I. DEFINITIONS

ORGANOIDS

3D *in vitro* cell culture models derived from stem cells, capable of self-renewal and self-organization, and reproducing aspects of the structure and functions of the corresponding *in vivo* tissue.

SPHEROIDS

Spherical cell aggregates, 3D *in vitro* culture models with less structural complexity than organoids.

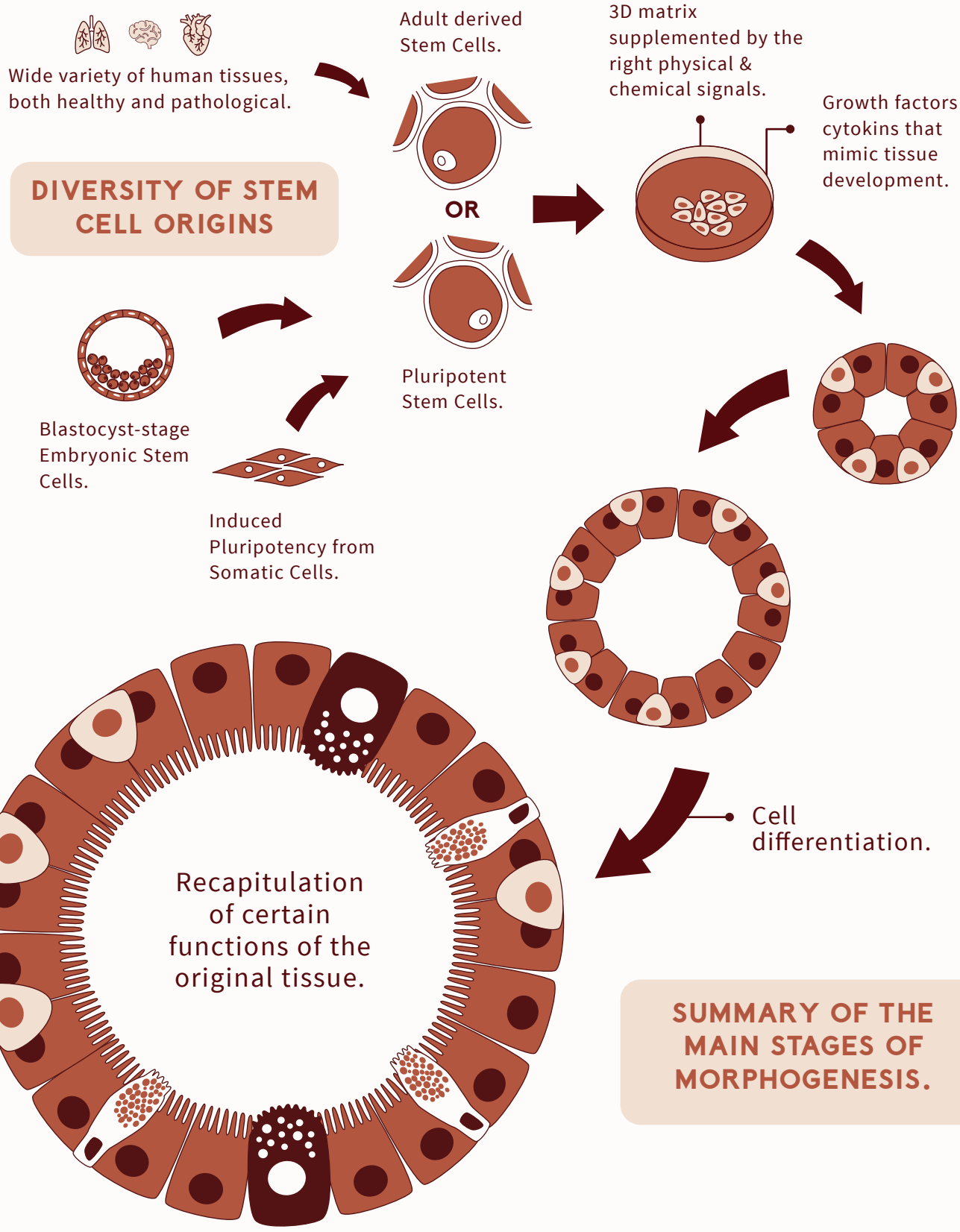
TUMOROIDS

Tumor cell spheroids, 3D models derived from patient tumors.

