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JOINN

Safety Assessment and Life Cycle Monitoring
for Your Pharmaceutical Innovation

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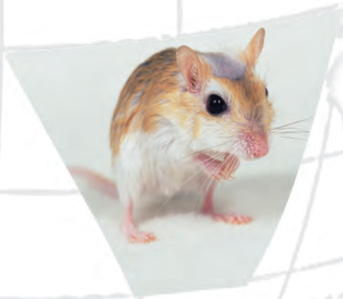
603127.SH/6127.HK



AAALAC Accredited
US FDA GLP Inspected
NMPA GLP Certified
OECD GLP Certified
PMDA GLP Inspected
MFDS GLP Inspected
CNAS/ILAC-MRA Certified

Content

Quality Assurance

Animal Welfare and OHS

Pharmacology and Pharmacodynamics

DMPK and Bioanalysis

Non-Clinical Safety Assessment

Safety Pharmacology

Developmental and Reproductive Toxicology (DART) & Genetic Toxicology

Carcinogenicity Study

Drug Abuse & Material Dependence

Ophthalmology Services

Inhalation Laboratory Services

Services on Neuroscience

BSL-2 Laboratory

Genetic Analysis Services

JOINN Distribution

JOINN（Beijing）

JOINNBIO（Beijing）

Biomere

JOINN（Suzhou）

JOINN（Wuzhou）

JOINN CA

JOINN（Guangzhou）

JOINN（Chongqing）

Model Animal Field（Guangxi）

Company Overview

Founded in 1995, JOINN Laboratories (China) Co., Ltd. (JOINN Laboratories, Stock Code: 603127.SSE/6127.HK) is dedicated to providing drug R&D CRO outsourcing services. Headquartered in Beijing, JOINN has subsidiaries in Beijing, Suzhou, Shanghai, Chongqing, Wuzhou and Guangzhou in China, and Richmond (CA) and Worcester (MA) in the United States, with over 2000 professionals. JOINN has built a thorough quality management system complying with international standards: CNAS/ILAC-MRA certification, NMPA, US FDA, OECD, Japan PMDA and Korean MFDS GLP certification and international AAALAC accreditation. JOINN provides customized services to the sponsor' s specific needs for non-clinical safety assessments, clinical trials, registrations, and pharmacovigilance, covering the entire spectrum from development to final drug registration. JOINN also provides services in animal feed and veterinary medicine evaluation, pesticide evaluation, medical device evaluations, and more.

JOINN adheres to the purpose of "Safety Assessment and Life Cycle Monitoring for Your Pharmaceutical Innovation". We utilize our unsurpassed capability, profound experience, and unremitting efforts to provide sponsors with a one-stop and high quality service for the entire process of new drug development and to help sponsors achieve their ultimate goal — bringing innovation to the markets.

Non-Clinical Services

JOINN Laboratories is the first private enterprise in China to engage in non-clinical assessments for innovative drugs. It is also the one of the largest institutions to offer non-clinical assessments in China. The Beijing and Suzhou sites, with a professional team of 2000 people, have established the most comprehensive non-clinical drug assessment platform on ophthalmic drug assessment (the largest in China), inhalation drug assessment, central nervous system assessment, gene therapy and cell therapy assessments, juvenile animal assessment, and carcinogenicity assessment. Reports issued by JOINN have been accepted by China NMPA, US FDA and regulatory authorities in Australia, Japan, and other countries.

In the United States, two subsidiary companies, JOINN-Biomere West based in Richmond, California and JOINN-Biomere East based in Worcester, Massachusetts provide lead compound screening, drug efficacy testing, chemical and biological analytical services for the pharmaceutical and biotechnology industry. JOINN-Biomere also conduct medical device evaluation, genetic engineered animal development, colony maintenance, development and evaluation of customized disease models from small animals to non-human primates (NHPs).

