Swiss Biotech – an Overview

Swiss Biotech Association

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CEO
Agenda

- Introduction – Stakeholders
- Latest Statistics (Swiss Biotech Report 2011)
- SBA – The Industry Association
### Introduction:
**Definition of Biotechnology, the OECD Colour Code**

OECD defines of biotechnology as the application of science and technology to living organisms, as well as parts, products and models thereof to alter living or non-living materials for the production of knowledge, goods and services.

- **White Biotechnology (industrial BT)**
  - Fermentation and biotransformation of chemicals and natural products & raw materials.

- **Red Biotechnology (pharmaceutical BT)**
  - Development and production of (bio)pharmaceuticals, vaccines and diagnostics.

- **Grey Biotechnology (environmental BT)**
  - Identification and decontamination of harmful products.

- **Blue Biotechnology (marine BT)**
  - Use of marine organisms for pharmaceuticals, nutrition, cosmetics and new materials.

- **Green Biotechnology (agricultural BT)**
  - Transgenic plants for nutrition and as renewable raw materials for sustainable chemistry.
Main Players in Swiss Biotech
Strategic Level / Structures

- SNSF & KTI/CTI Funding Agencies
- Biotechnet Switzerland (CTI R&D Consortium)
- Universities ETHZ / EPFL UoAppl.Sc.
- Swiss Medic Authorities - Governments
- SGCI / SSCI Swiss Society of Chemical Industries
- SIBC Swiss Industrial Biocatalysis Consortium
- SKB / SCCB Swiss Coordination Committee for Biotechnology
- Internutrition Interpharma
- SAMS & SATW & SCNAT Swiss Academies

Swiss Biotech Association
Main Players in Swiss Biotech
Promotion (e.g. Swiss Biotech Report)

Statistic Supplier
E & Y Switzerland

SIX
Swiss Exchange

S.E.C.A.
Swiss Private Equity & Corporate Finance Association

swiTT
Swiss Technology Transfer Association

SBA
Swiss Biotech Association

CTI
Swiss Innovation Promotion Agency

Biotechnet
Switzerland

SNSF
Swiss National Science Foundation

S.E.C.A.
Swiss Private Equity & Corporate Finance Association

OSEC
Business Network Switzerland
Region Clusters

IGE
Swiss Federal Institute of Intellectual Property
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Innovation Scoreboard 2010

European countries innovation performance


Note: Average performance is measured using a composite indicator building on data for 24 indicators going from a lowest possible performance of 0 to a maximum possible performance of 1. Average performance in 2010 reflects performance in 2008/2009 due to a lag in data availability.
Biotech start-ups from 1995 - 2010

Source: Swiss Biotech Report 2011
VC transactions per year and sector

Source: Swiss Biotech Report 2011, University Basel
VC transactions per canton and sector

Transaction landscape 1999–2009 per sector and canton

Source: Swiss Biotech Report 2011, University Basel
Biotech listings 1999 - 2010

Source: Bloomberg, Jan-2011, SIX Swiss Exchange

Source: Swiss Biotech Report 2011, SIX Swiss Exchange
Number of biotech companies in Switzerland

Source: Swiss Biotech Report 2011, SIX Swiss Exchange
Number of employees

Source: Swiss Biotech Report 2011, SIX Swiss Exchange
Capital investment in Swiss biotech companies

Capital investment in Swiss biotech companies

Source: Ernst & Young
(Capital investments include convertible bonds)
2010 financial data – all Swiss biotech companies

Source: Swiss Biotech Report 2011, SIX Swiss Exchange
Summary; A leading Biotech country
Agenda

- Introduction – Stakeholders
- Latest Statistics (Swiss Biotech Report 2011)
- SBA – The Industry Association
  - Focus on Cleantech by Biotech
Mission

The SBA intends to secure the position to which biotechnology SMEs will be entitled now and in future. Focus is on:

- Support to create the conditions in biotechnology appropriate for SMEs.
- Continue the awareness program to reduce the fear connected with modern biotechnology
- Intensify research-related communication between universities and the biotech industry
- Promotion of the opportunities attached to professional careers in science and biotechnology sector
- Integration of the Swiss Biotech Industry on the national level, on European level and global level.

