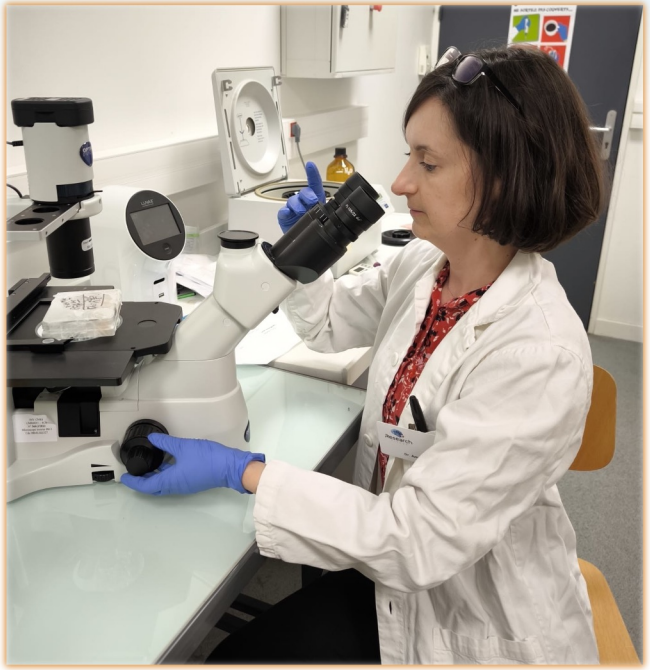
Research
PIECES

« To understand the Physiology of the CNS to accelerate the drug discovery against neurological diseases. »*



**** or Central Nervous System***

ID of Research PIECES

Provide innovative biological preclinical models to dissect molecular, cellular & tissular mechanisms in a physiological 3D-living tissue environment.

> **Started in** July 2022

> **Mark has registered with the USPTO** (Apr. 28, 2026)

> **BioLabs Community**

> **Deeptech Label ; Accreditation from MIMS**







> **Activity :** R&D, Design & Production of models, Services

> **Products** : Preclinical tailored-made models of Central Nervous System (**CNS**) & Alternative to animal model (**NAM**), for reducing animal used in research ***(Carnot Rendez-Vous Health Innovation Challenge Award 2025-Servier France)***, **to accelerate the discovery of future drugs against neurological diseases** (neurodegenerative diseases, cancer, epilepsy, infectious & rare diseases, etc.).

> **Customers :**

- Pharma/Biotech
- CRO
- Institutes/Academia

(* or House of the Innovation & the Specialized Medecine, in Houston)

We operate in the global neurology CRO* market

** or Contract Research Organization*

> **The market in which we operate is huge**

Global neurology contract research organization market
(US$ 7 Bn in 2021** & expected to reach **US$ 14.2 Bn by 2032*)

> ***Market trends :***

- **R&D and Innovation for development of new molecules (neurological diseases & cancer)**

- **Innovative** & **Alternative models** (NAM = New Approaches Methodologies), for reducing animals used in research in the different stages of **early drug discovery**

Therapeutic areas :
Neurodegenerative diseases (Parkinson, Dementia, etc.)
Cancer
Infectious diseases

Cancer (7772) & Neurology (3301) *have the most drug candidates in 2022**

Innovative preclinical models for different stages of new drug discovery
*(Global market **US$ 162 Md in 2030*)***

(from SVP analysis)*

Ineffective system on the market to model the CNS

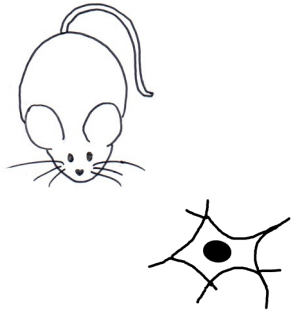


> **Many neurological diseases, as neurodegenerative diseases** (Parkinson, Alzheimer etc.), **do not have yet any treatments.**

> **More than 90 % of future therapeutic molecules fail in clinical trials phases because of a lack of robust & translatable preclinical models.**

> **To prevent molecules from failing in clinical trials, <u>we need :</u>**

> **<u>Powerful preclinical models</u> :**
- between *in vitro & in vivo,*
- to understand the CNS,
- to generate robust & translatable results,
- to reduce animal used in R&D, as an alternative to animal model or NAM*.



