

# Monoclonal Antibody Discovery Service

using Rabbit DNA Immunization  
and Single B-Cell Cloning

# About Us

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 in Europe, the US, and China, we strive to contribute to the global life science/chemical industry.

## Business Segments

### Laboratory Chemicals

Portfolio of 4000+ products for cell culture, life sciences, and chemistry, as well as CRO services

### Clinical Diagnostic Reagents

High-quality diagnostic reagents, tests, and assay kits for biochemistry and disease detection

### Specialty Chemicals

Reagents for polymer chemistry, pharmaceutical/cosmetic applications, and electronics

## Our CRO Services



Based on solid data and innovative research



Experienced scientists and premium customer service



Highly customizable service based on customers' needs



FUJIFILM Wako Chemicals Europe  
Distributor of Fujifilm CRO Services

FUJIFILM Wako Pure Chemical Corp.  
Bio One Stop Solutions Department

# Monoclonal Antibody Discovery

## Using Rabbit DNA Immunization and Single B-cell Cloning



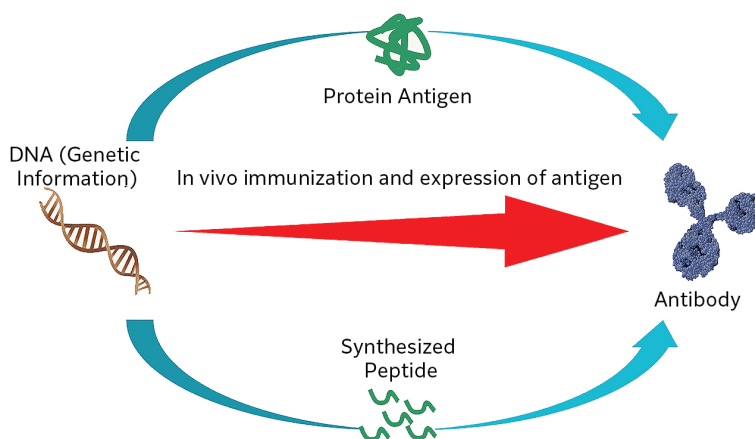
Our experienced antibody experts offer our clients a tailored milestone-based service for antibody discovery.

### Overview

By using the DNA immunization technique with rabbit monoclonal antibody production, we are able to obtain antibodies that possess both the benefits of the DNA immunization method and the “high efficacy and affinity” properties of monoclonal rabbit antibodies. These antibodies can be used as a next-generation antibodies for antibody therapeutics (i.e., TCR/CAR-T discovery, ADCs), diagnostic reagents, and more.

### What is DNA immunization?

In the conventional production of monoclonal antibodies, recombinant proteins are derived from DNA or peptide synthesis and then administered as antigens to immunized animals to generate antibodies. In contrast, the DNA immunization method involves directly injecting a plasmid into the animal to express the target protein within its body. This method avoids the need for antigen proteins/peptides, prevents contamination and denaturation, and allows easy modification of the target antigen. Additionally, it facilitates the production of neutralizing (functional) antibodies.



### Advantages of Rabbit Monoclonal Antibody



- Highly specific high affinity antibodies<sup>1</sup>
- More similar to human genome than to rodents<sup>1</sup>
- Broader recognition of immunogenic antigens and epitopes<sup>2</sup>

### Benefits at a Glance

- Antibodies that recognize the native form of antigen of interest and challenging membrane proteins
- No need for recombinant protein/peptide synthesis for immunization
- Guaranteed high affinity and performance next-gen antibodies

1: Mage, R. G., Esteves, P. J., & Rader, C. (2019). Rabbit models of human diseases for diagnostics and therapeutics development. *Developmental and Comparative Immunology*, 92, 99–104. <https://doi.org/10.1016/j.dci.2018.10.003>  
2: Weber, J., Peng, H., & Rader, C. (2017). From rabbit antibody repertoires to rabbit monoclonal antibodies. *Experimental & Molecular Medicine*, 49(3), e305–e305. <https://doi.org/10.1038/emm.2017.23>

# Milestones

**Target Information**  
(Accession No. & Application)

**Feasibility Study**  
2 weeks

**M1: Antigen Expression Analysis**  
1.5 months

**M2: Rabbit Immunization**  
2.5 months

**M3: mAb Production**  
Harvesting Splenocytes  
Single B-Cell Cloning  
Expression Check &  
Sequencing  
2-3 months

**Deliverables**  
Antibody Gene Sequence  
Report

# Service Information



## Feasibility Study

Based on the requested sequence information and intended use, we analyze the structure and properties of the target in silico and propose an antibody production strategy. We will propose the optimal immunizing region, immunization method, and screening method together with a report.

## Milestone 1: Antigen Expression Analysis

Based on the Feasibility Study, target genes are cloned into vectors provided by the customer or into our inhouse expression vectors to create immunizing plasmids. After transient expression in mammalian cells, we check antigen expression on the cell surface using a flow cytometer.

\*\*If the customer already has a vector that is known to express the antigen, Milestone 1 can be omitted.

## Milestone 2: Rabbit Immunization

Japanese white rabbits are injected subcutaneously with the immunizing plasmid. Antiserum is collected after about 2 months of immunization. Antibody titers are evaluated by flow cytometry using transient forced expression cells produced in Milestone 1.

## Milestone 3: mAb Production

**Harvesting:** Splens from rabbits with elevated antibody titers are harvested and splenocytes are obtained. Splenocytes are seeded into plates and cells are separated one by one.

## Single B-Cell Screening:

Primary screening is conducted in chambers seeded with spleen cells. By coating the chamber with extracellular vesicles (EVs) that express antigens on their membranes, membrane proteins can be screened according to our Fujifilm proprietary method (PAT: WO2024071374)<sup>3</sup>. The chambers are coated with antigen, and cells that secrete antibodies binding to the antigen are picked (up to 44 cells). The antibody genes are then amplified via single-cell PCR. In secondary screening, the amplified gene fragments are transiently expressed in mammalian cells, and their antigen-binding capabilities are assessed using flow cytometry or ELISA.

## Expression Check & Sequencing:

Six clones are selected and an expression vector carrying the antibody gene is constructed. The expression vector is transiently expressed in mammalian cells, and antigen binding and expression levels are analyzed by flow cytometry or ELISA. We will then sequence the antibody genes and deliver the antibody gene sequences and expression vectors.

3: World Intellectual Property Organization. (2024). Screening method for cell that produces objective substance, nucleic acid production method, and objective substance production method. (WO/2024/071374). Retrieved from <https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2024071374>

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