Protheragen
GeniusAb™

One-stop Solution from Single Domain Antibody Preparation to Screening

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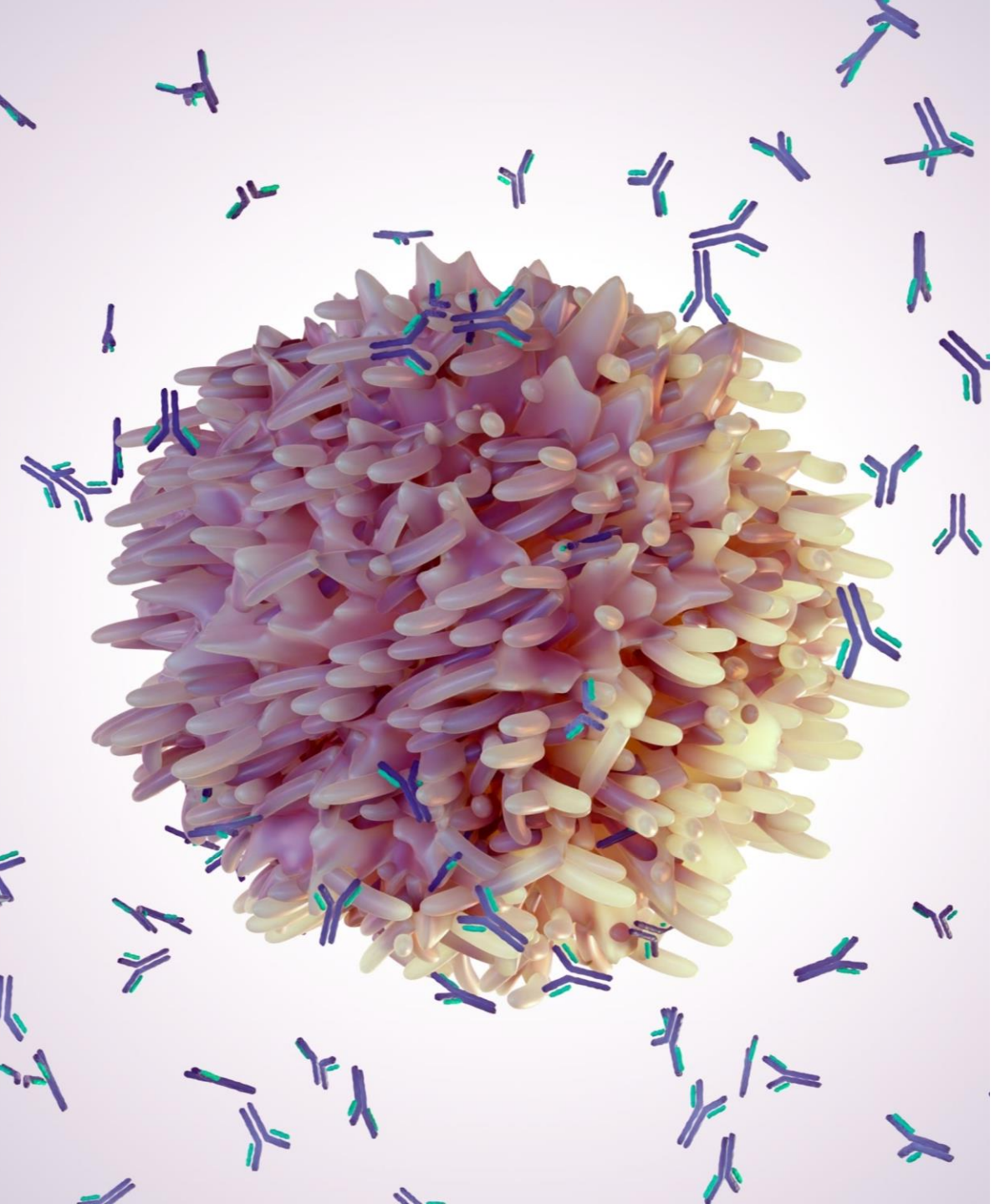

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About Us

Protheragen
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At Protheragen, we excel as a premier provider of antibody discovery and development services. With our innovative fully human single domain antibody platform and comprehensive antibody screening platforms, we offer a one-stop solution from antibody preparation to screening.

