

## Сайт Биологического Факультета - версия для печати

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**Department of Microbiology // The Faculty of Biology.  
Belarussian State University. English Version.**

**DEPARTME  
NT OF  
MICROBIOLOG  
Y**

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### Historical Background

The department was established in 1960. During this time it was headed by Prof. B. Ya. Elbert (1960–1963), Prof. P. A. Bulanov (1964–1969) and Prof. Yu. K. Fomichev (1969–1988). Prof. V. A. Prokulevich has been the Head of the Department since 1988.



### Staff:

**Professors:** Prof. Dr. [V. A. Prokulevich](#) – Head of Department, Prof. Dr. [M. A. Titok](#), [Prof. V.V. Lysak](#);

**Associate professors:** [V.E. Miamin](#), [A.G. Pesnyakevich](#), [O.V. Fomina](#), M.I. Charniauskaya, D.O. Gerlouskiy, A.V. Sidarenka, [T.A. Puchkova](#);

**Senior lecturers:** [E. I. Ignatenko](#), [N. V. Sautkina](#);

**Assistant professors:** E.I. Komar, M.I. Shavel.

**Scientists:** [M. I. Potapovich](#) (Head of Laboratory), S. G. Golenchenko, K.V. Kudin, I.V. Kudina, N.V. Polegenkaya, A.D. Titova, A.N. Fajbich, L.M. Kravchenko, H.A. Bukliarevich, K.V. Ostrikova.

**Technicians:** S.V. Balash, T. A. Rachkovskaya, N.A. Berdieva, Ya.V. Gormash.

## Training

The department carries out training in the following areas: Microbiology (specializations: Molecular microbiology; Applied microbiology); Biochemistry; Biology, Biotechnology; Bioecology.

### List of disciplines provided by lecturers of the Department of Microbiology:

- Microbiology
- Immunology
- Fundamentals of Immunology
- Fundamentals of Biotechnology
- Molecular Biology of Cancer
- Vector Systems
- Cell Cultivation
- Ecological Biotechnology
- Microbial Objects in Biotechnology
- Biotechnology of Industrial Waste Utilisation
- Molecular Bacteriology
- Systematics of Microorganisms
- Physiology of Microorganisms
- Extrachromosomal Genetic Structures of Microbial Cells
- Mechanisms of Antibiotic Biosynthesis and Their Effect on Bacterial Cells
- Applied Aspects of Immunology
- Industrial Microbiology
- Medical and Sanitary Microbiology
- Phytopathogenic Microorganisms
- Microbial Ecology
- Biotechnology - Principles and Applications
- Biogeochemical Activity of Microorganisms

## Main research directions

- Development of biological preparations for the prevention and treatment of diseases of farm animals.
- Studying the genetic regulation of biosynthesis of biologically active compounds by bacterial cells.
- Creating strains-producers for the biotechnology industry.
- Investigation of pathogenic bacteria of the genus *Erwinia* to obtain information about the functional activity of several gene products important for the interaction with the host plants.
  - Isolation, identification and study of spreading of bacterial pathogens of vegetable crops in Belarus. Development of molecular methods of plant pathogen identification.
  - Studies of antimicrobial activities of certain original synthesised organic compounds and possibilities of their practical application.

The group of genetic engineering of veterinary preparations led by prof. V.A. Prokulevich is currently working on:

- cloning of the genes and expressing proteins of alpha interferons of agricultural animals, studying of their specificity as well as antiviral, immune modulating and anti-proliferation activity with the final aim of creation of highly effective preparations for veterinary;
- development and creation of the biologically active cytokine preparation components and antibiotics of prolonged action;
- creation of solvents for increasing the effectiveness of vaccines used in veterinary;
- development of new generation of disinfectants.

These research activities are funded by the State Programmes "Industrial Biotechnology" and "New Technologies and Biological Preparations for Agriculture, Industry, Medicine and Environment Protection".

The department is also constantly developing on a permanent basis the new approaches in teaching microbiology,

biotechnology and related disciplines. Its activities include the development and publication of textbooks, manuals, recommendations, guidelines for the laboratory classes for students undergoing the training and expertise within the department as well as constant development and improvement of new methods of students', self-control taking into account the directions of development of higher education in Belarus.

