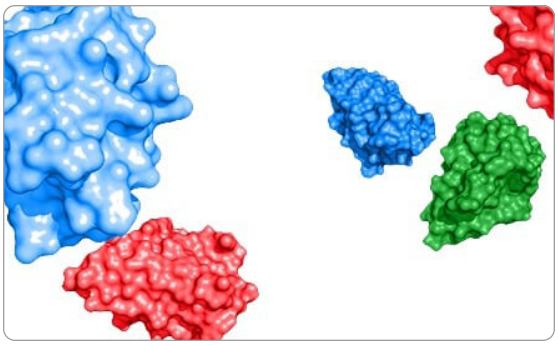
MiniMab™ Single-Domain Antibodies

Small Antibodies. Big Possibilities.



High-performance fluorescently labeled VHH antibodies for imaging and assay development

MiniMab™ Single-Domain Antibodies (SdAb) are recombinant VHH antibodies derived from camelid heavy-chain-only antibodies. Their small size (~15 kDa) enables improved target accessibility, rapid tissue penetration, and reduced steric hindrance compared to conventional antibodies. Biotium MiniMab™ SdAbs are directly conjugated to bright CF® Dyes for streamlined workflows and high-performance fluorescence detection.

MiniMab™ SdAbs Advantages

- **Smaller than IgG antibodies** for superior tissue penetration and faster staining
- **High solubility and stability** for reliable, reproducible performance
- **Minimal epitope-dye displacement**, ideal for super-resolution applications
- **Developed and optimized for imaging**
- **Conjugated to bright, photostable CF® Dyes**, including near-infrared CF®740 and STORM-compatible options

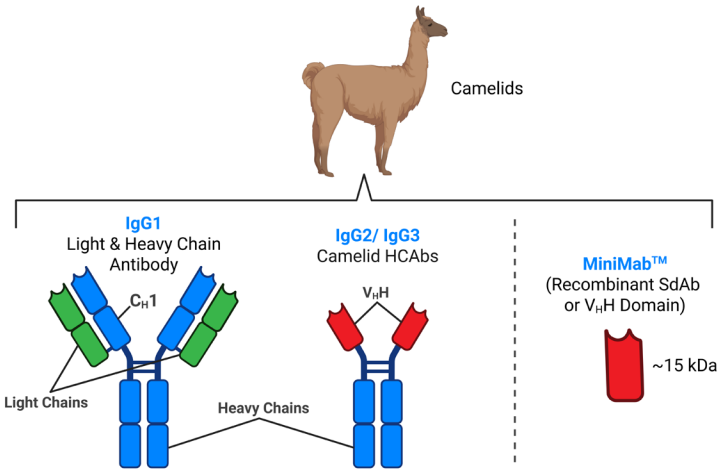


Figure 1. Alpacas produce three IgG subclasses. IgG1 has both heavy and light chains, while IgG2 and IgG3 are heavy-chain-only antibodies (HCAbs) lacking light chains and the CH1 domain. MiniMab™ Single-Domain Antibodies (SdAb) are the recombinant form of the VHH variable domain of these HCAbs. Created in BioRender. Criado, M. (2025) https://BioRender.com/oiig26t.

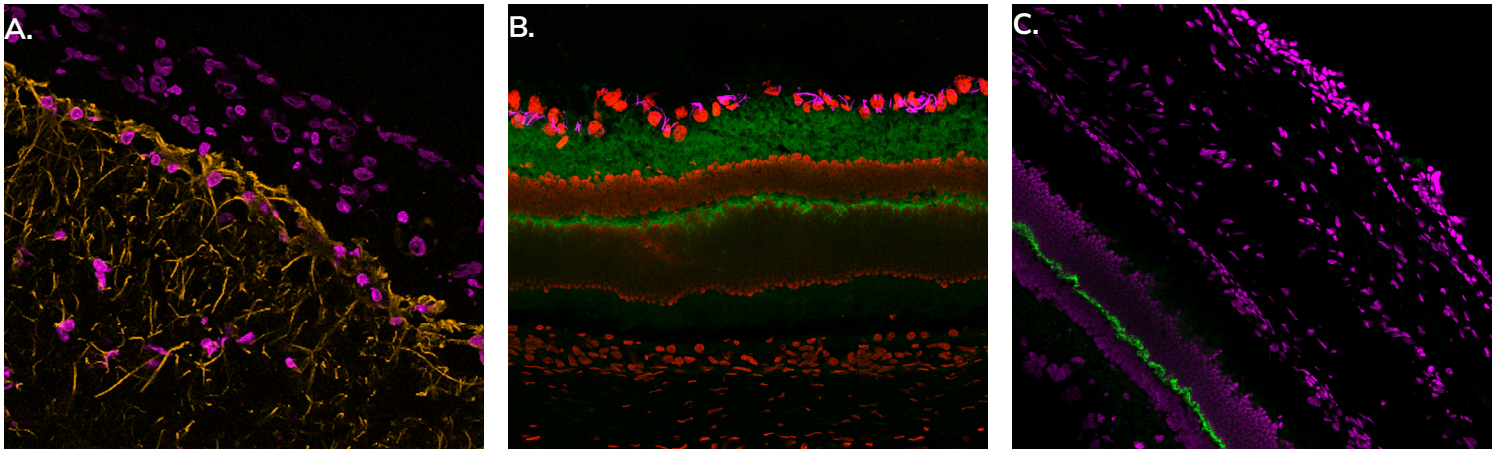


Figure 2. A) PFA-fixed rat brain cryosection stained with CF®568 GFAP rVHH (SdAb2409.GFAP) MiniMab™ (orange) and NucSpot® 680/700 nuclear stain (magenta). B) Rat retina cryosection stained with CF®488A SYT1 rVHH (SdAb2501.SYT1) MiniMab™ (green), anti-GFAP CF®740 (magenta), and NucSpot® 568/580 nuclear stain (red). C) PFA-fixed cryosection of rat eye stained with CF®488A Anti-PSD-95 Recombinant Alpaca VHH (SdAb2601.PSD95) MiniMab™, localized to neurons in the inner plexiform layer of the retina (green). Nuclei are counterstained with NucSpot® 680/700 Nuclear Stain (magenta).

