

Drug Discovery **CRO Services**

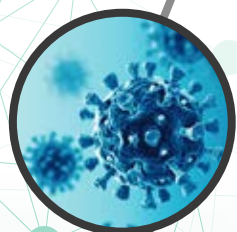
End-to-end contract research services using cutting-edge technologies



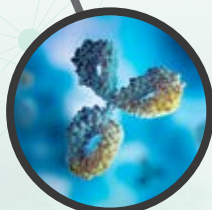
Service Highlights



iPS-derived Cell Based Assays - p. 5-6



Anti-Infectives Discovery - p. 7



Rabbit mAb Platform - p. 8-9
Discovery & Engineering



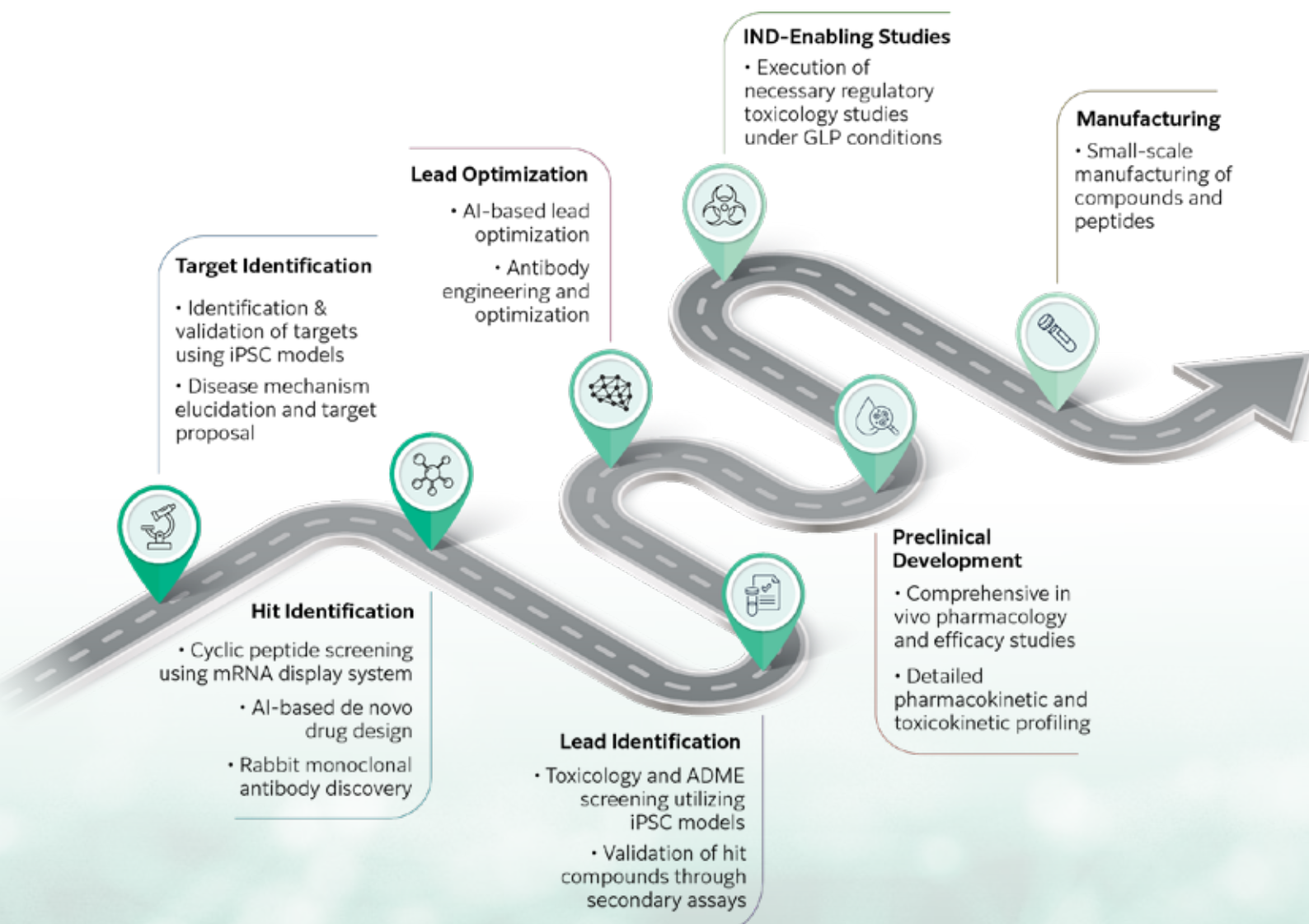
Cyclic Peptide Screening - p. 10
with mRNA Display System



