



INDUSTRIAL BIOTECHNOLOGY IN THE PORTUGAL

INDUSTRIAL BIOTECHNOLOGY IN PORTUGAL¹

I. RESEARCH AND INNOVATION	4
A. Public research funding	4
B. Pilot and demonstration plants	4
i. pilot plants	5
ii. demonstration plants	6
II. POLICY	7
A. Policies and regulations	7
B. Public procurement	7
C. Standardisation, labelling and certification	7
D. Access to finance	7
E. Communication	7

Released in January 2009

¹ Please send your contributions and modifications to [a.peeters\[at\]europabio.org](mailto:a.peeters[at]europabio.org)

INDUSTRIAL BIOTECHNOLOGY IN PORTUGAL

INTRODUCTION

Biotechnology is considered to be one of the priority sectors for growth and competitiveness in Portugal. The National Innovation Plan presented by the Government in 2005, before the general election, noted biotechnology was considered as one of the six priority areas that should contribute to create innovation platforms. However, while research in biotech has been supported through non-directed channels and through generic policy-directed initiatives, there has been no specific initiative to support research in biotechnology and the number of biotech companies is still low².

² http://ec.europa.eu/research/biosociety/pdf/biopolis_portugal_en.pdf

I. RESEARCH AND INNOVATION

A. Public research funding

Fundação para a Ciência e a Tecnologia³ (Foundation for Science and Technology) is member as partner of the European Network Area on Industrial biotechnology (**ERA-net IB**)⁴.

The Associate Laboratory **Institute for Biotechnology and Bioengineering (IBB)**⁵ is a research and development (R&D) unit, founded in October 2006 aiming to be a strategic infrastructure for the development of the Portuguese R&D and innovation policies in the areas of Biotechnology, Bioengineering, Biomaterials and Life, Biomedical and Agricultural Sciences. IBB combines its R&D activities with advanced education, technology transfer, consulting and services, with the aim of fostering the industrial, health, agriculture and environmental sectors.

IBB is a nation-wide Institution and a partnership of five research units funded by “Fundação para a Ciência e a Tecnologia”, from Ministry of Science, Technology and Higher Education. These centres are:

- Instituto de Biotecnologia e Química Fina (IBQF)⁶ at Instituto Superior Técnico, Lisboa;
- Centro de Engenharia Biológica (CEB)⁷, Universidade do Minho, Braga;
- Grupo de Investigação 3B´s-Biomateriais, Biodegradáveis e Biomiméticos⁸, Universidade do Minho, Braga;
- Centro de Genética e Biotecnologia (CGB)⁹, Universidade de Trás-os-Montes e Alto Douro, Vila Real;
- Centro de Biomedicina Molecular e Estrutural (CBME)¹⁰, Universidade do Algarve, Faro.

The three major areas of research in the field of industrial biotechnology are:

- Biological and Chemical Processes - Molecular and Cell Engineering; Reaction Engineering; Purification of Biomolecules and Valorisation of Natural Products; and Process design.
- Nanobiotechnology - Micro- and Nano-devices; Nano-structured catalytic materials; and Nanoparticles
- Modelling of Biological and Chemical Systems - Computational and predictive models; and Biosystems analysis

More information: Joaquim Cabral (joaquim.cabral@ist.utl.pt)

The **Department of Paper Science and Technology**¹¹, of the **University of Beira Interior** carries research which covers the whole chain, from wood to paper. The following scientific topics are included under the research lines: biobleaching, biorefining, new natural products/biorefinery and bioethanol. More information: Ana Paula Duarte (apcd@ubi.pt)

The **Research Centre for Chemical Processes Engineering and Forest Products (CIEPQPF)**¹² located in the Chemical Engineering Department of the University of Coimbra works namely in Biochemistry and Biotechnology, Process Systems Engineering and Engineering of Forest Products. More information: Maria da Graça Vaz Rasteiro (cideq@eq.uc.pt)

B. Pilot and demonstration plants

³ <http://www.fct.mctes.pt>

⁴ <http://www.era-ib.net>

⁵ <http://www.ibb.pt>

⁶ <http://dequim.ist.utl.pt/ibqf/>

⁷ <http://www.ceb.uminho.pt/>

⁸ <http://www.3bs.uminho.pt/>

⁹ <http://www.utad.pt/en/Research/cgb/index.html>

¹⁰ <http://www.cbme.ualg.pt/>

¹¹ <http://www.ubi.pt>

¹² <http://www.eq.uc.pt/centro>

i. pilot plants

a) Open to all

Lumiar

INETI – Instituto Nacional de Engenharia, Tecnologia e Inovação, I.P, Lumiar	
General, products, feedstocks	
Services	Fermentation from 2 to 100 L total volume; Solid liquid separation (disk-stack centrifuge/decanter, MF/UF filtration units); Semi-preparative HPLC; Thermo-chemical conversion facilities; pilot facilities for the growth of microalgae.
Financing	Public funding
Contact	Alberto Reis (Biotechnology Department, Pilot Plant Manager) / Ibrahim Kadri Gulyurtlu (Energy Engineering and Environmental Control Department, Research & Technology Unit); http://www.ineti.pt

