

Elizaveta Rogacheva



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I am a microbiologist researcher with many years of experience in scientific and medical organizations. My main research interests is antibiotic resistance of microorganisms of the *ESKAPE* group, nosocomial infections and development of new antibacterial compounds.

In my work I use modern methods for studying the phenotypic and genotypic properties of bacteria, guided by international standards. *I owned* the method of continuous and directed screening, the method of genome-wide sequencing in order to find resistance genes, as well as the MALDI-TOF spectrometry method on Vitek and Bruker, processes the obtained data on

the basis of bioinformatics knowledge. In the course of work, *I've mastered the methods* of studying the mechanism of action of antibacterial compounds, in particular, fluorescence, atomic force, electron microscopy. Repeatedly conducted a study of the antibacterial action of the leader compounds in experimental animals.

Analysis of the data obtained over the years of work *allowed me to publish* the results of research in the form of scientific articles in peer-reviewed journals (23) and make presentations at Russian (7) and international conferences (5).

Now I'm doing my PhD work (Antibacterial properties of new chemical compounds of natural and synthetic origin against bacteria of the ESKAPE group, specialty: Microbiology).

Interests:

- antimicrobial resistance,
- classical bacteriology,
- molecular diagnostic methods.

Media:

1. <https://www.pasteurorg.ru/article/261/3173/Reportazh-o-testirovanii-n-a-antitela-k-COVID-19>
2. <https://www.pasteurorg.ru/article/261/3179/Areg-Totolyan-Antitela-mo-gut-byt-zaschitnymi-a-mogut-ne-zaschischat-ot-infekcii>
3. https://www.instagram.com/p/CWAYICDIwx_/?utm_medium=copy_link
4. https://disk.yandex.ru/d/G550FN3LXoEqng/171121_Rogacheva-sait.mp4
5. <https://smotrim.ru/video/2416026>

Courses:

1. Biobanking 2022. HSeT, EVAg, Institut Pasteur. 16.02.2022-12.06.2022. France, Paris

My projects:

2020:

- Pasteur grant for junior researchers, WP leader, 2020
- RSF, 2019-2022, participant, No. 19-73-10090

2021:

- УМНИК 2020 на тему: «Development of new antibacterial compounds against nosocomial infections».
- European project of European Commission, 2021-2026. Predicting the Impact of Monoclonal Antibodies & Vaccines on Antimicrobial Resistance.

2022:

- Scholarship of the President of the Russian Federation 2022-2024

Teaching:

06.2021-present — teacher at the Center of Chemical Engineering at ITMO University, St. Petersburg.

List of publications:

- Snetkov, P.; **Rogacheva, E.**; Kremleva, A.; Morozkina, S.; Uspenskaya, M.; Kraeva, L. In-Vitro Antibacterial Activity of Curcumin-Loaded Nanofibers Based on Hyaluronic Acid against Multidrug-Resistant ESKAPE Pathogens. *Pharmaceutics* 2022, 14, 1186. <https://doi.org/10.3390/pharmaceutics14061186>
- Shetnev, A., Tarasenko, M., Kotlyarova, V. et al. External oxidant-free and transition metal-free synthesis of 5-amino-1,2,4-thiadiazoles as promising antibacterials against ESKAPE pathogen strains. *Mol Divers* (2022). <https://doi.org/10.1007/s11030-022-10445-1>
- Nazarov, D.; Ezhov, I.; Yudintceva, N.; Shevtsov, M.; Rudakova, A.; Kalganov, V.; Tolmachev, V.; Zharova, Y.; Lutakov, O.; Kraeva, L.;

Rogacheva, E.; Maximov, M. Antibacterial and Osteogenic Properties of Ag Nanoparticles and Ag/TiO₂ Nanostructures Prepared by Atomic Layer Deposition. J. Funct. Biomater. 2022, 13, 62. <https://doi.org/10.3390/jfb13020062>