Table 1. MiniMab™ SdAb Properties

Alpaca MiniMab™ SdAb	Cat. No.	Clone	Species reactivity	Applications
GFAP Alpaca rVHH	N001	SdAb2409.GFAP	Human, Mouse, Rat	IF
Histone Alpaca rVHH	N008	SdAb2511.HISTONE	Broad reactivity	IF
PSD95 Alpaca rVHH	N009	SdAb2601.PSD95	Human, Mouse, Rat	IF
SYT1 Alpaca rVHH	N002	SdAb2501.SYT1	Human, Mouse, Rat	IF
VGLUT1 Alpaca rVHH	N003	SdAb2412.VGLUT1	Human, Mouse, Rat	IF
Alpaca Anti-Human IgG (Fc), rVHH	N007	N2508.HFC	Human IgG Fc	Flow, IF, WB
Alpaca Anti-Mouse (Fab) Kappa, rVHH	N005	N2507.MFAB	Mouse Fab kappa	Flow, IF, WB
Alpaca Anti-Mouse IgG1 (Fc), rVHH	N004	N2504.M1FC	Mouse IgG1 Fc, Rat IgG1 Fc, Human IgG1 (weak)	Flow, IF, WB
Alpaca Anti-Mouse IgG2a/b, rVHH	N010	N2603.M2AB	Mouse IgG2a, Mouse IgG2b	Flow, IF, WB
Alpaca Anti-Rabbit IgG (Fc), rVHH	N006	N2507.RFC	Rabbit IgG Fc, Guinea Pig IgG, Human IgG (weak)	Flow, IF, WB

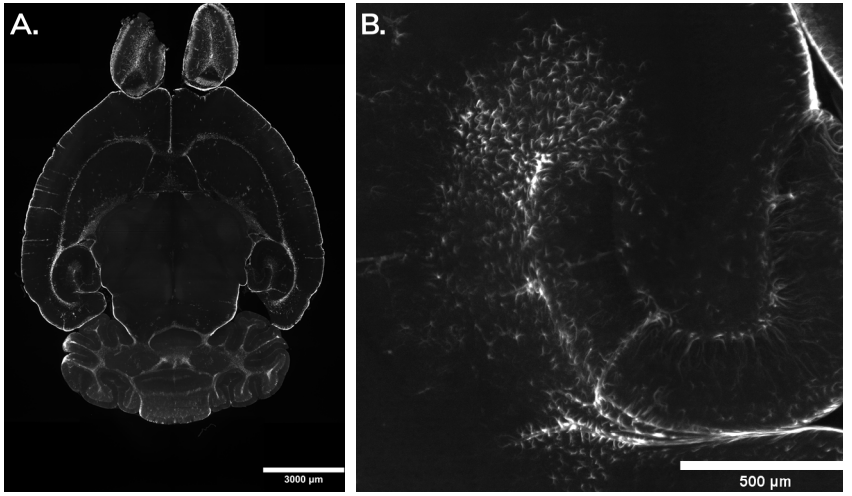


Figure 3. Whole mouse brain fixed in paraformaldehyde (PFA) and processed using the standard SHIELD protocol from LifeCanvas Technologies. The brain was then delipidated and immunolabeled with MiniMab™ GFAP SdAb (VHH) CF®568. A) Whole mouse brain, 40 µm max intensity projection. B) Zoom in of hippocampus. Imaging was performed on a SmartSPIM light-sheet microscope using a 3.6x objective. Image courtesy of LifeCanvas Technologies.

Table 2. MiniMab™ SdAb Conjugates

MiniMab™ SdAb	CF®405S	CF®488A	CF®498A	CF®568	CF®583R	CF®594	CF®640R	CF®647	CF®660C	CF®660R	CF®680	CF®680R	CF®740	CF®770
GFAP Alpaca rVHH		✓	✓	✓	✓			✓	✓		✓		✓	
Histone Alpaca rVHH		✓		✓	✓	✓		✓	✓		✓		✓	
PSD95 Alpaca rVHH		✓		✓	✓			✓	✓		✓		✓	
SYT1 Alpaca rVHH		✓	✓	✓	✓			✓	✓		✓		✓	
VGLUT1 Alpaca rVHH		✓	✓	✓	✓			✓	✓		✓		✓	
Alpaca Anti-Human IgG (Fc), rVHH	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Alpaca Anti-Mouse (Fab) Kappa, rVHH		✓	✓	✓	✓			✓	✓	✓	✓			
Alpaca Anti-Mouse IgG1 (Fc), rVHH	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Alpaca Anti-Mouse IgG2a/b, rVHH	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Alpaca Anti-Rabbit IgG (Fc), rVHH	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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MiniMab™ SdAbs
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