drug2drugs AI-AAM® - p. 11
AI Drug Discovery Service

Value from Innovation

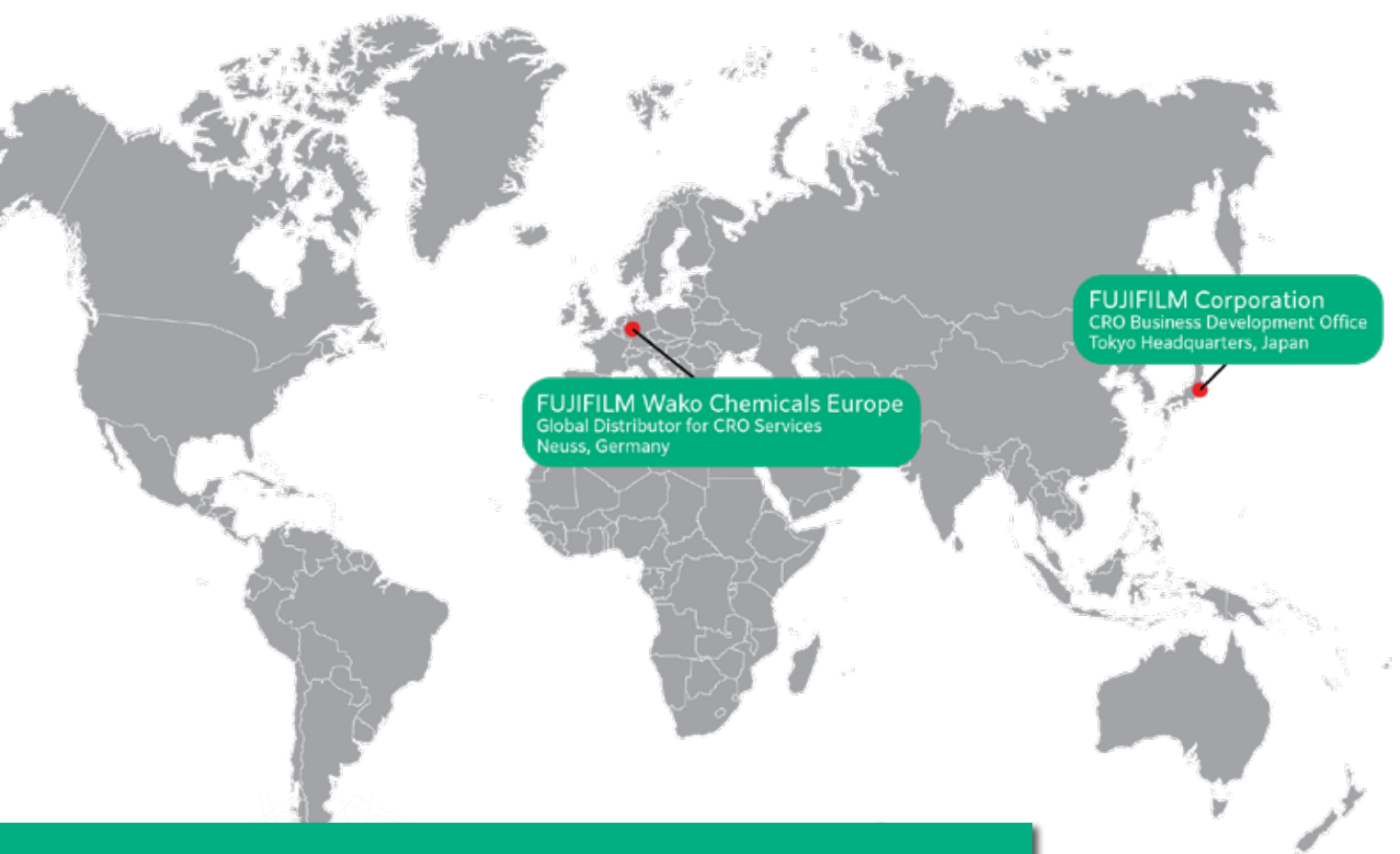
with our comprehensive CRO Services Platform



About Us

Founded over 90 years ago, Fujifilm is one of the world's leading technology companies. Today, Fujifilm is harnessing the strengths of all our diverse life sciences businesses to bring an unprecedented array of solutions to support our current and future partners. Together, we are Partners for Life, bringing the world more smiles.

