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Работа в ИБХ

2021–наст.вр.

Ведущий научный сотрудник

Научные интересы

Группа биосинтеза модифицированных нуклеозидов

Одним из основных направлений работ являются разработка фундаментальных и прикладных аспектов биотехнологии получения *препаратов на основе модифицированных нуклеозидов* для последующего внедрения в производство биофармацевтических препаратов. Разработка биокаталитических технологий получения новых модифицированных нуклеозидов для изучения их противовирусной и противоопухолевой активности.

Нами созданы технологии синтеза субстанций препаратов, используемых в современной клинической практике для терапии онкогематологических заболеваний:

Кладрибин - волосатоклеточный лейкоз, лечение рассеянного склероза рецидивирующего (ремиттирующего) течения (таблет. форма).

Флудара - В-клеточный хронический лимфолейкоз, неходжкинские лимфомы низкой степени злокачественности, а также фолликулярные В-клеточные лимфомы и лимфомы из клеток мантийной зоны (при приеме внутрь).

Неларабин - Т-клеточный острый лимфобластный лейкоз и Т-клеточная лимфобластная лимфома (у пациентов с рефрактерным к химиотерапии или рецидивирующим заболеванием).

Клофарабин - лечение острого лимфобластного лейкоза у детей старше 1 года с рецидивом или рефрактерностью к терапии после применения, по крайней мере, двух предшествующих схем химиотерапии и при отсутствии иных способов достижения стойкой ремиссии.

Технологии масштабированы и апробированы в условиях фармпроизводства компаний ОАО «Фармсинтез» (С.-Петербург) и ЗАО «Р-Фарм» (Москва).

Внедрение технологий на этих предприятиях сдерживается необходимостью проведения клинических исследований полученных субстанций и небольшой потребностью препаратов на рынке РФ (от 0.5 до 2 кг).

Получены метаболически устойчивые аналоги нуклеозидного антибиотика **кордицепина**, которые представляют огромный интерес для терапии Африканского трипаносомоза человека [Human African trypanosomiasis (HAT)].

Разработаны биотехнологические способы получения фармацевтических субстанций противовирусных препаратов – **рибавирина, видарабина, диданозина**. Синтезирован новый нуклеозид - рибозид 2-амино-5,6-дифторбензимидазола, обладающий высокой активностью против вируса герпеса человека 2 типа и низкой цитотоксичностью.

Партнеры:

- Институт органического синтеза им. И.Я.Постовского (ИОС УрОРАН) – синтез новых оснований бензимидазола.
- Институт тонких химических технологий им. М.В.Ломоносова Московского технологического университета, лаб. Биотехнологии – синтез новых оснований 1,2,4-триазола.
- Институт Биоорганической химии Национальной академии наук Беларуси – совместные работы в области каскадной полиферментативной технологии получения модифицированных нуклеозидов
- Институт молекулярной биологии им. В.А.Энгельгардта - синтез флексимерных гетероциклических оснований для получения новых нуклеозидов
- НИИ Экспериментальной диагностики и терапии опухолей РОНЦ им. Н.Н.Блохина - изучение цитотоксичности серии новых модифицированных нуклеозидов в лаборатории М.В.Киселевского
- Институт вирусологии им. Д.И.Ивановского (ФНИЦЭМ им.Н.Ф.Гамалеи Минздрава РФ) - тестирование противовирусной активности новых модифицированных нуклеозидов на моделях *in vitro* и *in vivo*

Степени и звания

Кандидат наук (Химические науки)

Гранты и проекты

2021– [Разработка средств профилактики и лечения COVID-19 и сопутствующих инфекционных заболеваний с использованием генетических технологий](#)
2023