Founded in 1998
Core Services and Platforms

Member Services

- Cross-Promotion
- Administration
- Communication
- Representation
- International Affairs
- Public Affairs

Core Services

- Therapeutic Biologics
- Nanotech
- Nutrition
- Regulatory Issues
- BioActors – Jobs
- International Marketing
- Cleantech by Biotech
- Nutritional Therapeutics
- Biologics
- Nanotech
- Cleantech
- International Marketing
- BioActors – Jobs

Swiss Biotech Association
Chemical Industry: How do you help your customers to become more sustainable?

- Technical service to improve operational sustainability: 65% (Customers' view), 58% (Suppliers' view)
- Provision of alternative (renewable) raw materials: 60% (Customers' view), 32% (Suppliers' view)
- Securing sustainability in supply chain: 60% (Customers' view), 55% (Suppliers' view)
- Possibility of product return and re-use: 45% (Customers' view), 32% (Suppliers' view)
- Disposal of waste: 25% (Customers' view), 23% (Suppliers' view)
- Other: 10% (Customers' view), 0% (Suppliers' view)

Quelle: A.T. Kearney, aus CHEManager 19/2010, Seite 9, GIT Verlag
Industrial Biotech Provides Solutions to Sustainable Production of Key Goods and Commodities

- High efficiency manufacturing (lower cost, higher speed, reduced energy and process resource consumption)
- Reduced use of environmentally persistent chemicals and materials
- Carbon neutral and/or biodegradable inputs and products
- Organic by-products recycled and re-used

...and many other products

- Chemical Products
- Energy
- Liquid Fuels
- Plastics
- Food Products
- Textiles
- Paper Products
- Pharmaceuticals
- Personal Care Products
Biotech detergents help save energy and money by reducing the temperature needed to wash clothes.

By washing at 86°F (30°C) rather than 140°F (60°C), the CO₂ savings potential in the U.S. and Europe alone is around 32 million tons annually—the equivalent of the emissions from 8 million cars.

The net impact: $4.1 billion in energy savings.

Streamlining Manufacturing Processes: The Case of Vitamin B-2

- The industrial biotechnology process for manufacturing vitamin B-2 took a laborious and costly traditional multi-chemical synthesis and purification process and reduced it to a one-step fermentation process.

- The simplified process resulted in a 30% reduction of CO$_2$ emissions and a 95% reduction in waste production.

