

## Резюме: Бочаров Эдуард Валерьевич



### Адрес

Федеральное государственное  
бюджетное учреждение науки  
Институт биоорганической химии им.  
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### Контакты

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### Образование

1993–1997	Москва	аспирантура ИБХ РАН
1987–1993	Долгопрудный	ФФХБ МФТИ

### Работа

2002–наст.вр.	Москва	ИБХ РАН	старший научный сотрудник
1999–2002	Москва	ИБХ РАН	научный сотрудник

### Работа в ИБХ

2002–наст.вр.	Старший научный сотрудник
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### Навыки

Методы гетероядерной ЯМР-спектроскопии высокого разрешения и молекулярного моделирования для исследования структуры и динамики низкомолекулярных соединений и биологических макромолекул.

### Владение языками

русский, английский, немецкий

### Научные интересы

Научные интересы относятся к области структурно-динамических исследований белков и их комплексов с биомолекулами (липидами, ДНК, РНК и т.д.) методами гетероядерной ЯМР-спектроскопии высокого разрешения в интеграции с другими методами структурной биологии и биофизики. Разработка новых методик ЯМР-спектроскопии для изучения подвижных белковых комплексов.

Основные работы посвящены исследованиям молекулярных механизмов биологической активности мембранных и мембраноактивных белков в норме и при патогенезе различных заболеваний человека (в том числе, онкологических и нейродегенеративных). В последние годы основные исследования направлены на установление биофизических принципов проведения сигнала рецепторами через мембрану клетки, а также функционирования мембранных белков в макромолекулярных комплексах. Особое внимание уделяется изучению аллостерических конформационных перестроек, белок-белковых и белок-липидных взаимодействий компонент цитохром Р450-зависимых систем, рецепторных тирозинкиназ (РТК) и РТК-подобных рецепторов, белка-предшественника  $\beta$ -амилоида (мутации в которых связаны с онкогенезом и болезнью Альцгеймера) для разработки перспективных лекарственных соединений. В то же время, часть работ направлена на исследования структурно-динамических свойств растворимых белков и их комплексов, в том числе рибосомных белков, цитокинов, цитохромов, гистонотипных НУ-белков из патогенных бактерий, пептидных и белковых токсинов из растений и животных.

Реализация научных Проектов в качестве Руководителя:

- 2001 г., РФФИ 01-04-48651-а и 01-04-06130-мас по теме «Пространственная структура и динамика рибосомного белка L7/L12 из Escherichia coli в растворе»;
- 2001-2002 г.г., РФФИ 01-04-06130-мас и 02-04-06650-мас «Исследование фемто-микросекундной внутримолекулярной динамики белков с использованием новых методов гетероядерной спектроскопии ЯМР»;
- 2003 г., РФФИ 03-04-06408-мас «Исследование взаимосвязи пространственной структуры и внутримолекулярной подвижности биологически активных полипептидов с их функцией»;
- 2003-2005 г.г., РФФИ 03-04-49011-а «Учет конформационной подвижности при описании электростатических взаимодействий в белках с помощью новых методов гетероядерной спектроскопии ЯМР и молекулярной динамики»;
- 2006-2008 г.г., РФФИ 06-04-49740-а «Структурно-динамические исследования трансмембранных доменов рецепторных протеинкиназ современными методами гетероядерной спектроскопии ЯМР и молекулярной динамики»;
- 2009-2011 г.г., РФФИ 09-04-00551-а «Структурно-динамический анализ специфических взаимодействий трансмембранных доменов рецепторных тирозинкиназ в норме и патологии»;
- 2012-2014 г.г., РФФИ 12-04-01816-а «Структурные, кинетические и термодинамические аспекты специфических взаимодействий трансмембранных доменов рецепторных тирозинкиназ в норме и патологии»;
- 2015-2017 г.г., РФФИ 15-04-07983-а «Установление молекулярных механизмов влияния патогенных мутаций в трансмембранных доменах на активность рецепторных тирозинкиназ»;
- 2018-2020 г.г., РФФИ 18-04-01289-а «Структурные аспекты воздействия онкогенных мутаций в трансмембранных доменах рецепторных тирозинкиназ на проведение сигнала через мембрану клетки»;
- 2020-2022 г.г., РФФИ 20-54-00041-Бел-а «Анализ взаимодействия мембран-связанных компонентов цитохром Р450-зависимых систем человека с использованием методов интегративной структурной биологии»;
- 2020-2022 г.г., РФФИ 20-64-46027 «Структурно-динамические исследования внутри- и межмолекулярных взаимодействий амилоидогенных пептидов и их предшественников для установления молекулярных механизмов патогенеза и разработки таргетных методов терапии нейродегенеративных заболеваний»;
- 2023-2025 г.г., РФФИ 23-44-10021 (международный, совместно с БРФФИ) «Конформационная динамика в образовании и функционировании биомакромолекулярных комплексов для биомедицинских и фармацевтических разработок».

