# Asahi Kasei Pharma Corporation

Asahi Kasei Pharma aims to expand and enrich the lives of people around the world through the research and development of new drugs and pharmaceutical technologies.

To achieve these goals, we have been promoting and strengthening open innovation activities worldwide. These activities include the introduction of cutting-edge technologies, partnership formation, and research collaboration. As described below, they are focused on facilitating the discovery of preclinical lead compounds and improving the efficiency of the drug development process.

We are publicly calling for new proposals related to drug development research as part its efforts for open innovation, to promote pharmaceutical research and development through enhanced cooperation with universities, research institutes, and enterprises around the world.

**The application period begins on 5:00 a.m. GMT on January 5 to 8:00 a.m. GMT on February 28, 2023.**

Further information is available on Asahi Kasei Pharma's Open Innovation website: **www.asahikasei-pharma.co.jp/a-compass/en/**

We look forward to receiving your proposal.

**An Overview of Research Topics Sought by Asahi Kasei Pharma**

- New drug seeds (drug target and drug candidate) and technologies in the core research fields of Asahi Kasei Pharma

1. Autoimmune disease
2. Renal disease
3. Neurodegenerative disease
4. Bone disease
5. Drug discovery platform technology
6. Pain

A detailed description of each research subject can be found in the following sections.
Contact Information: You can reach our support team using the “Contact Us” link on the web site shown above.

# Research Topics Sought by Asahi Kasei Pharma

## New drug seeds in the core research fields of Asahi Kasei Pharma

### 1. Autoimmune Diseases

**1-1. Novel drug target molecules, drug candidates and therapeutic concepts for autoimmune diseases**

#### 1-1-1. Primary Sjögren's syndrome (pSS)

Research interests

- T cell (cytotoxic or tissue-resident memory T cells) and/or B cell inhibition
- Recovery of mitochondrial function (Mitophagy induction or mtDNA release suppletion)
- Mechanism of action targeting non-immune cells
- Antigen Specific Immune tolerance (ASIT)

Other requirements

- *In vitro* experimental results demonstrating the expected mechanism of action must be already obtained.
- Differentiation strategies suggesting competitive advantages over launched drugs and/or drug candidates with similar mechanisms of action should be required.

#### 1-1-2. Systemic Lupus Erythematosus (SLE) and Lupus Nephritis

Research interests

- Mechanism of action targeting multiple cells in T cells, B cells and pDCs
- Removal of abnormal mitochondria (e.g., Mitophagy induction and mtDNA release suppletion)
- Mechanism of action targeting non-immune cells
- Antigen Specific Immune tolerance (ASIT)
- Mechanism of action to recover renal function

Other requirements

- *In vitro* experimental results demonstrating the expected mechanism of action must be already obtained.
- Differentiation strategies suggesting competitive advantages over launched drugs and drug candidates with similar mechanisms of action should be required.

**1-1-3. Immunological Kidney Diseases, such as ANCA associated nephritis, membranous nephropathy, anti-glomerular basement membrane nephritis**

Research interests

・Immunosuppression

・Antigen Specific Immune tolerance (ASIT)

・Suppression of NETosis

Other requirements

・*In vitro* experimental results demonstrating the expected mechanism of action must be already obtained.

**1-1-4. Systemic Sclerosis-associated interstitial pneumonia (SSc-ILD) and Idiopathic Pulmonary Fibrosis (IPF)**

Research interests

・Suppression of fibrosis

Other requirements

・*In vivo* experimental results demonstrating the expected mechanism of action must be already obtained.

**1-2. Drug development technologies for autoimmune diseases**

**1-2-1. Antigen Specific Immune tolerance (ASIT)**

Research interests

・Induction of antigen specific regulatory T cells and/or antigen specific anergy *in vivo*

・Inhibition and/or removal of antigen-specific cells *in vivo*

Other requirements

・*In vivo* experimental results demonstrating the expected mechanism of action must be already obtained.

・Competitive advantages over existing technologies, such as an immediate response and immune tolerance to whole protein antigens without limitation to partial peptides, should be required.

**1-2-2. Lymphocyte-specific Drug Delivery Technologies**

Research interests

・Lymphocyte-specific delivery of antibody, peptides, nucleic acids, or small molecules

Other requirements

・*In vivo* experimental results demonstrating lymphocyte-specific delivery must be already

obtained.