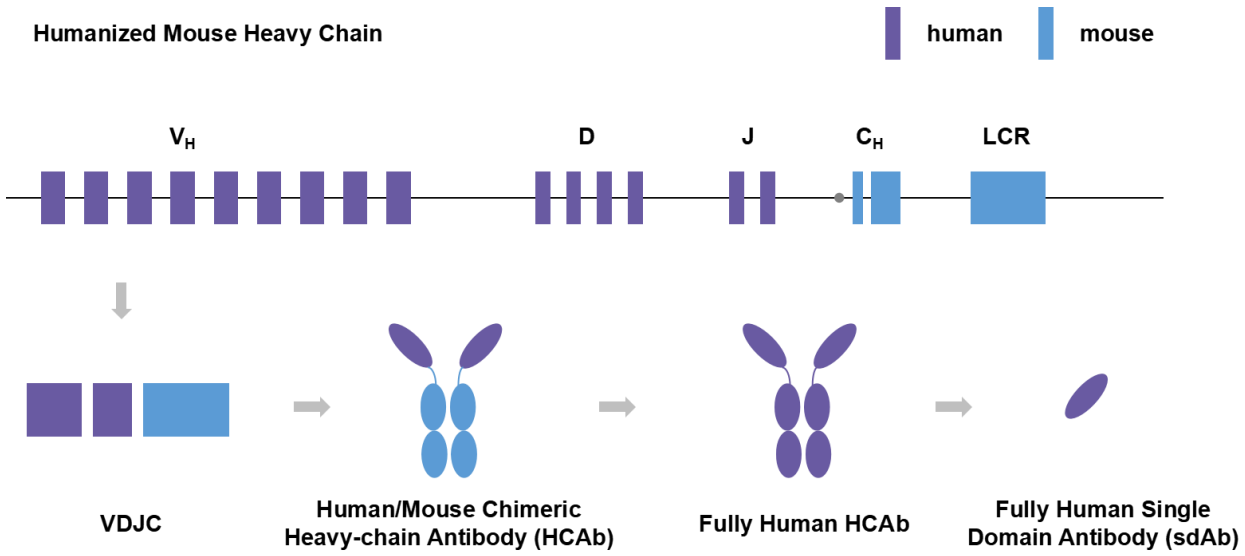
Our Mission

We are committed to reshaping the future of antibody R&D and revolutionizing the therapeutic landscape.

Our Vision

Our vision is to be the global leader in antibody innovation, and provide unparalleled solutions to our customers.

GeniusAb™: Fully Human Single Domain Antibody Platform



GeniusAb™ Mice

- To mitigate the expenses and time associated with discovering novel therapeutic single domain antibodies from species like camels and sharks, Protheragen has developed an innovative solution: *GeniusAb™* mice, which are genetically engineered to produce fully human single domain antibodies.
- By utilizing these mice, we eliminate the need for *in vitro* humanization, resulting in a more efficient and cost-effective process.

GeniusAb™: Fully Human Single Domain Antibody Platform

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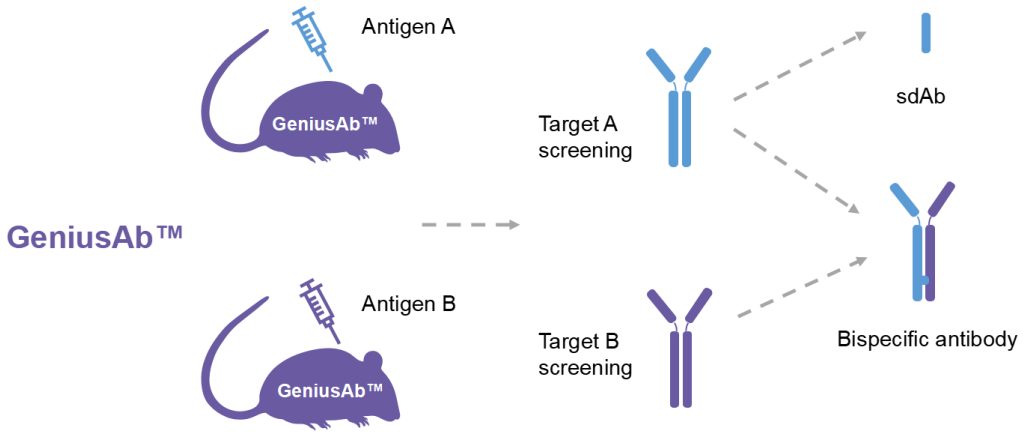
Advantages of *GeniusAb™* Mice

GeniusAb™ mice express fully human heavy-chain-only antibodies (HCAbs) without the need for *in vitro* humanization. This unique feature allows for the direct generation of fully human sdAbs, eliminating the potential immunogenicity associated with non-human frameworks.



Normal B Cell Development and Differentiation

The B cells of *GeniusAb™* mice can mature and differentiate normally, allowing for the generation of diverse and functional antibody repertoires.

