Cardio medex

JANVIER GROUP

THE CARDIOVASCULAR DISEASES EXPERTS

part of

JANVIER GROUP

BIOSCIENCES

JANVIER GROUP
BIOSCIENCES

Cardio medex
JANVIER GROUP

OUR DNA

Your key partner in

DRUG DISCOVERY

PRECLINICAL PHARMACOLOGY

CLINICAL BIOANALYSIS

RESEARCH MODELS & SERVICES

BIOMANUFACTURING

Global leader in RESEARCH MODELS & INNOVATIVE SOLUTIONS

Proudly supporting over **3,500 clients worldwide** in achieving their objectives thanks to a **tailor-made approach.**

Empowered by EXPERTISE

Our thriving team of 735 experts includes **150 PhDs** and is solely dedicated to **driving your research to success.**

Cutting-edge INFRASTRUCTURE

Our state-of-the-art facilities set **industry benchmarks worldwide for precision, performance, and innovative power.**

INDEPENDENCE as a strength

As the last European **family-owned** company in this sector, our independence allows us to **make unparalleled quality our primary focus.**

KEY AREAS OF EXPERTISE

- Oncology
- Immunology
- Infectious diseases
- Inflammatory diseases
- Metabolic diseases
- Cardiovascular diseases
- Auto-immune diseases
- Urogenital diseases
- Rare diseases

GROUP OFFERING | Tailor-made solutions based on gold-standard predictive models

RESEARCH MODELS & SERVICES

- MODEL CREATION & BREEDING SERVICES
  Contract breeding, reproductive sciences, …
- FACILITY MANAGEMENT
- LARGE RANGE OF MODELS
  Immunodeficient, Humanized PBMC/CD34, Immune Checkpoint, Liver-humanized, Preconditioned, …
- BIOLOGICAL PRODUCTS & TISSUES

Support all the *in vitro / in vivo* studies

DRUG DISCOVERY

Target Id / Validation

Hit Id / Hit to Lead

Lead Optimization

SMALL MOLECULES

BIOLOGICS

CELL THERAPIES

PRECLINICAL PHARMACOLOGY

EFFICACY EVALUATION

Anti tumor drugs

Autoimmune Inflammatory

Metabolic diseases

Cardiovascular diseases

Urogenital disorders

Liver-related disorders

IN VITRO / EX VIVO

- 40+ PDX-derived cells
- 2D/3D cell culture
- 15+ organoids
- Immuno-histochemistry
- Histology
- Flow cytometry
- Multi-omics
- Immunology assay
- Biochemistry analysis
- Molecular biology

IN VIVO

- 250+ PDX models (breast, lung, colorectal, urogenital, …)
- 40+ syngeneic tumor models
- 40+ CDX models
- FRG® liver-humanized mice
- Imaging
- Microsurgery
- Functional pharmacology
- Short-term cytotoxicity
- Toxicology (non-GMP)
- DMPK/ADME

CLINICAL BIOANALYSIS

BIOMARKER DISCOVERY

Biobanking

Genomics & Epigenomics

Transcriptomics

Proteomics

Bioinformatics

BIOMANUFACTURING

- MONOCLONAL ANTIBODIES & RECOMBINANT PROTEINS
- PLASMID DNA
- CELLS

Support the **drug discovery**, **preclinical** and **clinical** phases

GROUP OFFERING

Tailor-made solutions based on gold-standard predictive models

RESEARCH MODELS & SERVICES

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DRUG DISCOVERY

Target Id / Validation » Hit Id / Hit to Lead » Lead Optimization

SMALL MOLECULES

- HTS: AS-MS screening with a 2-million compounds library
- Compound libraries (exclusive/non-incl., frag./covalent)
- Organic & medicinal chemistry
- Custom synthesis, route scouting & analytical chem.

BIOLOGICS

- mAbs discovery by single cell technology (HTS)
- Generation & selection of Lead Candidates
- Engineering of mAbs & recombinant proteins
- In vitro pharmacology / in vivo pharmacology

CELL THERAPIES

- Drug candidate targeting with human primary T cells
- CAR (T/NK) & TCR design for cell therapies
- CRISPR-Cas 9, Immunomics

PRECLINICAL PHARMACOLOGY

ANTI TUMOR DRUG EFFICACY

- Prostate, breast, bladder, colorectal, lung, pancreas, ovaries, pediatric.

AUTOIMMUNE & INFLAMMATORY EFFICACY

- IgG4-Related disease, psoriasis, Peritonitis, IBD, Lupus, Prostatitis, Cystitis

METABOLIC DISEASES EFFICACY

- Obesity - Insulin resistance and diabetes, MASH, Kidney diseases, Fibrosis, Dyslipidemia, Atherosclerosis

CARDIOVASCULAR DISEASES EVALUATION

- Acute/chronic myocardial infarction, HTA, vascular diseases, cardiomyopathy, HF (reduced or pEF), sepsis, takotsubo cardiomyopathy, onco-cardiology, rare diseases, cardiac arrythmias

UROGENITAL DISORDERS EVALUATION

- Endometriosis, urinary incontinence, overactive bladder, lithiasis, benign prostatic hyperplasia, M/F infertility, pre-term labor, polycystic ovarian syndrom, sexual dysf., acute/chronic diseases

IN VITRO / EX VIVO

- 40+ PDX-derived cells
- 2D/3D cell culture
- 15+ organoids
- Immuno-histochemistry
- Histology
- Flow cytometry
- Multi-omics on animal or human samples
- Immunology assay
- Biochemistry analysis
- Molecular biology

IN VIVO

- 250+ PDX models
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CLINICAL BIOANALYSIS

BIOMARKER DISCOVERY

- Biobanking
- Genomics & Epigenomics
- Transcriptomics
- Proteomics
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BIOMANUFACTURING

- MONOCLONAL ANTIBODIES & RECOMBINANT PROTEINS
- PLASMID DNA
- CELLS

Support the **drug discovery**, **preclinical** and **clinical** phases

MEET OUR FAMILY

mAbs ANTIBODIES FOR MEDICINE

Antibody discovery

edelris

Small molecules
for drug discovery

JC DISCOVERY

Predictive models & CAR-T
preclinical solutions

Cardio medex JANVIER GROUP

Preclinical expert
in cardiovascular disorders

Physiogenex

Preclinical expert
in metabolic disorders

XenTech

Preclinical expert in oncology,
PDX, PDX-DC, CDX

urosphere

Preclinical expert in urogenital
disorders, PDX, Organoids

YECURIS

Liver-humanized mice
& associated solutions

Precursion

Biomarker discovery
& engineering

RD-Biotech

Engineering
services &
biomanufacturing

JANVIER LABS

Research models
& associated solutions

WHY US

TAILORED SOLUTIONS

We offer highly customized solutions that fit the specific needs of your research projects, based on a range of highly-specific, gold-standard models.

STRONG SCIENTIFIC SUPPORT

We offer **guidance with all our services.** Join a team of **experts,** available from start to finish to
ensure the success of your projects.

COMMITMENT TO EXCELLENCE

Our rigorous **ISO-certified quality strategies** help us consistently deliver outcomes that **exceed expectations.**

ISO 9001:2015 · ISO 14001:2015 · ISO 20387:2018 · ISO 27001:2022

GLOBAL REACH WITH LOCAL EXPERTISE

Our **global presence and local teams** ensure seamless collaboration across borders, making us the ideal partner
for your **international** research needs.

CURIOSITY, CREATIVITY, PASSION

Our team's **passion and enthusiasm** drive every project we undertake. Our experts infuse **creativity and dedication** to every stage of your research.

INNOVATION

Our state-of-the-art models and associated services, have been recognized for their ground-breaking impact in the scientific community.

MAXIMIZING GOVERNMENT R&D FUNDING OPPORTUNITIES

Our official accreditations such as **CIR** allow clients to benefit from significant **R&D tax incentives**, streamlining their path to innovation.