FDA 国家药品监督管理局 National Medical Products Administration UNITED STATES ENVIRONMENTAL PROTECTION AGENCY OECD

Pmda Ministry of Food and Drug Safety CNAS ilac-MRA

Quality Assurance

As a leading pre-clinical CRO company with cutting edge techniques in China, JOINN is committed to providing our sponsors with efficient, high-quality, and high-standard services on the premise of meeting the regulatory requirements of both domestic and global regulatory agencies, and meeting or exceeding the expectations of our customers. Through more than 20 years of operational GLP experience and continuous training & improvements, we have established a comprehensive quality management system, that adheres to strict requirements. Every employee at JOINN engaged in GLP activities has a strong sense of quality and insists on compliance and standardizing operations throughout the work process:

Quality Management System:

As the basis for the operation and management of the quality system, JOINN has established effective quality assurance program and a reliable management system as well as all necessary documents and detailed SOPs involving all aspects of study management and technical process control. We strictly follow SOPs to ensure that the project operation and study data are accurate, complete, traceable, and effectively support the standardized operation and continuous development, so as to ensure the consistent high-quality service for our sponsors.

Training Management System:

As the cornerstone of the company' s operation, JOINN has customized a special training and assessment program based on the personal goals and job requirements of employees. It includes continuous regulatory training based on domestic and global regulatory agencies' requirements. Corporate culture, industry norms, occupational health and safety, and job-specific skills, are also part of the training program to meet personal and career development goals, to cultivate in quality, professionalism, competency in advanced technology and core competitiveness.

Quality Assurance Team Building:

Under the leadership of a number of experienced domestic and international GLP regulation experts, JOINN has established an independent and professional quality assurance team. Quality assurance personnel have undergone professional induction training and followed by continuous training and education to support the quality assurance mission of JOINN and ensure the regulatory compliance of the research projects.

Certificates and Qualifications:

Through the unremitting efforts of each employee, the experience of our quality management system has been accumulated, and the quality system that conforms to the national and international GLP standards has been established and improved. JOINN has been awarded with GLP certificates or qualifications of the US FDA, OECD, China NMPA and the accreditation of other organizations including AAALAC, CNAS/ILAC-MRA etc. JOINN' s data have been accepted by regulatory agencies worldwide.

Animal Welfare and OHS

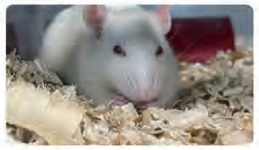
Animal Welfare

Many lifesaving advances in medicine and human health were drawn from the scientific discoveries using animal research and development. We are committed to helping to improve the quality of human life while ensuring the highest possible standards of animal welfare.

We provide a high quality animal welfare system:

- We treat our animals humanely and with respect. We honor the contributions that our animals make to lifesaving advances.
- We strictly follow all applicable laws and regulations for animal welfare.

- We employ alternative scientific methods to animal use where appropriate.
- We minimize animal discomfort. We apply best practice for animal welfare to minimize discomfort or stress to animals.



- We ensure that our employees and processes meet the standards and requirements of AAALAC.
- We train JOINN employees who handle animals to utilize the best techniques and procedures, and to apply consistent controls to ensure that our Code of Respect is followed.

NIH National Institutes of Health
Office of Laboratory Animal Welfare

At JOINN, animal welfare means more than a clean, safe environment and good nutrition. It also means that the animals are provided with the best husbandry available to experience a stress-free life and good health. Both facility sites in Beijing and Suzhou have been accredited by the Association for Assessment and Accreditation of Laboratory Animal Care (AAALAC) International, confirming our commitment to conducting studies in an ethical and humane way.

As one of the world's leading providers of pre-clinical drug development services and other services toward human safety, we accept both the legal and the moral obligation to be a leader in assuring that animals in our facilities are treated in accordance with all applicable rules and with elevated standards of respect and compassion. In addition to laws and ethics, this obligation is scientifically important because failure to meet these rules and standards can undermine the validity of scientific research.

If we learn that any of our employees have failed to follow the Code of Respect, we will take appropriate remedial and disciplinary actions.

OHS

To protect employees from unhealthy factors at work and promote their physical and mental health, JOINN have established a systematic occupational health protection system:

1. Establish the Occupational Health and Safety Committee (OHS)

2. Conduct pre-employment and on-job health assessment of employees

3. Organize employees to conduct occupational health and safety training and emergency drills

4. Conduct safety risk assessment for workplace, develop personnel protection plan and provide safety guarantee and continuous improvement

Pharmacology and Pharmacodynamics

With a multi-disciplinary background such as molecular pharmacology, neuro-pharmacology, cell biology, immunology and veterinary medicine, we can provide a wide range of non-clinical services such as in vitro and in vivo testing platforms for disease models from rodents to non-human primates. We have a complete package of advanced pre-clinical technologies and a huge platform for efficient evaluations. We are committed to drug development and regulatory submissions to both local and international authorities.