### Teaching aids developed by members of the department in recent years:

1. V.V. Grichik, A.G. Pesnyakevich, I.V. Bogacheva, O.N. Rogozhnikov, V.V. Lysak. Common biology. Experimental textbook for 11<sup>th</sup> grade of secondary schools / Minsk: Narodnaya Asveta, 2004, 135 p. (in Russian)
2. Blazhevich O.V. Cell Cultivation: Lecture course / Minsk: BSU, 2005. 78 p. (in Russian)
3. R. A. Zheldakova. Mechanisms of Antibiotic Biosynthesis and Their Effect on Bacterial Cells: Teaching aids / Minsk: BSU, 2005. 123 p. (in Russian)
4. A.E. Korenkov, N.V. Korenkova, A. G. Pesnyakevich. Ecology Olympiads: preparation and performance / Minsk: Rodiola-plus, 2005. 212 p. (in Russian)
5. R. A. Zheldakova, V.E. Myamin. Phytopathogenic Microorganisms : Teaching aids / Minsk: BSU, 2006. 116 p. (in Russian)
6. Yu. K. Fomichev, A.N. Evtushenkov. Introduction to Biotechnology. Lecture course / Minsk: BSU, 2005. 78 p. (in Russian)
7. A. G. Pesnyakevich Fundamentals of Immunology: Курс лекций / Minsk: BSU, 2008. 195 с. (in Russian)
8. V. V. Lysak. Microbiology: Textbook / Minsk: BSU, 2007. 343 p. (in Russian)
9. R. A. Zheldakova, V.D. Poliksenova, V. V. Lysak. Methodological approaches to organization of controlled independent work of students within the faculty of biology of the BSU // Proc. Resp. Conf. "Informational-methodological supplies for the controlled independent work of university students". Minsk: BSU, 2007. P. 162-166. (in Russian)

### Recent scientific publications

1. V. E. Myamin, A. G. Pesnyakevich, V. A. Prokulevich. Purification of pectine metabolites // Vestnik BSU. Ser. 2. 2003. № 1. P.47-51. (in Russian)
2. S.A. Skoblyakov, V. E. Myamin, A.L. Lagonenko, A. G. Pesnyakevich, Y.A. Nikolaichik. The effect of the pelW and kdgR mutations on pectinases production by *Erwinia carotovora* subsp. *atroseptica* // Vestnik BSU. Ser. 2. 2004. № 2. P.40-44. (in Russian)
3. V. E. Myamin, A. G. Pesnyakevich, Y.A. Nikolaichik, V. A. Prokulevich. Genetic regulation of the pathogenicity and virulence factors in *Erwinia carotovora* subsp. *atroseptica*. Identification of the kduD gene // Genetics. 2004. T. 40. № 9. P. 1187-1193. (in Russian)
4. V. E. Myamin, A. G. Pesnyakevich, V. A. Prokulevich Genetic regulation of the pathogenicity and virulence factors in *Erwinia carotovora* subsp. *atroseptica*. Phenotypic characterization of the kduD mutant bacteria // Genetics. 2004. T. 40. № 9. P.1194-1199. (in Russian)
5. A.V. Lagodich, E.A. Cherva, Ya.V. Shtanyuk, V. A. Prokulevich, Yu. K. Fomichev, A.A. Prosorov, M.A. Titok. Construction of the vector system for molecular cloning in the cells of *Bacillus subtilis* and *Escherichia coli* // Mol. Biol. 2005. T. 39. №2. P.345-348 (in Russian)
6. M.A. Titok, V. A. Prokulevich, L. Janniere. The influence of the host cell replication machinery on the inheritance of the pBS72 plasmid of *Bacillus subtilis* // Proc. NAS Belarus. 2005. T.49. №3. P.70-76. (in Russian)
7. Zheldakova R. A., Lysak V. V., Mitroshkina O. A. Creation a culture collection of microorganisms for education purposes // Microbial diversity: current situation, conservation strategy and biotechnological potentialities: Proceedings of II Int. Conf., 20-25 September, 2005, Perm/Institute of Ecology and Genetics of Micro-organisms, Ural Branch, Russian Academy of Sciences. 2005. P. 216.
8. R. A. Zheldakova, A. G. Pesnyakevich, V. V. Lysak. 30 years of studying bacteria from the genus *Erwinia*: results and perspectives // Vestnik BSU. Ser. 2. 2006. № 3. P.65-68. (in Russian)
9. Loginova N. V., Kovalchuk T. V., Zheldakova R. A., Polozov H. I., Sorokin V. L., Shadyro O. I. Copper (II) complexes of sterically hindered diphenol derivates: synthesis, characterization and microbiological studies // Centr. Eur. J. Chem. — 2006/ — V. 4, №3. — P. 440-457.
10. Loginova N. V., Kovalchuk T. V., Zheldakova R. A., Polozov H. I., Sorokin V. L., Shadyro O. I. Synthesis, characterization antifungal activity of copper (II) complexes of sterically hindered diphenol derivates // Polyhedron. — 2006. — Vol. 25. — P. 3603-3610.
11. Loginova N. V., Kovalchuk T. V., Zheldakova R. A., Polozov H. I., Sorokin V. L., Shadyro O. I. Synthesis and biological evaluation of copper (II) complexes of sterically hindered o-aminophenol derivates as antimicrobial agents // Bioorg. Med. Chem. Lett. — 2006. — Vol. 16. — P. 5403-5407.
12. Loginova N. V., Polozov H. I., Sorokin V. L., Shadyro O. I., R. A. Zheldakova Bioactive metallocomplexes of sterically shielded diphenol and aminophenol derivatives as the new direction for development of antimicrobial and antiviral preparations // Vestnik BSU. Ser. 2. — 2006. — №3. — P. 3-20. (in Russian)

