





INDUSTRIAL BIOTECHNOLOGY IN SWITZERLAND

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INDUSTRIAL BIOTECHNOLOGY IN SWITZERLAND

INTRODUCTION

Switzerland has the highest density of biotechnology companies relative to population. According to a report prepared by Ernest and Young[2], 220 enterprises were active in the biotech sector in 2008; 72 were biotech suppliers and 148 were core biotech companies. The thematic strongholds of the Swiss biotechnology scene are mainly to be found in the area of medical biotechnology, particularly (bio)pharmaceuticals, genomics and proteomics as over 80% of the core biotech companies conduct their business in the areas of human and animal health biotech. Industrial biotechnology is therefore at an early stage of development in Switzerland (like in many other European countries) and will certainly benefit from the high level of R&D investment, from the geographic proximity to leading biotechnology regions of Germany and France and from the presence of leading multi-national corporations in the chemical sector.

[2] www.swissbiotech.org/php5/aa2/UserFiles/File/8498_Swissbiotech_Report_2008.pdf

I. RESEARCH AND INNOVATION

Modern industrial biotechnology is a relatively new discipline, with major areas of knowledge still to be explored. Public support to research as well as the establishment of pilot and demonstration facilities to scale-up individual processes will therefore help in the development of a European bio-based economy.

A. Public research funding

There is no specific funding available for industrial biotechnology. These projects receive general funds from the Swiss national Science Foundation (SNSF) and the Swiss Confederation's innovation promotion agency (CTI) (cf. access to finance).

The Swiss National Science Foundation (SNSF)[3] funds **projects for basic research**[4]. Applications are accepted twice a year (March and October) and must be submitted directly by researchers.
Any researcher working in Switzerland is entitled to participate. Researchers are free to choose their research topics. SNF project funding grants cover direct research costs (staff salaries, materials, travel costs etc.).
Applications are evaluated by the SNSF Research Council based on peer reviews by external experts working in most cases outside Switzerland. The central criteria for evaluation are the scientific quality, originality and project methodology as well as qualifications and track record of the applicants. Grants are awarded on a competitive basis.

The **R'Equip programme**[5] (Research Equipment) of the Swiss National Science Foundation supports the purchase, development and modernization of research equipment.
The SNSF accepts applications for R'Equip funding for all specialist areas. The conditions for applications and funding are to be found in the R'Equip regulations.

B. Pilot and demonstration plants

i. pilot plants

a) Open to all

Everywhere in Switzerland

Biotechnet Switerland	
General, products, feedstocks	Biotechnet Switzerland is a virtual network enabling companies and interested institutions to activate biotechnological expertise according to their specific needs. One of the services it offers is access to state-of-the-art technologies and machinery in universities and institutes.
Services	Description of facilities available: http://www.biotechnet.ch/services/machinery.php
Financing	
Contact	http://www.biotechnet.ch

St. Gallen

EMPA Materials Science and Technology	
General,	Pilot plant facility for the biotechnological manufacture of valuable products,

[3] http://www.snf.ch/E/Pages/default.aspx
[4] http://www.snf.ch/E/funding/projects/Pages/default.aspx
[5] http://www.snf.ch/E/funding/infrastructure/Requip/Pages/default.aspx

products, feedstocks	especially biomaterials / bioplastics / enzymes:
Services	Bioreactors; high pressure reactor for two-phase solvent fermentation; chromatography Up- and downstream process development (enzymes, bioplastics, biomaterials, biofilms); enzymatic catalysis: screening, production and process optimisation; small scale production for customers; process qualifications and transfer to industry Strain development; scale down / scale up
Financing	Public (federal) and private
Contact	http://www.empa.ch/plugin/template/empa/852/*/---/l=1

Sion

Institute of Life Technologies, University of Applied Sciences of Western Switzerland, Sion	
General, products, feedstocks	Biotechnet Switzerland is a virtual network enabling companies and interested institutions to activate biotechnological expertise according to their specific needs. One of the services it offers is access to state-of-the-art technologies and machinery in universities and institutes.
Services	Pilot plant facility for the biotechnological manufacture of valuable products. Bioreactors from 0.5 to 300 L; ultra-micro-nanofiltration; electrodialysis; chromatography Up and downstream process development (microbial and mammalian cells); enzymatic catalysis: screening, production and process optimisation; Isolation, purification, refolding of proteins; Immobilization and encapsulation of biocatalysts and therapeutic molecules; small scale production for customers; process qualifications and transfer to industry; strain development; scale down / scale up
Financing	Public (cantonal and federal) and private
Contact	http://life.hevs.ch/