At FUJIFILM, we provide cutting-edge contract research services globally based on advanced research performed in Japan. Based on our accumulated expertise, we offer a comprehensive suite of highly customizable services from drug discovery to pre-clinical stages.



Our CRO Services



Comprehensive range of capabilities across the drug discovery and pre-clinical stages



Established leader in custom research services



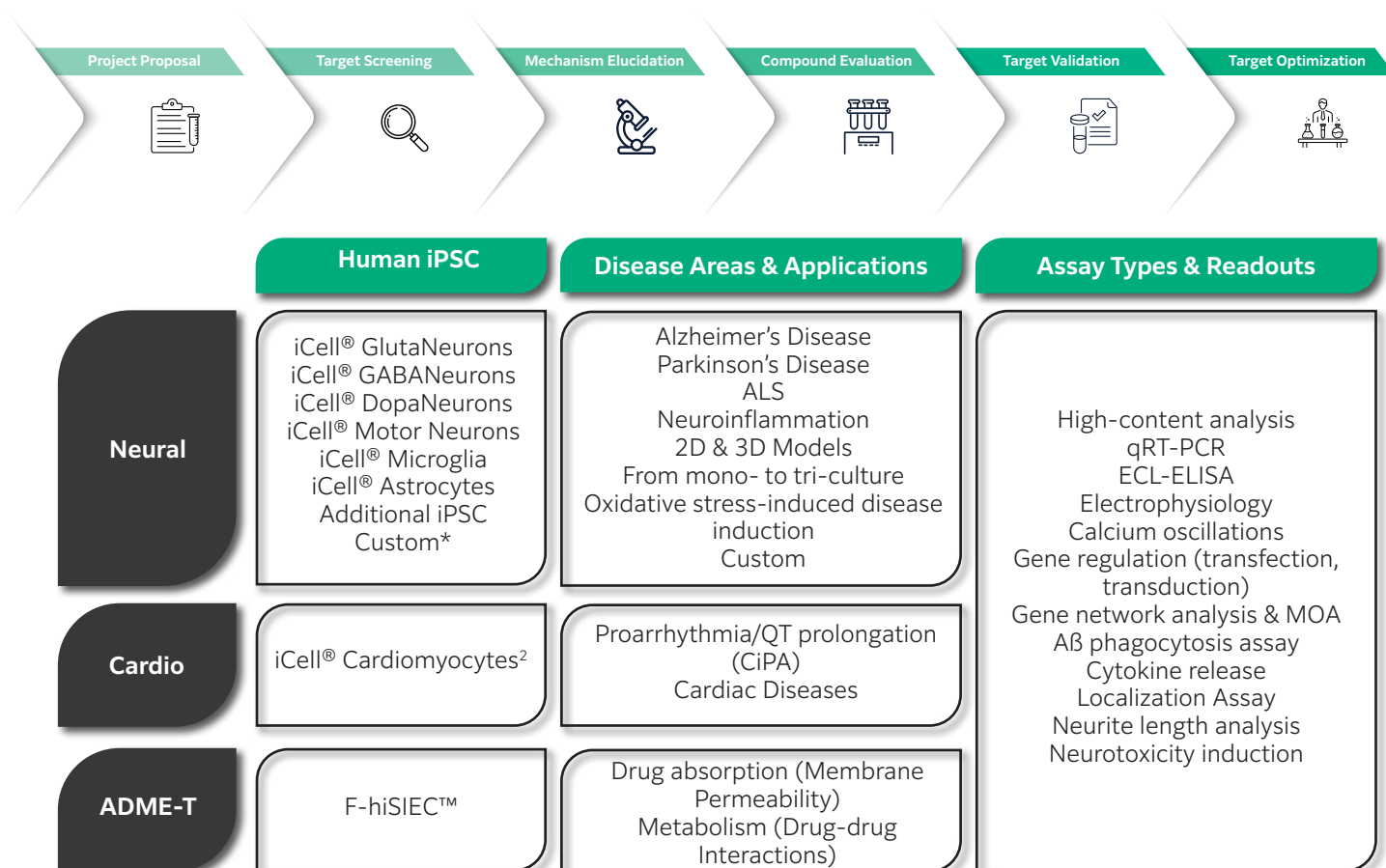
Decades of pharma infrastructure for supporting you in the drug development lifecycle

h-iPS derived Cell-Based Assays



A wide range of assays for disease modeling & drug discovery

We combine our 10+ years of drug discovery research and human iPS cell-based assay development across FUJIFILM Group with the reliable, high-quality iCell® product line from FUJIFILM Cellular Dynamics, Inc. to bring you a diverse range of assay solutions for R&D in neuro and cardio disease focus areas.



