

AFSSI
PILIER DE L'INNOVATION

PREMIER PÔLE
DE RECHERCHE
& DÉVELOPPEMENT
PRÉCLINIQUE
EN FRANCE



LES ENTREPRISES
PARTENAIRES DE VOTRE R&D

afssi.fr

Les **membres AFSSI**
ont la **parole**

WEBINAIRE


CYPRIO
Spheroid Revolution

Faire de la France le leader de la R&D en santé



Raphaël DURAND
CYPRIO SAS

Romainville

+33 6 07 40 82 72

raphael.durand@cyprio.fr

www.cyprio.fr

Webinaire

LES MEMBRES AFSSI ONT LA PAROLE

25 JANVIER 2024

15h00

Elodie Millerot
Business Developer

Nicolas Demoures
Business Developer

Raphaël Durand
CEO et Président

bioKryo bioKryo CYPRIO

NOTRE ACTIVITÉ

CYPRIO développe et commercialise des modèles cellulaires 3D (sphéroïdes/organoïdes) grâce à une technologie unique d'encapsulation. Ces modèles prédictifs sont destinés à la recherche, aux services R&D et à l'industrie pharmaceutique.



1 – About Us

- Founded in 2017 following 10 years of R&D and collaboration between the Paris School of Industrial Physics and Chemistry (*ESPCI Paris*) and industrial partners
- Strong expertise in physico-chemistry, 3D cell culture, liver biology and tissue engineering
- Shareholders and founders: scientists, a scientific foundation and private business angels
- Strategic Committee: key leaders in pharmaceutical industries, microfluidics and business development
- Our Team:
 - R&D Engineers in Physics, Biology, Chemistry and Biochemistry (all PhD.)
 - Production Engineers
 - Project leaders in specific areas like cryopreservation
 - Business Developers
- Our headquarters located very close to Paris includes 250 sqm = 2,700 sqf of labs (L1 & L2) dedicated to production and R&D
L2 Labs are fully equipped with the most recent technology like the COPAS F-1000 robot





2 - Rationale: The Crucial Need for New Predictive Cell Models

➔ Going faster and further in development & therapy

! *Comprehensive Solutions: Cells and Technology, closer and to organs...*



➔ Towards the end of animal experimentation?

! *Predictivity issues*
A lot of drugs failed in clinical trials...

Why animal studies are often poor predictors of human reactions to exposure
Michael B Bracken J R Soc Med 2008; 91: 120-122. DOI 10.1258/jrsm.2008.098022



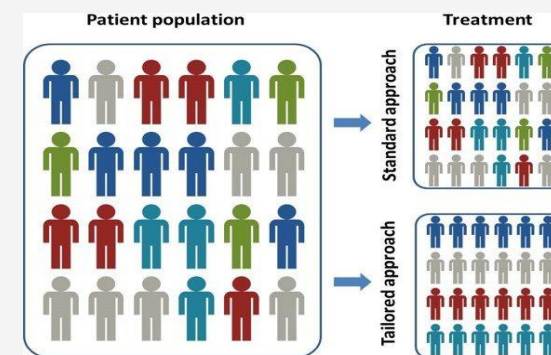
For precision and personalized medicine
Quickly find the right treatment...

nature
Misleading mouse studies waste medical resources
Erika Check Hayden 26 March 2014

Limitations of Animal Studies for Predicting Toxicity in Clinical Trials
Is it Time to Rethink Our Current Approach?
Gail A. Van Norman, MD JACC: BASIC TO TRANSLATIONAL SCIENCE VOL. 4, NO. 7, 2019 NOVEMBER 2019:845-54