Platforms

Animal behavior evaluation platform

Electrophysiological platform

Immunological research platform

Microbiological research platform

In Vitro Services

Immune cell typing

Flow cytometry (lymphocyte typing, intracellular cytokine staining, etc.)

ELISPOT

Cytokine release

In Vivo Models

Tumors: heterotopically/orthotopically implanted tumors, immune reconstruction model based on PBMC and hematopoietic stem cell (HSC), multiple immune checkpoint humanization animal model

Neuropsychiatric Diseases: Alzheimer's disease, Parkinson's disease, depression/anxiety, ischemic necrotizing disease, pain, epilepsy, spinal cord injury, substance dependence, neurotoxicity, multiple sclerosis, pituitary dysplasia, etc.

Hematological Diseases: hemophilia, thrombosis, anemia, granulocytopenia, thrombocytopenia, etc.

Metabolic Diseases: obesity, diabetes and complications, hyperuricemia, osteoporosis, growth hormone deficiency, nutrient deficiency, etc.

Digestive Diseases: gastric ulcer, acute liver failure, fatty liver disease (alcoholic and non-alcoholic fatty liver), liver fibrosis, cirrhosis, hepatic ascites, chemotherapy-induced diarrhea, etc.

Cardiovascular Diseases: atherosclerosis, myocardial infarction, heart failure, etc.

Respiratory Diseases: pulmonary fibrosis, pulmonary embolism, asthma

Urologic Diseases: renal fibrosis, nephrectomy, drug-induced renal injury, surgically induced renal injury, acute/chronic renal insufficiency, prostatic hyperplasia, etc

Immunity Related Diseases: osteoarthritis, rheumatoid arthritis, ulcerative colitis, Crohn's disease, psoriasis, atopic dermatitis, graft-versus-host disease (GVHD), systemic lupus erythematosus, multiple sclerosis, immune thrombocytopenia, etc.

Infectious Diseases: infectious models by a variety of bacteria and viruses

Others: exogenous virus factors, biological titer (insulin, FSH, growth hormone, etc.), tumorigenicity study in vivo and in vitro, etc.

DMPK and Bioanalysis

JOINN supports full ADME and pharmacokinetic services to support customers' needs from early drug discovery to submission. We have an experienced pharmacokinetic research team, which can design and carry out in vivo and in vitro pharmacokinetic studies according to the program' s specific needs.

Animal Species

All standard laboratory animals supported, including the bellows.

Rodents: Mice, Hamsters, Rats, Guinea Pigs

Non-Rodents: Rabbits, Dogs, Mini pigs, Non-human primates

Services

Test Article Formulation & Analysis

Formulation (liquid solutions and suspensions, injectables, etc.)

Vehicle screening

Test Article analysis (Methods development and Method validation)

Method Development and GLP Bio-analysis Method Validation

Chemicals (HPLC, LC-MS/MS, ICP/MS, Online-SPE-MS/MS)

Biologics (ELISA, EIA, RIA, ECL, RT-qPCR, LC-MS/MS)

in vitro ADME Study

Physicochemical Properties

Solubility

LogD

Chemical stability

Plasma stability

Plasma protein binding

in vitro Metabolism

Liver microsome/Hepatocyte stability

CYP phenotyping

Metabolite ID (Phase I & II)

Permeability

Caco-2

PAMPA

Drug—Drug Interaction

Drug interactions mediated by metabolic enzymes

CYP Inhibition Assay

CYP Induction Assay

Time-dependent inhibition (TDI)

Reversible inhibition

Transporter-mediated drug interactions

ABC transporter substrates and inhibition

SLC transporter substrates and inhibition

In vivo PK Study

Non-GLP and GLP PK study in mice, rats, dogs, mini pigs and nonhuman primates

Various routes of administration

Tissue distribution and excretion in rodents

Bioavailability in different species

Crossover and non-crossover study design for large animals

Isotope labeling for tissue distribution study in rodents and mass balance studies

Element Residues

Based on ICP-MS technology to determine the heavy metal impurities of bulk drugs, Chinese medicinal materials, drug packaging materials, food additives, food packaging materials, pharmaceutical water, and pharmaceutical excipients.

