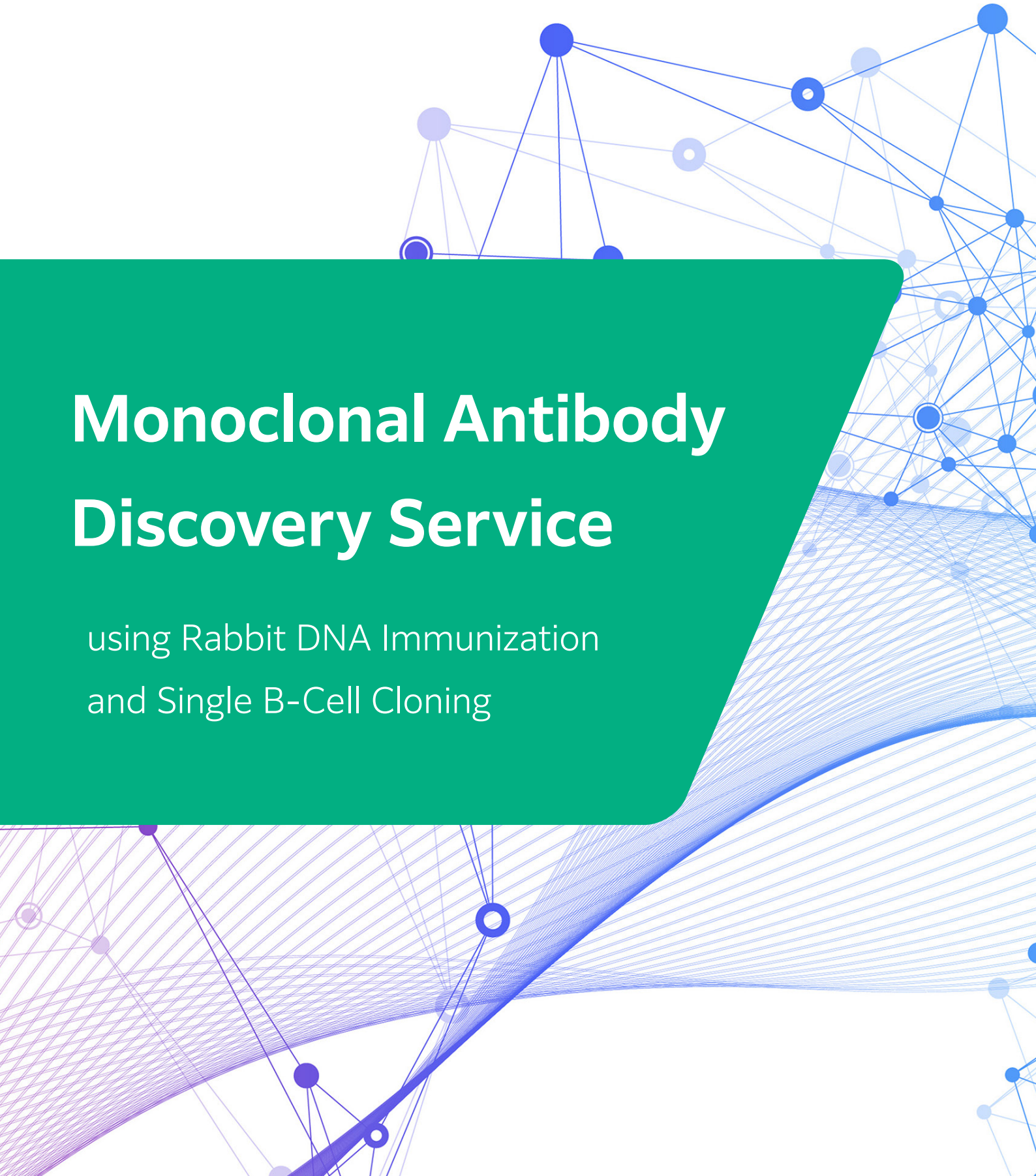
FUJIFILM
Value from Innovation

Wako

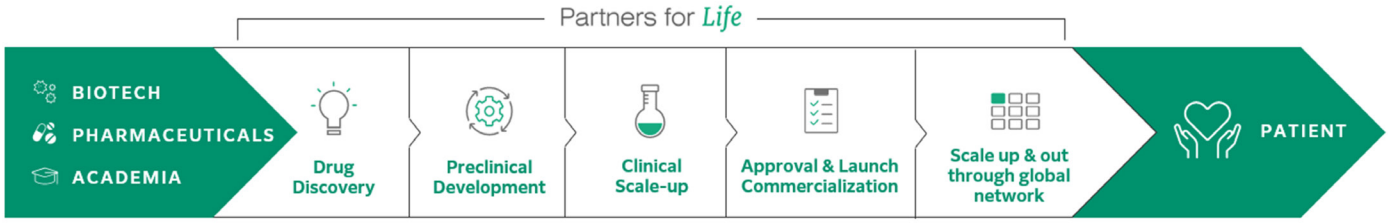


Monoclonal Antibody Discovery Service

using Rabbit DNA Immunization and Single B-Cell Cloning

