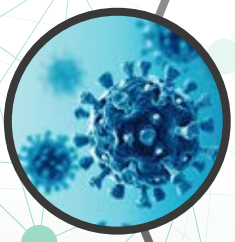
FUJIFILM
Value from Innovation

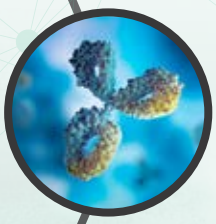
Drug Discovery
CRO Services

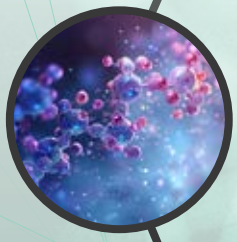
End-to-end contract research services using cutting-edge technologies

FUJIFILM
Value from Innovation

Service Highlights

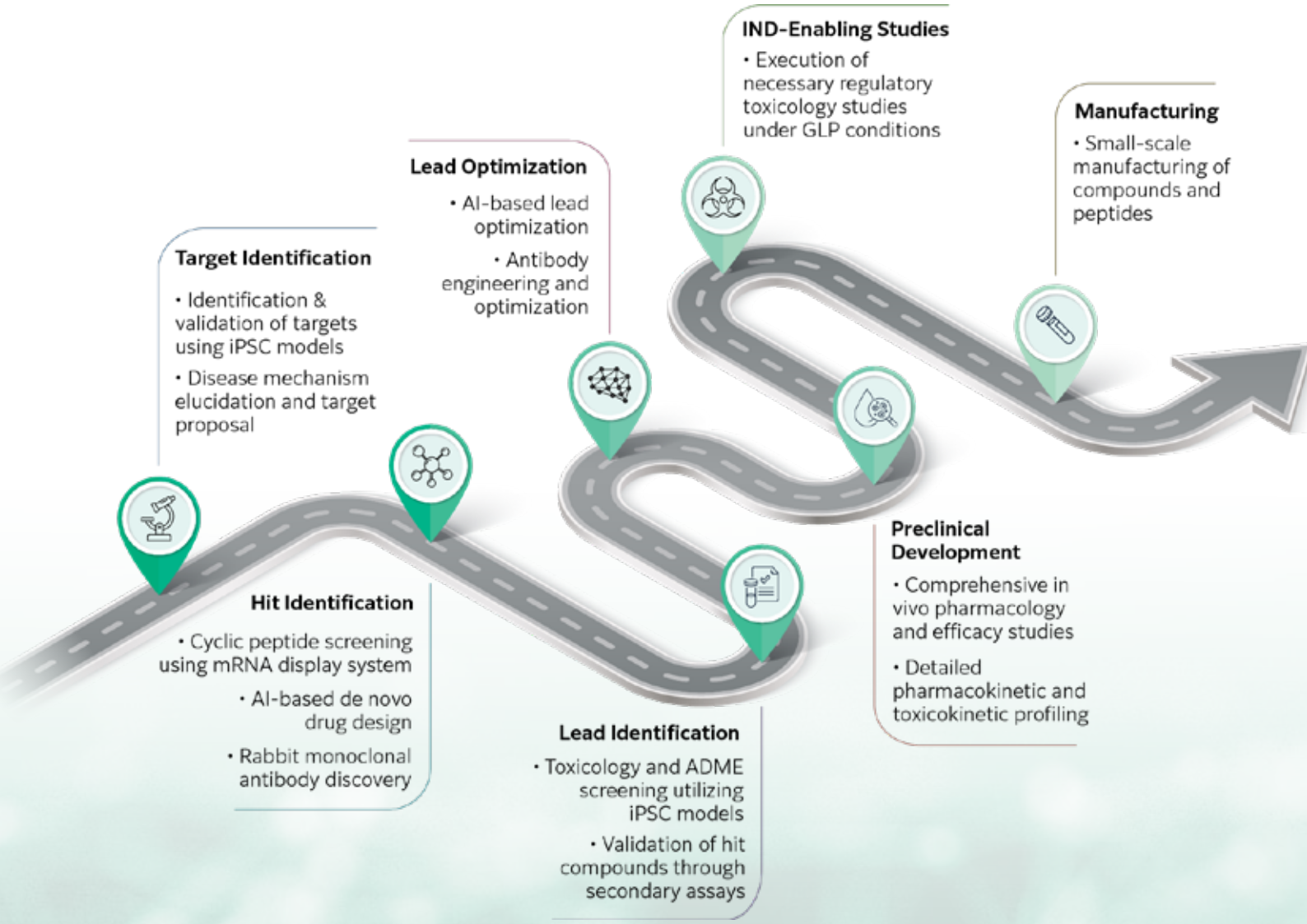


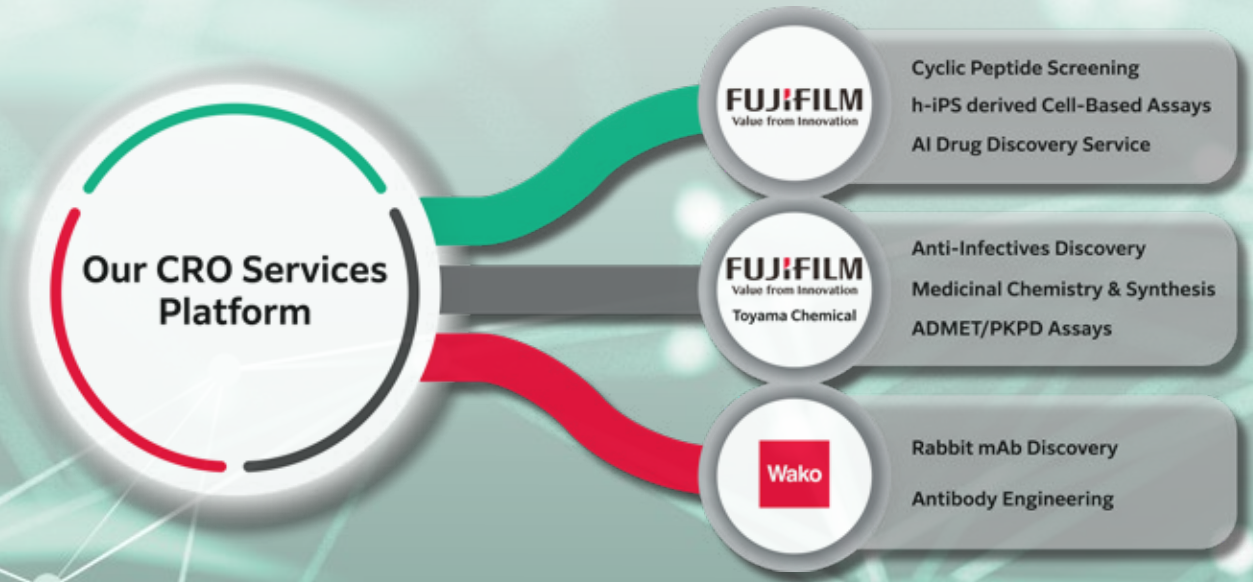




Value from Innovation

with our comprehensive CRO Services Platform

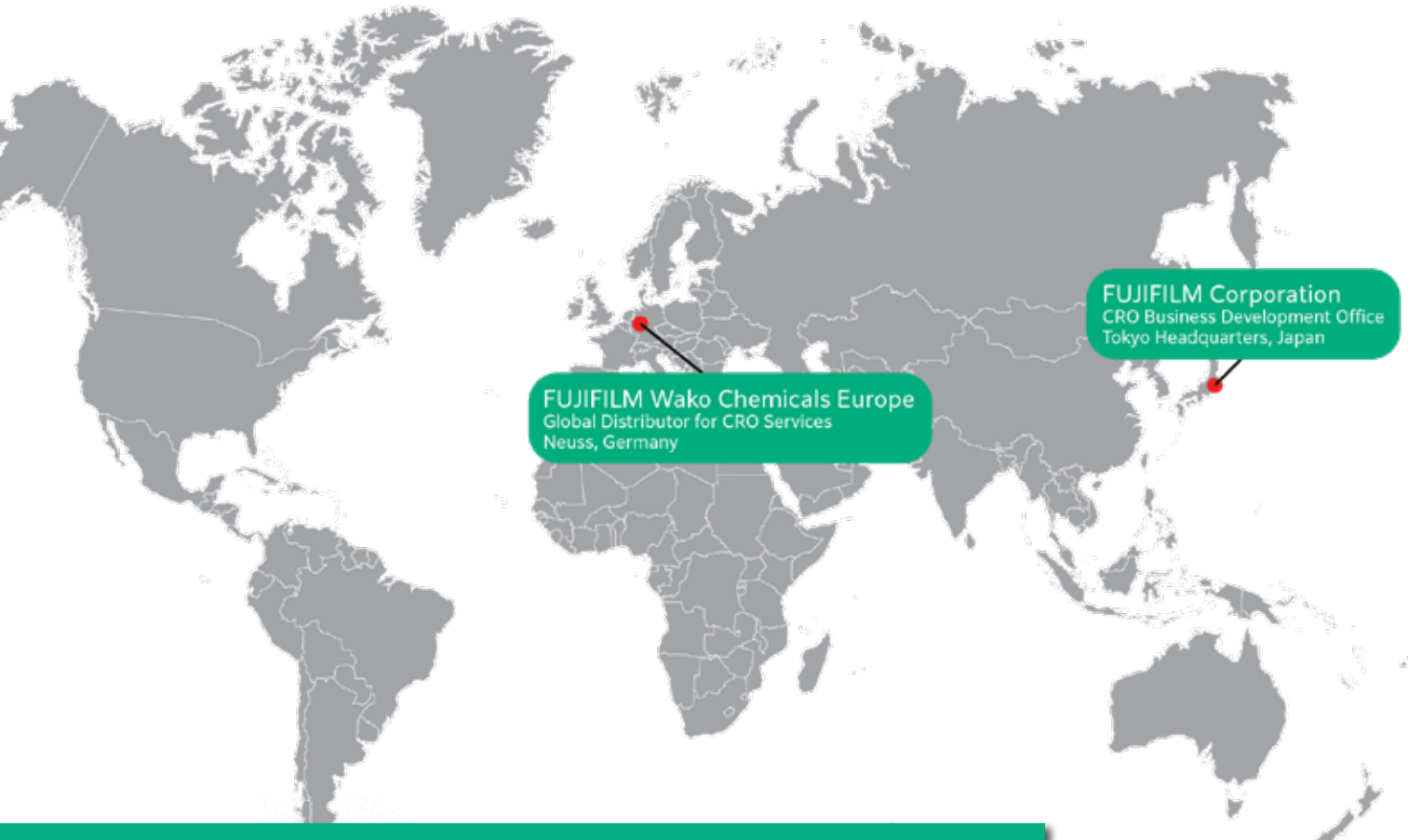




About Us

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

View Online

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.

	Human iPSC	Disease Areas & Applications	Assay Types & Readouts
Neural	iCell® GlutaNeurons iCell® GABANeurons iCell® DopaNeurons iCell® Motor Neurons iCell® Microglia iCell® Astrocytes Additional iPSC Custom*	Alzheimer's Disease Parkinson's Disease ALS Neuroinflammation 2D & 3D Models From mono- to tri-culture Oxidative stress-induced disease induction Custom	High-content analysis qRT-PCR ECL-ELISA Electrophysiology Calcium oscillations Gene regulation (transfection, transduction) Gene network analysis & MOA Aß phagocytosis assay Cytokine release Localization Assay Neurite length analysis Neurotoxicity induction
Cardio	iCell® Cardiomyocytes[2]	Proarrhythmia/QT prolongation (CiPA) Cardiac Diseases	
ADME-T	F-hiSIEC™	Drug absorption (Membrane Permeability) Metabolism (Drug-drug Interactions)	

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

Featured Service

Scan to Check Out Our Neuropharmacology Research Services Online

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

View 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 & Ca^{2+} oscillations and AI methods for detecting ion channel blockers

