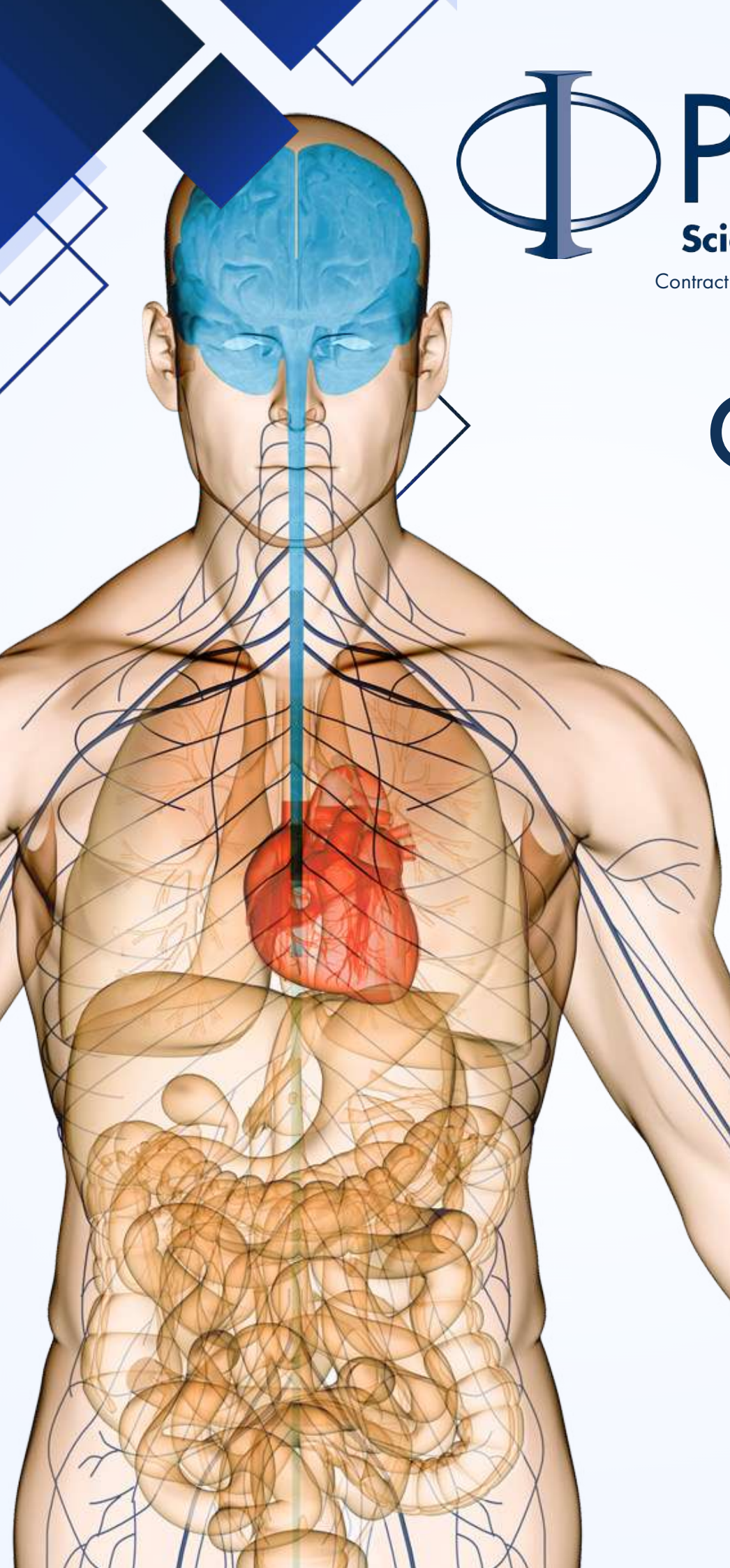


Porsolt

Scientist-to-Scientist

Contract Research in Preclinical Pharmacology

Catalog

2025

Drug Discovery, Safety, Efficacy & Toxicology

Histology, Biomarkers of Small Molecules

Biologics & Gene Therapies

Discover *in vitro*, *in vivo*, and *ex vivo* models, along with tailored solutions designed for your specific needs.

GLP

aaalac INTERNATIONAL

About Us

We are a long established international preclinical CRO (Contract Research Organisation), accredited by AAALAC and fully GLP compliant. We have been providing efficacy evaluation and safety pharmacology services for over 40 years, covering the drug development process from early screening through regulatory submission.

We offer comprehensive pathophysiological models across multiple species and cell lines, providing customized procedures and tailored solutions. Our services include *in vitro* assays, drug formulation analysis, and bioanalytical support. Leveraging advanced platforms such as high-throughput screening, high-content analysis, and high-content histology, we address a wide range of therapeutic areas, including psychiatric and neurological disorders, pain and inflammation, cardiovascular diseases, metabolic and eating disorders, dermatology, allergy, and oncology.

Our Values

Client projects are our priority

We listen to our clients and provide them with our expert advice, established models, tailor-made solutions and flexibility.

Your Expert Science Team Extension

We aim to be an extension of your team of expert scientists. We continuously work hand in hand with our clients and their scientists. Together, we develop the best solutions.

Reliable, Experienced & Quality-focused

We have been AAALAC accredited and GLP compliant for 24 years, maintaining operational excellence and the highest quality standards to exceed expectations.

+ 3 800 CLIENTS TRUST US

+ 350 STUDIES PERFORMED ANNUALLY

Our clients · Head office / Main Research Facility · Representation

Our Expertise

Assay & Model Development

Our vast experience and varied expertise, including newly incorporated *in vitro*, *ex vivo* and *in vivo* models, biomarkers and histology and image analysis, provide the perfect solution for clients looking for bespoke model development. We are uniquely placed to combine *in vitro* and *in vivo* models and capabilities from multiple species and disease areas in order to answer the specific questions from our clients. Whether performing high-throughput screening, high-content analysis, mechanism of action, efficacy, safety or toxicology testing, we are the ideal partner for your development programs.

Consulting

Our unique expertise and experience, developed over four decades, combined with our broad portfolio of services in multiple species, allows us to provide unparalleled consulting and advice on the preclinical process and bespoke model development to address specific questions. This includes screening, efficacy evaluation, safety pharmacology, discovery and regulatory needs.

Cell Biology

We maintain a panel of over 100 validated cell-based assays that allow for the quantification of key phenotypic and molecular events at the single-cell level. Most of the cellular assays listed below can be adapted for different biological models, or adapted for different detection platforms, according to your specific needs.

Learn about our assay & development services:

- Cell proliferation, migration, differentiation (live cell kinetic image analysis - Incucyte ®, flow cytometry, EnSight ™).

- Primary cell isolation, culture and characterization (Immunophenotyping ...) and iPS cell handling (culture and functional assays).

- Biomarker analysis (Luminex ®, Western Blot, ELISA, CBA, HTRF ®, AlphaLisa ™...).

- Cell stress, metabolism, inflammation and signaling pathways.

- Predictive toxicology (cell death/health, apoptosis).

- Gene expression modulation (siRNA transfection, AAV/LVV transduction).

Looking for a precise solution ?

Let's discuss how we can tailor it to your needs

www.porsolt.com

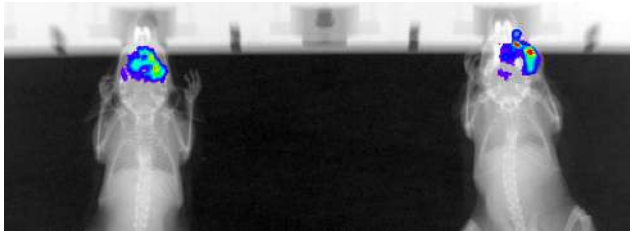
Recent News & Updates

Porsolt Enhances Preclinical Development Services with New Capabilities

Porsolt proudly announces the expansion of its service offerings to further serve the growing needs of the Biotech and Pharmaceutical industries. We are introducing several advanced research areas to bolster the preclinical development process, aligning with the industry's rapid evolution and complex therapeutic demands.

Biodistribution Studies for Efficacy & Safety

Recognizing the importance of gene therapies and cell therapies in advancing medical research, Porsolt is now developing expanded biodistribution study capabilities to assess Efficacy and GLP Safety. These studies are crucial for gaining a better understanding around the distribution within the body of gene therapy products, confirming that treatments reach their intended targets and exert their intended effects, thereby maximizing efficacy. Simultaneously, these studies are also pivotal from a safety perspective in identifying any unintended sites of distribution that could lead to adverse effects.



Advanced Toxicology Studies

Porsolt is also expanding its toxicology study offerings, which are vital in evaluating the safety of new therapeutic compounds. The expanded services include a range of studies—from acute toxicity assessments, examining the immediate effects of a single dose, to comprehensive GLP 28-day toxicology studies that provide in-depth safety profiles after repeated dosing. These studies are designed to highlight potential adverse effects and establish dose-response relationships, ensuring that any safety concerns are identified early in the development process. Furthermore, Porsolt's toxicology studies include organ-specific evaluations through histopathological assessments and thorough monitoring of physiological parameters including blood chemistry and hematology, facilitating a thorough understanding of a compound's safety profile.

Innovative Compounds & Administration Methods

Porsolt has broadened its portfolio of capabilities to accommodate a diverse array of compound types and complex modes of administration. Test items include biologics, nanoparticles, and innovative drug delivery systems. Porsolt can also support therapeutic development through complex modes of administration such as intravenous (IV) and intrathecal (IT) injections, as well as intra-duodenal (ID) delivery for targeted gastrointestinal effects. Additionally, Porsolt offers intracerebroventricular (ICV) administration for central nervous system therapies, enhancing the efficacy of drugs designed to act within the brain. These specialized capabilities mean that Porsolt is equipped to support the development of next-generation therapeutics that require novel and precise approaches for optimal therapeutic outcomes patient.

Development of Migraine Models

A fast growing area of interest for preclinical research is pain, and specifically migraine. Porsolt has recently validated the KCl- induced migraine model and is in the process of validating further advanced preclinical models for studying migraine pathophysiology and therapeutic interventions. These models are designed to mimic the complexities of human migraine conditions, providing valuable insights into the underlying mechanisms and potential treatment options. Porsolt's expanded expertise can facilitate the development of more effective therapies targeting this significant and often debilitating condition, aligning with the pressing needs of clients in the evolving landscape of headache research.

With these strategic enhancements, Porsolt reaffirms its dedication to pushing the boundaries of preclinical research and supporting the biotech and pharma markets. Porsolt continues to provide more robust, flexible, and cutting-edge solutions that meet the changing needs of its clients, fostering a new era of medical innovation.

For more information about how Porsolt's expanded capabilities can support your therapeutic development needs, please contact us at contact@porsolt.com.

Recent Posters

SFN 2024

The dual-hit model of schizophrenia-like behavior in the female Wistar rats.

E. Esneault, C. Froger-Colléaux, E. Sablé and A-M Hernier

Fear Conditioning and Extinction in the rat: A Gender and Strain Comparison.

E. Esneault, C. Froger-Colléaux, E. Camperos, A. Lecoq and A-M Hernier

EAACI 2024

Development of a preclinical murine model for peanut protein allergy.

S. Goineau, J. Bellec-Dyèvre, L. Barrais, C. Cancio, M. Paquet and G. Froget

SPS 2024

'All-inclusive' evaluation of the efficacy and safety of Methotrexate in a murine breast cancer model integrating the 3Rs to enhance preclinical assessment.

T. Rupp, S. Goineau and G. Froget

AES 2024

SUDEP model in the DBA/1 mouse: Comparative study between males and females.

G. Peyon, D. Babin, M. Martineau and E. Esneault

Electrical amygdala kindling model in the rat: Comparative study with two different stimulation protocols.

G. Peyon, L. Genest, C. Froger-Colléaux and E. Esneault

SPS 2023

Intravenous self-administration in the rat: Advantages of transcutaneous buttons for improving Animal Welfare.

S. Brèche, B. Péan, C. Rondeau and C. Froger-Colléaux

SFN 2023

MDMA in the treatment of anxiety and PTSD: a behavioral assessment in rodents.

K. Walker, E. Esneault, C. Froger-Colléaux, E. Camperos, A. Lecoq and A-M. Hernier

SFN 2023

Cuprizone-induced demyelination in the mouse: immunohistochemical characterization.

E. Esneault, C. Rondeau, S. Cottereau, S. Pedron and F. Simon

AcTox 2023

Characterization of a model of neurotoxicity by histology.

F. Simon, G. Peyon, E. Esneault, C. Froger-Colléaux and S. Brèche

AcTox 2023

Dog Telemetry Assay Sensitivity to Detect QTc Prolongation: Retrospective Statistical Power Analysis, and Moxifloxacin Effects by Timepoint and Concentration-QTc Relationship Analysis.

P. Guillaume, F. Tantot, S. Goineau-Brissieux, S. Brèche and G. Froget

Recent Publications

Evaluation of Clobetasol and Tacrolimus treatments in an Imiquimod-Induced psoriasis rat model
P. Guillaume, T. Rupp, G. Froget and S. Goineau
Int. J. Mol. Sci. 2024, 25, 9254 (DOI : 10.3390/ijms25179254)

St. John's Wort Extract Ze 117 and Escitalopram Alter Plasma and Hippocampal Lipidome in a Rat Model of Chronic-Stress-Induced Depression
H. Bussmann, S. Bremer, A-M Hernier, J. Drewe, H. Häberlein, S. Franken, V. Freytag, G. Boonen and V. Butterweck.
Int. J. Mol. Sci. 2024, 25, 12667 (DOI : 10.3390/ijms252312667)

Imiquimod-induced pruritus in female wild-type and knockin Wistar rats: underscoring behavioral scratching in a rat model for antipruritic treatments
K. Lariosa-Willingham, D. Leonoudakis, F. Simon, K. Walker, P. Guillaume, L. Warren and J. Stratton
BMC Research Notes 2023 (DOI : 10.1186/s13104-023-06627-1)

Genetic Background Influence on Hippocampal Synaptic Plasticity: Frequency-Dependent Variations between an Inbred and an Outbred Mice Strain
C-M. Roux, P. Lecouflet, J-M Billard, E. Esneault, M. Leger, P. Schumann-Bard and T. Freret
Int J Mol Sci. 2023 Feb 21;24(5):4304. (DOI: 10.3390/ijms24054304)

Drug Discovery and Evaluation: Safety and Pharmacokinetic Assays
C. Froger-Colléaux, E. Esneault, A-M Hernier and V. Castagné

Repeated Anodal Transcranial Direct Current Stimulation (RA-tDCS) over the Left Frontal Lobe Increases Bilateral Hippocampal Cell Proliferation in Young Adult but Not Middle-Aged Female Mice
S. Dumontoy, B. Ramadan, P-Y. Risold, S. Pedron, C. Houdayer, A. Etiévant, L. Cabeza, E. Haffen, Y. Peterschmitt and V. Van Waes
Int J Mol Sci. (2023) May 14;24(10):8750. (DOI: 10.3390/ijms24108750)

New Tests & Models

Central Nervous System

CNS GENERAL SCREENING
MK-801-induced neurotoxicity
Seizure-induced respiratory arrest in the model of SUDEP *(mouse)*

NEURODEGENERATION
Cuprizone-induced demyelination *(mouse)*

Dermatology
Imiquimod-induced psoriasis-like skin inflammation *(rat)*

Gastrointestinal System
Mastocyte staining - Toluidine blue

Inflammation
Bleomycin-induced lung injury

Oncology
Leptomeningeal carcinomatosis model

Pain

INFLAMMATORY PAIN
Migraine KCl-induced cortical spreading depression and facial allodynia in the rat

Respiratory System
Bleomycin-induced pulmonary fibrosis

New Capabilities

TOXICOLOGY AND BIODISTRIBUTION STUDIES

PHARMACOKINETICS
PK Analysis - Non Comportemental Analysis *(NCA)* model

ROUTES OF ADMINISTRATION
Renal capsule, Intraduodenal, Intracaecal, Long-term vascular infusion, etc.

