



MASTER 1 MOLECULAR AND CELLULAR BIOLOGY

THE "MOLECULAR AND CELLULAR BIOLOGY" MASTER'S DEGREE IS THE COMMON CORE OF THE 7 PROGRAMS OF THE MASTER'S DEGREE IN BIOLOGY (4 RESEARCH PROGRAMS AND 3 PROFESSIONAL ONES).

The First year of the Master's degree in Biology is called "[Master 1 - Molecular and Cellular Biology](#)" and is common to the 7 Master 2 programs of the Master's degree in Biology. These Master 2 programs are named respectively:

- "[Physiology, Epigenetics, Differentiation and Cancer](#)" (PhEDC),
- "[Neurobiology Neurosciences](#)" (NN),
- "[Integrative Structural Biology](#)" (ISB),
- "[Immunology, Microbiology, Infectious Diseases](#)" (IMID),
- "[Pro2Bio](#)",
- "[Biologie et Techniques de Commercialisation](#)" (BioTechCo),
- "[Lab Science Trading](#)" (LST).

(NB : The plant Int Program has its own specificities. Students who are interested in this program will find information by clicking on the following link. <http://formations.univ-grenoble-alpes.fr/fr/catalogue/master-XB/sciences-technologies-sante-STS/master-biologie-program-master-biologie/parcours-planta-international-plant-int-subprogram-planta-international-plant-int.html>)

The first semester (Fall Semester) of the Master 1 year includes

- 1) 12 credits (credits in Europe are abbreviated "ECTS" for ECTS for European Credit Transfer System) of disciplinary teaching in Biochemistry, Genetics, Epigenetics and Cell Biology and
- 2) 18 ECTS of practical work (integrated practical sessions).

The second semester (Spring Semester) of the Master 1 - Molecular and Cellular Biology will prepare you to the Master 2 program of your choice. The choice of modules (in France, modules are abbreviated "UE" for "Unité d'Enseignement") offered during this Spring Semester is quite large. You must choose at least two modules that belong to your Master 2 program of interest. A mandatory 11-week laboratory internship will take place at the end of this Spring Semester.

ALMOST ALL OUR MASTER'S COURSES ARE TAUGHT IN ENGLISH.

We benefit of the hindsight now on the use of **English as the language of teaching of our Master's programs**. Students prefer English because they see **the importance of English** for their career, whether in **fundamental research, research and development, or international trade** in Biology and Biotechnology products.

A survey carried out on the 2019/20 class of the Master 1 "Molecular and Cellular Biology" program showed that students adapt very quickly to being taught in English. **Scientific English is indeed easy to understand. Experience shows that even those of you, who have not had English courses during their Bachelor's degree adapt very quickly.** In short, English should not frighten you.

APPLICATION TO THE MASTER 1 "MOLECULAR AND CELLULAR BIOLOGY" PROGRAM

Any student with a Bachelor's degree in Biology or Chemistry-Biology can apply to our Master's degree in Biology, thus to the **Master 1 year "Molecular and Cellular Biology"**. Experience shows that students who have obtained their Bachelor's degree at Université Grenoble Alpes are well prepared to succeed in our Master's degree. However, students who have received equivalent training elsewhere in France or in other countries are also welcome. They enrich our courses with their specificity and foreign students succeed very well, as long as the content of their Bachelor's degree or equivalent matches ours!

The application procedure includes

- 1) the analysis of the written application and
- 2) a phone or Skype interview with a teacher involved in the Master 2 program you have selected.



Through the analysis of the written application, the phone or Skype interview with the student, we try to test if the student will be able to follow the Master's courses.

It is our responsibility to prevent you from taking a path that would drive you into a dead end!

The question we ask ourselves, when reviewing an application is:

“does this student have the motivation, the work power, and the scientific and technical backgrounds necessary to succeed in this Master's degree?” Of course, we analyze the grades... but beyond the overall average of your former semesters, we try to determine whether the student has acquired a sufficient level in the topics that we consider as being essential for the preparation of the Master's degree.

A too weak transcripts' record (examples: average mark of terminal exams never reached, exams always passed during second sessions, ...) **will be rejected.**

A too weak transcripts' record indeed reveals that the student has not acquired the knowledge and the methods that will be essential for the preparation of the Master's degree.

This could be due to a lack of work, a lack of motivation, or other reasons.

