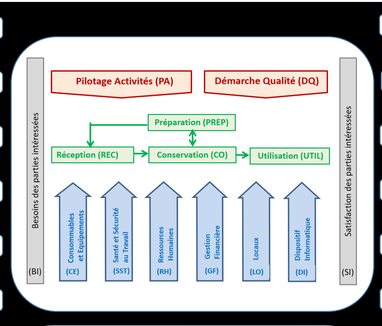

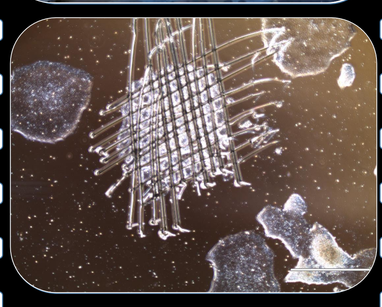

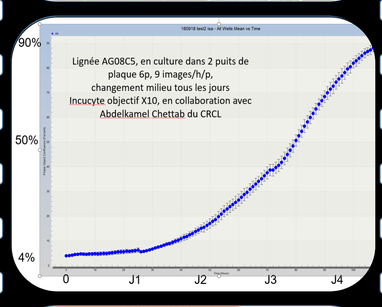

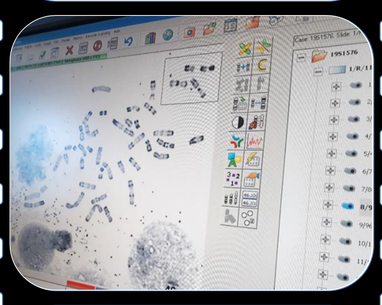

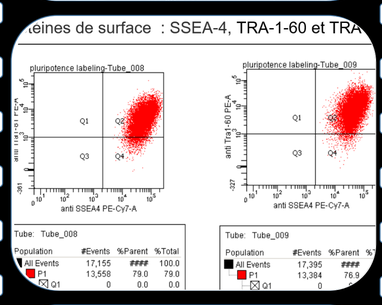

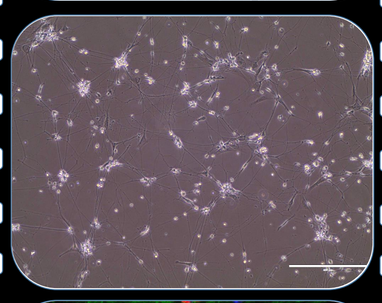

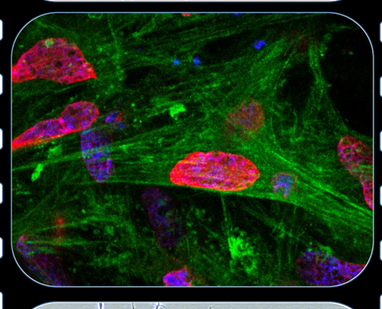

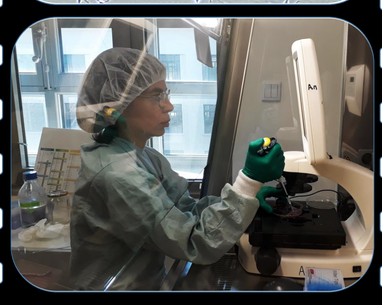

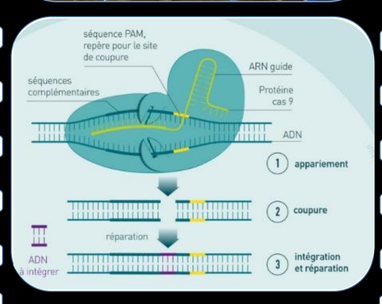

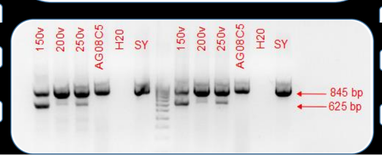

‘iPS_INMG’ core facility

Institut NeuroMyoGène (INMG), 8 Avenue Rockefeller, 69008 Lyon, France

The goal of the Institut NeuroMyoGene (**INMG**) is to unravel fundamental aspects of the muscle and nervous system cell biology from development to aging under normal and pathological conditions.
The platform named ‘iPS_INMG’ is a service of the INMG, under the supervision of the CNRS, INSERM and the University Claude Bernard Lyon1. The platform manages services related to the manipulation of cells used for research in biology and health, in particular induced Pluripotent Stem Cell (iPSC). It benefits from access to the specific equipment and expertise of the INMG research teams to develop new collaborative projects and the expertise of the Hôpital Neurologique genetics department for the analysis of karyotype and the identification of genetic anomalies. The iPS_INMG platform receives and controls primary cell before they are reprogrammed in iPSC by specialized core facility.
The platform stores, maintains and controls iPS cell lines. His objective is to encourage scientific cooperation aimed at the development of cell applications as well as the exchange of technical data concerning their use.

PERSONNELS

I. Grosjean, IE Inserm, Technical manager and **V. Risson**, IR CNRS, Scientific officer and **L. Schaeffer,** INMG Director.