MOLECULAR BIOLOGY
qPCR

HISTOLOGY
Expanded in-house capacity for tissue sectioning frozen and paraffin embedded
Histology process, FFPE tissue staining and veterinary pathologist analysis / scoring, immunohistochemistry (*IHC*), immunofluorescence (*IF*) & tissue microarray (*TMA*)

Models Under Development

Central Nervous System

COGNITION & AGING
Fear conditioning (rat)

ANXIETY
Fear extinction *(rat)*

MICRODIALYSIS

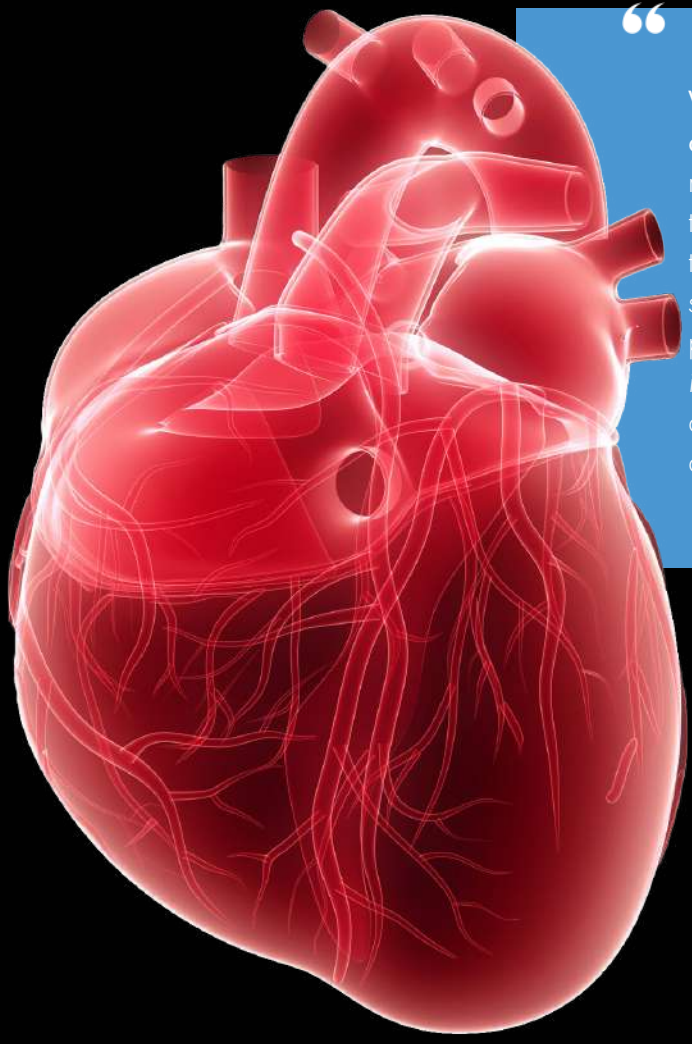
Oncology
Organoid models of Glioblastoma

Inflammation
Biomarker analysis in inflammation models *(CFA, Carrageenan...)*

Pain
Osteoarthritis *(guinea-pig)*
TNBS-induced colitis *(guinea-pig ; rat)*

Respiratory System
Rhinitis *(guinea-pig)*

CARDIOVASCULAR SYSTEM



We have an extensive portfolio of cardiovascular procedures, ranging from standard cardiovascular telemetry studies for safety evaluation, to pathophysiological models for specific therapeutic areas. We also possess considerable expertise with *in vitro* models, providing clients with a comprehensive assessment of all aspects of cardiovascular function.

in vivo ARRHYTHMIAS & CARDIAC TOXICITY

Digoxin-induced ventricular arrhythmias *(anesthetized animals)*	Guinea-pig	CV 3.5
Torsades de Pointes arrythmias *(modified Carlsson model)*	Rabbit	CV 3.9

in vivo AUTONOMIC NERVOUS SYSTEM

Postural hypotension *(anesthetized animals)*	Rat	CV 6.3

in vitro CARDIAC ACTIVITY RECORDING

Calcium assay	iPSC-derived cardiomyocytes	PF 1.7
hCav 1.2 channel	HEK 293 cells	CV 5.9
hERG channel	HEK 293 cells	CV 5.6
hERG trafficking	HEK 293 cells	CV 5.10
hKir 2.1 channel	HEK 293 cells	CV 5.8
hKir 2.1 trafficking	HEK 293 cells	CV 5.13
hNav 1.5 channel	HEK 293 cells	CV 5.7
Inositol triphosphate receptor channel function	H9C2 cells	PF 3.21
MEA assay	iPSC-derived cardiomyocytes	CV 5.14

in vivo HEMODYNAMICS

Anesthetized Animals

Arterial blood pressure, heart rate and ECG	Rat, Guinea-pig	CV 1.1
Regional blood flow	Rat	CV 1.5
Systemic, cardiac, renal and pulmonary hemodynamics	Dog, Mini-pig	CV 1.7
Systemic and cardiac hemodynamics *(cardiac denervated animal)*	Dog	CV 1.11

Conscious Animals (Telemetry)

Arterial blood pressure, heart rate ± ECG	Mouse, Rat, Dog, Guinea-pig, Mini-pig	CV 1.4
Left ventricular pressure, heart rate ± ECG	Rat, Dog	CV 1.16
Pulmonary arterial blood pressure, heart rate and ECG	Dog	CV 1.14
Right ventricular pressure and heart rate	Rat	CV 1.15

HYPERTENSION

in vitro Endothelial cell activation / Drug-Induced Vascular Injury	HUVECs	PF 1.6
in vivo 5/6 nephrectomy	Rat	REN 3
Arterial blood pressure and heart rate *(anesthetized animals)*	SH Rat	CV 2.1
Arterial blood pressure and heart rate *(telemetry)*	SH Rat	CV 2.4
Bile duct ligation-induced portal vein hypertension *(telemetry)*	Rat	CV 2.7
Chronic (2K1C) Goldblatt hypertension *(high renin model)*	Rat	CV 2.5
Chronic DOCA - salt hypertension *(low renin model)*	Rat	CV 2.3

Monocrotaline-induced pulmonary hypertension *(anesthetized animals)*	Rat	CV 2.6
Monocrotaline-induced pulmonary hypertension *(telemetry)*	Rat	CV 2.8

ex vivo

ISOLATED VASCULAR BEDS

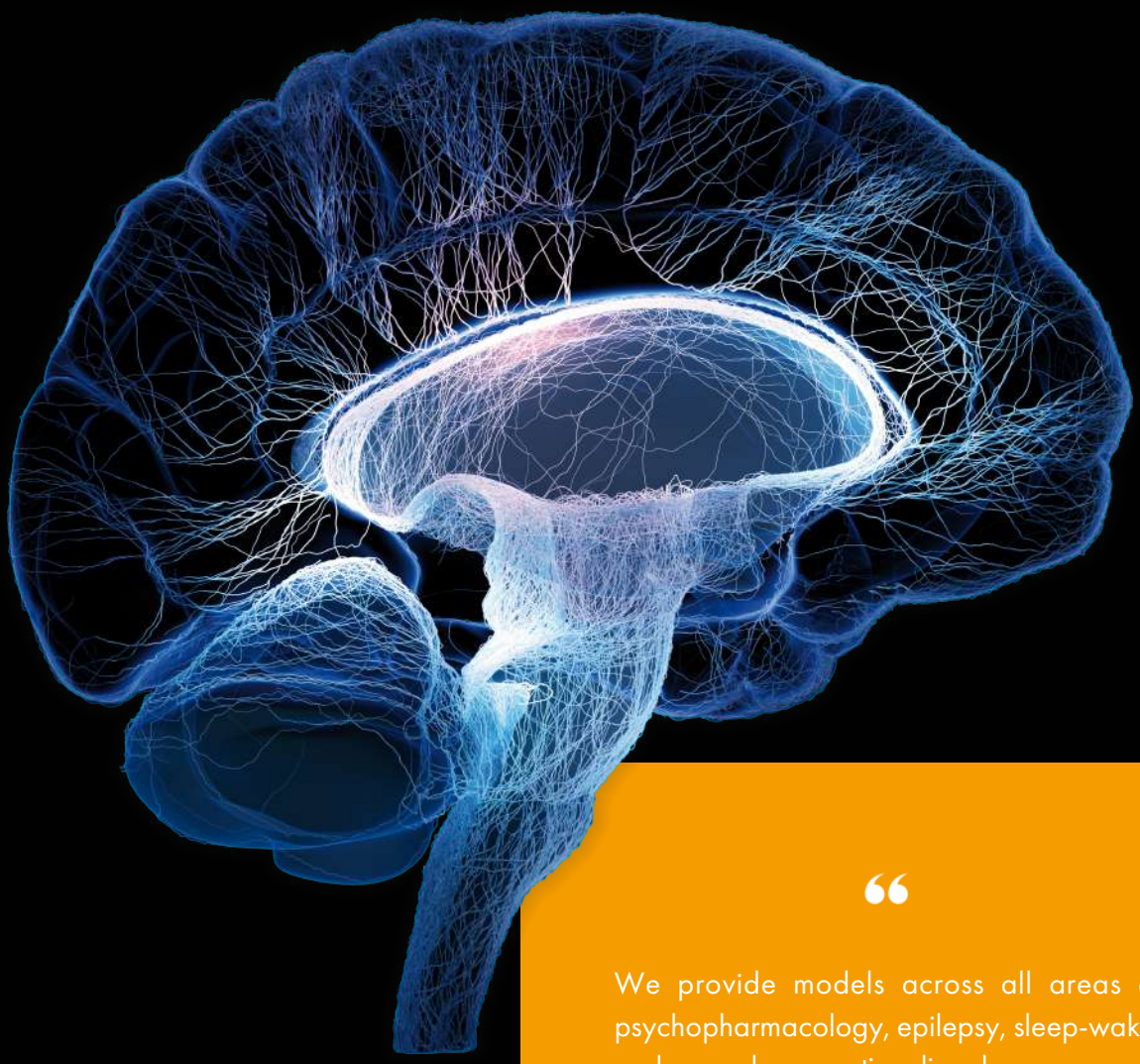
Isolated mesentric artery	Dog	CV 8.4
Isolated saphenous vein	Rabbit, Dog	CV 8.2
Isolated thoracis aorta	Rat, Rabbit	CV 8.1

TECHNICAL CAPABILITIES

- Histology
- Cellular imaging
- **Biochemistry:** Protein detection and protein quantification *(ELISA, Luminex®, HTRF®, AlphaLISA®, Western Blot)*
- **Molecular Biology** *(qPCR quantification)*
- **Cell health and cellular metabolism assays**
- **Flow cytometry**
- **Ion channel monitoring** *(FlipR™)*
- **Live cell imaging** *(Incucyte ®)*

These complementary capabilities can be integrated upon request to align with your project needs.
Detailed descriptions are provided at the end of the catalog (p. 57).

CENTRAL NERVOUS SYSTEM



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We provide models across all areas of psychopharmacology, epilepsy, sleep-wake, and neurodegenerative disorders.

Our expertise allows us to offer a comprehensive range of CNS efficacy and safety pharmacology assessments, from basic models and regulatory tests to advanced evaluations of abuse potential, dependence liability, and proconvulsant risk using EEG.

CNS GENERAL SCREENING

in vitro	Calcium response *(release or spontaneous oscillation)*	Mouse, Rat primary neurons	PF 3.3
	Cytolisis / Viability	Mouse, Rat primary neurons	PF 3.4
	Mitochondrial membrane potential measurement	Mouse, Rat primary neurons	PF 3.4
	Neurite outgrowth *(scratch assay)*	Rat primary neurons	PF 3.44
	Neurite outgrowth *(scholl assay)*	Rat primary neurons	PF 3.45
in vivo	Accelerating rotarod	Mouse, Rat	CNS 1.17
	Activity meter	Mouse, Rat	CNS 1.2
	Barbiturate interaction *(sleep induction)*	Mouse, Rat	CNS 1.8
	Beam walking	Mouse, Rat	CNS 1.12
	Ethanol interaction *(sleep induction)*	Mouse, Rat	CNS 1.9
	Foot-fault	Rat	CNS 1.16
	Grip strenght	Mouse, Rat	CNS 1.19
	Neurological score	Rat	CNS 1.15
	Primary observation *(Irwin)*	Mouse, Rat	CNS 1.1
	Rectal temperature *(option: implants)*	Mouse, Rat	CNS 1.11
	Removal of adhesive	Rat	CNS 1.14
	Rotarod	Mouse, Rat	CNS 1.5
	Tetrad test	Mouse, Rat	CNS 1.13

in vivo COGNITION & AGING

Age-Related Deficit

Delayed alternation *(acquisition)*	Aged rat	CNS 6.10
Delayed alternation *(stabilized performance)*	Aged rat	CNS 6.11
Morris water maze *(acquisition & retention)*	Aged mouse, Aged rat	CNS 6.7
Operant reversal	Aged rat	CNS 6.34
Social recognition	Aged rat	CNS 6.9
Y-Maze *(Novelty-based spatial preference)*	Aged rat	CNS 6.41
Y-Maze *(Spontaneous alternation)*	Aged mouse, Aged rat	CNS 6.39

Experimental Procedures

Delayed alternation *(acquisition)*	Rat	CNS 6.13
Delayed alternation *(stabilized performance)*	Rat	CNS 6.15
Fear conditioning *(context & cue)*	Mouse, Rat	CNS 6.38
Morris water maze *(single session)*	Rat	CNS 6.16
Morris water maze *(acquisition & retention)*	Mouse, Rat	CNS 6.17
Operant reversal	Rat	CNS 6.24
Operant set-shifting	Rat	CNS 6.35

Passive avoidance	Mouse, Rat	CNS 6.19
Social recognition *(30 minutes retention)*	Rat	CNS 6.20
Social recognition *(120 minutes retention; delay-induced forgetting)*	Rat	CNS 6.21
Y-Maze *(Novelty-based spatial preference)*	Mouse, Rat	CNS 6.41
Y-Maze - Spontaneous alternation	Mouse, Rat	CNS 6.39

Models of Pharmacologically-Induced Amnesia

Diazepam-induced amnesia

Passive avoidance	Mouse, Rat	CNS 6.27

MK 801-induced amnesia

Delay alternation *(stabilized performance)*	Rat	CNS 6.29
Morris water maze *(acquisition & retention)*	Rat	CNS 6.23
Operant reversal	Rat	CNS 6.31
Passive avoidance	Rat	CNS 6.26
Social recognition *(30 minutes retention)*	Rat	CNS 6.33

Scopolamine-induced amnesia

Delay alternation *(stabilized performance)*	Rat	CNS 6.28
Morris water maze *(acquisition & retention)*	Rat	CNS 6.18
Morris water maze *(single session)*	Rat	CNS 6.3
Operant reversal	Rat	CNS 6.32
Passive avoidance	Mouse, Rat	CNS 6.1
Social recognition *(30 minutes retention)*	Rat	CNS 6.5

Neurodegeneration-Related Deficit

> See "Neurodegeneration" section on page 16

in vivo

DRUG ABUSE & DEPENDENCE (Safety & Efficacy)

Drug discrimination	Rat	CNS 7.8
Flumazenil-precipitated withdrawal *(ECS threshold)*	Mouse	CNS 7.2
Naloxone-precipitated withdrawal *(Saelens)*	Mouse, Rat	CNS 7.1
Non-precipitated withdrawal *(option: telemetry)*	Rat	CNS 7.3
Opiate tolerance *(hot plate)*	Mouse, Rat	CNS 7.4
Place preference	Mouse, Rat	CNS 7.5
Self-administration *(initiation)*	Rat	CNS 7.6
Self-administration *(substitution)*	Rat	CNS 7.7
Self-administration *(reinstatement)*	Rat	CNS 7.9
Self-administration *(progressive ratio)*	Rat	CNS 7.10

ELECTROPHYSIOLOGY

ex vivo Brain slices *(LTP)*	Mouse	CNS 9.9
Brain slices *(4-AP-induced seizure)*	Mouse	CNS 9.10

in vivo Conscious Animals (Telemetry)

Anesthetized animals

Compound motor action potential *(CMAP)*	Mouse, Rat	CNS 9.8
Nerve Conductance Velocity *(NCV)*	Mouse, Rat	CNS 9.8
EEG trace monitoring	Mouse, Rat, Dog	CNS 9.5
Electrical amygdala kindling	Rat	CNS 9.3
Quantified EEG	Mouse, Rat, Dog	CNS 9.7
Sleep / wakefulness cycle	Rat	CNS 9.2

EPILEPSY

in vitro 4-AP calcium spontaneous oscillation modulation	Mouse, Rat primary neurons	PF 9.16
GABA Pathway *(calcium spontaneous oscillations)*	Mouse, Rat primary neurons	PF 9.17
Glutamate pathway *(calcium release & spontaneous oscillations)*	Mouse, Rat primary neurons	PF 9.18
Kainate *(calcium release)*	Mouse, Rat primary neurons	PF 9.19
NMDA antagonists *(calcium release)*	Mouse, Rat primary neurons	PF 9.20
ex vivo 4-AP induced seizure on hippocampal slices	Mouse	CNS 9.10
in vivo 6Hz psychomotor	Mouse, Rat, Gerbil	CNS 5.9
Audiogenic seizures	Mouse	CNS 5.7
Bicuculline convulsions	Mouse, Rat	CNS 5.6
Electrical amygdala kindling *(Electrophysiology)*	Rat	CNS 9.3
Electroconvulsive threshold	Mouse, Rat, Gerbil	CNS 5.2
GBL-induced absence epilepsy *(EEG telemetry)*	Mouse	CNS 5.12
Genetic absence epilespy *(WAG)*	Rat	CNS 5.14
Intravenous PTZ seizure threshold	Rat	CNS 5.11
Kainic acid convulsions	Mouse, Rat	CNS 5.10
Kainic acid-induced spontaneous seizure	Rat	CNS 5.16
Maximal electroshock	Mouse, Rat	CNS 5.1
Pentylenetetrazole *(PTZ)* seizures	Mouse, Rat, Dog	CNS 5.15
Pilocarpine-induced spontaneous seizure	Rat	CNS 5.17
Pilocarpine convulsions	Rat	CNS 5.13
Picrotoxin convulsions	Mouse, Rat	CNS 5.5
Strychnine convulsions	Mouse, Rat	CNS 5.4
Seizure-Induced Respiratory Arrest *(SIRA)* in the model of SUDEP *(Sudden Unexpected Death in Epilepsy)*	Mouse	CNS 5.18

NEUROINFLAMMATION

in vitro Inflammatory cytokine release *(LPS stimuli)*	hiPSC derived microglia	PF 9.23

NEURODEGENERATION

Alzheimer Disease

in vivo Streptozotocin (STZ)-induced cognitive deficit	Rat	CNS 10.11

< Experimental Procedures

Morris water maze
Y-Maze *(Novelty-based spatial preference)*

Huntington Disease

Motor function and neuroscore subchronic 3-NPA	Rat	CNS 10.8

< Experimental Procedures

Activity meter
Rotarod
Lesion volume

Multiple Sclerosis

Cuprizone-induced demyelination	Mouse	CNS 10.24

Parkinson Disease

in vitro 6-OHDA induced toxicity	hiPSC derived dopaminergic neurons	PF 9.32
MPP+ induced toxicity	hiPSC derived dopaminergic neurons	PF 9.27
MPP+ induced toxicity	SH-SY5Y cells	PF 9.34
in vivo Alpha Synuclein PFF model	Mouse	CNS 10.22
Cognitive deficit bilateral striatal 6-OHDA lesion	Rat	CNS 10.9
L-DOPA dyskinesia unilateral Medial Forebrain Bundle (MFB)	Rat	CNS 10.5
Motor deficit unilateral Medial Forebrain Bundle (MFB) 6-OHDA lesion	Rat	CNS 10.2R
MPTP-induced lesion	Mouse	CNS 10.25

in vivo PSYCHIATRIC DISEASES

Anxiety

Elevated plus-maze	Mouse, Rat, Gerbil	CNS 3.3
Fear extinction	Mouse, Rat	CNS 6.38
Fear potentiated startle reflex	Rat	CNS 3.13
Four plates	Mouse	CNS 3.1
Light-dark box	Mouse	CNS 3.4
Marble burying	Mouse	CNS 3.7