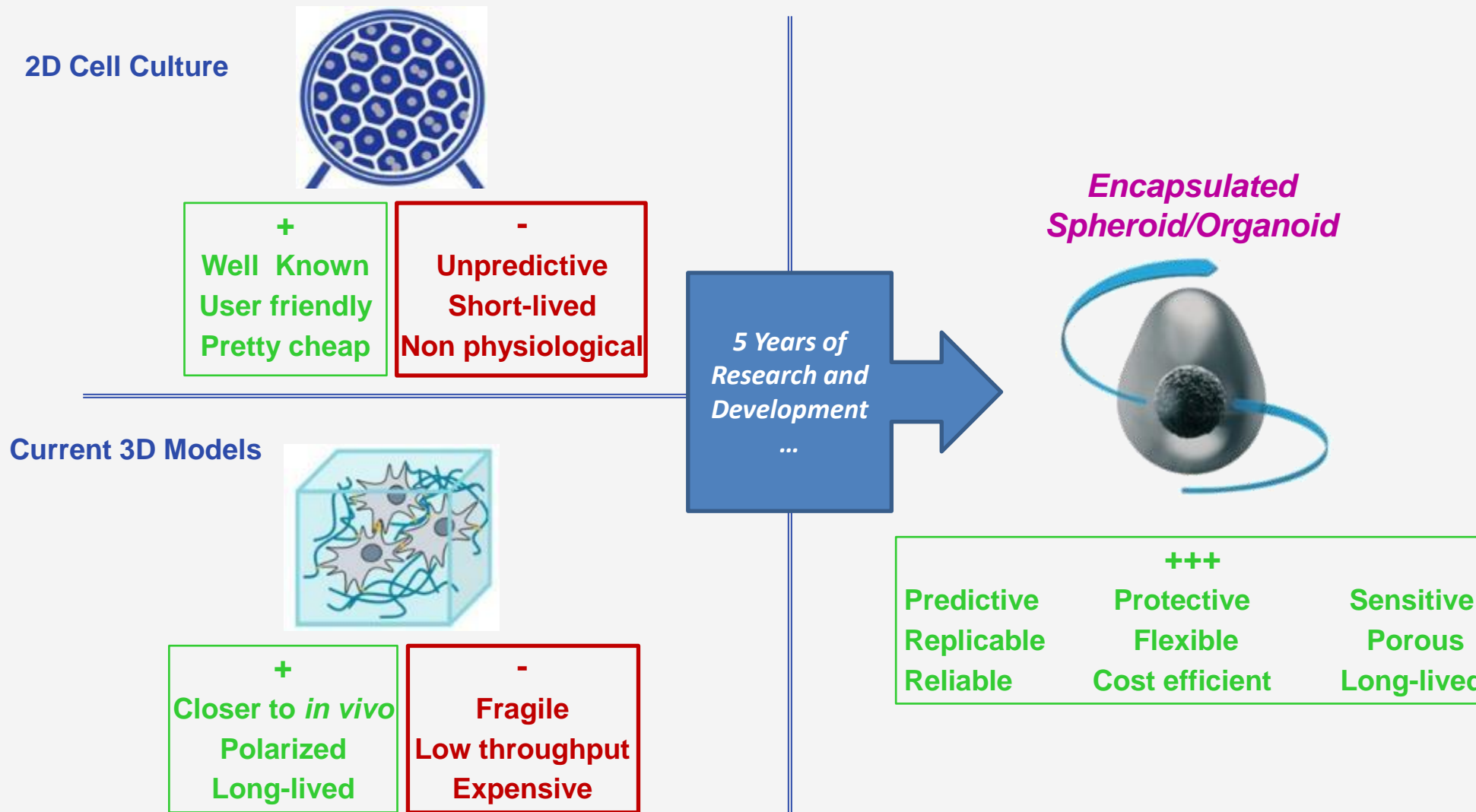
Science 10 JAN 2023 • 5:30 PM • BY MEREDITH WADMAN
FDA no longer needs to require animal tests before human drug trials

! *Ethical concerns and 3Rs rules & regulations*
EU already banned animal testing for cosmetics...