### 1-2-3. Kidney-specific Drug Delivery Technologies

Research interests

・Kidney-specific delivery of antibody, peptides, nucleic acids, or small molecules

Other requirements

・*In vivo* experimental results demonstrating kidney-specific delivery must have been already obtained.

## 2. Renal Diseases

### 2-1. Novel drug target molecules, drug candidates and therapeutic concepts for renal diseases

#### 2-1-1. Genetic Renal Diseases, such as Autosomal Dominant Tubulointerstitial Kidney Disease (ADTKD)

Research interests

・Drug discovery and development for refractory genetic renal diseases with no standard treatments

Other requirements

・*In vitro* experimental results demonstrating the expected mechanism of action must be already obtained.

#### 2-1-2. Immunological Kidney Diseases, such as ANCA associated nephritis, membranous nephropathy, and anti-glomerular basement membrane nephritis

Research interests

・Immunosuppression

・Antigen Specific Immune tolerance (ASIT)

・Suppression of NETosis

Other requirements

・*In vitro* experimental results demonstrating the expected mechanism of action must be already obtained.

### 2-2. Drug development technologies for renal diseases

#### 2-2-1. Kidney-specific Drug Delivery Technologies

Research interests

・Kidney-specific delivery of antibody, peptides, nucleic acids, or small molecules

Other requirements

・*In vivo* experimental results demonstrating kidney-specific delivery must be already obtained.

## 3. Neurodegenerative Diseases

### 3-1. Novel drug target molecules, drug candidates and therapeutic concepts for neurodegenerative diseases

#### 3-1-1. Polyglutamine Disease, such as spinocerebellar degeneration

Research interests

・Prevention of polyglutamine protein aggregation and/or degradation of aggregated polyglutamine protein

Other requirements

・*In vitro* experimental results demonstrating the expected mechanism of action must be already obtained.

#### 3-1-2. Synucleinopathy, such as Multiple System Atrophy (MSA)

Research interests

・Prevention of α-synuclein aggregation and/or degradation of aggregated α-synuclein aggregation

Other requirements

・*In vitro* experimental results demonstrating the expected mechanism of action must be already obtained.

#### 3-1-3. Tauopathy, such as Progressive Supranuclear Palsy (PSP)

Research interests

・Prevention of Tau aggregation and/or degradation of aggregated Tau

Other requirements

・*In vitro* experimental results demonstrating the expected mechanism of action must be already obtained.

#### 3-1-4. TDP-43 Proteinopathy, such as sporadic Amyotrophic Lateral Sclerosis (sALS)

Research interests

・Prevention of TDP-43 aggregation and/or degradation of aggregated TDP-43

Other requirements

・*In vitro* experimental results demonstrating the expected mechanism of action must be already obtained.

## 3-2. Drug development technologies for neurodegenerative diseases

### 3-2-1. Animal models that can evaluate drug efficacy for Multiple System Atrophy (MSA)

Research interests

・Animal models with α-synuclein aggregation

Other requirements

・Experimental results suggesting motor dysfunction must be already obtained.

### 3-2-2. Assay systems using patient-derived induced pluripotent stem cells (iPSCs) that can evaluate drug efficacy for neurodegenerative diseases

Research interests

・Evaluation of drug efficacy for Polyglutamine Diseases, Synucleinopathy, Tauopathy and TDP-43 Proteinopathy

Other requirements

・Experimental results demonstrating intracellular protein aggregation must be already obtained.

## 4. Bone Diseases

### 4-1. Novel drug target molecules, drug candidates and therapeutic concepts for bone diseases

#### 4-1-1. Refractory diseases with ossification of soft tissues, such as muscles, ligaments, tendons (e.g., Posterior longitudinal ligament ossification (OPLL) and Ossification of Ligamentum Flavum (OLF))

Research interests

・Suppression of heterotopic ossification

Out of interests

・Symptomatic treatment (e.g., anti-inflammatory analgesia)

Other requirements

・*In vitro* experimental results demonstrating the expected mechanism of action must be already obtained.

・*In vivo* experimental results suggesting inhibitory efficacy against heterotopic ossification must be already obtained.

