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Адрес

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Контакты

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Образование

1970– 2007	Россия, Москва	Московский государственный университет имени М.В. Ломоносова (МГУ), Биологический факультет	Присвоено ученое звание профессора по специальности «биофизика».
1970– 1999	Россия, Москва	Московский государственный университет имени М.В. Ломоносова (МГУ), Биологический факультет	Диплом доктора физико-математических наук (тема диссертации: «Молекулярное моделирование мембрано- связанных участков белков и пептидов»)
1970– 1986	Россия, Москва	Московский государственный университет имени М.В. Ломоносова (МГУ), Биологический факультет	Диплом кандидата физико-математических наук (тема диссертации: «Топография и микроокружение хромофоров в бактериальном и зрительном родопсинах (спектроскопия комбинационного рассеяния света и квантовохимические расчеты)»)
1977– 1983	Россия, Москва	Московский инженерно- физический институт (МИФИ), Факультет экспериментальной и теоретической физики	Диплом с отличием (тема: «Математические методы определения вторичной структуры белков и полипептидов на основании спектров КР и полуэмпирических расчетов»)

Работа в ИБХ

2018–наст.вр.	Главный научный сотрудник
2018–наст.вр.	Ведущий научный сотрудник
2021–наст.вр.	Заместитель директора по науке

Членство в советах и комиссиях ИБХ

Методическая комиссия
Диссертационный совет
Ученый совет
Аттестационная комиссия

Владение языками

английский, французский

Членство в сообществах

Член редколлегии журналов «Биоорганическая химия», Москва; «The Open Structural Biology Journal», «The Open Bioinformatics Journal».

Член Ученого Совета ИБХ РАН.

Член специализированных диссертационных советов (МГУ, ГУ НИИ БМХ РАН).

Степени и звания

2007	Профессор
2000	Доктор наук (Физико-математические науки, 03.00.02 — Биофизика)
1986	Кандидат наук (Физико-математические науки)

Ссылки и контакты

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Гранты и проекты

2024— наст.вр.	Онкотераностика и проблемы резистентности к противоопухолевым и антибактериальным препаратам
2014— 2016	Компьютерный анализ структурно-функциональных аспектов олигомеризации трансмембранных доменов рецепторов сигнальных систем клетки
2023— наст.вр.	Молекулярно-биофизическая платформа для изучения мембранных белков: роль олигомеризации и белок-липидных взаимодействий
2018— 2022	Молекулярно-биофизические аспекты олигомеризации мембранных доменов рецепторов, определяющие клеточную сигнализацию в норме и онкогенезе
2018— 2021	Управление димеризацией сиалидазы NEU1 как перспективный подход к лечению атеросклероза
2019— 2021	Динамический «молекулярный портрет» клеточной мембраны и его биологическая роль
2019— 2022	Структурная биология мембранных белков для создания новых лекарственных и диагностических средств

Публикации

- Maryewski XA, Krasilnikov MS, Straková P, Holoubek J, Frčková T, Panina IS, Krylov NA, Gvozdev DA, Denisov VS, Semenov AN, Lotosh NY, Selishcheva AA, Chistov AA, Gulyak EL, Kozhemyakin GL, Korshun VA, **Efremov RG**, Ustinov AV, Růžek D, Eyer L, Alferova VA (2025). Membrane-Active Singlet Oxygen Photogenerators as a Paradigm for Broad-Spectrum Antivirals: The Case of Halogenated (BO₂)-DIPYromethenes. *ACS Appl Mater Interfaces* 17 (3), 4502–4528, [10.1021/acsami.4c17482](https://doi.org/10.1021/acsami.4c17482)
- Volynsky PE, Urban AS, Pavlov KV, Bershatsky YV, Bocharova OV, Kryuchkova AK, Zlobina VV, Gavrilenkova AA, Dolotova SM, Kamynina AV, Zangieva OT, Taldaev A, Batishchev OV, Okhrimenko IS, Rakitina TV, **Efremov RG**, Bocharov EV (2025). Diverse Interactions of Sterols with Amyloid Precursor