RESPONSIBILITY

We uphold the highest standards of sustainability, with a strong commitment to Environmental, Social, and Governance (ESG) principles.

COMMITTED ecovadis JUL 2024

TRUSTED BY RESEARCH LEADERS

with an average **satisfaction rate of 98,2% last year**

Academic Institutions	Pharma / Biotech / CRO / CDMO	Cosmetics / Food
Gustave Roussy Cancer Campus Grand Paris	Bristol Myers Squibb	L'Oréal
Cancer Research UK	Roche	Chanel
dkfz. German Cancer Research Center in the Helmholtz Association	Pfizer	Danone One Planet. One Health
Inserm	evotec	Nestlé
institut Curie	Boehringer Ingelheim	
	Servier	
	novo nordisk®	
	nuvamid	
	AstraZeneca	
	GlaxoSmithKline	
	AMGEN	
	Genentech A Member of the Roche Group	
	abbvie	
	Takeda	
	sanofi	
	Bayer	
	cytori	
	astellas	
	Sangamo Therapeutics	
	Biogen	
	AUROBAC Therapeutics	

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THE CARDIOVASCULAR DISEASES EXPERTS

Preclinical CRO services for drugs targeting Cardiovascular diseases & cardiometabolic complications

Physio-pathological models for *in vivo* studies

In vivo functional exploration platform

***In vitro/Ex vivo* assays**

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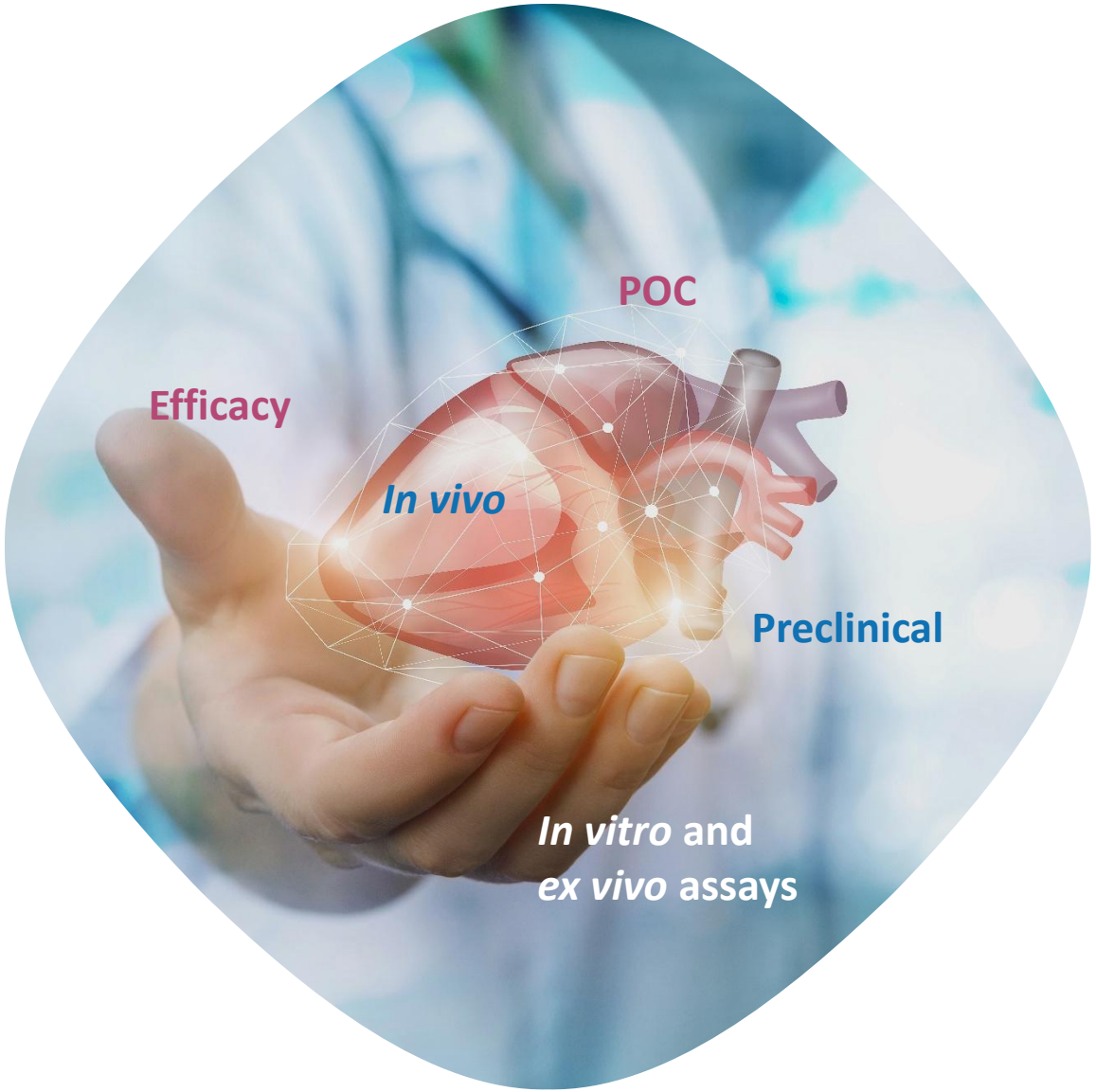
We are

- A **CRO** specialized in **cardiovascular diseases** founded in 2011
- We provide **added-value expertise** to develop your **drug candidate** and deliver reliable results
- We offer a **wide variety of services** ranging from gold standard integrated patho-physiological models to isolated organs and cells