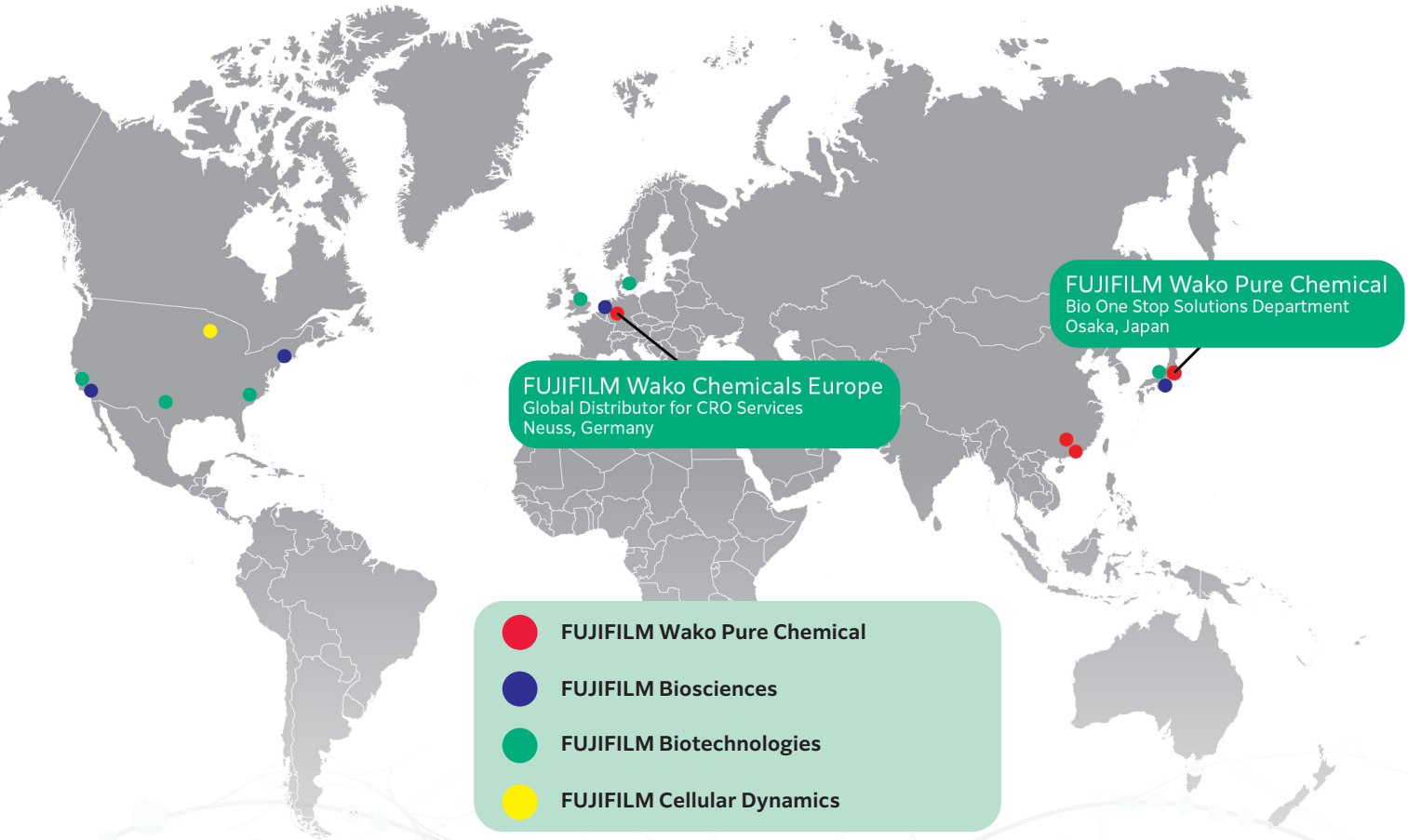
About Us

Fujifilm Life Sciences provides an integrated suite of products, services and solutions backed with deep expertise and a history of innovation to rapidly progress your product to market.



