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BIOLOGY

2009

It is often forgotten that Louis Pasteur was not a medical doctor by training but a chemist and biologist. With a well-established high-tech pharmaceutical industry (Aventis, Sanofi-Synthélab, Servier), France is the number one European producer and the world's fourth leading exporter of pharmaceutical products.

It also is Europe's third leading country in biotechnology companies. Clermont-Ferrand, Évry near Paris, Lille, Marseille, Montpellier, Strasbourg, and Toulouse are all centers for genome studies that bring together research organizations and firms developing applications. Biology, of course, deals with research but also with applications for humans, animals, and plants. Biology has entered the industrial world today through biotechnology, a new science created from basic research with applications in the fields of health, chemistry, agri-food industries, the pharmaceuticals, energy, perfume and cosmetics, and environmental engineering.

Specializations are available at all academic levels in licence, licence professionnelle (Bac +3), master's (bac +5), and doctoral (bac +8) programs.

Websites

- Agropolis International Montpellier Languedoc-Roussillon http://www.agropolis.fr/recherche
- CEA - Atomic Energy Commission : life sciences : http://www.cea.fr
- CEMAGREF (Institute for Research in Agricultural and Environmental Engineering : biology of aquatic ecosystems, hydrobiology, microbiology, biological processing of wastes) http://www.cemagref.fr
- CIRAD (Center for International Cooperation in Agronomic Research for Development : agronomic research to benefit developing countries : biology, biodiversity) : http://www.cirad.fr
- National Center for Scientific Research - CNRS : http://www.cnrs.fr/sdv/
- French Institute for Research into Practical Use of the Seas : biology of marine species http://www.ifremer.fr
- National Institute of Agronomic Research : http://www.inra.fr
- INSERM (Health- Medical) http://www.inserm.fr
- Curie Institute (the battle against cancer) http://www.curie.fr
- Pasteur Institute molecular biology, immunology, microbiology http://www.pasteur.fr
- IRD (Development Research Institute : biodiversity, biotechnologies, microbiology) : http://www.ird.fr
- Société Française de Génie Biologique et Médical http://sfgbm.enst-bretagne.f
- Ademe ((environmental maîtrise in energy) http://www.ademe.fr
- Promotion for biotechnologies http://www.adebiotech.org
- Ministry of Ecology, Energy, Sustainable Development, and Regional Development http://www.ifen.fr
- Pharmaceutical industry http://www.leem.org
- INSERM (National Institute of Health and Medical Research : biostatistics, genetic epidemiology, health) http://www.inserm.fr
- Portal dedicated to the mobility of European researchers http://www.ec.europa.eu/euraxess
- National Research Agency http://www.agence-nationale-recherche.fr
- Fondation Alfred Kastler (services for international researchers visiting France) http://www.fnak.fr
- Bernard Gregory Association (from dissertation to employment)http://www.abg.asso.fr/
- Dissertation and postdoctoral proposals from the French Society for Biomedical Engineering http://sfgbm.enst-bretagne.fr/spip.php?rubrique14

Keywords

agriculture, agri-food, agrobiosciences, agronomy, animals, anthropization, anthropology, human systems, aromas, insurance, biochemistry, biodiversity, bioinformation systems, bioengineering, biomaterials, biometrics, biophotonics, biostatistics, business, water, merchandizing, packaging, control, cosmetics, sustainable development, law, sustainability, ecotoxicity, environment, epidemiology, forestry, galenics, genetics, management, ichthyology, imaging, immunology, coast, tropical diseases, materials, mathematics, mecatronics, medicines, microbiology, media, modeling, nanotechnobiologies, neurobiology, nutrition, oceanography, œnology, fragrances, pharmacokinetics, plasturgy, populations, production, intellectual property, protection, quality, health, security, selection, athletics, statistics, synthesis, textiles, therapies, toxicology, vegetal, vine, wines, virology.

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BIOTECHNOLOGY

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For many people, the word 'biotechnology' evokes genetically modified foods and cloning. But in fact this term applies to an entire range of technologies 'informed' by the advances in fields such as microbiology, biochemistry, cellular and molecular biology, chemical engineering and information technology and used in highly varied industrial processes. All of which constitutes a vast area of particular interest to the food-processing and pharmaceuticals industries, medicine and environmental sciences.

There are an estimated 5,000 biotechnology companies in the world. Observers maintain that biotechnology is now entering a phase of development which is comparable to that seen in the field of computers and information technology in the 1970s and 1980s. The rapid growth of this sector offers numerous career possibilities in biotechnological R&D, sales and marketing, production and quality control, as well as administration and management of information.

The biotechnologist conducts fundamental or applied researchin a university, a public laboratory or the R&D division of a large firm. The field offers an ideal market for highly qualified young people, essentially PhDs, but also engineers. Particularly sought after are candidates with double backgrounds in management and science, who are thus prepared for the specific challenges of management applied to the biotechnologies (management of high-risk companies, legal advisors in the area of intellectual property, knowledge of computer science, etc.).
The most frequently requested profiles are PhDs and post-docs; Masters programmes (1 or 2 years) lead rather to lab technician positions.
For websites in French only, click on "Formations" or "Enseignements" to access offerings. Admission into Masters programmes generally requires an undergraduate diploma in Life Sciences (see "Biology" data sheet as well). There are, however, French undergraduate programmes with an initial specialisation in biotechnologies.

Websites

- Centers of competitiveness in biotechnology
http://www.industrie.gouv.fr/enjeux/zonebio.html
- CNRS, life sciences : http://www.cnrs.fr/sdv
- National Institute of Agronomic Research : http://www.inra.fr
- Interministerial site on the OGM : http://www.ogm.gouv.fr
- National network of clusters in genetics : http://rng.cnrg.fr
- Biotechnologies France database : http://www.biotechnologiefrance.org
- Association of biotechnology firms « France Biotech » : http://www.france-biotech.org
- Biotechnology in the Paris region : http://www.econovista.com/econovistav2
- National Research Agency : http://www.agence-nationale-recherche.fr
- Fondation Alfred Kastler (services for international researchers visiting France) : http://www.fnak.fr
- Bernard Gregory Association (from dissertation to employment) : http://www.abg.asso.fr/
- Adebiotech (synergies to support and promote the biotechnology sectors in France and at the international level) : http://www.adebiotech.org
- Généthon, research center on the human genome : http://www.genethon.com

Keywords

agri-food, agrobiosciences, agroindustry, biochemistry, bioinformation science, biomaterials, biomechanics, bioprocesses, biostatistics, biotechnics, plant biotechnologies, biotherapies, oncology, cosmetics, law, environment, ethics, genetics, imaging, pharmaceutical industry, information science, macrobiology, management, mathematics, mecatronics, microbiology, microbiology, modeling, nanobiotechnologies, nutrition, populations, animal reproduction, plant reproduction, toxicology, commercialization, vectorology.