



RESEARCH IN NEUROSCIENCE AND COGNITIVE SCIENCE

All put together, diseases of the brain and the nervous system represent the largest single area of health expenditure in Europe, at €800 billion per year. In France, 625 research teams are active across all bodies in the fields of neuroscience, cognitive science, neurology, psychiatry, and sensory organs, at different institutions such as Inserm, CNRS, universities, INRA, CEA, Institut Pasteur, and INRIA. Understanding the organization and functioning of the brain remains a challenge for international research conducted in France, in which some 2 500 faculty and researchers are involved, working in about 250 teams and over 80 research units and laboratories associated to 20 Doctoral Departments in biology and the life and health sciences.

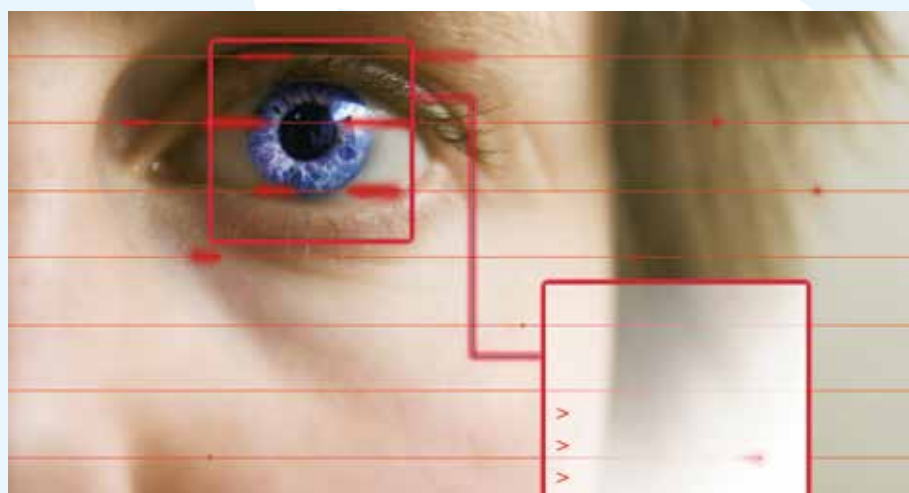
French research in neuroscience, cognitive science, neurology, psychiatry, and sensory organs is ranked third in Europe, behind the UK and Germany, and seventh worldwide. Since 2005, the National Research Agency (ANR) has funded some 1,000 neuroscience projects, nearly a quarter of them in biology and health. At the European level, of the 40 projects granted support by the European Research Council (ERC), a high proportion is found in the field of cognitive neuroscience. French researchers are also pioneers in the field of functional neurosurgery, biotherapy, and cellular and gene therapy as well as the development of brain-machine interfaces.

This international recognition is reflected in areas of excellence in French research, including psychology and cognitive neuropsychology, biophysics and cellular biology of synapses, interactions between neurons and glial cells, neuron networks, neurogenetics, vision and signal treatment, neuroinflammation, and rare diseases as well as the study of neurodegenerative diseases, visual and auditory disorders, and psychiatric conditions.

Emeritus professor at Joseph Fourier University in Grenoble (France), Alim-Louis Benabid is co-winner with Mahlon R. DeLong of Emory University (Atlanta, Georgia) of the prestigious Lasker Prize 2014

A neurosurgeon, Alim-Louis Benabid created and developed the technique of deep brain stimulation, which makes it possible to reduce the tremors experienced by patients suffering from Parkinson's disease.

Awarded by the Albert and Mary Lasker Foundation in New York and one of the most respected scientific prizes in the world, the Lasker prize crowns a career dedicated to patients with Parkinson's disease.





FROM MEDICAL CONDITIONS TO APPLICATIONS OF RESEARCH INTO THE BRAIN

Neurological and neurodegenerative diseases (Alzheimer's, Parkinson's, epilepsy, multiple sclerosis, and strokes), together with psychiatric conditions (anxiety, depression, addiction, schizophrenia, autism) and disorders affecting sensory organs (visual, auditory, somatosensory, and olfactory) are most often related to research into the brain, which also addresses motor control, sensory perception, learning, decision making, language,

manipulation of symbols, awareness, and social interactions. Applications of this research also concern the fields of education, information technology, robotics, systems security, road and industrial safety, and economics.

- > By bringing together research developed in basic biology and the pathophysiology of human diseases, two priorities have been set for French research in line with European priorities for 2020: Understanding the functioning (or dysfunction) of the nervous system and sensory organs (development, maturation, aging) in interaction with the genome and the environment;
- > Identification of the mechanisms underlying neurological and psychiatric diseases and sensory organs for new diagnostic and therapeutic approaches through powerful translational research.

In France, research in neuroscience and cognitive science is conducted principally in the research units that link universities and the National Center for Scientific Research (CNRS) and the National Institute for Health and Medical Research (INSERM), together with other specialized bodies in various areas such as CEA, INRA, INRIA, and Institut Pasteur. Like the fields of cognition, neurology, and psychiatry, the neurosciences are interdisciplinary, involving research teams working in the life and health sciences but also, information technology, human and social sciences informed by cognitive and experimental neurosciences.