Exhibit Robust Immune Responses to Multiple Antigens

GeniusAb™ mice exhibit robust immune responses to a wide range of antigens, enabling the generation of antibodies against various targets.

Sequence Diversity and Optimal Affinity

GeniusAb™ mice possess a broad antibody sequence library highly similar to humans, facilitating the generation of multiple antibody variants to identify high affinity sdAbs.

Excellent Developability

Our sdAbs exhibit stability, low immunogenicity, and compatibility with downstream manufacturing processes, making them ideal for antibody commercialization.

Platform Application — Therapeutic Development

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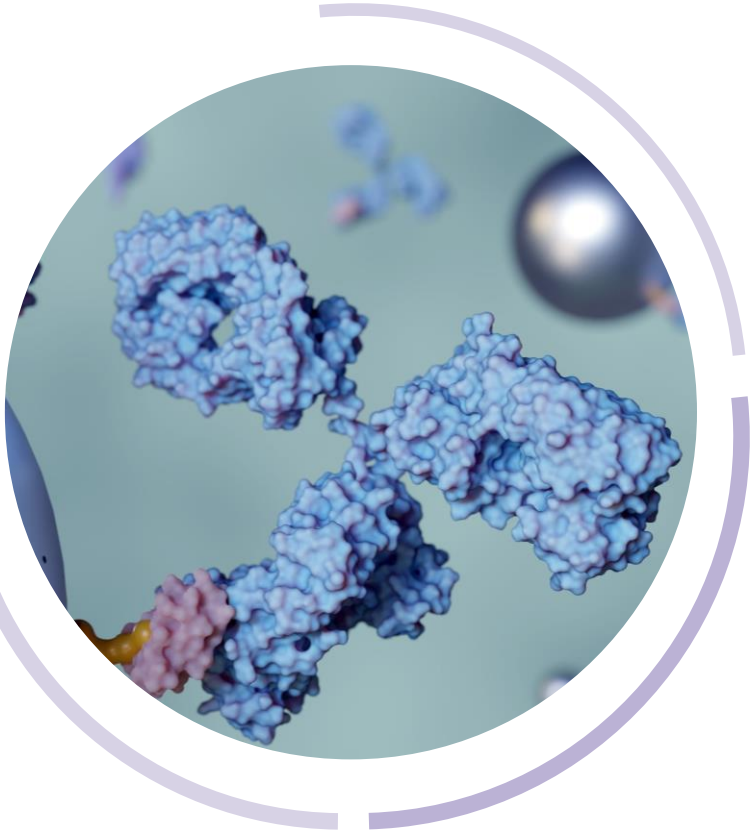
The unique properties of sdAbs, including high specificity, small size, and stability, make them attractive candidates for targeted therapy and immunotherapy.

- Immune Checkpoint Inhibitor
- Immune Checkpoint Agonists
- Bispecific Antibody
- CAR-T Cell Therapy
- Vaccine Adjuvants
- Drug Delivery Carrier
- Cytokine Therapy
- And More



High Potential Therapeutic Targets

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High Potential Targets for Single Domain Antibody Development				
4-1BB	CDH17	GUCY2C	Nectin-4	ROR1
ALB	DLL3	HER3	OX40	RSV
BCMA	EPHA2	IL3RA	PD-L1	TPBG (5T4)
CD16A	FOLR1	LIV-1	PSMA	TROP2
CD71 (TFR1)	GPRC5D	MUC16	PTK7	And More

Various Types of Targets

Protheragen has utilized the *GeniusAb™* mouse to establish a fully human single domain antibody library comprising over 100 high potential therapeutic targets, including tumor-associated antigens, GPCRs, immune checkpoints, cytokines/chemokines, and factors associated with neurological disorders.