Novelty-induced hypophagia	Mouse, Rat	CNS 3.5
Stress-induced hyperthermia *(group-housed animals)*	Mouse	CNS 3.6
Stress-induced hyperthermia *(singly-housed animals) (option: implants)*	Mouse	CNS 3.17
Vogel conflict	Rat	CNS 3.8

Depression

Behavioral despair	Mouse, Rat	CNS 2.5
Chronic Mild Stress	Mouse	CNS 2.10
Differential Reinforcement of Low Rate *(DRL 30)*	Rat	CNS 2.6
Open space swimming	Mouse	CNS 2.8

Psychosis

Amphetamine hyperactivity	Mouse, Rat	CNS 4.1
Amphetamine stereotypy	Mouse, Rat	CNS 4.2
Catalepsy	Mouse, Rat	CNS 4.9
Dual-hit neonatal PCP and post-weaning social isolation	Rat	CNS 4.18
MK-801 hyperactivity	Mouse, Rat	CNS 4.13
PCP hyperactivity	Mouse, Rat	CNS 4.8
Prepulse inhibition *(deficit induced by apomorphine)*	Rat	CNS 4.11
Prepulse inhibition *(deficit induced by MK-801)*	Rat	CNS 4.14
Prepulse inhibition *(deficit induced by PCP)*	Rat	CNS 4.15
Sociability *(3-Chamber)* Test	Mouse	CNS 4.19

STROKE

in vitro	Excitatory neurotransmitter induced excitotoxicity *(Glutamate, NMDA, and Kainate)*	Rat, Mouse primary neurons	PF 9.29
	Excitatory neurotransmitter induced excitotoxicity *(Mitochondrial Membrane Potential) ; (Glutamate, NMDA, and Kainate)*	Rat, Mouse primary neurons	PF 9.30
	Excitatory neurotransmitter induced excitotoxicity *(Calcium response) ; (Glutamate, NMDA, and Kainate)*	Rat, Mouse primary neurons	PF 9.31
in vivo	Intrastriatal NMDA administration	Mouse	CNS 10.14
	Transient focal cerebral ischemia middle cerebral artery occlusion	Rat	CNS 10.3

< Experimental Procedures

Lesion volume
Beam walking
Foot-fault
Removal of adhesive
Neurological score

TECHNICAL CAPABILITIES

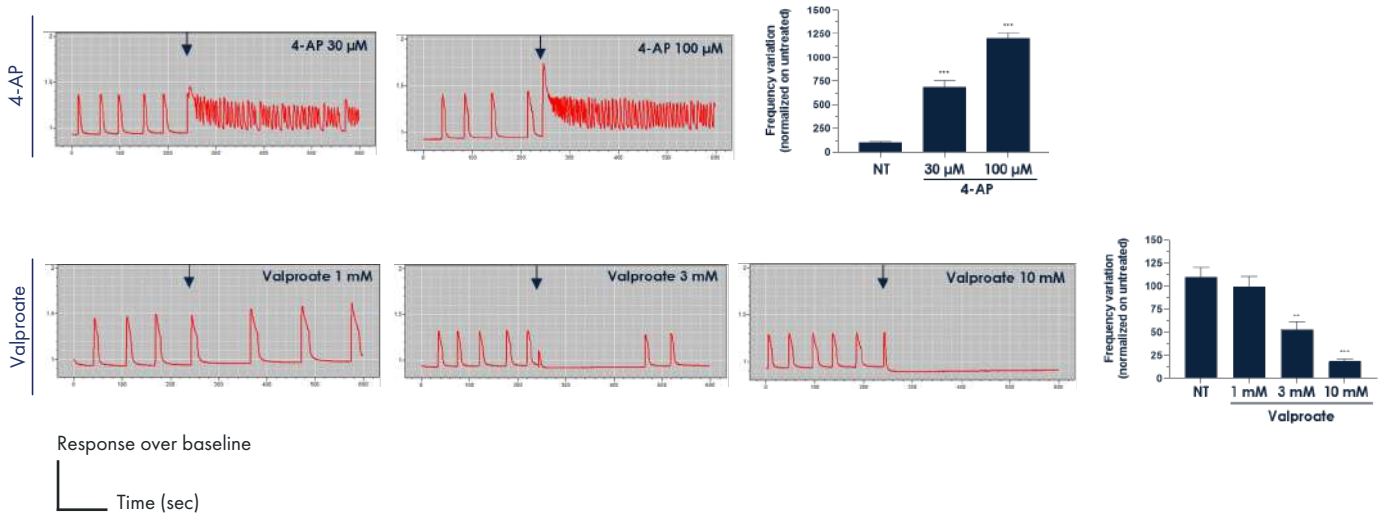
- Histology
- Cellular imaging
- **Biochemistry:** Protein detection and protein quantification *(ELISA, Luminex®, HTRF®, AlphaLISA®, Western Blot)*
- **Molecular Biology** *(qPCR quantification)*
- Cell health and cellular metabolism assays
- Flow cytometry
- **Ion channel monitoring** *(FlipR™)*
- **Live cell imaging** *(Incucyte ®)*

These complementary capabilities can be integrated upon request to align with your project needs.
Detailed descriptions are provided at the end of the catalog (p. 57).

At a Glance — Our Cutting-Edge Technical Capabilities

Real-time calcium flux monitoring in rat mixed cortical neurons using **FlipR™ Tetra**.

4-AP was used as a selective voltage activated K+ blocker and Valproate was used as a reference anti-epileptic drug (GABAergic potentiation).



*One-way ANOVA followed by Dunnett multiple comparisons to untreated or Student t-test. ** p < 0.01, *** p < 0.001. NT : untreated.*

DERMATOLOGY

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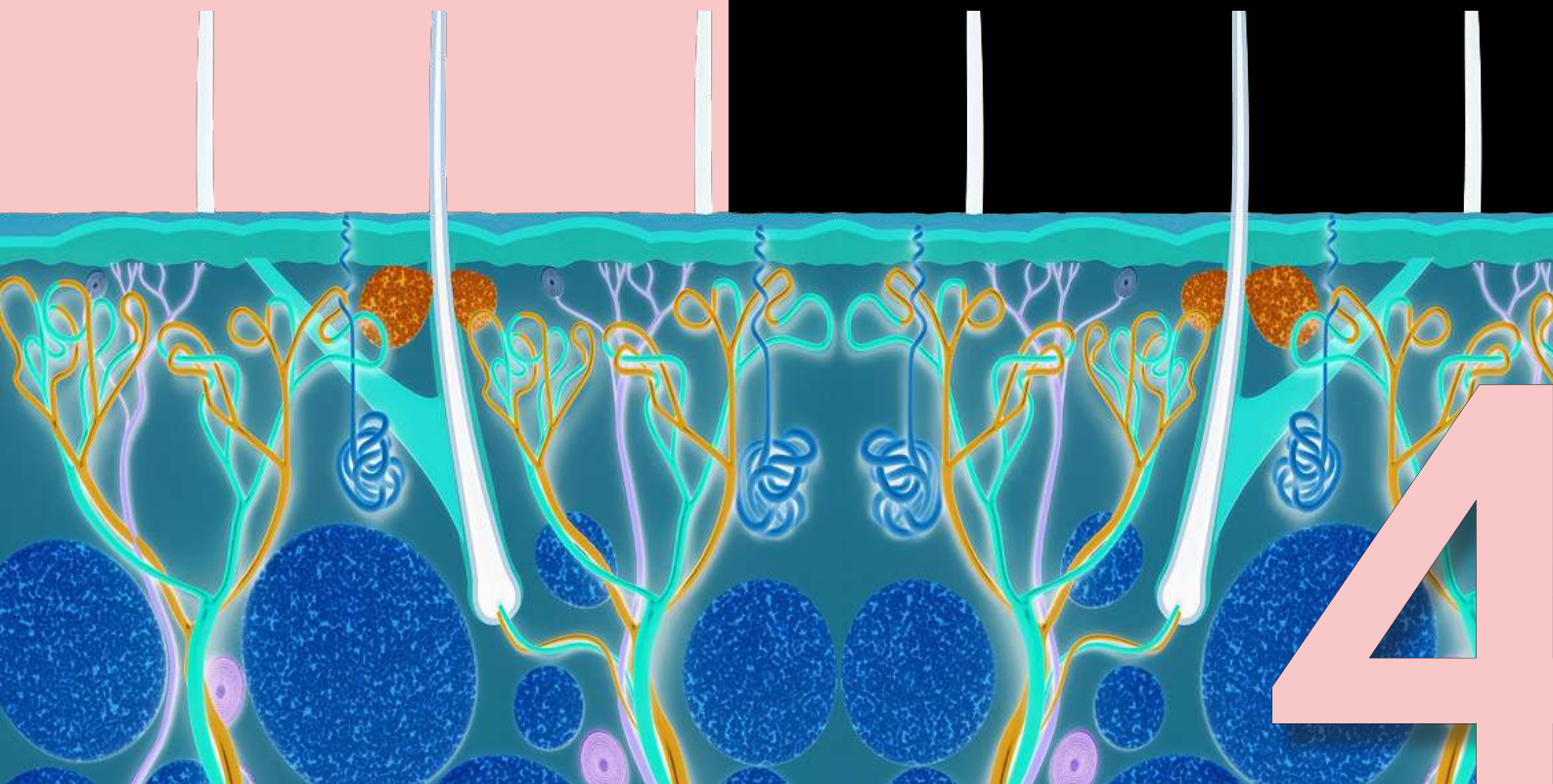
We provide *in vitro* and *in vivo* models for testing at various stages of the drug development process.

Dermatological conditions such as psoriasis, allergic contact dermatitis (ACD), and atopic dermatitis (AD) or irritant contact dermatitis are immune-related skin diseases that affect a large patient population, posing a significant public health challenge.



4

in vitro

Inflammatory Pathway And Anti-Inflammatory Activity

Atopic Dermatitis-Poly *(I:C)* induced cytokine release	NHEK	PF 4.26
Cannabinoid anti-inflammatory evaluation cytokine release	NHEK	PF 4.27
Cytokine release	Keratinocytes Dendritic cells *(Langerhans)*	PF 4.10
IL-6 induced secretion *(by IL-17)*	NHDF	PF 4.25
TNFα induced cytotoxicity	L929	PF 4.1

Oxidative Damage & Anti-Oxidant Potential

Cell viability - protection	HaCaT, NHEK, NHDF	PF 4.2 & 3.4
Lipid peroxidation induction	HaCaT, NHEK	PF 4.23
Reactive Oxygen Species induction *(ROS)* ; *(multiple inducers)*	HaCaT, NHEK	PF 4.22

Predictive Toxicity

Cytotoxicity - Cell viability	Cell lines *(3T3, L929, HaCaT)*, NHEK, NHDF	TOX 17 & 18
Ocular irritation HET-CAM	Chicken egg	PF 4.14
Skin irritation	Reconstituted human epidermis	PF 4.15
Skin sensitization	Monocyte cell line *(THP1)*	PF 4.20

Protection Against Pollution

Indoor dust – Inflammatory cytokine release	Dendritic cells *(Langerhans)*	PF. 4.24
Urban dust – Inflammatory cytokine release	NHEK Dendritic cells *(Langerhans)*	PF. 4.10
Urban dust - Lipid peroxidation	NHEK	PF. 4.9
Urban dust - Reactive Oxygen Species induction *(ROS)*	NHEK	PF. 4.8

Skin Aging

Wound healing	Elderly fibroblast or keratinocyte donor	PF. 4.12
Senescence *(oxidative stress induction or high passage senescence)*	Keratinocytes	PF. 4.11
Total collagen secretion	Elderly fibroblast donor	PF. 4.13

Skin Regeneration

Cell migration/Wound healing	HaCaT, NHEK, NHDF	PF. 3.14
Cell proliferation	HaCaT, NHEK, NHDF	PF 3.9
Total collagen formation	NHDF	PF. 4.3

Allergic Contact Dermatitis	Pig	DER 2
Imiquimod-induced psoriasis-like skin inflammation	Mouse – Rat	DER 1
Pruritogens-induced scratching behavior	Mouse – Rat	DER 3
Wound healing	Mouse	DER 4

TECHNICAL CAPABILITIES

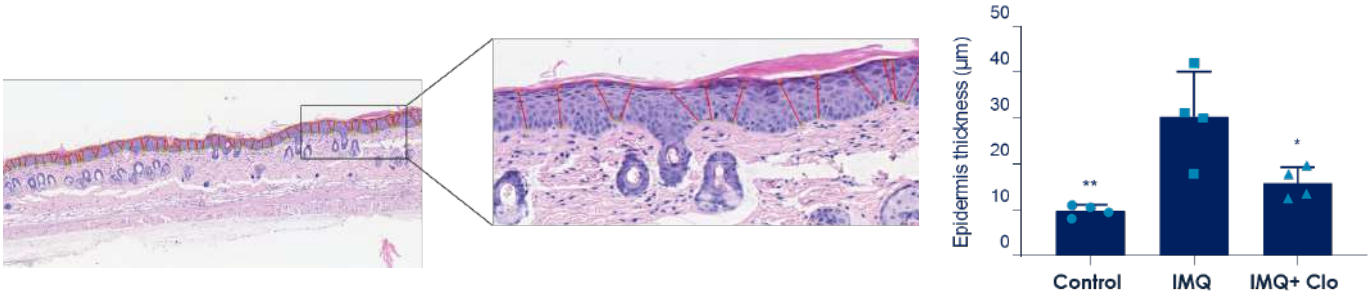
- Histology
- Cellular imaging
- Biochemistry: Protein detection and protein quantification *(ELISA, Luminex®, HTRF®, AlphaLISA®, Western Blot)*
- Molecular Biology *(qPCR quantification)*
- Cell health and cellular metabolism assays
- Flow cytometry
- Live cell imaging *(Incucyte ®)*

These complementary capabilities can be integrated upon request to align with your project needs.
Detailed descriptions are provided at the end of the catalog (p. 57).

At a Glance — Our Cutting-Edge Technical Capabilities

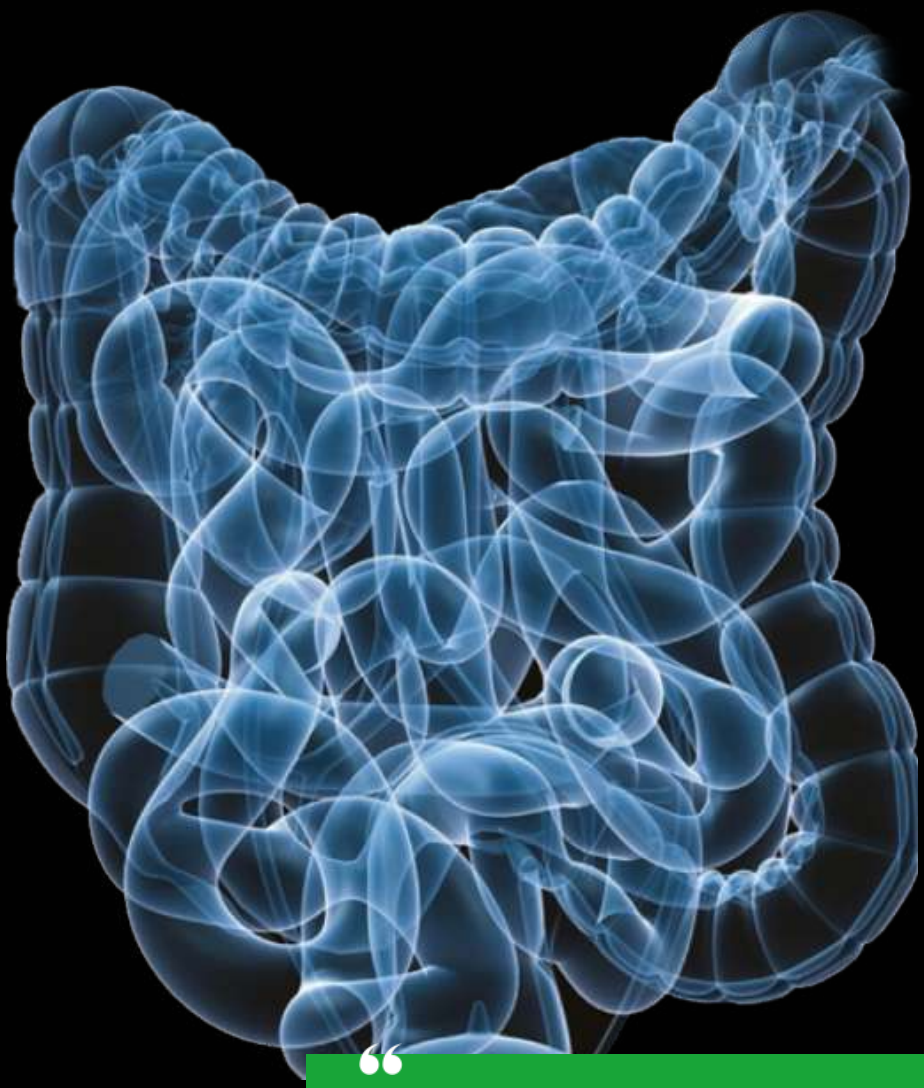
Histological and **image analysis** of hematoxylin and eosin-stained skin sections.

Imiquimod-induced psoriasis and inflammation treated with Clobetasol.
Epidermal thickness is automatically detected using proprietary algorithms.