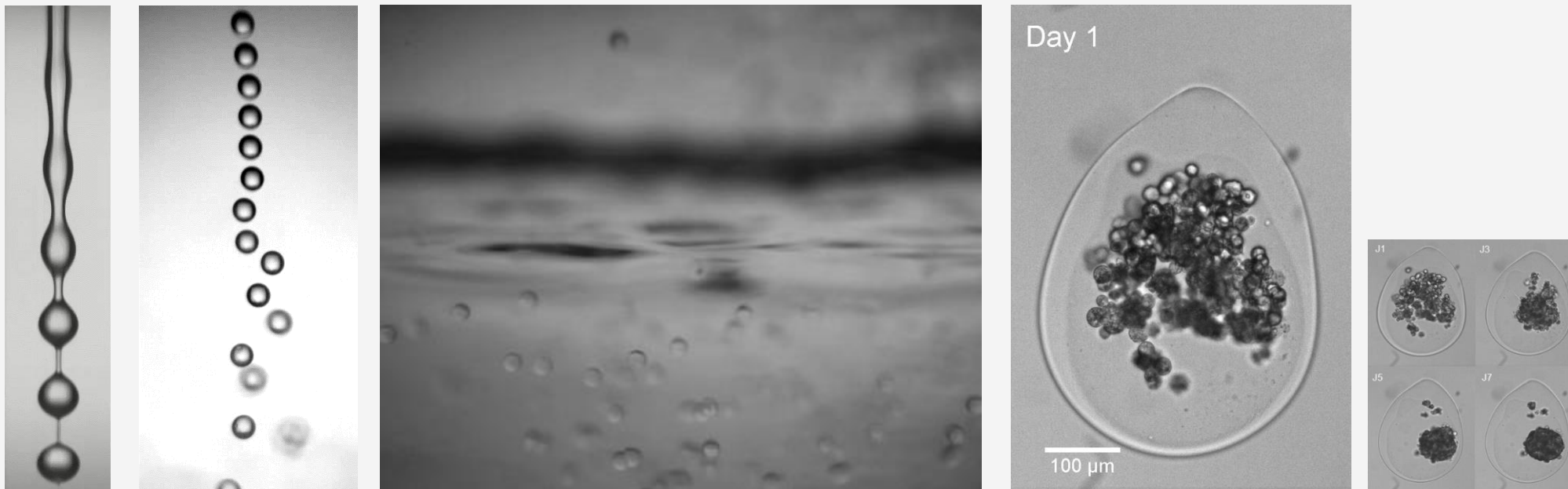


3 - The Next Generation of 3D Cell Model for Drug Discovery and Screening

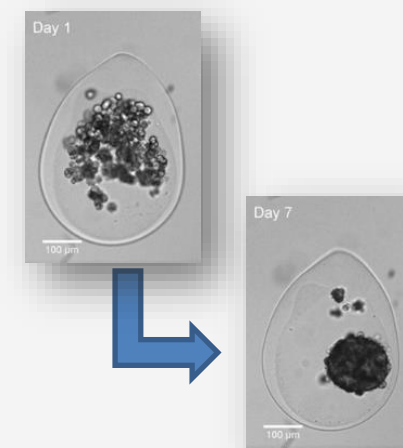




4 - A Unique and Disruptive Encapsulated 3D Model



- ➔ 3D culture of mammalian cells in **micrometric alginate capsules**
- ➔ **High-throughput** and **customizability**
- ➔ **Proprietary** technology protected by a family of 4 patents
- ➔ **Maintenance** of the biological functions during the lifespan of the spheroid

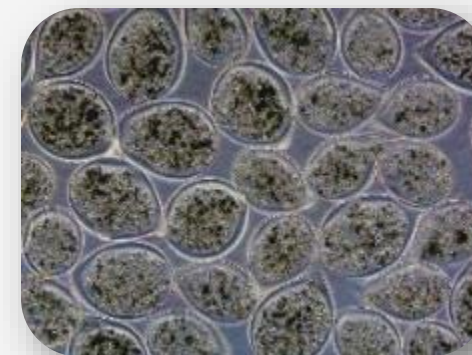




4 - A Unique and Disruptive Encapsulated 3D Model

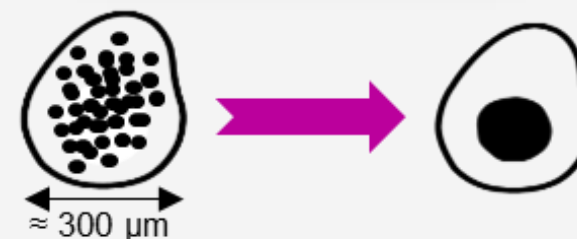
→ High throughput

- > 1,000 capsules per second
- Delivery in bulk or plate
- Easy distribution in plates/wells



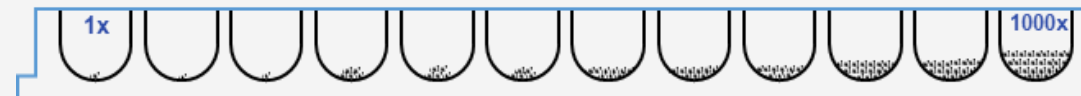
→ Preferential microenvironment

- Reduced volume enabling cells to self-assemble



→ Customizability & flexibility

- All type of mammalian cells allowed
- Customized number of cells per capsule
- Required number of capsules per well
- Easy culture media change





4 - A Unique and Disruptive Encapsulated 3D Model

→ Porosity:

- Exchanges between external and internal media
- Oxygen, nutrients, waste, drugs, growth factors, etc.