## Членство в сообществах

Российское общество Биохимиков и Молекулярных Биологов, Biophysical society, FEBS.

## Степени и звания

2024	Доктор наук (Физико-математические науки, 1.5.2. — Биофизика)
1998	Кандидат наук (Химические науки, 02.00.10 — Биоорганическая химия)

## Ссылки и контакты

ResearcherID: [R-5231-2016](#), Scopus: [7004085574](#), ORCID: [0000-0002-3635-1609](#)

## Гранты и проекты

2023– наст.вр.	<a href="#">Конформационная динамика в образовании и функционировании биомакромолекулярных комплексов для биомедицинских и фармацевтических разработок</a>
2020– 2023	<a href="#">Бел: Анализ взаимодействия мембран-связанных компонентов цитохром Р450-зависимых систем человека с использованием методов интегративной структурной биологии</a>
2018–	<a href="#">Структурные аспекты воздействия онкогенных мутаций в трансмембранных доменах</a>

2020	<a href="#">рецепторных тирозинкиназ на проведение сигнала через мембрану клетки</a>
2019– 2022	<a href="#">Структурная биология мембранных белков для создания новых лекарственных и диагностических средств</a>
2014– 2018	<a href="#">Структурные основы молекулярных механизмов передачи сигнала интегральными мембранными белками I типа</a>