LEADER IN ANTIBODY DEVELOPMENT

Pipeline

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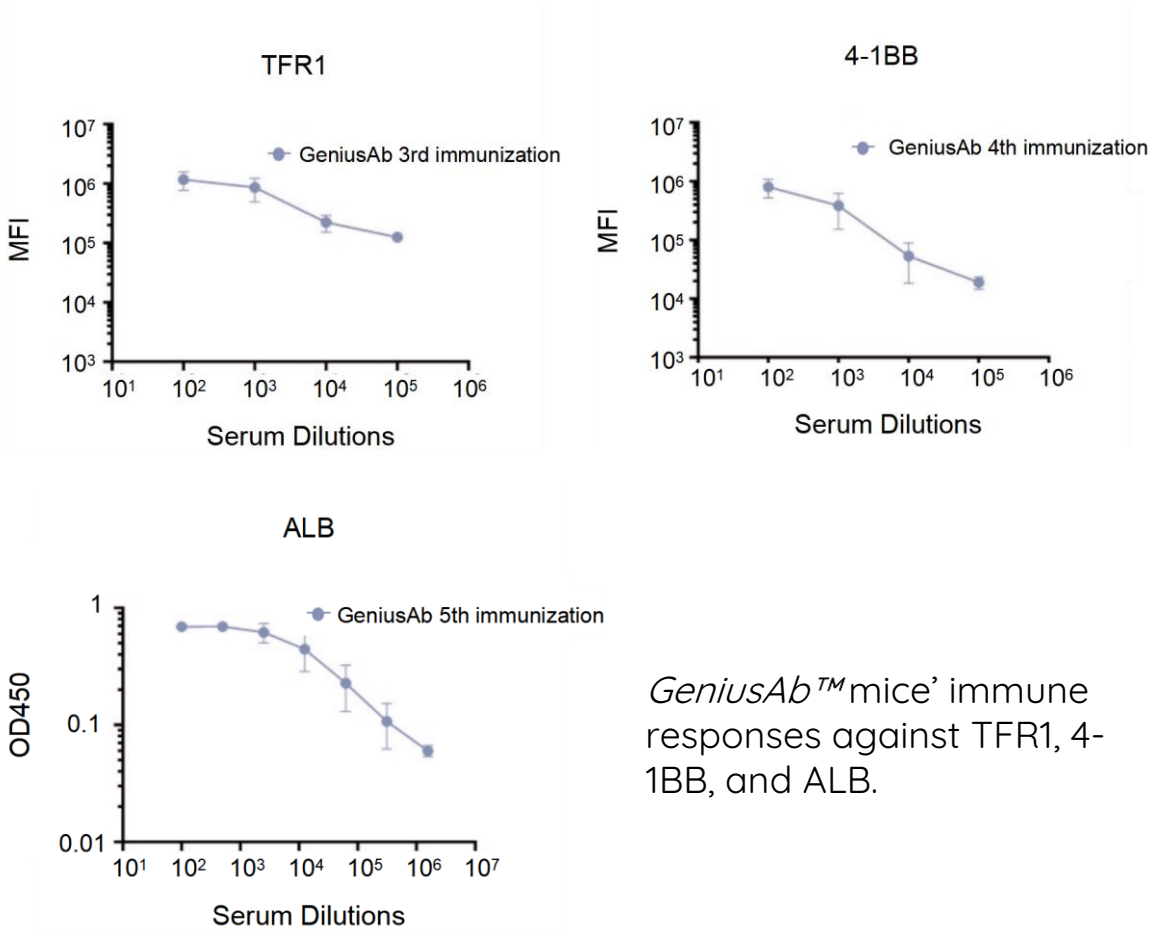
Strategic Pipeline

- With the *GeniusAb™* platform, our strategic focus is to combat solid tumors by developing a series of single domain antibodies targeting high-potential antigens.
- As we navigate the ever-evolving realm of cancer research, our platform is dynamically engaged in both the hit identification and lead discovery stages for a variety of pivotal targets.

Projects	Target	Indication	Discovery	Preclinical	IND	Clinical
GENI005	MUC16	Solid Tumors	→			
GENI0010	BCMA	Solid Tumors	→			
GENI0013	EPHA2	Solid Tumors	→			
GENI0016	MSLN	Solid Tumors	→			
GENI0019	Nectin-4	Solid Tumors	→			
GENI0023	PSMA	Solid Tumors	→			
GENI0027	ROR1	Solid Tumors	→			
GENI0030	TROP2	Solid Tumors	→			
GENI0032	CDH17	Solid Tumors	→			
GENI0035	FAP	Solid Tumors	→			
GENI0038	FOLR1	Solid Tumors	→			
GENI0041	GPRC5D	Solid Tumors	→			
GENI0044	GUCY2C	Solid Tumors	→			
GENI0046	Her3	Solid Tumors	→			

Case Study



GeniusAb™ mice' immune responses against TFR1, 4-1BB, and ALB.

GeniusAb™ mice demonstrate robust immune responses against multiple antigens

- The sera obtained from *GeniusAb™* mice, following immunization with TFR-1 and 4-1BB (membrane antigens), underwent dilution and incubation with antigen-expressing CHO cells. Subsequently, fluorochrome-conjugated secondary antibodies were employed to label CHO-bound HCAbs. The mean fluorescence intensity (MFI) was quantified through flow cytometry to ascertain the titer of antigen-specific HCAbs.
- In the case of sera derived from *GeniusAb™* mice immunized with ALB (a secreted antigen), a similar procedure was followed. Post dilution and incubation with fluorochrome-conjugated secondary antibodies, OD450 measurements were taken using ELISA to assess the antigen-specific HCAb titer.