It has happened that a student "reveals himself/herself" during the last semester of his/her Bachelor's degree and, despite low grades during the first 5 semesters of the Bachelor's degree, he/she has finished the last semester with excellent grades: it is never too late!

Advices for your written application:

- 1) highlight your strong points in your cover letter and
- 2) explain your weak points, if you have any. In the same way, explain your repetitions, program changes ... If you hesitate between two Master 2 programs, do not hesitate to mention it in your letter.

GENERAL ORGANIZATION AND GOALS OF THE MASTER 1 YEAR.

The Master 1 year “Molecular and Cellular Biology” gives a large place to experimentation, which is a specificity of the Grenoble Master's degree in Biology.

During the integrated practical sessions of the Fall Semester you will have to propose and carry out experimental work that will be part of a theme previously chosen by your professors. Within this framework, you will have to define questions of interest, propose experimental protocols, and perform your proposed experiments. For this work, you will be tutored by your teachers to make sure, the questions and the protocols are appropriate. At the end of the experimental work, you will have to write a report (a brief scientific article) and present your work orally. These integrated practical sessions constitute an excellent preparation for the internship, which takes place at the end of the Spring Semester. This internship, which is performed in a research laboratory will also be concluded by a written- and an oral report.

This first practical training in research is very much appreciated by the research laboratories of the Grenoble area. These laboratories are numerous, they cover many fields in Biology (those, which are taught in our Master 2 programs) and they are high standard laboratories. Researchers from these laboratories are actively involved in teaching and the laboratories offer, each year, a very large number of internships to both the M1 students and the Master 2 students (120 internship offers to the Master 1 students and 80 to the Master 2 students). These numerous teaching offers demonstrate that the research laboratories value our training.

The Master 1 “Molecular and Cellular Biology” year is thus critical:

- 1) it allows you to specialize in the biology fields that interest you the most;
- 2) the large amount of time devoted to experimental work will allow you to understand the coherence and importance of the theoretical teaching you have received during your Bachelor's degree and during the Fall Semester.

The two years of the Master's degree are perceived by the students as being labor intensive. However, the rate of success is actually excellent. The Master 1 year will require you to be organized so that you are able to provide sustained work throughout the academic year! **This is why you should not engage yourself into this Master's training by default**, "just to continue your studies". **A real motivation is mandatory to provide a sustained work.**



MASTERS 2 BIOLOGY

1- APPLICATION TO THE MASTER 1 “MOLECULAR AND CELLULAR BIOLOGY” PROGRAM WITH THE PERSPECTIVE OF A “MASTER PRO”

Because of its theoretical and fundamental contents as well as its various experimental approaches in the different fields of Biology, the Master 1 year “Molecular and Cellular Biology” constitutes a common base for various types of professional careers other than in fundamental research.

An initiation to the business world, its stakes, and its functioning will be proposed to you during the Spring Semester of the Master 1 year and choosing these modules will be positively appreciated for your selection in one of our 3 “Master2 Pro” programs. Would you be tempted by one of these programs, we would help you find internships in Biotech companies rather than in fundamental research laboratories.

Our 3 “Master 2 Pro” programs are designed to train you to work in sales, commerce (respective Master 2 programs “BioTechCo” and “Lab Science Trading”) or in research and development at the design engineer level (Master 2 program “Pro2Bio”).

In these programs, you will thus be trained for the targeted professions, which are in various applied fields of Biology in connection with the business world, biotechnologies, *in vitro* diagnosis, human health, ... on the national territory (case of the 3 “Master Pro” programs) or internationally (Master 2 programs “Lab Science Trading” and “Pro2Bio”). The courses will be taught mainly by employees from Biotech companies with which we have a strong partnership. These companies appreciate the scientific level of our students and in particular their skills and autonomy in learning.

Your interests, motivations, curiosities and perhaps a first experience in a private company will be appreciated and welcome. We also value a solid scientific background and a fair level in English.

These Master programs lead to a job most of the time within 3 months after graduation and very often in the same Biotech company, where the Master 2 internship was performed. The goal of these Master 2 programs is thus to get a job at the end of 5 years of studies at the University, not to prepare to a PhD degree.

WHICH KIND OF JOB AT THE END OF OUR “PRO” MASTER PROGRAMS?