ASSEMBLOIDS

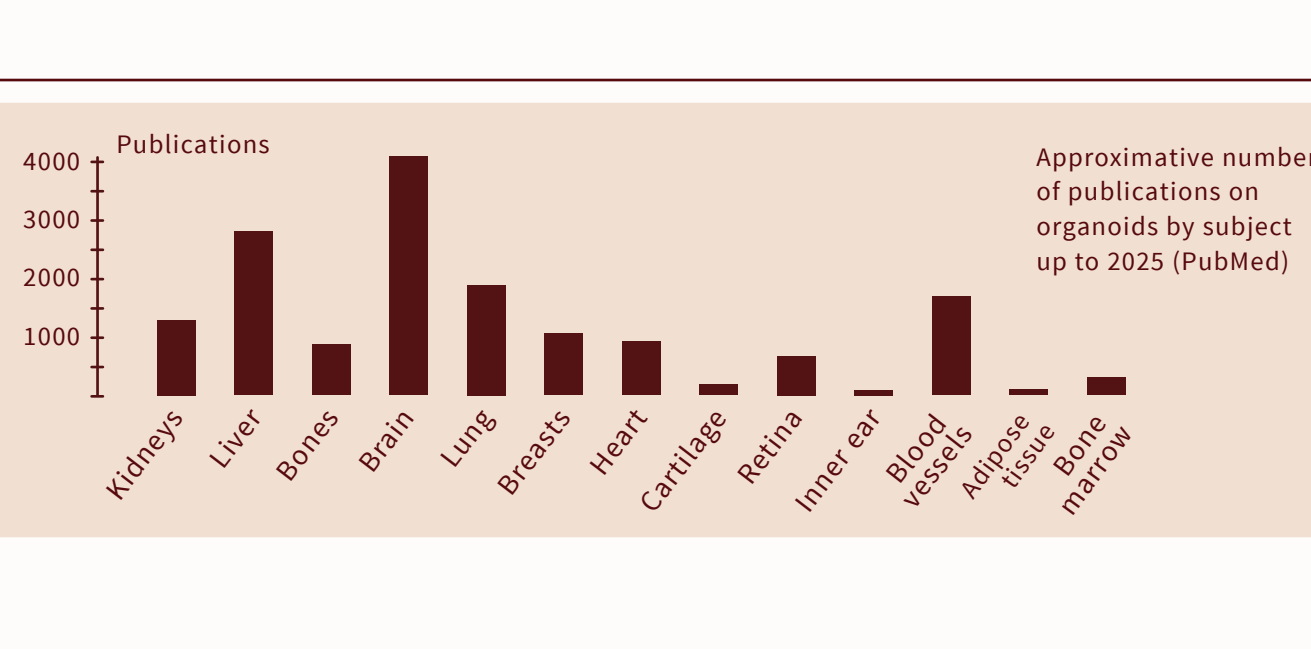
3D culture model combining different cell types.