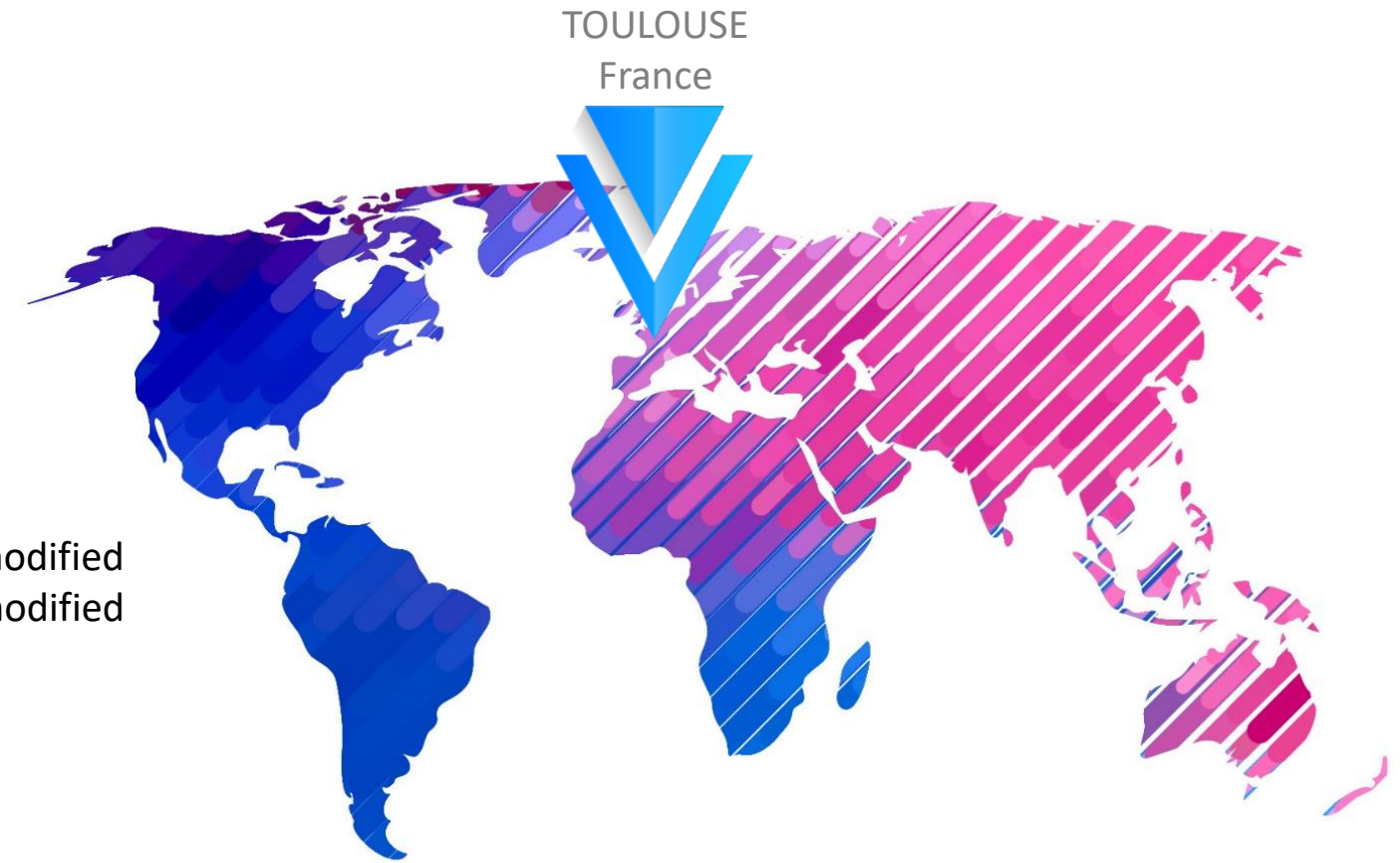


Our facilities

- Animal Housing area ISO-9001: **Rats, mice and hamsters**
  - SPF
  - SPOF

- Accredited by French/UE authorities to use genetically-modified organisms (adenovirus-associated vectors, genetically-modified animals, etc.)

- Research tax credit (CIR)



Direct access / easy connections

1h15 by plane from Paris
accessible by train from Paris

Cardiomedex with Janvier Labs

The perfect synergies for your drug development

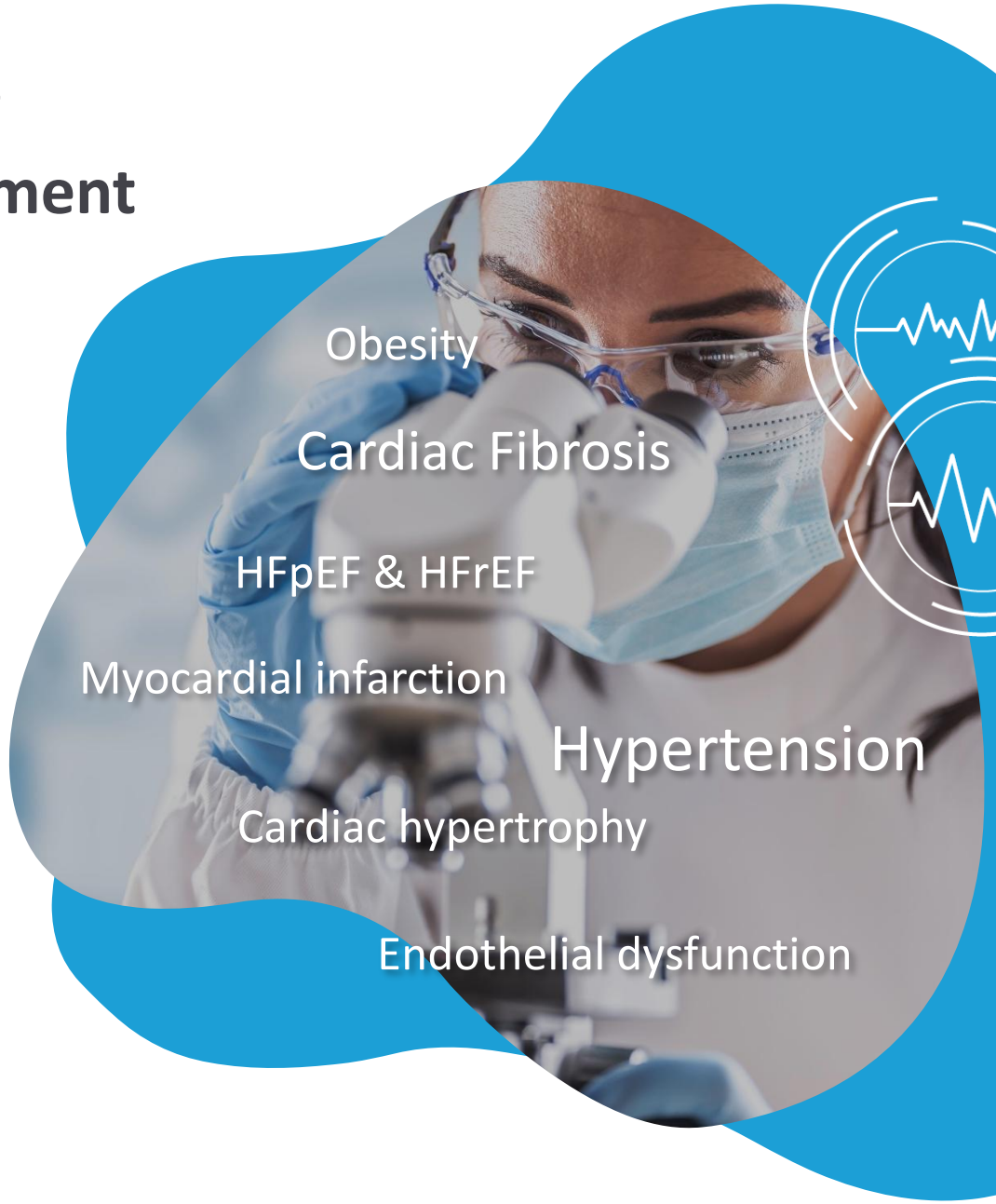
Deliver early *in vivo* and *ex vivo* translational efficacy services to evaluate new innovative drugs for cardiovascular diseases:

In vivo and *ex vivo* assays together with translational models with multiple common risk factors such as MASH, diabetic nephropathy, metabolic syndrome, hypertension and type 2 diabetes.

GOLD STANDARD PRECLINICAL MODELS

Create and breed translational disease rodent models to best evaluate drugs targeting metabolic disorders:

- Golden hamster
- B6 MASH
- OB/OB mouse
- DB/DB mouse
- Diet-induced B6 DIO



Cardiomedex and Physiogenex

Innovative twin sister-CRO companies
to evaluate your drugs on cardiometabolic disorders
And more recently…JC discovery

- Physio-pathological predictive models
- Customized preclinical pharmacology studies
- *In vitro, ex vivo, in vivo* exploration

Predictive models and in vivo exploration :
immuno-oncology, inflammation, auto-immune, and infectious diseases.