PROGRAMS AND RESEARCH PROJECTS IN NEUROSCIENCES

> Investments in the future

University Hospital Institute – Institute for the Brain and the Spinal Cord IHU-A-ICM - <http://icm-institute.org>

The Pierre and Marie Curie University, INSERM, and Pitié-Salpêtrière Hospital (Assistance Publique – Hôpitaux de Paris) are the project leaders. The areas covered cross the disciplines of neuroscience, cognitive science, neurology, psychiatry, and diseases of the nervous system. IHU-A-ICM aims to be a center for research and treatment of global standing and to create a translational research infrastructure in the field of neuroscience combining imaging, electrophysiology, animal models, cellular models, clinical research, data processing, and biostatistics.

Labex in Biological Psychiatry (Labex Bio-Psy) – Neuroscience School of Paris Île-de-France (ENP):

www.paris-neuroscience.fr >L'ENP>Partenaires>Bio-Psy

This team brings together psychiatrists, neuroscientists, and geneticists working on understanding brain dysfunctions in psychiatric diseases. Research themes focus on brain development, neurotransmission and signaling, the plasticity of brain circuits, gene-environment interactions, and social issues. Bio-Psy also seeks to promote the emergence of a new generation of psychiatrists trained in neuroscience.

Labex BLRI – Brain & Research Language Institute

www.blri.fr

Labex BLRI brings together multidisciplinary expertise in linguistics, information technology, psychology, and neuroscience along with medical expertise covering all the necessary skills in the study of language processing and its basis in the brain. The objective is the development of a generic and integrated model of language that can be simulated digitally.

Labex Brain – Bordeaux Neurosciences

www.neuroscience.univ-bordeauxsegalen.fr

The Bordeaux Neurosciences Federation brings together six bodies: the Interdisciplinary Institute for Neurosciences (IINS), the Institute for Neurodegenerative Diseases (IMN), the Laboratory for Nutrition and Integrated Neurobiology (NutriNeuro), the Magendie Neurocenter, the Aquitaine Institute for Cognitive and Integrative Neuroscience (INCIA), and the Sleep, Attention, and Neuropsychiatry Institute (SANPSY). The research is based on four platforms: motor analysis (PAM), the Bordeaux imaging center (BIC), experimental psychopathology in rodents (OPTOPATH), and virtual reality (PHENOVIER).

Labex CeLyA – Lyon Center for Acoustics

<http://celya.universite-lyon.fr>

The CeLyA brings together more than 60 researchers in the field of acoustics (audible and ultrasonic), overlapping with several other disciplines including physics, solid and fluid mechanics, signal processing, and cognitive psychology. Eight research centers and laboratories are involved.

Labex DISTALZ Alzheimer's Disease

www.univ-lille-nord-de-france.fr/?q=lancement-du-labex-distalz

The Labex DISTALZ is developing innovative strategies for a cross-disciplinary approach to Alzheimer's disease. It brings together seven research units with the aim of exploring new hypotheses about the pathophysiology of Alzheimer's disease in the light of recent genetic discoveries.

Labex ICST Ion Channel Science and Therapeutics

www.labex-icst.fr

Labex ICST is a national network leading innovative research at the interface between medicine and biology and dedicated to the understanding of ion propagation processes across cell membranes and to the validation of new therapeutic targets for the development of drugs used in the treatment of pain, epilepsy, cancer, and diseases of the kidneys.



USEFUL LINKS

- Bordeaux Neurocampus: www.neuroscience.univ-bordeauxsegalen.fr
- Brain Research Federation – FRC: www.frc.asso.fr
- Cognitive Science Institute: www.isc.cnrs.fr
- Dana Foundation: www.dana.org
- European Dana Alliance for the Brain: www.dana.org/danaalliances/edab
- Federated Research Institute – NeuroSud Paris: www.ifr144.u-psud.fr
- Federation of European Neuroscience Societies – FENS: www.fens.org
- Foundation for the Promotion of Medical Research on Multiple Sclerosis – ARSEP: www.arsep.org
- Information Network for the Cognition Sciences – RISC: www.risc.cnrs.fr
- International Brain Research Organization – IBRO: <http://ibro.info>
- ITMO Neurosciences, Cognitive Science, Neurology, and Psychiatry: <https://itneuro.aviesan.fr>
- LabEx Brain: <http://brain.labex-univ-bordeaux.fr/en/>
- Language, Brain, and Cognition Laboratory (L2C2): <http://l2c2.isc.cnrs.fr>
- LARC Network – Neurosciences: <http://larc-neurosciences.univ-rouen.fr>
- Medical Research Foundation – FRM: www.frm.org
- Montpellier Neuroscience Institute: <http://inmfrance.com>
- National Alliance for Life Sciences and Health: www.aviesan.fr
- NEUREX – Rhine Valley Neurosciences Network: www.neurex.org
- Neurodis Foundation: www.fondation-neurodis.org
- Neuroendocrinology Society: www4.inra.fr/societeneuroendocrino
- Neuroscience Society: www.neurosciences.asso.fr
- Neurosciences Society: www.sfn.org
- Paris-Île-de-France School of Neurosciences – ENP: www.paris-neuroscience.fr
- Society for the Study of Blood-Brain Interfaces – SEISC: <http://seisc.free.fr>
- Thérèse and René Planiol Foundation for the Study of the Brain: www.fondation-planiol.fr
- Young Researchers in Neuroscience: www.neurosciences.asso.fr > Jeunes chercheurs