TYPICAL EXAMPLE OF ORGANOID PRODUCTION



DIVERSITY OF STEM CELL ORIGINS

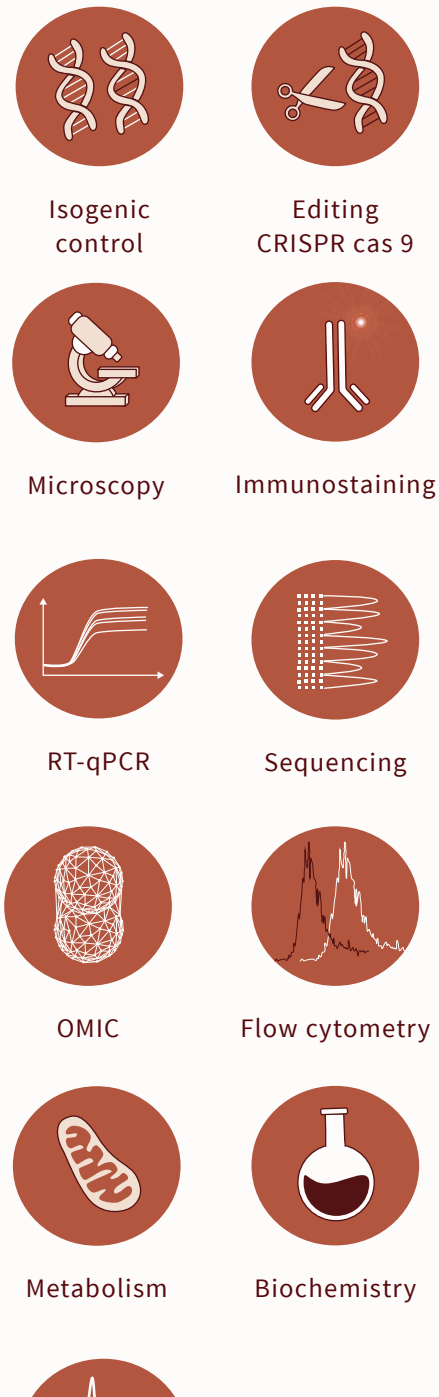
SUMMARY OF THE MAIN STAGES OF MORPHOGENESIS.



Approximative number of publications on organoids by subject up to 2025 (PubMed)

METHODS FOR VALIDATION & CHARACTERIZATION

Long and extensive processes are used to characterize function, maturity, etc.



The nature of the model (the cells of origin, the protocol used, the level of complexity, etc.) depends on the scientific question to be answered.

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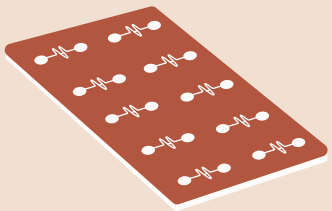
II. COMPLEXIFICATION OF ORGANOIDS

What needs to be improved or added to current organoids in order to achieve models that are increasingly similar to organs *in vivo*?

It is important to keep the purpose of organoids in mind: models do not always need to be the most complex to be useful.

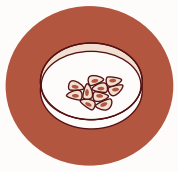
ORGANOID ON-CHIP



Organ-on-a-chip technology can contribute to addressing major technical challenges in organoid research.

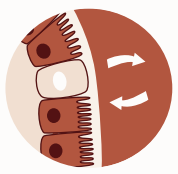
MATURATION, FUNCTION

Towards a better recapitulation of the functions of the original tissue.



CULTURE CONDITIONS

Medium suitable for different cell types in co-culture, oxygen concentration, etc.



INTERFACE WITH PHYSIOLOGICAL BARRIERS

Examples: Skin, Lungs, Intestins, Placenta, Blood-brain barrier.

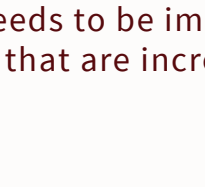
GREATER CELLULAR DIVERSITY

EXTRACELLULAR MATRIX, STROMA

Properties & remodeling of the EMC, supportive cells, etc.

SHEAR STRESS

Mechanical stress on cells.



VASCULARIZATION

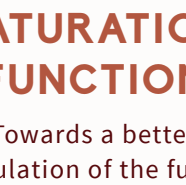
Method example: microfluidic.

MICROBIOTE, IMMUNOCOMPETENCE

Reconstitution of the immune microenvironment & microbiote.

CIRCADIAN RHYTHM

Taking it into consideration, synchronization.



INNERVATION

Construction & integration of the nervous system.