(* or New Approaches Methodologies)

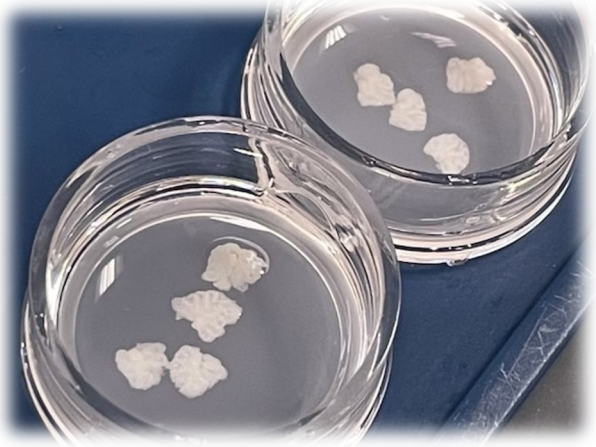
Currently, only artificial alternative models (organoids, Bioprinting), with limitations are available.

Research PIECES removes the limitations in Neurology

> **Models with advantages but also limitations**

Models	Cellular model *« in vitro »*	Animal model *« in vivo »*	Organoids	Bioprinting	Research PIECES products
Physiological		☑	artificial	artificial	☑
High level of complexity		☑			☑
Rapid speed of production	☑		☑	☑	☑
Accessibility to cellular mechanisms	☑		☑		☑
Access to all cell types of the organ		☑			☑
Control age of the tissue	☑	☑			☑
Alternative to animal model (EU rule 2030)	☑		☑	☑	☑

Preclinical 3D-Models+



+ **Robust & Translatable**
+ **Physiological** (*vs* organoids, Bioprinting)
+ **Customized**
+ **Alternative to animal models or NAM**
+ **High level of complexity** (= *in vivo*)
+ **Large scale**
  & multiplicity of analyses in parallel

> **We have the innovation :**

- **to accelerate the early drug discovery**
  (screening, drug sensibility, toxicity test, etc.)
- **to decrease the risk of failure *in vivo* testing**
  (currently mandatory & regulatory)
- **to save time & money with a better accuracy**

No direct competitors all over the world

> **Others companies are developing 3D models but :**

- these are not **living** tissue,
- these are not « **tailored-made** » models,
- these do not provide **pathological models,**
- this is not their area of expertise or **main activity,**

> **They provide 3D models based on organoids/C-stems & Bioprinting, but :**

- these are **artificial** (not physiological as us),
- they can **not control the age of the tissue** (key point in neurodegenerative diseases),
- **they do not keep the 3D functional structure & complexity of the brain** (all the cell types, connections, etc.),
- **they do not keep the lipid composition** (fundamental for understanding the physiological mechanisms of the CNS).

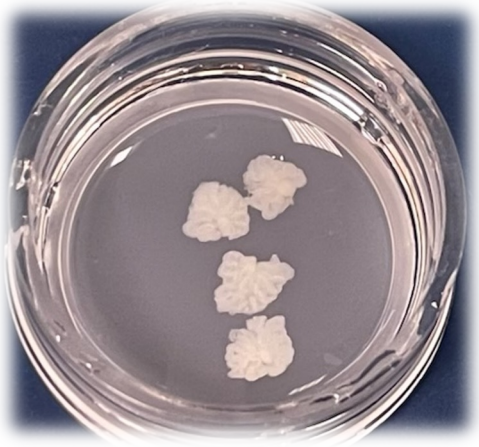
We are the only one to provide 3D physiological customizable models, necessary to access CNS complexity.

Unrivaled performance, versatility & efficiency

Research PIECES

Our model permit to :

- **dynamically access to molecular mechanisms** (= *in vitro*)
- **access all cell types at the same time microglia included** (= *in vivo*)
- **preserve the lipid composition** (neurodegenerative diseases)
- **> 4 weeks in culture** (tissue integrity & cells viability)
- control the age of tissue is (age of the pathology)
- quickly generate models (only few days)
- **induce pathological models** (proteinopathy in 2-4 weeks *vs* 6 months *in vivo*)



- Large-scale analysis

- Vectorisation (AAV, lentivirus)
- Delivery of mRNA, small molecules, etc.
- Collecting the medium (secreted molecules)

- Multiplicity of analyses in parallel

- Biochemistry
- Immunostainings (> 12)
- Proteomics, epigenetics, etc.

