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USC1361

Stem Cell and Brain Research Institute (SBRI)

Management

Colette Dehay, Director

Research topics

- Biology, medicine and health

Key figures (U1208)

- 35 researchers
- 30 engineers
- 7 research teams

Key figures (USC 1361)

- 5 researchers
- 2 engineers

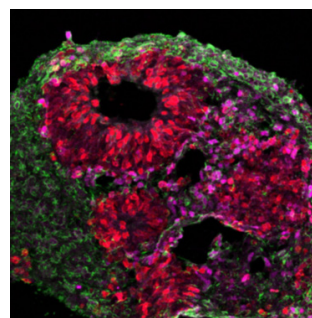
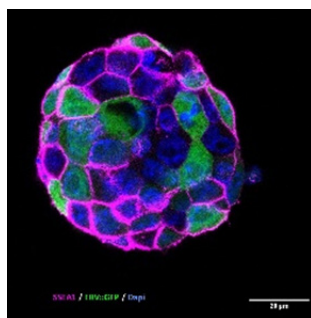
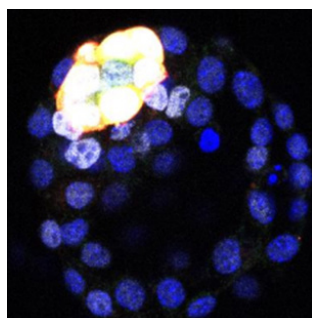
Keywords

- Stem cells
- Development
- Brain
- Organoid

Mission and objectives

USC 1361 - Stem Cell and Brain Research Institute (SBRI) – is an INRAE contract-based unit within U1208 INSERM, UMS1208 (Université Claude Bernard Lyon 1).

SBRI's scientific objectives are to acquire understanding of stem cell pluripotency mechanisms in different species and their use for biotechnological purposes.



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The USC consists of teams led by Pierre Savatier "Pluripotent Stem Cells in Mammals" and Bertrand Pain "Physiology and Biotechnology of Embryonic Stem Cells".

P. Savatier's team aims to produce lineages of embryonic stem cells (ES) and induced pluripotent stem cells (iPS) enabling the creation of somatic and germline chimeras in rabbits. To this end, the team is studying the transcriptome and epigenome of pluripotent stem cells. They are also studying pluripotency regulation mechanisms in rabbit embryos. Finally, they are trying to determine the conditions enabling pluripotent stem cells to colonize the rabbit embryo and thus contribute to foetal development.

B. Pain's team aims to compare pluripotency mechanisms between the avian (chicken and duck) and mammalian (man, cow, pig, horse and bat) models by studying the pluripotent stem cells (PSC) derived, depending on the species, from embryos or from somatic reprogramming. All these cells are characterized at the molecular and developmental level. PSCs are also used to derive new viral replication substrates and to obtain cerebral organoids, models for studying neurotropic viruses and evaluating anti-viral or medicinal molecules used in the nervous system.



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SBRI Teams

- Physiology and biotechnology of embryonic stem cells
- Pluripotent stem cells in mammals

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Research

The unit's research objectives are both pure and applied and include all the cellular and molecular approaches necessary to:

- 1) better define and characterize the bases of pluripotency in domestic avian and mammal species in order to obtain pluripotent stem cells (PSC) with the greatest possible developmental plasticity;
- 2) control and induce the differentiation of PSCs to obtain original phenotypes to be used for biotechnological purposes, as substrates for studying host-pathogen interactions;
- 3) develop new protocols to induce PSCs from different species in cerebral blastoids and organoids in order to mimic in vitro certain developmental processes.

SBRI has unique expertise in studying the pluripotency of PSC in different species and in the ability to master and use molecular biology to study the genic and epigenomic functions of these cells and their derivatives.

Collaboration and expertise

Local and regional

Collaboration with institutes in Lyon (CIRI, CRCL, etc.).

Collaboration with other INRAE centres across France (Tours, Jouy, Rennes, etc.) and with external institutes, Institut Pasteur, Université Paris-Saclay, INSERM units, etc.

International

Collaboration in Europe (Germany, Hungary, the UK and Poland).

Collaboration in Asia (China, Vietnam, Thailand, Japan, Korea and Taiwan).

Scientific facilities

SBRI has access to several platforms:

- within the unit: cell culture, histology, imaging, scRNAseq;
- locally (SFR): cell sorting and imaging;
- nationally: sequencing and metabolomics.

Teaching

SBRI personnel are involved in teaching and training activities at local and national level (master's, research school, specialized training).



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