RÉPUBLIQUE FRANÇAISE
Liberté
Égalité
Fraternité

ANR-20-SFRI-0008

FRANCE 2030

Graduate school INTHERAPI

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CR INSERM, UMR 1231 CTM

Project Manager: **Sebastien Causse**
PhD

UNIVERSITÉ BOURGOGNE EUROPE

UNIVERSITÉ MARIE & LOUIS PASTEUR

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RÉPUBLIQUE FRANÇAISE
Liberté Égalité Fraternité

ANR-20-SFRI-0008

INTHERAPI GRADUATE SCHOOL

Comprehensive individual care

INnovative THERApies, Pharmaco-imaging and multimodal Imaging

4 GRADUATE PROGRAMS

- Targeted therapies - Inflammation
- Cancer - Immunology
- Bioactive Substances Vectorization
- Pharmaco-imaging and multimodal imaging

3 DOCTORAL SCHOOLS

- Carnot Pasteur
- Environment & Health (ES)
- Doctoral School of engineering sciences and microtechnics (SPIM)

170 PhD students

32% international students

9 MASTER PROGRAMS

5 masters taught in English

195 MASTER STUDENTS

40% international students

7 RESEARCH UNITS

307 Researchers

RÉPUBLIQUE FRANÇAISE
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ANR-20-SFRI-0008

Graduate school INTHERAPI

FRANCE 2030

GRADUATE PROGRAMS

Graduate Programs	Masters' courses	Doctoral schools	Research labs
Cancer-Immunology	• Interactions Immunitaires et Ingénierie Cellulaire (I3C) • Signalisation Cellulaire et Moléculaire (SCM) • Innovative Drugs	• Environment-Health	2, 3, 5
Targeted therapies - Inflammation	• Interactions Immunitaires et Ingénierie Cellulaire (I3C) • Signalisation Cellulaire et Moléculaire (SCM) • Innovative Drugs • Nutrition-Santé	• Environment-Health	1, 2, 4, 5, 7
Bioactive substances vectorization	• Innovative Drugs • Transition Metals in Molecular Chemistry (T2MC)	• Environment-Health	2, 3, 4, 5
Pharmaco-imaging and multimodal Imaging	• Medical Imaging and Applications (MAiA)* • Health AI • Intelligence artificielle et systèmes de santé (INASYS) • Optimisation des traitements interventionnels par l'imagerie (OPTIMSYS)	• Environment-Health • Physical Engineering and Microtechnology (SPIM) • Carnot-Pasteur	3, 6
MD/PharmD- PhD program	Program dedicated to obtaining both a MD or PharmD and a PhD		2, 4, 5, 6, 7