(without tissue storage limitation)

NO NEED :

- **Expertise and to train the staff**
  (perform surgery through the skull to access brain & appropriate culture conditions)
- **Equipment, materials, etc.**
- **Big costs** (associated with housing animals)
- **Drastic regulations** (working with animals)

Customizable 3D-models & large Services provided

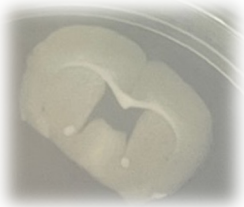
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Design of protocols

3D-Models « customized »

Services

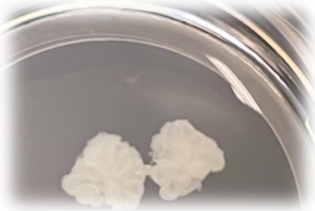
Examples of brain areas :



Anterior cortex



striatum SVZ

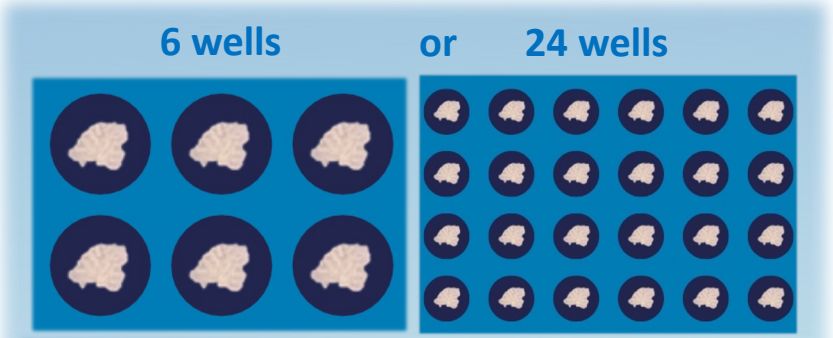


½ cerebellum

etc.

> **Brain areas** (Anterior to posterior area)
> **Age** (adult or postnatal)

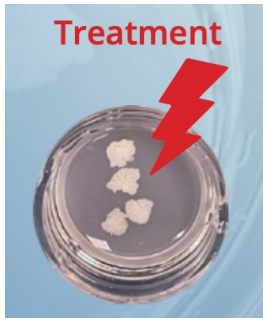
Configurations & formats :



> **Live :** living slice
> **Fixed :** fixed slice for staining
> **Tube :** frozen slice for protein analysis

> **Wild-type or Transgenic**
> **Induction of pathological pathways** (without sterotaxic injection)

Treatments & Analyses



- Viral infections (AAV, lentivirus)
- mRNA
- ASOs
- Small molecules
- Fibrils, oligomers
- Etc.

Cell viability
Screening of molecules
Toxicity test
Drug sensitivity
Stainings
Biochemistry
Proteomic
Etc.

All the different CNS areas are targeted

Research PIECES

Preclinical innovative models for all the stages of the « new early drug discovery » (screening, lead of molecules, target validation, tests of toxicity, etc.)

Preclinical innovative models for the early stages of the micro medical device (microelectrode)

Therapeutic areas :
Neurodegenerative diseases (Parkinson, Alzheimer, MSA*, ALS, Dementia, Huntington, Prion, etc.)

Therapeutic areas :
Cancer (glioblastoma)
Epilepsy,
Infectious diseases
Rare Diseases (Krabbe), etc.

Physics areas :
UV, frequency, ultrasounds, radiations, etc.

Microdevice (microelectrode)

(* Multiple System Atrophy, Amyotrophic Lateral Sclerosis)

Proposed project (2 examples)

Example 1 : Researcher in Pharmaceutical Industry in neurodegenerative field

They have : Results *in vitro* (2D) & *in vivo* models
= with 1 molecule with protective effects (against protein accumulation)

They need :
- to dissect mechanisms (molecular, cellular and tissular level)
- to screen more molecules
- to test neuroprotective effect
- derisking before going to *in vivo* models

They do not have :
- laboratory (need a CRO)
- experimental platform / no autorizations

Example 2 : Researcher in Academia in cancer field (glioblastoma)

They have : Results *in vitro* (2D)

They need :
- need more data to write a grant
- to increase the TRL
- induce pathological mechanisms
- dissect mechanisms (molecular, cellular and tissular level)

They do not have :
- autorizations (animal experimentation accreditation)

Provided solution (2 examples)

Example 1 : Researcher in Pharmaceutical Industry in neurodegenerative field

We provide :

Design of protocols

- **Species** (rat, mouse)
- **Age** (postnatal, adult)
- **Brain area** (cortex, cerebellum)

3D-models « tailored-made »

- **From wild-type or transgenic mouse**

Services

Treatments : inducing of pathological pathways by viral infection (AAV or lentivirus), without sterotaxic injection

Analyses : Screening of molecules, toxicity test, cell viability, etc.