Benefits of our synergies

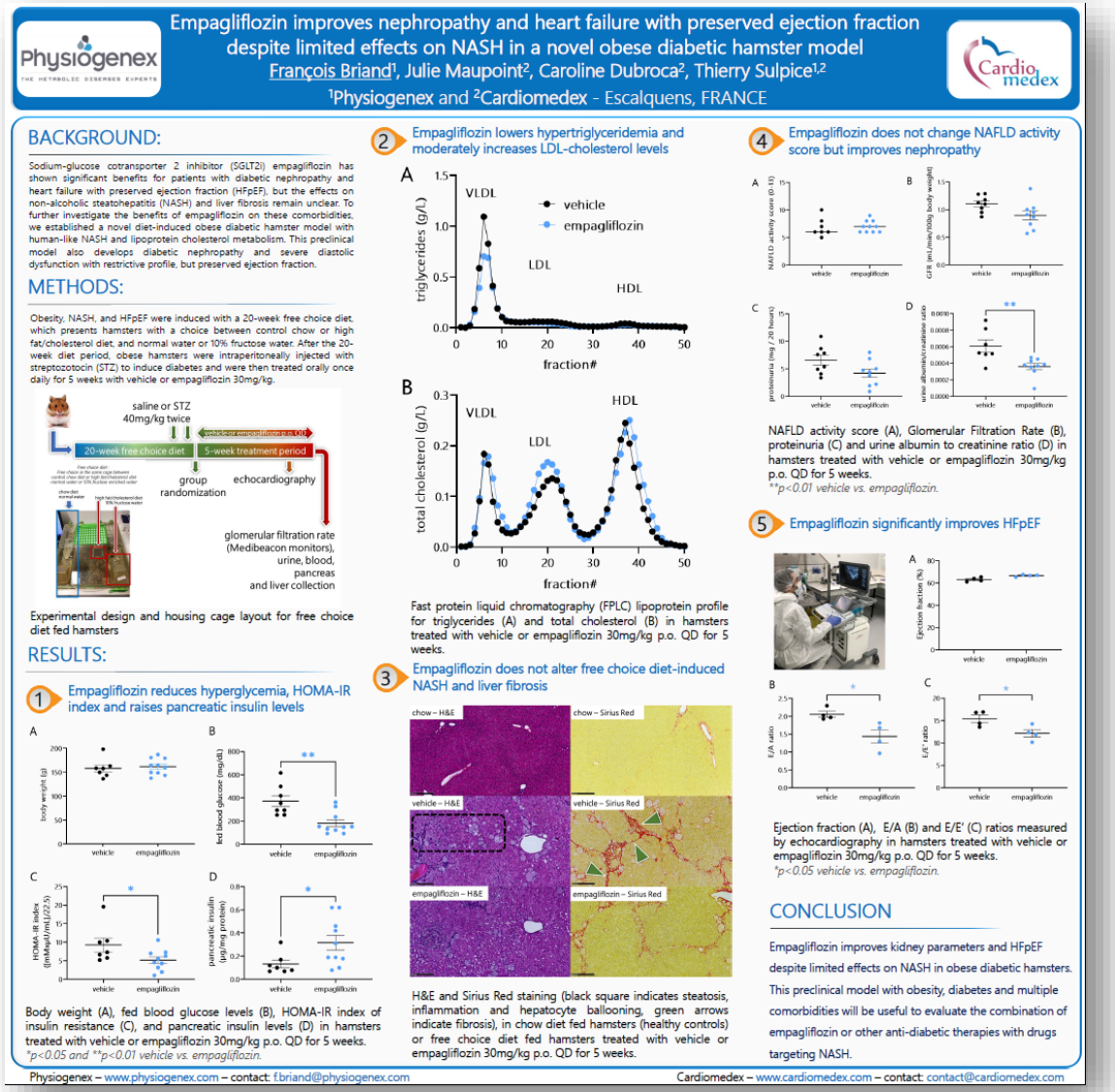
Example of unique synergy between Cardiomedex, Physiogenex and Janvier Labs

HIGH-VALUE RESULTS

Empagliflozin improves diastolic dysfunction in **Janvier Labs Golden Syrian hamster model of diabetes and diet induced NASH**.

This model shows severe heart failure with preserved ejection fraction (HFpEF) related to evident hepatocellular ballooning and portal/bridging (stage 2-3) fibrosis and develops alterations in kidney function as **characterized by our subsidiary company Physiogenex.**

Empagliflozin became the first clinically proven therapy to improve outcomes for patients with HFpEF.



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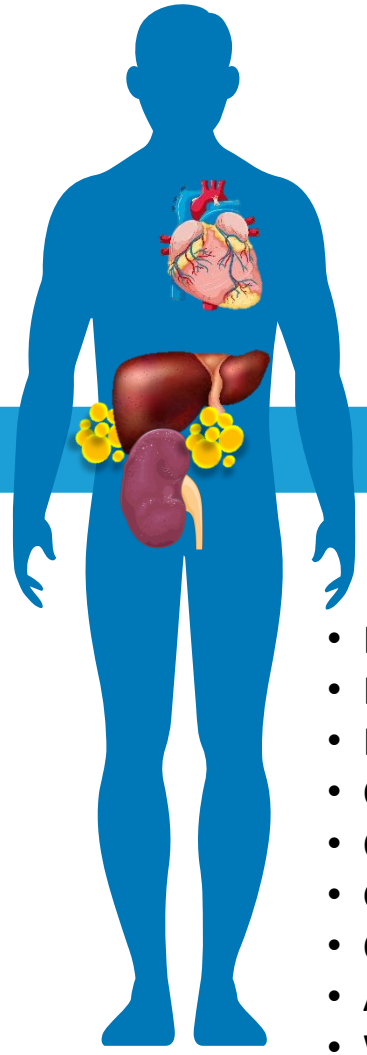
Derisk Translational data

Your drug development early and efficiently

- Diet-induced cardiometabolic diseases
- Genetic cardiovascular diseases
- Other cardiovascular associated diseases (aging, systemic inflammation, hypertension, obesity, diabetes, dyslipidemia, etc.)



Marketed therapies

Original & human-like animal models

Translatable efficacy parameters

- Myocardial infarction and ischemia/reperfusion injury
- Heart failure with reduced ejection fraction (HFrEF)
- Heart failure with preserved ejection fraction (HFpEF)
- Cardiac hypertrophy
- Cardiac fibrosis
- Genetic (GMO models) and non genetic Cardiomyopathy
- Cardio-renal disease
- Aging
- Women's Health

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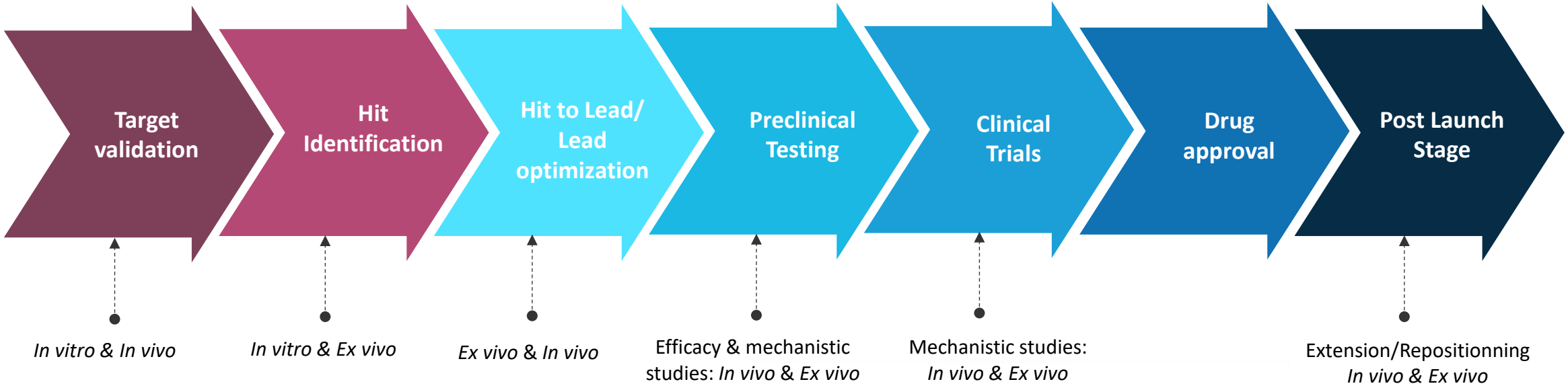
Drug efficacy testing pipeline