- Protein Transmembrane Domain Can Shift Distribution Between Alternative Amyloid- β Production Cascades in Manner Dependent on Local Lipid Environment. *Int J Mol Sci* 26 (2), 553, [10.3390/ijms26020553](https://doi.org/10.3390/ijms26020553)
3. Neuberger A, Shalygin A, Trofimov YA, Veretenenko II, Nadezhdin KD, Krylov NA, Gudermann T, **Efremov RG**, Chubakov V, Sobolevsky AI (2024). Structure-function analyses of human TRPV6 ancestral and derived haplotypes. *Structure* 33, , [10.1016/j.str.2024.10.018](https://doi.org/10.1016/j.str.2024.10.018)
 4. Konshina AG, Bocharov EV, Konvalova EV, Schulga AA, Tolmachev V, Deyev SM, **Efremov RG** (2024). Structural Basis of Activity of HER2-Targeting Construct Composed of DARPIN G3 and Albumin-Binding Domains. *Int J Mol Sci* 25 (21), 11370, [10.3390/ijms252111370](https://doi.org/10.3390/ijms252111370)
 5. Polyansky AA, **Efremov RG** (2024). Lipid-Mediated Adaptation of Proteins and Peptides in Cell Membranes. *Biochem (Mosc) Suppl Ser A Membr Cell Biol* 18 (3), 241–256, [10.1134/S1990747824700235](https://doi.org/10.1134/S1990747824700235)
 6. Veretenenko II, Trofimov YA, Krylov NA, **Efremov RG** (2024). Nanoscale lipid domains determine the dynamic molecular portraits of mixed DOPC/DOPS bilayers in a fluid phase: A computational insight. *BIOCHIM BIOPHYS ACTA* 1866 (7), 184376, [10.1016/j.bbamem.2024.184376](https://doi.org/10.1016/j.bbamem.2024.184376)
 7. Polyansky AA, **Efremov RG** (2024). Transmembrane Domains of Bitopic Proteins as a Key to Understand the Cellular Signaling (A Review). *Russ. J. Bioorganic Chem.* 50 (4), 1202–1214, [10.1134/S1068162024040095](https://doi.org/10.1134/S1068162024040095)
 8. Serebrennikova M, Grafskaya E, Maltsev D, Ivanova K, Bashkirov P, Kornilov F, Volynsky P, **Efremov R**, Bocharov E, Lazarev V (2024). TripleP-CPP: Algorithm for Predicting the Properties of Peptide Sequences. *Int J Mol Sci* 25 (13), 6869, [10.3390/ijms25136869](https://doi.org/10.3390/ijms25136869)
 9. Trofimov YA, Krylov NA, Minakov AS, Nadezhdin KD, Neuberger A, Sobolevsky AI, **Efremov RG** (2024). Dynamic molecular portraits of ion-conducting pores characterize functional states of TRPV channels. *Communications Chemistry* 7 (1), 119, [10.1038/s42004-024-01198-z](https://doi.org/10.1038/s42004-024-01198-z)
 10. Lohan S, Konshina AG, Tiwari RK, **Efremov RG**, Maslennikov I, Parang K (2024). Broad-Spectrum Activity of Membranolytic Cationic Macrocyclic Peptides Against Multi-Drug Resistant Bacteria and Fungi. *Eur J Pharm Sci* 197, 106776, [10.1016/j.ejps.2024.106776](https://doi.org/10.1016/j.ejps.2024.106776)
 11. Polyansky AA, **Efremov RG** (2024). Lipid-Mediated Adaptation of Proteins and Peptides in Cell Membranes. *BIOL MEMBRANE* 41 (5-6), 473–491, [10.31857/S0233475524050093](https://doi.org/10.31857/S0233475524050093)
 12. Karnaukhov VK, Shcherbinin DS, Chugunov AO, Chudakov DM, **Efremov RG**, Zvyagin IV, Shugay M (2024). Structure-based prediction of T cell receptor recognition of unseen epitopes using TCReN. *NAT COMPUT SCI* 4, 510–521, [10.1038/s43588-024-00653-0](https://doi.org/10.1038/s43588-024-00653-0)
 13. El-Mowafi SA, Konshina AG, Mohammed EHM, Krylov NA, **Efremov RG**, Parang K (2023). Structural Analysis and Activity Correlation of Amphiphilic Cyclic Antimicrobial Peptides Derived from the [W4R4] Scaffold. *Molecules* 28 (24), 8049, [10.3390/molecules28248049](https://doi.org/10.3390/molecules28248049)
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 15. Aliper ET, **Efremov RG** (2023). Inconspicuous Yet Indispensable: The Coronavirus Spike Transmembrane Domain. *Int J Mol Sci* 24 (22), 16421, [10.3390/ijms242216421](https://doi.org/10.3390/ijms242216421)
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 17. Chugunov AO, Dvoryakova EA, Dyuzheva MA, Simonyan TR, Tereshchenkova VF, Filippova IY, **Efremov RG**, Elpidina EN (2023). Fighting Celiac Disease: Improvement of pH Stability of Cathepsin L In Vitro by Computational Design. *Int J Mol Sci* 24 (15), 12369, [10.3390/ijms241512369](https://doi.org/10.3390/ijms241512369)