Example 2 : Researcher in Academia in cancer field (glioblastoma)

Design of protocols

- **Species** (rat, mouse)
- **Age** (postnatal, adult)
- **Brain area** (cortex, striatum)

3D-models « tailored-made »

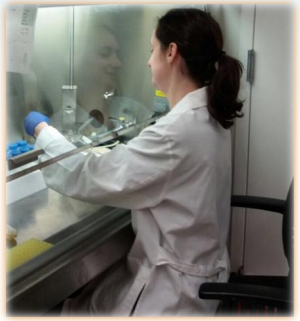
- **From wild-type or tansgenic mouse**

Services

Treatments : inducing of pathological pathways by neurospheres injection, without sterotaxic injection

Analyses : Drug sensitivity, stainings & biochemistry analyses, etc.

Our team & partners



> **Dr. Amandine Roux (Founder & President, Neuroscientist)**
- **PhD in Neurosciences** UPMC (University Pierre and Marie Curie, Paris France)
- **> 10 years in Academia** (6 years in US as Post-doc & Research Associate)
- **Funding from US & French governments; & associations** (**NIH**, France Parkinson Association, etc.)
- **Talks at International Meetings** (Society for Neurosciences, etc.) & **papers** (Journal of Parkinson's disease, etc.)





> **Scientific & Advisory Boards**
- Dr. Dominique Cambon (Head of Department, Saintes Hospital, France)
- Mr. Alain Roux (Inventor)



> **Technician and developer**

> **Recruitment in progress !**

> **Partners**
- **Spartners by Servier & Biolabs at Campus Paris-Saclay**
- **CNRS** (The French National Centre for Scientific Research)
  European Consortium, LIPAGG (4,6M€)
- **Mutualia** (Health Insurance)
- **MIMS (House of Innovation & the Specialized Medecine)**
  (France & Houston)

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Contenu conçu et proposé par L'équipe du Figaro Services pour Biotech

DOSSIER

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Biotech et santé, des innovations à taille humaine pour transformer le quotidien

Envato / Yuri Arcurs peopleimages.coom

Research PIECES : des modèles innovants pour révolutionner la recherche sur le cerveau

Par L'équipe du Figaro Services

Il y a 14 heures



«3D-Living System », modèles biologiques physiologiques développés par Research PIECES. *A. Roux, Research PIECES*

Le cerveau reste l'un des territoires les plus mystérieux du corps humain, Et celui qui concentre certains des plus grands défis médicaux : maladies neurodégénératives, cancers, effets des polluants. Dans ce contexte, la jeune start-up Research PIECES, installée à Poitiers, développe des modèles biologiques

Le Figaro

Biotech 2025 Special Report

« Biotech, e-Health, silver economy : when innovation takes on a human scale ».

(October 1st , 2025)



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Research PIECES : accélérer la recherche en neurosciences grâce à des modèles biologiques nouvelle génération

Amandine Roux présentant l'anatomie du cerveau au laboratoire. ©A. Roux/Research PIECES

Forbes BrandVoice Paid program

16 mars 2026

Le Forbes France

« Research PIECES : accelerating neurosciences research using next-generation biological models ».

(March 16th 2026)



Les chercheurs impliqués dans le projet LIPAGG : Lucie Khemtemourian, Christian Griesinger, Sandrine Ongeri Anna Erlandsson, Céline Galvagnion, Gunnar Schröder Carmelo La Rosa, Birgit Strodel, Rita Guzzi © Hartmut Sebesse, MPINA (Allemagne)

Accueil > Actualités

LIPAGG, un projet européen pour mieux comprendre la formation des fibres amyloïdes

LIPAGG, European project to better understand the formation of amyloid fibers

maladie d'Alzheimer, la maladie de Parkinson et le diabète de type 2, cachent encore de nombreux secrets. Le mécanisme d'endommagement cellulaire induit par les protéines amyloïdes est au cœur de LIPAGG, un

Partner in the EU consortium LIPAGG, by the CNRS (2026)

We are looking to…

> **Increase our visibility** (2026 French Healthcare Booster)



> **Build new relationship** (already Pharma, Biotech, Academia in Europe)

> **Establish new partnership/collaboration**

- **Feedback from customers :** *« structured and qualified expertise… » (Confidential from Company)*

« slices remain alive for 4 weeks; …we can follow the injected cells over time… » (CNRS)

> **Participate in Consortium** (as already in Europe)



LIPAGG, European project to better understand the formation of amyloid fibers

Partner in the EU consortium LIPAGG, by the CNRS (2026)



Research PIECES

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