*Ask us for a full list of iPSC models and CNS services



Featured Service

Co-culture of Neurotoxic Aged Astrocytes & Neurons for Target Discovery

At Fujifilm Drug Discovery Services, we have an advanced model for detection of neuroprotective compounds utilizing iPSC-neurons and aged iPSC-astrocytes. We utilize human iPSC-derived iCell® neuronal and glial cells for CNS drug discovery and development, focusing on neurodegeneration and neuroinflammation, among other models. Our proprietary cell aging and co-culture technologies enable customized HTS pharmacological assay services tailored to your needs.



Expertise with iPSCs

Over a decade of iPSC-based neural drug discovery within our integrated pharma platforms



Advanced Technology

Pioneering solutions for innovative CNS drug discovery and development



Possibilities with AI

Proprietary AI solutions for enhanced target discovery and validation

Scan to Check Out Our
Neuropharmacology
Research Services Online



h-iPS Case Study

Cardiac Safety Services



Identifying Proarrhythmic Potential with Human iPSC-derived Cardiomyocytes

Human iPSC-derived cardiomyocytes (hiPSC-CM) have proved to be an invaluable tool for predicting the proarrhythmic potential of drug candidates *in vitro*. FUJIFILM is able to provide *in vitro* cardiotoxicity and safety pharmacology services using CiPA-validated iCell® Cardiomyocytes², as per ICH Guidelines (S7B/E14), in addition to GLP-compliant studies. Our advanced high-throughput MEA assay enables quick detection of drug candidates of proarrhythmic potential and ion channel blockade through alterations in extracellular field potentials.

KEY FEATURES



Proprietary optimization of high-throughput MEA assay



GLP study availability and flexible experiment planning tailored to customer needs



Innovative solutions for combined analysis of MEA & Ca²⁺ oscillations and AI methods for detecting ion channel blockers

SERVICE DETAILS

Cells & Reagents (Fujifilm Cellular Dynamics, Inc.)

Cells: iCell® Cardiomyocytes²

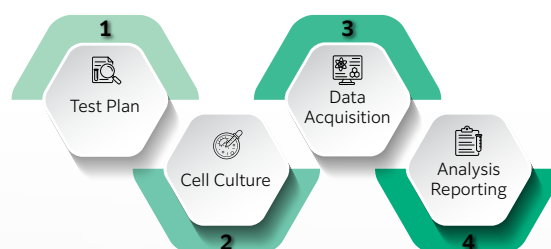
Media: iCell® CM Plating, Maintenance and Serum-Free

MEA system (Axion Biosystems, Inc.)

Maestro Pro and CytoView MEA plate

Typical End Points

- FPD/FPDc
- Proarrhythmic Potential (EAD), Cardiac Arrest
- Beat Rate



- ✓ CiPA-validated through multi-site longitudinal analysis
- ✓ Fast: Initial results within two weeks of cell culture launch
- ✓ High throughput: 96well (24 compounds, n=4) per 1 MEA plate. Up to 8 doses by cumulative addition
- ✓ Proprietary: Optimized assay robustness and automation

Case Study 1: Identification of Proarrhythmic Potential

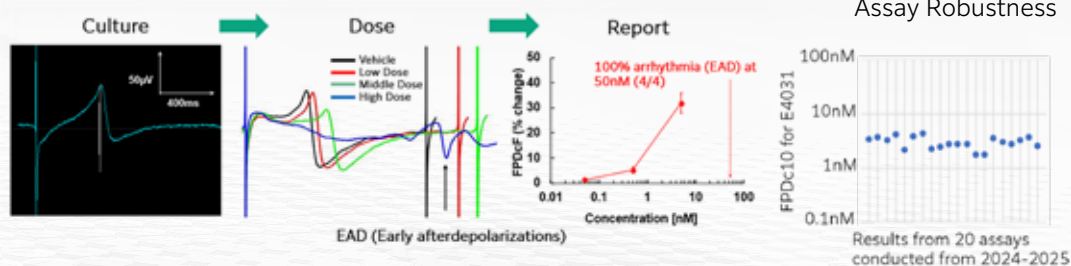
Rapid Detection of Proarrhythmia Through Changes in Field Potential Duration in a High-Throughput MEA Assay

Goal: To establish a robust and high-throughput assay for identifying the proarrhythmic potential of drug compounds.