*One way ANOVA compare to PSO group. * p < 0.05, ** p < 0.01.*

GASTROINTESTINAL SYSTEM



We have extensive expertise and years of experience in gastrointestinal safety pharmacology and efficacy.

Our models cover a range of gastrointestinal indications and target different parts of the digestive system. Additionally, we continuously develop and validate new, relevant models to advance research in this field.

5

COLONIC MOTILITY

Anti-diarrhea *(castor oil)*	Mouse – Rat	GI 7
Colonic transit *(bead model)*	Mouse – Rat	GI 16
Fecal consistency	Mouse – Rat	GI 22

EMESIS - NAUSEA

Early and delayed emesis *(telemetry)*	Ferret	GI 15
Early anti-emetic activity *(morphine, cisplatin, emetine,...)*	Ferret	GI 10
Emesis induction	Ferret	GI 9
Pica behavior	Rat	GI 17

FOOD ALLERGY

Beta-lactoglobulin-induced allergy	Mouse	FA 2
Peanut-induced allergy	Mouse	FA 1

GASTRIC EMPTYING

Gastric emptying *(measurement of plasma acetaminophen levels)*	Rat	GI 23
Gastric emptying *(phenol red test)*	Mouse – Rat	GI 8

GASTROINTESTINAL TRANSIT

Charcoal meal test	Mouse – Rat	GI 1
Distribution pattern of phenol red	Mouse	GI 26

GASTROPARESIS

Clonidine-induced delayed gastric emptying *(liquid meal)*	Rat	GI 20
Clonidine-induced delayed gastric emptying *(solid meal)*	Rat	GI 21
Post operative ileus	Mouse	GI 25

INTESTINAL MUCOSITIS

Chemotherapy-induced intestinal mucositis	Mouse – Rat	GI 32

ULCEROGENIC ACTIVITY

in vitro Indomethacin-induced gastric mucosal cell damage	Rat gastric mucosal cells	GI 29
in vivo Colorectal distension *(CRD model)* after acetic acid sensitization	Rat	GI 13
Colorectal distension *(CRD model)* after TNBS sensitization	Rat	GI 30
Gastric acid secretion *(Shay's method)*	Mouse – Rat	GI 3
Ulcerogenic activity *(acute and sub-chronic)*	Rat	GI 2
Ulcerogenic activity prevention *(induced by ethanol)*	Rat	GI 19

Ulcerogenic activity prevention *(induced by indomethacin)*	Rat	GI 27

ex vivo

VISCERAL SMOOTH MUSCLE

Isolated colon	Guinea-pig - Rat	VSM 6
Isolated duodenum	Rat	VSM 2
Isolated ileum	Guinea-pig	VSM 1

in vivo

ADDITIONAL MODELS

Conditioned taste aversion	Rat	GI 24
Pilocarpine salivation	Mouse – Rat	PNS 7
Salivation induction	Mouse – Rat	PNS 6

TECHNICAL CAPABILITIES

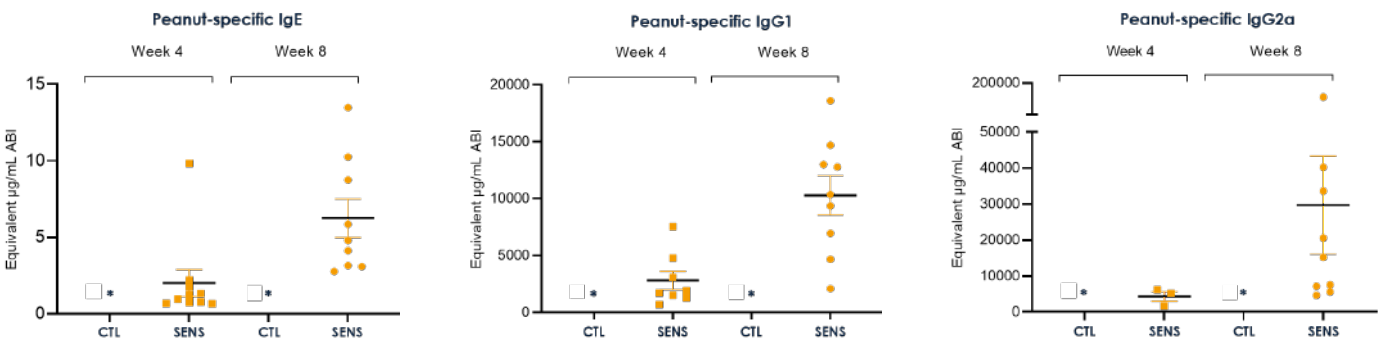
- Histology
- Cellular imaging
- **Biochemistry:** Protein detection and protein quantification *(ELISA, Luminex®, HTRF®, AlphaLISA®, Western Blot)*
- Hematological Biochemistry
- Molecular Biology *(qPCR quantification)*
- Cell health and cellular metabolism assays
- Flow cytometry
- Live cell imaging *(Incucyte ®)*

These complementary capabilities can be integrated upon request to align with your project needs.
Detailed descriptions are provided at the end of the catalog (p. 57).

At a Glance — Our Cutting-Edge Technical Capabilities

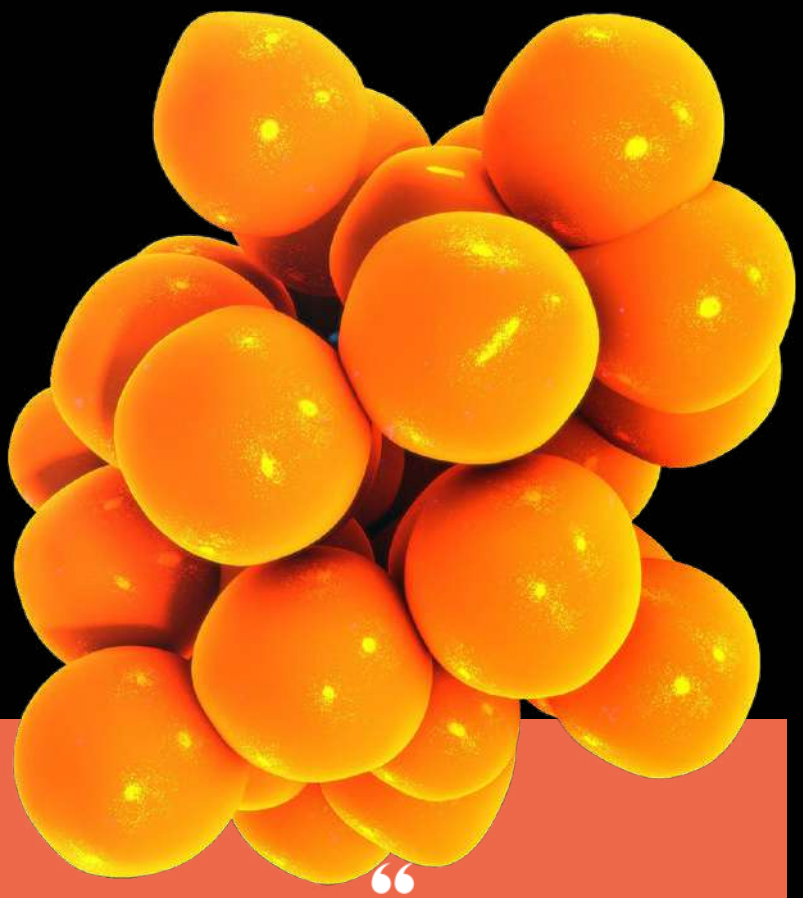
ELISA quantification of immune response.

Peanut food allergy-induced model and quantification of peanut-specific immunoglobulins, E, G1 and G2a.



** In these groups, all calculated values were below the lower limit of detection. CTL : control, SENS : sensitized, ABI : primary antibody.*

INFLAMMATION



Inflammation is a response to various stimuli, including damaged cells, irritants, and pathogens, and plays a key role in numerous indications.

Leveraging our broad expertise and diverse capabilities, Porsolt offers a range of *in vitro* and *in vivo* models for screening, efficacy evaluation, and safety assessment of potential compounds, allowing us to meet the specific needs of the industry.

in vitro

IMMUNE RESPONSE

Basophile activation assay *(CD200R)*	Mouse whole blood	PF 5.11
Cell proliferation	Multiple cellular models	PF 3.9
Cytokine release *(inflammation)*	Mouse primary splenocytes and mesenteric lymph node hiPS microglia	PF 5.12
Cytolysis	Multiple cellular models	PF 3.4
Immune cell activation and proliferation	Primary mouse splenocytes	PF 5.8
Immune cell killing assay	Human T lymphocyte and tumor cells	PF 10.47
Immune check point inhibitor	*(PD1) - (PDL1)* biochemical assay *(HTRF)*	ONC 11.2
Immune check point inhibitor	*(CTLA-4) - (B7-1)* biochemical assay *(HTRF)*	ONC 11.2
Phagocytosis	Mouse – Rat Human macrophages	PF 5.10
Sensitization	Monocytes *(THP-1 cell line)*	PF 4.20

in vivo

IN VIVO MODELS

12-tetradecanoylphorbol-13-acetate *(TPA)*-induced ear edema	Mouse	PI 18
Air pouch	Mouse	PI 24
Arachidonic acid-induced ear edema	Mouse	PI 31
Carrageenan-induced edema	Mouse – Rat	PI 9.17
Peanut-induced allergy	Mouse	FA1
Bleomycin-induced lung injury	Guinea-pig	RES 8
Lipopolysaccharide (LPS) Lung Injury (acute)	Mouse	RES 9
Yeast-induced hyperthermia	Mouse	PI 11
DSS-induced colitis model	Mouse	PI 37

TECHNICAL CAPABILITIES

- Histology
- **Biochemistry:** Protein detection and protein quantification *(ELISA, Luminex®, HTRF®, AlphaLISA®, Western Blot)*
- Molecular Biology *(qPCR quantification)*
- Hematological Biochemistry
- Flow cytometry

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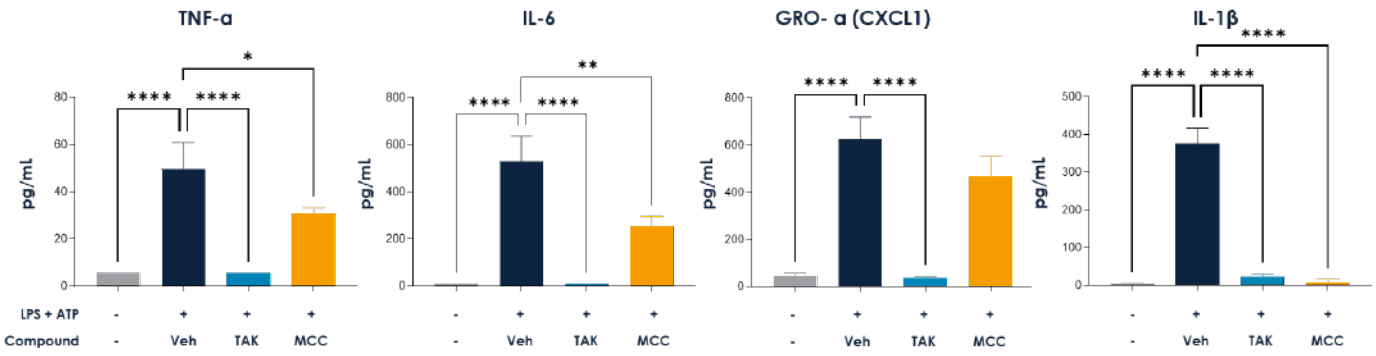
At a Glance — Our Cutting-Edge Technical Capabilities

Cytokine release quantification using Luminex® technology.

Human iPS-derived microglial cells treated with LPS and ATP.
Measurement of TNFa, IL-6, IL-1b levels following TLP4 and NLRP3 inhibitors.



*One way ANOVA followed by Bonferroni post analysis vs LPS+ATP wells. * p < 0.05, ** p < 0.01 and **** p < 0.0001. Veh : vehicle .*

LIVER & HEPATIC SYSTEM

“

Understanding the effects of compounds on the liver and hepatic system is a critical aspect of efficacy, safety, and toxicology assessments.

With extensive experience in preclinical safety and efficacy, we have developed specialized models designed to evaluate liver function and hepatic health.

in vitro	Acetaminophen *(acute model)*	Primary hepatocytes	PF 6.03
	Cholestasis/Bile canaliculi network	Primary hepatocytes sandwich configuration, Rat	PF 3.16
	Glutathione *(GSH)*, intracellular GSH content	Primary human and rat hepatocytes	PF 3.28
	Steatosis/Lipid, intracellular accumulation: neutral lipids	Primary human and rat hepatocytes	PF 3.29
	Cytolysis	Primary human and rat hepatocytes	PF 3.4
	Lipid intracellullar accumulation: phospholipids	Primary human and rat hepatocytes	PF 3.30
	3D Hepatotoxicity *(Viability)*	Primary human hepatocyte spheroids	PF 6.02
in vivo	Acetaminophen *(acute model)*	Mouse, Rat	LI 2
	Bile Duct Ligation *(BDL) (chronic model)*	Rat	CV 2.7
	Carbon tetrachloride *(CCl4) (acute model)*	Rat	LI 1

TECHNICAL CAPABILITIES

- - Histology
- - Cellular imaging
- - **Biochemistry:** Protein detection and protein quantification *(ELISA, Luminex®, HTRF®, AlphaLISA®, Western Blot)*
- - Molecular Biology *(qPCR quantification)*
- - Cell health and cellular metabolism assays
- - Flow cytometry
- - Live cell imaging *(Incucyte ®)*

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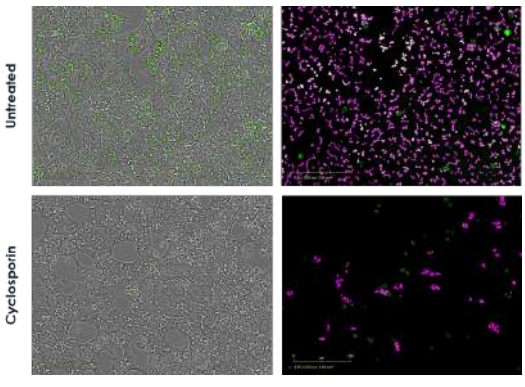
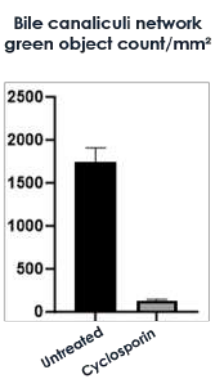
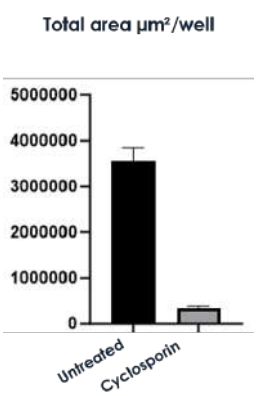
At a Glance — Our Cutting-Edge Technical Capabilities

Hepatotoxicity detected using fluorescence staining and Incucyte® detection.

Cyclosporin A is a BSEP pump antagonist. Activity is detected using primary rat hepatocytes in sandwich-culture stained with a CLF probe.







MEDICAL DEVICES

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With our extensive range of validated models and technical expertise developed over many years, we offer testing services for medical devices in compliance with ISO and OECD guidelines.

Our services include both *in vitro* and *in vivo* models for sensitization, toxicity, and safety assessments.

CYTOTOXICITY

in vitro MTT colorimetric cell viability assay	L929 cells	TOX 18
in vitro Neutral red colorimetric cell viability assay	3T3 cells	TOX 19

IRRITATION

in vitro Reconstituted human epidermis irritation assay	Episkin	TOX 21
in ovo HET-CAM *(Hen's Egg Test Chorio Allantoic Membrane)* - alternative to ocular irritation assay	Chicken egg	TOX 24
in vivo Acute dermal irritation *(topical application)*	Rabbit	TOX 22
Intradermal reactivity test *(intracutaneous injection)*	Rabbit	TOX 16
Skin irritation test	Rabbit	TOX 3

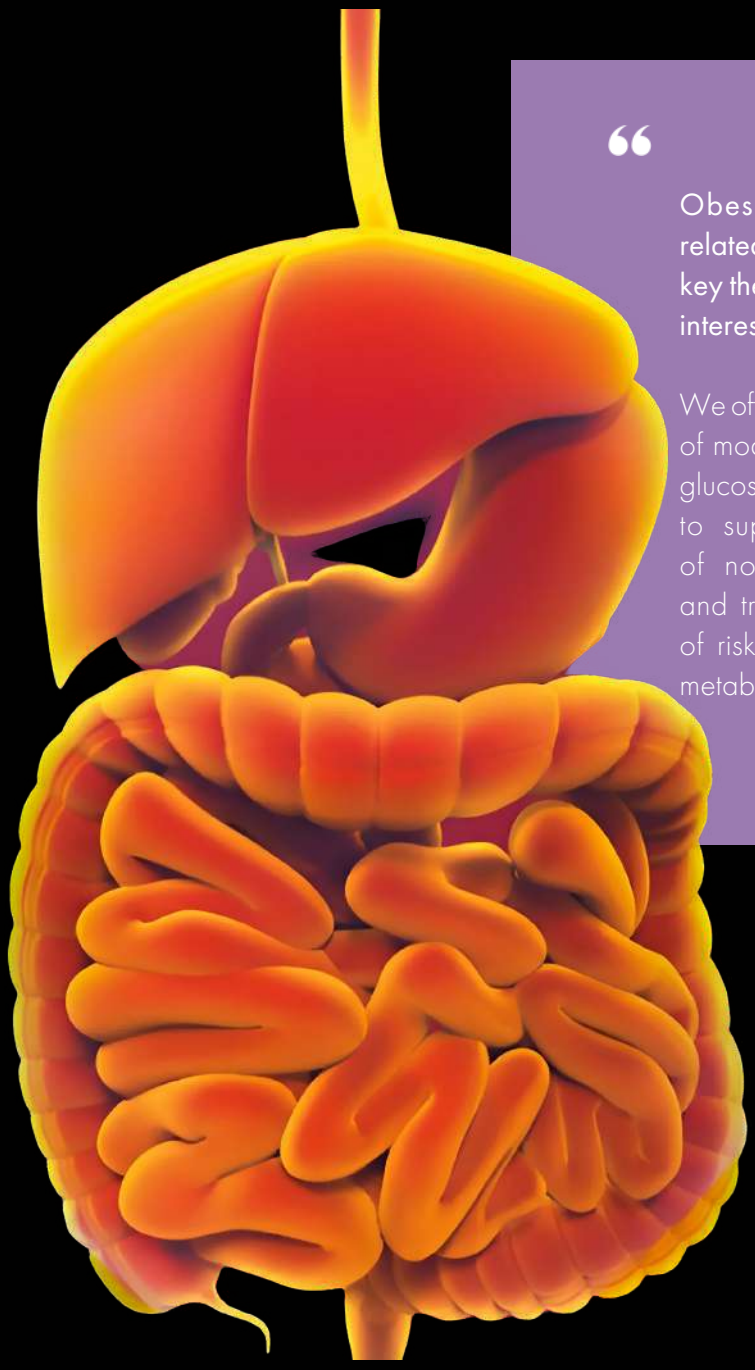
SKIN SENSITIZATION

in vivo Local Lymph Nodes Assay *(LLNA)*	Mouse	TOX 14

TOXICITY

in vitro Skin sensitization	Monocyte cell line *(THP1)*	PF 11.2
in ovo Acute systemic toxicity *(or repeated doses)* -alternative to embryotoxicity in mammals	Chicken egg	TOX 23
in vivo Acute systemic toxicity	Mouse, Rat	TOX 11
Repeat dose system toxicity	Mouse, Rat	TOX 12

OBESITY & METABOLIC SYSTEM



“

Obesity and metabolism-related disorders have become key therapeutic areas of global interest.