THE BEST OPTIONS FOR YOUR LEAD COMPOUNDS

- Disease models development
- Comprehensive range of services

Our experts help you choose the best options

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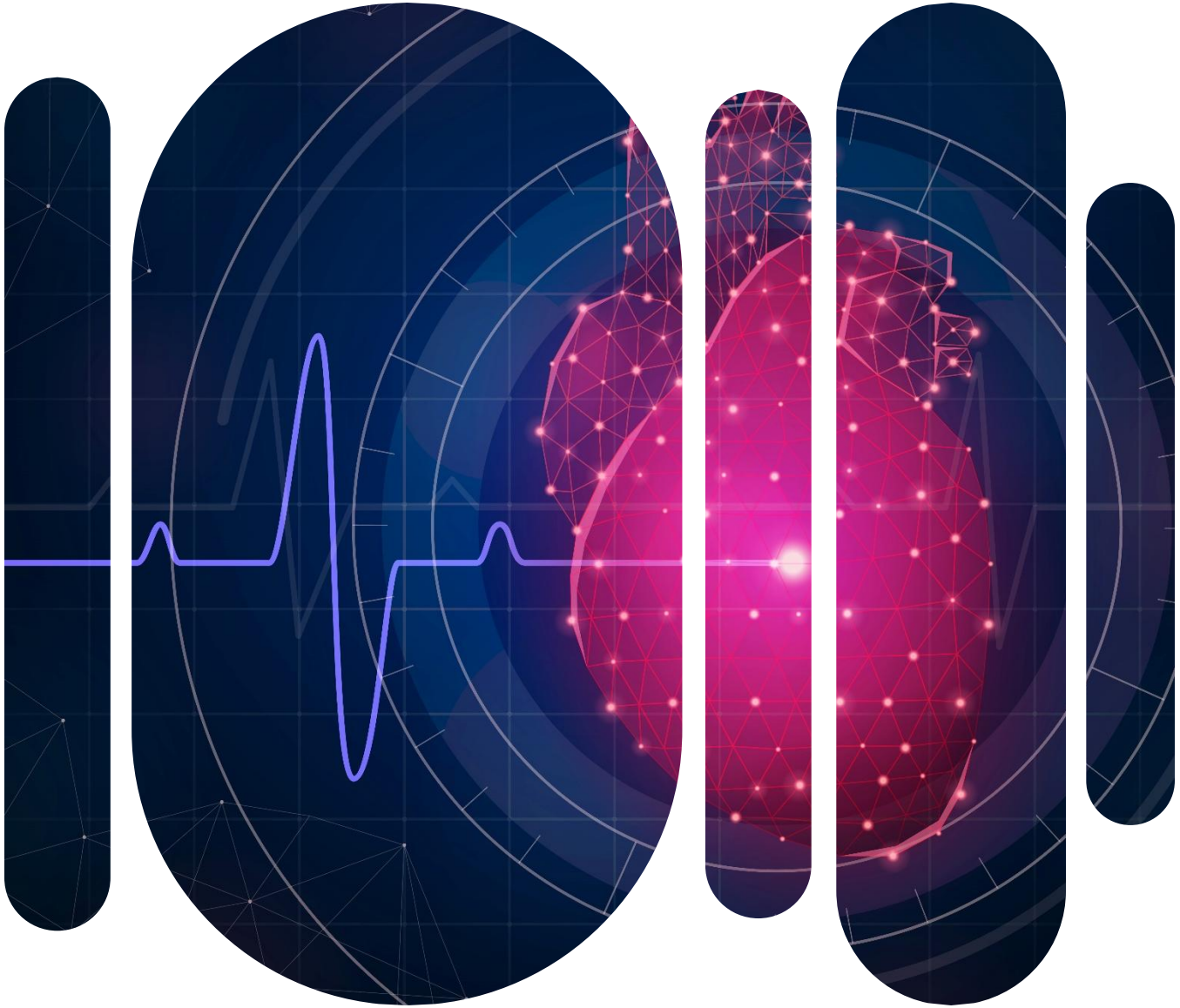
DISEASE MODELS DEVELOPMENT



Therapeutic indications

- Myocardial infarction induced heart failure with reduced ejection fraction (HFrEF)
- Acute Myocardial Infarction
- Heart failure with preserved ejection fraction (HFpEF)
- Cardiac hypertrophy
  Cardiac fibrosis
- Genetic and non-genetic Cardiomyopathy
- Takotsubo syndrome
- Hypertension
- Sepsis
- Cardiometabolic and Cardio-renal
- Aging
- Women’s Health

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Innovative physio-pathological models

HFpEF

- Hamster free-choice
- Rat diet-induced obesity
- Rat SDT fatty uninephrectomy
- Mouse diet+L-NAME
- Mouse diet-induced
- Mouse Angiotensin-II ± HFD (young and old)
- MASH mice

HFrEF

- Rat/Mouse transaortic arterial constriction
- Rat/Mouse permanent or transient artery ligature
- Rat/Mouse transient artery ligature to test cardioprotective strategies

Cardiac hypertrophy/ Cardiac fibrosis

- Rat/Mouse transaortic arterial constriction
- Mouse Angiotensin-II ± HFD (young and old)

Cardiomyopathy

- Mouse doxorubicin-induced toxicity
- Genetic models
- Mouse Takotsubo model

Hypertension

- Spontaneously hypertensive rat
- Rat Renal ligature

Sepsis

- Lipopolysaccharide-induced models
- Cecal ligation and puncture ligature

Takotsubo syndrome

- Mouse Takotsubo model

Cardiometabolic/ Cardio-renal

- Rat Diabetic Nephropathy
- Mouse HFD+L-NAME
- MASH mice
- 5/6 nephrectomized rat
- Rat diet-induced obesity

Aging

- Mice HFD + Ang II

Women's Health

- HFD+AngII aged female
- SDT female rat
- PCOS models (under development)

New model design

New preclinical models based on emerging areas to fulfil our partners' needs

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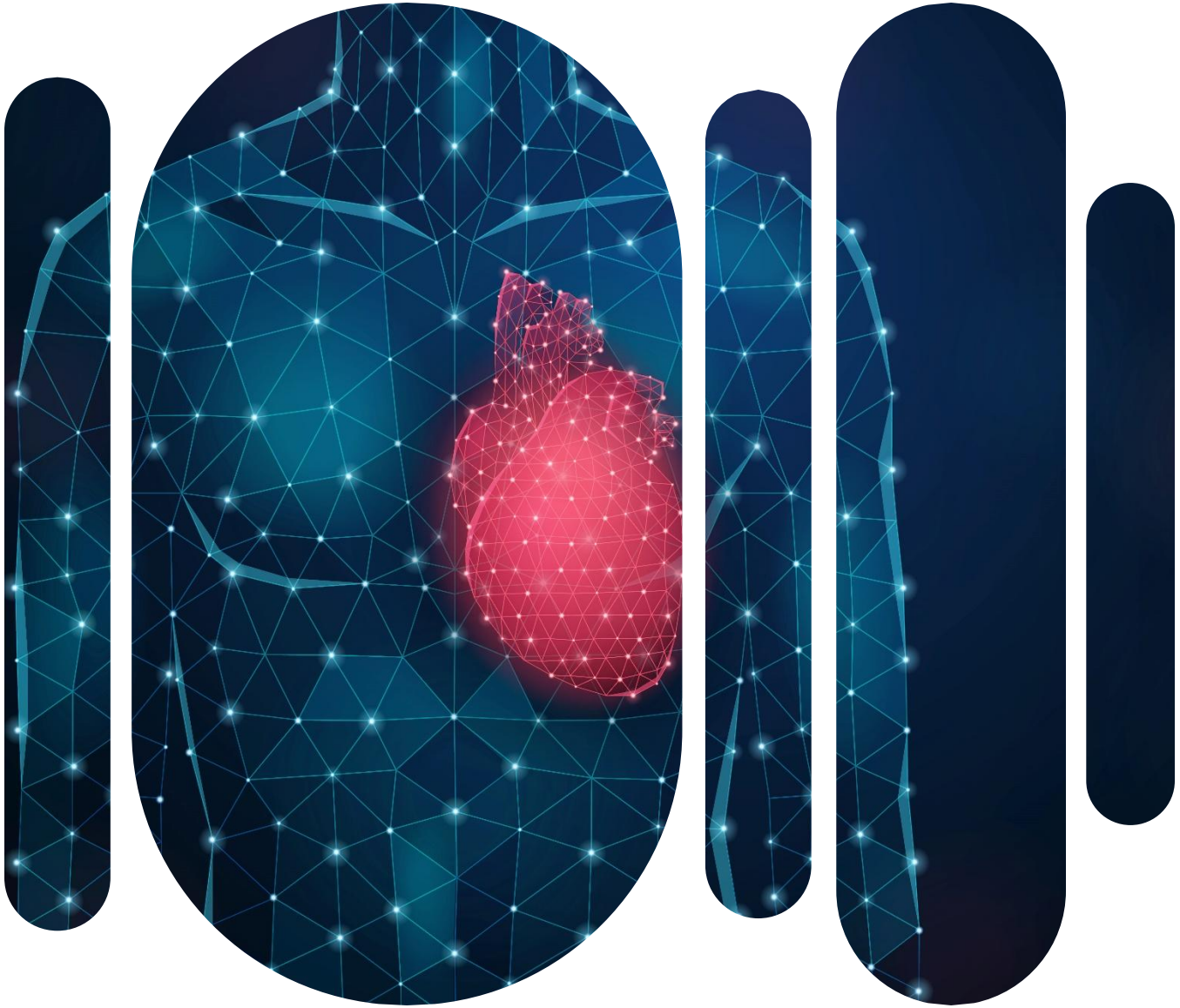
COMPREHENSIVE RANGE OF SERVICES



