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Адрес

Федеральное государственное бюджетное учреждение науки Институт биоорганической химии им. академиков М.М. Шемякина и Ю.А. Овчинникова Российской академии наук, Москва, Россия

Контакты

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Образование

1970–2006	Россия, Москва	Московский государственный университет имени М.В. Ломоносова (МГУ), биологический факультет	Присуждена учёная степень доктора биологических наук
1970–1991	Россия, Москва	Московский государственный университет имени М.В. Ломоносова (МГУ), биологический факультет	Присуждена учёная степень кандидата физ.-мат. наук
1982–1988	Россия, Москва	Московский инженерно-физический институт (МИФИ)	диплом инженера-физика

Работа в ИБХ

2017–наст.вр.	Главный научный сотрудник
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Членство в советах и комиссиях ИБХ

Ученый совет

Научные интересы

Изучение структуры и функциональных свойств биологически активных соединений с широким использованием методов оптической спектроскопии и микроскопии. Разработка новых методических подходов к изучению биологических молекул на основе методов оптической микроскопии и спектроскопии.

Основные направления исследований включают в себя:

скрининг, структурно-функциональные, доклинические и клинические исследования новых фотосенсибилизаторов для противоопухолевой и антимикробной фотодинамической терапии (ФДТ);

оптимизация структуры и изучение свойств конъюгатов хлорина е6 с наночастицами бора применительно к ФДТ, бор нейтрон-захватной терапии рака и флуоресцентной диагностике;

изучение функциональной роли трансмембранных доменов эфриновых тирозинкиназных рецепторов EphA2;

изучение свойств и механизмов действия на клетки эукариот и прокариот природных пептидов из ядов насекомых;

поиск новых лигандов потенциал-зависимых калиевых каналов, изучение их активности и свойств.

Степени и звания

Доцент

Гранты и проекты

2022– наст.вр.	Гомо- и гетеро- тетрамерные потенциал-зависимые калиевые каналы Kv1 в клетках эукариот и их взаимодействия с поровыми блокаторами
2018– 2020	Разработка флуоресцентных хемосенсоров на основе резонансного переноса энергии для определения биогенных металлов в растворах и клетках
2019– 2022	Эпигенетические механизмы биологических процессов и их роль в патогенезе онкологических заболеваний
2017– 2020	Механизм взаимодействия PARP-1 с хроматином
2016– 2019	Магнито-плазмонные гибридные наносенсоры как многофункциональная платформа для детекции клеток рака груди
2019– 2021	Полифункциональные фотосенсибилизаторы на основе гуанидиновых производных природных порфиринов