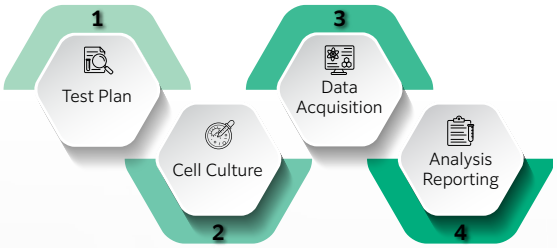
SERVICE DETAILS

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

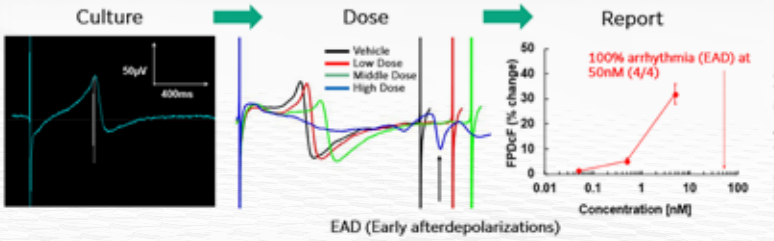


- ✓ CiPA-validated through multi-site longitudinal analysis
- ✓ Fast: Initial results within two weeks of cell culture launch
- ✓ High throughput: 96well (24 compounds, n=4) per 1 MEA plate. Up to 8 doses by cumulative addition
- ✓ Proprietary: Optimized assay robustness and automation

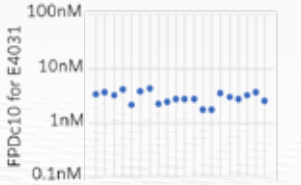
Case Study 1: Identification of Proarrhythmic Potential

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.



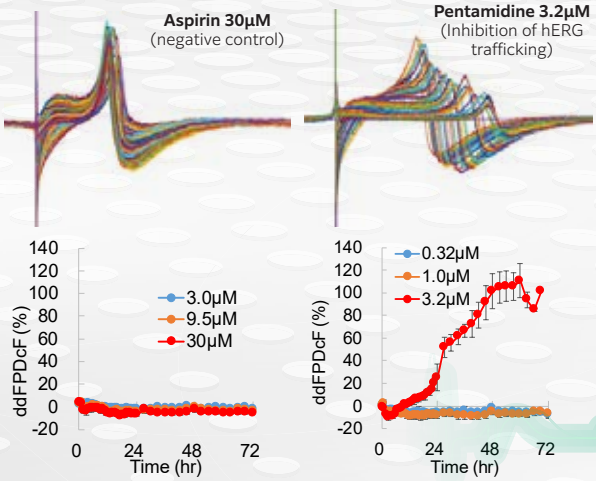
Assay Robustness



Results from 20 assays conducted from 2024-2025

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.

View Online

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 vaccines, 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.

1936	Toyama Chemical Co. established
1980	Injectable Penicillin [Pentcillin®]
1987	Oral Cepharosporin [Tomiron®]
1990	Quinolone [Ozex®]
2002	Injectable Quinolone [Pasil®]
2007	Oral Quinolone [Geninax®]
2008	Injectable Penicillin [Zosyn®]
2008	Acquired by Fujifilm
2012	Anti-Rheumatic [Kolbet®] [Careram®]
2014	Oral Anti-Virals [Avigan®]
2015	Injectable Penicillin [Zosyn IV Bags®]
2023	Entry into CRO/CDMO business

Our Integrated Drug Discovery Capabilities

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

TPP
- Target Patient
- Value Proposition
- Product indication, etc.

Chemistry
- In-depth SAR study
- Candidate identification
- Small molecule, peptide, and ADC synthesis
- Chemistry FTE/FFS

Microbiology
- Target identification
- Library screening
- *In vivo* and *in vitro* experiments
- Vaccine evaluation

Toxicology
- Toxicity profiling of candidates
- Cardiotoxicity using iCell® Cardiomyocytes²
- Exploratory to GLP tox study design

DMPK
- ADME Screening
- Permeability evaluation using F-hiSIEC™
- PKPD Assays

CMC
- Scale-up synthesis and process development (small molecule & peptide)
- Pre-formulation study, formulation development
- Analytical development
- GMP Manufacturing Consultation

