

► Research developed at ITMO

Neurosciences are aimed at understanding how the nervous system develops, functions and ages under normal and pathological conditions:

- **from a basic standpoint it includes biology of neural cells, physiology of perception and action, cognition and behavior;**
- **from a clinical standpoint it covers prevention, diagnosis, treatment pathophysiology of neurological and psychiatric disorders and those affecting the sensory organs – in both common and rare diseases.**

The health challenges are:

- **neurological diseases:** Alzheimer's, Parkinson's and other sporadic or inherited neurodegenerative diseases – which are constantly on the rise – brain tumors, epilepsy, multiple sclerosis and demyelinating or dysimmune diseases, migraine, stroke, neuro-infectious diseases and peripheral neuropathies;
- **mental diseases:** anxiety, depression, bipolar disorder, schizophrenia, autism, obsessive-compulsive disorder and addiction – which represent a major public health problem and a considerable cost for the community;

French teams in the field

550 teams

3,300 researchers, post-doctoral students, engineers, technicians and administrative staff and students

18 clinical investigation centers

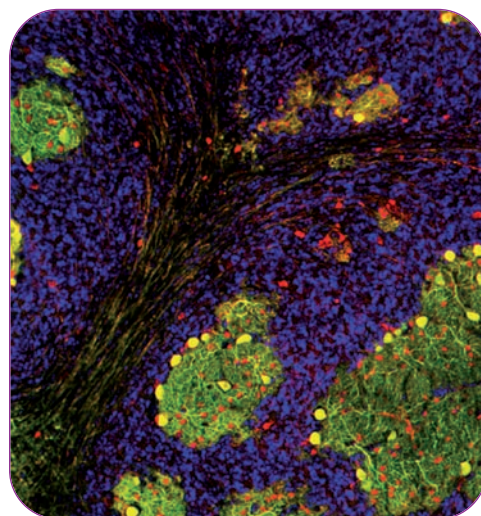
4,200 publications a year

220 million euros of budget (excluding salaries)

- **sensory organ deficits:** visual and hearing deficiencies, which affect 2 and 4 million inhabitants in France respectively.

Research priorities

- **To Raise neurobiologists' awareness of a multi-scale approach of the nervous system by developing methods for the simultaneous analysis of data obtained from a single molecule, individual cells, network and neural assemblies – through an interdisciplinary approach.**
- **To Promote research on the main functions of the nervous system, from development to aging.**
- **To Support the development of new technologies for the living organism, particularly in the imaging field (microscopic, mesoscopic, macroscopic).**



Role of plexins in axonal guidance.
Abnormal migration of neurons in the cerebellum during development in mice lacking the migration factor plexin B2 (Institut de la vision, Paris).
Authors: Alain Chédotal © Inserm

The scientific experts

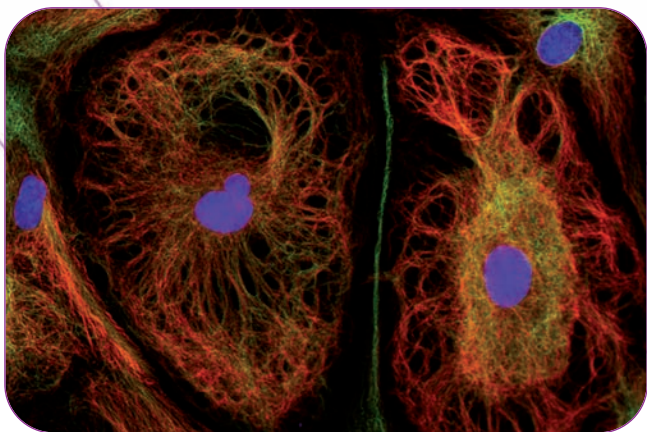
ITMO directors

Etienne HIRSCH (DRCE, CNRS)
and Bernard POULAIN (DR1, CNRS)

Scientific policy officers

François Bourre (CR CNRS)
Marie-Louise KEMEL (Inserm)

- Foster translational research by ensuring the networking of platforms and experts centers offering specific know-how and personnel dedicated developed under the auspice of the investment for the future.



Cultures of astrocytes.

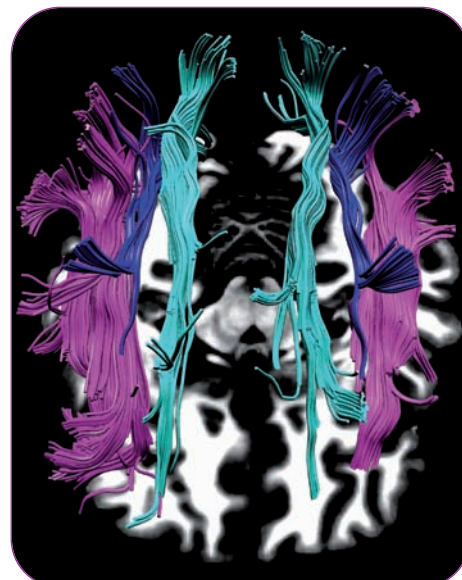
Astrocytes are glial cells with a star shape that are found in the central nervous system. They play a major role in the functioning and activity of the neurons.

Authors: Yasmina Saoudi © Inserm

- Project psychiatry as a leading field in neurosciences research by fostering the implementation of joint projects, including industry through a mapping of French research, and by facilitating European cooperation in the field, particularly through the Eranet Neuron, joint call devoted to the theme of mental health in 2013.
- Step up research into neurological disorders by triggering a national – and even international – impetus of collaborative research, from the most basic approaches to patient treatment.

Expert group:

- Philippe AMOUEL (PU-PH, Inserm)
- Etienne AUDINAT (DR CNRS, Inserm)
- Bernard BIOULAC (PU-PH, CNRS)
- Alexis BRICE (PU-PH, Inserm)
- Frédéric CANINI (IRBA)
- Patrick CHAUVEL (PU-PH, Inserm)
- Michel CLANET (PU-PH, Inserm)
- Jean-René DUHAMEL (DR CNRS, CNRS)
- Alain EHRENBURG (DR CNRS, CNRS)
- Patricia GASPAR (DR Inserm, UPMC)
- Michel HAMON (PU Inserm, UPMC)
- Philippe HANTRAYE (DR CNRS, CEA)
- Pascal HUGUET (DR, CNRS)
- Marie-Odile KREBS (PU-PH, DR Inserm)
- Marion LEBOYER (PU-PH, Inserm)
- Christophe MULLE (DR CNRS, CNRS)
- Stéphane OLIET (DR CNRS, Inserm)
- Patricia PARNET (DR Inra, Inra)
- Laurent PRADIER (ARIIS)
- Bertrand THIRION (CR Inria, Inria)
- Elisabeth TOURNIER-LASSERVE (PU-PH, Inserm)



The right hemisphere: the brain of visuospatial attention.

Tractographic reconstruction is a new imaging technique that allows the fiber tracks connecting the parietal lobe to the frontal lobe to be visualized in the human brain.

Author: Michel Thiebaut de Schotten
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