We offer a comprehensive range of models for obesity, impaired glucose tolerance, and diabetes to support the development of novel therapeutic agents and treatments, and reduction of risk factors associated with metabolic diseases.

9

DIABETES | METABOLIC DISORDERS |OBESITY

Diabetes

in vitro Type 1 diabetes: Cytokine induced pancreatic cell death *(ATP content)*	Rat insulinoma INS-1 cells	PF 7.3
Glucose stimulated insulin secretion	Rat insulinoma INS-1 cells	PF 7.2

in vivo

Chemically-induced animal models

Alloxan-induced type 1 diabetes single injection of alloxan	Rat	MET 17
HFD/STZ-induced type 2 diabetes nigh fat diet and single injection of streptozotocin	Rat	MET 15
Streptozotocin *(STZ)*-induced type 1 diabetes single injection of streptozotocin	Mouse, Rat	MET 16

Genetic animal models

Zucker Diabetic Fatty *(ZDF)* type 2 diabetes, glucose intolerance, hyperinsulinemia	Rat	MET 12
Leptin-deficience ob/ob - db/db obesity, type 2 diabetes	Mouse	MET 7

Nutritional animal models

Diet-induced obesity *(DIO)* special diets	Mouse	MET 18

Assessments

Insulin tolerance test *(ITT)*	Mouse, Rat	MET 2
Intravenous glucose tolerance test *(IVGTT)*	Rat	MET 1
Oral glucose tolerance test *(OGTT)* HOMA-IR, QUICKI and ISI calculation	Mouse, Rat	MET 12

in vivo

Metabolic Disorders

Insulin tolerance test *(ITT)*	Mouse, Rat	MET 2

Obesity

Genetic animal models

Leptin-deficience ob/ob - db/db obesity, type 2 diabetes	Mouse	MET 7
Zucker Fatty obesity, hyperlipidemia	Rat	MET 7

Nutritional animal models

Diet-induced obesity *(DIO)* special diets	Mouse	MET 18

Assessments

Acute 24-hr feeding	Rat	MET 14
Fast-induced feeding *(over 4 hours)*	Mouse	MET 13
Food/water intake and body weight gain *(3-hr schedule-fed over 10 days)*	Rat	MET 6
Food/water intake and body weight gain *(over 28 days in pathologic animals)*	Mouse, Rat	MET 7

TECHNICAL CAPABILITIES

- Histology
- Cellular imaging
- **Biochemistry:** Protein detection and protein quantification *(ELISA, Luminex®, HTRF®, AlphaLISA®, Western Blot)*
- Molecular Biology *(qPCR quantification)*
- Cell health and cellular metabolism assays
- Flow cytometry
- Live cell imaging *(Incucyte ®)*

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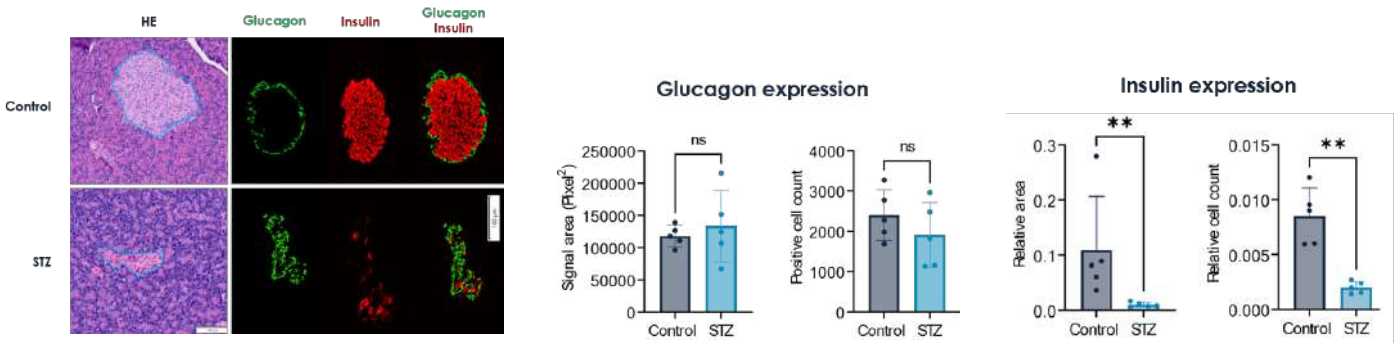
At a Glance — Our Cutting-Edge Technical Capabilities

Histological analysis using **multiplex immunofluorescent staining** and quantification using **Porsolt segmentation algorithms.**

Pancreatic islets of STZ injected rats (type 1 diabetes) stained with hematoxylin and eosin to detect small and irregular islet morphology.



*Mann-Whitney. ns :non significant, ** $p < 0.01$.*

ONCOLOGY

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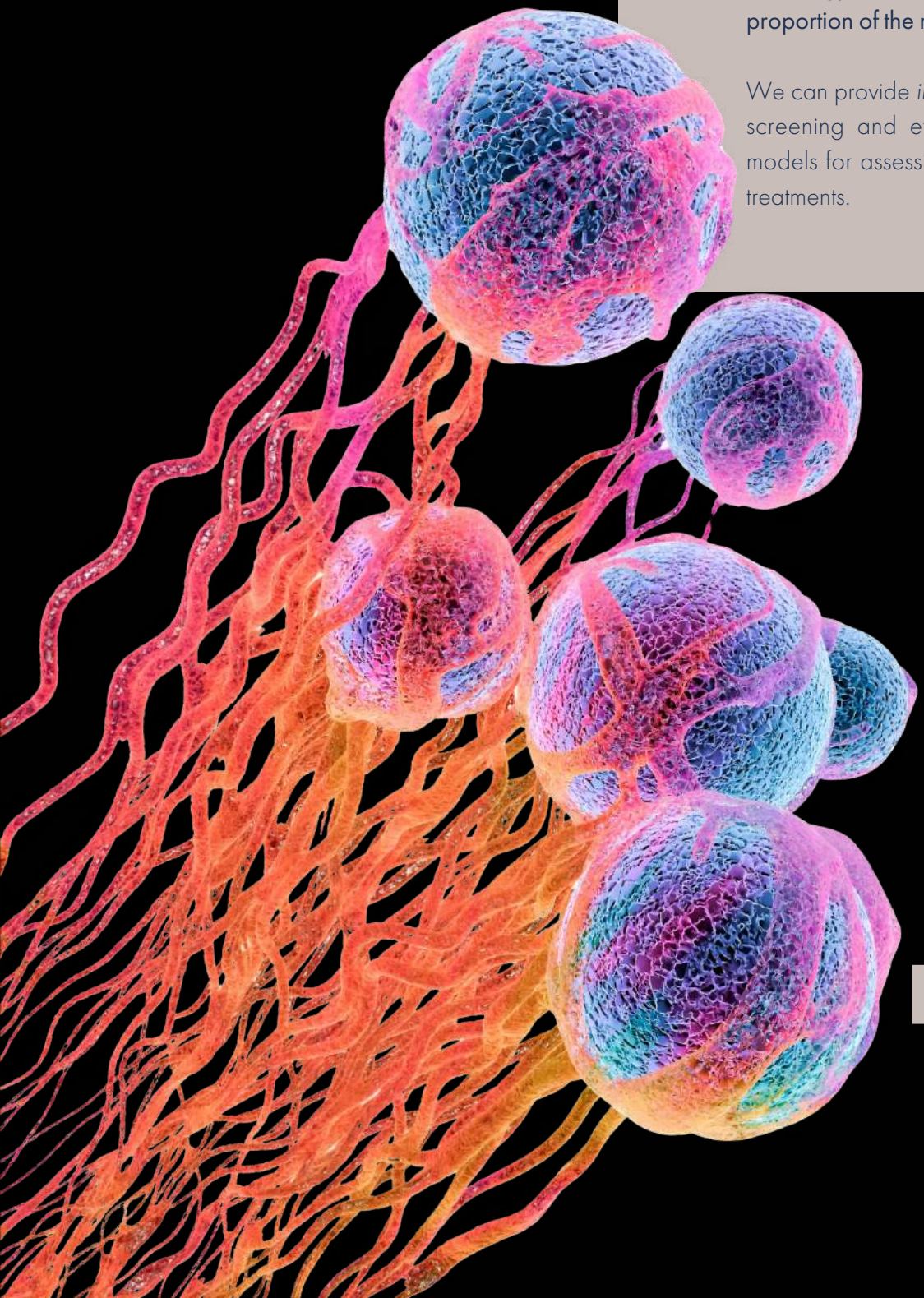
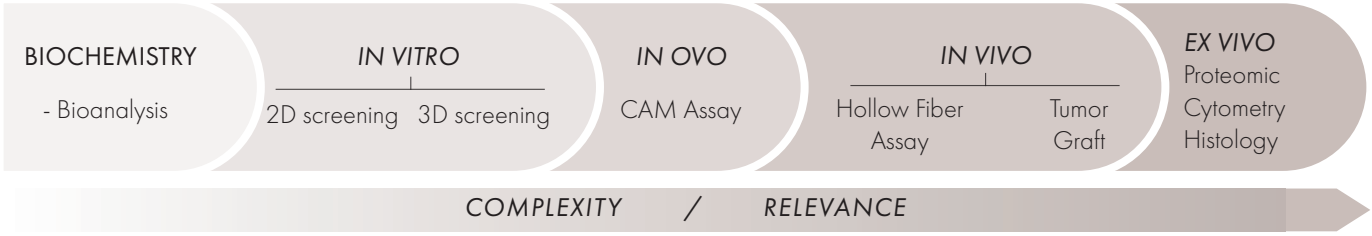
Oncology is an area that commands a larger proportion of the research world’s resources.

We can provide *in vitro* and *in vivo* oncology screening and efficacy testing as well as models for assessing potential side effects of treatments.





in vitro

RECEPTOR PHARMACOLOGY AND SIGNALING PATHWAYS

High-content imaging

AKT phosphorylation	Multiple cellular models	PF 10.7
Androgen receptor nuclear translocation	LNCaP cell line	PF 10.1
Calcium homeostasis	Multiple cellular models	PF 3.33
cAMP quantification	Multiple cellular models	PF 3.40
ERK activation *(pERK 1/2)*	Multiple cellular models	PF 3.27
NFkB activation	Multiple cellular models	PF 3.23
Prostate Specific Antigen *(PSA)* expression	LNCap cell line	PF 10.15

TARGETING ANGIOGENESIS

in ovo	HET-CAM assay *(screening - 3R approach)*	Chicken eggs, Multiple cells cancer	ONC 13.1

TARGETING THE IMMUNE SYSTEM: IMMUNO-ONCOLOGY

Biochem.	Binding assay of immune check points inhibitors *(HTRF)*	Multiple inhibitors	ONC 11.2
in vitro	Immune T-cell infiltration assay *(cytometry)*	3D co-culture multiple cells	ONC 10.6
	Immune T-cell killing assay *(high-content imaging)*	2D co-culture	PF 10.47
	T-cell activation assay *(high-content imaging)*	Human peripheral mononuclear blood cell and CD3+T cells	PF 10.50

in vivo

Syngeneic models of:

Breast cancer *(anti-PD-1 / CTLA-4)*	4T1 cells *(mouse)*	ONC 3.1
Colon cancer *(anti-PD-1 / CTLA-4)*	CT26.WT cells *(mouse)*	ONC 3.2
Glioblastoma *(anti-PD-1 / CTLA-4)*	GL261 cells *(mouse)*	ONC 3.3
Renal cancer *(anti-PD-1 / CTLA-4)*	RenCa cells *(mouse)*	ONC 3.4

TARGETING METASTASIS

in vivo	Experimental lung metastasis syngeneic model of breast cancer	4T1 *(mouse)*	ONC 1.1
	Experimental lung metastasis syngeneic model of colon cancer	CT26.WT *(mouse)*	ONC 1.2
	Experimental lung metastasis xenograft model of breast cancer	MDA-MB-231 cells *(mouse)*	ONC 8.1
	Leptomeningeal Carcinomatosis model	MDA-MB-231 cells *(mouse)*	ONC 8.2
in vitro	Invasion assay *(high-content imaging)*	Multiple 3D cellular models	PF 3.15
	Migration assay *(high-content imaging)*	Multiple 2D cellular models	PF 3.1

TARGETING TUMOR-ASSOCIATED SIDE EFFECTS

Pain

Chemotherapy - induced intestinal mucositis	Mouse	GI 32
Chemotherapy - pain - Vincristine model	Rat	PI 21
Chemotherapy induced pain: Cisplatin model	Rat	PI 41

Cachexia

Drug-induced cachexia model	Rat	ONC 9.2
Tumor-induced cachexia model	AH-130 cells *(rat)*	ONC 9.1
Tumor-induced cachexia model	C26 cells *(mouse)*	ONC 9.3
Tumor-induced cachexia model	LLC1 cells *(mouse)*	ONC 9.4

TARGETING PRIMARY TUMOR

Cell cycle *(cytometry)*	Multiple 2D or 3D cellular models	PF 3.8
Cell proliferation/cytolysis assay *(high-content imaging)*	Multiple 2D cellular models	ONC 10.2
Cell viability *(colorimetric assay)*	Multiple 2D cellular models	ONC 10.1
Clonogenicity assay anchorage-independent	Multiple 3D cellular models	ONC 10.4
Spheroid proliferation/cytolysis assay *(high-content imaging)*	Multiple 3D cellular models	ONC 10.3
Organoid models of Glioblastoma	Multiple patient samples	In development
Tumor chicken Chorio Allantoic Membrane *(TCAM)* xenograft assay *(screening – 3R approach)*	Multiple cellular models, Chicken eggs	ONC 4
Hollow fiber assay *(screening – 3R approach)*	Multiple cellular models *(mouse - rat)*	ONC 5

Orthotopic syngeneic models of:

Breast cancer	4T1 cells *(mouse)*	ONC 3.1
Colon cancer	CT26.WT/C26 cells *(mouse)*	ONC 3.2
Glioblastoma *(brain tumor)*	GL261 cells *(mouse)*	ONC 3.3
Kidney cancer	RenCa cells *(mouse)*	ONC 3.4

Orthotopic xenograft models of:

Breast cancer	MDA-MB-231/BT 20 *(mouse)*	ONC 7.1
Glioblastoma *(brain tumor)*	U87MG cells *(mouse)*	ONC 7.2
Pancreatic cancer	BxPC-3/PANC-1 cells *(mouse)*	ONC 7.3

Subcutaneous syngeneic models of:

Breast cancer	4T1 cells *(mouse)*	ONC 2.1
Colon cancer	CT26.WT/C26 cells *(mouse)*	ONC 2.2

Glioblastoma *(brain tumor)*	GL261 cells *(mouse)*	ONC 2.3
Lung cancer	LLC1/KLN205 cells *(mouse)*	ONC 2.4
Renal cancer	105K cells *(mouse) (TSC Alliance)*	ONC 3.4

Subcutaneous syngeneic models of:

Bladder cancer	SW780 cells *(mouse)*	ONC 6.13
Breast cancer	MDA-MB -231/BT-20 cells *(mouse)*	ONC 6.1
Colon cancer	HCT-8/HCT-116 cells *(mouse)*	ONC 6.2
Fibrosarcoma	HT-1080 cells *(mouse)*	ONC 6.9
Glioblastoma *(brain tumor)*	U118MG/U87MG/ U138MG cells *(mouse)*	ONC 6.3
Kidney cancer	ACHN cells *(mouse)*	ONC 6.4
Liver cancer	Hep3B2.1-7/HepG2 cell *(mouse)*	ONC 6.6
Lung cancer	A549/PC-9/H69 cells *(mouse)*	ONC 6.5
Pancreatic cancer	BxPC-3/CFPAC-1/ PANC-1 cells *(mouse)*	ONC 6.11
Prostate cancer	LNCaP/PC-3 *(mouse)*	ONC 6.10

TECHNICAL CAPABILITIES

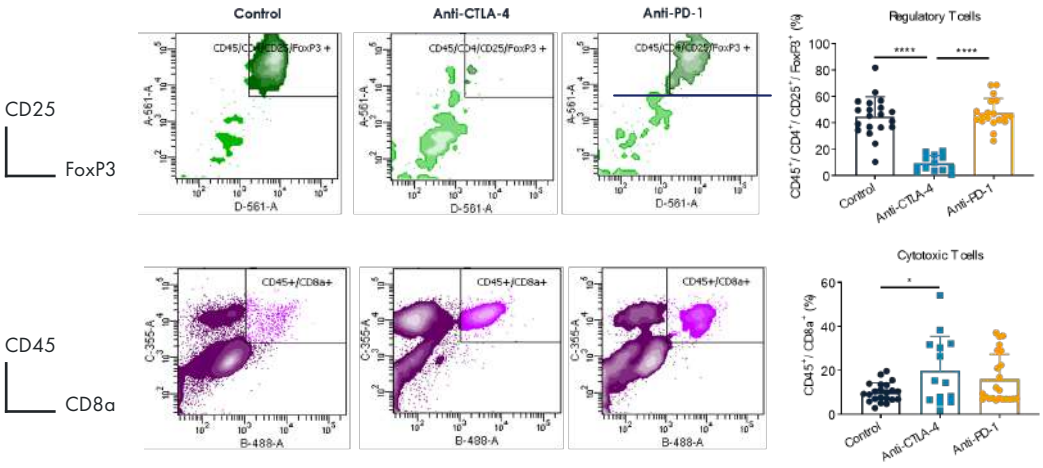
- Histology
- Cellular imaging
- **Biochemistry:** Protein detection and protein quantification *(ELISA, Luminex®, HTRF®, AlphaLISA®, Western Blot)*
- **Molecular Biology** *(qPCR quantification)*
- **Cell health and cellular metabolism assays**
- **Flow cytometry**
- **Live cell imaging** *(Incucyte ®)*

These complementary capabilities can be integrated upon request to align with your project needs.
Detailed descriptions are provided at the end of the catalog (p. 57).