MASTER INNOVATIVE DRUGS

MASTER i3C

SCM

MAIA

T2MC

MASTER iS Ingénierie de la santé

SIA MASTER SANTÉ ET INTELLIGENCE ARTIFICIELLE UNIVERSITÉ BOURGOGNE EUROPE

ÉCOLE DOCTORALE Environnements - Santé

Carnot Pasteur

SPIM

PEC2

CTM

LINC

Right

SINERGIES

* Erasmus mundus

1- CSGA(CNRS-INRAe) 2- CTM (INSERM) 3- ICMUB (CNRS) 4- LINC (INSERM) 5- RIGHT (INSERM) 6- Sinergies 7- PEC2

ANR-20-SFRI-0008

LABORATORIES

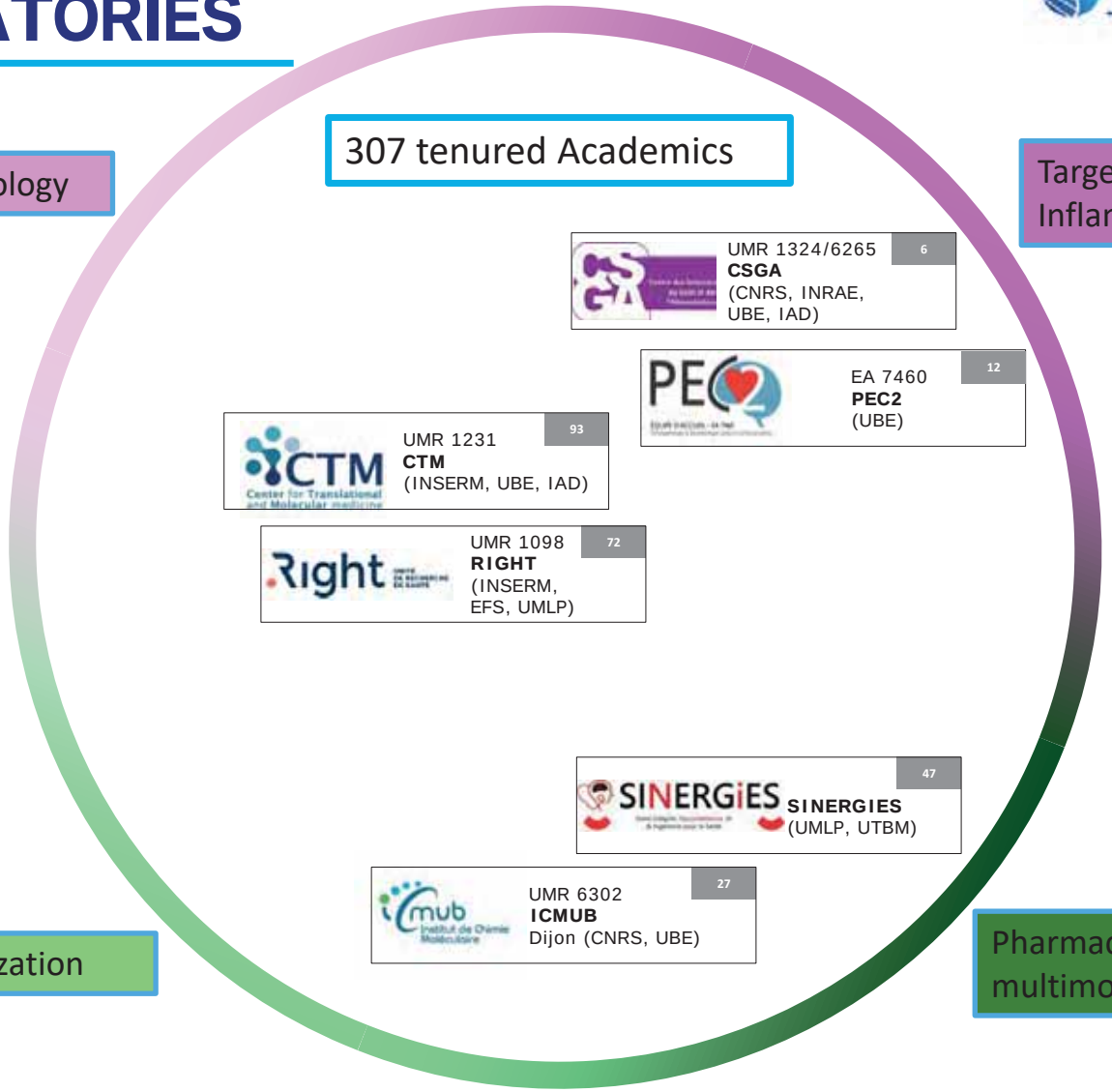
307 tenured Academics

Cancer-Immunology

Targeted Therapies-Inflammation

Bioactive Substances vectorization

Pharmaco-imaging multimodal imaging



- UMR 1324/6265 **CSGA** (CNRS, INRAE, UBE, IAD) — 6
- EA 7460 **PEC2** (UBE) — 12
- UMR 1231 **CTM** (INSERM, UBE, IAD) — 93
- UMR 1098 **RIGHT** (INSERM, EFS, UMLP) — 72
- UMR 1322 **LINC** (INSERM, UMLP) — 50
- **SINERGIES** (UMLP, UTBM) — 47
- UMR 6302 **ICMUB** Dijon (CNRS, UBE) — 27

RÉPUBLIQUE FRANÇAISE
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LABORATORIES

ANR-20-SFRI-0008

Graduate school INTHERAPI

FRANCE 2030

Links to websites:

- INSERM UMR 1231 **Centre de recherche Translationnelle en Médecine moléculaire**
  - https://ctm.ube.fr/
- INSERM UMR 1098 **Interactions Hôte-Greffon-Tumeur & Ingénierie Cellulaire et Génique**
  - https://umr-right.com/
- UR **SINERGIES**
  - https://lab-sinergies.fr/fr/
- CNRS/INRAE UMR 1324/6265 **Centre des Sciences du Goût et de l'Alimentation**
  - https://csga.fr/
- CNRS UMR 6302 **Institut de Chimie Moléculaire de l'Université de Bourgogne**
  - https://icmub.ube.fr/
- INSERM UMR 1322 **Laboratoire de recherches Integratives en Neurosciences et psychologie Cognitive**
  - https://neurosciences.univ-fcomte.fr/
- EA 7460 PEC2 **Physiopathologie et Epidémiologie Cérébro-Cardiovasculaires**
  - https://pec2.ube.fr/

Graduate school INTHERAPI

UNIVERSITÉ BOURGOGNE EUROPE

UNIVERSITÉ MARIE & LOUIS PASTEUR

Cellular and molecular signaling

Organization:

First year

- M1 SCM in DIJON or M1 BS SCM in BESANCON

Second year

- Hybrid, online/in-person

Subjects developed:

- **Cellular and molecular signaling**
- **Methodology in research laboratories**

+ OPTIONAL :

- **Onco-Immunology - Immunology**
- **Oncology**
- **Metabolic disease**
- **Neurosignaling**

Requirements, Application

Undergraduate degree → MASTER degree 1st year → MASTER degree 2nd year → PhD program

Who can apply?

Student awarded a **Bachelor's degree** (for the entry in M1) or **master's degree** (for the entry in M2) or equivalent in the following subjects:

- Biochemistry,
- Cellular biology
- Molecular biology
- Health and Life Sciences

Language requirement : **English**, Intermediate level.

How to apply?

For an enrollment in M1: monmaster platform (https://monmaster.gouv.fr) or ecandidat (contact the Masters' supervisor)
For an enrollment in M2: ecandidat

First year program

Semester 1 (30 ECTS)

- **English** (20hrs) / **Seminars / Visits of Company** (6 ECTS)
- **Tools for biology investigation** (6 ECTS): Provides theoritical and practical knowledge of the tools and methods used in research laboratories
- **Project Managment / Biostatistic** (6 ECTS): Design and execution of a project (deadline, objectives, milestones, resource).
- **« Omic » analysis GTPIA** (6 ECTS): Genc mics, proteomics, transcriptomic) / Artificial intelligence
- **Molecular and cellular signaling (SCM)** (6 ECTS): Cell communication, membranes receptors, signal transduction, proliferation, cell cycle regulation, cell death

- **Tools for biology investigation / Biostatitics** (6 ECTS): Investigation tools for cellular biology and biochemistry. Data processing methods.
- **Project Managment, preparation of working life / English** (6 ECTS): Training in Project Management and career development. Communicating research findings in English.
- **From epigenetic to post-translational modification** (6 ECTS): Gene Expression Regulation, Epigenetic & Post-Translational Modifications, Protein Trafficking, and Metabolic Pathways. Cellular Signaling, Intercellular Communication, and Environmental Stimuli Integration.
- **Immunology** (6 ECTS): Fundamental Immunology, Innate Immunity, and Adaptive Immunity. Molecular and Cellular Mechanisms of the Immune System.
- **Cell culture and toxicology** (6 ECTS): Cell culture techniques, experimental environmental and Pharmaceutical toxicology, In Vitro Assays, and Risk Management.

Semester 2 (30 ECTS)

- **UE6 STA (7,5 ECTS) - Internship (2 months)** / English
- **Physiopathology of dyslipidemia** (4,5 ECTS): Provides solid foundations concerning etiology of certain metabolics disorders linked to excess weight, ageing, environmental or genetic factors
- **Immunopathology and immunotherapies** (4,5 ECTS): Understanding the immune response, mecanisms of infectious diseases, cancer and auto-immune diseases
- **Molecular oncology** (4,5 ECTS): Molecular basis of oncogenesis
- **Neurosciences** (4,5 ECTS): in-depth knowledge of cellular and molecular signaling at the neuronal, glial and microglial levels

+ Optional:

- **Molecular Pharmacology and pharmacotherapies** (4,5 ECTS): Basics in pharmacology, pharmacokinetics, pharmacodynamics and drug safety
- **Nutriments & Molecular regulation** (4,5 ECTS): Basics in mutritional genomics and nutrigenomics : Analysis of the relationship between genes and nutrients