## 5. Drug Discovery Platform Technologies

### 5-1. Drug formulation

#### 5-1-1. Technologies that enable high-dose subcutaneous administration of antibody drugs

Out of interests

・Technologies subjected to modify the antibody itself

Other requirements

・The expected mechanism must be already demonstrated with some antibody.

#### 5-1-2. Technologies that improve drug retention in the lungs

Research interests

・Oral inhalation

Other requirements

・Retention in the lungs must be already demonstrated to be improved with some drug that is rapidly transferred into the blood by oral inhalation.

・Preferably, additives are in clinical use or GRAS certified.

#### 5-1-3. Technologies that enable the oral administration of peptides

Research interests

・Technologies that enables increased intestinal absorption through the oral administration of peptides by formulation, DDS technology or modification of the peptide itself.

Other requirements

・The capability must be already demonstrated with some peptide.

・Technology applicable to cyclic peptides is desirable.

### 5-2. Analysis methods

#### 5-2-1. Molecular dynamics methods to estimate the binding pose of small molecules to proteins

Research interests

・Methods applicable to membrane protein systems

Other requirements

・Method must be theoretically applicable for membrane proteins.

**5-2-2. Structural analysis methods for long RNA strands**

Research interests

・Methods that can experimentally analyze the secondary or tertiary structure of over 300-mer RNA

Out of interests

・Predictions using computational methods only (e.g. *in silico* simulation)

・Methods using large-scale experimental equipment

Other requirements

・Preferably, the comparative data with the SHAPE-MaP or dimethyl sulfate method is already obtained.

**5-2-3. Structural analysis methods for middle-sized molecules**

Research interests

・Methods that enables structural analysis of middle -sized molecules (molecular weight 1000-3000) such as peptides even when crystals cannot be obtained

Other requirements

・The structural analysis data on some middle -sized molecules must be already obtained. Otherwise, capability of the method to middle-sized molecules must be supported with theoretical rationale.

・Methods that can be performed with generic tools and equipment are desirable.

**5-2-4. A solution-state nuclear magnetic resonance (NMR) methods that can obtain dynamics information of the interaction between drug candidates and targeted biomolecules**

Research interests

・Methods utilizing the state-of-the-art techniques (e.g., Chemical Exchange Saturation Transfer (CEST), Carr Purcell-Meiboom Gill (CPMG), and order parameter)

・Method that has a capability to observe protein side chain dynamics.

Other requirements

・The analysis of some biomolecule, including nucleic acids or proteins with a molecular weight of over 20 kDa, must be already succeeded.

## 5-3. Organic synthesis

### 5-3-1. Organic synthetic reaction technologies with On-DNA applicable to DNA-encoded synthesis

Research interests

・Synthetic reactions under nonacidic conditions (pH 4–12) at non-high temperatures and in water-containing solvents

Other requirements

・The organic synthetic reaction must be already demonstrated by some experimental results, but not necessarily with On-DNA.

## 6. Pain

### 6-1. Novel drug target molecules, drug candidates and therapeutic concepts for pain

#### 6-1-1. Chronic Pain, such as neuropathic pain, nociceptive pain, nociplastic pain, cancer pain and postoperative pain

Research Interests

・Mechanism of action targeting neurons (e.g., dorsal root ganglion neurons and dorsal horn neurons)

・Mechanism of action targeting glial cells (e.g., astrocyte, microglia and satellite glia)

Out of Interests

・Same mechanism of action as opioids or non-steroidal anti-inflammatory drugs (NSAIDs)

Other Requirements

・In vitro experimental results demonstrating the expected mechanism of action must be required for novel drug target molecules.

・Experimental data suggesting competitive advantages over launched drugs and/or drug candidates should be required.

### 6-2. Drug development technologies for pain

#### 6-2-1. Pain Phenotypic Screening System

Research Interests

・Cell-based in vitro assay systems with primary neurons (e.g., dorsal root ganglion neurons and dorsal horn neurons) and/or glial cells (e.g., astrocyte, microglia and satellite glia) for new target identification

Other Requirements

・Plate-based screening with medium (96-well) to high (384-well) throughput is desirable.

・Cell culture system with iPS cell-derived neurons and/or glial cells from healthy or patient, or with rat primary cells is desirable.