



iMIND

International Master In Neurodegenerative Diseases

PARIS

2020-2021



iMIND

International Master In Neurodegenerative Diseases

Programme presentation ----- 3

Main modules of the programme:

- Brain to Market Summer School ----- 4
- Hot Topics: Transdisciplinary Approaches to Neurodegenerative and Psychiatric Diseases ----- 5
- Novel Technologies applied to Human Neuropathologies ----- 6
- Glial Pathologies and Neurodegenerative Diseases ----- 7
- Developing a Research Project ----- 8

Contacts ----- 9

International Master In Neurodegenerative Diseases

Specialized and selective track of the **Master BIP - Neuroscience** (year 2)

The first masters programme to focus specifically on neurodegenerative disorders

Developed with the **Paris Brain Institute** (previously known as the Brain and Spine institute, ICM)

Recruits students who wish to understand the functioning of the brain in normal and pathological conditions

Coursework (5 x 6 ECTS), Msc second year, first semester

Brain to Market summer school

Novel Technologies applied to Human Neuropathologies

Glial Pathologies and Neurodegenerative Diseases

Hot Topics: Transdisciplinary Approaches in Neurodegenerative and Psychiatric Diseases

Developing a Research Project

- Programme entirely taught in **English**
- **Research**-oriented (medical, scientific, R&D...)
- **Flexibility** allowed regarding course choices
- (access to *Neurosciences master BIP modules*)
- **Guaranteed** access to modules with limited spots
- Lectures delivered by **researchers expert in their field**, from the Paris Brain Institute, and other research institutes in Paris

Master's thesis (30 ECTS), Msc second year, second semester

- Partnership with the **University of Vienna**, **Trinity College Dublin**, the **Catholic University of Leuven** and the **Technical University of Munich**.
- **Funding** provided for transportation and living expenses abroad.
- **Referent researcher** assigned to each student going abroad.

KU LEUVEN



iMIND is designed to teach the latest scientific advances in the field of neurodegenerative diseases and to stimulate scientific curiosity, creativity, autonomous and team work, as well as critical thinking.

Prerequisites: first year of Msc (M1) level in neurosciences, biology or equivalent

The Brain to Market Summer School



BRAIN TO MARKET SUMMER SCHOOL PARIS BRAIN INSTITUTE (ICM) COURSEWORK

Brings together a diverse group of students from backgrounds in science, engineering, design and medicine **to develop original solutions for people living with brain disorders**

Basis of **entrepreneurship** and **business plan development** including project management

Themes have included depression, Parkinson's, MS, epilepsy and rehabilitation.

Continuity with Paris Brain Institute tech transfer team's annual hackathon and prototyping sessions

No prerequisite in marketing or business required

**Day
1**

Introduction of the scientific topic by all the care workflow (researchers, clinicians, paramedical staff).

**Days
2-3**

Basis of marketing, business, health economy, ethic and regulatory aspects by actors of the Health and Wellbeing Business Community examples (companies, patients, regulators professionals).

**Days
3-5**

Within multidisciplinary teams, design of a valuable proposal to develop concepts and products transferable from research to business and vice versa.

