

Резюме: Ефремов Роман Гербертович



Адрес

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

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

Профессор

Доктор наук (Физико-математические науки, 03.00.02 — Биофизика)

Гранты и проекты

- | | |
|-------------------|--|
| 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

- 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](#)
- Konshina AG, Bocharov EV, Konovalova 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](#)
- 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](#)
- 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](#)
- 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](#)
- Serebrennikova M, Gafskaja 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](#)
- 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](#)
- 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)

9. 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)
10. 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)
11. Mikhnovets IE, Holoubek J, Panina IS, Kotouček J, Gvozdev DA, Chumakov SP, Krasilnikov MS, Zhitlov MY, Gulyak EL, Chistov AA, Nikitin TD, Korshun VA, **Efremov RG**, Alferova VA, Růžek D, Eyer L, Ustinov AV (2023). Alkyl Derivatives of Perylene Photosensitizing Antivirals: Towards Understanding the Influence of Lipophilicity. *Int J Mol Sci* 24 (22), 16483, [10.3390/ijms242216483](https://doi.org/10.3390/ijms242216483)
12. 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)
13. Neuberger A, Trofimov YA, Yelshanskaya MV, Khau J, Nadezhdin KD, Khosrof LS, Krylov NA, **Efremov RG**, Sobolevsky AI (2023). Molecular pathway and structural mechanism of human oncochannel TRPV6 inhibition by the phytocannabinoid tetrahydrocannabivarin. *Nat Commun* 14 (1), 4630, [10.1038/s41467-023-40362-2](https://doi.org/10.1038/s41467-023-40362-2)
14. 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)
15. 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)
16. Neuberger A, Trofimov YA, Yelshanskaya MV, Nadezhdin KD, Krylov NA, **Efremov RG**, Sobolevsky AI (2023). Structural mechanism of human oncochannel TRPV6 inhibition by the natural phytoestrogen genistein. *Nat Commun* 14 (1), 2659, [10.1038/s41467-023-38352-5](https://doi.org/10.1038/s41467-023-38352-5)
17. Goryacheva E, **Efremov R**, Krylov N, Artemyev I, Bogdanov A, Mamontova A, Pletnev S, Pletneva N, Pletnev V (2023). Crystal Structure of Bright Fluorescent Protein BrUSLEE with Subnanosecond Fluorescence Lifetime; Electric and Dynamic Properties. *Int J Mol Sci* 24 (7), 6403, [10.3390/ijms24076403](https://doi.org/10.3390/ijms24076403)
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22. 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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- gated potassium channel isoform KV1.6. *J Biol Chem* 298 (11), 102467, [10.1016/j.jbc.2022.102467](https://doi.org/10.1016/j.jbc.2022.102467)
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 34. Chernykh MA, Kuldyushev NA, Peigneur S, Berkut AA, Tytgat J, **Efremov RG**, Vassilevski AA, Chugunov AO (2021). Derivative of Scorpion Neurotoxin BeM9 Is Selective for Insect Voltage-Gated Sodium Channels. *Russ. J. Bioorganic Chem.* 47 (4), 854–863, [10.1134/S1068162021040063](https://doi.org/10.1134/S1068162021040063)
 35. 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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 37. Tabakmakher VM, Kuzmenkov AI, Gigolaev AM, Pinheiro-Junior EL, Peigneur S, **Efremov RG**, Tytgat J, Vassilevski AA (2021). Artificial Peptide Ligand of Potassium Channel KV1.1 with High Selectivity. *J Evol Biochem Physiol* 57, 386–403, [10.1134/S0022093021020186](https://doi.org/10.1134/S0022093021020186)
 38. 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)
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- receptors: Structures and possible role in activation. *BIOCHIM BIOPHYS ACTA* 1862 (11), 183417, [10.1016/j.bbamem.2020.183417](https://doi.org/10.1016/j.bbamem.2020.183417)
43. Sosorev A, Dominskiy D, Chernyshov I, **Efremov R** (2020). Tuning of Molecular Electrostatic Potential Enables Efficient Charge Transport in Crystalline Azaacenes: A Computational Study. *Int J Mol Sci* 21 (16), 1–18, [10.3390/ijms21165654](https://doi.org/10.3390/ijms21165654)
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 45. Gigolaev AM, Kuzmenkov AI, Peigneur S, Tabakmakher VM, Pinheiro-Junior EL, Chugunov AO, **Efremov RG**, Tytgat J, Vassilevski AA (2020). Tuning Scorpion Toxin Selectivity: Switching From KV1.1 to KV1.3. *Front Pharmacol* 11, 1010, [10.3389/fphar.2020.01010](https://doi.org/10.3389/fphar.2020.01010)
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