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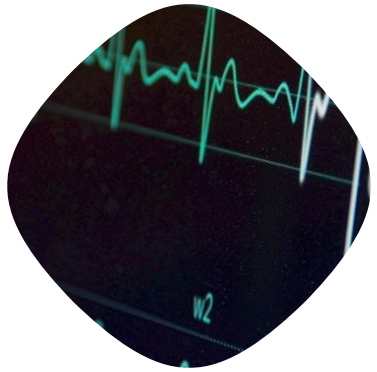
In vivo exploration of cardiovascular diseases

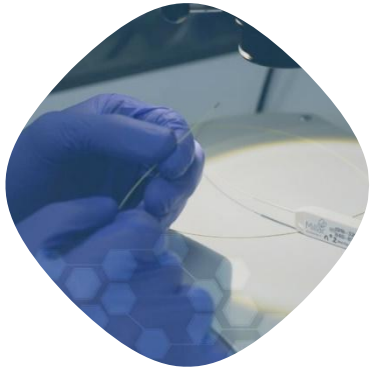
ECHOCARDIOGRAPHY

- **Gold standard** tool for comprehensive information about cardiac structure and function
- **Systolic and diastolic** function including M-mode, 2D, color, pulsed -wave Doppler, and tissue Doppler imaging.
- **Stress echocardiography**
- **Strain** analysis of left ventricle and/or left atrium
- **Left atrium** dimensions analysis
- **Pulmonary artery** flow analysis



TELEMETRY MONITORING

- Conscious freely moving animals
- Measured parameters: blood pressure, heart rate, ECG, temperature, etc.



INVASIVE CARDIAC FUNCTION

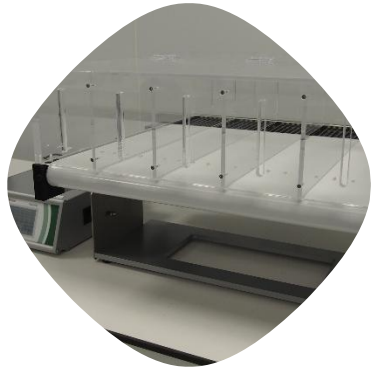
- **Millar probes**
- Accurate **pressure measurements** within the left ventricle or real time left ventricular **pressure-volume loops**

ELECTROCARDIOGRAM & HEART RATE VARIABILITY

- **Surface electrocardiogram** on anesthetized animals to measure the heart's electrical activity and highlight cardiac arrythmias.
- **Heart rate variability**: quantitative markers of autonomic nervous system activity

DOPPLER FLOW VELOCITY

- **Pulse Wave Velocity (PWV) measurements**
- Simultaneous Doppler velocity spectrogram acquisitions at two different locations
- Indicator for arterial stiffness

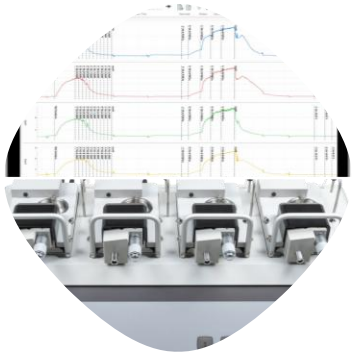


TREADMILL/CALO TREADMILL (In collaboration with Physiogenex)

- With an adjustable speed and slope, enable **forced exercise** training and accurate fatigue testing in rodents.
- Established for the **exhaustion test** on healthy mice, rats and hamsters as well as on our HFpEF models.
- Measurement of **indirect calorimetry parameters** (VO_2, VCO_2, RQ, and energy expenditure) during experimenter-defined activity profiles.

EX VIVO AND *IN VITRO* ASSAYS

FOR MYOCARDIAL CONTRACTILITY AND VASCULAR REACTIVITY EVALUATION



MYOGRAPH VASCULAR REACTIVITY, ENDOTHELIAL FUNCTION

- **Endothelial function** and **contractile properties** evaluation
- Isometric tension in **isolated arterial rings** from rodent measurement
- **Endothelium-dependent or -independent relaxation**

CELLULAR ASSAYS (under development)

- **Undifferentiated & differentiated cardiomyoblast**
- **iPSc cardiomyocytes**

LANGENDORFF PERFUSED ISOLATED HEART

- **Cardiovascular safety and efficacy** screening of new drug candidates
- **Cardio-protective effects evaluation** during **ischemia-reperfusion**

OROBOROS

- **Respiration measurement** at controlled oxygen levels
- **Redox biology** (NADH & CoQ)
- **ROS & ATP production, mt-Membrane potential** measurements

Complementary readouts

To fully characterize your drug candidates' mechanism of action and efficacy

Colorimetric assays

- Lactic acid – lactate dehydrogenase
- Creatine kinase
- Calcium
- Cholesterol, triglycerides, fatty acids
- ALT/AST
- Albumin
- Creatinine

ELISA and multiplex assays

- Hormones (pro-BNP, troponin I, insulin, etc.)
- Cytokines / chemokines panel (IL-1β, IL-6, MCP-1, TNFα, IFNγ, MIP-1α/ β; MIP-2, RANTES… etc.)

Western Blot analysis

- WES technology for any protein. on any sample/tissue.
- **Protein (western blot) and Gene (qPCR) expression on any tissue**:

Calcium signaling
Cardiac injury/overload
Cardiac hypertrophy
Glucose/fatty acid metabolism
ER and oxidative stress
Inflammation
Fibrosis

Histology analysis

- H&E
- Sirius Red
- Masson Trichrome
- ORO
- PAS staining
- Immunohistochemistry (F4/80, CD68 ED1, collagen III alpha-SMA, etc.)
- NAS scoring (steatosis, inflammation, hepatocyte ballooning fibrosis)

Nephropathy histopathology scoring (glomerulosclerosis interstitial fibrosis, etc.)