EXAMPLE OF IN VIVO TISSUE (INTESTINES)

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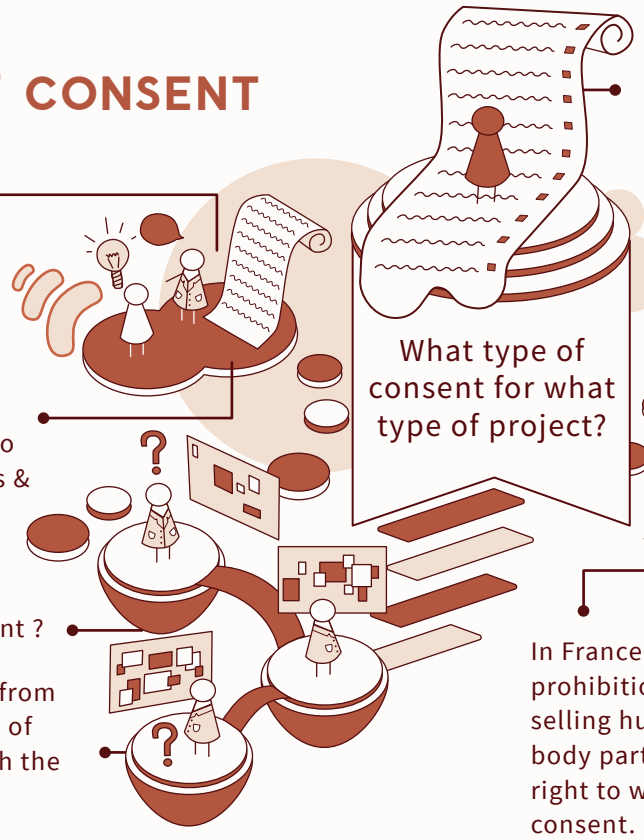
1 DONORS' CONSENT



How can patients be properly informed about the use of their donations (transparency, traceability)?

Anonymization of samples: difficult to re-contact patients & need for intermediaries.

Dynamic consent ?

Projects often evolve from the initial description of what will be done with the donations.

Add a box for non-consent to prevent abuse?

Longer chains of use of donations in space and time with the rise of biobanks.

Often, sick patients or the families of sick or deceased individuals do not wish to be contacted again after the first consent.

Differences in consent models between countries.

In the US: possibility of selling donations, with definitive consent.

In France: prohibition on selling human body parts and right to withdraw consent.

Unfair competition, as US samples pose less risk to investors.

2 PARTICULAR ORGANOIDS

For the past 50 years, bioethics has formulated strict rules to monitor the involvement of human beings in biomedical research.

Gonad models.

Embryonic models: Embryo or simple cell culture? How long should they be kept in culture?

Brain models: raises the question of consciousness and sentience.

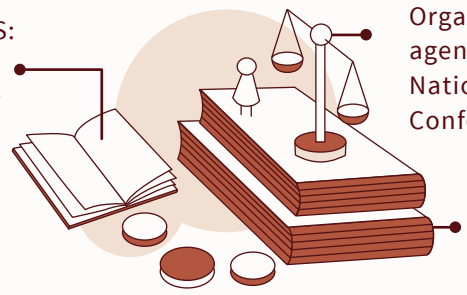
What tools and models should be used to measure consciousness?

What if it were connected to other organoids or artificial organs?

Limits of gene editing / CRISPR cas 9 method?

3 REGULATIONS AND LEGAL FRAMEWORK

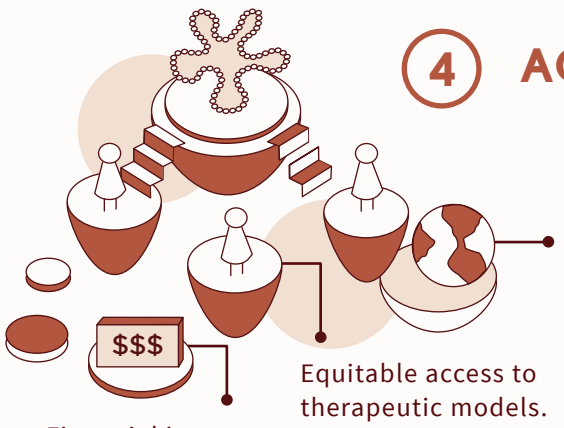
HYBRIDA GUIDELINES: European project to develop a regulatory framework for organoids.