Oeiras

IBET – Instituto de Biologia Experimental e Tecnológica, Oeiras	
General, products, feedstocks	Production of proteins, DNA, viruses, viral particles and cells under novel bioprocessing and downstream processes; Development and validation of analytical methods and conduction of several studies; Detection and quantifications of genetically modified organisms (GMO) in food, feed and ingredients; Development of alternative green technologies for the isolation of natural of bioactive compounds with high added-value and application in food, cosmetic and pharmaceutical industries.
Services	Fermentation from 2 to 300 L working volume; Solid liquid separation (disk-stack and tubular centrifuges, MF/UF filtration units); Homogenizer; Film evaporator; Chromatographic separations; Supercritical extraction.
Financing	Non profit association with public and private shareholders, but mostly public funding
Contact	António Cunha, http://www.ibet.pt

b) Partly restricted

Eixo

RAIZ – Instituto de Investigação da Floresta e Papel (shareholders with preferential access), Eixo	
General, products, feedstocks	On-going biorefinery R&D programme
Services	Pilot facilities for fiber pulping
Financing	Association with public and private shareholders, mostly driven by a large pulp and paper holding
Contact	Gabriel Sousa, http://www.raiz-iiifp.pt

Lisbon

Biotrend, Lisbon

General, products, feedstocks	Industrial biotechnology process development; production of food and feed additives Fermentation technology using conventional and non-conventional microorganisms, bioreaction engineering. High-throughput screening of biocatalysts and of optimal process conditions.
Services	Bioprocess development and optimization contract research
Financing	Private
Contact	Bruno Sommer Ferreira, http://www.biotrend.biz

Under development

Braga

Biotempo - Biotechnology Consulting, Ltd., Braga	
General, products, feedstocks	Development and optimization of bioprocesses; Fermentation technology for the production of functional food ingredients, proteins and chemicals; software and technologies for the evaluation of the performance of wastewater treatment plants; enzymatic technology
Services	A 1 m ³ capacity fermentation pilot plant is being projected
Financing	Private limited company
Contact	Isabel Rocha, http://www.biotempo.com

Sine

Algafuel, Sine	
General, products, feedstocks	In March 2008, a consortium agreement was established between GALP ENERGIA ¹³ , Portugal's leading integrated oil and natural gas Company, Portuguese Engineering, Technology and Innovation (INETI) ¹⁴ and Algafuel ¹⁵ for the production of biomass and biofuels from microalgae crops and the attendant capture of CO ₂ . The objective of this project is to set up a pilot plant for the production of microalgae-based biomass and vegetable oil, using captured combustion gases.
Services	
Financing	Private
Contact	Vitor Verdelho Vieira (vvv[at]algafuel.pt)

c) Restricted

ii. demonstration plants

There is no demonstration plant.

¹³ <http://www.galp.pt>

¹⁴ <http://www.ineti.pt>

¹⁵ <http://www.algafuel.pt>

II. POLICY

A. Policies and regulations

National regulatory framework typically adheres to EU-wide regulations. As such, no national regulatory or political restraints exist regarding introduction of biobased products, however, no policies have been implemented to support the development and/or market penetration of biobased products.

B. Public procurement

There is no National Action Plan on Green Procurement.

C. Standardisation, labelling and certification

There is no national labelling for biobased products, neither voluntary certification.

D. Access to finance

Financing is granted through the:

- **Innovation Agency**¹⁶ (applied research). However, there is no specific programme for industrial biotechnology.
- **The Portuguese Institute for the Medium and Small Enterprises and Innovation**¹⁷ which funds R&D and innovation programmes for SMEs. Nevertheless, there is no programme dedicated for industrial biotechnology.

The projects range from basic research to pre-competitive projects that are supposed to benefit society and have an impact on national or regional economies and on human resource qualification upgrade. Typically the grants can cover up to 50% of the investment of the companies in R&D activities (or 75% for SME's). Demonstration activities are supported in any economic sector, however, no large scale industrial biotechnology demonstration plants project exist.

Biocant Park¹⁸ is the first Portuguese Science and Technology Park exclusively dedicated to Biotechnology promoting the formation of a cluster of companies and R&D institutions of excellence in the centre region of Portugal. It is the result of an investment made by the City of Cantanhede, Centre for Neurosciences of Coimbra and Biocant Park.

CEbio - Portuguese R&D network of excellence on bioenergy¹⁹ is a non-profit organization involving universities, R&D institutions and private companies focused in the development, promotion and use of bioenergy. The mission of CEbio is to add dynamism to the emerging Bioenergy sector in Portugal and to promote national and international interactive synergies in the field. More information: José Carlos Teixeira ([jt\[at\]dem.uminho.pt](mailto:jt[at]dem.uminho.pt))

E. Communication

¹⁶ www.adi.pt

¹⁷ www.iapmei.pt

¹⁸ <http://www.biocantpark.com>

¹⁹ <http://www.cebio.net/>

The awareness of the potential benefits of bio-based products and processes is very low in Portugal. No specific communication activities targeted to the general public in the area of bio-based products have been implemented.

A **Biotechnology Week** was jointly organized by the Portuguese Institute for the Medium and Small Enterprises and Innovation, the University of Minho, the MIT-Portugal Programme, in which a full day will be dedicated to industrial biotechnology (seminar organised by APBio, IAPMEI²⁰ and E-Unlimited²¹). The main goals of this seminar are:

- to increase general awareness of industrial biotechnology and its current and potential benefits;
- to show to national policy makers EU-wide best practices and their positive effects on developing and supporting sustainable bioeconomies;
- to present the opportunities of industrial biotechnology to national companies that could largely benefit from it, particularly from the chemical, pulp and paper, forestry, energy, textile, food and drink sectors.

Industrial biotechnology enterprises are represented through the national association APBio²². APBio also organises a yearly event, Biomeet²³ with significant impact on national media that promotes the awareness of biotechnology.

²⁰ www.iapmei.pt

²¹ www.e-unlimited.com

²² www.apbio.pt

²³ www.biomeet.org