## Публикации

1. Bedanokova DR, Goncharuk MV, Shabalkina AV, Lushpa VA, Arseniev AS, **Bocharov EV**, Mineev KS, Goncharuk SA (2024). Production and Refolding of the Ligand-Binding Domain of TrkA Receptor with the Extracellular Juxtamembrane Region. *Russ. J. Bioorganic Chem.* 50 (6), , [10.1134/S1068162024060232](#)
2. Motov VV, Kot EF, Kislova SO, **Bocharov EV**, Arseniev AS, Boldyrev IA, Goncharuk SA, Mineev KS (2024). On the Properties of Styrene–Maleic Acid Copolymer–Lipid Nanoparticles: A Solution NMR Perspective. *Polymers (Basel)* 16 (21), 3009, [10.3390/polym16213009](#)
3. 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](#)
4. Lushpa VA, Goncharuk MV, Talyzina IA, Arseniev AS, **Bocharov EV**, Mineev KS, Goncharuk SA (2024). TIR domains of TLR family-from the cell culture to the protein sample for structural studies. *PLoS One* 19 (7), e0304997, [10.1371/journal.pone.0304997](#)
5. Serebrennikova M, Grafskaya E, Maltsev D, Ivanova K, Bashkurov P, Kornilov F, Volynsky P, Efremov R, **Bocharov E**, Lazarev V (2024). TriPEP-CPP: Algorithm for Predicting the Properties of Peptide Sequences. *Int J Mol Sci* 25 (13), 6869, [10.3390/ijms25136869](#)
6. Smirnova EV, Timofeev VI, Rakitina TV, Petrenko DE, Elmeeva OS, Saratov GA, Kudriaeva AA, **Bocharov EV**, Belogurov AA (2024). Myelin Basic Protein Attenuates Furin-Mediated Bri2 Cleavage and Postpones Its Membrane Trafficking. *Int J Mol Sci* 25 (5), 2608, [10.3390/ijms25052608](#)
7. Pham DD, Pham TH, Bui TH, Britikova EV, Britikov VV, **Bocharov EV**, Usanov SA, Phan VC, Le TBT (2024). In vitro and in vivo anti-tumor effect of Trichobakin fused with urokinase-type plasminogen activator ATF-TBK. *Mol Biol Rep* 51 (1), 130, [10.1007/s11033-023-09036-6](#)
8. Петухов МВ, Ракитина ТВ, Агапова ЮК, Петренко ДЕ, Конарев ПВ, Бритиков ВВ, Бритикова ЕВ, **Бочаров ЭВ**, Штыкова ЭВ (2023). СРАВНИТЕЛЬНОЕ СТРУКТУРНОЕ ИССЛЕДОВАНИЕ ГИСТОНОПОДОБНЫХ БЕЛКОВ НУ МЕТОДОМ МАЛОУГЛОВОГО РЕНТГЕНОВСКОГО РАССЕЯНИЯ. *Кристаллография* 68 (6), 914–921, [10.31857/S0023476123600143](#)
9. Petoukhov MV, Rakitina TV, Agapova YK, Petrenko DE, Konarev PV, Britikov VV, Britikova EV, **Bocharov EV**, Shtykova EV (2023). Comparative Structural Investigation of Histone-Like HU Proteins by Small-Angle X-ray Scattering. *Cryst. Rep* 68 (6), 912–919, [10.1134/S1063774523600953](#)
10. Goncharuk MV, Vasileva EV, Ananiev EA, Gorokhovatsky AY, **Bocharov EV**, Mineev KS, Goncharuk SA (2023). Facade-Based Bicelles as a New Tool for Production of Active Membrane Proteins in a Cell-Free System. *Int J Mol Sci* 24 (19), , [10.3390/ijms241914864](#)
11. Krasnobaev VD, Bershatsky YV, Bocharova OV, **Bocharov EV**, Batishchev OV (2023). Amyloid Precursor Protein Changes Arrangement in a Membrane and Its Structure Depending on the Cholesterol Content. *Membranes (Basel)* 13 (8), , [10.3390/membranes13080706](#)
12. Semenova MA, Bochkova ZV, Smirnova OM, Ignatova AA, Parshina EY, Ziganshin RH, **Bocharov EV**, Brazhe NA, Maksimov GV, Kirpichnikov MP, Dolgikh DA, Chertkova RV (2023). Development of a System for Biosynthesis, Isolation and Purification of the Holoform of Recombinant Human Neuroglobin and Its Characteristics. *Russ. J. Bioorganic Chem.* 49 (3), 550–561, [10.1134/S1068162023030196](#)
13. Bozin T, Berdyshev I, Chukhontseva K, Karaseva M, Konarev P, Varizhuk A, Lesovoy D, Arseniev A, Kostrov S, **Bocharov E**, Demidyuk I (2023). NMR structure of emfourin, a novel protein metalloprotease inhibitor: insights into the mechanism of action. *J Biol Chem* 299 (4), 104585, [10.1016/j.jbc.2023.104585](#)
14. Bershatsky YV, Kuznetsov AS, Idiatullina AR, Bocharova OV, Dolotova SM, Gavrilenkova AA, Serova OV, Deyev IE, Rakitina TV, Zangieva OT, Pavlov KV, Batishchev OV, Britikov VV, Usanov SA, Arseniev AS,