- **Internship (2 months) (6 ECTS)**

- **Life Science issues and Scientific Communication in English (English)** (6 ECTS): Expanded foundational knowledge in the essential field of Cell Biology, Biochemistry, and Molecular Biology.
- **DNA Repair, Cell cycle and Apoptosis: Life and death of the cell** (6 ECTS): Cell Life and Death Mechanisms, dysregulations leading to Cancer and Neurodegenerative Diseases and how to target them.
- **Mechanisms and therapies for cancer** (6 ECTS): Cancer Epidemiology, chemical, viral or bacterial carcinogenesis. Oncogenes and Tumor Suppressor Genes, Angiogenesis, EMT, and Cancer Immunosurveillance, Diagnosis, Prognosis, and Therapeutics of Cancers.
- **Molecular mechanisms of genetic diseases** (6 ECTS): Clinical Case Studies. Fundamental Genetics Diagnostic Techniques Molecular Basis of Genetic Diseases (mitochondrial, epigenetic-related and neurodegenerative diseases) Oncogenetic Diagnosis. High-Throughput Sequencing Techniques.

Second year program

Hybrid, online/in-person

Semester 3 (30 ECTS)

- **SCM, Molecular and cellular signaling (6 ECTS):** Understanding cellular communication mechanisms and how cells respond to their environment.
- **AMPR (6 ECTS):** Methodological approach of a research project (50hrs) / « Ethics in research ».
- **Mentored project » (6 ECTS):** Bibliographic review, analysis and synthesis of research articles.
- **Communication – English / CONFERENCES / Meeting » (6 ECTS)**

3 units to choose from the following :

- **Oncology (3 ECTS):** The challenges of cancer research, diagnostic and therapeutic tools
- **Immunology (3 ECTS):** Concepts of comparative immunology, immunopathology and immunotherapy
- **Neurosignaling (3 ECTS):** From the perception of immediate environment, integration of signals in specialised neural networks to the appropriate response of the brain and adjustment of behaviours
- **Lipids and physiopathology (3 ECTS):** Various aspects of the interaction between lipids, their signaling and their relationship with pathologies (hypercholesterolaemia, atherosclerosis, obesity, diabetes, degeneratives diseases and cancer) will be discussed.

Semester 4 (30 ECTS)

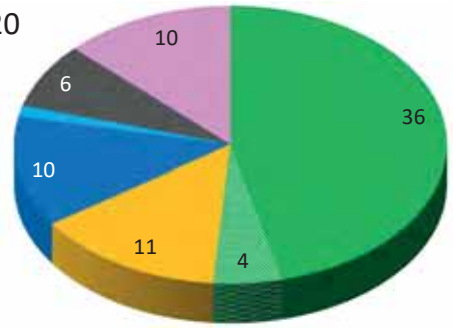
6 month Internship in a research laboratory

ORAL DEFENSE

MASTER BIOLOGIE SANTE
Signalisation Cellulaire et Moléculaire

Job Opportunities:

2018-2020



- **45 – 65%** PhD program
- 15 – 25% Jobs in biology, research or R&D
- 5 – 15 % Other training programs
- ≈ 1% Other Jobs
- ≈ 15% Continuation of medical studies

Graduate school INTHERAPI

UNIVERSITÉ BOURGOGNE EUROPE

UNIVERSITÉ MARIE & LOUIS PASTEUR

MASTER INNOVATIVE DRUGS

Organization:

International double degree with the University of Lebanon

- **First year**

Operated by UBE (Dijon, UFR Heath Sciences)

- **Second year**

Two tracks:

Nanomedicine Track, operated by UMLP

Radiopharmaceuticals and molecular imaging Track, operated by UBE

Subjects developed:

- **Radiopharmaceutical sciences (including imaging)**
- **Nanomedicine**
- **Targeted pharmaceutical and theranostic vectors**

MASTER INNOVATIVE DRUGS

Graduate school INTHERAPI

➢ Original training with avec 2 complementary topics

Nanomedicine topic	Radiopharmaceuticals topic
• Synthesis of innovative drug delivery systems(natural or biomimetic nanovectors, inorganic nanoparticles) • Encapsulation of active substances, plasmids, RNA, and imaging agents • Passive / active targeting • Applications: - Tissue targeting (lung, brain, skin) - Therapy (cancer, inflammation) - Vaccination Theranostics	• Basic principles of conventional imaging techniques(MRI, ultrasound, CT scan, scintigraphy, and optical imaging) • Study of theoretical and practical aspects of preclinical imaging • Bioconjugation techniques and radiolabeling • Radiopharmaceutical chemistry, chemistry of multimodal probes

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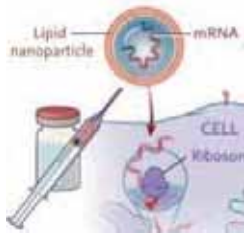
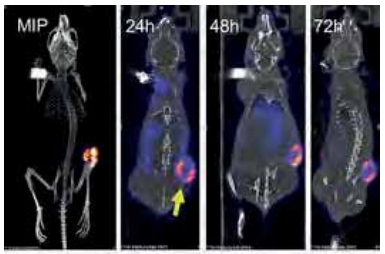


- **Common courses between the two tracks**
- **In-depth study of one of these two topics, depending on the chosen track**



Uptake of ^{111}In-DOTA-trastuzumab in BT474 tumors

Requirements, Application

Undergraduate degree → MASTER degree 1st year → MASTER degree 2nd year → PhD program

Who can apply?

Master M1 Innovative Drugs:

☑ Bachelor's degree (L3) completed in the fields of life and health sciences, chemistry or physics.

☑ English proficiency at a B2 level according to the CEFR.

Master M2 Innovative Drugs:

☑ Master's Year 1 (M1) completed in the fields of life and health sciences, chemistry or physics.

☑ English proficiency at a B2 level.

How to apply?