- Development of E-tests with substances in vitro potentiate the effect of antimicrobial drugs for multidrug-resistant *Klebsiella pneumoniae* strains. Bacterial susceptibility & resistance. **E. Rogacheva**, A. Samoilova, I. Likhachev, L. Kraeva. ECCMID, 9-12.07.2021
- Mirna Sabbouh, Anna Nikitina, **Elizaveta Rogacheva**, Lyudmila Kraeva, Sviatlana A. Ulasevich, Ekaterina V. Skorb, Michael Nosonovsky, Separation of motions and vibrational separation of fractions for biocide brass, Ultrasonics Sonochemistry, Volume 80, 2021, 105817, ISSN 1350-4177
- MUTUALLY ISOMERIC 2- AND 4- (3-NITRO-1,2,4-TRIAZOL-1-YL) PYRIMIDINES INSPIRED BY AN ANTIMYCOBACTERIAL SCREENING HIT: SYNTHESIS AND BIOLOGICAL ACTIVITY AGAINST THE ESKAPE PANEL OF PATHOGENS Chupr, D. **Rogacheva E.**, Kraeva L., Levin O., Manicheva O., Dogonadze M., Vinogradova T., Bakulina O., Krasavin M. Antibiotics. 2020.Vol. 9.No. 10.P. 666.
- Rostovskii NV, Koronotov AN, Sakharov PA, Agafonova AV, Novikov MS, Khlebnikov AF, **Rogacheva EV**, Kraeva LA. Azirine-containing dipeptides and depsipeptides: synthesis, transformations and antibacterial activity. Org Biomol Chem. 2020 Dec 7; 18 (46): 9448-9460. doi: 10.1039 / d0ob02023k. PMID: 33170920. <https://pubs.rsc.org/en/content/articlelanding/2020/ob/d0ob02023k#!divAbstract>
- DEVELOPMENT OF A METHOD FOR SYNTHESIS OF UNNATURAL 2H-ASIRIN-2-CARBONIC ACIDS DEMONSTRATING HIGH ANTIBACTERIAL ACTIVITY Rostovsky N.V., Sakharov P.A., Koronotov A.N., Khlebnikov A.F., Novikov M.S., Glukharev M.S., Glebnikov A.F., Novikov A.S. G., **Rogacheva E.V.**, Kraeva L.A., Sharoyko V.V., Tennikova T.B. In the collection: Topical issues of organic chemistry and biotechnology.

materials of face-to-face reports of the International Scientific Conference. Ekaterinburg, 2020.S. 153-155.

- DEVELOPMENT OF DOMESTIC KITS FOR DETERMINING SENSITIVITY OF CLINICALLY SIGNIFICANT MICROORGANISMS TO ANTIBACTERIAL DRUGS. Samoilova A.A., Likhachev I.V., **Rogacheva E.V.**, In the collection: FUNDAMENTAL AND APPLIED ASPECTS OF ANALYSIS OF POPULATION HEALTH RISK. Materials of the All-Russian scientific and practical Internet conference of young scientists and specialists of Rospotrebnadzor with international participation. Perm, 2020.S. 180-185.
- Approbation of the domestic set "MPK-MICRO", designed to determine the antibiotic susceptibility of microorganisms by the method of serial microdilutions. Clinical microbiology and antimicrobial chemotherapy. 2020; 22 (3): 231-236 Samoilova A.A., Kraeva L.A., Likhachev I.V., **Rogacheva E.V.**, Verbov V.N., Mikhailov N.V., Zueva E.V.
- Likhachev IV, Kraeva LA, Samoilova AA, **Rogacheva EV**, Kaftyreva LA, Egorova SA, Mikhailov NV. Approbation of russian test strips for antimicrobial susceptibility testing of microorganisms by gradient diffusion method (E-test). Klin Lab Diagn. 2020 Sep 16; 65 (9): 557-561. English. doi: 10.18821 / 0869-2084-2020-65-9-557-561. PMID: 33245641;
- Vedekhina, T .; Lukin, A .; **Rogacheva, E .**; Kraeva, L .; Krasavin, M. Zn (OTf) 2-catalyzed arenehydrazination of protected propargylamines leading to 3-amidoindoles. Tetrahedron Lett. 2020, 61, 151430
- Rostovskii NV, Koronotov AN, Sakharov PA, Agafonova AV, Novikov MS, Khlebnikov AF, **Rogacheva EV**, Kraeva LA. Azirine-containing dipeptides and depsipeptides: synthesis, transformations and antibacterial activity. Org Biomol Chem. 2020 Dec 7;18(46):9448-9460. doi: 10.1039/d0ob02023k. PMID: 33170920.
<https://pubs.rsc.org/en/content/articlelanding/2020/ob/d0ob02023k#!divAbstract>

