The overview of Biotechnology in Latvia

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General state of biotechnology in Latvia

Biotechnology is defined by the government of Latvia as one of the priority sectors of national economy

with sector development strategy set in close connection with innovation, science and education policies. The country's long experience and traditions, the availability of highly qualified specialists, cost efficiency, high competence in R&D and a developing manufacturing base are the factors that form an excellent foundation for business and innovative activities in Latvia's biotech sector.

LBA creation

Latvian Biotechnology Association (LBA) was created as Latvian biotech network in 2006. The main task of LBA is to promote the cooperation between biotech research institutions and business encourage biotech companies to participate in joint projects, assist in setting up international cooperation.

Since Latvia joined the EU, the progress in Latvian biotech sector is remarkable. This regards to research activities as well as involved business activities, to great extent due to the participation in EU supported projects. As the result, the competitiveness of Latvian biotech companies and research institutions is increasing constantly in both domestic and foreign markets.

LBA now are participating in two EU network projects: Bridge-BSR (ScanBalt coordinated) and MOSBIO (coordinator – Latvia University of Agriculture).

Biotech in Latvia after joining EU

After Latvia joining the EU, in the year 2004, the amount of the various kinds of the support programs substantially increased, as a result of this the development of various biotechnological directions activated. The Biotechnology and the agro biotechnology - being a separate branch -, were proclaimed to be one of the priority branches of the State of Latvia

SME activities

Starting approximately from beginning of 1990s, first small and medium-size biotech companies (SME) appeared and organized their business activities based on private business conditions.

The activities of SME can divided in following directions:

1. Developing and manufacturing of biotechnological and medical equipment (Biosan, Elmi, Biotehniskais centrs);
2. Biotechnology services such as gene synthesis and development of biopharma preparations (Asla-Biotech, GenEra, PharmIdea, Anima Lab);
3. Manufacturing of biological active substances and application of biotransformation processes (Biolat, Silvanols, Bioefekts, BF-esse);
4. Industrial biotechnology (Jaunpagasts Plus, Latvijas Balzams);
5. Environmental protection (Eko Osta, BAO).
6. Marine biotechnology (Lateus)

Developing and manufacturing of equipment biotechnological and medical equipment

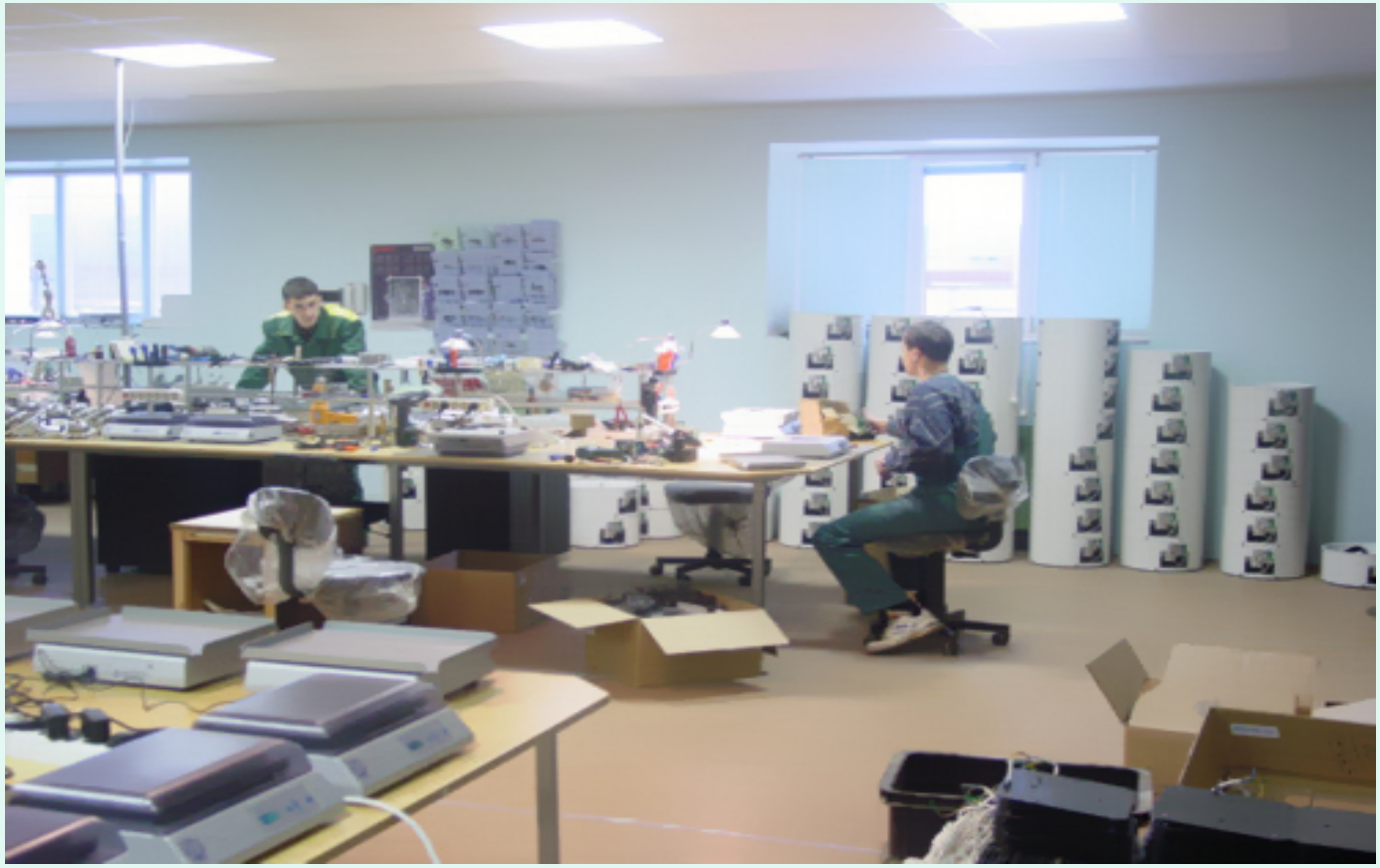
This direction developed from beginning of 1990s independently based on contract deliveries of foreign companies.
It is necessary to mention that in the international biotech exhibitions usually alone participants with biotech equipment from Eastern Europe are only Latvian companies:

1. **Biosan, Ltd** (www.biosan.lv)
   Developing and manufacturing of innovative biotechnological equipment;
2. **Elmi, Ltd** (www.elmi-tech.lcom)
   Developing and manufacturing of innovative biotechnological equipment;
3. **Biotehniskais centrs, JSC** (www.bioreactors.net)
   Developing and manufacturing of laboratory bioreactors. Industrial process automation.
4. **Biotechnomica, Ltd**
   Development of biotechnological instruments

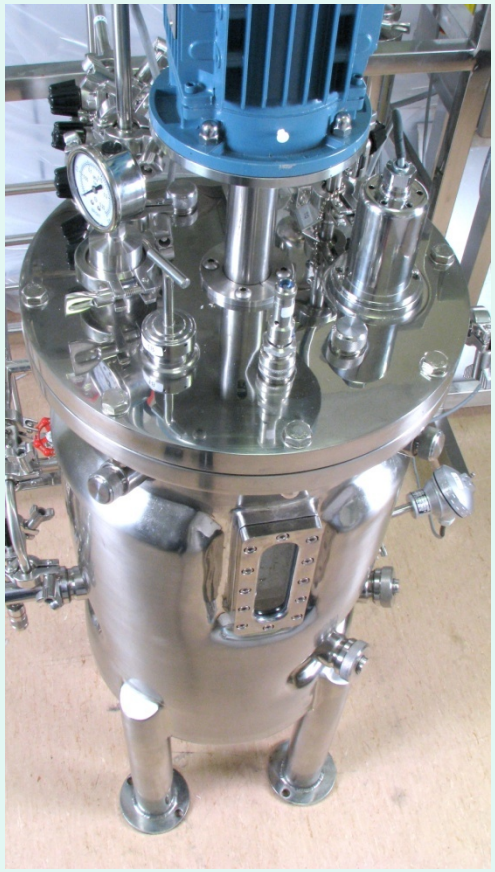
Biosan, Ltd

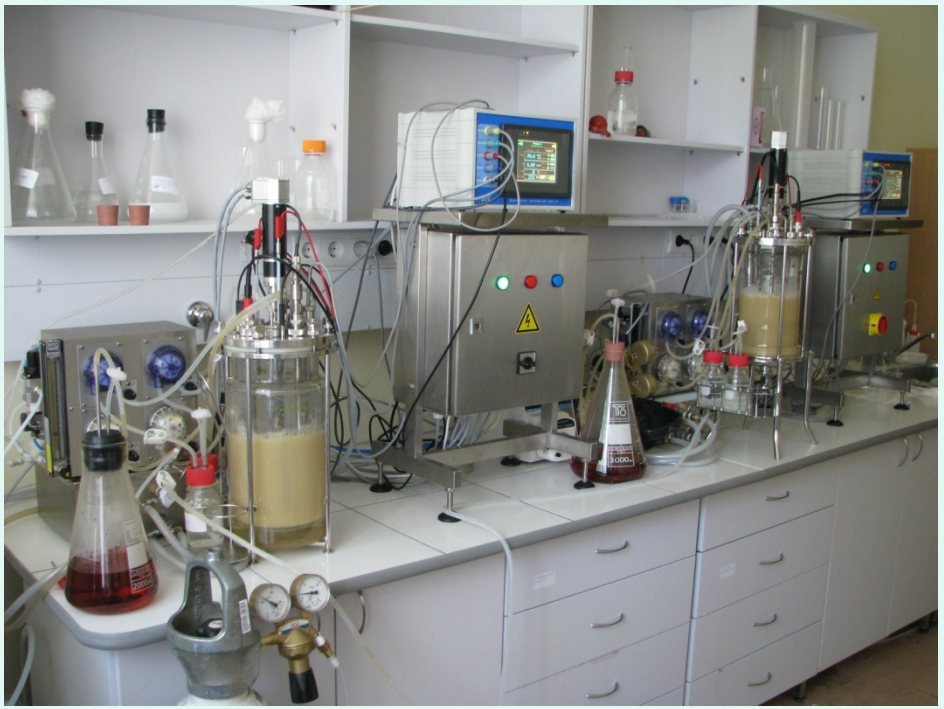

Terra Cellomica
Terra Biochemica
Biosan's World Of Biotechnomica
Terra Immunologica
Terra Genomica
terra innovatica