Immunology

ELISAs, ELISPOT, C3 assays, cytokine quantitation

Immunogenicity (IgG, anti-drug Ab, Neutralizing Ab)

Molecular Biology

Real-time qPCR assays

DNA/RNA extraction

Prober/primer design

Rich Experience in

Methodological development and validation, especially in peptides, ADC, bi-specific antibodies, small nucleic acids and special dosage forms of chemical drugs.

Data processing and statistical analysis: BE equivalence, PK parameters and other WinNonlin data statistical analysis.

Biomarker

Multiple biomarker detection based on high sensitivity electro-chemiluminescence (ECL)

Multiple biomarker detection based on flow cytometry (FCM)

Detection of tumor tissue biomarkers based on IHC and RNA in situ hybridization

Biomarker detection based on LC-MS/MS

Development and validation of biomarker methods

Analysis of biomarker samples

Methods & Equipment

LC-MS/MS

- Sciex Triple quad 6500+ (5)
- Sciex Triple quad 6500 (5)
- Sciex Triple quad 5500 (9)
- API4000 (4)
- Shimadzu 8050 LC-MS/MS (4)
- Water TQD (1)
- Water TQS (3)
- Agilent ICP-MS (2)
- Triple TOF (2)

Biomacromolecule Analysis

- Enzyme Immuno Assay Analyzer (5)
- MSD (3)
- Q-PCR (3)
- DD-PCR (1)
- Automated Chemiluminescent immunoassay Analyzer (3)

Sample Storage and Management

- -60℃ Refrigerators (29) and others Refrigerators (24)

Sample Dilution and Preparation

- Hamilton Microlab Star

Standardized Biological Analysis System and Laboratory Data Management

- WatsonTM LIMS
- QC/QA Inspection
- Company harmonized SOPs, protocols and reporting formats
- Traceable Data and Backup System

Non-Clinical Safety Assessment

With accumulated experiences over the past 20+ years, JOINN offers the broadest suite of services at the highest standards available. Our toxicology department has professional teams with rich experience in toxicology studies. We offer high-quality data and rapid turnaround to support drug discovery and development.

Services

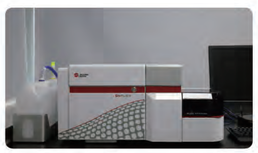
- General Toxicology
- Safety Pharmacology
- Developmental and Reproductive Toxicology
- Juvenile Animal Study (JAS)
- Genetic Toxicology
- Carcinogenicity Studies
- Drug Abuse & Substance Dependence
- Immunogenicity and Immunotoxicity
- Special Toxicities
- Clinical Pathology
- Toxicokinetics
- Assessment of radiopharmaceuticals
- Assessment of biohazardous drugs

Animal Species

- Rodents: Mice, Hamsters, Rats, Guinea Pigs
- Non-Rodent: Rabbits, Dogs, Mini pigs, Non-human primates

Dosing Techniques and Routes

- Oral
- Intravenous
- Inhalation
- Special Ocular Routes
  - Conjunctival Sac
  - Vitreous Body
  - Retrobulbar Injection
  - Subretinal Injection
- Intradermal
- Dermal
- Intranasal
- Intravaginal
- Subcutaneous
- Intraperitoneal
- Intramuscular
- Intra-Articular
- Subarachnoid
- Intracerebral (precise administration with the aid of brain stereotaxic apparatus)



Safety Pharmacology

JOINN Laboratories has been engaged in safety pharmacology evaluations for almost 20 years. All study designs are based on the International Conference on Harmonization (ICH) Tripartite Guidelines (S7A, S7B) and NMPA regulations. With years of experience, our safety pharmacology team provides "full-scope evaluation services" to sponsors.

Services

Cardiovascular System

Conscious animal telemetry (dogs, mini pigs, non-human primates): ECG, blood pressure, body temperature, activity

Anesthetized animals (dogs, non-human primates): ECG, blood pressure

Patch Clamp: hERG currents, sodium currents Nav1.5 and Cav1.2 currents recording

Respiratory System

Conscious Animal (dogs, mini pigs, non-human primates): respiratory rate, tidal volume, ventilatory volume per minute

Rodent (WBP model): respiratory rate, tidal volume, ventilatory volume per minute

Central Nervous System

Functional observation battery (FOB, rats, mice, dogs, non-human primates)

Locomotor activities of mice and rats (video monitoring and analysis)