Wako

FUJIFILM Wako Pure Chemical is a general life science company from Japan with almost 100 years of history. Based on advanced technological development, we provide highly functional and high-quality laboratory chemicals, specialty chemicals, and clinical diagnostic reagents as our products, in addition to cutting-edge CRO services. With our presence in Japan and our local subsidiaries globally, we strive to contribute to the life science and chemical industry worldwide.



Our CRO Services

- Based on solid data and innovative research
- Experienced scientists and premium customer service
- Highly customizable service based on customers' needs

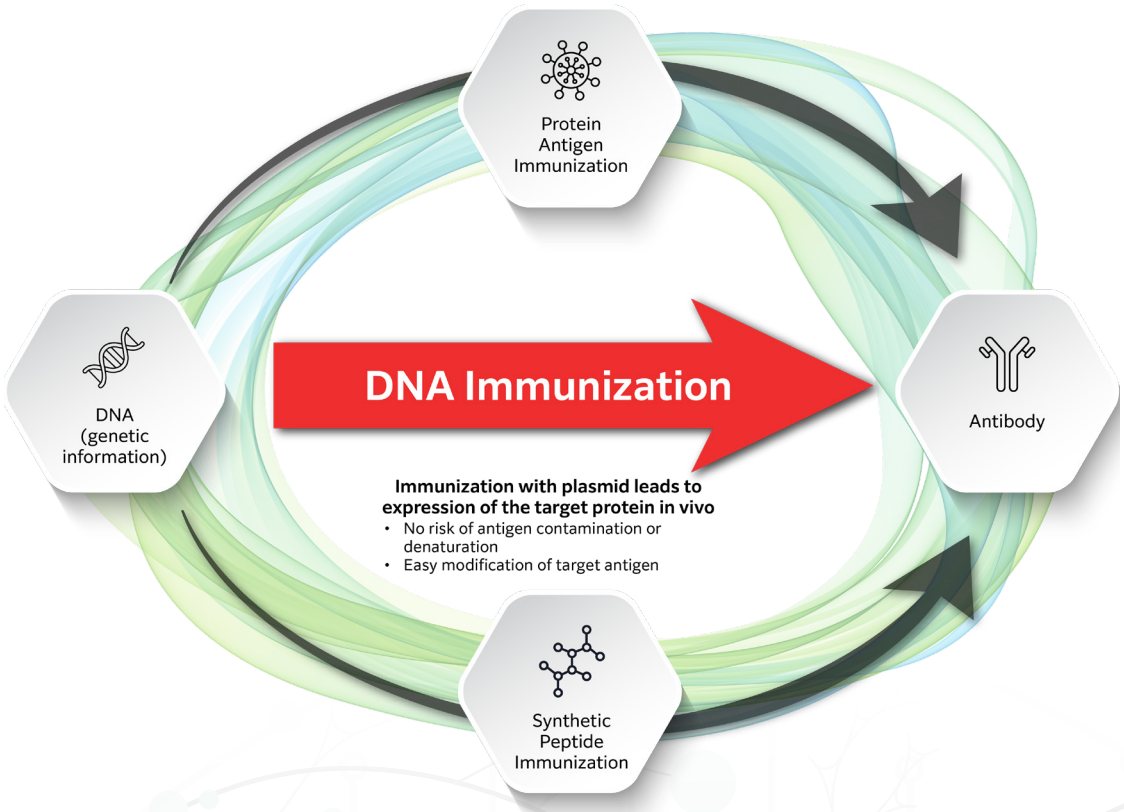
Monoclonal Antibody Discovery

Using Rabbit DNA Immunization and Single B-cell Cloning

Our experienced antibody experts at Fujifilm Wako in Japan offer you a tailored milestone-based service for discovering rabbit monoclonals.