- Efremov RG, **Bocharov EV** (2023). Diversity of Structural, Dynamic, and Environmental Effects Explain a Distinctive Functional Role of Transmembrane Domains in the Insulin Receptor Subfamily. *Int J Mol Sci* 24 (4), , [10.3390/ijms24043906](https://doi.org/10.3390/ijms24043906)
15. Petrenko DE, Karlinsky DM, Gordeeva VD, Arapidi GP, Britikova EV, Britikov VV, Nikolaeva AY, Boyko KM, Timofeev VI, Kuranova IP, Mikhailova AG, **Bocharov EV**, Rakitina TV (2023). Crystal Structure of Inhibitor-Bound Bacterial Oligopeptidase B in the Closed State: Similarity and Difference between Protozoan and Bacterial Enzymes. *Int J Mol Sci* 24 (3), 2286, [10.3390/ijms24032286](https://doi.org/10.3390/ijms24032286)
  16. Gaponov YA, Timofeev VI, Agapova YK, **Bocharov EV**, Shtykova EV, Rakitina TV (2022). Comparative structural analysis of a histone-like protein from *Spiroplasma melliferum* in the crystalline state and in solution. *MENDELEEV COMMUN* 32 (6), 742–744, [10.1016/j.mencom.2022.11.011](https://doi.org/10.1016/j.mencom.2022.11.011)
  17. Britikov VV, **Bocharov EV**, Britikova EV, Dergousova NI, Kulikova OG, Solovieva AY, Shipkov NS, Varfolomeeva LA, Tikhonova TV, Timofeev VI, Shtykova EV, Altukhov DA, Usanov SA, Arseniev AS, Rakitina TV, Popov VO (2022). Unusual Cytochrome c552 from *Thioalkalivibrio paradoxus*: Solution NMR Structure and Interaction with Thiocyanate Dehydrogenase. *Int J Mol Sci* 23 (17), , [10.3390/ijms23179969](https://doi.org/10.3390/ijms23179969)
  18. Britikov VV, Britikova EV, **Bocharov EV**, Bershatsky YV, Kuzmina NV, Boyko KM, Usanov SA (2022). PHYSICAL AND CHEMICAL PROPERTIES OF  $\Delta 3-12$  CYSTEINE-DEPLETED CYTOCHROME P450 3A4 WITH AMINO ACID SUBSTITUTION OF S291C. *DNASB* , , [10.29235/1561-8323-2022-66-2-176-186](https://doi.org/10.29235/1561-8323-2022-66-2-176-186)
  19. 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)
  20. **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- $\beta$  Precursors. *J Med Chem* 64 (22), 16464–16479, [10.1021/acs.jmedchem.1c00632](https://doi.org/10.1021/acs.jmedchem.1c00632)
  21. Urban AS, Bershatskii YV, Pavlov KV, **Bocharov EV** (2021). Structural Study of Membrane Glycoprotein-Precursor of  $\beta$ -Amyloid and Proteins Involved in Its Proteolysis. *Cryst. Rep* 66 (5), 737–750, [10.1134/S1063774521050229](https://doi.org/10.1134/S1063774521050229)
  22. Lesovoy DM, Georgoulia PS, Diercks T, Matečko-Burmann I, Burmann BM, **Bocharov EV**, Bermel W, Orekhov VY (2021). Unambiguous tracking of protein phosphorylation by fast high-resolution FOSY NMR. *Angew Chem Int Ed Engl* 60 (44), 23540–23544, [10.1002/anie.202102758](https://doi.org/10.1002/anie.202102758)
  23. Bozin TN, Chukhontseva KN, Lesovoy DM, Filatov VV, Kozlovskiy VI, Demidyuk IV, **Bocharov EV** (2021). NMR assignments and secondary structure distribution of emfourin, a novel proteinaceous protease inhibitor. *Biomol NMR Assign* 15 (2), 361–366, [10.1007/s12104-021-10030-x](https://doi.org/10.1007/s12104-021-10030-x)
  24. Urban AS, Pavlov KV, Kamynina AV, Okhrimenko IS, Arseniev AS, **Bocharov EV** (2021). Structural Studies Providing Insights into Production and Conformational Behavior of Amyloid- $\beta$  Peptide Associated with Alzheimer's Disease Development. *Molecules* 26 (10), , [10.3390/molecules26102897](https://doi.org/10.3390/molecules26102897)
  25. Batishchev OV, Kuzmina NV, Mozhaev AA, Goryashchenko AS, Milesheva ED, Orsa AN, **Bocharov EV**, Deyev IE, Petrenko AG (2021). Activity-dependent conformational transitions of the insulin receptor-related receptor. *J Biol Chem* 296, 100534, [10.1016/j.jbc.2021.100534](https://doi.org/10.1016/j.jbc.2021.100534)
  26. Dadayan AK, Borisov YA, Zolotarev YA, **Bocharov EV**, Nagaev IY, Myasoedov NF (2021). Solid-State Catalytic Hydrogen/Deuterium Exchange in Mexidol. *RUSS J PHYS CH* 95 (2), 273–278, [10.1134/S0036024421020096](https://doi.org/10.1134/S0036024421020096)
  27. Albrecht C, Kuznetsov AS, Appert-Collin A, Dhaideh Z, Callewaert M, Bershatsky YV, Urban AS, **Bocharov EV**, Bagnard D, Baud S, Blaise S, Romier-Crouzet B, Efremov RG, Dauchez M, Duca L, Gueroult M, Maurice P, Bennisroune A (2020). Transmembrane Peptides as a New Strategy to Inhibit Neuraminidase-1 Activation. *Front Cell Dev Biol* 8, 611121, [10.3389/fcell.2020.611121](https://doi.org/10.3389/fcell.2020.611121)
  28. Kuznetsov AS, Zamaletdinov MF, Bershatsky YV, Urban AS, Bocharova OV, Bennisroune A, Maurice P, **Bocharov EV**, Efremov RG (2020). Dimeric states of transmembrane domains of insulin and IGF-1R 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)
  29. Agapova YK, Altukhov DA, Timofeev VI, Stroylov VS, Mityanov VS, Korzhenevskiy DA, Vlaskina AV,