Публикации

1. Eletskaia BZ, Mironov AF, Fateev IV, Berzina MY, Antonov KV, Smirnova OS, Zatsepina AB, Arnautova AO, Abramchik YA, Paramonov AS, Kayushin AL, Khandazhinskaya AL, Matyugina ES, Kochetkov SN, Miroshnikov AI, Mikhailopulo IA, Esipov RS, **Konstantinova ID** (2024). Enzymatic Transglycosylation Features in Synthesis of 8-Aza-7-Deazapurine Fleximer Nucleosides by Recombinant E. coli PNP: Synthesis and Structure Determination of Minor Products. *Biomolecules* 14 (7), 798, [10.3390/biom14070798](#)
2. Fateev IV, Sasmakov SA, Abdurakhmanov JM, Ziyaev AA, Khasanov SS, Eshboev FB, Ashirov ON, Frolova VD, Eletskaia BZ, Smirnova OS, Berzina MY, Arnautova AO, Abramchik YA, Kostromina MA, Kayushin AL, Antonov KV, Paramonov AS, Andronova VL, Galegov GA, Esipov RS, Azimova SS, Miroshnikov AI, **Konstantinova ID** (2024). Synthesis of Substituted 1,2,4-Triazole-3-Thione Nucleosides Using E. coli Purine Nucleoside Phosphorylase. *Biomolecules* 14 (7), 745, [10.3390/biom14070745](#)
3. Alexandrova LA, Oskolsky IA, Makarov DA, Jasko MV, Karpenko IL, Efremenkova OV, Vasilyeva BF, Avdanina DA, Ermolyuk AA, Benko EE, Kalinin SG, Kolganova TV, Berzina MY, **Konstantinova ID**, Chizhov AO, Kochetkov SN, Zhgun AA (2024). New Biocides Based on N4-Alkylcytidines: Effects on Microorganisms and Application for the Protection of Cultural Heritage Objects of Painting. *Int J Mol Sci* 25 (5), , [10.3390/ijms25053053](#)
4. Zayats EA, Fateev IV, Abramchik YA, Kostromina MA, Timofeev VI, Yurovskaya DO, Karanov AA, **Konstantinova ID**, Golovin AV, Esipov RS (2024). Designing an Efficient Biocatalyst for the Phosphoribosylation of Antiviral Pyrazine-2-carboxamide Derivatives. *ACS Catal* 14 (5), 3687–3699, [10.1021/acscatal.3c05059](#)
5. Kayushin AL, Antonov KV, Dorofeeva EV, Berzina MY, Arnautova AO, Prohorenko IA, Miroshnikov AI, **Konstantinova ID** (2024). A New Approach to the Synthesis of Anti-Reverse Cap Analog (ARCA) 2mGpppG. *Russ. J. Bioorganic Chem.* 50 (1), 1–7, [10.1134/S106816202402033X](#)
6. Abramchik YA, Zayats EA, Timofeev VI, Shevtsov MB, Kostromina MA, Fateev IV, Yurovskaya DO, Karanov AA, **Konstantinova ID**, Kuranova IP, Esipov RS (2023). Preliminary X-ray Study of Crystals Obtained by Co-Crystallization of Hypoxanthine–Guanine Phosphoribosyltransferase from Escherichia coli and Pyrazine-2-Carboxamide Derivatives. *Cryst. Rep* 68 (6), 852–856, [10.1134/S1063774523600965](#)
7. Khandazhinskaya A, Eletskaia B, Mironov A, **Konstantinova I**, Efremenkova O, Andreevskaya S, Smirnova T, Chernousova L, Kondrashova E, Chizhov A, Seley-Radtke K, Kochetkov S, Matyugina E (2023). New