M1 and M2 radiopharmacy/imaging track:

E-candidat UBE: **https://ecandidat.u-bourgogne.fr/ecandidat/#!accueilView**

M2 nanomedicine track:

E-candidat UMLP: **https://scolarite.univ-fcomte.fr/ecandidat/#!offreFormationView**

MASTER INNOVATIVE DRUGS

First year program (M1)

Graduate school INTHERAPI

UNIVERSITÉ BOURGOGNE EUROPE

Semester 1 (30 ECTS)

- UE1 - Chemistry and physical chemistry (3 ECTS)
- UE2 - MOOC: Nanosciences (4 ECTS)
- UE3 - Molecular and functional imaging (4 ECTS)
- UE4 - Biochemistry (3 ECTS)
- UE5 - Biomolecules (2 ECTS)
- UE6 - Bioproduction and biotherapies (6 ECTS)
- UE7 - Spectroscopic methods and upgrade (6 ECTS)
- UE8 - Tutored project (Nanomedicine or Radiopharmacy) (2 ECTS)

Semester 2 (30 ECTS)

- UE9 - Drug design (8 ECTS)
- UE10 - Molecular and functional imaging (3 ECTS)
- UE11 - Biochemistry (3 ECTS)
- UE12 - Radiopharmaceutical chemistry (4 ECTS)
- UE13 - Scientific project management (4 ECTS)
- UE14 - 2 month internship (8 ECTS)

Second year program (M2)

Semester 3 (30 ECTS)

- UE1 Pharmaceutical development (6 ECTS)
- UE2 Radiobiology, Radiopharmacology and Radiopharmacy (6 ECTS)

- UE3 Pharmaceutical technology, Pharmaco-imaging (6 ECTS)
- UE4 Advanced pharmaco-imaging Radioligand therapy academy (e-learning) (6 ECTS)

- UE3 From biology to Biotherapies (6 ECTS)
- UE4 Synthesis and characterization of nanoparticles (6 ECTS)

- UE5 Biomedical applications of nanoparticles tutored project (6 ECTS)

Semester 4 (30 ECTS)

6 month Internship in a research laboratory

ORAL DEFENSE

MASTER INNOVATIVE DRUGS

Graduate school INTHERAPI

➢ Opportunities

⇒ R&D Engineer in Pharmaceutical Technology
Medical Imaging Engineer
Radiochemist
Hospital Career…

⇒ Pursuing a PhD in Pharmaceutical Technology, Applied Biology, Chemistry, or Imaging

Graduate school INTHERAPI

UNIVERSITÉ BOURGOGNE EUROPE

SIA
MASTER SANTÉ ET INTELLIGENCE ARTIFICIELLE
UNIVERSITÉ BOURGOGNE EUROPE

Health-AI

SIA
MASTER SANTÉ ET INTELLIGENCE ARTIFICIELLE
UNIVERSITÉ BOURGOGNE EUROPE

UNIVERSITÉ BOURGOGNE EUROPE

Graduate school INTHERAPI

International Partners and double degrees:

- Hellenic Mediterranean University
- Universitas Gunadarma (Indonesia)
- ESISA (Morocco)

UNIVERSITAS GUNADARMA

Organization:

First year

- Due to open in September 2026

Second year

- In person

UNIVERSITÉ BOURGOGNE EUROPE

Subjects developed:

- **methodology courses with a main focus on AI applications for Health.**
- **Bridging skills and competences from Computer Science and Image Processing/Signal Processing fields.**

SIA
MASTER SANTÉ ET INTELLIGENCE ARTIFICIELLE
UNIVERSITÉ BOURGOGNE EUROPE

Requirements, Application

Graduate school INTHERAPI

Graduate school INTHERAPI

Undergraduate degree → MASTER degree 1st year → MASTER degree 2nd year → PhD program

Who can apply?

Student awarded a **master's degree** in the following subjects:

- Computer Science, Electronics/Signal Processing
- Health Sciences (with some knowledge in Computer Science and high motivations towards Artificial Intelligence)

Language requirement : **English**, Intermediate level.

How to apply?

Procedure for EU or non-EU applicants who have not completed one year of a French national university degree

Procedure and timetable to follow : https://en.u-bourgogne.fr/admission/degree-seeking-students.html

- **« Etudes en France » procedure**: Candidates should create their Studying in France personal on-line account right away.
- **« Etudes en France » procedure**: Candidates have to fill in the online form: application form for ENGLISH-taught programs

Procedure for applicants who already have a French diploma, which gives them access to this study program.

Candidates have to apply using ecandidat platform.

SIA
MASTER SANTÉ ET INTELLIGENCE ARTIFICIELLE
UNIVERSITÉ BOURGOGNE EUROPE

Second year program

Graduate school INTHERAPI

UNIVERSITÉ BOURGOGNE EUROPE

Semester 3 (36 ECTS)

- 1 teaching unit depending on the background:
  - Medical Imaging and Health Data **(6 ECTS)** for computer scientists
  - Computer Science / Python **(6 ECTS)** for clinicians
- Image processing **(6 ECTS)**
- Machine Learning and Deep Learning**(6 ECTS)**
- Cloud Computing and Cybersecurity **(6 ECTS)**
- Hybrid and Distributed AI **(6 ECTS)**
- Project **(6 ECTS)**

Semester 4 (24 ECTS)

5-6 month Internship in a research laboratory

ORAL DEFENSE in September

Graduate school INTHERAPI

UNIVERSITÉ BOURGOGNE EUROPE

Nutrition - Santé

Organisation:

First year

- M1 NS in Dijon

Second year

- M2 NS in Dijon

Subjects developed:

- **Human and Animal Nutrition**
- **Methodology in research laboratories**
- **Detection & Metabolism of Nutrients**
- **Lipids & Metabolic diseases**
- **Emerging Risks & Nutritional Quality**

Requirements, Application

Undergraduate degree → MASTER degree 1st year → MASTER degree 2nd year → PhD program

Who can apply?

Student awarded a **Bachelor's degree** (for the entry in M1) or **master's degree** (for the entry in M2) or equivalent in the following subjects:

- **Nutrition Physiology,**
- **Cellular biology**
- **Health and Life Sciences**

Language requirement: **English**, Intermediate level.

How to apply?