The Master 2 “Pro2Bio” program aims at the training of design engineers in the field of biotechnologies. The teaching is in English for the scientific part (shared with other Master programs), and in French for the professional part. This Master 2 year includes a Fall Semester of regular teaching at the University, followed by a 6-month internship. Interns are recruited in the Research and Development laboratories of companies (SMEs, VSEs, start-ups, international companies) or to run technological platforms of big research institutes.

The Master 2 “BioTechCo” program is a nearly 30-year-old training program, which is famous among vending companies in France. For more than 15 years, BioTechCo has been proposed in apprenticeship and has been taught as work-study programs. This method of co-training both at the University and in a private company is ideal to get some initial experience in the field through the missions entrusted to the students, and for professional integration. BioTechCo is taught in French and follows an average rhythm of 1 week per month at the University and 3 weeks per month in a private company, over a period of 12 months. This rhythm has been defined in agreement with the companies. Our Master 2 interns are integrated in private companies to carry out commercial actions, mainly in the sale field but also in marketing or in application and after-sales service. Close to 100% of our interns are hired by the Company, where they did their Master 2 mission.

The Master 2 “Lab Science Trading” program aims at providing students trained in sciences (biology, chemistry, or physics) with a commercial training. Teaching is in English and the program is open to a wide range of students (60% of students come from outside Europe). The targeted professions are in export, geographical area manager, product manager, international distributor manager or international business developer.



The training will follow the rhythm of a work-study program from September 2020, and will definitively open to work-study starting from September 2021, as this is the best rhythm to optimize practical training in the Company and training at the University. The statistics of employment of our former students show that 80% of them got a job within the month following their graduation and 100% of them, within the three following months.

Commerce is strongly represented (face-to-face commerce, digital commerce, choice of distributors, management of the international sales force, communication with scientific audiences...). Operational marketing allows to understand the commercial offer proposed by the company.

A commercial project based on the marketing of innovative products is the guiding thread for the practical applications throughout the academic year.

In 2021, this project will be carried out in coordination with the “**Lab Science Trading**” Master's degree in Vietnam and Lebanon, two locations where “Lab Science Trading” will start thanks to the long-standing collaborations with these countries.

This international-oriented course is offered to scientific students who have already completed an Erasmus exchange in their university curriculum. The jobs at the end of this program are both in France and abroad. The career developments of our former students correspond to the choices of a well-thought and organized professional and personal project. The entire Science Trading team is mobilized to answer to your questions.

2- APPLICATION TO THE MASTER 1 “MOLECULAR AND CELLULAR BIOLOGY” PROGRAM WITH THE PERSPECTIVE OF BEING ENROLLED IN A “RESEARCH” MASTER

The qualities required for a master's degree in research are numerous and varied, in line with the research activity. **Ability to integrate a large amount of information, aptitude for experimental work, attraction for novelty, stamina, tenacity and rigor, good editorial capacity...** These various capabilities are all important and will be considered in your application.

PROFESSIONAL CAREER PATHS AT THE END OF OUR RESEARCH MASTER PROGRAMS (PHEDC, NN, ISB, IMID)

Following the example of students from the Pro2Bio course, some students from our research programs are hired in research laboratories with the status of Engineer, at the end of their Master 2 year. A few students may continue their Master's program with another High Education program (e.g. Ecole Pratique des Hautes Etudes (EPHE), preparation of a Master's degree in Management...). **Most of our students continue with the preparation of a PhD.**

The status of PhD student is quite unique: you keep a student status (with access to all the services offered to students) **AND you are already considered as running a job.** In France, the preparation of a PhD thesis takes 3 years. Thesis registration requires that you have obtained a specific thesis salary.

There are different types of funding available : government research fellowships (gross salary: 1,769 euros per month, for 3 years), private or public research funding, mixed funding involving a private company and a public laboratory (“Conventions Industrielles de Formation par la REcherche”, i.e. CIFRE contracts).

As a PhD student one benefits from a dual status of employee AND student enrolled in a Doctoral School. Most of the students from our Master's programs are registered at the Doctoral School of Chemistry and Life Sciences (EDCSV) or the Doctoral School of Engineering for Health, Cognition and the Environment" (EDISCE) in Grenoble.

Many of our Master students are also enrolled in other Doctoral Schools elsewhere in France (theses carried out in other French Universities).

A fair number of students also prepare their thesis abroad (Switzerland, Germany, Belgium, Netherlands, Denmark, Great Britain, Canada, Australia, Japan, Sweden, ...). Their Master's degree in English is a great asset for this temporary expatriation.