Rota Rod test

Grip strength test

Body temperature

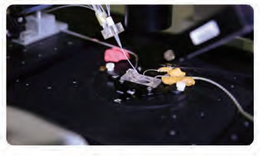
Gastrointestinal System

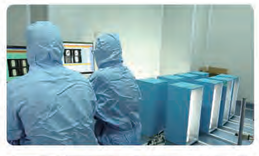
Gastric acid secretion and pH value in rats

Evaluation of gastrointestinal motor function in mice

Renal/Urinary System

Evaluation of kidney function in rats





Developmental and Reproductive Toxicology (DART) & Genetic Toxicology

JOINN Laboratories offers advanced expertise in DART studies and genetic toxicology services that meet ICH, US FDA, OECD, US EPA, and NMPA regulation standards. we have a well-documented historical database, stable technical team and skillful scientific staff to ensure prompt, effective and high quality services to global customers.

DART Services

Fertility and Early Embryo Development Studies (Seg. I, Mice, Rats)

Embryo-Fetal Developmental Toxicity Studies (Seg.II, Mice, Rats, Rabbits, Non-human Primates)

Prenatal/Postnatal Developmental Toxicity Studies (Seg. III, Mice, Rats, Rabbits)

Enhanced Perinatal Toxicity Studies (ePPND, Non-human Primate)

Developmental Toxicity Screening Studies

Sperm Abnormality Studies

Reproductive Toxicity Studies (One-Generation/Multi-Generation)

Reproduction Studies

Developmental Neurotoxicity Studies

Developmental Immunotoxicity Studies

Sexual Function Models

SGA Models

Whole-mount Embryo Culture - Drug Early-stage Screening (in vitro)

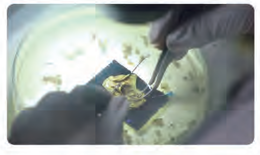
Genetic Toxicology Services

Ames Assay

In vitro Chromosome Aberration Assay

In vivo Micronucleus Assay

In vitro Micronucleus Assay



Animal Species:

Rodent

- Rat (SD, Wistar)
- Mouse (ICR, KM, C57BL/6, transgenic mouse)

Non-Rodent

- Rabbit (New Zealand White, Japanese White)
- Non-human Primate (Cynomolgus macaques)

Carcinogenicity Study

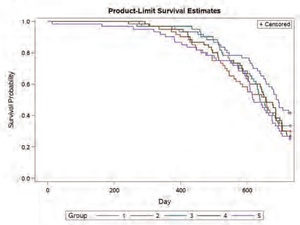
JOINN has filed the most cases of carcinogenicity studies to the Chinese NMPA and US FDA, among all Chinese CROs. Protocols for carcinogenicity studies are designed according to the regulatory over-sight guidelines (NMPA, FDA, ICH, EPA, OECD and EU) and are conducted in full compliance with GLP standards. We have an expert veteran pathological diagnostic team and a strong historical database of carcinogenicity studies. JOINN has established credibility and excellent track record of acceptance of carcinogenicity study data by USFDA and Chinese NMPA.

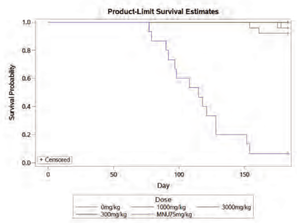
Study Experience

104-week carcinogenicity study in SD rats

104-week carcinogenicity study in mice

26-week carcinogenicity study in transgenic mice (Tg.rasH2, P53+/-, Tg.AC)





Drug Abuse & Material Dependence

Non-clinical drug dependence studies can provide clinical information on drug abuse and dependence, and the obtained non-clinical trial data is conducive to guiding clinical research and rational drug use, warning of abuse tendency, and is of great significance for the research and development of drugs for drug withdrawal, dependence tendency and central nervous system action. JOINN has established a dependency assessment method based on the guidelines of FDA, ICH, EMA and NMPA, and possesses advanced and comprehensive instruments, which complies with international GLP standards, and can provide customers with a complete set of rodent dependency assessment services.