Process: Optimization of cell culture conditions based on deep insights into factors affecting extracellular field potential quality. Proprietary software enables advanced data analysis.

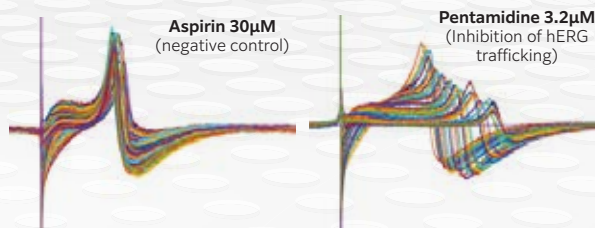
Result: FPDc10 (concentration required to prolong FPDc by 10%) for E-4031 was highly consistent across independent experiments.

Takeaway: Our Cardiac Safety Assay Services are an effective solution for early-stage screening of compounds with proarrhythmic risk in drug discovery.



Case Study 2: Identification of Chronic Effects

Chronic Effects of Test Compounds on Proarrhythmic Potential Can be Detected by Long-term Exposure

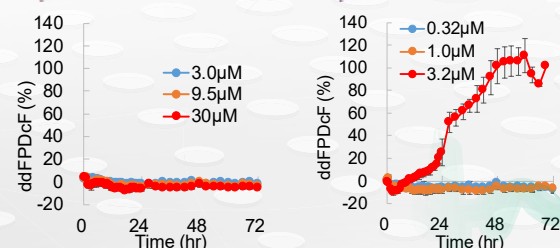


Goal: To clarify the chronic effects of drug compounds on human cardiomyocytes.

Process: Non-invasive electrophysiological assessment of hiPSC-cardiomyocytes leveraging our proprietary hiPSC and MEA technologies.

Result: Long-term exposure to pentamidine (a hERG trafficking inhibitor) clearly induced QT prolongation.

Takeaway: Our Cardiac Safety Assay Services are an effective approach for evaluating long-term drug-induced QT prolongation risk, supporting safer compound profiling in drug discovery.



Anti-Infectives Drug Discovery



Comprehensive anti-infective discovery services for a wide range of modalities

FUJIFILM offers bespoke drug discovery services for anti-infective drugs, from target identification to IND submission, rooted in our expertise from FUJIFILM Toyama Chemical Co., Ltd. for developing clinically approved anti-infectives. We have a proven track record spanning nearly two decades in the discovery of anti-infectives, from preclinical candidate identification to marketed drugs. Through this process, we have established a state-of-the-art drug discovery platform that enables the discovery and development of new treatments for serious, life-threatening infectious diseases. Our drug discovery experts have extensive expertise and proven experience in diverse drug discovery modalities, including small molecules, natural products, peptides, antibody-drug conjugates, and vaccines.

Key Features



Advanced Research Facilities

We have one of the most advanced microbiology research facilities in Japan, supporting our capabilities for accelerating our partners' drug discovery efforts for anti-infectives.



Unique Drug Design

We have a proven track record for discovering important drugs targeting infectious diseases, based on our combination of our competitive edge, insight, originality, and unconventional wisdom.

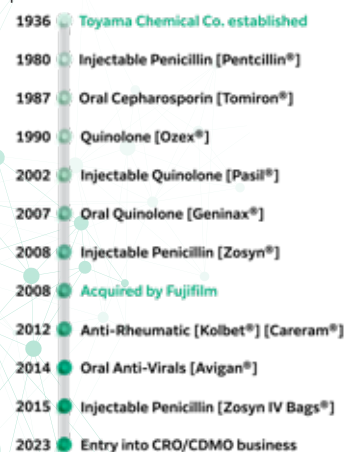


Wide Range of Modalities

Our drug discovery team has a wide range of expertise with small molecules, peptides, and mAbs/ADCs, and are capable of performing *in vivo* and *in vitro* experiments for infectious disease research.