- Smirnova EV, **Bocharov EV**, Rakitina TV (2020). Structure-based inhibitors targeting the alpha-helical domain of the *Spiroplasma melliferum* histone-like HU protein. *Sci Rep* 10 (1), 15128, [10.1038/s41598-020-72113-4](https://doi.org/10.1038/s41598-020-72113-4)
30. Britikov VV, Britikova EV, Urban AS, Lesovoy DM, Le TBT, Van Phan C, Usanov SA, Arseniev AS, **Bocharov EV** (2019). Backbone and side-chain chemical shift assignments for the ribosome-inactivating protein trichobakin (TBK). *Biomol NMR Assign* 14 (1), 55–61, [10.1007/s12104-019-09920-y](https://doi.org/10.1007/s12104-019-09920-y)
  31. Shtykova EV, Petoukhov MV, Mozhaev AA, Deyev IE, Dadinova LA, Loshkarev NA, Goryashchenko AS, **Bocharov EV**, Jeffries CM, Svergun DI, Batishchev OV, Petrenko AG (2019). The dimeric ectodomain of the alkali-sensing insulin receptor-related receptor (ectoIRR) has a drop-like shape. *J Biol Chem* 294 (47), 17790–17798, [10.1074/jbc.RA119.010390](https://doi.org/10.1074/jbc.RA119.010390)
  32. Dadayan AK, Borisov YA, **Bocharov EV**, Zolotarev YA, Nagaev IY, Myasoedov NF (2019). Solid-State Catalytic Isotope Exchange of Hydrogen for Deuterium in Cyclopropylglycine. *DOKL PHYS CHEM* 484 (1), 15–19, [10.1134/S0012501619010056](https://doi.org/10.1134/S0012501619010056)
  33. **Bocharov EV**, Nadezhdin KD, Urban AS, Volynsky PE, Pavlov KV, Efremov RG, Arseniev AS, Bocharova OV (2019). Familial L723P Mutation Can Shift the Distribution between the Alternative APP Transmembrane Domain Cleavage Cascades by Local Unfolding of the  $\eta$ -Cleavage Site Suggesting a Straightforward Mechanism of Alzheimer's Disease Pathogenesis. *ACS Chem Biol* 14 (7), 1573–1582, [10.1021/acschembio.9b00309](https://doi.org/10.1021/acschembio.9b00309)
  34. Lesovoy DM, Dubinnyi MA, Nolde SB, **Bocharov EV**, Arseniev AS (2019). Accurate measurement of dipole/dipole transverse cross-correlated relaxation  $\Gamma_2$  in methylenes and primary amines of uniformly  $^{13}\text{C}/^{15}\text{N}$ -labeled proteins. *J Biomol NMR* 73 (5), 245–260, [10.1007/s10858-019-00252-6](https://doi.org/10.1007/s10858-019-00252-6)
  35. Babailov SP, Zapolotsky EN, Kruppa AI, Stabnikov PA, Godovikov IA, **Bocharov EV**, Fomin ES (2019). Two types of conformational dynamics and thermo-sensor properties of praseodymium-DOTA by  $^1\text{H}/^{13}\text{C}$  NMR. *Inorganica Chim Acta* 486, 340–344, [10.1016/j.ica.2018.10.044](https://doi.org/10.1016/j.ica.2018.10.044)