→ Protection & easy handling

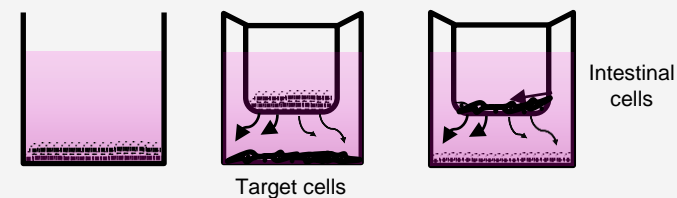
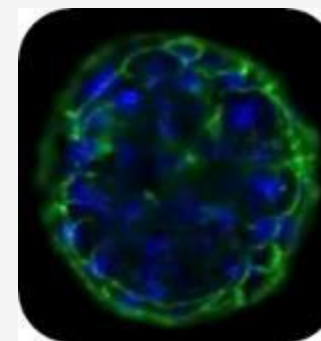
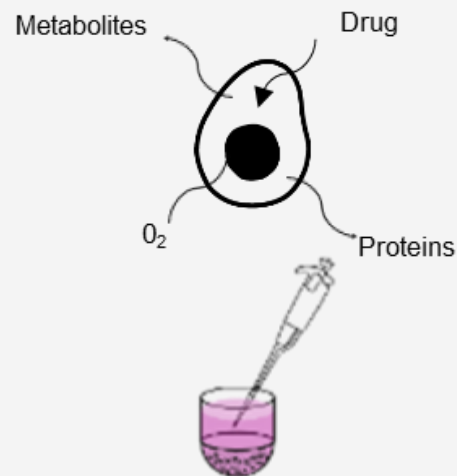
- No shear stress
- Capsules visible to the naked eye

→ Simple removal of the alginate shell if need be

- For immunofluorescence analysis
- To seed the cells in 2D after subcloning,...

→ Versatility

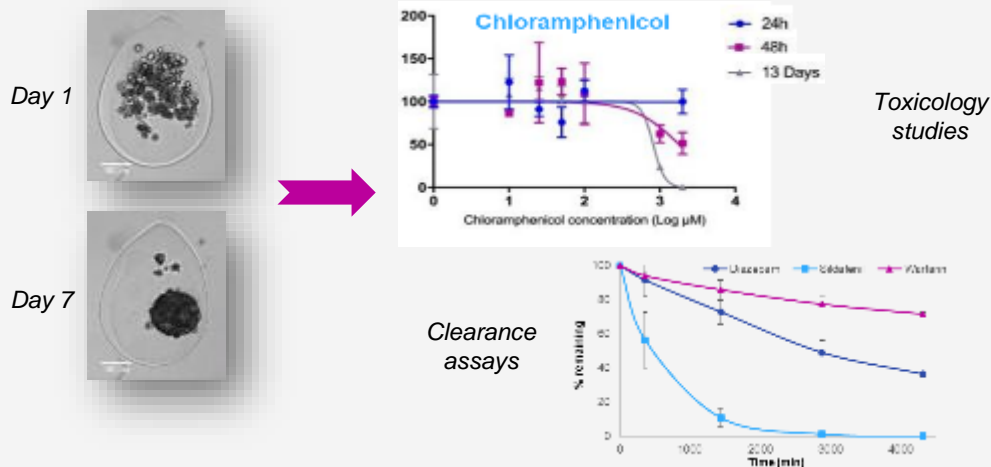
- A lot of compatible readouts : qRT-PCR, ELISA, LC-MS, etc.
- Adaptable to your plates and experiments