Organoids are on the agenda of the 2026 National Bioethics Conference.

Uncertainty in applying the regulatory framework.

ORGANOIDS



Financial issues.

Equitable access to therapeutic models.

4 ACCESSIBILITY & INCLUSIVITY

Diversity of the populations from which the samples originate: ethnicity, sex, gender, social background, age, heath conditions, etc.

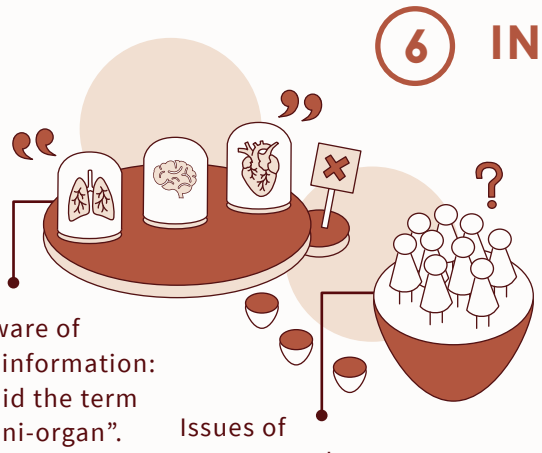
5 SCIENTIFIC INTEGRITY

Competitiveness.

Interpretations.

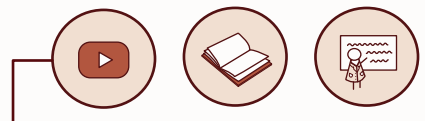
Reproductibility of experiments.

6 INFORMATION FOR THE GENERAL PUBLIC



Beware of misinformation: avoid the term “mini-organ”.

Issues of acceptance by the general public.



Communication and outreach.

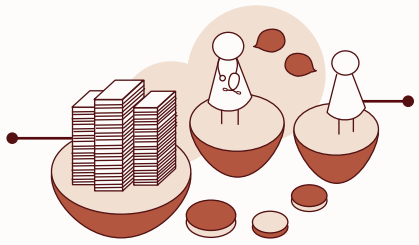
7 MODELING &TESTING

Towards a replacement for animal models?

Legal & ethical framework for clinical trials.

8 RELATIONSHIP WITH PHYSICIANS

Carefull with the excessive workload of medical staff.



Key intermediaries in communication and the collection of consent and samples.

III.ETHICAL QUESTIONS

1 RESEARCH GROUP (GDR)

HYBRIDA for ethics: definition of guidelines, particularly for publications and obtaining funding.

Structuring of a network of platforms.

Platforms are gradually moving closer to their biobanks.

Platforms often offer training courses.

Monthly webinar.

General public communication or more specialized magazines.

Industrial Partners Club.

CNRS thematic schools.

Nearly 150 laboratories offer this type of research topic or use organoids in France.

RIBBON

RIBBON website: national network for organoid production and biobanks.

Allows you to search for available organoid models & contacts.

2 EXEMPLE: OUESTOID NETWORK

Network of expertise for Bretagne and Pays de la Loire regions.

Mailing list, news, transmission of GDR information.

Mapping of expertise, directory, visualization of what platforms offer and available training courses.

Monthly webinar on technical approaches.

3 NEEDS EXPRESSED

Open training courses to industrials.

Open training courses to beginners.

Dedicated forum.

More visibility on existing training courses.

Training

Survey of training needs among different research teams.

Increase the visibility of models, expertise, banks, and organized structures

Avoid developing models that are already in place.

Public communication

Sharing, joint actions

Videos, events, books...

Various initiatives are emerging in parallel: how can they be connected?

Standardization of protocols, harmonization

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IV. ORGANIZATION OF THE FRENCH ORGANOID COMMUNITY