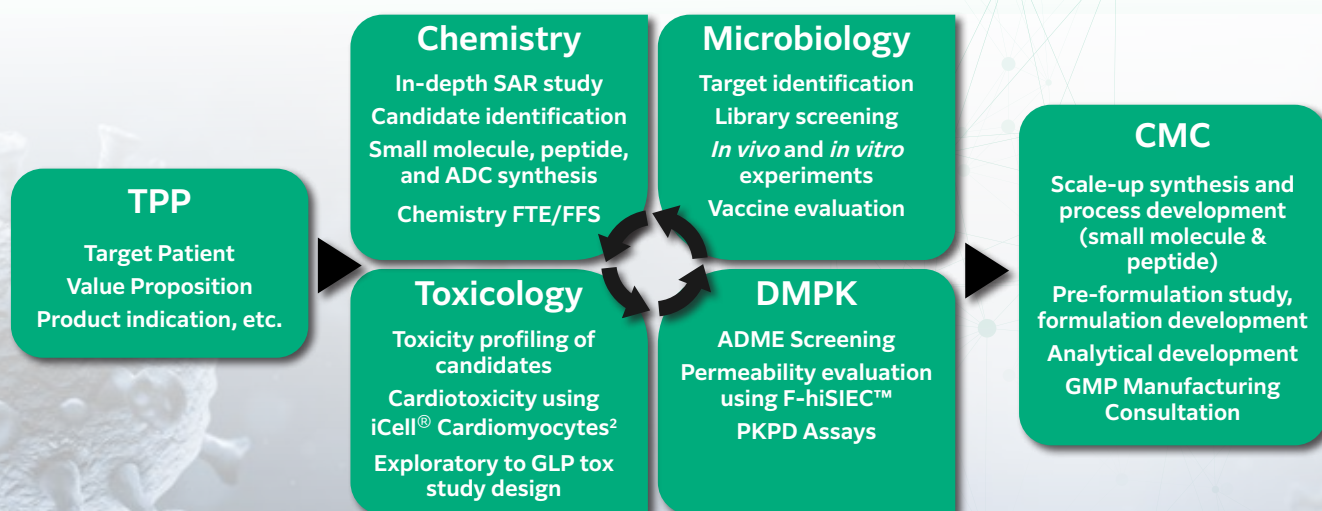
Our History of Excellence

FUJIFILM Toyama Chemical has decades of experience in anti-infective drug discovery research and have created a number of diverse classes of anti-infectives, such as **piperacillin** and **cefoperazone**, which are still widely prescribed globally as fixed-dose combinations with β -lactamase inhibitors.



Our Integrated Drug Discovery Capabilities

Our team of experts seamlessly manages all ongoing projects based on the specific needs of the customers.



Rabbit Monoclonal Antibody Discovery

Wako



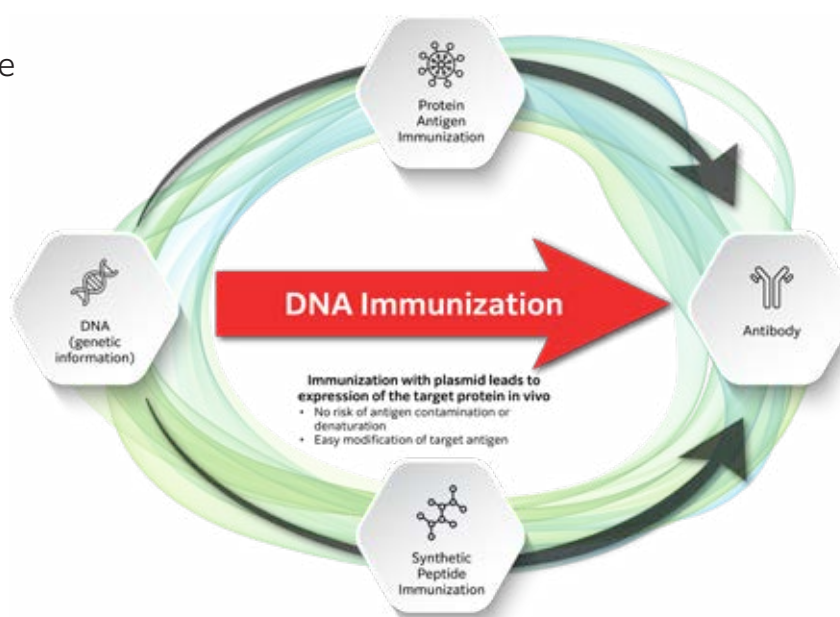
Using DNA Immunization and Single B-cell Cloning

Discover rabbit monoclonal antibodies against challenging targets

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.

Our Core Technology

DNA immunization involves directly immunizing with genetic material like cDNA, as opposed to the traditional method of using peptide or protein antigen. This reduces risk of antigen contamination and denaturation, while allowing us to customize the cDNA for easy modification of the target antigen. Downstream, we use our single B-cell screening method to achieve high antibody quality, adaptability, and yield, allowing us to acquire a broader pool of positive clones and directly obtains antibody gene sequences.