For the entry in M1: monmaster platform (https://monmaster.gouv.fr) or ecandidat (contact the Masters' supervisor)
For the entry in M2: ecandidat

First year program

Semester 1 (30 ECTS)

- **UE1 - English** (20hrs) / **Seminars / Visits of industrial companies** (6 ECTS)
- **UE2 - Tools for biology investigation** (6 ECTS): Provides theoritical and practical knowledge of the tools and methods used in research laboratories
- **UE3 - Project Managment & Biostatistic** (6 ECTS)**:** Designing and executing a project (deadline, objectives, milestones, resource).
- **UE4 - « Omic » analysis GTPIA** (6 ECTS)**:** Genomics, proteomics, transcriptomic) / Artificial intelligence
- **UE5 - Covering the current food needs** (6 ECTS)**:** Provides knowledges in nutrients and micronutrients requirements and supplies

Semester 2 (30 ECTS)

- **UE6 STA (7,5 ECTS) - Internship (2 months)** / English
- **UE7 - Nutritional physiology** (6 ECTS)
- **UE8 - Health Value of Food** (6 ECTS)
- **UE9 - Endocrine Communication & Health** (6 ECTS)
- **UE10 - Physiological Regulation of Feeding Behaviour** (6 ECTS)

+ Optional:

- **Global Business Knowledge** (4,5 ECTS)
- **Nutriments & Molecular regulation** (4,5 ECTS)**:** Basics in mutritional genomics and nutrigenomics : Analysis of the relationship between genes and nutrients

Second year program

Semester 3 (30 ECTS)

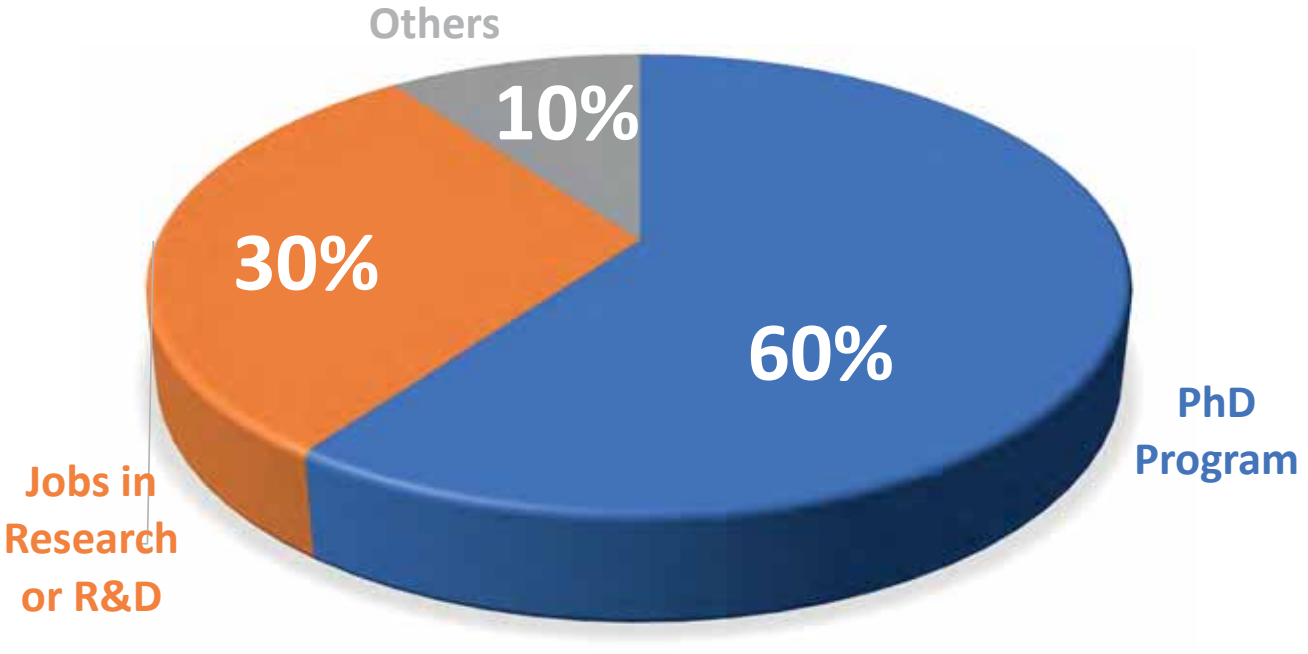
- **UE1 - Human & Animal Nutrition (6 ECTS):** Deep review of the updated nutritional balance recommandations, taking into account the physiological status (child, pregnancy, breastfeeding, athlete, …). Animal Nutrition (pet food & Productive Livestock)
- **UE2 - Detection & Metabolism of Nutrients (8 ECTS):** Detection and Metabolism **(4 ECTS);** Lipids and physiopathology **(4 ECTS):** Presentation of the various aspects of the interaction between lipids, their signaling and their relationship to pathologies (hypercholesterolaemia, atherosclerosis, obesity, diabetes, degeneratives diseases and cancer).
- **UE3 - Nutrition & Pathologies (6 ECTS):** Lipoproteins & Drug Delivery; Emerging Risks & Nutritional Quality
- **UE4 - (10 ECTS): Communication – English / CONFERENCES / Meeting (4 ECTS):** Methodological approach of a research project (50hrs) / « Ethics in research », **Mentored project (6 ECTS):** Bibliographic review, analysis and synthesis of research articles

Semester 4 (30 ECTS)

6 month Internship in a research laboratory (30 ECTS)

ORAL DEFENSE

Job Opportunities 2019 - 2023



Graduate school INTHERAPI

UNIVERSITÉ BOURGOGNE EUROPE

UNIVERSITÉ MARIE & LOUIS PASTEUR

MASTER I3C

Interactions Immunitaires et Ingénierie Cellulaire

Organization:

First year

- M1 I3C in DIJON or M1 BS I3C in BESANCON

Second year

- M2 in Besançon

Partnerships:

Subjects developed:

- Fundamental principles of **immune interactions** in grafts, oncology, auto-immune diseases, transfusion.
- **Cellular engineering** and **biotechnology** tools modulating immune interactions.
- Stakes and challenges of **immune interventions**, **cellular** and **gene therapies**.
- Conception, execution and valorisation of **innovation development** and **research projects** in the field of immune interactions and cellular engineering.

Requirements, Application

Undergraduate degree → MASTER degree 1st year → MASTER degree 2nd year → PhD program

Who can apply?

Student awarded a **Bachelor's degree** (for an entry in M1) or **master 1 degree** (for an entry in M2) or equivalent in Health or Life Sciences.

How to apply?