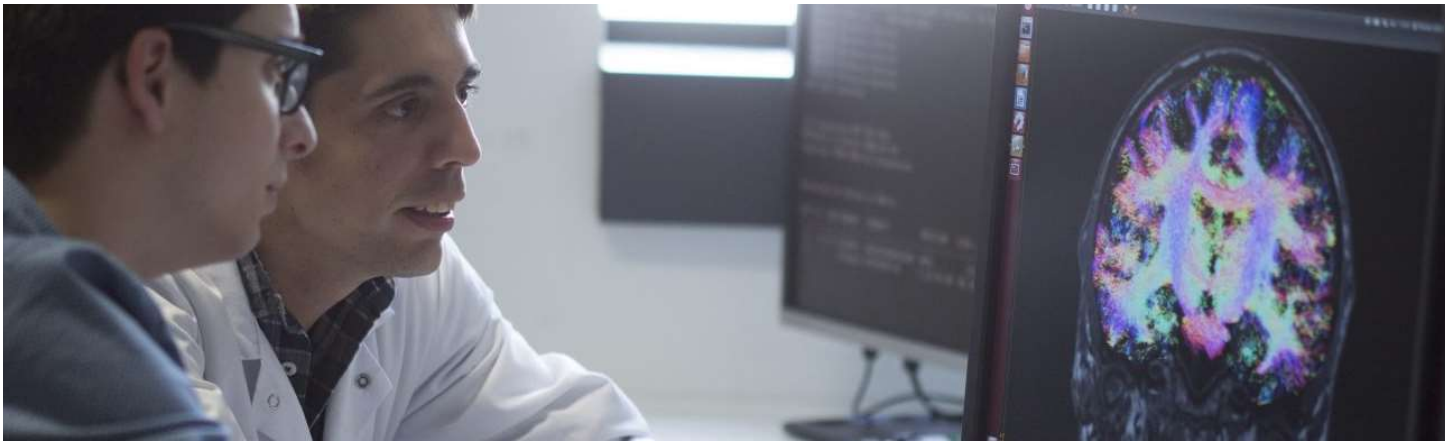
**Day
5**

Presentation of the projects to a panel of experts.

- ✓ Identify challenges raised by a neurological/psychiatric disease in the context of ageing
 - ✓ Learn and exchange within a multidisciplinary group
 - ✓ How to prepare a marketable project
 - ✓ Create a network of alumni
 - ✓ How to pitch a project in front of potential investors

10 students maximum

4



HOT TOPICS: TRANSDISCIPLINARY APPROACHES TO NEURODEGENERATIVE AND PSYCHIATRIC DISEASES

Students will develop a research project under the supervision of an expert tutor in the field, **a cross between research and library project**.

Project topics will cover **the latest advances in neurosciences**, specifically regarding neurodegenerative or psychiatric pathologies as well as cutting-edge technologies.

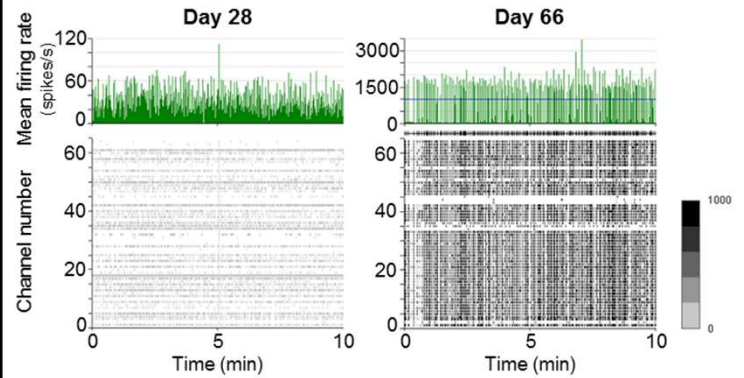
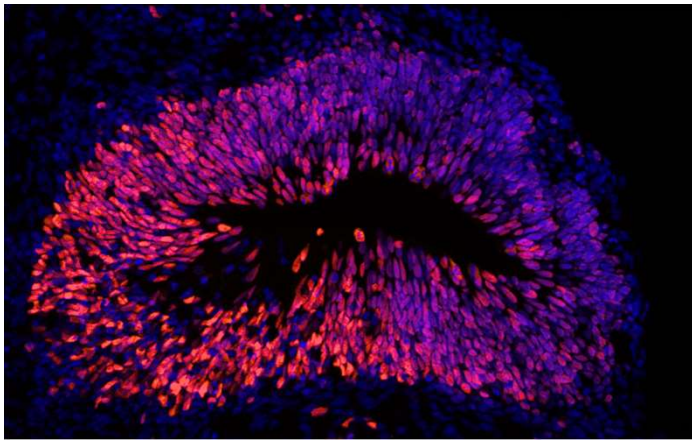
Students will be exposed to notions of fundamental, translational and clinical research by attending **conferences at the Paris Brain Institute**, where they will participate to discussions with the international scientists presenting.

