

DOCTORAL PROGRAMS

Biotechnology

Identificative data of the program

Code	H0401
Denomination	Biotechnology
Areas of the program	Ciències Ciències Mèdiques i de la Salut Ciències de la Vida
Maximum number of students	50
URL of the program	http://www.ub.edu/bbmfar/BIOTECNOLOGIA%2020062007.htm

Coordinator

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Training period

UB master/s which is/are partially or totally integrated in this period:

Master

Biotecnologia Molecular	Total
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Research period

General objectives of the program

Biotechnology, a historical perspective

In a broad sense, biotechnology is related to the production of commercial products generated by the metabolic action of the organisms. More formally, biotechnology is defined as the application of scientific and engineering principles to the production of compounds across biological agents for the purpose of providing goods and services. Until the early 1970's, traditional biotechnology, mainly applied to the fermentative processes, a scientific discipline was not well known. Modern biotechnology, also known as molecular biotechnology, emerged as a new area of research thanks to the merger, at the end of the 1970s, the technology of genetic engineering in the traditional industrial microbiology. The potential for genetic manipulation of an organism was then applied not only to microorganisms, but also to plants and animals, and this application had a greater impact on the field of health, agriculture and environment. The molecular biotechnology has been regarded as the latest technological revolution of the twentieth century.

Economic aspects of molecular biotechnology

The economic impact of molecular biotechnology was quickly recognized at the beginning of 1980 with the creation of a large number of biotechnological companies (in 1985 there were approximately 400 biotech companies in the United States only). Today there are more than 1500 companies of this kind in the United States in more than 3000 worldwide. In addition, many multinational chemical and pharmaceutical companies, including among others, Monsanto, DuPont, Upjohn, American Cyanamid, Eli Lilly, SmithKline, Beecham, Merck, Novartis and Hoffman La Roche, have made significant advances in molecular biotechnology. Much of the commercial development of molecular biotechnology has focused on the United States, and more recently also in Japan. The European biotechnology industry was developed subsequently. In 1995, there were approximately 600 Biotechnological companies in Europe. By the mid 1990, more than a dozen drugs produced by recombinant DNA technology were authorized for use in humans, more than 100 were in the process of being used for clinical trials, and more than 500 products were in the process of development. It has also produced and commercialized many products produced by molecular biotechnology to improve and increase crop yields in agriculture. The annual profits of the molecular biotech industry has increased from 6 million in 1986 to about 30,000 million euros in 1996. It is estimated that at the beginning of the decade of 2000, sales of products derived from biotechnology Molecular doblaran the value of 1996.

Social impact of molecular biotechnology

It is widely recognized that the molecular biotechnology can provide benefits to humanity unprecedented. These benefits include: 1) to provide tools for an accurate diagnosis, prevent or cure a wide range of infectious diseases or genetic, 2) significantly increase the yield of agricultural crops through the creation of plants resistant to insects, diseases viruses or fungi, and environmental stress situations such as drought or freezing temperatures, 3) develop microorganisms that produce chemicals, antibiotics, amino acids, enzymes, and certain food additives, 4) Genetic improvement animals to livestock, 5) elimination of environmental contaminants.

Although it is very interesting to highlight the positive aspects of these new developments, we must also consider the social impact that

could cause its consequences in the absence of regulatory agencies. These aspects have been considered by government commissions, discussed extensively in conference and widely discussed and analysed in scholarly and popular publications. On these bases have formulated a series of rules and regulations, and have established guidelines and policies to follow. However, despite these developments, there are still disputes open.

The molecular biotechnology as a new academic discipline

Molecular Biotechnology has become in a short period of time a scientific discipline, both commercial and academic. Today there are a large number of new publications devoted to molecular biotechnology. We have also created programs and graduate and undergraduate courses in many universities of various countries to teach molecular biotechnology. In this regard, the University of Barcelona offers this Ph.D. program in Biotechnology since 1999.

The main objectives of the doctorate are:

1. It is providing training, both theoretical and practical, in the various aspects of biotechnology, with particular emphasis on the bases and applications of molecular biotechnology.
2. Provide a solid background in conceptual and methodological Biotechnology to graduates and professionals in biomedical, industrial, agricultural, pharmaceutical areas, food, environmental, and all those who are interested in basics and biotechnology products and processes.
3. To obtain professionals ready to satisfy the demand of the growing number of biotechnology companies in our country and try to reduce the time between the basic discovery and immediate implementation.
4. To deep in the applications of biotechnology in the sustainability of production systems and in the bioremediation of the environment.
5. Provide to the students with the knowledge of methods and management techniques in both research and business.
6. Provide the knowledge of the legislation governing the treatment of biotech products in terms of patents and biosecurity.