Публикации

1. Panchenko PA, Efremenko AV, Polyakova AS, **Feofanov AV**, Ustimova MA, Fedorov YV, Fedorova OA (2024). Application of RET Approach for Ratiometric Response Enhancement of ICT Fluorescent Hg²⁺ Probe Based on Crown-containing Styrylpyridinium Dye. *Chem Asian J*, e202400777, [10.1002/asia.202400777](#)
2. Malinina DK, Armeev GA, Geraskina OV, Korovina AN, Studitsky VM, **Feofanov AV** (2024). Complexes of HMO1 with DNA: Structure and Affinity. *Biomolecules* 14 (9), 1184, [10.3390/biom14091184](#)
3. Plotnikova E, Abramova O, Ostroverkhov P, Vinokurova A, Medvedev D, Tihonov S, Usachev M, Shelyagina A, Efremenko A, **Feofanov A**, Pankratov A, Shegay P, Grin M, Kaprin A (2024). Conjugate of Natural Bacteriochlorin with Doxorubicin for Combined Photodynamic and Chemotherapy. *Int J Mol Sci* 25 (13), 7210, [10.3390/ijms25137210](#)
4. Polyakova AS, Panchenko PA, Efremenko AV, **Feofanov AV**, Fedorov YV, Fedorova OA (2024). A naphthalimide-based fluorescent and colorimetric probe for the detection of mercury(II) ions in aqueous solutions and in living cells. *MENDELEEV COMMUN* 34 (3), 418–420, [10.1016/j.mencom.2024.04.034](#)
5. Akulinichev SV, Glukhov SI, Efremenko AV, Kokontsev DA, Kuznetsova EA, Martynova VV, **Feofanov AV**, Yakovlev IA (2024). The Cellular Response to Exposure to Ionizing Radiation and Light in the Presence of a Photosensitizer. *Biophysics (Oxf)* 68 (5), 783–791, [10.1134/S0006350923050044](#)
6. Kost V, Sukhov D, Ivanov I, Kasheverov I, Ojomoko L, Shelukhina I, Mozhaeva V, Kudryavtsev D, **Feofanov A**, Ignatova A, Utkin Y, Tsetlin V (2023). Comparison of Conformations and Interactions with Nicotinic Acetylcholine Receptors for E. coli-Produced and Synthetic Three-Finger Protein SLURP-1. *Int J Mol Sci* 24 (23), 16950, [10.3390/ijms242316950](#)
7. Oleinikov PD, Fedulova AS, Armeev GA, Motorin NA, Singh-Palchevskaia L, Sivkina AL, Feskin PG, Glukhov GS, Afonin DA, Komarova GA, Kirpichnikov MP, Studitsky VM, **Feofanov AV**, Shaytan AK (2023). Interactions of Nucleosomes with Acidic Patch-Binding Peptides: A Combined Structural Bioinformatics, Molecular Modeling, Fluorescence Polarization, and Single-Molecule FRET Study. *Int J Mol Sci* 24 (20), 15194, [10.3390/ijms242015194](#)
8. Maluchenko NV, Korovina AN, Saulina AA, Studitsky VM, **Feofanov AV** (2023). The Role of the WGR Domain in the Functions of PARP1 and PARP2. *Mol Biol* 57 (5), 782–791, [10.1134/S0026893323050114](#)
9. Andreeva TV, Maluchenko NV, Efremenko AV, Lyubitelev AV, Korovina AN, Afonin DA, Kirpichnikov MP, Studitsky VM, **Feofanov AV** (2023). Epigallocatechin Gallate Affects the Structure of Chromatosomes, Nucleosomes and Their Complexes with PARP1. *Int J Mol Sci* 24 (18), , [10.3390/ijms241814187](#)
10. Stefanova ME, Volokh OI, Chertkov OV, Armeev GA, Shaytan AK, **Feofanov AV**, Kirpichnikov MP, Sokolova