View Online

Rabbit Monoclonal Antibody Discovery

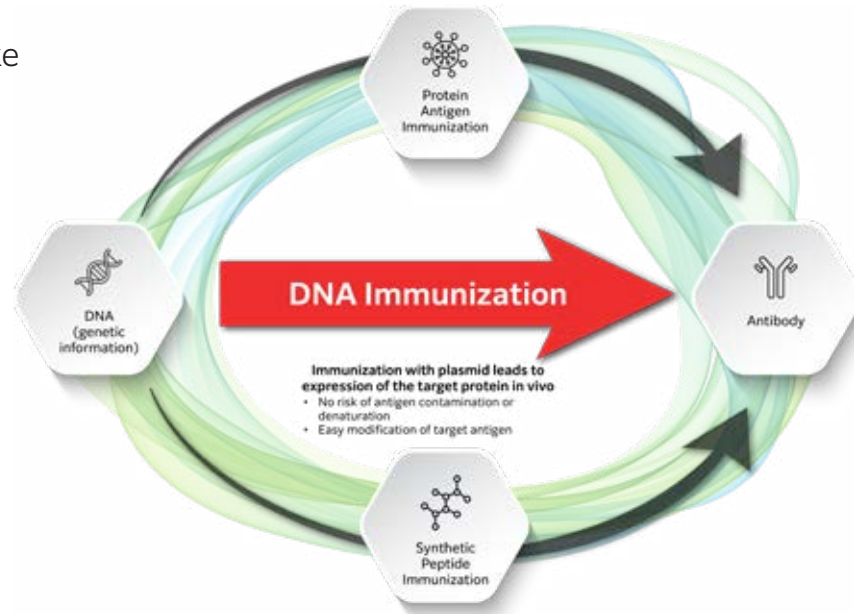
Using DNA Immunization and Single B-cell Cloning

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

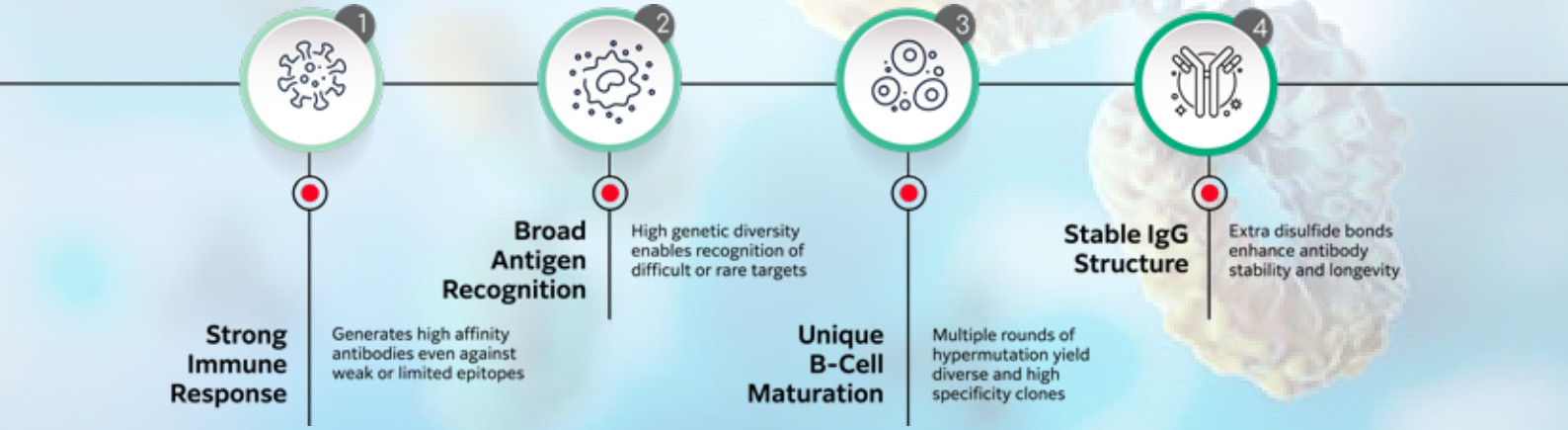
DNA immunization involves directly immunizing with genetic material like cDNA, as opposed to the traditional method of using peptide or protein antigen. This reduces risk of antigen contamination and denaturation, while allowing us to customize the cDNA for easy modification of the target antigen. Downstream, 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