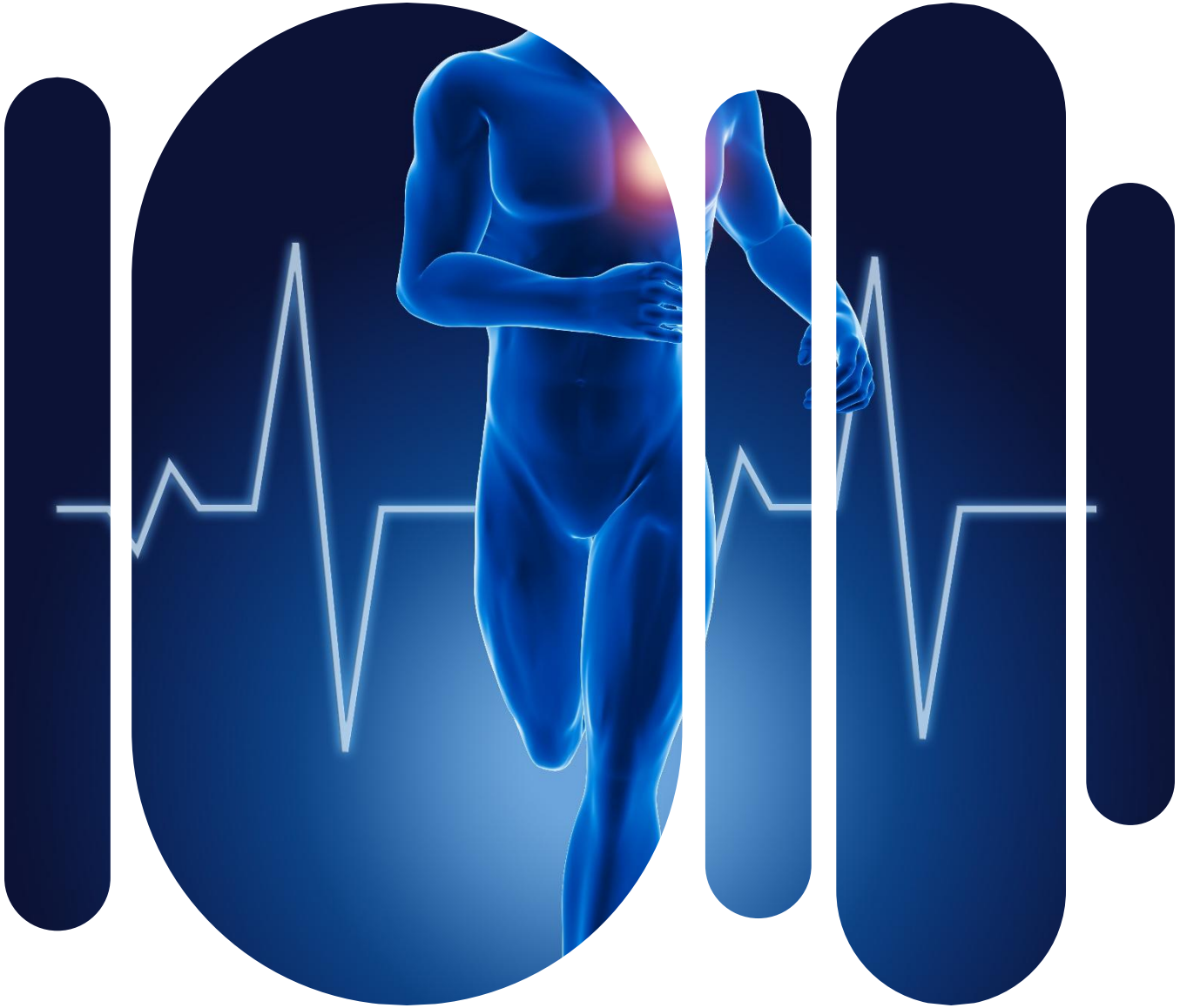
Pre-clinical pharmacology

- PK
- PD

** In collaboration with a network of experts*

PROVEN

EXPERTISE



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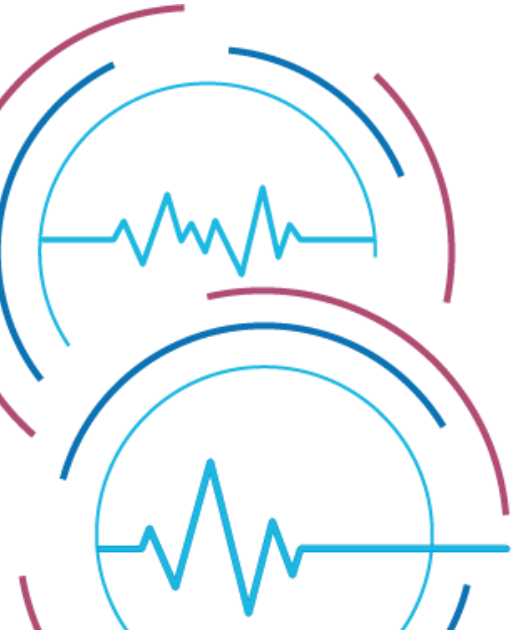
Publications showing Cardiomedex expertise in many scientific journals



› Metabolism. 2021 Apr;117:154707. doi: 10.1016/j.metabol.2021.154707. Epub 2021 Jan 11.

Elafibranor improves diet-induced nonalcoholic steatohepatitis associated with heart failure with preserved ejection fraction in Golden Syrian hamsters

François Briand [1], Julie Maupoint [2], Emmanuel Brousseau [3], Natalia Breyner [3], Mélanie Bouchet [3], Clément Costard [2], Thierry Leste-Lasserre [4], Mathieu Petitjean [5], Li Chen [5], Audrey Chabrat [6], Virgile Richard [6], Rémy Burcelin [7], Caroline Dubroca [2], Thierry Sulpice [8]

Affiliations + expand

PMID: 33444606 DOI: 10.1016/j.metabol.2021.154707

› Eur J Pharmacol. 2020 Sep 5;882:173316. doi: 10.1016/j.ejphar.2020.173316. Epub 2020 Jul 1.

Liraglutide shows superior cardiometabolic benefits than lorcaserin in a novel free choice diet-induced obese rat model

François Briand [1], Emmanuel Brousseau [2], Julie Maupoint [3], Caroline Dubroca [3], Clément Costard [3], Natalia Breyner [2], Rémy Burcelin [4], Thierry Sulpice [5]

Affiliations + expand

› Elife. 2023 Jan 17;12:e80904. doi: 10.7554/eLife.80904.

Ephrin-B1 regulates the adult diastolic function through a late postnatal maturation of cardiomyocyte surface crests

Clement Karsenty [1 2], Celine Guilbeau-Frugier [1 3], Gaël Genet [4], Marie-Helene Seguelas [1], Philippe Alzieu [5], Olivier Cazorla [6], Alexandra Montagner [1], Yuna Blum [7], Caroline Dubroca [8], Julile Maupoint [8], Blandine Tramunt [1 9], Marie Cauquil [1], Thierry Sulpice [8], Sylvain Richard [6], Silvia Arcucci [1], Remy Flores-Flores [1], Nicolas Pataluch [1], Romain Montoriol [3], Pierre Sicard [6], Antoine Deney [1], Thierry Couffinhal [5 10], Jean-Michel Senard [1 11], Celine Galés [1]

Affiliations + expand

PMID: 36649053 PMCID: PMC9844986 DOI: 10.7554/eLife.80904

› Dose Response. 2022 May 17;20(2):15593258221099281. doi: 10.1177/15593258221099281. eCollection 2022 Apr-Jun.