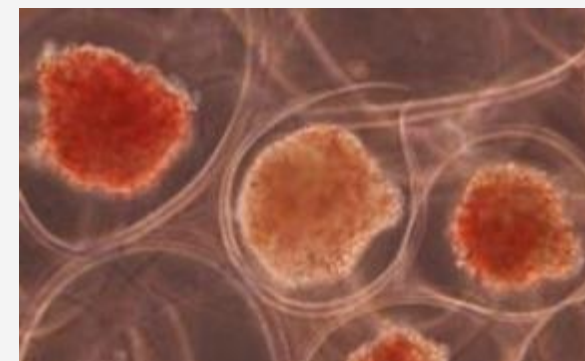


5 - An Encapsulation Technology with Numerous Applications

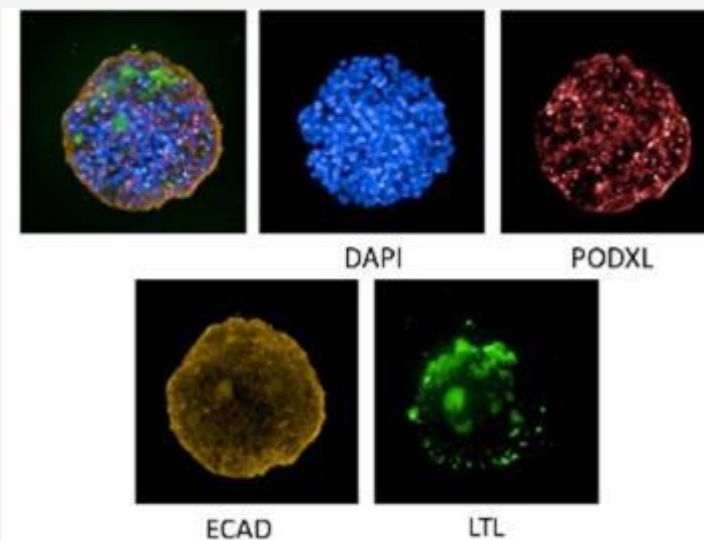
→ Primary hepatocytes (*HepatoPearls*[®])