- On the partner university websites:

Université Marie et Louis Pasteur: www.univ-fcomte.fr,
Or Université Bourgogne Europe : www.u-bourgogne.fr

- **For foreign students requiring :**

Applications via "Etudes en France" - Campus France

First year program

Semester 1 (30 ECTS)

- **UE1 (6 ECTS): English** (20hrs) / **Seminars / Visits of Company**
- **UE2 - Tools for biology investigation (6 ECTS)**: Provides theoritical and practical knowledge of the tools and methods used in research laboratories
- **UE3 - Project Managment / Biostatistic (6 ECTS)**: Design and execution of a project (deadline, objectives, milestones, resource).
- **UE4 - « Omic » analysis GTPIA (6 ECTS):** Genomics, proteomics, transcriptomic) / Artificial intelligence
- **UE5 - Molecular and cellular signaling (SCM) (6 ECTS)**: Cell communication, membranes receptors, signal transduction, proliferation, cell cycle regulation, cell death

- **Tools for biology investigation / Biostatitics (6 ECTS)**: Investigation tools for cellular biology and biochemistry. Data processing methods.
- **Project Managment, preparation of working life / English (6 ECTS)**: Training in Project Management and career development. Communicating research findings in English.
- **From epigenetic to post-translational modification (6 ECTS)**: Gene Expression Regulation, Epigenetic & Post-Translational Modifications, Protein Trafficking, and Metabolic Pathways. Cellular Signaling, Intercellular Communication, and Environmental Stimuli Integration.
- **Immunology (6 ECTS):** Fundamental Immunology, Innate Immunity, and Adaptive Immunity. Molecular and Cellular Mechanisms of the Immune System.
- **Cell culture and toxicology (6 ECTS)**: Cell culture techniques, experimental environmental and Pharmaceutical toxicology, In Vitro Assays, and Risk Management.

Semester 2 (30 ECTS)

- **Internship (2 months) (6 ECTS)**

1 unit to select from the following:

- **Molecular Pharmacology and pharmacotherapies (6 ECTS):** Basics in pharmacology, pharmacokinetics, pharmacodynamics and drug safety
- **Molecular oncology (6 ECTS)**: Molecular basis of oncogenesis

Optional

- **Normal and Pathological Hematopoïesis (2 ECTS)**: Provides solid foundations concerning etiology of certain metabolics disorders linked to excess weight, ageing, environmental or genetic factors
- **Advanced cellular signaling and carcinogenesis (2 ECTS)**
- **Tumor immunology (2 ECTS)**

- **Internship (2 months) (6 ECTS)**

- **Life Science issues and Scientific Communication in English (English) (6 ECTS):** Expanded foundational knowledge in the essential field of Cell Biology, Biochemistry, and Molecular Biology.
- **DNA Repair, Cell cycle and Apoptosis: Life and death of the cell (6 ECTS)**: Cell Life and Death Mechanisms, dysregulations leading to Cancer and Neurodegenerative Diseases and how to target them.

➢ **2 options out of 3 units**

- **Molecular mechanisms of genetic diseases (6 ECTS)**
- **Immunotherapy and Immunopathology (6 ECTS)**
- **Innovative biodrugs and biotherapy (6 ECTS)**

Second year program

Semester 3 (30 ECTS)

- **UE1 II, Immune Interactions (8 ECTS):** Immunology, Inflammation, Immune interventions, immuno-pharmacology.
- **UE2 BIC, Biotechnologies and Cellular Engineering (6 ECTS):** Biotechnologies, Nanobiotechnology, Stem cells.
- **UE3 ST Scientific Skills (6 ECTS):** Scientific English and Communication, Biostatistics, Research methodologies in health, tutored project, article analysis, scientific integrity, hazards and risk management in laboratories, innovation and entrepreneurship, bliographic review, analysis and synthesis of research articles.

2 units to choose from the following:

- **UE4 ICB Bioproduction and Cellular Engineering (5 ECTS)**
- **UE5 RHG Host-Graft Interactions (5 ECTS):** Immune interactions between a graft and the host.
- **UE6 RHT Host-Tumor Interactions (5 ECTS):** Immune interactions in cancer.
- **UE7 RHH Host-Host Interactions (5 ECTS):** Immune interactions and auto-immunity.
- **UE8 RHS Host-Blood product Interactions (5ECTS):** Immune Interactions in the context of transfusion.

Semester 4 (30 ECTS)

6 month Internship in a research laboratory

ORAL DEFENSE

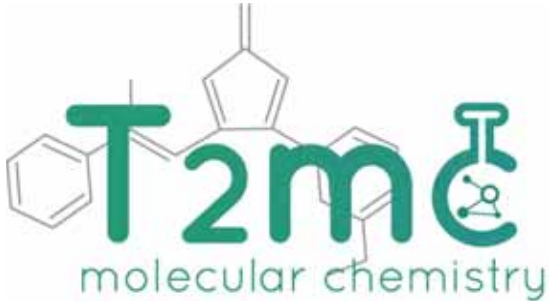
Job Opportunities:

- Public and Private Research
- Medical or academic careers
- Biotech and pharmaceutical industries
- Regulatory agencies

Graduate school INTHERAPI

Graduate school EIPHI

UNIVERSITÉ BOURGOGNE EUROPE



Transition Metals in Molecular Chemistry

Organisation:

First year

- M1 T2MC in Dijon or M1 TMC in Prague

Second year

- M2 T2MC in Dijon

Subjects developed:

- **Organic, Organometallic, Inorganic and Theoretical Chemistry, Spectroscopy**

+ OPTIONAL:

- **Advanced Synthetic Methods**
- **Biomolecules/Methods in Imaging**
- **Electrochemistry/Electrosynthesis**
- **Polymers/Molecular Materials and devices**

Requirements, Application

Undergraduate degree → MASTER degree 1st year → MASTER degree 2nd year → PhD program

Who can apply?

Student awarded a **Bachelor's degree** (for the entry in M1) or **Master's degree** (for the entry in M2) or equivalent in the following subjects:

- Chemistry
- Physical-Chemistry
- Biochemistry

Language requirement : **English**, Intermediate level.

How to apply?

