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Series

Technology – Financing – Investment

Industrial Biotechnology

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Waking up from its winter sleep

In Europe, industrial biotechnology is typically synonymous with white biotechnology, although it is also important to bear in mind that industrial biotechnology applications are also used in other colourful fields of biotechnology (such as "red-medicine" and "green-agricultural"). In Russia in particular, with its huge territory ensuring the availability of vast biomass resources and well-founded molecular basic research, industrial biotechnology is focusing on the other colours as well. **By Nicole Burghardt, Alina Osmakova and Irina Abramychева**

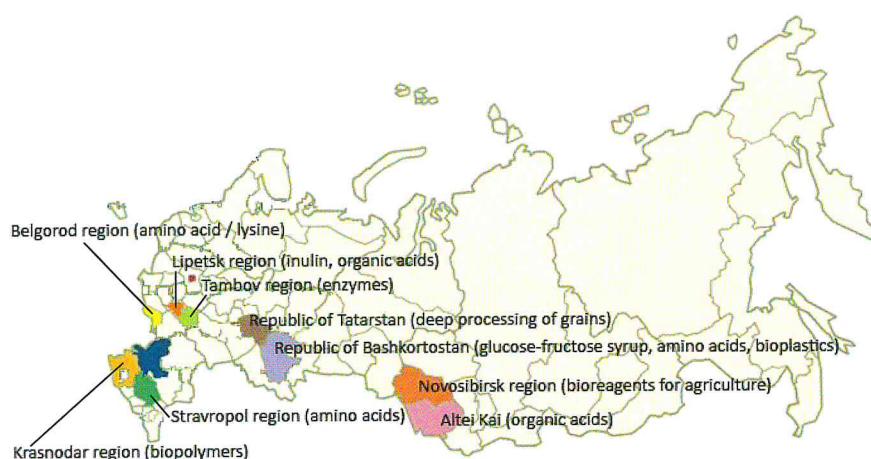


Illustration: A.N. Bach Institute of Biochemistry, RAS, 2014

batches, often using laboratory equipment that is unfit for up-scaled production.

As a consequence of this, international companies dominate all of production segments in which demand for industrial biotechnology products is high.¹



ABOUT THE AUTHORS

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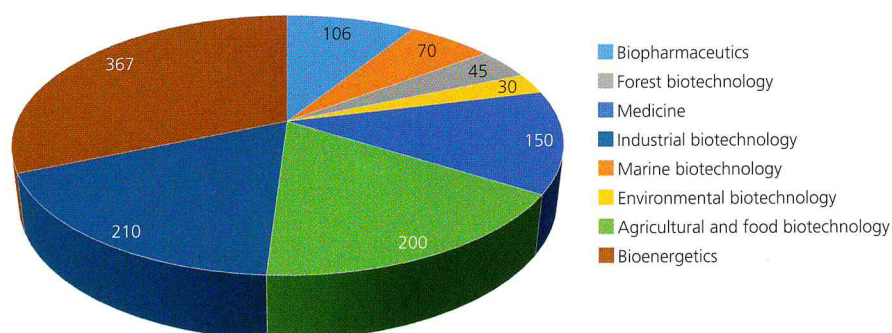
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In the 1980s and 1990s, the former Soviet Union constructed new industrial plants, established a system of applied and fundamental scientific institutions, and actively commercialized new biological products in agriculture, as well as in the food and chemical industries. Over the following years, although new methods, processes and products were consistently optimised in the leading industrial nations, Russia failed to jump on the fast running

"industrial biotechnology" bandwagon. Today, Russia faces two major problems as a direct result of this failure. Firstly, more than 80 % of the biotechnology products used in Russia have to be imported, and their consumption remains much lower than it is in both developed and developing countries. And secondly, lacking the invention and further development of up-scale process lines, Russian biotechnology products are manufactured in small

Fig. 1: Bio2020 – Estimated financing needs for the period 2011-2020 (bln. rub*)



Source: State Coordination Programme for the Development of Biotechnology in the Russian Federation until 2020, Moscow 2012 – VP-P8 322

¹) State Coordination Programme for the Development of Biotechnology in the Russian Federation until 2020, Moscow 2012 – VP-P8 322