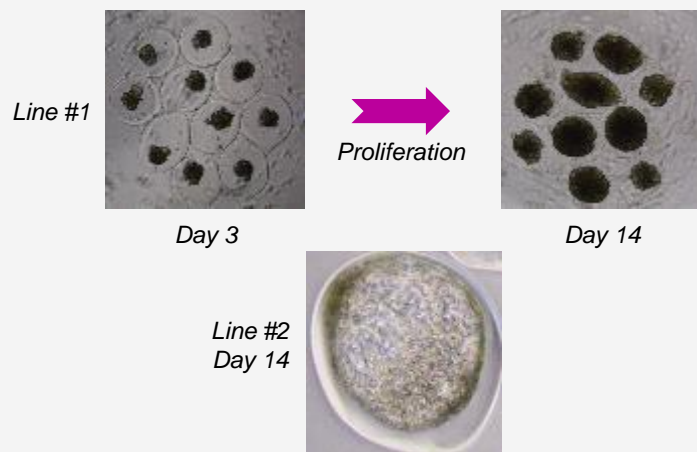
→ Human Hematopoietic Stem Cells



→ Kidney-derived iPSCs



→ Cancerous Cell Lines





5 - CYPRIO Products

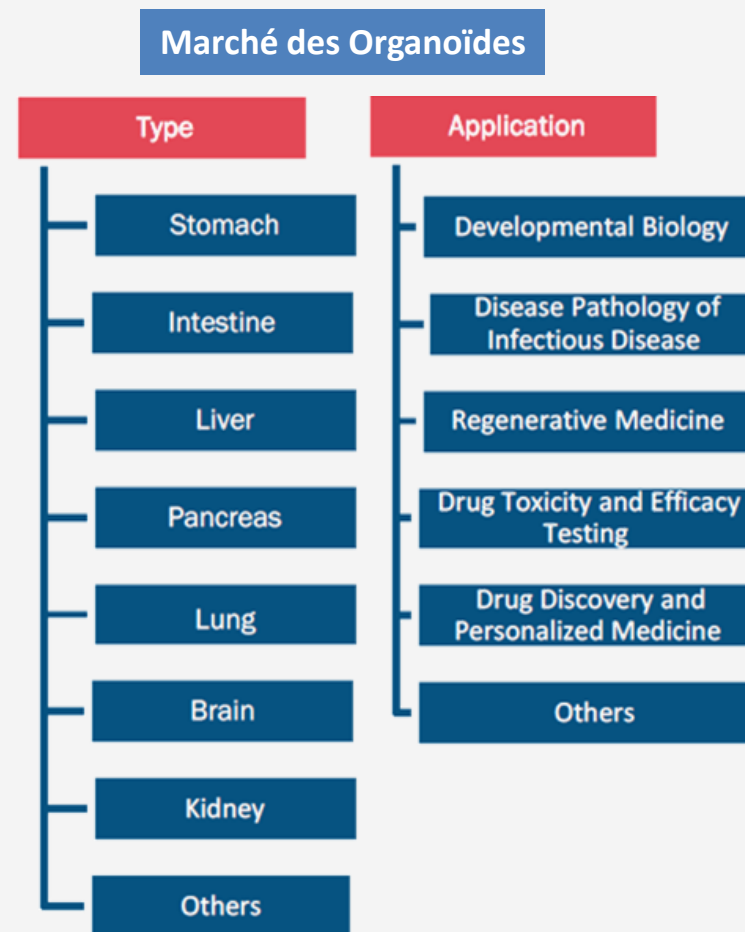
Species	Commercial Name	Description	Delivery
Human	HepatoPearl®	Encapsulated Organoid of 150-170 hepatocytes from 1 donor	<ul style="list-style-type: none"> • In any type of plates (24-48-96... wells) from 1 to 1 000 pearls/well • At 37°C • To EU and the US by air freight and road
	Pooled HepatoPearl®	Encapsulated Organoid of 150-170 hepatocytes from 3-10 donors	
	Pooling of HepatoPearls®	Pool with 3-5 donors of Encapsulated Organoid of 150-170 hepatocytes from 1 donor	
	HCLPearl® with HepaRG®	Encapsulated Organoid of 150-170 HepaRG® from 1 donor	
Rat	Rat-HepatoPearl®	Encapsulated Organoid of 150-170 rat hepatocytes (pooled)	

6 - CYPRIO Services

Species	Commercial Name	Description	Delivery
Human	“Encapsulation as a Service”	<ul style="list-style-type: none"> • Service of encapsulation of cells or cell lines in alginate microcapsules with culture media • Already delivered: kidney, several cancer lines,... 	<ul style="list-style-type: none"> • In any type of plates (24-48-96... wells) from 1 to 1 000 pearls/well • At 37°C • To EU and the US by air freight and road



- ➔ **CYPRIO a développé un modèle 3D prédictif unique qui permet de nombreuses applications**
- ➔ **La technologie CYPRIO est utilisée en Drug Discovery, Toxicologie et DMPK grâce à la flexibilité et la viabilité de ses modèles**
- ➔ **La technologie CYPRIO répond aujourd'hui aux exigences du marché en transformation : solutions in-vitro proches de l'in-vivo, fin de l'expérimentation animale et, à terme, besoins de la médecine personnalisée**
- ➔ **Le marché européen des sphéroïdes/organoïdes demeure à organiser, il est aujourd'hui emmené essentiellement par des acteurs industriels américains...**
- ➔ **A côté des modèles internes éventuels, les acteurs européens doivent s'appuyer sur des modèles existants fiables, flexibles et qui correspondent aux nouvelles demandes en termes de solutions complexes**



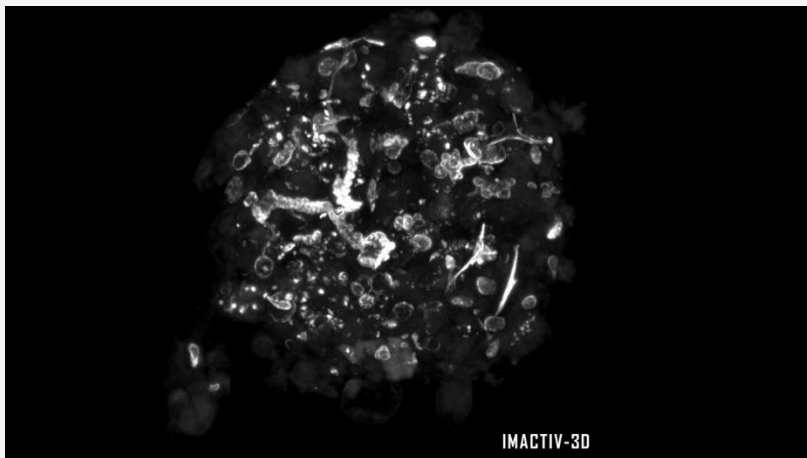


Thank you...