Overview

Our Rabbit Monoclonal Antibody Discovery Service leverages the benefits of the DNA Immunization method in combination with Fujifilm's proprietary single B-cell screening technology. Rabbit mAbs boast 10-100x higher binding affinity than those from mice or rats, covering a wider range of epitopes. The DNA Immunization method, which involves immunization of rabbits using plasmid DNA, bypasses the need for immunization using recombinant protein/peptide, and facilitates the in vivo synthesis of proteins, leading to the generation of antibodies that recognize conformational epitopes, including challenging membrane proteins like multipass transmembrane proteins. From the target information, we can provide the antibody gene sequence for the high performance, high affinity antibody discovered through our service. This service is ideal for discovering ADCs, biologics, antibody therapeutics, antibodies for diagnostic uses, and also for research uses requiring antibodies that can recognize conformational epitopes and/or the native form of the antigen is critical (e.g., flow cytometry, immunoprecipitation, immunofluorescence, IHC on non-fixed tissues, therapeutic antibodies, or neutralizing antibodies).



Benefits at a Glance

- Antibodies that recognize the native form of antigen of interest and challenging membrane proteins
- Consult with antibody experts with decades of experience
- Premium, custom antibodies specific to the customer's target

CUTTING-EDGE: **Single B-Cell Screening Technology**

In Stage 3, we unlock the full potential of the rabbit immune system by leveraging FUJIFILM's proprietary single B-cell screening technology (PAT.P: WO2024071374), which preserves native heavy/light chain pairing and maximizes the recovery of high-affinity clones.

Harvesting Splenocytes

Splenocytes from rabbits with sufficiently high antibody titer are collected.

Primary Screening

Cells are seeded into 196,000 well plates pretreated with exosomes carrying antigens expressed from plasmids. Positive cells which exhibit binding to the target antigen are picked.

Single-Cell PCR

RNA is collected from the cells, and RT-PCR is performed to amplify the antibody gene.

Secondary Screening

Amplified H- and L-chain antibody gene fragments are transfected into cultured cells, and the antibodies are produced in the supernatant. Flow cytometry is performed to determine specificity.

Cloning

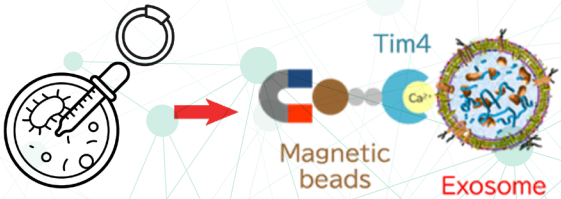
Gene fragments that are determined to be specific antibodies are cloned.

Antibody Gene Sequencing

Sequencing analysis is performed to obtain the nucleotide sequence of the specific antibody.

TECH HIGHLIGHT — Exosome Technology for Single B-Cell Screening

Our proprietary single B-cell screening method enables precise, high-throughput identification of antibody-producing cells.

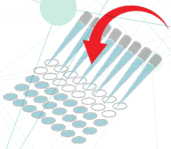


STEP 1 ›

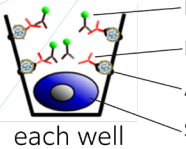
Antigen-expressing exosomes are generated by transfecting cultured cells with antigen-encoding plasmids, followed by purification from the culture supernatant using the phosphatidylserine (PS) affinity method via Tim4.

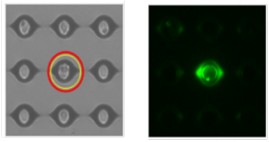
STEP 2 ›

Tim4 coating is applied to the 196,000-well chamber. The exosomes, which preserve antigens in their native conformation, are added and immobilized by Ca^{2+}-dependent binding with Tim4.



1. Tim4 coating
2. Antigen-expressing exosomes
3. Splenocytes





Example: Green fluorescence results when the cell seeded in the well produces antibodies specific to the antigen, allowing for identification of a high number of positive clones.

STEP 3 ›

Antibody-producing cells are added to the wells, and single cells producing specific antibodies are detected through fluorescence imaging.

Using this screening method, we can reliably identify a high number of positive clones, which increases the likelihood of identifying mAbs with exceptional specificity, affinity, and diversity.