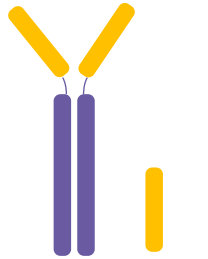
Open Collaboration of Single Domain Antibody Assets

Protheragen GeniusAb™

Protheragen is seeking collaboration with global innovators by offering access to our advanced fully human single domain antibody platform, designed to accelerate drug discovery and development.

Collaboration Areas:

- Cell therapy
- Blood-brain barrier crossing
- Bispecific/multispecific antibodies
- Antibody-drug conjugates (ADCs)
- Radionuclide-drug conjugates (RACs)
- Nano-drugs

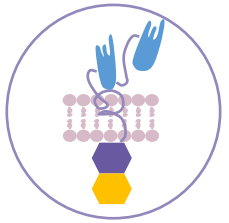


GeniusAb™

HCAb/sdAb

BsAb/Engager

Multi-specific Ab



CAR-T/CAR-NK

Radionuclide antibody conjugate (RAC)

Nano-drug

Antibody Screening Platforms

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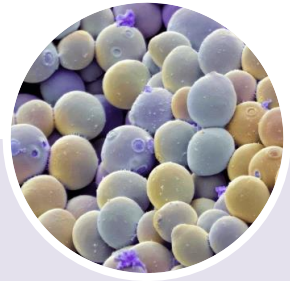
With our relentless pursuit of cutting-edge research and development, Protheragen has established comprehensive antibody screening platforms. These platforms integrate a diverse range of state-of-the-art technologies, enabling us to quickly and accurately screen high-affinity antibodies, ensuring accurate and specific selection of ideal candidate antibodies for a variety of research, diagnostic and therapeutic purposes.

Phage Surface Display

Utilizing phage surface display technology, our platform provides a powerful tool for antibody discovery and engineering.

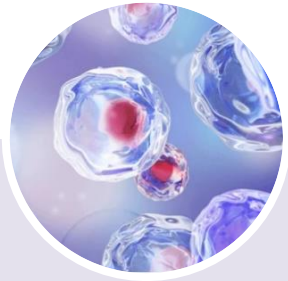


Yeast Surface Display

Yeast display is used for directed evolution of antibodies, protein engineering, and high-throughput screening of antibody libraries.

Bacteria Surface Display

By displaying proteins on the surface of bacteria, we are paving the way for the development of new types of biomolecules.

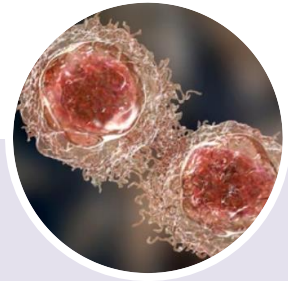


Mammalian Cell Surface Display

This platform enables you to deeply study protein interactions, screen antibodies, and develop potent biologics.

Ribosome and mRNA Display

Our platform provides in vitro technologies for the rapid discovery and optimization of antibodies, enzymes and proteins.



B Cell Sorting

B cell sorting is essential for identifying rare antibodies and generating mAbs for therapeutic and diagnostic applications.

Display Technology Comparison

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At Protheragen, we provide an extensive array of state-of-the-art antibody display technologies tailored to diverse research requirements. Presented below is a comparative analysis of six display technologies to facilitate a clear understanding of the strengths and limitations of each approach. We trust that this comparison will assist you in selecting the optimal platform aligned with your specific needs.

Display Technology	Throughput	Protein Folding Complexity	Post-Translational Modifications	Diversity	Efficiency	Cost	Ease of Operation
Phage Surface Display	●	●	●	●	●	●	●
Yeast Surface Display	●	●	●	●	●	●	●
Bacteria Surface Display	●	●	●	●	●	●	●
Mammalian Cell Surface Display	●	●	●	●	●	●	●
Ribosome and mRNA Display	●	●	●	●	●	●	●
B Cell Sorting	●	●	●	●	●	●	●

● Favorable Rating ● Moderate Rating ● Less Favorable Rating

Collaboration Opportunities

Harnessing the Power of Our Antibody Platforms

Protheragen is actively seeking collaborations with global innovators to offer access to the *GeniusAb™* platform or to provide single domain antibody candidate drug development services to clients dedicated to biopharmaceutical research and development.

- Cutting-edge Technology
- Professional Team
- Customization Options
- Reliable Partner

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