POST MASTER BIOLOGY

The PhD degree has been recognized as a professional diploma for a very long time in most countries.

It is now also registered as a professional training through research in France:

<https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000038200990>

At the end of their PhD thesis, PhD students continue with one or two post-doctoral trainings in France or abroad. These 2-year research contracts are requested to expand the research experience of those young researchers.

At the end of this PhD + 2-4 years of post-doctoral training, our Master alumni continue their careers as researchers in France (Atomic Energy Centre (CEA), National Centre for Scientific Research (CNRS), National Institute for Medical Research (INSERM) or as Lecturer-Researcher in a French University, or in foreign Universities as Research scientists or Lecturers.

Many of our former students also join Biotechnology companies as project leaders in research and development.

Other former students have also been recruited, at the end of their PhD, for research-related jobs, if they have completed additional trainings (e.g. project management after additional management training, patent management after additional training in patent law, assistance with the marketing of drugs, assistance to companies in obtaining research tax credits, clinical research associate, after training in clinical research, etc.).

SOME LINKS CONCERNING THE THESIS

You will find useful information concerning the preparation of a PhD degree at:







<https://www.enseignementsup-recherche.gouv.fr/cid20185/le-doctorat.html#doctorat>

A very large network of laboratories and research teams will welcome you in Grenoble for an M1 or M2 internship, then for the preparation of your PhD.

The themes of these laboratories cover all the disciplinary fields proposed in the courses of our Master's degree in Biology. Each Research Institute or Research Unit listed below is constituted of several independent research teams.

Research Unit number	Name of the Research Institute or the Research Unit	Name of the Director of the Research Institute or Research Unit	Link to the Research Institute or the Research Unit
UMR_S 1036	<u>BCI - Biologie du Cancer et de l'Infection - CEA</u>	Jean-jacques FEIGE	Fiche
UMR_S 1038	<u>Biologie à grande échelle CEA</u>	Xavier GIDROL	Fiche
CEA	<u>CEA/LETI/DTBS/Service Bio System-on-Chip - LCMI CEA</u>	Severine VIGNOUD	Fiche
UPR 5301	<u>Centre de Recherche sur les MACromolécules Végétales CERMAV- campus</u>	Anne IMBERTY	Fiche
U 1209	<u>https://iab.univ-grenoble-alpes.fr/ Centre de recherche Epigenetics, Chronic Disease, Cancer Institut pour l'avancée des Biosciences (IAB-La Tronche)</u>	Pierre HAINAUT	Fiche
	<u>European Synchrotron Radiation Facility</u>	Francesco SETTE	Fiche
UMR_S 1216	<u>Grenoble Institut des Neurosciences (GIN - La Tronche)</u>	Frederic SAUDOU	Fiche
EA 7408	<u>Groupe d'Etude et de Recherche du Processus Inflammatoire</u>	Athan BAILLET	Fiche



	(GREPI – La Tronche)		
UMR 1042	<u>Hypoxie et Physiopathologie cardiovasculaire et respiratoire</u> (HP2 - campus)	Jean-Louis PEPIN	 Fiche
UMR 5075	<u>Institut de Biologie Structurale</u> (IBS)	Winfried WEISSEHORN	 Fiche
UMR_S 1055	<u>Laboratoire Bioénergétique Fondamentale et Appliquée</u> (LBFA) - campus	Uwe SCHLATTNER	 Fiche
UMR 5249	<u>Laboratoire de Chimie et Biologie des Métaux</u> (CEA)	Stephane MENAGE	 Fiche
UMR 5168	<u>Laboratoire de Physiologie Cellulaire Végétale</u> (CEA)	Eric MARECHAL	 Fiche
	<u>laboratoire européen de biologie moléculaire</u> (EMBL)	Stephen CUSACK	 Fiche
UMR 5819	<u>Systèmes Moléculaires et Nano Matériaux pour l'Énergie et la Santé</u> (SYMMES - CEA)	Frédéric CHANDEZON	
UMR 5525	<u>TIMC</u> (Translational Innovation in Medicine and Complexity) (Campus Santé)	Philippe CINQUIN	https://www-timc.imag.fr/en
USC 1450	Unité de Recherche PaVaL (Campus Scientifique) Pathogenèse et Vaccination Lentivirales	Yahia CHEBLOUNE	