For both M1 or M2:

Etudes en France: https://pastel.diplomatie.gouv.fr/etudesenfrance/dyn/public/authentification/login.html

eCandidat, https://ecandidat.u-bourgogne.fr/ecandidat/#!accueilView

First year program (M1)

DIJON or PRAGUE

Semester 1 (30 ECTS)

- **UE1 Organic Chemistry (6 ECTS)**
- **UE2 Inorganic Chemistry (6 ECTS)**: Provides theoritical and practical knowledge of the tools and methods used in research laboratories
- **UE3-5 Spectroscopy Methods (6 ECTS)**: NMR, Optical and Molecular Spectroscopies
- **UE6-8 Introduction in (6 ECTS):** Analytical Methods, Biomolecules, Polymers
- **UE9-11 Transversal Courses (6 ECTS)**: Scientific Comm. in English, Bibliography, Handling of Organometallic and sensitive products

Semester 2 (30 ECTS)

- **UE25-26 Molecular Modeling, Thermodynamics, Reactivity (5 ECTS)**
- **UE27 Organometallic Chem. and Reactivity (6 ECTS)**
- **UE32 Specialty Project (1 ECTS)**
- **UE33 Internship (10 ECTS)**

3 units to choose out of 4:

- **UE28 Advanced Synthetic Methods (3 ECTS)**: Photochemistry, Innovative Methods
- **UE29 Biomolecules (3 ECTS)**: Analytical Methods, Biomolecules, Polymers
- **UE30 Electrochemistry and chromatography (3 ECTS)**
- **UE31 Polymer Processing (3 ECTS)**

Double Diploma curriculum

- **UE2 – Organic Chemistry (7 ECTS)**
- **UE1 – Coordination Chemistry (6 ECTS)**
- **UE3 – Organic Reaction Mechanisms (6 ECTS)**
- **UE4 –Computational Chemistry – Molecule Vizualization (4 ECTS)**
- **UE5 – Specialization Laboratory Courses - Chemistry (7 ECTS)**
- (Optional) Czech Language – Beginners **(2 ECTS)**

- **UE6 – Retrosynthesis (6 ECTS)**
- **UE7 – Physical Organic Chemistry (5 ECTS)**
- **UE8 –Structural Analysis (4 ECTS)**
- **UE9– Internship (3 ECTS)**
- **UE10 – Laboratory Project Chemistry (7 ECTS)**
- **UE11 – Kinetics of Chemical and Photophysical Processes (4 ECTS)**

Second year program (M2)

Semester 3 (30 ECTS)

- **UE50-52 Organic Chemistry (5 ECTS):** Heterochemistry, Macrocyclic Chemsitry, Metals in Multistep Synthesis
- **UE 53-55Transition Metal Chemistry (7 ECTS):** Molecular Modeling and Metals, Transition Metal Catalysis, Coordination and Physical Chemistry of Metals
- **UE56-57 Transversal Courses » (6 ECTS):** Project Management, Innovation, Communication
- **UE58 Communication – English / CONFERENCES / Meeting » (6 ECTS)**
- **UE62 Specialty Implementation (3 ECTS)**

3 units to choose out of 4:

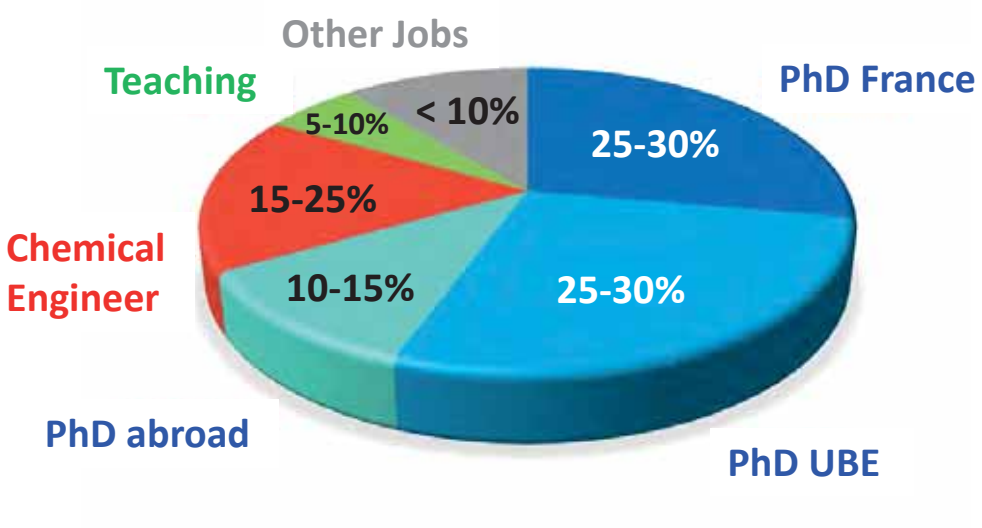
- **UE58 – Advanced Synthetic Methods (3 ECTS):** Photocatalysis, Heterogeneous Catalysis, Advanced Total Synthesis, Retrosynthesis
- **UE59 – Biomolecules (3 ECTS):** Methods in Molecular Imaging, Metals and Biology, Bioconjugation Chemistry and Vectorization
- **UE60 Electrochemical Methods and Electrosynthesis (3 ECTS)**
- **UE61– Polymer (3 ECTS):** Chemical and Materials from Renewable Resources, Molecular Materials and Devices, Organic Polymers/Catalysis

Semester 4 (30 ECTS)

5-6 month Internship in a research laboratory

ORAL DEFENSE

Job Opportunities: From 2022 to 2024



- **>70 %** PhD program
- 15 – 25% Chemical Engineer
- 5 – 10 % Teaching
- < 10 % Other Jobs

Graduate school INTHERAPI

UNIVERSITÉ MARIE & LOUIS PASTEUR

SINERGIES

Soins Intégrés, Nanomédecine, IA & Ingénierie pour la Santé

Soins intégrés, Nanomédecine, IA & Ingénierie pour la Santé

International Partnerships with the Haute Ecole d'Ingénierie et de Gestion de Vaud

Organisation:

First year • M1 INASYS (IA,IOT, Health System Organization) in BESANCON

Second year • M2 INASYS & OPTIMSYS (Optimisation des traitements interventionnels par l'imagerie) in BESANCON

Subjects developed:

- **Health system organizations**
- **Artificial Intelligence in Healthcare**
- **Engineering in Health**
- **Medical Imaging ; 2D, 3D, 4D imaging reconstruction**
- **Imaging for surgical planning**
- **Modeling, optimization, logistics, Internet of Things, data mining,**
- **Emergency care/logistics and patient pathways**
- **multicentric clinical research protocols**
- **Scientific litterature : communication & « how to write a paper »**

+ OPTIONAL:

- **3D printing**

Requirements, Application

Undergraduate degree → MASTER degree 1st year → MASTER degree 2nd year → PhD program

Who can apply?