Elmi, Ltd



Biotehniskais Centrs (BTC) , JSC





Biotech services of SME

1. **Asla Biotech, Ltd**

Biotechnology services such as gene synthesis, custom of DNA/ RNA services, expression of proteins, Polyclonal & preimmune sera, monoclonal antibodies, stabule cell lines;

2. **GenEra, Ltd**

Analyzation and manipulation of DNS: genotyping, determination of A and B hemophilia mutations, breast ovary risk assessment, 15 loci parenthood test, diagnostics of monogene and other disease, pharmagenomic researches;

3. **PharmIdea, Ltd**

Creation of scale-up laboratory for sterile, freeze-dried injectables with main focus on anticancer drugs and biologics, et cetera.

4. **Anima Lab, Ltd**

Food supplements for treatment of Hepatitis C, oncological diseases and infarct.

Manufacturing of biological active substances and application of biotransformation processes

Most significant companies are:

Biolat, Ltd

Manufactures biologically active substances from tree foliage and other plant biomass for industry, pharmacy, cosmetics, plant protection etc.

Silvanols, Ltd

Development and manufactures of natural based pharmaceutical preparations.

Bioefekts, Ltd

Establishing of new soil cultures of micro organisms, development of new microbiological products' varieties.

BF-esse, Ltd

Manufacturing of biological active substances

Industrial biotechnology

Jaunpagasts Plus, Ltd

Manufacturing of bioethanol using novel fermentation technologies.

Latvijas Balzams, JSC

The cultivation of yeast biomass in controlled bioreactor to produce the seed material for champagne manufacturing.

Environmental biotechnology

Eko osta, Ltd

The development of fermentation technologies for ground purification from oil pollution.

BAO, Ltd

The development of fermentation technologies for the recycling of wastes.

Marine biotechnology

Lateus, Ltd

The development of technology , offered by company, which can get synthetic oil through bioctalitic cracking, with a high quality of algae biomass. Using this technology for biofuels production, its allows to convert all the biomass into high quality fuel.

Latvian Institute of Aquatic Ecology

The research activities of department concern following directions:

- Eutrophication processes and the role of environmental factors (salinity; inorganic and organic nutrients; nutrient limitation)
- Mixotrophy and the role of DOM
- Biodiversity of aquatic ecosystems
- Interactions between algal and bacterial communities
- Harmful algal blooms (HAB) in marine and fresh water environments
- Toxicological studies (the influence of heavy metals, waste waters and algal toxins)

Main research activities of institutes and universities

- Gene engineering (Latvian Biomedical Research and Study Centre)
- Recombinan proteines (Latvian Biomedical Research and Study Centre)
- Food biotechnology (University of Latvia, Latvia University of Agriculture)
- Environment biotechnology (University of Latvia, Riga Technical University)
- Steam cell biotechnology (University of Latvia)
- Biomaterials (Riga Technical University)
- Biodegradation of wood materials (Latvian State institute of Wood Chemistry)
- Biogass production technologies (Latvia University of Agriculture)
- Bioengineering (Latvian State institute of Wood Chemistry)
- Animal biotechnology (Research Institute of Biotechnology and Veterinary Medicine “SIGRA”)
- Systembiotechnology (Latvia University of Agriculture)

Biotech education

Biotechnology is included in the study program of following universities and colllege:

1. **University of Latvia** www.lu.lv
2. **Latvia University of Agriculture** www.llu.lv
3. **Riga Technical University** www.rtu.lv
4. **Mechanical and Technological college of Olaine (**www.omtk.lv **)** has the study programs for environmental protection, food quality control and biotechnology. It is only college in Eastern and Central Europe, where the biotechnology study program is applied.

Summary

The potential of the Latvian biotechnology is in the availability of the corresponding specialists and students. Regardless of the fact, that the conditions for the more rapid development of the biotechnology are being created insufficiently intensive, which is mainly connected with the poor availability of the investments, because the local investors are oriented towards the more rapid profit bringing branches, however the foreign investors have taken the wait-and-see position.

In order to promote the more rapid development of the Latvian biotechnology, the scientific researches are to be focused in the most topical directions, it is necessary to promote the SME activities, as well as the international collaboration has to be developed in the sphere of the initiation of the larger projects, as well as it is necessary to solve the issues, connected with the investment attraction.

Useful Contacts

Latvian Biotechnology Association:
- member of ScanBalt
- member of European Federation of Biotechnology
- takes a participation in EuropaBio activities

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