At a Glance — Our Cutting-Edge Technical Capabilities

Immunophenotyping of tumor infiltrating lymphocytes using **flow cytometry** after **cell dissociation and separation.**

Mice injected with colon carcinoma cells (CT26.WT) treated with anti-CTL-4 and anti-PD-1 monoclonal antibodies investigated for tumor infiltrating lymphocytes.



*One way ANOVA followed by post-hoc Tukey's multiple comparison. * $p < 0.05$, and **** $p < 0.0001$.*

PAIN

Pain management is an increasingly important focus in the industry, and our expertise, built over many years, positions us as a trusted partner in this field.

We offer a wide range of models, from *in vitro* screening to *in vivo* acute, neuropathic, and chronic pain studies, supporting the development of pain therapeutics and the evaluation of associated symptoms and side effects.

in vivo ACUTE PAIN

Cold plate	Mouse, Rat	PI 36
Hot plate	Mouse, Rat	PI 1
Modified hot plate	Mouse	PI 28
Pain after local administration	Mouse, Rat	PI 40
Pinchmeter	Mouse, Rat	PI 22
Tail flick	Mouse, Rat	PI 2

in vivo INFLAMMATORY PAIN

Capsaicin paw	Mouse, Rat	PI 30
Carrageenan-induced acute inflammatory pain (reversal & prevention protocol)	Mouse, Rat	PI 14
Complete Freund Adjuvant (CFA)-induced acute inflammatory pain	Mouse, Rat	PI 20
Complete Freund Adjuvant (CFA)-induced chronic inflammatory pain: monoarthritis model	Mouse, Rat	PI 15
Formalin paw (early phase)	Mouse, Rat	PI 7
Formalin paw (late phase)	Mouse, Rat	PI 8
Migraine: KCl-induced cortical spreading depression and facial allodynia	Rat	PI 45
Mono-iodoacetate (MIA)-induced chronic inflammatory pain: osteoarthritis model	Rat	PI 19
Mono-iodoacetate (MIA)-induced low back pain	Rat	PI 43
Surgery-induced chronic pain - osteoarthritis model	Guinea-pig	PI 39

in vivo NEUROPATHIC PAIN

Chemotherapy-induced neuropathic pain: Cisplatin	Rat	PI 21
Chemotherapy-induced neuropathic pain: Vincristine model	Rat	PI 21
Chronic Constrictive Injury - induced neuropathic pain: CCI / Bennett model	Mouse, Rat	PI 12
Diabetic-induced neuropathy	Rat	PI 23
Spared nerve injury	Rat	PI 42
Spinal Nerve Ligation -induced neuropathic pain: SNL/Chung model	Mouse, Rat	PI 13

in vivo POST-OPERATIVE PAIN

Brennan model post-operative pain	Rat, Guinea-pig	PI 16

in vivo VISCERAL PAIN

Acetic acid writhing	Mouse	PI 6
Colorectal distension (CRD)	Rat	GI 30
Dextran Sodium Sulfate (DSS) - induced colitis	Mouse	PI 37

Parabenzoquinone writhing	Mouse	PI 27
TNBS-induced colitis	Rat, Guinea-pig	PI 46

NON-EVOKED PAIN ENDPOINTS

Home Cage Observation
Dynamic Weight Bearing
Abnormal Postures
Locomotor Activity
Gait Score
Rotarod
Ptosis

TECHNICAL CAPABILITIES

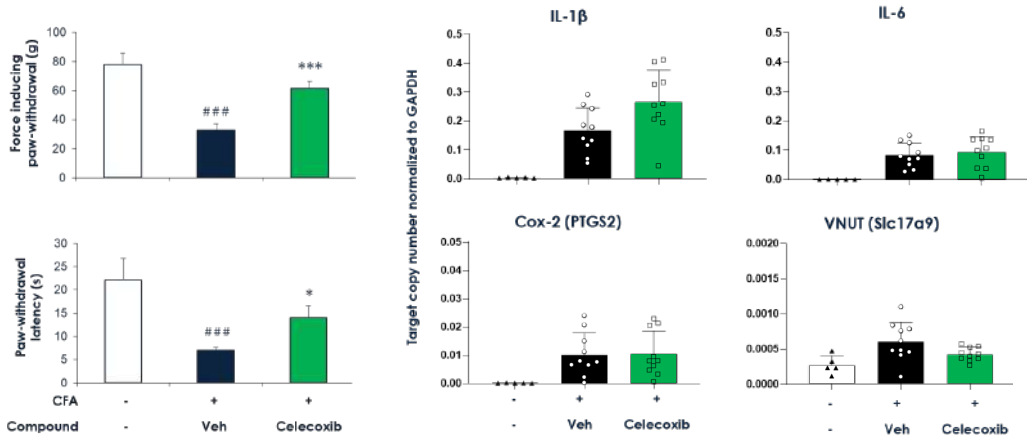
- Histology
- **Biochemistry:** Protein detection and protein quantification *(ELISA, Luminex®, HTRF®, AlphaLISA®, Western Blot)*
- **Molecular Biology** *(qPCR quantification)*
- **Flow cytometry**

These complementary capabilities can be integrated upon request to align with your project needs.
Detailed descriptions are provided at the end of the catalog (p. 57).

At a Glance — Our Cutting-Edge Technical Capabilities

Cytokine gene expression quantification using qPCR.

Complete Freund Adjuvant (CFA) inflammation model treated with Celecoxib to investigate analgesic and anti-inflammatory effects in rats.



*Student's t test. ### p < 0.001 compared with neutral control , * p < 0.05 and *** p < 0.001 compared with control (CFA+Veh). Veh : vehicle.*

PHARMACOKINETICS

“

Pharmacokinetic (PK) studies are a crucial component of drug development, guiding optimal administration methods, dosing, and treatment schedules.

With years of experience, we conduct PK studies as standalone services in multiple different species (small and large), or as part of larger studies using established models.
Our varied capabilities and expertise enable us to use multiple routes of administration, in different species and collect a variety of tissues for analysis.

PK STUDIES IN MULTIPLE SPECIES:

- Mouse
- Rat
- Guinea-pig
- Ferret
- Rabbit
- Dog
- Mini-pig
- Pig (incl. piglet)

ROUTES OF ADMINISTRATION

Standard:

- Intracerebroventricular *(i.c.v)*
- Intramuscular *(i.m.)*
- Intranasal *(i.n.)*
- Intraperitoneal *(i.p.)*
- Intraplantar *(i.pl.)*
- Intravenous *(i.v., caudal, cephalic, saphenous, ear)*
- Nebulization
- Oral: per os *(p.o.)*, capsule
- Subcutaneous *(s.c.)*
- Topical application *(ex: ear, skin, ocular)*
- Transdermal, transmucosal *(using patch)*
- Renal capsule injection *(mouse)*

Catheterization:

- Intracaecal
- Intrajejunum
- Intravesical
- Intraduodenal

Intravenous catheterization
(i.v. slow bolus or infusion)

- Caudal
- Femoral
- Jugular
- Cephalic
- Saphenous veins

Under Anesthetic:

- Intra-tracheal
- Intra-lesion
- Intra mammary fat pad
- Intraarticular *(knee, ankle, facet joint)*
- Intracardiac *(with or without thoracotomy)*
- Intracaecal
- Intracerebroventricular *(i.c.v)*, intracerebral *(using stereotaxy)*
- Intracolonic
- Intradermic
- Intrapancreatic
- Intrarenal
- Intrathecal *(i.t.)*, intraspinal
- Intratibial
- Intratumoral
- Oropharyngeal aspiration
- Perineural *(ex : perineural)*

Mini-pump implantation *(i-precio, osmotic)* for infusion:

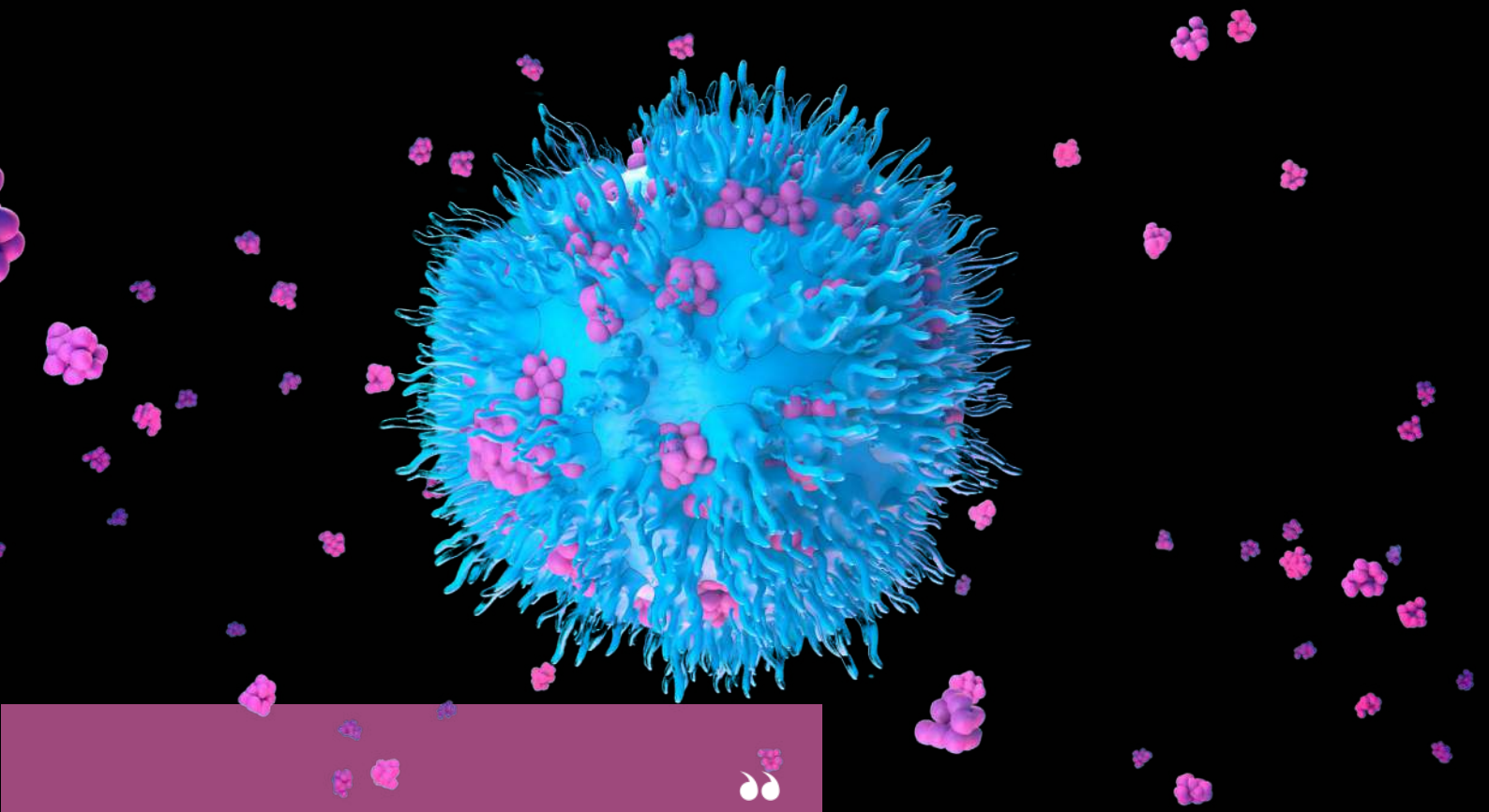
- *s.c.*
- *i.v.*
- *i.p.*

Organs:	Tissues:	Fluids:
Adrenal gland	Adipose tissue	Ascitic fluid
Bladder	Bone	Blood (Plasma, serum, whole)
Brain (Cerebral structures)	Caecum	Bronchoalveolar liquid
Heart	Colon	Cerebrospinal fluid
Intestines	Diaphragm	Urine
Kidney	Ear	
Liver	Ganglia	
Lung	Lymph nodes	
Ovary	Muscle	
Spleen	Nerve	
Stomach	Paw	
Testis	Skin	
Thymus	Spinal Cord	
Vesicular gland	Tumor	

CLINICAL CHEMISTRY | COAGULATION | HEMATOLOGY | ELISA

*> Read the detailed chapter ''Biomarker Assays'' in our **Technical Capabilities** on page 57.*

PREDICTIVE TOXICITY



Drug toxicity remains one of the leading causes of drug attrition. Traditional methods often lack sufficient *in vitro* predictive accuracy.

To address this, we combine highly predictive cell models, such as primary cultures of target organs, with optimized assays tailored to each specific type of toxicity. Our *in vitro* toxicity prediction services leverage true target cells within a physiological environment, ensuring more accurate and reliable assessments.

in vitro

CARDIOTOXICITY

Comprehensive *in vitro* Proarrhythmia Assay (CiPA)

Electrophysiology measurement *(conventional manual patch-clamp)*	Cardiac ion channels	CV 5.6 to CV 5.9*
Cardiotoxicity	iPSC-derived cardiomyocytes: iCell^{2}®	PF 1.08
Proarrhythmic risk assessment *(MEA & Calcium transient assay)*	Human-induced pluripotent stem cell-derived cardiomyocytes *(hiPSC-CMs)*	CV 5.14 PF 1.7

(*): Read the detailed list of these tests on page 10.

in vitro

DRUG INDUCED VASCULAR INJURY (DIVI)

Cell toxicity	HUVEC	PF 11.1
Coagulation impairment Tissue Factor and Thrombomodulin	HUVEC	PF 11.1
Leucocyte recruitment VCAM-1, E-Selectin and ICAM-1	HUVEC	PF 11.1

in vitro

GASTROINTESTINAL SYSTEM

Gastric mucosal cell damage	Primary Rat gastric mucosal cells	GI 29

in vivo

GENERAL TOXICITY

Acute toxicity	Rat, Mouse, Dog, Mini-pig	TOX 11
Preliminary chronic toxicity	Rat, Mouse	TOX 12

in vitro

HEPATOTOXICITY

Cholestasis & bile canaliculi network	Primary hepatocytes *(R)* sandwich configuration	PF 3.16
Cytolysis *(2D & 3D)*	Primary hepatocytes *(H & R)* and HepG2	PF 3.4
Oxidative stress: Glutathione *(GSH)* depletion	Primary hepatocytes *(H & R)* and HepG2	PF 3.28
Phospholipidosis	Primary hepatocytes *(H & R)* and HepG2	PF 3.30
Steatosis: intracellular lipid accumulation triglycerides	Primary hepatocytes *(H & R)* and HepG2	PF 3.30

in vitro

NEPHROTOXICITY

Cytolysis	RPTECs, HK-2, MDCK-II and CRFK	PF 3.4
Lysosomal activity	RPTECs and HK-2	PF 3.7
Mitochondrial membrane potential	RPTECs and HK-2	PF 3.3

in vitro

NEUROTOXICITY

Cytolysis	Primary neurons *(R,M)* cell lines	PF 3.4
Excitotoxicity Calcium measurement	Primary neurons *(R,M)* cell lines	PF 3.33
Mitochondrial membrane potential	Primary neurons *(R,M)* cell lines	PF 3.3
Neurite outgrowth	Primary neurons *(R,M)* cell lines	PF 3.6

SKIN TOXICITY

	Cytotoxicity - Cell viability	3T3 & L929 fibroblasts	TOX 18 & 19
in ovo	Ocular irritation *(HET-CAM)*	Chicken egg	TOX 24
in vitro	Skin irritation	Reconstituted human epidermis	TOX 21
	Skin sensitization	Monocyte cell line *(THP1)*	PF 11.2

TECHNICAL CAPABILITIES

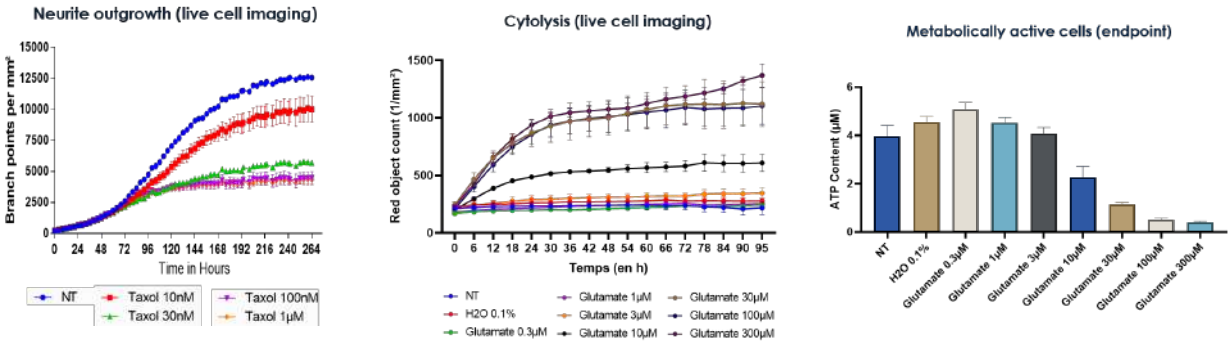
- Histology
- Cellular imaging
- Biochemistry: Protein detection and protein quantification *(ELISA, Luminex®, HTRF®, AlphaLISA®, Western Blot)*
- Molecular Biology *(qPCR quantification)*
- Cell health and cellular metabolism assays
- Ion channel monitoring *(FlipR™)*
- Live cell imaging *(Incucyte ®)*

These complementary capabilities can be integrated upon request to align with your project needs.
Detailed descriptions are provided at the end of the catalog (p. 57).