Highly Diluted Antibodies to eNOS Restore Endothelium Function in Aortic Rings From Hypertensive Rats

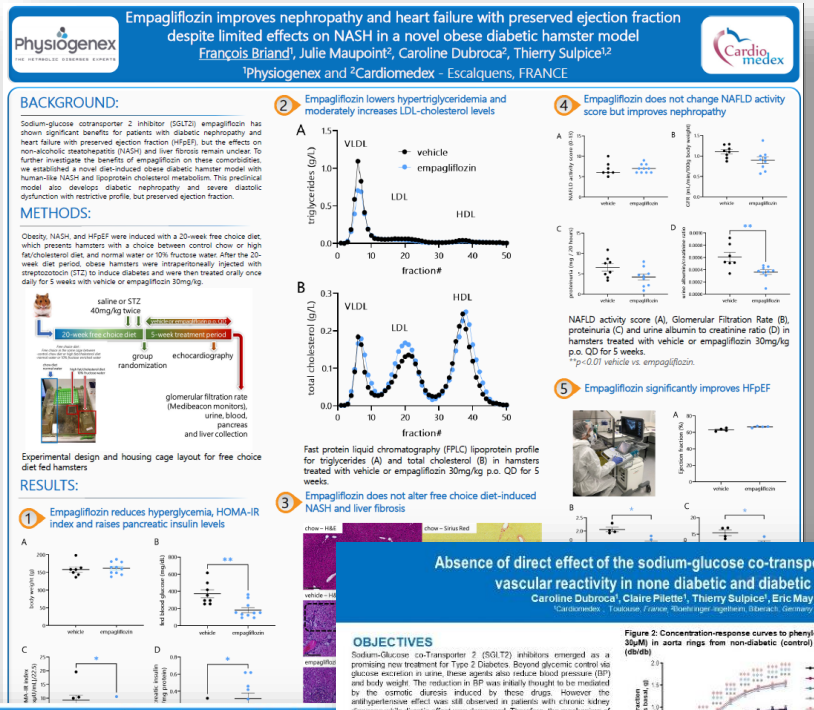
Nataliya V Petrova [1 2], Sergey A Tarasov [1 2], Oleg I Epstein [1 2], Caroline Dubroca [3], Thierry Sulpice [3]

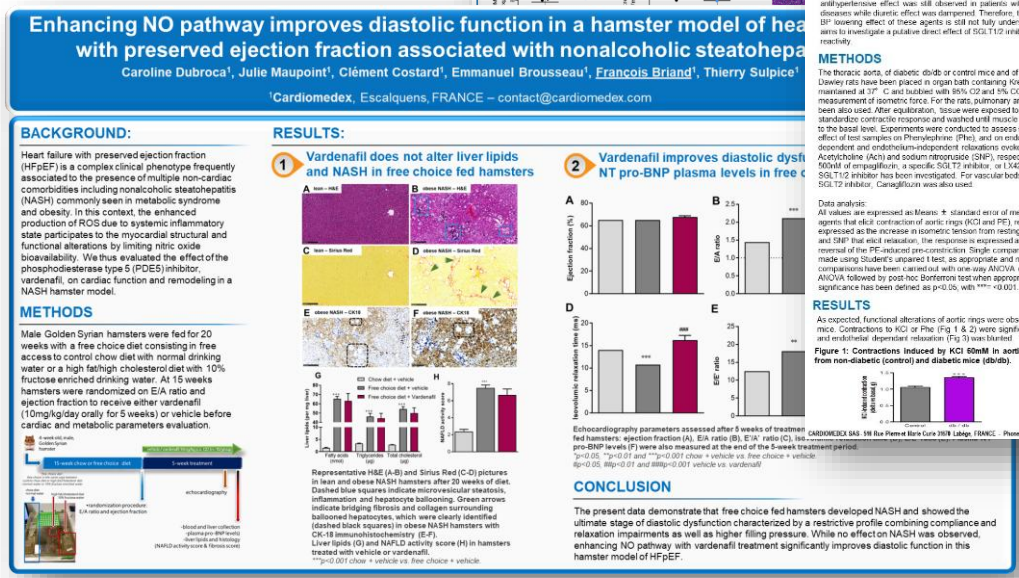
Affiliations + expand

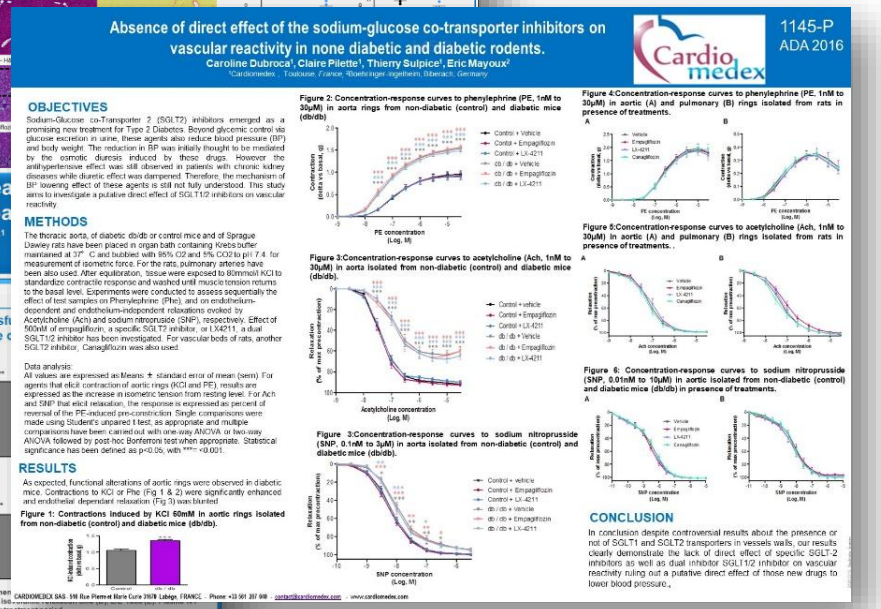
PMID: 35602582 PMCID: PMC9118459 DOI: 10.1177/15593258221099281

POSTERS and TALKS during international conferences

To make our **innovative new services and models** known for your drug evaluation success, early.







What if we work together?

Major steps ahead

- **Interactive process**
- **Data secured and fully provided to customer**
- **Confidentiality/Intellectual property defined contractually**

Partnering with us to launch your new therapies successfully

Over **10 years of experience/expertise** in drug development with major pharmas & biotechs.

Unique, **translational** preclinical models published in **major scientific journals**

Time and cost-effective preclinical studies to reach the clinical stage development

High added-value partnering with Physiogenex, Janvier Labs, JC Discovery and the other members within the Group to move your therapies successfully towards clinical stages.

As R&D studies providers, we propose and set-up **dedicated tools/animal models** to target your needs

Cardio medex
JANVIER GROUP

Cardiomedex and you

JANVIER GROUP

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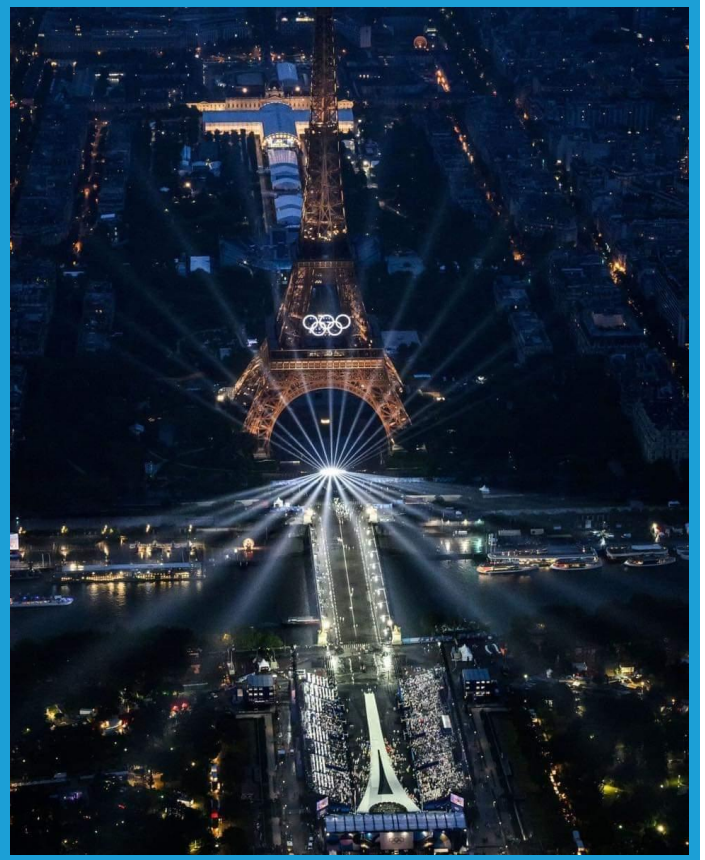
Merci



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