Current Status of Biotechnology in Slovakia

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Life Science Structure

Infrastructure organization of the Life Sciences in Slovakia is very asymmetrical.

- Up to **75% is concentrated to Bratislava**, 20% to Košice and Nitra, with the remaining 5% for the rest of the country.
- The most of the Life sciences and biotechnology capacity is held in the Slovak Academy of Sciences, less at the universities and agricultural research institutions, but only a very small part in private business.
Universities:

Comenius University in Bratislava
Slovak University of Technology (FCHFT) in Bratislava
University of Agriculture in Nitra
P. J. Šafárik University in Košice
University of Veterinary Medicine in Košice
University of SS. Cyril and Methodius in Trnava
Slovak Academy of Sciences: Branch of Life Sciences – the largest one

Medical and Chemical Sciences Institutes:
Institute of Virology
Cancer Research Institute
Center for Molecular Medicine
Institute of Molecular Physiology and Genetics
Institute of Neuroimmunology
Institute of Molecular Biology
Institute of Experimental Endocrinology
Institute of Chemistry
Institute of Experimental Pharmacology
Institute of Neurobiology Košice
Institute of Normal and Pathological Physiology
Institute for Heart Research
Slovak Academy of Sciences:

Agricultural and Veterinary Sciences Institutes:

Institute of Zoology
Institute of Animal Biochemistry and Genetics
Parasitological institute Košice
Institute of Animal Physiology Košice
Institute of Forest Ecology Zvolen
Institute of Landscape Ecology

Technological Institute SAS – support for technology transfer at SAS
Ministry of Agriculture Research Institutes:

Research Institute for Animal Production  Nitra
Food Research Institute  Bratislava
Research Institute of Veterinary Medicine  Košice
Research Institute of Plant Production  Piešťany
The story began in 1953, when the industrial production of penicillin in Biotika started as a first fermentation technology in Slovakia.

Biotika is up to these days the main producer in the field of pharmaceutical biotechnology in Slovakia.
Middle 80-ies of 20\textsuperscript{th} century, within former Czechoslovakia - Development Programme of Priorities was elaborated and biotechnologies were one of four top priorities.

Coordination was by the Ministry of Agriculture, which has probably influenced its understanding and realisation in significant way.

But in spite of its - some infrastructural projects, like Biocentre in Modra, fermentation facilities in Dolná Krupá or Bioplant (enterprise for enzyme production in Petrova Ves) have been realised.
State policy/support

1996/1997 - a new initiative on state level: „Programme on Development and Elaboration of Biotechnologies in Agriculture“ was prepared as a part of the „National Programme on the Biotechnologies Development“. Unfortunately this has been never realised.

Strategy for research, development and innovations in the Slovak Republic up to 2020 has been recently prepared. Its Priority III, Appendix 9 (applied research, development and innovation) is aimed at Biomedicine and Biotechnology.
State policy/support

Life Sciences, including biotechnologies are generally supported within the 7FP EU priorities, that are accepted and as a part of 7FP supported by both Ministry of Education SR (including APVV grant agency) and Slovak Academy of Sciences.
Governmental support of SMEs.

Slovak government permanently declared its support of SMEs.

Specialized agency has been held for this purpose at the Ministry of Economy.

However, in real life to these days, there is no biotech project successful in gaining the financial support from this agency.
The regulatory environment

In the legislation field, in 2002 was approved and passed the bill on GMO, compatible with EU directives. The competent authority also for the contained use of GMO, became the Ministry of Environment, SR.

In the intellectual property rights protection, the last amendment that passed 11 years ago has been devoted mainly to patents in biotechnology.

SR is member of EPC.
Biotika, a.s. Slovenská Ľupča is one of the most important manufacturers working in the sphere of biotechnology and pharmaceutical industry.

Biotika was founded in 1953 as a new manufacturer of Penicillin on the territory of former Czechoslovakia with the aim to meet domestic demand.

At the beginning of the 60’s the biotechnological production was extended by Oxytetracycline production and later by the production of Chlortetracycline and Dextran for the pharmaceutical application.

In 1971 L-Lysine production by biotechnological process was launched and thereby Biotika became the third manufacturer of this essential amino acid in the world.
• **Evonik/Fermas** was established in December 1992 and incorporated in companies’ register in January 1993. The shareholders of Fermas were the German company Degussa AG (today Evonik) in Frankfurt on the Main (51%) and the Slovak Biotika a.s. (49%).

• From 1998 Fermas is a 100% subsidiary company of Degussa/Evonik. **L-Threonin producer**

• **Imuna Pharm Holding**

• Established in 1953, as one of the oldest and largest pharmaceutical company today present in infusion solutions, culture media, tablets, blood derivates, dietetics, hemodialytic solutions, bacteriological and biochemical preparations.
• **hameln rds** In 2006, hameln pharma rds acquired Slovakian company VUL Modra. The acquisition enabled hameln pharma rds to expand its range of services by adding toxicological/clinical studies and extensive laboratory services to the mix, alongside its existing product development work, approval service and trading activities. **Today,** hameln rds offers an unique range of services that covers the entire value chain from drug development right through to drug sales and distribution.

• **AZOTER** is a small plant running fermentation enterprise, which was originally built in 1990 within the state supporting program for biotechnologies in former Czechoslovakia. It was oriented on the production of enzymes utilized in the food industry. In 2002 it changed again the owner and is now held by Azoter Company s.r.o. with main product – Azoter fertilizer.
Small Companies

Genexpress s.r.o. – represents a private center focused on prenatal DNA diagnostics of human monogenic hereditary diseases.

Danubeclone s.r.o. - is the company focused on monoclonal antibodies production as well as on the neuroimmunology research.

Slovgen s.r.o. – provides DNA diagnostics and identification based on DNA of particular endangered wild life animals, e.g. Falcons and Eagles

DNAtest, s.r.o – provides DNA analysis and tests based on DNA analysis in human diagnostics.
Small Companies

Geneton s.r.o. – modern DNA based methods of genetic analysis.

BioScience, s.r.o. – biotech research and development in the field of diagnostics of infectious diseases targeting immunocompromised patients, including organ transplant recipients and patients on dialysis.

Glaston, s.r.o. – stem cells research - cooperation with Faculty of Pharmacy of Comenius Univ

DB Biotech, s.r.o., Košice - the design and production of high quality rabbit clonal antibodies developed by a novel „in vitro cloning technology“
Conclusions (and Future?)

Slovakia has the most important qualifications and potential for the Life sciences and Biotech development:

1. due to its appropriate research in biotechnology,
2. significant permanent interest of young people to study and work in the field and
3. modest background of the fermentation technologies in the country.

Biomed Science Parks and Research Centers (3+2)

Plan for new building for R&D in Biomedicine and Biotechnology in area of Mlynská dolina - in the frame of project “Science Park of Comenius University” contract with Min. of Education was signed on Friday, 17th May.