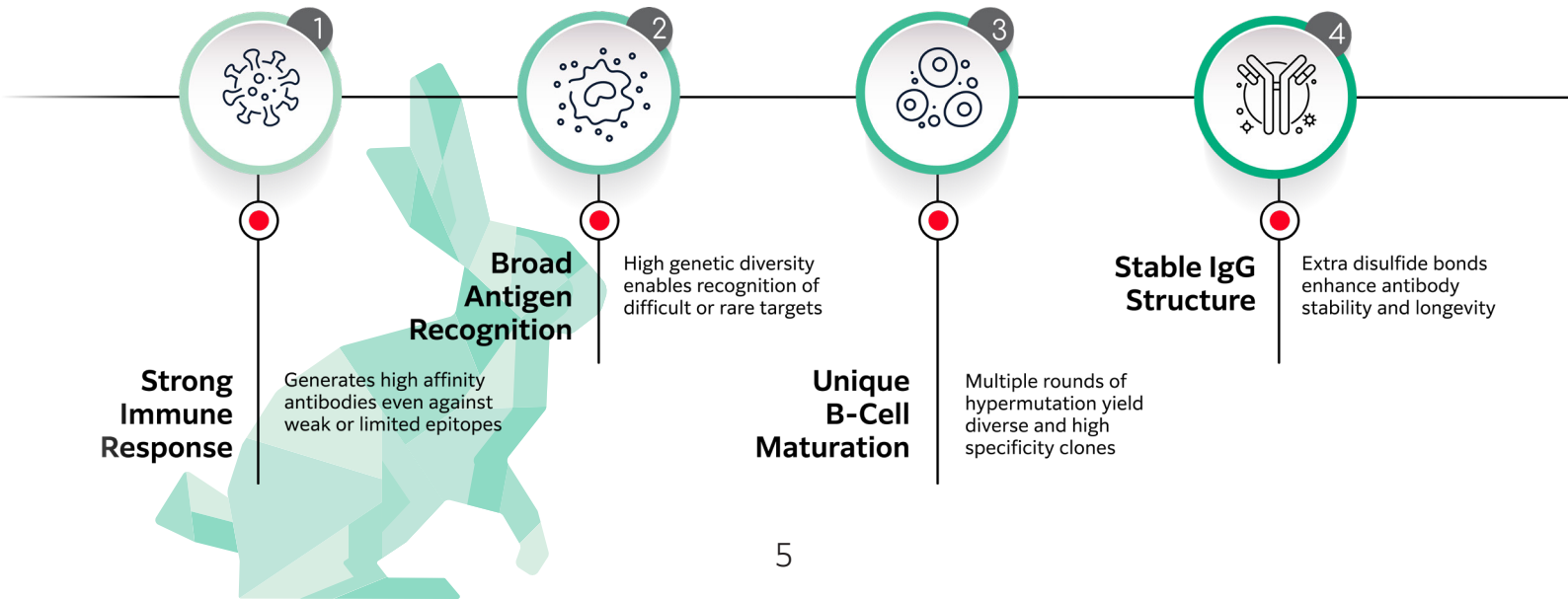
Scan to learn more about the PS Affinity Method for EV Isolation!

A New Standard in Antibody Generation Methods

Our **single B-cell screening method** pushes the boundaries of monoclonal antibody discovery by combining excellence in antibody quality, adaptability, and yield. Unlike traditional approaches such as hybridoma or phase display, single B-cell cloning delivers a broader pool of positive clones and directly obtains antibody gene sequences, paving the way for unparalleled quality and reproducibility that meets the rigorous demands of modern antibody development.

	Single B-Cell Screening	Hybridoma	Phage Display
Antibody Affinity	High	High	Moderate (Improveable through extra steps)
Number of Positive Clones	Many	Few	Few
Animal Model Flexibility	High (e.g., rabbit, mouse, rat, others)	Limited (Mostly mouse)	Animal-Free (Synthetic)
Speed to Results	Moderate	Slow	Fast
Technological Complexity	High	Moderate	High
Antibody Yield	High	Moderate	Variable

Advantages of Rabbit Monoclonal Antibodies



Stage-Gated Service

Our stage-gated antibody discovery process puts you in control. Each stage is clearly defined, independently invoiced, and transparently executed. You get data reports at every stage, enabling reduced risk and informed decision-making at every step.

No surprises. Just flexible, science-forward custom antibody development built for your pipeline.

Feasibility Study

2 weeks

Proposing antibody production strategies based on target information and intended use.

Stage 1

4-6 weeks

Insertion of cDNA into expression vector, transfection of plasmids to mammalian cells, followed by a check of the expression of the target antigen on the cell membrane by flow cytometry (FCM).

Stage 2

6-8 weeks

Immunization of rabbits using our in-house immunization method, which enables reliable induction of high antibody titers. The target antigen is expressed on the surface of immune cells in vivo. Using the antiserum, FCM analysis is performed.