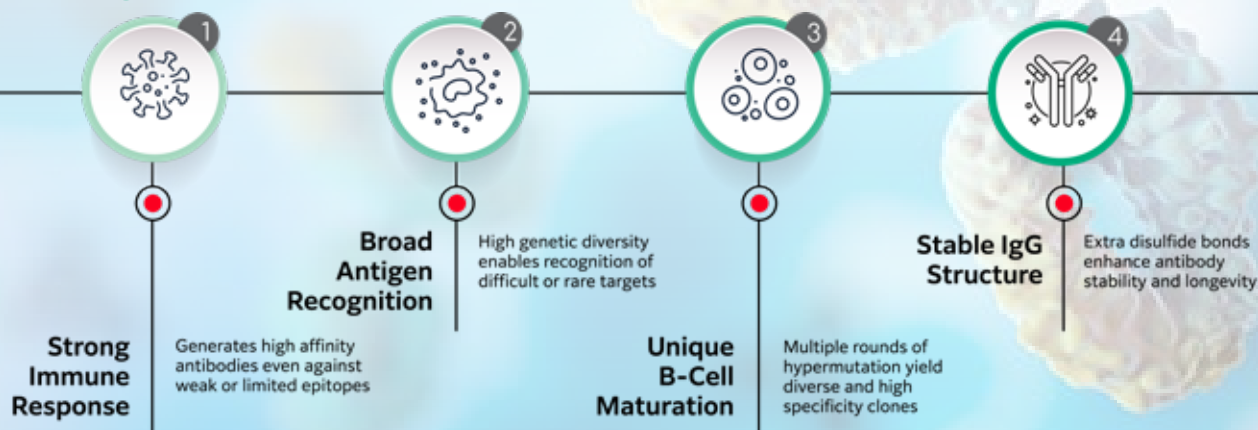
Benefits at a Glance

- Antibodies that recognize the native, non-reduced form of antigen of interest and challenging membrane proteins

Consult with antibody experts with decades of experience in a stage-gated service

Discover premium, custom antibodies specific to your target

Advantages of Rabbit Monoclonal Antibodies



Monoclonal Antibody Engineering



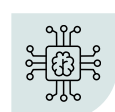
X



AI & ML techniques for improved antibody optimization and humanization

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, **aiProtein®**, combines the power of machine learning with directed evolution to achieve rapid, multi-dimensional optimization of proteins, driving transformative advancements in the field of biopharmaceuticals.

Key Features of aiProtein®



Integrate 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.



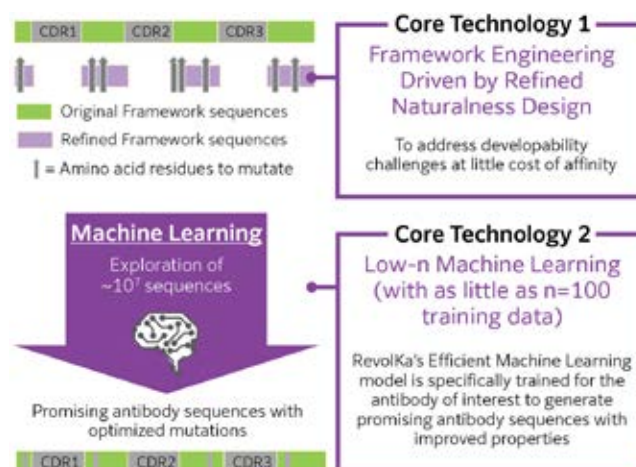
Simultaneous Property Engineering

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.



RevolKa is committed to quality biological data that accurately trains their machine-learning engines. **aiProtein®** does not require big data, which is often difficult to acquire in the field of protein engineering, instead using relatively smaller datasets for more accurate prediction models. This saves time and labor, opening opportunities for complex biological data, such as cell cytotoxicity and receptor internalization. **aiProtein®** has been highly validated with different types of proteins, such as antibodies and enzymes.

Service Offering

- **Antibody Optimization**

Utilizing advanced machine learning algorithms alongside directed evolution, RevolKa can enhance antibody affinity, specificity, and immunogenicity, ensuring superior therapeutic outcomes with minimal resource expenditure.

- **Antibody Humanization**

RevolKa is capable of strategically modifying non-human antibodies to reduce immunogenicity and increase compatibility with the human immune system, ensuring higher efficacy and safety for clinical applications.

This service is only available in the EMEA and APAC regions.