EQUIPMENTS AND BIOLOGICAL RESSOURCES

The platform uses a biosafety level 2 cell culture laboratory equipped with 2 Biological Safety Stations, 2 incubators, and 2 microscopes.
The cell collection is actually composed of 915 cryotubes for 40 cell lines including **15 iPS cell lines.**

CELL CULTURE TRAINING

In addition to the training provided to platform users, an agreement between INMG and CNRS-Formation-Entreprises allows the platform to respond to training requests in a very structured way (https://cnrsformation.cnrs.fr). Every year, 2 sessions of a basic training on cell lines culture (2 days) and 1 session of iPSC culture (3 days) are programmed. All formations combine theory and practice.

SERVICES

The iPS_INMG platform is open to any request from academic or industrial players, please contact us to assess the feasibility of your project isabelle.grosjean@univ-lyon1.fr. To implement its mission, the platform develops technical support and know-how on methods and expertise in cell culture: reception, culture and freezing of primary cells and cell lines, traceability and quality control of cells.

* Training in sample preparation for quality control and interpretation of results
* Technical help for long term culture protocol
* Collection of a cell line, control of growing conditions, cell culture adaptation, manufacture of freezing cell up to 30 cryotubes
* Custom cell culture work, as in : *in vitro* differentiation projects and genetic modification projects of cell lines
* Control of the absence of mycoplasma contamination : MycoAlert, Plasmotest, and indirect Hoechst staining
* Karyotype control in collaboration with experts at hospital
* Traceability by controlling the genetic profile and specific controls according to the cell line.

iPS_INMG team USERS

Bessereau JL.

« We primarily uses the nematode C. elegans to investigate the cellular and molecular mechanisms involved in synapse formation and maintenance. To test the functional conservation of the genes identified in C. elegans, we started to invalidate these genes in iPSC and we plane to differentiate these cells into neurons or muscle cells. We are currently focusing on genes putatively involved in the biosynthesis of neurotransmitter receptors ».

Gache V.

« Cardiomyopathy is an heterogenous group of cardiac disorders with alteration of heart tonus. There are different types (dilated, hypertrophic, restrictive,…). In different cases, the cardiac disorders can be associated to a muscular dysfonction. To date, many genes have been identified to be implicated. To discover the physiopathological mechanism, we use cardiomyocyte derived from iPSc generate from patient PBMC (Peripheral Blood Mononuclear Cell). We develop the CRISPR strategy to produce iPSC mutated and HiPSC Wild Type ».

Lomonte P.

« The loss of Survival Motor Neuron (SMN) gene causes Spinal Muscular Atrophy (SMA). We use iPS cells derived from a SMA patient to generate motor neurons as a cellular model to investigate the role of SMN in the SMA pathology ».

« Herpes Simplex Virus 1 is a neurotropic virus responsible for neurons decay. We differentiate iPS cells into sensory neurons as a model to investigate HSV-1 viral infection »

Marcel C.

« We use patient iPSC in order to find the treatment for Duchenne's Muscular Dystrophy, which is an incurable genetic disease of skeletal muscles. To this aim we modify HiPSC's genome and differentiate them into hematopoietic cells and myoblasts »

Schaeffer L.

« Charcot-Marie-Tooth disease (CMT) refers to a heterogeneous group of chronic inherited motor and sensory disorders of the peripheral nervous system. Clinical signs are characterized by a slow progressing weakness beginning in the distal limb muscles that typically occurs in the lower extremities before it affects the upper ones. Recently, mutations in NEFH gene have been identified as a rare cause of axonal dominant CMT, leading to protein aggregation and an axonal neuropathy. We are deciphering the physio-pathological mechanism of this disorder using motoneuron derived from iPSC generate from patient fibroblasts ».

« Genetic alterations of neurotransmission resulting from presynaptic, synaptic, or post-synaptic defects cause congenital myasthenicsyndromes (CMS), a heterogeneous family of neuromuscular disorders characterized by skeletal muscle weakness and fatigue. Using iPSC derived from a patient with CMS caused by agrin mutations, we show a defect in the secretion of agrin by motor neurons that could be responsible for the disease. Now we would like to screen small molecules on these cells to identify those that will increase agrin secretion ».

Pictures from top to bottom : Process mapping, © I. Grosjean. Laboratory L2 of the iPS_INMG platform, © Eric Le Roux, UCBL1. Passage of iPSC by colonie cutting, © I. Grosjean. Growth curve of the AG08C5 iPSC line, © I. Grosjean. iPS training at the IPS_INMG platform, © CNRS-Formation-Entreprises. Karyotypes analysis, © I. Grosjean. Quality control, © I. Grosjean. Sensory neurons derived from iPSC, © S. Roubille. Cardiomyocytes derived from iPSC, © E. Lafont. Motor neuron progenitors derived from iPSC, © O. Binda. Laboratory L2 of the iPS_INMG platform, © I. Grosjean. Illustration of the CRISPR Cas9 system, © Inserm / L. Lemierre. PCR products analysis, © V. Risson.