- Flexible Analogues of 8-Aza-7-deazapurine Nucleosides as Potential Antibacterial Agents. *Int J Mol Sci* 24 (20), 15421, [10.3390/ijms242015421](https://doi.org/10.3390/ijms242015421)
8. Berzina MY, Eletskaia BZ, Kayushin AL, Dorofeeva EV, Lutonina OI, Fateev IV, Zhavoronkova ON, Bashorin AR, Arnautova AO, Smirnova OS, Antonov KV, Paramonov AS, Dubinnyi MA, Esipov RS, Miroshnikov AI, **Konstantinova ID** (2023). Intramolecular Hydrogen Bonding in N6-Substituted 2-Chloroadenosines: Evidence from NMR Spectroscopy. *Int J Mol Sci* 24 (11), 9697, [10.3390/ijms24119697](https://doi.org/10.3390/ijms24119697)
 9. Garipov IF, Timofeev VI, Zayats EA, Abramchik YA, Kostromina MA, **Konstantinova ID**, Esipov RS (2023). Structural Bioinformatics Study of the Structural Basis of Substrate Specificity of Purine Nucleoside Phosphorylase from *Thermus thermophilus*. *Cryst. Rep* 68 (2), 280–287, [10.1134/S1063774523010108](https://doi.org/10.1134/S1063774523010108)
 10. Eletskaia BZ, Berzina MY, Fateev IV, Kayushin AL, Dorofeeva EV, Lutonina OI, Zorina EA, Antonov KV, Paramonov AS, Muzyka IS, Zhukova OS, Kiselevskiy MV, Miroshnikov AI, Esipov RS, **Konstantinova ID** (2023). Enzymatic Synthesis of 2-Chloropurine Arabinonucleosides with Chiral Amino Acid Amides at the C6 Position and an Evaluation of Antiproliferative Activity In Vitro. *Int J Mol Sci* 24 (7), 6223, [10.3390/ijms24076223](https://doi.org/10.3390/ijms24076223)
 11. Khandazhinskaya A, Fateev I, Eletskaia B, Maslova A, **Konstantinova I**, Seley-Radtke K, Kochetkov S, Matyugina E (2023). Design and Synthesis of New Modified Flexible Purine Bases as Potential Inhibitors of Human PNP. *Molecules* 28 (3), 928, [10.3390/molecules28030928](https://doi.org/10.3390/molecules28030928)
 12. Smirnova OS, Berzina MY, Fateev IV, Eletskaia BZ, Kostromina MA, Kayushin AL, Paramonov AS, Prutkov AN, Grebenkina LE, Chudinov MV, Andronova VL, Galegov GA, Deryabin PG, Miroshnikov AI, Esipov RS, **Konstantinova ID** (2022). Chemo-enzymatic synthesis of 5-substituted ribavirin analogs: Unexpected cooperative effect in the interaction of 5-alkyloxymethyl 1,2,4-triazol-3-carboxamides with *E. coli* purine nucleoside phosphorylase active site. *Sustainable Chemistry and Pharmacy* 30, 100881, [10.1016/j.scp.2022.100881](https://doi.org/10.1016/j.scp.2022.100881)
 13. Zayats EA, Fateev IV, Kostromina MA, Abramchik YA, Lykoshin DD, Yurovskaya DO, Timofeev VI, Berzina MY, Eletskaia BZ, **Konstantinova ID**, Esipov RS (2022). Rational Mutagenesis in the Lid Domain of Ribokinase from *E. coli* Results in an Order of Magnitude Increase in Activity towards D-arabinose. *Int J Mol Sci* 23 (20), , [10.3390/ijms232012540](https://doi.org/10.3390/ijms232012540)
 14. Berzina MY, Eletskaia BZ, Kayushin AL, Dorofeeva EV, Lutonina OI, Fateev IV, Paramonov AS, Kostromina MA, Zayats EA, Abramchik YA, Maltsev DV, Naumenko LV, Taran AS, Yakovlev DS, Spasov AA, Miroshnikov AI, Esipov RS, **Konstantinova ID** (2022). Synthesis of 2-chloropurine ribosides with chiral amino acid amides at C6 and their evaluation as A1 adenosine receptor agonists. *Bioorg Chem* 126, 105878, [10.1016/j.bioorg.2022.105878](https://doi.org/10.1016/j.bioorg.2022.105878)
 15. (конференция) Арнаутова АО, **Константинова ИД**, Каюшин АЛ, Антонов КВ (2022). New method of chemoenzymatic synthesis of 2- fluorocordycepin. *Nucleosides Nucleotides Nucleic Acids* , .
 16. Timofeev VI, Fateev IV, Kostromina MA, Abramchik YA, **Konstantinova ID**, Volkov VV, Lykoshin DD, Mikheeva OO, Muravieva TI, Esipov RS, Kuranova IP (2022). The comparative analysis of the properties and structures of purine nucleoside phosphorylases from thermophilic bacterium *Thermus thermophilus* HB27. *J Biomol Struct Dyn* 40 (8), 3626–3641, [10.1080/07391102.2020.1848628](https://doi.org/10.1080/07391102.2020.1848628)
 17. Khandazhinskaya A, Fateev I, **Konstantinova I**, Esipov R, Polyakov K, Seley-Radtke K, Kochetkov S, Matyugina E (2022). Synthesis of New 5'-Norcarbocyclic Aza/Deaza Purine Fleximers - Noncompetitive Inhibitors of *E.coli* Purine Nucleoside Phosphorylase. *Front Chem* 10, 867587, [10.3389/fchem.2022.867587](https://doi.org/10.3389/fchem.2022.867587)
 18. **Konstantinova ID**, Andronova VL, Fateev IV, Esipov RS (2022). Favipiravir and Its Structural Analogs: Antiviral Activity and Synthesis Methods. *Acta Naturae* 14 (2), 16–38, [10.32607/actanaturae.11652](https://doi.org/10.32607/actanaturae.11652)
 19. Khandazhinskaya A, Eletskaia B, Fateev I, Kharitonova M, **Konstantinova I**, Barai V, Azhayev A, Hyvonen MT, Keinanen TA, Kochetkov S, Seley-Radtke K, Khomutov A, Matyugina E (2021). Novel fleximer pyrazole-containing adenosine analogues: chemical, enzymatic and highly efficient biotechnological synthesis. *Org Biomol Chem* 19 (34), 7379–7389, [10.1039/d1ob01069g](https://doi.org/10.1039/d1ob01069g)
 20. Abramchik Y, Zayats E, Kostromina M, Lykoshin D, Fateev I, **Konstantinova I**, Zhukhlistova N, Timofeev V, Kuranova I, Esipov R (2021). Comparison of spatial structures and packaging of phosphorybosil pyrophosphate synthetase 2 from *thermus thermophilus* hb27 in rhombohedral and tetragonal crystals. *Crystals (Basel)* 11 (9), , [10.3390/cryst11091128](https://doi.org/10.3390/cryst11091128)
 21. Kayushin AL, Tokunova JA, Fateev IV, Arnautova AO, Berzina MY, Paramonov AS, Lutonina OI, Dorofeeva