Cyclic Peptide Discovery

in collaboration with **PUREfrex[®]**



Diverse, high-affinity cyclic peptides using mRNA display technology

Cyclic peptides have emerged as a Goldilocks drug class, showcasing their remarkable potential as therapeutics due to their unique balance of properties. Fujifilm's patented mRNA display technology enables the rapid discovery of diverse, high-affinity cyclic peptides. Our independently developed platform allows for the exploration of cyclic structures incorporating unnatural amino acids, leveraging the industry's largest peptide library that is encoded by our mRNA display technology without requiring target information.

KEY FEATURES



Swift identification of lead peptides/binders with desired properties

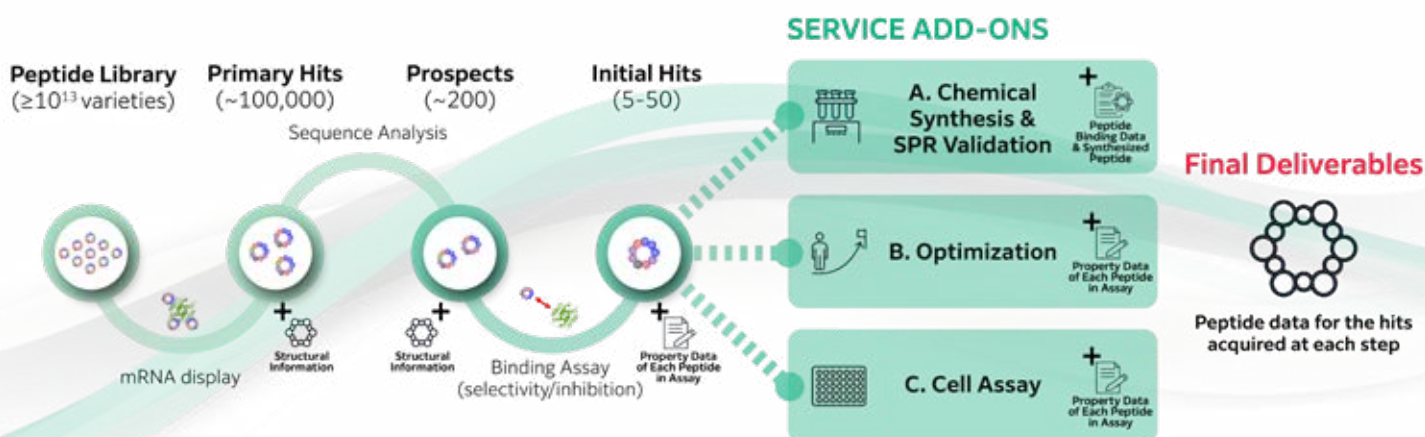


mRNA display technology enables high efficiency of target identification



Our efficient biosynthesis & assays systems enable high throughput selection and cell activity characterization

Service Contents



mRNA Display System

Our proprietary mRNA display system allows screening from a huge library of $\geq 10^{13}$ uniquely designed mRNA-peptide conjugates, enabling us to acquire peptides with strong, specific binding with target proteins. Up to 48 conditions can be run in parallel.





Accelerate your drug discovery efforts with AI

drug2drugs AI-AAM® is an AI and chemical simulation-based drug discovery support service which generates many candidate compounds with different scaffolds from the structural information of one active compound. By leveraging our proprietary AI-AAM (amino acid mapping) method, our platform can utilize *de novo* design or library search methods to explore vast chemical space to identify structurally diverse and thermal stable compounds, while also taking care to avoid generating only compounds that are difficult to synthesize. Within just one month turnaround time, drug2drugs AI-AAM® can deliver around 100 candidate compounds that could potentially unlock improved bioactivity, potency, reduced toxicity, IP clearance, or even unlock the possibilities for overhauling the drug delivery mechanism of the drug. All results are delivered securely and confidentially, accelerating your small molecule and peptide discovery efforts without compromising quality.

Built for Medicinal Chemists. Trusted by Innovators.



ATOM-BASED COMPOUND GENERATION

AI-AAM makes diverse scaffolds, filtering for thermally stable structures.



DE-RISK LEAD OPTIMIZATION

Identify better binders, faster.



STREAMLINED LEAD OPTIMIZATION

No target information required. Only 1 month turnaround for computation.



CONFIDENTIAL & SECURE

Minimal experimental data required. Your IP stays yours.

Top Use Cases

- Changing the core structure to enhance potency
- Finding a candidate compound that avoids structure-derived toxicity
- Generating hits from medium-sized molecules, proteins, and natural compounds to initiate discovery
- Exploring backup compounds
- Identifying IP-cleared scaffolds

Why choose drug2drugs AI-AAM®?