Taking Industrial Biotech Home: New Benefits for Consumers

<table>
<thead>
<tr>
<th>CONSUMER PRODUCT</th>
<th>OLD NON-BIOTECH MANUFACTURING PROCESS</th>
<th>NEW INDUSTRIAL BIOTECH PROCESS</th>
<th>ENVIRONMENTAL SUSTAINABILITY BENEFITS</th>
<th>CONSUMER BENEFIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bread</td>
<td>Potassium bromate, a suspected cancer-causing agent at certain levels, added as a preservative and a dough strengthening</td>
<td>Genetically enhanced microorganisms produces baking enzymes to • Enhance rising • Strengthen dough • Prolong freshness</td>
<td>Reduces CO₂ emissions in grain production, milling and baking and transportation</td>
<td>• High-quality bread • Longer shelf life • Eliminates suspected carcinogen potassium bromate</td>
</tr>
<tr>
<td>Personal Care</td>
<td>Chemical ingredients such as propylene glycol and butylene glycol from petroleum used as solvents to mix ingredients</td>
<td>Genetically enhanced microbe produces 1,3 propanediol from renewable feedstocks, which can function as a solvent, humectant, emollient or hand-feel modifier</td>
<td>20% reduction of greenhouse gas emissions compared to petroleum PDO</td>
<td>• High purity • Environmentally sustainable and renewable process • Non-irritating for sensitive skin • Enhanced clarity</td>
</tr>
<tr>
<td>Cosmetics</td>
<td>Mineral oil and petroleum jelly from fossil sources used as ingredients</td>
<td>Metathesis chemistry applied to convert renewable vegetable oils to replacement ingredients</td>
<td></td>
<td>• Smoother, less greasy feel • Semi-occlusive film former • Enhanced hair-care properties</td>
</tr>
<tr>
<td>Detergent</td>
<td>Phosphates added as a brightening and cleaning agent</td>
<td>Microbes or fungi genetically enhanced to produce biotech enzymes, which are added as brightening and cleaning agents • Protease enzymes remove protein stains • Lipases remove grease • Amylases remove starch</td>
<td>Elimination of water pollution due to phosphates</td>
<td>• Brighter, cleaner clothes with lower wash temperature • Energy savings</td>
</tr>
<tr>
<td>Textiles</td>
<td>New cotton textiles prepared with chlorine or chemical peroxide bleach</td>
<td>Use of biotech cellulose enzymes to produce peroxides • allows low-temperature bleaching of textiles, at 65°C and • at a neutral pH range</td>
<td>• 25% reduction in greenhouse gases • 25% reduction in non-renewable energy use</td>
<td>New fabrics have • lower impact on the environment • better dyeing results • a permanent soft and bulky handle</td>
</tr>
<tr>
<td>Paper</td>
<td>Wood chips are boiled in a harsh chemical solution to yield pulp for paper making</td>
<td>Wood bleaching enzymes produced by genetically enhanced microbes to selectively degrade lignin and to break down wood cell walls during pulping</td>
<td>Reduces use of chlorine bleach and dioxins in the environment</td>
<td>Cost savings from lower energy and chemical use</td>
</tr>
</tbody>
</table>
Taking Industrial Biotech Home

- Enzymes clean clothes and dishes at lower temperatures than chemical detergents, saving energy.
- Enzymes can keep fruits from breaking apart in baked goods.
- Enzymes help to extract more fermentable sugars from fruits and starchy vegetables (potatoes) to produce more alcohol or wine, more efficiently.
- Enzymes also extract harmful substances from corks, to prevent off-tastes in wine.
- Enzymes can help reduce the amount of bleaching needed for paper production. And, enzymes can also remove inks from paper to be recycled.
- Enzymes remove more types of stains and soils from clothes than chemical detergents, without bleaching dyes from fabrics.
- Fabrics can be pretreated with enzymes to change their texture without wear on the fibers, making them more durable and longer-lasting.

Microorganisms can safely remove more protein stains and mold from carpets and other fabrics.

- Enzymes can speed up fermentation in beer.
- Enzymes can convert transfats to more healthful fats in oils.
- Enzymes convert the starch in corn, potatoes and other grains to sugars for use in sweeteners and sodas.
- Bread baked with enzymes remains fresh longer.
- Enzymes allow us to get every single drop of juice out of fruits.
- Enzymes can replace harsh chemicals in pretreatment of cotton and in leather softening. Enzymes are biodegradable, cheaper, and less damaging to fabrics.
- Enzymes help animals to digest food better, promoting better nutrition and less waste.
Production-oriented value chain

Source: OECD Workshop on “Outlook on Industrial Biotechnology”, 08.01.2010, Vienna
scienceindustries and Swiss Biotech Association have joined forces to create awareness and develop supportive measures for Cleantech by Biotech in the Swiss chemical-pharmaceutical industry.

How?

- Submission of a proposal for a new National Research Program NPF „Cleantech by Biotech“ (June 2011)
- Event „Cleantech by Biotech“ (spring 2012)
Thank you for your attention

Join us in 2012!

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- or info@swissbiotech.org