- EV, Antonov KV, Esipov RS, Mikhailopulo IA, Miroshnikov AI, **Konstantinova ID** (2021). Radical dehalogenation and purine nucleoside phosphorylase e. Coli: How does an admixture of 2',3'-anhydroinosine hinder 2-fluoro-cordycepin synthesis. *Biomolecules* 11 (4), , [10.3390/biom11040539](https://doi.org/10.3390/biom11040539)
22. Fateev IV, Kostromina MA, Abramchik YA, Eletskaia BZ, Mikheeva OO, Lukoshin DD, Zayats EA, Berzina MY, Dorofeeva EV, Paramonov AS, Kayushin AL, **Konstantinova ID**, Esipov RS (2021). Multi-enzymatic cascades in the synthesis of modified nucleosides: Comparison of the thermophilic and mesophilic pathways. *Biomolecules* 11 (4), 586, [10.3390/biom11040586](https://doi.org/10.3390/biom11040586)
23. Artsemyeva JN, Remeeva EA, Buravskaya TN, **Konstantinova ID**, Esipov RS, Miroshnikov AI, Litvinko NM, Mikhailopulo IA (2020). Anion exchange resins in phosphate form as versatile carriers for the reactions catalyzed by nucleoside phosphorylases. *Beilstein J Org Chem* 16, 2607–2622, [10.3762/bjoc.16.212](https://doi.org/10.3762/bjoc.16.212)
24. **(книга) Konstantinova ID**, Kayushin AL, Arnautova AO, Antonov KV, Yeletskaia BZ, Berzina MY, Dorofeeva EV, Lutonina OI, Fateev IV, Esipov RS, Miroshnikov AI (2020). Convenient Approach to the Biosynthesis of C2,C6-Disubstituted Purine Nucleosides Using E. coli Purine Nucleoside Phosphorylase and Arsenolysis. *Wiley-VCH, John Whittall (Editor), Peter W. Sutton (Editor)* , 211–215.
25. Eletskaia BZ, Gruzdev DA, Krasnov VP, Levit GL, Kostromina MA, Paramonov AS, Kayushin AL, Muzyka IS, Muravyova TI, Esipov RS, Andronova VL, Galegov GA, Charushin VN, Miroshnikov AI, **Konstantinova ID** (2019). Enzymatic Synthesis of Novel Purine Nucleosides Bearing a Chiral Benzoxazine Fragment. *Chem Biol Drug Des* 93 (4), 605–616, [10.1111/cbdd.13458](https://doi.org/10.1111/cbdd.13458)
26. Fateev IV, Sinitsina EV, Bikanasova AU, Kostromina MA, Tuzova ES, Esipova LV, Muravyova TI, Kayushin AL, **Konstantinova ID**, Esipov RS (2018). Thermophilic phosphoribosyltransferases *Thermus thermophilus* HB27 in nucleotide synthesis. *Beilstein J Org Chem* 18 (14), 3098–3105, [10.3762/bjoc.14.289](https://doi.org/10.3762/bjoc.14.289)
27. Kharitonova MI, **Konstantinova ID**, Miroshnikov AI (2018). Benzimidazole nucleosides: Antiviral and antitumour activities and methods of synthesis. *RUSS CHEM REV* 87 (11), 1111–1138, [10.1070/RCLR4832](https://doi.org/10.1070/RCLR4832)
28. Zhurilo NI, Chudinov MV, Matveev AV, Smirnova OS, **Konstantinova ID**, Miroshnikov AI, Prutkov AN, Grebenkina LE, Pulkova NV, Shvets VI (2017). Isosteric ribavirin analogues: Synthesis and antiviral activities. *Bioorg Med Chem Lett* 28 (1), 11–14, [10.1016/j.bmcl.2017.11.029](https://doi.org/10.1016/j.bmcl.2017.11.029)