Services

Autonomous Administration Test

Conditioned Place Preference/Aversion

Behavioral Sensitization Test

Drug Identification Test

Natural Withdrawal Test

Urgent Withdrawal Test

Ophthalmology Services

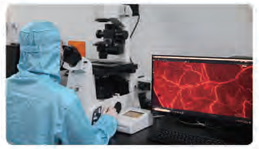
JOINN's ophthalmology laboratory was established in 2012 in our Suzhou facility to provide compre-hensive and GLP compliant study services for the development of innovative ocular drugs and new ocular devices. A professional scientific research team consisting of 35+ people with high caliber of technical skills and 500 m^2 of ophthalmology laboratory has been established and equipped with world-class comprehensive ophthalmic instruments. It has provided non-clinical experimental services to over 100 sponsors, completed over 500 service contracts, and assisted sponsors to complete nearly 30 domestic and global IND submissions.

Services

Safety evaluation

Efficacy evaluation

Pharmacokinetics



Animal Model

Wet AMD

Choroidal Neovascularization (CNV)

VEGF Induced Vascular Leakage

Glaucoma

IOP

Keratoconjunctivitis Sicca (KCS)

Allergic Conjunctivitis

Corneal Wound Healing

Corneal Neovascularization

Corneal Graft Rejection

Corneal Epithelial/Endothelial Cell Dystrophy

Oxygen Induced Retinopathy (OIR)

Retinal Neovascularization

Retinal Degeneration

Diabetic Retinopathy

Uveitis

Cataract

Ocular Ischemia/Reperfusion

Optic Nerve Degeneration

Myopia

New Model Development

Standardized Procedures of Eye Examination

Slit lamp microscopy

Direct/Indirect ophthalmoscopy

Fundus photography (FP)

Fundus fluorescein angiography (FFA)

Optical coherence tomography (OCT)

OCT Angiography (OCTA)

Intraocular pressure (IOP)

Electroretinogram (ERG)

Electroretinogram (ERG)

Multifocal ERG (mf-ERG)

Visual evoked potential (VEP)

A/B ultrasound scan

Ultrasound Biomicroscopy (UBM)

Dioptometry

Axial length examination

Pupil diameter examination

Animal Species

Rodents: Mice, Rats, Guinea Pigs

Non-Rodents: Rabbits, Dogs, Mini pigs, Non-human primates

Dosing Techniques

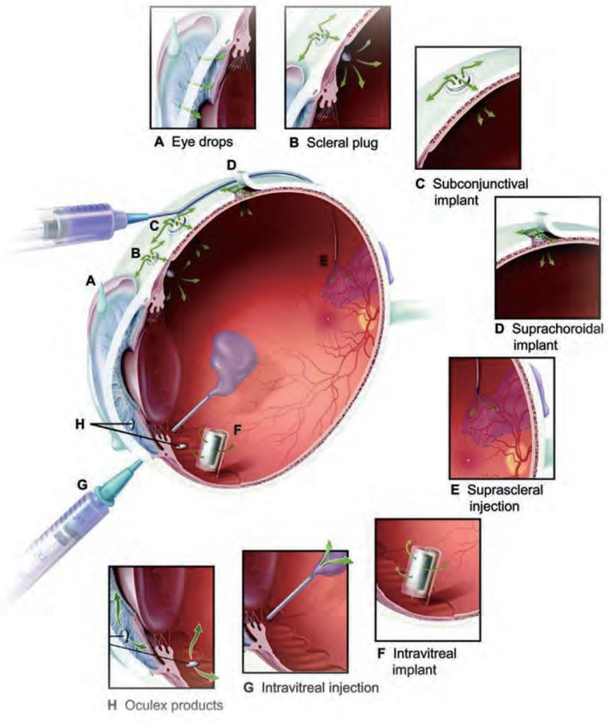
Topical

Conjunctival sac (eye drops, ointments, gels)/periorbital skin

Subconjunctival injection/ anterior chamber injection/ intravitreal injection/ subretinal injection/ suprachoroidal injection/ retrobulbar injection

Systemic

Oral/ gavage/ intramuscular/ intravenous injection



Inhalation Laboratory Services

JOINN' s respiratory safety assessment laboratory supports inhalation toxicology studies for pharmaceuticals, agrochemicals and industrial chemicals. We can provide customized studies for inhaled drug formulations to test efficacy, pharmacokinetics and toxicity in different animal species.