Stage 3

10 weeks

Rabbit spleens are collected. Splenocytes are isolated, seeded into a 196,000-well plate, which is pretreated with antigen-expressing exosomes. Cells producing antibodies that recognize the target antigen show green fluorescence, enabling single B-cell picking for a high number of positive clones.

Deliverables

Amplified H- and L-chain Ab gene fragments are transfected into cultured cells to produce antibodies. FCM is used to test for specificity, and specific antibodies are cloned and sequenced.

1. Antibody Gene Sequence

2. Detailed Report

Average total TAT: 6 months

OUR PARTNERS

for Downstream Antibody Solutions

Partners for *Life*

RevolKa

AI & ML techniques for antibody engineering

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FUJIFILM Wako is collaborating with **RevolKa Ltd.**, a next-gen protein engineering company, to bring you a comprehensive solution combining monoclonal antibody discovery and antibody engineering services. Their technology platform, ***ai*Protein®**, combines the power of machine learning with directed evolution to achieve rapid, multi-dimensional optimization of proteins.

Key Features of *ai*Protein®

Integrated ML & Directed Evolution

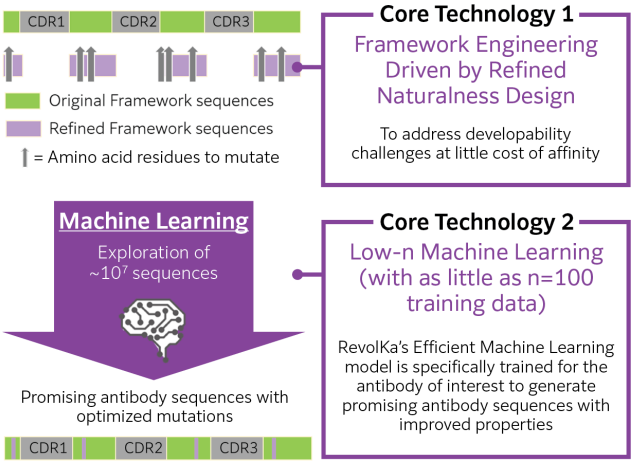
RevolKa's proprietary ML algorithm enhances the traditional directed evolution process. This allows for the modeling of fitness landscape of proteins and predicting the best mutations for protein engineering.

Simultaneous Property Engineering

Multi-dimensional optimization for stability, expression levels, affinity, and solubility with minimal tradeoffs. These improvements are crucial for practical applications such as creating effective and stable biologics.

Efficient Use of Small Datasets

The platform's ability to predict superior protein variants from limited datasets reduces the need for extensive variant screening, conserving resources and time.



*** Available in Asia and European regions only**

FUJIFILM Biotechnologies

CDMO manufacturing of antibodies

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kojoX™ Supply agility through modular approaches

> "FUJIFILM Biotechnologies' kojoX ecosystem aligns and globally harmonizes their facilities for unparalleled supply agility and resilience."

FUJIFILM Biotechnologies provides CDMO services globally for biologics and advanced therapies from pre-clinical development to commercialization, helping to bring life-impacting treatments to patients.

Key Highlights

- mAb gene sequence to IND in 12 months
- Over 30 years of CDMO experience, proven track record of excellence
- Locations in Europe, US, and Japan allow for scaling from process development to GMP from 500L to 20,000L

Supporting Our Partners From Preclinical to Commercial Within One Globally Harmonized Network

Preclinical	Early Clinical Phase I, II	Late Clinical Phase III	Regulatory Approval Commercial Production
Non-GMP Drug Substance	Drug Substance Development and Manufacturing 500 L, 2-20K L fed batch and continuous		
Non-GMP DP Development	Drug Product Development and Manufacturing		
Tech Transfer / Scale-up			
CMC Services including formulation development, optimization, and viral clearance			
Process Invention	Process Development	Process Characterization	Finished Goods / ALP
Cell Line Development	Process Optimization	Process Validation	Post-Approval Activities
Manufacturability Assessments & Bioinformatics	Analytical Method Development and Validation		Product Lifecycle Mgmt
	Stability		Process Lifecycle Mgmt

* ALP = Assembly, Label, and Packaging

Partners for *Life*

Contact Us

For any inquiries, please send us an email at:
ffwk-cservice@fujifilm.com

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