 18. Polyansky AA, Gallego LD, **Efremov RG**, Köhler A, Zagrovic B (2023). Protein compactness and interaction valency define the architecture of a biomolecular condensate across scales. *Elife* 12, , [10.7554/eLife.80038](https://doi.org/10.7554/eLife.80038)
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25. Lohan S, Konshina AG, **Efremov RG**, Maslennikov I, Parang K (2022). Structure-Based Rational Design of Small α -Helical Peptides with Broad-Spectrum Activity against Multidrug-Resistant Pathogens. *J Med Chem* 66 (1), 855–874, [10.1021/acs.jmedchem.2c01708](https://doi.org/10.1021/acs.jmedchem.2c01708)
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29. Aliper ET, Krylov NA, Nolde DE, Polyansky AA, **Efremov RG** (2022). A Uniquely Stable Trimeric Model of SARS-CoV-2 Spike Transmembrane Domain. *Int J Mol Sci* 23 (16), , [10.3390/ijms23169221](https://doi.org/10.3390/ijms23169221)
30. Panina I, Krylov N, Gadalla MR, Aliper E, Kordyukova L, Veit M, Chugunov A, **Efremov R** (2022). Molecular Dynamics of DHC20 Acyltransferase Suggests Principles of Lipid and Protein Substrate Selectivity. *Int J Mol Sci* 23 (9), , [10.3390/ijms23095091](https://doi.org/10.3390/ijms23095091)
31. Dubovskii PV, Dubova KM, Bourenkov G, Starkov VG, Konshina AG, **Efremov RG**, Utkin YN, Samygina VR (2022). Variability in the Spatial Structure of the Central Loop in Cobra Cytotoxins Revealed by X-ray Analysis and Molecular Modeling. *Toxins (Basel)* 14 (2), , [10.3390/toxins14020149](https://doi.org/10.3390/toxins14020149)
32. Volynsky P, Maltseva D, Tabakmakher V, Bocharov EV, Raygorodskaya M, Zakharova G, Britikova E, Tonevitsky A, **Efremov R** (2022). Differences in Medium-Induced Conformational Plasticity Presumably Underlie Different Cytotoxic Activity of Ricin and Viscumin. *Biomolecules* 12 (2), , [10.3390/biom12020295](https://doi.org/10.3390/biom12020295)
33. Lohan S, Mandal D, Choi W, Konshina AG, Tiwari RK, **Efremov RG**, Maslennikov I, Parang K (2022). Small Amphiphilic Peptides: Activity Against a Broad Range of Drug-Resistant Bacteria and Structural Insight into Membranolytic Properties. *J Med Chem* 65 (1), 665–687, [10.1021/acs.jmedchem.1c01782](https://doi.org/10.1021/acs.jmedchem.1c01782)
34. Bocharov EV, Gremer L, Urban AS, Okhrimenko IS, Volynsky PE, Nadezhdin KD, Bocharova OV, Kornilov DA, Zagryadskaya YA, Kamynina AV, Kuzmichev PK, Kutzsche J, Bolakhrif N, Müller-Schiffmann A, Dencher NA, Arseniev AS, **Efremov RG**, Gordeliy VI, Willbold D (2021). All-d-Enantiomeric Peptide D3 Designed for Alzheimer's Disease Treatment Dynamically Interacts with Membrane-Bound Amyloid- β Precursors. *J Med Chem* 64 (22), 16464–16479, [10.1021/acs.jmedchem.1c00632](https://doi.org/10.1021/acs.jmedchem.1c00632)
35. Panina I, Taldaev A, **Efremov R**, Chugunov A (2021). Molecular dynamics insight into the lipid ii recognition by type a lantibiotics: Nisin, epidermin, and gallidermin. *Micromachines (Basel)* 12 (10), , [10.3390/mi12101169](https://doi.org/10.3390/mi12101169)
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37. Chernykh MA, Kuldyushev NA, Peigneur S, Berkut AA, Tytgat J, **Efremov RG**, Vassilevski AA, Chugunov AO

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38. Tabakmakher VM, Gigolaev AM, Peigneur S, Krylov NA, Tytgat J, Chugunov AO, Vassilevski AA, **Efremov RG** (2021). Potassium channel blocker crafted by α -hairpinin scaffold engineering. *Biophys J* 120 (12), 2471–2481, [10.1016/j.bpj.2021.04.020](https://doi.org/10.1016/j.bpj.2021.04.020)
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 41. Krylov NA, **Efremov RG** (2021). libxtc: an efficient library for reading XTC-compressed MD trajectory data. *BMC Res Notes* 14 (1), 124, [10.1186/s13104-021-05536-5](https://doi.org/10.1186/s13104-021-05536-5)
 42. Konshina AG, Dubovskii PV, **Efremov RG** (2021). Stepwise Insertion of Cobra Cardiotoxin CT2 into a Lipid Bilayer Occurs as an Interplay of Protein and Membrane “Dynamic Molecular Portraits”. *J Chem Inf Model* 61 (1), 385–399, [10.1021/acs.jcim.0c01137](https://doi.org/10.1021/acs.jcim.0c01137)
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