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11. Orlov NA, Kryukova EV, Efremenko AV, Yakimov SA, Toporova VA, Kirpichnikov MP, Nekrasova OV, **Feofanov AV** (2023). Interactions of the Kv1.1 Channel with Peptide Pore Blockers: A Fluorescent Analysis on Mammalian Cells. *Membranes (Basel)* 13 (7), 645, [10.3390/membranes13070645](https://doi.org/10.3390/membranes13070645)
 12. Primak AL, Orlov NA, Peigneur S, Tytgat J, Ignatova AA, Denisova KR, Yakimov SA, Kirpichnikov MP, Nekrasova OV, **Feofanov AV** (2023). AgTx2-GFP, Fluorescent Blocker Targeting Pharmacologically Important Kv1.x (x = 1, 3, 6) Channels. *Toxins (Basel)* 15 (3), 229, [10.3390/toxins15030229](https://doi.org/10.3390/toxins15030229)
 13. Petrunina NA, Shtork AS, Lukina MM, Tsvetkov VB, Khodarovich YM, **Feofanov AV**, Moysenovich AM, Maksimov EG, Shipunova VO, Zatsepin TS, Bogomazova AN, Shender VO, Aralov AV, Lagarkova MA, Varizhuk AM (2023). Ratiometric i-Motif-Based Sensor for Precise Long-Term Monitoring of pH Micro Alterations in the Nucleoplasm and Interchromatin Granules. *ACS Sens* 8 (2), 619–629, [10.1021/acssensors.2c01813](https://doi.org/10.1021/acssensors.2c01813)
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 17. Orlov NA, Ignatova AA, Kryukova EV, Yakimov SA, Kirpichnikov MP, Nekrasova OV, **Feofanov AV** (2022). Combining mKate2-Kv1.3 Channel and Atto488-Hongotoxin for the Studies of Peptide Pore Blockers on Living Eukaryotic Cells. *Toxins (Basel)* 14 (12), 858, [10.3390/toxins14120858](https://doi.org/10.3390/toxins14120858)
 18. Efremenko A, Dyakova E, Ostroverkhov P, Ignatova A, Grin M, **Feofanov A** (2022). Photodynamic properties of lysine and arginine derivatives of bacteriopurpurinimide. *Future Med Chem* 14 (22), 1635–1647, [10.4155/fmc-2022-0192](https://doi.org/10.4155/fmc-2022-0192)
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 20. Panchenko PA, Efremenko AV, Polyakova AS, **Feofanov AV**, Ustimova MA, Fedorov YV, Fedorova OA (2022). Fluorescent RET-Based Chemosensor Bearing 1,8-Naphthalimide and Styrylpyridine Chromophores for Ratiometric Detection of Hg²⁺ and Its Bio-Application. *Biosensors (Basel)* 12 (9), , [10.3390/bios12090770](https://doi.org/10.3390/bios12090770)
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 22. Orlov NA, Yakimov SA, Nekrasova OV, **Feofanov AV** (2022). Recombinant Peptides Ce1 and Ce4 from the Venom of Scorpion *Centruroides elegans* and Their Interactions with Hybrid Channels KcsA-Kv1.x (x = 1, 3, 6). *Moscow Univ Biol Sci Bull* 77 (2), 119–125, [10.3103/S0096392522020067](https://doi.org/10.3103/S0096392522020067)
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 24. Denisova KR, Orlov NA, Yakimov SA, Kirpichnikov MP, **Feofanov AV**, Nekrasova OV (2022). Atto488-Agitoxin 2—A Fluorescent Ligand with Increased Selectivity for Kv1.3 Channel Binding Site. *Bioengineering (Basel)* 9 (7), , [10.3390/bioengineering9070295](https://doi.org/10.3390/bioengineering9070295)
 25. Kotova EY, Hsieh FK, Chang HW, Maluchenko NV, Langelier MF, Pascal JM, Luse DS, **Feofanov AV**, Studitsky VM (2022). Human PARP1 Facilitates Transcription through a Nucleosome and Histone Displacement by Pol II In Vitro. *Int J Mol Sci* 23 (13), , [10.3390/ijms23137107](https://doi.org/10.3390/ijms23137107)