Labex IEC – Institute for Cognition Studies www.cognition.ens.fr

Labex IEC is part of the École Normale Supérieure (PSL – Paris Sciences Lettres Quartier Latin) and comprises seven CNRS and INSERM research units, bringing together 70 researchers from various disciplines including philosophy, psychology, linguistics, neurosciences, and mathematics. IEC supports four research programs: perception, attention, and consciousness, language and social and collective cognition, decision making, and rationality.

Labex IRON – Innovative Radio-pharmaceuticals in Oncology and Neurology: www.labex-iron.com

This national consortium is based in Nantes and associated with seven other cities across the country (Angers, Caen, Orleans, Rennes, Strasbourg, Toulouse, and Tours). Labex IRON aims at the clinical transfer of innovative radio-pharmaceuticals for PET diagnostic imaging in neurology and oncology and molecular radiation in oncology.

Labex LIFESENSES – Seeing and Hearing www.institut-vision.org

This Labex cross-references research in hearing and vision and develops high-resolution imaging systems for micro-electronics and micro-fluidics with researchers from the Observatoire de Paris, ONERA, ENS Cachan, ESPCI, ENSCI, École Polytechnique, SupOptique, and CEA. These studies are developed for diagnosis, prevention, regenerative medicine, and prosthetics in order to address conditions of visual and auditory deficits rarely or entirely untreated, particularly in the context of aging.

Labex MemoLife

www.univ-psl.fr > Recherche > Investissements d'avenir > Labex

The MemoLife project brings together all the teams from the Biology Institute of École Normale Supérieure (IBENS), the Center for Interdisciplinary Research in Biology of Collège de France (CIRB), and two teams from the Neurobiology Unit of ESPCI ParisTech. It aims to develop collaborations between biologists from different areas, focusing on interactions with mathematicians, chemists, and physicists with a strong interest in biological processes. Scientific areas under study include cell biology, development, plasticity, and regeneration, the dynamics of neural and glial circuits, genes and behavior in modeling systems, genetics, pharmacology and physiology, the genome, and synapses and receptors.



Agence nationale de la recherche – ANR National Research Agency

www.agence-nationale-recherche.fr

> Alzheimer's disease (MALZ)

> Translational Research Program in Health (PRTS)

> Mental Health and Addictions (SAMENTA)

International programs:

- ERA-NET NEURON II – Neurosciences: www.neuron-eranet.eu
- JPND – JPI on Neurodegenerative Diseases
- Franco-American program - Collaborative Research in Computational Neuroscience (CRCNS)

FRENCH RESEARCH PORTAL

www.campusfrance.org/en/researcher

A UNIQUE, **ONLINE-ACCESS INFORMATION POINT**
FOR LOCATING RESEARCH PROJECTS



◆ UNDERSTANDING FRENCH RESEARCH

- > Understanding how PhDs operate in France;
- > Knowing how to start and finance a PhD;
- > Applying to international research programs (Hubert Curien Partnerships, *Make Our Planet Great Again*, etc.).



◆ DIRECTORY OF DOCTORAL SCHOOLS

Point of entry for starting a PhD and the 270 doctoral schools organizing and supervising doctoral training.

- > Search by key words, regions, and disciplines;
- > Comprehensive information on doctoral schools: Research areas, criteria and points of contacts for admission, welcome mechanisms, proposed topics, current financing, international dimension, and points of contacts for associated research laboratories;
- > Access to fields offered by each doctoral schools.

10 doctoral schools in Neurosciences accessible at:

<https://doctorat.campusfrance.org> type «neurosciences» in the search field



◆ PhD TOPICS, MASTER INTERNSHIPS, AND POST-DOCTORAL POSITIONS:

- > Offers financed through doctoral contracts, Industrial agreements for training through research (CIFRE), and specific offers devoted to programs financed by foreign governments;
- > Offers for master internships for experience in a research laboratory;
- > Post-doctoral offers for work in French laboratories;
- > A detailed financing mechanism for each research offer (PhD topics, post-docs, and internships).

Almost 50 offers in Neurosciences posted every year, accessible at :

<https://doctorat.campusfrance.org/phd/offers>