Contact us: contact@cyprio.fr

Follow us on...

cyprio.fr



IMACTIV-3D

HepatoPearl® Spheroid (with the courtesy of Imactiv-3D)

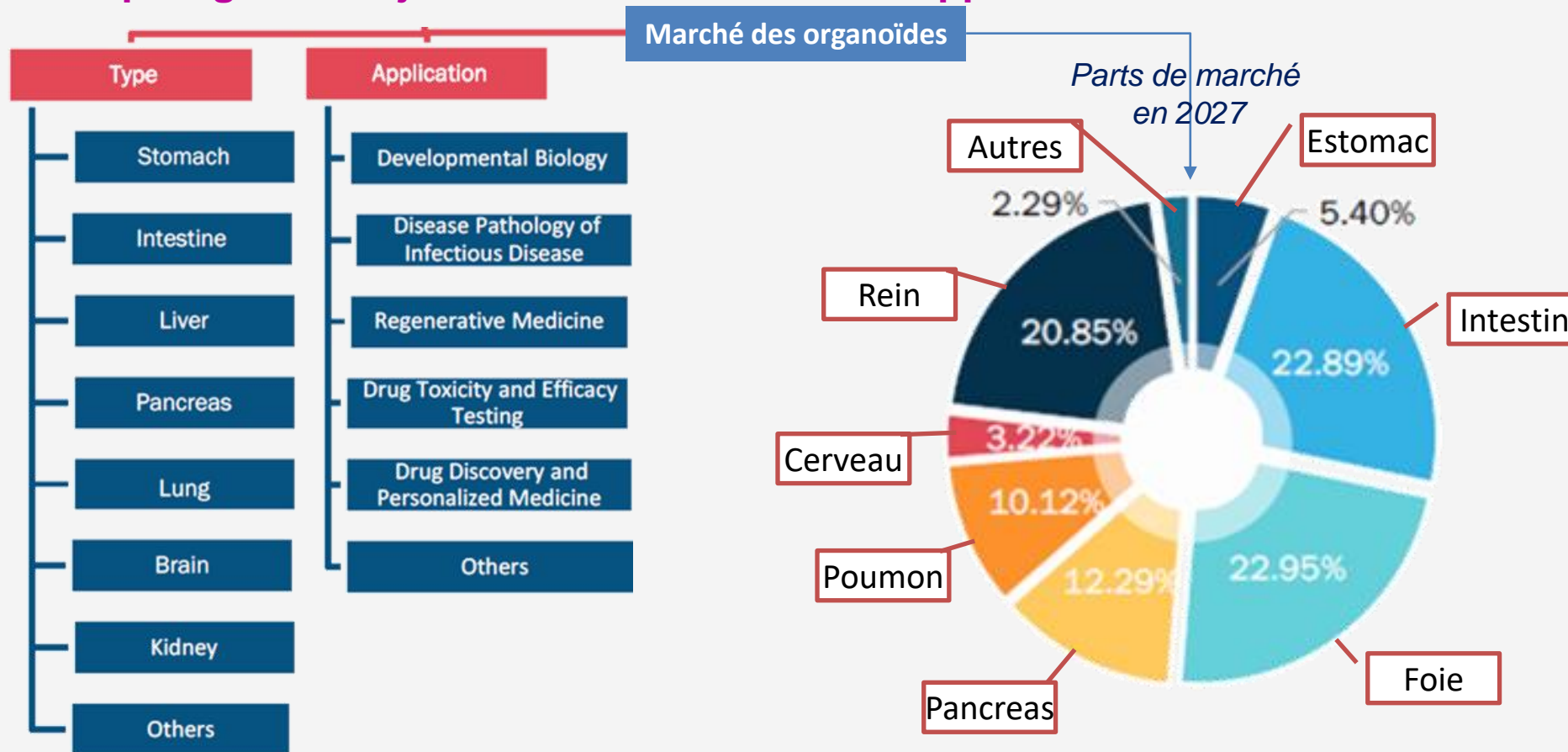


Biocitech – Bât. Lavoisier
102, avenue Gaston Roussel
93230 Romainville
France
contact@cyprio.fr
cyprio.fr



Annexe 1 – Un marché très segmenté

→ Sept organes majeurs avec de nombreuses applications



En 2027, trois organes représenteront 65% du marché en volume, mais les autres organes restent également des marchés à forte valeur

*3D Cell Culture Market – Market Future Research, Brand Essence Research, Allied Market Research