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27. Denisova KR, Orlov NA, Yakimov SA, Kryukova EA, Dolgikh DA, Kirpichnikov MP, **Feofanov AV**, Nekrasova OV (2022). GFP–Margatoxin, a Genetically Encoded Fluorescent Ligand to Probe Affinity of Kv1.3 Channel Blockers. *Int J Mol Sci* 23 (3), , [10.3390/ijms23031724](https://doi.org/10.3390/ijms23031724)
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32. Sharonov GV, Nekrasova OV, Kudryashova KS, Kirpichnikov MP, **Feofanov AV** (2021). Bioengineered System for High Throughput Screening of Kv1 Ion Channel Blockers. *Bioengineering (Basel)* 8 (11), 187, [10.3390/bioengineering8110187](https://doi.org/10.3390/bioengineering8110187)
33. Maluchenko NV, Nilov DK, Pushkarev SV, Kotova EY, Gerasimova NS, Kirpichnikov MP, Langelier MF, Pascal JM, Akhtar MS, **Feofanov AV**, Studitsky VM (2021). Mechanisms of nucleosome reorganization by PARP1. *Int J Mol Sci* 22 (22), , [10.3390/ijms222212127](https://doi.org/10.3390/ijms222212127)
34. Maluchenko NV, **Feofanov AV**, Studitsky VM (2021). PARP-1-Associated Pathological Processes: Inhibition by Natural Polyphenols. *Int J Mol Sci* 22 (21), , [10.3390/ijms222111441](https://doi.org/10.3390/ijms222111441)
35. Gannesen AV, Schelkunov MI, Geraskina OV, Makarova NE, Sukhacheva MV, Danilova ND, Ovcharova MA, Martyanov SV, Pankratov TA, Muzychenko DS, Zhurina MV, **Feofanov AV**, Botchkova EA, Plakunov VK (2021). Epinephrine affects gene expression levels and has a complex effect on biofilm formation in *Micrococcus luteus* strain C01 isolated from human skin. *Biofilm* 3, 100058, [10.1016/j.biofilm.2021.100058](https://doi.org/10.1016/j.biofilm.2021.100058)
36. Danilova ND, Geraskina OV, Diuvenji EV, **Feofanov AV**, Plakunov VK, Gannesen AV (2021). Inhibitory Effect of Norepinephrine on Biofilm Growth of the Human Skin Commensal *Kytococcus schroeteri* H01. *Microbiology* 90 (5), 666–669, [10.1134/S0026261721050039](https://doi.org/10.1134/S0026261721050039)
37. Andreeva TV, Lyubitelev AV, Malyuchenko NV, Studitsky VM, Kirpichnikov MP, **Feofanov AV** (2021). Influence of Linker DNA on Nucleosome Structure according to Single-Particle Fluorescence Microscopy Data. *Moscow Univ Biol Sci Bull* 76 (3), 118–122, [10.3103/S0096392521030019](https://doi.org/10.3103/S0096392521030019)
38. Efremenko AV, Dyakova ED, Ostroverkhov PV, Kirin NS, Mironov AF, Grin MA, **Feofanov AV** (2021). Intracellular Localization and the Mechanisms of Photodynamic Action of 131-[2-(Guanidinyl)ethylamino] Chlorin e6 Dimethyl Ester. *Russ. J. Bioorganic Chem.* 47 (4), 845–853, [10.1134/S1068162021040087](https://doi.org/10.1134/S1068162021040087)
39. Kudryashova KS, Nekrasova OV, Kirpichnikov MP, **Feofanov AV** (2021). Chimeras of KcsA and Kv1 as a bioengineering tool to study voltage-gated potassium channels and their ligands. *Biochem Pharmacol* 190, 114646, [10.1016/j.bcp.2021.114646](https://doi.org/10.1016/j.bcp.2021.114646)
40. Maluchenko NV, Koshkina DO, **Feofanov AV**, Studitsky VM, Kirpichnikov MP (2021). Poly(ADP-Ribosyl) Code Functions. *Acta Naturae* 13 (2), 58–69, [10.32607/actanaturae.11089](https://doi.org/10.32607/actanaturae.11089)
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43. Panchenko PA, Efremenko AV, **Feofanov AV**, Ustimova MA, Fedorov YV, Fedorova OA (2021). Ratiometric

- Detection of Mercury (II) Ions in Living Cells Using Fluorescent Probe Based on Bis(styryl) Dye and Azadithia-15-Crown-5 Ether Receptor. *Sensors (Basel)* 21 (2), 1–15, [10.3390/s21020470](https://doi.org/10.3390/s21020470)
44. Mineev KS, Kryukova EV, Kasheverov IE, Egorova NS, Zhmak MN, Ivanov IA, Senko DA, **Feofanov AV**, Ignatova AA, Arseniev AS, Utkin YN, Tsetlin VI (2021). Spatial Structure and Activity of Synthetic Fragments of Lynx1 and of Nicotinic Receptor Loop C Models. *Biomolecules* 11 (1), 1–16, [10.3390/biom11010001](https://doi.org/10.3390/biom11010001)
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 52. (конференция) Orlov N, Ignatova A, Nekrasova O, Kirpichnikov M, **Feofanov A** (2020). Design of far-red fluorescent Kv1.3 channel for membrane expression in eukaryotic cells and its interactions with hongotoxin1. *Microsc Microanal* , , [10.1017/S1431927620017936](https://doi.org/10.1017/S1431927620017936)
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