29. Denisova AO, Tokunova YA, Fateev IV, Breslav AA, Leonov VN, Dorofeeva EV, Lutonina OI, Muzyka IS, Esipov RS, Kayushin AL, **Konstantinova ID**, Miroshnikov AI, Stepchenko VA, Mikhailopulo IA (2017). The Chemoenzymatic Synthesis of 2-Chloro- and 2-Fluorocordycepins. *Synthesis (Stuttg)* 49 (21), 4853–4860, [10.1055/s-0036-1590804](https://doi.org/10.1055/s-0036-1590804)
30. Kharitonova MI, Antonov KV, Fateev IV, Berzina MY, Kaushin AL, Paramonov AS, Kotovskaya SK, Andronova VL, **Konstantinova ID**, Galegov GA, Charushin VN, Miroshnikov AI (2017). Chemoenzymatic Synthesis of Modified 2'-Deoxy-2'-fluoro-β-d -arabinofuranosyl Benzimidazoles and Evaluation of Their Activity Against Herpes Simplex Virus Type 1. *Synthesis (Stuttg)* 49 (5), 1043–1052, [10.1055/s-0036-1588625](https://doi.org/10.1055/s-0036-1588625)
31. Kharitonova MI, Denisova AO, Andronova VL, Kayushin AL, **Konstantinova ID**, Kotovskaya SK, Galegov GA, Charushin VN, Miroshnikov AI (2017). New modified 2-aminobenzimidazole nucleosides: Synthesis and evaluation of their activity against herpes simplex virus type 1. *Bioorg Med Chem Lett* 27 (11), 2484–2487, [10.1016/j.bmcl.2017.03.100](https://doi.org/10.1016/j.bmcl.2017.03.100)
32. Esipov RS, Abramchik YA, Fateev IV, Muravyova TI, Artemova KG, **Konstantinova ID**, Kuranova IP, Miroshnikov AI (2016). Recombinant phosphoribosyl pyrophosphate synthetases from *Thermus thermophilus* HB27: Isolation and properties. *Russ. J. Bioorganic Chem.* 42 (5), 512–521, [10.1134/S1068162016040075](https://doi.org/10.1134/S1068162016040075)
33. **Konstantinova ID**, Fateev IV, Miroshnikov AI (2016). The arsenolysis reaction in the biotechnological method of synthesis of modified purine β-D-arabinonucleosides. *Russ. J. Bioorganic Chem.* 42 (4), 372–380, [10.1134/S1068162016040105](https://doi.org/10.1134/S1068162016040105)
34. Esipov RS, Abramchik YA, Fateev IV, **Konstantinova ID**, Kostromina MA, Muravyova TI, Artemova KG, Miroshnikov AI (2016). A Cascade of Thermophilic Enzymes As an Approach to the Synthesis of Modified Nucleotides. *Acta Naturae* 8 (4), 82–90, [10.32607/20758251-2016-8-4-82-90](https://doi.org/10.32607/20758251-2016-8-4-82-90)
35. Chudinov MV, Matveev AV, Prutkov AN, **Konstantinova ID**, Fateev IV, Prasolov VS, Smirnova OA, Ivanov AV, Galegov GA, Deryabin PG (2016). Novel 5-alkyl(aryl)-substituted ribavirine analogues: Synthesis and antiviral evaluation. *MENDELEEV COMMUN* 26 (3), 214–216, [10.1016/j.mencom.2016.04.012](https://doi.org/10.1016/j.mencom.2016.04.012)
36. Eletskaia BZ, **Konstantinova ID**, Paramonov AS, Esipov RS, Gruzdev DA, Vigorov AY, Levit GL,

