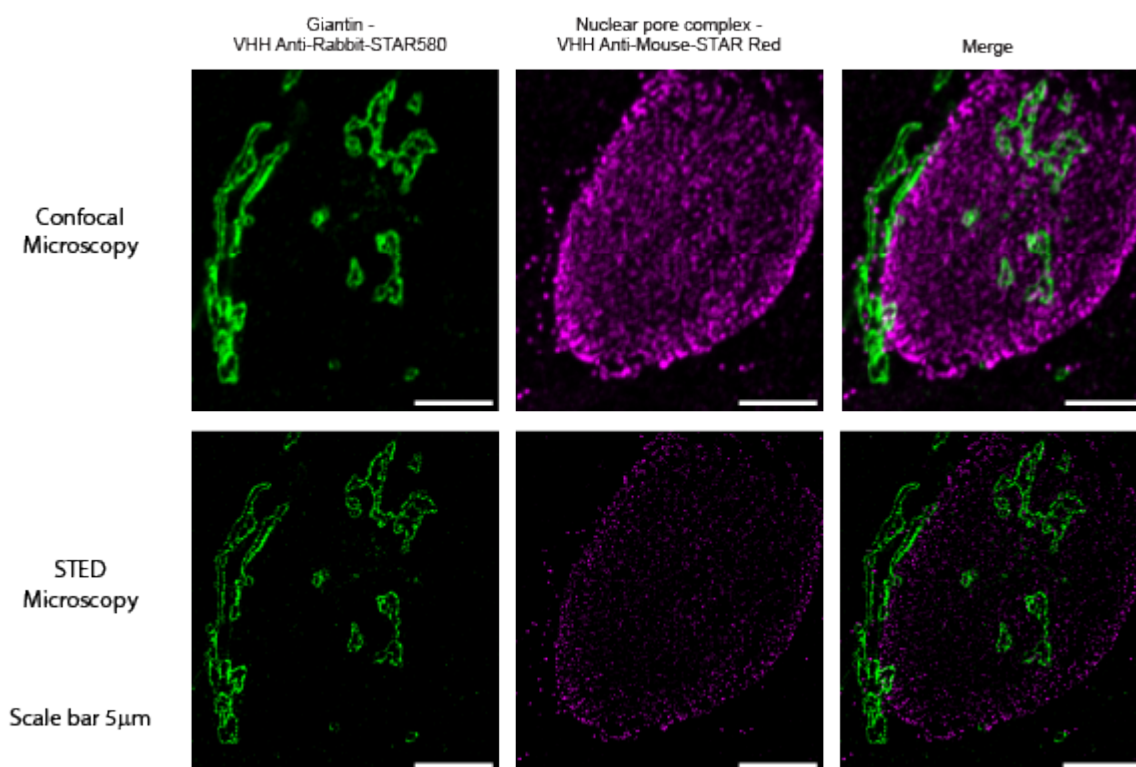


Figure 5: Two-color indirect immunostaining. The comparison of confocal microscopy to STED SRM highlights the high-resolution imaging achievable with JIR AffiniPure VHH™ antibodies and Abberior STAR dyes. Imaging performed on the Abberior STEDYCON platform.

Register to watch our Webinar to learn more about JIR AffinPure VHH™ antibodies and Abberior STAR dyes for super-resolution microscopy.



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