View Online

Monoclonal Antibody Engineering

Wako x RevolKa

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, ***ai*Protein®**, 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 *ai*Protein®

Integrate ML & Directed Evolution

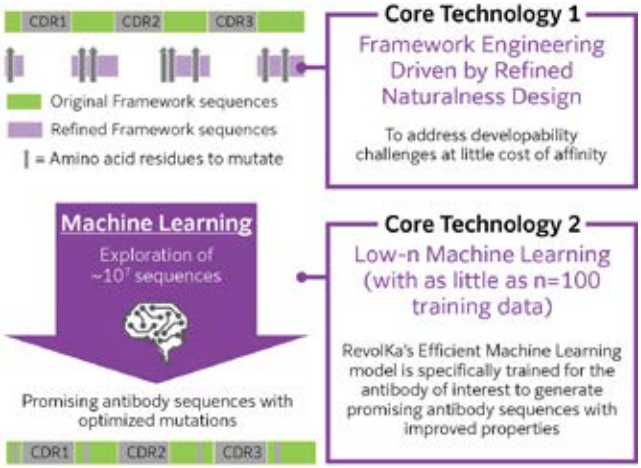
RevolKa's proprietary ML algorithm enhances the traditional directed evolution process. This allows for the modeling of fitness landscape of proteins and predicting the best mutations for protein engineering.

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. ***ai*Protein®** 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. ***ai*Protein®** 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 compatability with the human immune system, ensuring higher efficacy and safety for clinial applications.

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

View Online

Cyclic Peptide Discovery

in collaboration with PURE*frex*®

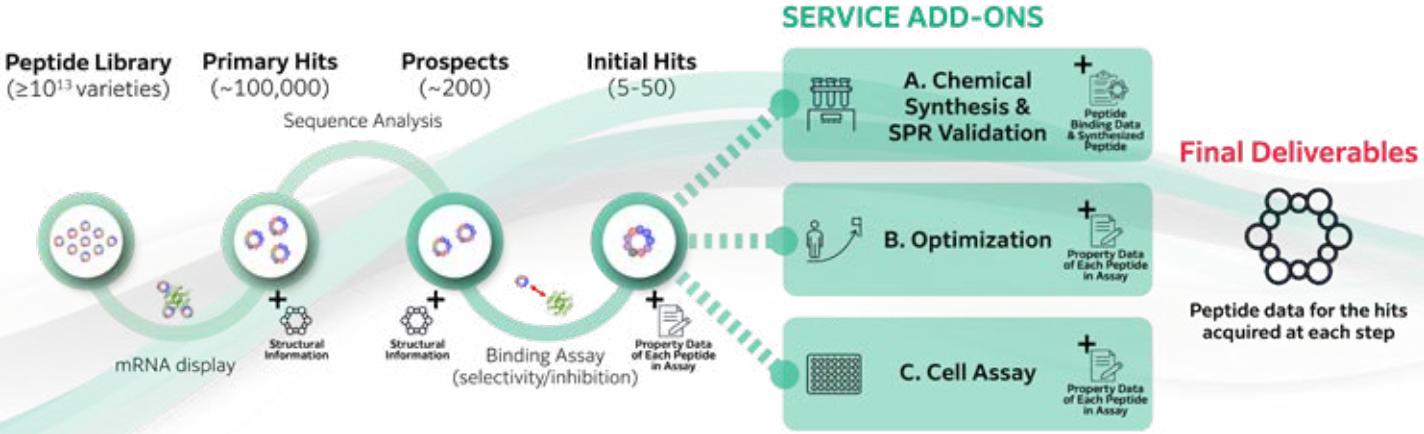
Diverse, high-affinity cyclic peptides using mRNA display technology