- Miroshnikov AI, Krasnov VP, Charushin VN (2016). Chemoenzymatic arabinosylation of 2-aminopurines bearing the chiral fragment of 7,8-difluoro-3-methyl-3,4-dihydro-2H-[1,4]benzoxazines. *MENDELEEV COMMUN* 26 (1), 6–8, [10.1016/j.mencom.2016.01.003](https://doi.org/10.1016/j.mencom.2016.01.003)
37. Kharitonova MI, Fateev IV, Kayushin AL, **Konstantinova ID**, Kotovskaya SK, Andronova VL, Galegov GA, Charushin VN, Miroshnikov AI (2016). Chemoenzymatic Synthesis and Antiherpes Activity of 5-Substituted 4,6-Difluorobenzimidazoles Ribo- and 2'-Deoxyribonucleosides. *Synthesis (Stuttg)* 48 (3), 394–406, [10.1055/s-0035-1560911](https://doi.org/10.1055/s-0035-1560911)
 38. Chudinov MV, Prutkov AN, Matveev AV, Grebenkina LE, **Konstantinova ID**, Berezovskaya YV (2016). An alternative route to the arylvinyltriazole nucleosides. *Bioorg Med Chem Lett* 26 (14), 3223–3225, [10.1016/j.bmcl.2016.05.072](https://doi.org/10.1016/j.bmcl.2016.05.072)
 39. Fateev IV, Kharitonova MI, Antonov KV, **Konstantinova ID**, Stepanenko VN, Esipov RS, Seela F, Temburnikar KW, Seley-Radtke KL, Stepchenko VA, Sokolov YA, Miroshnikov AI, Mikhailopulo IA (2015). Recognition of Artificial Nucleobases by E. coli Purine Nucleoside Phosphorylase versus its Ser90Ala Mutant in the Synthesis of Base-Modified Nucleosides. *Chemistry* 21 (38), 13401–13419, [10.1002/chem.201501334](https://doi.org/10.1002/chem.201501334)
 40. Sakharov V, Baykov S, **Konstantinova I**, Esipov R, Dorogov M (2015). An Efficient Chemoenzymatic Process for Preparation of Ribavirin. *International Journal of Chemical Engineering* 2015, , [10.1155/2015/734851](https://doi.org/10.1155/2015/734851)
 41. Fateev IV, Antonov KV, **Konstantinova ID**, Muravyova TI, Seela F, Esipov RS, Miroshnikov AI, Mikhailopulo IA (2014). The chemoenzymatic synthesis of clofarabine and related 2'-deoxyfluoroarabinosyl nucleosides: The electronic and stereochemical factors determining substrate recognition by E. coli nucleoside phosphorylases. *Beilstein J Org Chem* 10, 1657–1669, [10.3762/bjoc.10.173](https://doi.org/10.3762/bjoc.10.173)
 42. Deryabin PG, Galegov GA, **Konstantinova ID**, Muzyka IS, Miroshnikov AI, Lvov DK (2014). The combination of ribavirin and ozeltamivir effectively inhibits reproduction of influenza a virus resistant to rimantadine (Amantadine) in vitro and in vivo. *Dokl Biochem Biophys* 455 (1), 80–83, [10.1134/S1607672914020100](https://doi.org/10.1134/S1607672914020100)
 43. **Konstantinova ID**, Fateev IV, Galegov GA, Deryabin PG, Botikov AG, Muzyka IS, LVov DK, Miroshnikov AI (2013). The arsenolysis reaction in the biotechnological synthesis of ribavirin. the in vitro and in vivo inhibition of influenza A virus replication with a combination of ribavirin and ozeltamivir. *Russ. J. Bioorganic Chem.* 39 (5), 530–538, [10.1134/S1068162013050099](https://doi.org/10.1134/S1068162013050099)