Student awarded a **Bachelor's degree** (for the entry in M1) or **master's degree** (for the entry in M2):

- This Master program is designed for students in medicine (particularly in surgical disciplines, anaesthesiology, and radiology), midwifery, and pharmacy, as well as for engineers, technological sciences students and students in electro-radiology who wish to pursue a dual curriculum in the field of health.

Language requirement: **French**, Intermediate level or higher.

How to apply?

For an enrollment in M1: monmaster platform (https://monmaster.gouv.fr) or Campus France or ecandidat (contact the Masters' supervisor)
For the enrollment in M2: ecandidat

First year program

Semester 1 (30 ECTS)

- **UE1 – Health systems** (6 ECTS)
- **UE2 – Health engineering/ Medical imaging (basics)** (6 ECTS)
- **UE3 – Basics in Medical Economics** (4 ECTS)
- **UE4 – Information systems in Health care organizations (basics)** (6 ECTS)
- **UE5 – French and European Regulations in medical research** (4 ECTS)
- **UT – Communication in medical research** (4 ECTS)

Semester 2 (30 ECTS)

- **UE1 - Information systems in Health care organizations (advanced)** (6 ECTS)
- **UE2 – Health Engineering : integrated healthcare** (6 ECTS)
- **UE3 – Research & Development for health services/products** (6 ECTS)
- **UE4 – Analysis of healthcare databases (basics)** (6 ECTS)
- **UE5 – NRBC** (4 ECTS)
- **UE6 – Student individual project under supervision** (2 ECTS)

ORAL PRESENTATION of students projects

Second year program

Semester 3 (30 ECTS)

- **UE1 – Health systems & integrated healthcare (advanced) (6 ECTS)**
- **UE2 – healthcare databases (advanced) (6 ECTS)**
- **UE4 – Analysis of healthcare databases (advanced) (6 ECTS)**
- **UE5 – Diagnostic aids and tools (6 ECTS)**
- **UE6 – Student individual project under supervision (6 ECTS)**

Semester 4 (30 ECTS)

6 months Internship in a research laboratory, public healthcare organization, or private/industrial company

ORAL DEFENSE

Job Opportunities:

- PhD programs
- Jobs in biomedical companies
- Continuation of medical/pharmaceutical studies
- Jobs in research or R&D
- Other formations

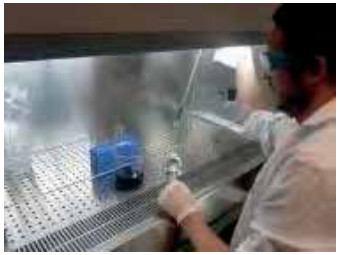
Parcours
Physiologie, Neurosciences & Comportement
Mention Biologie Santé

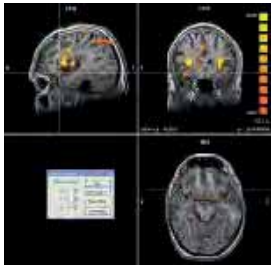
Responsable M1 et Parcours
Laurence JACQUOT
laurence.jacquot@univ-fcomte.fr

Responsable M2
Vincent VAN WAES
vincent.van_waes@univ-fcomte.fr

https://neurosciences.univ-fcomte.fr/

Laboratoire de recherches Intégratives en Neurosciences et psychologie Cognitive



MASTER 1 PHYSIOLOGIE, NEUROSCIENCES ET COMPORTEMENT

Semestre 1 (30 ECTS)

OUTILS D'INVESTIGATION EN BIOLOGIE (4ECTS)

BIOSTATISTIQUES (2ECTS)

ANGLAIS (2ECTS)

MANAGEMENT DE PROJET, PREPARATION A LA VIE PROFESSIONNELLE (4ECTS)

NEUROBIOLOGIE CELLULAIRE (6ECTS)

COMPORTEMENT ANIMAL: ETUDES EN MILIEU NATUREL ET EN LABORATOIRE (6ECTS)

NEUROSCIENCES INTEGRATIVES ET COMPORTEMENTALES (6ECTS)

Semestre 2 (30 ECTS)

ENJEUX EN SCIENCES DU VIVANT ET COMMUNICATION SCIENTIFIQUE EN ANGLAIS (6ECTS)

STAGE EN ENTREPRISE OU D'INITIATION À LA RECHERCHE (6ECTS)

ADAPTATIONS PHYSIOLOGIQUES CHEZ L'ANIMAL (6ECTS)

NEUROPHARMACOLOGIE ET METHODOLOGIE EN NEUROSCIENCES (6ECTS)

ANALYSES SENSORIELLES (6ECTS)

UE mutualisées avec le Master 1 Biologie-Santé - Parcours pluridisciplinaire (SCM/MAGE/I3C)

MASTER 2 PHYSIOLOGIE, NEUROSCIENCES ET COMPORTEMENT

Semestre 1 (30 ECTS)

UE1 6 ECTS : Approches pluridisciplinaires en neurosciences (conférences)

UE2 6 ECTS: Méthodologies, outils et applications (aspects cliniques)

UE3 6 ECTS : Familiarisation à la Recherche (projet bibliographique, fond)

UE4 6 ECTS : Valorisation, expression et communication (projet bibliographique, forme)

UE5 6 ECTS : Option libre (à choisir à l'UMLP, en rapport avec le projet)

Semestre 2 (30 ECTS)

UE 30 ECTS : Stage et mémoire de recherche (gratification 4 mois)

Après le M2 PNC ?

- Bénéficiaire d'un contrat doctoral
- Ingénieurs d'études
- Attaché de recherche clinique

	Master PNC		
Année universitaire	**Nombre d'étudiants diplômés poursuivant en doctorat**	**Taux d'insertion après 18 et 30 mois.**	**Taux d'insertion des diplômés dans le tissu socio-économique régional.**
2020-2021	2	83%	
2021-2022	5	77%	
2022-2023	4	70%	
2023-2024	4	65%	

RÉPUBLIQUE FRANÇAISE
Liberté
Égalité
Fraternité

ANR-20-SFRI-0008

FRANCE 2030

Graduate school INTHERAPI

Coordinator: **Yann Godet**
Professor, UMR 1098 RIGHT

Adjunct Coordinator: **Laurence Dubrez**
CR INSERM, UMR 1231 CTM

Project Manager: **Sebastien Causse**
PhD

UNIVERSITÉ BOURGOGNE EUROPE

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