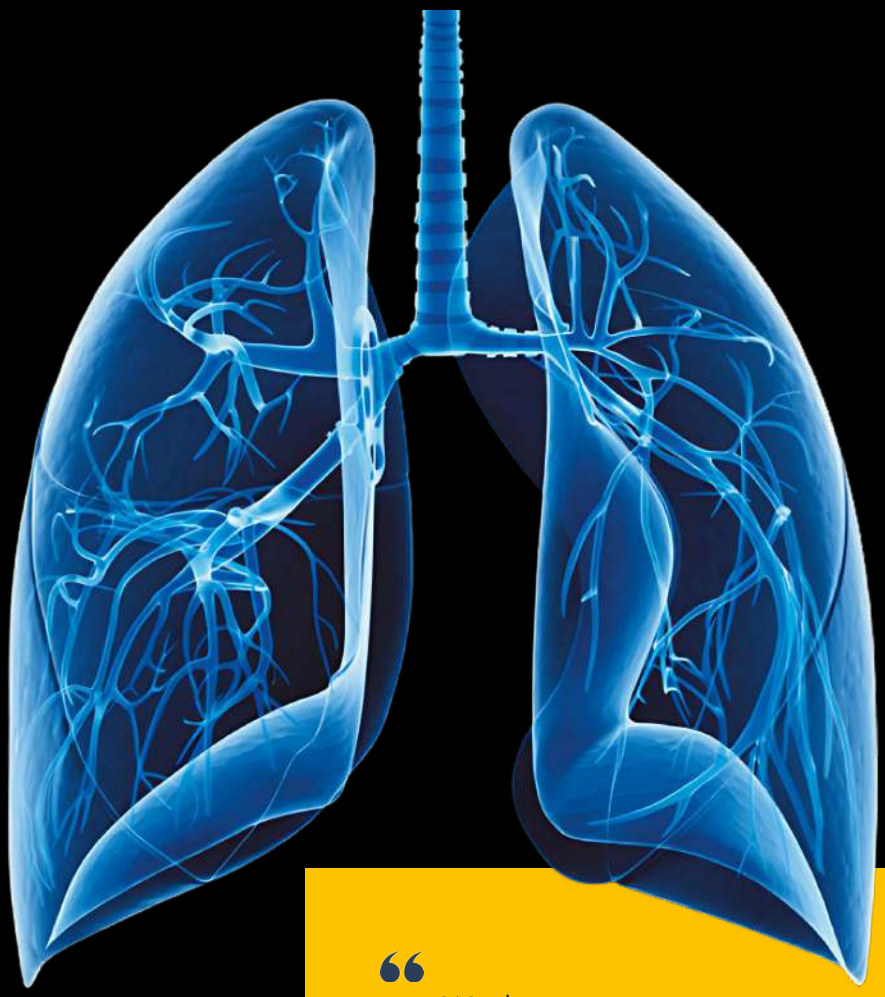
At a Glance — Our Cutting-Edge Technical Capabilities

Kinetic live imaging of cells to detect potential toxic effects.

Neurite outgrowth monitored for cell health and metabolism in real time, following taxol and glutamate treatment, to detect potential toxic effects (cytolysis) and the implicated cellular pathways.



RESPIRATORY
SYSTEM



“We have extensive experience in evaluating the effects of compounds and therapies on the respiratory system using a variety of models across different species. These models are designed to assess both efficacy and safety and include airway function, asthma, cough, fibrosis, bronchospasm, and more.

14

ex vivo	Isolated pulmonary artery	Rat	RES 10
	Isolated trachea	Rat, Guinea-pig	RES 4
in vivo	Airway function *(whole body plethysmography)*	Mouse, Rat, Guinea-pig	RES 1
	Airway function in large animals	Dog	RES 7
	Airway function under hypercapnia *(whole body plethysmography)*	Rat	RES2
	Bleomycin-induced pulmonary fibrosis	Guinea-pig, Mouse	RES 8
	Citric acid-induced cough	Guinea-pig	RES 6
	Histamine bronchospasm	Guinea-pig	RES 3
	LPS-induced pulmonary injury	Guinea-pig, Mouse	RES 9
	Ovalbumin-induced asthma	Guinea-pig	RES 5
	Tracheal mucus output	Mouse	RES 11

TECHNICAL CAPABILITIES

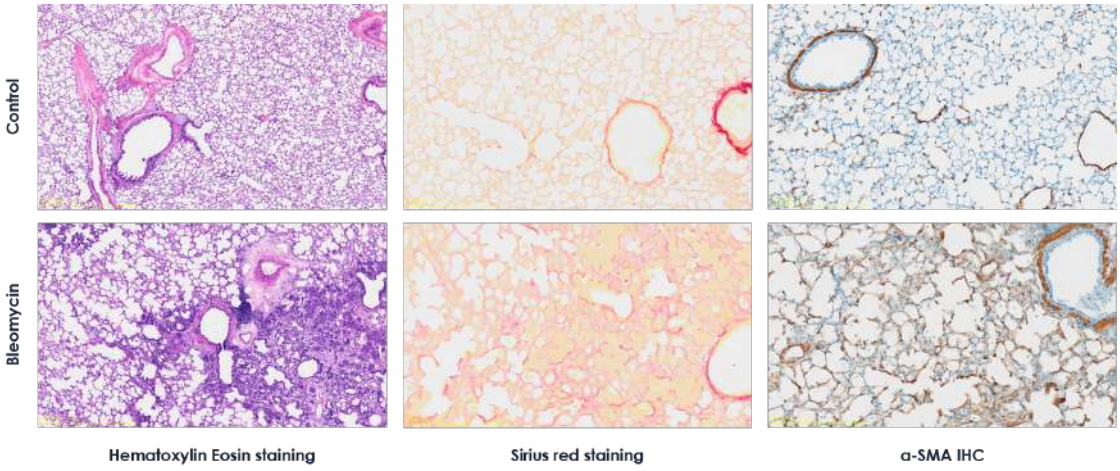
- Histology
- Biochemistry: Protein detection and protein quantification *(ELISA, Luminex®, HTRF®, AlphaLISA®, Western Blot)*
- Molecular Biology *(qPCR quantification)*
- Flow cytometry
- Hematological Biochemistry

These complementary capabilities can be integrated upon request to align with your project needs.
Detailed descriptions are provided at the end of the catalog (p.57)

At a Glance — Our Cutting-Edge Technical Capabilities

Histological analysis, cell counting, and gene expression in lung fibrosis.

Bleomycin model used to detect the level of fibrosis in bronchoalveolar fluid, gene expression in lung tissue, histology and pathological analysis.



SAFETY & REGULATORY PACKAGES

“

With our extensive expertise and years of experience in preclinical pharmacology, we are the ideal partner for conducting GLP-compliant Safety Pharmacology studies.

We offer *in vitro* and *in vivo* safety assessments using validated facilities, procedures, materials, and software that meet GLP standards. Additionally, we provide Biodistribution and Toxicology studies to support and strengthen your drug development programs.

Safety

BEHAVIORAL PHARMACOLOGY STUDIES FOR INVESTIGATING ABUSE & DEPENDENCE POTENTIAL

Conditioned place preference	Rat	CNS 7.5
Drug discrimination	Rat	CNS 7.8
Non-precipitated withdrawal *(option: telemetry)*	Rat	CNS 7.3
Self-administration *(initiation)*	Rat	CNS 7.6
Self-administration *(substitution)*	Rat	CNS 7.7

CORE BATTERY [ICH S7]

Cardiovascular Activity Recording

in vitro hERG channel	HEK 293 cells	CV 5.6

Cardiovascular Studies in Conscious Animals

in vivo Arterial blood pressure, heart rate and ECG	Dog, Mini-pig	CV 1.4

Central Nervous System Studies

in vivo

Activity meter	Mouse, Rat	CNS 1.2
Primary observation *(Irwin)*	Mouse, Rat	CNS 1.1
Rotarod	Mouse, Rat	CNS 1.5

Respiratory Studies

in vivo Airway function *(whole body plethysmography)*	Mouse, Rat, Guinea-pig	RES 1

FORMULATION ANALYSIS

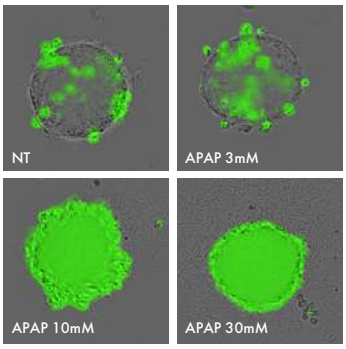
*> Read the detailed content in "**Technical Capabilities**" section on p.57*

SUPPLEMENTAL STUDIES

in vivo Autonomic nervous system	Rat	CV 6
Cardiovascular studies in anesthetized animals	Multiple species	CV 1*
Gastrointestinal system	Multiple species	GI
Renal function	Mouse, Rat	REN
in vitro Cardiomyocytes	iCell²®	CV 5.14

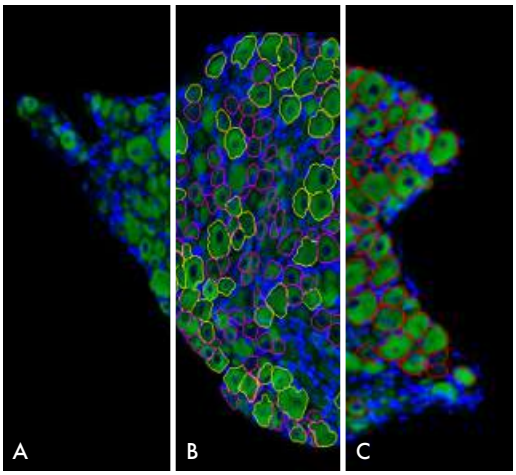
Toxicology

Porsolt is expanding its capabilities into GLP-compliant toxicology studies, critical for the regulatory package of new drugs and treatments.
These studies, initially focusing on the 28-day rat toxicology assessment, evaluate sub-chronic effects and look to identify any unexpected adverse effects, to further determine safe exposure limits. Porsolt works with board certified pathologists to enhance these studies and ensure accurate analysis and identification of potential risks. The integration of acute and 28-day GLP-compliant toxicology studies aids researchers in fulfilling regulatory requirements and delivering reliable data as part of the overall safety regulatory package for new pharmaceuticals and treatments.



Example of cytolysis staining of primary human hepatocytes spheroids in untreated condition (NT) or Acetaminophen (APAP), 96h.

Biodistribution



(A) Original image

(B) Neuronal cells detection with beta 3 tubulin staining

(C) Neuronal cells detected with AAV-Tag (HA+) (positive neurons in yellow)

Porsolt has introduced Biodistribution studies as part of its preclinical testing services to enhance efficacy, safety, and regulatory assessments for new treatments, including gene and cell therapies.

These studies evaluate distribution of the treatment throughout the body, identifying areas of accumulation in tissues and organs post-administration. Understanding biodistribution is critical for assessing therapeutic effects and potential side effects, as it informs dosing strategies and establishes the safety profile. Porsolt's Biodistribution studies help clients meet regulatory requirements, and ensure safety and efficacy, thereby reinforcing its commitment to supporting innovative therapy development.

We offer models to evaluate the effects of compounds and potential therapies on blood flow.

These models can be used to investigate both direct effects and potential side effects or confounding factors associated with specific treatments

THROMBOSIS & BLOOD

16

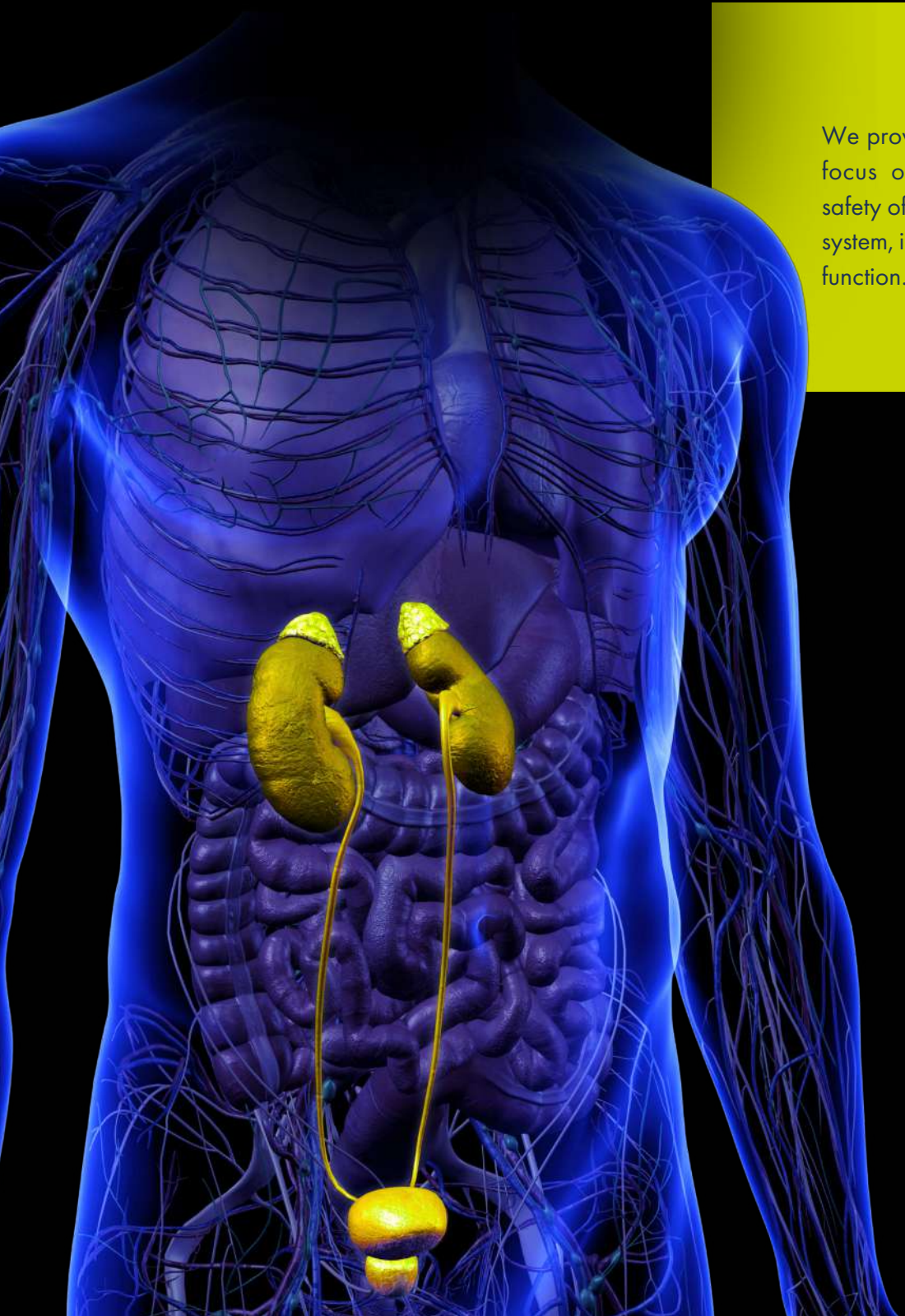
in vitro	Endothelial cell activation/ Drug-Induced Vascular Injury (DIVI)	HUVECs cells	PF 2.1
in vivo	Arterial thrombosis (FeCl2)	Rat	BL 3
	Arterio-venous shunt (silk thread model)	Rat	BL 5
	Bleeding time (anesthetized animal)	Rat	BL 2
	Venous thrombosis (FeCl2)	Rat	BL 4

TECHNICAL CAPABILITIES

- Histology
- Cellular imaging
- **Biochemistry:** Protein detection and protein quantification *(ELISA, Luminex®, HTRF®, AlphaLISA®, Western Blot)*
- **Molecular Biology** *(qPCR quantification)*
- **Cell health and cellular metabolism assays**
- **Flow cytometry**
- **Ion channel monitoring** *(FlipR™)*
- **Live cell imaging** *(Incucyte ®)*

These complementary capabilities can be integrated upon request to align with your project needs.
Detailed descriptions are provided at the end of the catalog (p. 57).

UROGENITAL SYSTEM



“

We provide a variety of models that focus on screening, efficacy and safety of treatments on the urogenital system, including bladder and kidney function.