- [РАЗРАБОТКА МЕТОДА СИНТЕЗА НЕПРИРОДНЫХ 2Н-АЗИРИН-2-КАРБОНОВЫХ КИСЛОТ, ДЕМОНИСТРИРУЮЩИХ ВЫСОКУЮ АНТИБАКТЕРИАЛЬНУЮ АКТИВНОСТЬ](#) Ростовский Н.В., Сахаров П.А., Коронатов А.Н., Хлебников А.Ф., Новиков М.С., Глухарев А.Г., **Рогачева Е.В.**, Краева Л.А., Шаройко В.В., Тенникова Т.Б. В сборнике: Актуальные вопросы органической химии и биотехнологии. материалы очных докладов Международной научной конференции. Екатеринбург, 2020. С. 153-155.
- RSC Adv., 2019, 9, 37901–37905. Pavel A. Sakharov, ^a Alexander N. Koronotov, ^a Alexander F. Khlebnikov, ^a Mikhail S. Novikov, ^a Artem G. Glukharev, ^a **Elizaveta V. Rogacheva**, ^{ab}Liudmila A. Kraeva, ^b Vladimir V. Sharoyko, ^a Tatiana B. Tennikova ^a Non-natural 2H-azirine-2-carboxylic acids were obtained in high yields by FeCl₂-catalyzed isomerization of 5-chloroisoxazoles to azirine-2-carbonyl chlorides followed by their hydrolysis. The 3-aryl- and 3- heteroaryl-substituted acids are stable during prolonged storage, exhibit antibacterial activity against ESKAPE pathogens and show a low level of cytotoxicity.
- Mikhail V. Il'in, Alexandra A. Sysoeva, Dmitrii S. Bolotin, Alexander S. Novikov, Vitalii V. Suslonov, **Elizaveta V. Rogacheva**, Liudmila A. Kraeva, Vadim Yu. Kukushkin. Aminonitrones as highly reactive bifunctional synthons. An expedient one-pot route to 5-amino-1,2,4-triazoles and 5-amino-1,2,4-oxadiazoles – potential antimicrobials targeting multi-drug resistant bacteria. October 2019. New Journal of Chemistry 43(44) DOI: 10.1039/C9NJ04529E
- Eur. J. Med. Chem. 2019. 166, 125-135. DOI: 10.1016/j.ejmech.2019.01.050. Krasavin, M.; Lukin, A.;Vedekkhina, T.;Manicheva, O.; Dogonadze, M.; Vinogradova, T.; Zabolotnykh, N.; **Rogacheva, E.**; Sharoyko, V.; Tennikova, T. B.; Dar'in, D.; Sokolovich, E.
- Vedekkhina, T.; Lukin, A.; **Rogacheva, E.**; Kraeva, L.; Krasavin, M. Zn(OTf)₂-catalyzed arenehydrazination of protected propargylamines leading to 3-amidoindoles. Tetrahedron Lett. 2020, 61, 151430
- P. A. Sakharov, A. N. Koronotov, A. F. Khlebnikov, M. S. Novikov, A. G. Glukharev, **E. V. Rogacheva**, L. A. Kraeva, V. V. Sharoyko, T. B.

Tennikova, N. V. Rostovskii. Non-natural 2H-azirine-2-carboxylic acids: anexpedient synthesis and antimicrobial activity. The Royal Society of Chemistry. 2019.- No. 9. - p. 37901-37905