Tab. 1: Russias latest steps in the industrial biotechnology

Date	Step
04/2011	Creation of three technology platforms: «Medicine of the Future», «Bioindustry and Bioresources», «Bioenergy»
04/2012	A state coordination programme for the development of biotechnologies in the Russian Federation for the period 2012-2020 – BIO2020 was approved ¹
11/2012	Strategy for the development of the pharmaceutical industry for the period up to 2020 (PHARMA 2020) ² and the federal target programme «The development of the pharmaceutical and medical industry of the Russian Federation for the period up to 2020 and beyond»
11/2012	Formation of a governmental working group for the development of biotechnologies (main task: definition of the strategic directions of development of the bio economy in Russia, the development of a set of measures aimed at the development of the biotechnology industry, as well as ensuring the coordinated work within existing programmes and implementation of BIO -2020) ³
04/2013	Profile biotech projects are supported in the scope of the Russian Federal Targeted Programme «Research and Development in Priority Areas of Russia's Scientific and Technological Complex 2014-2020» ⁴
07/2013	The Russian government approved the Action Plan («roadmap») «Development of Biotechnology and Bioengineering» ⁵
12/2014	Creation of the Federal State Institution «Federal Research Centre "Fundamentals of Biotechnology" of the Russian Academy of Sciences» (by merging the Centre «Bioengineering» and the S.N. Vinogradsky Institute of Microbiology to A.N. Bach Institute of Biochemistry). ⁶

1) Prime Minister of the Russian Federation V. Putin (decree No 1853p-P8, VP-P8 322), 24.04.2012; 2) Russian government (decree No 2057), 03.11.2012

3) Prime Minister of the Russian Federation, D. Medvedev (decree DM- P8- 6930), 19.11.2012; 4) Russian government (decree No 426), 21.04.2013

5) Russian government (decree No 1247-p), 18.07.2013; 6) Federal Agency of Scientific Organizations (decree No 1420), 31.12.2014

Source: A.N. Bach Institute of Biochemistry, RAS, 2014

Current situation and future steps

Acknowledging that the omissions of the past are set to freeze future growth and the independence of the Russian biotechnology market, the Russian government has implemented a number of incentives in order to support the development of biotechnology (see tab. 1).

The general aim of the programme Bio2020 is to take several selected biotechnology areas to a competitive level on the global market.

The expected results are a boost to in-

dustrial biotechnology production in Russia of about 1% of global gross domestic product (GDP) by 2020, and the creation of conditions for an increase in GDP of at least 3% by 2030, as well as the availability of new energy sources due to the development of bioenergetics.

Currently, three Russian Technology Platforms are assisting the efforts of the programme:

◆ Bioindustry and Bioresources – Bio-Tech 2030

◆ Bioenergy

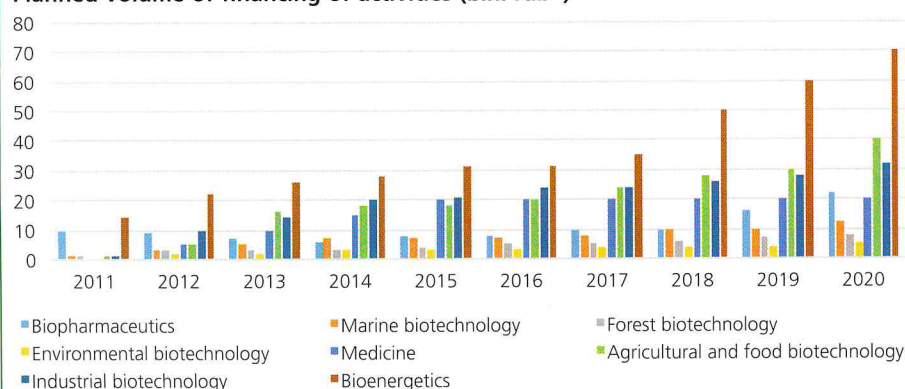
◆ Medicine of the Future

At the moment, many Russian regions are acting according to the aforementioned strategic programmes for biotechnological development, innovative biotech clusters are being formed, pilot plants are being constructed, and biotechnological factories are up and running.

Best practice example and outlook

In December 2014, the first plant for the production of protein concentrates opened in the Altai region. Its main product (sunflower protein concentrate - Protopic) will be a "homemade" alternative on the Russian market for high protein feedstuff, and will compete against the imported market leaders. By 2020, the implementation of the „Protein Russia“ project will increase the share of protein concentrates in the Russian feedstuff market up to more than 60%, displacing the imports that currently predominate. Russia is now advancing in the field of industrial biotechnology and has the potential to become a key player in the sector.

Fig. 2: Bio2020 - Planned volume of financing of activities (bln. rub*) Bio2020 – Planned volume of financing of activities (bln. rub*)



Source: State Coordination Programme for the Development of Biotechnology in the Russian Federation until 2020, Moscow 2012 – VP-P8 322

2) www.biotech2030.ru, (19.01.2015)

3) www.tp-bioenergy.ru, (19.01.2015)

4) www.tp-medfuture.ru, (19.01.2015)