BLADDER FUNCTION

Isolated bladder strip	Rat	VSM 4

in vivo

GENITAL SYSTEM

Isolated uterus	Rat	VSM 3
Penil erection	Rat	UG 1

in vitro

IN VITRO NEPHROLOGY

Cytolysis	RPTECs, HK-2, MDCK-II and CRFK	PF 3.4
Lysosomal activity	RPTECs	PF 3.7
Mitochondrial membrane potential	RPTECs and HK-2	PF 3.3

in vivo

RENAL FUNCTION

Diuresis and urinary electrolytes	Mouse, Rat	REN 1
Unilateral ureteral obstruction-induced renal fibrosis	Rat	REN 4

Hypertension Models

5/6 nephrectomy	Rat	REN 3
Chronic *(2K1C)* Goldblatt hypertension *(high renin model)*	Rat	CV 2.5
Chronic DOCA - salt hypertension *(low renin model)*	Rat	CV 2.3

TECHNICAL CAPABILITIES

- Histology
- Cellular imaging
- **Biochemistry:** Protein detection and protein quantification *(ELISA, Luminex®, HTRF®, AlphaLISA®, Western Blot)*
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- **Cell health and cellular metabolism assays**
- **Live cell imaging** *(Incucyte ®)*
- **Flow cytometry**

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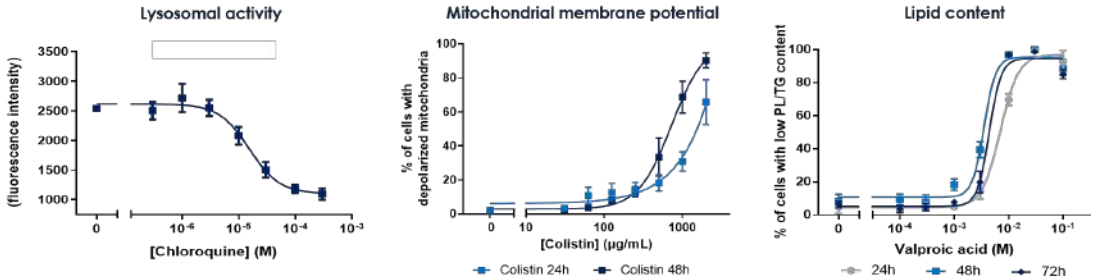
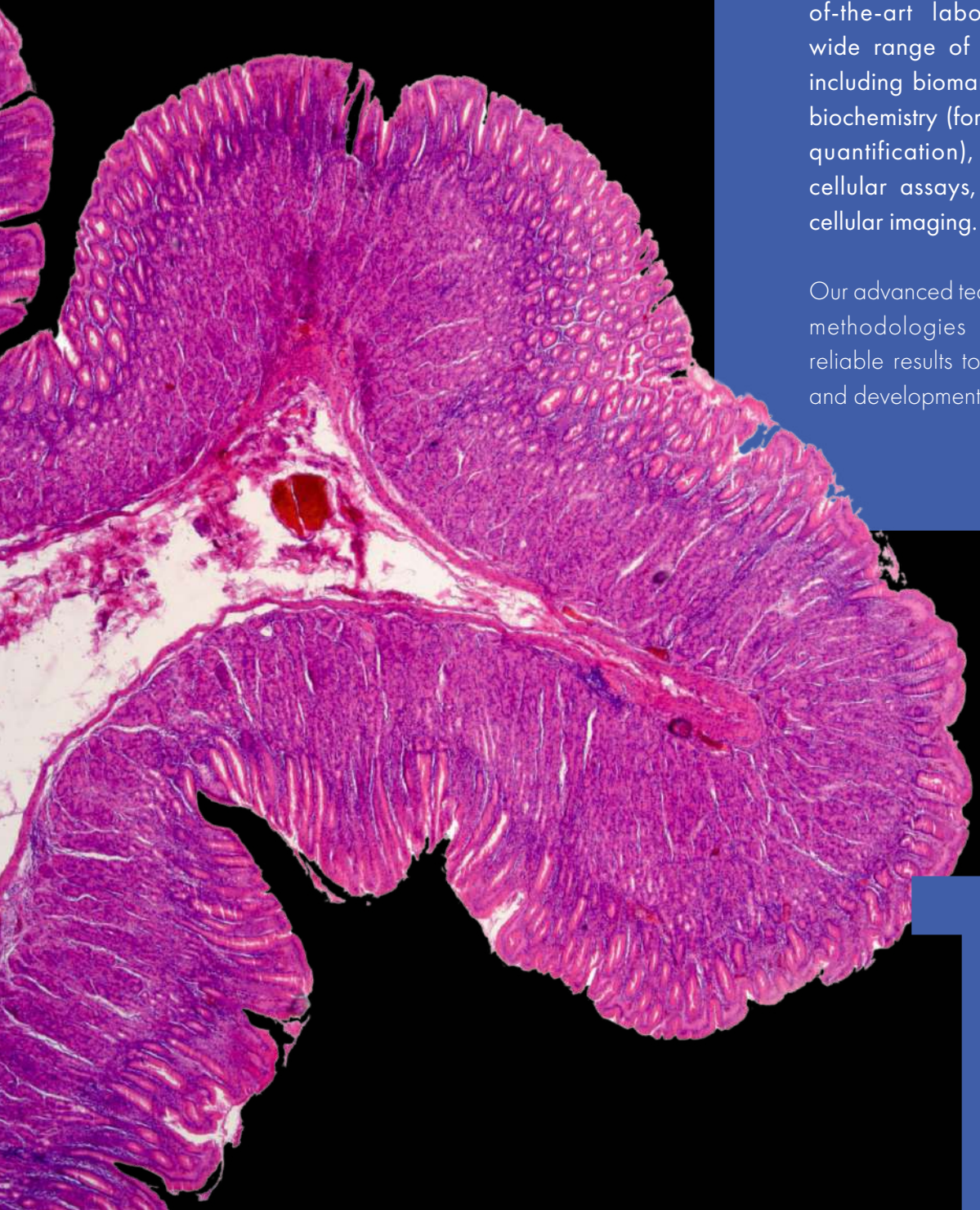
At a Glance — Our Cutting-Edge Technical Capabilities

Flow Cytometry analysis of nephrotoxicity.

Human primary Renal Proximal Tubule Epithelial Cells (RPTECs) used to detect nephrotoxicity via lysosomal activity (degradation of cellular waste), mitochondrial membrane potential (cellular respiration) and intracellular lipid content (lipid metabolism dysfunction).



TECHNICAL CAPABILITIES



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Leveraging our expertise and state-of-the-art laboratory, we offer a wide range of high-quality services, including biomarker assays, histology, biochemistry (for protein detection and quantification), molecular biology, cellular assays, flow cytometry, and cellular imaging.

Our advanced technologies and rigorous methodologies ensure precise and reliable results to support your research and development needs.

Biomarker Assays

CLINICAL CHEMISTRY

Parameters measured on serum/plasma samples:

- Calcium (total)
- Magnesium, phosphorus, sodium, potassium
- Chloride, triglycerides, creatinine
- Total bilirubin
- AST (Aspartate Aminotransferase), ALP (Alkaline Phosphatase), ALT (Alanine Aminotransferase)
- GGT (Gamma Glutamyl Transferase)
- Cholesterol, HDL cholesterol, LDL cholesterol, glucose
- NEFA (Non Esterified Fatty Acids)
- Total proteins, urea, albumin
- Amylase (pancreatic), lipase
- Insulin, glucagon
- Adiponectin, leptin

Parameters measured on urinary samples:

- Creatin
- Sodium, potassium, chloride
- Albumin (microalbumin), total proteins, semi-quantitative parameters

Parameters measured on cell culture sup. :

- LDH (Lactate Deshydrogenase)

Parameters measured on total blood:

- HbA1c (glycated hemoglobin)

COAGULATION

Parameters measured on plasma samples:

- APTT (Activated Partial Thrombin Time)
- Prothrombin time, fibrinogen

HEMATOLOGY

Parameters measured in total blood samples:

Red Blood Cell (RBC):

- Red Blood Cell (RBC) count
- Hemoglobin (Hb)
- Hematocrit (Hct)
- Mean Cell Volume (MCV)
- Mean Cell Hemoglobin (MCH)
- Mean Cell Hemoglobin Concentration (MCHC)

White Blood Cell (WBC):

- White Blood Cell (WBC) count
- Neutrophils
- Lymphocytes
- Monocytes
- Eosinophils
- Basophils

Histology

We offer GLP-compliant histology services for various tissue types across all animal species we house, supporting your preclinical, investigative, safety assessment, and toxicology studies.

\+ Our capabilities complement ongoing studies or are provided as stand-alone services, offering a flexible and reliable solution to meet your research needs.

1 Method qualification

- Choice of appropriate antibody
- Verification of specificity with positive control tissue
- Optimization of experimental conditions (pH unmasking, blocking, dilution, multiplexing, signal amplification)

2 Tissue Preparation

- Macroscopy
- Decalcification
- FFPE (Formalin-Fixed Paraffin-Embedded)
- Frozen tissue & cryosection
- Tissue Micro Array (TMA)
- 3D micro tissue

3 Staining

- Chemical staining (e.g., HE, Sirius Red)
- Immunostaining (IHC, multiplex IF)

4 Image acquisition

- Slide scanner for High Resolution and High Throughput Acquisition
- Brightfield
- 6 Channel Fluorescence
- Whole Section Acquisition

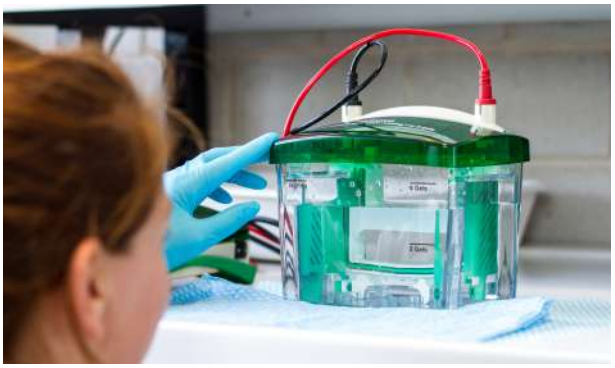
5 Analysis

- Automated and semi-automated image analysis (shape, texture, color, intensity, event counting and region on interest detection)
- Tailor made image analysis algorithms, machine learning
- Quantitative expression, mapping, colocalization analysis, subcellular localization
- Pathological review (semi quantitative scoring, microscope, observation and findings, annotation, report)

+ Equipment

- Automated tissue processor (dehydration)
- Block and slide printers
- High throughput automated stainer
- Automated slide immunostainer
- Automated coverslipping (staining and IHC)
- High throughput slide scanner

Biochemistry - Protein detection



We provide expert biochemistry services for protein detection using Western blot, a timeless technic to compare protein levels as essential biomarkers of gene expression across diverse samples.

\+ No matrix effect issues, making it particularly suitable for rare targets of interest and phosphorylation studies.

1

Method qualification

When applicable

Choice of appropriate antibody

Verification of specificity using positive control

Optimization of experimental conditions

2

Sample Preparation

Cell and tissue lysates, supernatant, serum, plasma and cerebrospinal fluid (CSF)

Subcellular fractionation

3

Protein Separation & Immunoblotting

Chemiluminescence or fluorescence detection

Multiplexing and Membrane Stripping*

Phosphorylation-specific antibodies*

(*): Get more data from the same sample

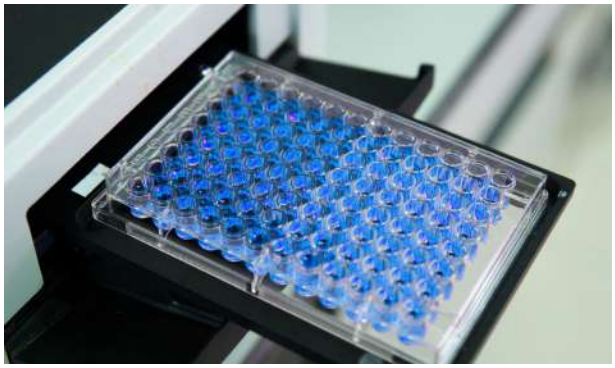
4

Analysis

Normalization Using Housekeeping Genes

Semi quantitative analysis and comparison

Biochemistry - Protein quantification



As biochemistry experts, we offer services for protein quantification using advanced assays such as ELISA, Luminex®, HTRF®, and AlphaLISA™, ensuring accurate and reliable data for your research.

\+ All new assays are qualified, where each assay is defined by a specific technique, target, and matrix for a given commercial reference.

---

1 Method qualification

When applicable

- Choice of appropriate technique
- Choice of appropriate commercial kit
- Method transfer
- Development of in-house method (specific Immunoglobulin Titration)
- Qualification of commercial kit (recovery, linearity)
- Optimization of experimental conditions (sample preparation, dilution)

2 Sample Preparation

- Serum, plasma, Cerebrospinal fluid (CSF), BAL, supernatant
- Cell and tissue lysates (know mild to high matrix interference)
- Concentration, enrichment

3 Assays

- Sandwich, indirect or competitive ELISA
- Specific Immunoglobulin titration
- Bead-Based Multiplex Quantification by Luminex ®
- FRET-Based Detection and Phosphorylation Quantification Using HTRF ® and AlphaLISA™

4 Analysis

- Normalization by sample weight or loaded protein amount
- Quantitative analysis using standard curves
- Ratio of phosphorylation

+ Equipment

- Automated Plate Reader for Absorbance, Luminescence, and Fluorescence
- BioPlex 200 System (Luminex®)
- Automated plate washer

Molecular Biology - qPCR Quantification

We provide GLP-compliant expert molecular biology services, specializing in qPCR quantification for precise gene expression analysis, delivering reliable data to support your research and diagnostic needs

\+ Versatility of sample types thanks to very low matrix interference, multiplexed analysis, in-house design and qualification of primers for your targets

1

Method qualification & Validation

When applicable

Primer design for your target of interest in your species of interest

Quantification of specific isoforms (if needed)

Primer validation (specifity, efficacity, linearity)

Optimization for multiplex assays (combinations, experimental conditions)

Method validation for GLP studies

2

Sample Preparation

Cell and tissue lysate, body fluids (blood, cerebrospinal fluid, urine)

Reverse Transcription

3

qPCR Assay

Quantification of genes (TaqMan™ Multiplexing)

Quantification of miRNA levels (SYBR™)

Detection of biological material from different species

Biodistribution (Gene and Cell Therapy)

4

Analysis

Standard curve (efficacity, linearity) on each plate
Calculation of Copy Number of DNA template from Standard Curves

GLP required parameters (range, limits of quantification, accuracy, precision)

\+

Equipment

- FastPrep-24™ homogenizer
- NanoDrop™ spectrophotometer
- QuantStudio™ 5 Real Time PCR system

Cellular Assays

Comprehensive cellular assays are available to evaluate cell behavior, drug responses, and biological processes, providing valuable insights for research and therapeutic development.

\+ Our B2SL2 facility enables us to generate modified cells efficiently and effectively.

1 Test Systems

>150 immortalized cell lines

Freshly isolated primary cells (neurons, splenocytes, Mesentric Lymph Nodes, BMDM, PBMC, hepatocytes)

Commercial primary and IPS-derived cells (neurons, microglia, cardiomyocytes, fibroblasts, hepatocytes)

Partnership with the French Blood Bank *(EFS: Etablissement Français du Sang)*

2 Assays

Cell health and cellular metabolism (cell death, ROS...)

Transfection and transduction assays (class II OGM)

Live cell imaging (cytolysis, cell growth, scratch, differenciation, cellular network)

Ion channel monitoring (FlipR™)

Flow cytometry

Cellular imaging

\+

Equipment

- Fluorescence/Luminescence Plate Reader
- Incucyte® Live cell analysis system
- FlipR™ Tetra High-Throughput cellular screening system
- NucleoCounter® NC-200™

Flow Cytometry

Our flow cytometry service provides accurate cell population analysis, helping advance your research in immunology, inflammation, cell biology, and diagnostics.

\+ We offer custom panel design and qualification

1 Method qualification

- Panel design (on demand) and gating strategy
- Antibody selection
- Panel qualification (specificity, multiplexing, dilution, isotype controls)
- Optimization of experimental conditions (compensation)

2 Sample Preparation

- Isolated cells (cell lines, primary cells)
- Body fluids (blood, CSF, BAL)
- Fixation and permeabilization
- Enrichment using magnetic columns
- Stimulation

3 Acquisition

- Tubes / 96-Well Plate module
- 5-Laser Fluorescence System
- Immunophenotyping / Activation Assay
- Biomarker detection (cell surface, cellular mechanisms)
- Transfection and transduction monitoring
- Oncology (T cells infiltration, cell cycle)
- Micronucleus assay

4 Analysis

FlowJo™ analysis software

+ Equipment

- GentleMACS™ Dissociator
- QuadroMACS™ Separator
- LSRFortessa™ Flow Cytometer

Cellular Imaging

Our cellular imaging service provides high-resolution visualization of cells and tissues, enabling detailed analysis of cellular structures, processes, and interactions for advanced research applications.

\+ Standard and custom-made analysis

1

Method qualification

When applicable

Choice of appropriate antibody

Verification of specificity

Optimization of experimental conditions (dilution, multiplexing)

2

Sample Preparation

Fixation of cultured cells (cell lines, primary cell, IPS-derived cells)

Permeabilization for intracellular detection

3

Immuno-Staining

Immunofluorescence

Multiplex

Cell surface and intracellular biomarkers

4

Image acquisition

High-automated content fluorescence microscope for cellular imaging in plates

4 laser Fluorescence

5

Analysis

Automated and semi-automated image analysis (shape, texture, color, intensity, event counting and region on interest detection)

Tailor made image analysis algorithms, machine learning

Quantitative expression, mapping, colocalization analysis, subcelullar localization

\+

Equipment

- ArrayScan™ XTI Cellomics

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Scientist-to-Scientist, since 1984.

10+
Disease Areas

350+
Tests & Models

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Species

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