- ➔ Exposure to the multidisciplinary aspects of neurodegenerative and psychiatric diseases research
- ➔ Participation in discussions with international experts *via* the **Paris Brain Institute conference series** which is integrated into the programme
- ➔ **Tutorship with scientists from the Paris Brain Institute and the Neuroscience Paris Seine Institute** to develop a research project

- ✓ Critically analyse the scientific literature
- ✓ Master approaches and tools to study neurodegenerative and psychiatric diseases
 - ✓ Evaluate the validity of these approaches and tools
 - ✓ Suggest experimental approaches to answer scientific issues
 - ✓ Elaborate and organise the interpretation of research data
 - ✓ Present in a clear summarized manner

iMIND students

5



NOVEL TECHNOLOGIES APPLIED TO HUMAN NEUROPATHOLOGIES

Overview of the **latest methodological approaches** used to study in an integrative way the molecular and cellular mechanisms associated with neuronal function and dysfunction

Focus on four main domains: **Omics, stem cell research, imaging and electrophysiology**

Applications to advance research on **diverse brain disorders** including: Parkinson's disease, ALS, Alzheimer's disease, MS, cancer, neurodevelopmental and psychiatric disorders

- ➔ **Theoretical bases** underlying the main techniques addressed in this course.
- ➔ **Technical demonstrations** at the ICM's cutting-edge facilities.
- ➔ **Talks from expert scientists** covering their latest research on neurodegenerative diseases (Parkinson's Disease, Alzheimer's Disease, ALS, MS), as well as other human pathologies (neurodevelopmental diseases, epilepsy, addiction, cancer).
- ➔ **Talks from junior scientists** discussing their research projects as well as their professional experience and training.
- ➔ **Workshop on ethical considerations** regarding these new methodological approaches.

- ✓ Understand the most recent approaches to study cellular and molecular mechanisms underlying human diseases
 - ✓ Gain knowledge on the scientific advances in these fields
- ✓ Acquire the methodological understanding (advantages and drawbacks of different approaches) to answer a specific scientific issue
 - ✓ Develop critical thinking regarding an experimental design, results and literature
 - ✓ Develop analysis and synthesis skills

20 students maximum

6



DEVELOPING A RESEARCH PROJECT

Acquire the tools to **describe and present a research project**

Students will introduce the scientific question that they will study during their **Master's thesis**

With the help of their host laboratory, students will **develop their experimental approach** with detailed protocols and feasibility considerations.

Opportunity to acquire the pre-requisites skills necessary to complete the Master's thesis, with literature analysis and discussion with the host team during the first semester.

- ➔ **Writing a letter of intention** (scientific background, question raised, experimental strategy)
- ➔ **Oral presentation** and discussion with a researcher

- ✓ Present in a synthetic manner
- ✓ Conduct a literature review and critical analysis
- ✓ Describe a research project and experimental protocols
- ✓ Acquire theoretical skills necessary to apprehend useful concepts for experimental practice in biology
- ✓ Assess feasibility and limits associated with planned experiments

iMIND

International Master In Neurodegenerative Diseases

Contacts

Director of the Biology and Integrative Physiology (BIP) Master:

Isabelle Limon (isabelle.limon@sorbonne-universite.fr)

Director of the BIP Master 2 Neurosciences:

Regis Lambert (regis.lambert@sorbonne-universite.fr)

Coordinator of International Programs, BIP Master 2 Neurosciences:

Ann Lohof (ann.lohof@sorbonne-universite.fr)

Director of iMIND:

Hélène Cheval (helene.cheval@sorbonne-universite.fr)

Applications: mid May 2020 to early July 2020

Should you have any questions, please contact: **Hélène Cheval**

<https://sciences.sorbonne-universite.fr/masters/master-biologie-integrative-et-physiologie-bip/m2-parcours-neurosciences>

9