- M. Krasavin, A. Lukin, T. Vedekhina, O. Manicheva, M. Dogonadze, T. Vinogradova, N. Zabolotnykh, **E. Rogacheva**, L. Kraeva, V. Sharoyko, T. Tennikova, D. Dar'in, E. Sokolovich. Attachment of a 5-nitrofuroyl moiety to spirocyclic piperidines produces non-toxic nitrofurans that are effective in vitro against multidrug-resistant Mycobacterium tuberculosis. European Journal of Medicinal Chemistry. 2019.- No. 166. - p. 125-135
- T. Vedekhina, A. Lukin, **E. Rogacheva**, L. Kraeva, M. Krasavin. Zn (OTf) 2-catalyzed arenehydrazination of protected propargylamines leading to 3-amidoindoles. Tetrahedron Letters 61 (2020) 151430. <https://doi.org/10.1016/j.tetlet.2019.151430>
- M.V. Il'in, A.A. Sysoeva, D.S. Bolotin, A.S. Novikov, V.V.Suslonov, **E.V. Rogacheva**, L.A. Kraeva, V.Yu. Kukushkin. Aminonitrones as highly reactive bifunctional synthons. An expedient one-pot route to 5-amino-1,2,4-triazoles and 5-amino-1,2,4-oxadiazoles - potential antimicrobials targeting multi-drug resistant bacteria. New Journal of Chemistry. 2019. 44. <https://pubs.rsc.org/en/content/articlelanding/2019/nj/c9nj04529e/unauth#!div>
- Krasavin, M., Lukin, A., Vedekhina, T., **Rogacheva E.**, Kraeva, L., Yablonsky, P. Conjugation of a 5-nitrofuran-2-oyl moiety to aminoalkylimidazoles produces non-toxic nitrofurans that are efficacious in vitro and in vivo against multidrug-resistant Mycobacterium tuberculosis. European Journal of Medicinal Chemistry. 2018. V. 157. P. 1115-1126. DOI: 10.1016 / j.ejmech.2018.08.068
- Kraeva L.A., Tokarevich N.K., Lavrentieva I.N., Roshchina N.G., Kaftyreva L.A., Kunilova E.S., Kurova N.N., Stoyanova N.A., Antipova A.Yu., Svarval A.V., Porin A.A., **Rogacheva E.V.**, Zheltakova I.R., Khamitova I.V., Timofeeva E.V., Bepalova G.I. Infection of labor migrants from Central

Asia and permanent residents of St. Petersburg with pathogens of various infectious diseases and susceptibility to them. Infection and immunity. - T. 8. - No. 1. - p. 61-70.

- Kraeva L.A., **Rogacheva E.V.**, Khamdulaeva G.N., Kunilova E.S. Evaluation of the antibacterial activity of three new classes of compounds against bacteria of the genus Klebsiella. Materials of the 5th national congress of bacteriologists. 2019, p. 45-46.
- **E.V. Rogacheva**, L.A. Kraeva, G.N. Khamdulaeva, V.P. Chelibanov. Antibacterial activity of synthesized compounds from different classes of chemicals. Materials of the International Conference "Molecular Fundamentals of Epidemiology, Diagnosis, Prevention and Treatment of Topical Infections". Infection and immunity. 2018.- Volume 8, No. 4.- p. 616.
- Zueva E.V., Mikhailov N.V., Egorova S.A., Likhachev I.V., **Rogacheva E.V.**, Dudko D.A., Karpova E.S., Samoilova A.A., Verbov V .N., Kraeva L.A. Differentiation of strains of Klebsiella spp. sensitivity to antibiotics using mass spectrometric analysis of MALDI-TOF. International Conference "Molecular Fundamentals of Epidemiology, Diagnosis, Prevention and Treatment of Topical Infections". St. Petersburg, December 4-6, 2018
- **Rogacheva E.V.**, Likhachev I.V., Kraeva L. A. Relationship between the results of genetic and phenotypic methods for detecting carbapenemases in K. pneumonia strains. 5th National Congress of Laboratory Medicine 2019, poster session :, Moscow.
- **E.V. Rogacheva**, E.V. Zueva., I.V. Likhachev., E. S. Karpova, E. S. Kunilova, N.V. Mikhailov., S.A. Egorova., L.A. Kraeva. Detecting antibiotic resistance Klebsiella spp by MALDI-TOF MS analysis. Institut Pasteur International Network Symposium. Combating Resistance: microbes and vectors. Paris November 15-16, 2018.

Languages:

- English: B2
- French: A1

Experience:

2015-2017: GBU SPb NII SP them. I.I. Janelidze as a laboratory assistant.

2016-2017: Laboratory of immunological research as a laboratory assistant.

2017-2019: Pasteur Institute, laboratory of medical bacteriology as a laboratory assistant.

Since 2019: Postgraduate studies, 3st year of study at the SPb Pasteur Institute. Junior researcher of laboratory medical bacteriology.