To achieve these objectives, we have coordinated activity of Departments of the Faculty of Pharmacy, Biology, and Chemistry, all of them from the University of Barcelona, which have experience in research and teaching in the field of biotechnology.

It is intended that the skills and training acquired to extend this doctoral program will be useful not only for the development of experimental work related to the doctoral thesis, but also of interest to those companies interested in incorporating trained personnel in this emerging area.

Procedimientos, requisitos y criterios específicos de admisión al programa, así como de valoración de los méritos de las personas candidatas.

* Be graduated in one of the following areas: biology, biochemistry, biotechnology, Pharmacy, Medicine, Veterinary Medicine, Chemistry, Chemical Engineering, Engineering and Technical Materials, Technical Agriculture and Forestry, Environment, Science and Technology of Food Science Sea and Informatics or equivalent title granted by foreign universities

* The selection and admission of students shall be made by the coordinating PhD committee if the acceptance is the period of investigation and in accordance with the commission's master and based primarily with the academic record and the profile of training, if acceptance is to the training period of PhD, which in this case consists of subjects from the Master of Molecular Biotechnology

Complements específics de formació en recerca, a cursar en màsters de la UB, que es considerin necessaris i activitats que hauran de seguir-se durant el període de recerca (seminaris, cursos metodològics o altres activitats formatives programades)

Attendance at seminars on topics related to the research topic of the thesis offered by the doctoral programme or externally. There will be a control assistance through certificate. Attendance at training courses preparations for the world of work. Acquisition of other cross-cutting skills by presenting oral and writing communications. In the view of the tutor in any ongoing methodological application in the field of the thesis is scheduled over the course of research seminars where students describe the main techniques used throughout his experimental work. Once a year the results of the thesis work will have to be presented by the PhD student.

Offered research lines, teachers and researchers and registering centers

[+] 100573 Genómica, proteómica y bioinformática

[+] 100574 Biotecnología Vegetal

[+] 100575 Terapia génica

[+] 100174 Nanobiotecnología

[+] 100171 Biotecnología: Modelos, metodologías y aplicaciones

[+] 100172 Biotecnología biomédica

[+] 100173 Biocatálisis

General information

Procedimientos para la admisión y el seguimiento del proyecto de tesis

Admission procedure:

a) training period

We will take into account the previous training, research experience, and accreditation of a third language.

b) Research period

The student must comply with the requirements approved by the commission in the UB doctoral's Governing Council on December 20, 2007. The PhD commission will assign a thesis advisor who meets the requirements set by the UB. It will assess the draft thesis respect to quality, methodology, today's topic and compatibility with the duration of the scholarship if they have or do not exceed a period longer than 4 years.

Follow-up:

a mentor is awarded to each student to follow the work during the period of execution of the thesis. A regular meetings in which students will present to the PhD committee the evolution of their work will be done. If necessary he can count with the participation of some external member. This fact is considered important when the subject of the thesis has a more applied contents in the biotechnology field.

Procesos administrativos (plazos y procedimientos de preinscripción) y otros datos de interés para el estudiante sobre el programa.

All deadlines and procedures for registration, lists of admitted students, and programming schedules, as well as the dates for registration will be detailed in the WEB of the PhD program at the UB

Procedimientos para que el estudiante, si lo desea, pueda formular reclamaciones en relación con el programa.

Procedure for the student

In case you have a problem or complaint on the development of the courses, the student can send a letter to the secretariat of the Faculty of Pharmacy, addressed to the coordinator, giving reasons and detailing what are the reasons for his claim, or by contacting with the coordinator of the master. It is necessary to specify whether the claim is administrative or teaching. The coordinator in conjunction with other teachers of the doctoral program will analyze the situation and according to the student who has brought the claim, will found an appropriate solution to the conflict.

Procedure for Professor

If lead-is any conflict with the doctoral student, the thesis director address a letter explaining the facts and reasoned the coordinator of master, which in turn meet the Commission's permanent doctorate to analyze the case and devise a possible solution. Sino solution has been reached is to raise the case of Vicerectorado Science Policy.