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

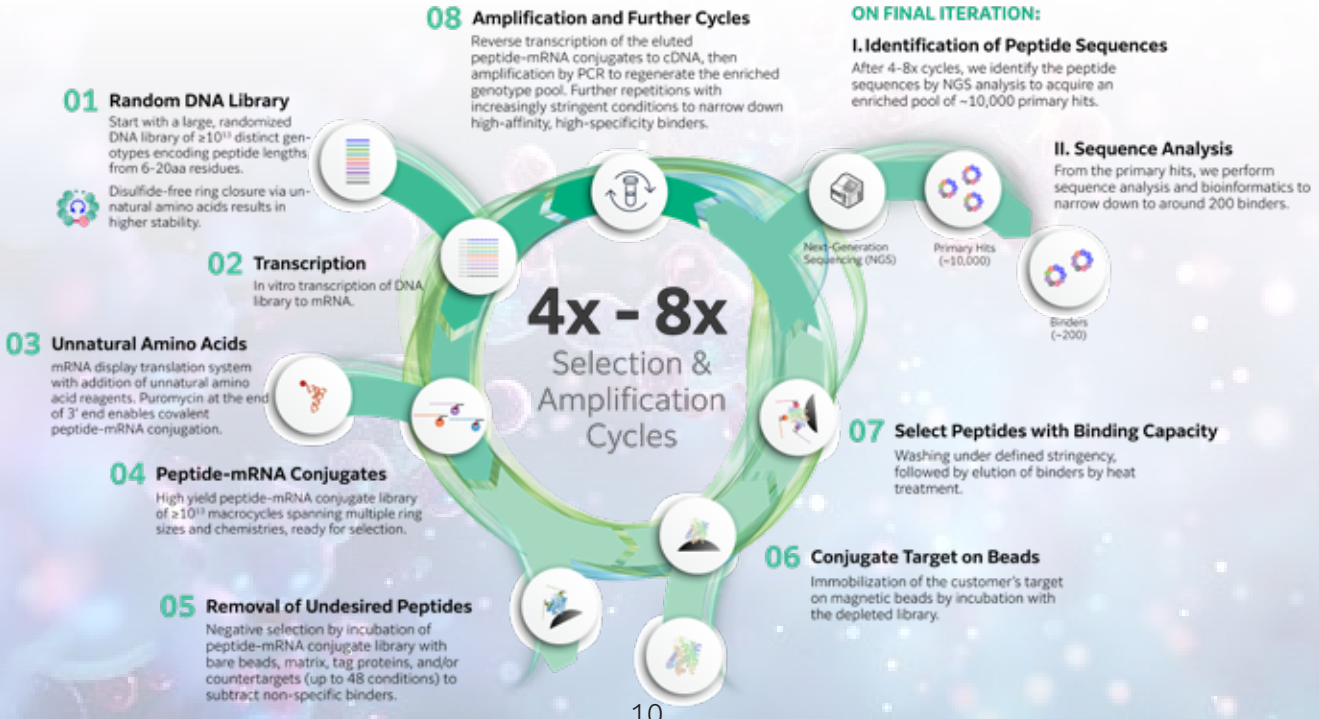
- Swift identification of lead peptides/binders with desired properties
- mRNA display technology enables high efficiency of target identification
- Our efficient biosynthesis & assays systems enable high throughput selection and cell activity characterization

Service Contents



mRNA Display System

Our proprietary mRNA display system allows screening from a huge library of ≥10¹³ 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.



drug2drugs®
AI-AAM

View Online

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.

STREAMLINED LEAD OPTIMIZATION
No target information required. Only 1 month turnaround for computation.

DE-RISK LEAD OPTIMIZATION
Identify better binders, faster.

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®?

1 **Save Time and Costs in R&D**
ROI for drug discovery efforts has been falling industry-wide. Innovate smarter with **drug2drugs AI-AAM®.**

2 **Explore Novel Scaffolds**
Increase your chances of discovering a successful drug candidate or improving aspects of an existing drug.

3 **No Need for Large Data**
Only the structural information of the bioactive region of your compound is required.

4 **IP-Clean Backup Compounds**
Rapidly generate patent-safe analogs to safeguard your lead series or navigate IP constraints.

Partners for *Life*

Contact Us

For any inquiries, please send us an email at:
dge-CRO-inq@fujifilm.com

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