 44. **Konstantinova ID**, Chudinov MV, Fateev IV, Matveev AV, Zhurilo NI, Shvets VI, Miroshnikov AI (2013). Chemoenzymatic method of 1,2,4-triazole nucleoside synthesis: Possibilities and limitations. *Russ. J. Bioorganic Chem.* 39 (1), 53–71, [10.1134/S1068162013010056](https://doi.org/10.1134/S1068162013010056)
 45. **Konstantinova ID**, Selezneva OM, Fateev IV, Balashova TA, Kotovskaya SK, Baskakova ZM, Charushin VN, Baranovsky AV, Miroshnikov AI, Balzarini J, Mikhailopulo IA (2013). Chemo-enzymatic synthesis and biological evaluation of 5,6-disubstituted benzimidazole ribo- and 2'-deoxyribonucleosides. *Synthesis (Stuttg)* 45 (2), 272–280, [10.1055/s-0032-1317782](https://doi.org/10.1055/s-0032-1317782)
 46. **Konstantinova ID**, Antonov KV, Fateev IV, Miroshnikov AI, Stepchenko VA, Baranovsky AV, Mikhailopulo IA (2011). A chemo-enzymatic synthesis of β -D-arabinofuranosyl purine nucleosides. *Synthesis (Stuttg)* (10), 1555–1560, [10.1055/s-0030-1260010](https://doi.org/10.1055/s-0030-1260010)
 47. Chudinov MV, **Konstantinova ID**, Ryzhova OI, Esipov RS, Yurkevich AM, Shvets VI, Miroshnikov AI (2005). A new effective method for the synthesis of 1,2,4-triazole-3-carboxamide and ribavirin derivatives. *PHARM CHEM J* 39 (4), 212–215, [10.1007/s11094-005-0119-7](https://doi.org/10.1007/s11094-005-0119-7)
 48. **Konstantinova ID**, Leonteva NA, Galegov GA, Ryzhova OI, Chuvikovskii DV, Antonov KV, Esipov RS, Taran SA, Verevkina KN, Feofanov SA, Miroshnikov AI (2004). Ribavirin: Biotechnological synthesis and effect on the reproduction of Vaccinia virus. *Russ. J. Bioorganic Chem.* 30 (6), 553–560, [10.1023/B:RUBI.0000049772.18675.34](https://doi.org/10.1023/B:RUBI.0000049772.18675.34)
 49. **Konstantinova ID**, Leonteva NA, Galegov GA, Ryzhova OI, Chuvikovskii DV, Antonov KV, Esipov RS, Taran SA, Verevkina KN, Feofanov SA, Miroshnikov AI (2004). Biotechnological synthesis of ribavirin. Effect of ribavirin and its various combinations on the reproduction of Vaccinia virus. *Bioorg Khim* 30 (6), 613–620.
 50. **Константинова ИД**, Леонтьева НА, Галегов ГА, Рыжова ОИ, Чувиковский ДВ, Антонов КА, Есипов РС, Таран СА, Верёвкина КН, Феофанов СА, Мирошников АИ (2004). Биотехнологический способ получения рибавирина. Действие рибавирина и некоторых его комбинаций на репродукцию вируса осповакцины. *Bioorg Khim* 30 (6), 613–620.

51. Antonov KV, **Konstantinova ID**, Miroshnikov AI (1998). New approach to the synthesis of 2',3'-dideoxyadenosine and 2',3'- dideoxyinosine. *Nucleosides Nucleotides* 17 (13), 153–159, [10.1080/07328319808005166](https://doi.org/10.1080/07328319808005166)
52. Zavgorodnii SG, Malyshev AA, **Konstantinova ID**, Kuznetsov SA, Miroshnikov AI (1997). Regiospecificity of Methylthiomethylation of Nucleic Bases of the Uracil Series in the Synthesis of Nucleosides by the Silyl Method. *Bioorg Khim* 23 (7), 599.