Wädenswil

Institute of Biotechnology, ZHAW, Zurich University of Applied Sciences, Wädenswil	
General, products, feedstocks	
Services	Pilot plant facility for the biotechnological manufacture of valuable products. Bioreactors for microbial and cell cultivation, Up and downstream process development (microbial and mammalian cells); Isolation, purification, refolding of proteins; small scale production for customers; process qualifications and transfer to industry; strain development; scale down / scale up
Financing	Public (cantonal and federal) and private
Contact	http://www.ibt.zhaw.ch/en/science/ibt.html

b) Partly restricted

c) Restricted

ii. demonstration plants

There are no demonstration plants in Switzerland.

II. POLICY

Public authorities can promote the quick take-up of industrial biotechnology innovations by implementing a number of "instruments" or policy initiatives. This can be the improvement of the regulatory framework; the integration of specification for bio-based products in public procurement; the establishment of standardisation, labelling and certification schemes to overcome perceived uncertainty about product properties and weak market transparency; the development of financial instruments and supports to increase investments into research, technology development and innovation as well as the elaboration of communication and information campaign to communicate the benefits of bio-based products to users.

A. Policies and regulations

There is no policy or regulation dedicated to industrial biotechnology and bio-based products.

B. Public procurement

The Swiss Confederation has developed an integrated product policy (IPP) strategy[6] which aims to minimise the negative effects a product can cause during its life cycle by incorporating all phases of a product (goods and services) and including all players, and by implementing measures in areas where they are most effective. However, bio-based products are not part of this strategy.

C. Standardisation, labelling and certification

There is no standardisation, labelling or certification scheme for bio-based products.

D. Access to finance

The Swiss Confederation's innovation promotion agency (CTI)[7] has one initiative targeted to life sciences. CTI's budget for "Life science R&D programmes" (biotech & medtech) is CHF 60 million. Just under half of these costs are assumed by the Confederation, the remaining costs are borne by business partners. The initiative supports notably applied research and development projects in industrial biotechnology involving both universities and industry.
The strategic CTI biotech initiative as been designed as a national information and contact platform and makes helps bringing together interested partners from business and research.
CTI Biotech[8] is supporting the development of the Swiss industrial biotech sector by:

- Encouraging the launch and the advancement of new key biotech areas such as bioinformatics, systems biology, nanobiotechnology and industrial biotechnology.
- Positioning biotechnology as a sustainable strategy for industrial production – with the understanding that Switzerland must achieve an optimal position in the ongoing worldwide "renaissance" of industrial biotechnology for which the OECD, EU and individual European countries, USA and Japan are strongly pushing.
- Using targeted biotech promotion and stimulating new R&D partnerships, focusing on projects involving larger integrated and synergistic groups of academic and industrial partners.
- Stimulating a more synergistic interaction between core biotech companies and biotech suppliers.

[6] http://www.bafu.admin.ch/produkte/01967/index.html?lang=en#sprungmarke3_6
[7] http://www.bbt.admin.ch
[8] http://www.bbt.admin.ch/kti/projektfoerderung/00240/00241/index.html?lang=en

- Offering scientific expert support and coaching (e.g., via seminars focusing on defined critical issues of concern to the whole biotech/life sciences sector).

E. Communication

The industrial biotechnology industry is represented by the Industrial Biotech Platform of the national association "Swiss Biotech Association"[9] that also involves the "Swiss Industrial Biocatalysis Consortium" and the "Swiss Chemical Industry Society"[10].

The Swiss Coordination Committee for Biotechnology (SCCB)[11] serves as an umbrella for leading biotechnology organizations (industrial and academic) in Switzerland. It encourages the development of a sustainable biotechnology sector in the country.

[9] http://www.swissbiotech.org/industry_association_sba/
[10] http://www.sgci.ch/
[11] http://www.sk-biotechnologie.ch