Studies

Pharmacology and Pharmacodynamics

General Toxicology

TK/PK (including bioavailability)

Pulmonary NOAEL (Pathology and Functional Testing)

Pulmonary Function Assessment (Pulmonary Ventilation and Blood Gas Analysis)

Animal Species

Rodents: Mice, Rats

Non-rodent: Dogs, Non-human Primate

Animal Models

Pulmonary fibrosis

Chronic obstructive pulmonary diseases (COPD)

Asthma

Pneumonia

Lung injury

Pulmonary hypertension

Dosing Techniques

Whole body exposure (Rodents)

Oral and nasal inhalation (Rodents, Dogs, Non-human Primates)

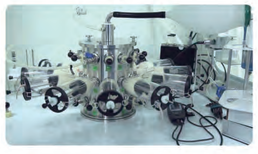
Intratracheal (solution, dry powder)

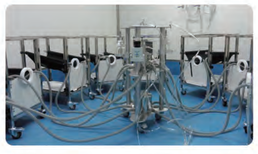
Analytical Support

Inhalation solution (IS)

Metered dose inhaler (MDI)

Dry powder (DPI)





Services on Neuroscience

JOINN is one of the earliest institutions to establish a central nervous system drug evaluation platform in China. The neuroscience laboratory is equipped with advanced instruments and equipment, and has established various animal models and characteristic evaluation platforms from rodents to non-human primates.

Animal Models

- Alzheimer's disease
- Parkinson's disease
- Depression/anxiety
- Ischemic necrotizing disease
- Pain
- Epilepsy
- Spinal cord injury
- Drug dependence
- Neurotoxicity
- Multiple sclerosis
- Pituitary dysplasia

Platform

Behavioral testing facilities

Automatic behavior detection platform (Cognition Wall)

Traditional behavioral testing platform (maze, open field, shuttle/dark escape, forced swimming, tail hanging, etc.)

Imaging platform (MRI, PET/CT, DSA)

Multiple CNS administration techniques (intraventricular, epidural, and intrathecal injections)

Electrophysiological platform

Microdialysis platform

BSL-2 Laboratory

JOINN's well-established BSL-2 suite can be used on a bespoke basis or for outsourced services. The facility is set-up for routine microbiology, vaccine development and testing, and handling of active biological agents.

Services

Pharmacodynamics studies

A variety of viral and bacterial infection models (such as HSV, SIV, H. pylori, Escherichia coli, staphylococcus aureus, pseudomonas aeruginosa, etc.)

Toxicity testing (acute toxicity and immunotoxicity studies for sendai virus)

Animal Species

Rodents

Non-Rodents (Rabbits, Dogs, Minipigs, Non-human Primates, etc.)

Installations and Protective Devices

Biosafety cabinets within each suite

Autoclave within each suite

IVCs for contained rodent housing

Facial protection (glasses, masks or other spray device)

Special protective clothing and gloves

Radiopharmaceuticals Services

Isotope tracer technology is one of the main means of pre-clinical pharmacokinetic research of protein and peptide drugs, and the sensitivity of the method is high, the degree of interference is low, and comprehensive data on drug concentration kinetics, tissue distribution and excretion research can be obtained. At present, JOINN has carried out research for a range of monoclonal antibodies, ADCs, cytokines, hormones, blood products and other biomolecules, based on isotope tracer technology pharmacokinetics study. We also carried out radio-immune analysis for a variety of endogenous components.

Services

Pre-clinical biomolecular pharmacokinetics, tissue distribution, excretion research
Pre-clinical and clinical radioactivity immune analysis

Technology

Radionuclide labeling and detection techniques
Barrier grade and general grade feeding conditions

Technology

Radionuclide labeling and detection techniques
Barrier grade and general grade feeding conditions

Animal Species

Rodents: Mice, Hamsters, Rats, Guinea Pigs
Non-Rodent: Dogs, Mini pigs, Non-human Primates

Genetic Analysis Services

The genetic analysis laboratory serves for pre-clinical and clinical research of genes and cellular therapies. We have rich experience on a variety of gene therapy modalities including oncolytic viruses, various DNA or RNA viruses, CAR-T, gene editing and stem cell drugs.

Services

RT-qPCR bioassay development and validation

Development and validation of methods for relative and absolute quantitative analysis of gene expression products

Detection of drug content and gene expression products in blood, tissues, secretions and other substrates

Equipment

Automatic nucleic acid extractor
High-throughput fluorescent quantitative PCR
Digital PCR and related supporting equipment
Supporting compliance data analysis software