13. Yu.V. Seleznyova, V. A. Prokulevich Development of veterinary preparations on the basis of genetically engineered strains producing unspecific immune modulators and compounds with antioxidant activity // Molecular applied genetics: scientific works. Research results within the state programme "Genetic engineering" 2002-2006. — 2006. — Т. 3. — P. 115-119. (in Russian)

14. Potapenko N.T., Loginova N.V., R. A. Zheldakova, G.P. Shevchenko. Ag-SiO<sub>2</sub> nanostructures with antimicrobial activity // Vestnik BSU. Ser. 2. — 2008. — №1. — P. 18-22. (in Russian)

15. S.V. Smolskaya, A.G. Pesnyakevich. Mechanisms of the intercellular interactions in prokaryotes // Proceedings of the Belarusian State University. Vol. 1, 2006, P. 42-55. (in Russian)

16. S. A. Skoblyakov, V. E. Myamin, A. G. Pesnyakevich. Creation of the genetic constructs for the inactivation of the Eca0852 and Eca0804 genes of *Erwinia carotovora* subsp. *atroseptica* // Proceedings of the Belarusian State University. Vol. 2, 2007. P. 172-180. (in Russian)

17. M.I. Potapovich, V. A. Prokulevich. Characterisation of the chicken  $\alpha$ -interferon and influence of the gene structure on its expression in the cells of *Escherichia coli* // Vestnik BSU. Ser. 2, 2008. №2. - P. 34-37 (in Russian)

18. Biodiversity of Hydrocarbon-Oxidizing Soil Bacteria from Various Climatic Zones / M.I.Charniauskaya, A.A.Bukliarevich, Ya.A.Delegan, A.E.Akhremchuk, A.E.Filonov, M.A.Titok // Microbiology. - 2018. Vol. 87, No. 5. P. 699-711. ([Full Text](#))

19. Effect of the Structural and Regulatory Heat Shock Proteins on Hydrocarbon Degradation by *Rhodococcus pyridinivorans* 5Ap / H. A. Bukliarevich, M. I. Charniauskaya, A. E. Akhremchuk, L. N. Valentovich, M. A. Titok // Microbiology. - 2019. - Vol. 88, No. 5. - P. 573-579.

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