  36. Polyansky AA, **Bocharov EV**, Velghe AI, Kuznetsov AS, Bocharova OV, Urban AS, Arseniev AS, Zagrovic B, Demoulin JB, Efremov RG (2019). Atomistic mechanism of the constitutive activation of PDGFRA via its transmembrane domain. *BIOCHIM BIOPHYS ACTA* 1863 (1), 82–95, [10.1016/j.bbagen.2018.09.011](https://doi.org/10.1016/j.bbagen.2018.09.011)
  37. (конференция) Lesovoy DM, Nolde SB, Dubinnyi MA, **Bocharov EV**, Mineev KS, Arseniev AS (2018). Assortment and optimization of NMR relaxation techniques for  $^{13}\text{CH}_2$ ,  $^{13}\text{CH}_3$  and  $^{15}\text{NH}_2$  groups of the protein side chains. *XXVIIIth International conference on Magnetic Resonance in Biological Systems, University College Dublin, Ireland*, 169–170.
  38. **Bocharov EV**, Pavlov KV (2018). Lipid-mediated mechanisms in protein functioning. *Tsitologiya* 60 (7), 510–518, [10.31116/tsitol.2018.07.04](https://doi.org/10.31116/tsitol.2018.07.04)
  39. **Bocharov EV**, Lesovoy DM, Bocharova OV, Urban AS, Pavlov KV, Volynsky PE, Efremov RG, Arseniev AS (2018). Structural basis of the signal transduction via transmembrane domain of the human growth hormone receptor. *BIOCHIM BIOPHYS ACTA* 1862 (6), 1410–1420, [10.1016/j.bbagen.2018.03.022](https://doi.org/10.1016/j.bbagen.2018.03.022)
  40. Timofeev VI, Altukhov DA, Talyzina AA, Agapova YK, Vlaskina AV, Korzhenevskiy DA, Kleymenov SY, **Bocharov EV**, Rakitina TV (2018). Structural plasticity and thermal stability of the histone-like protein from *Spiroplasma melliferum* are due to phenylalanine insertions into the conservative scaffold. *J Biomol Struct Dyn* 36 (16), 1–13, [10.1080/07391102.2017.1417162](https://doi.org/10.1080/07391102.2017.1417162)
  41. (книга) Pavlov KV, Akimov SA, Batishchev OV, Chekashkina KV, Bashkirov PV, **Bocharov EV** (2018). Protein-lipid interplay in vital biological functions. , 133–199.
  42. Lesovoy DM, Mineev KS, Bragin PE, Bocharova OV, **Bocharov EV**, Arseniev AS (2017). NMR relaxation parameters of methyl groups as a tool to map the interfaces of helix–helix interactions in membrane proteins. *J Biomol NMR* 69 (3), 165–179, [10.1007/s10858-017-0146-1](https://doi.org/10.1007/s10858-017-0146-1)
  43. **Bocharov EV** (2017). Alternative dimerization of receptor tyrosine kinases with signal transduction through a cellular membrane. *Russ. J. Bioorganic Chem.* 43 (5), 477–486, [10.1134/S1068162017050041](https://doi.org/10.1134/S1068162017050041)
  44. **Bocharov EV**, Sharonov GV, Bocharova OV, Pavlov KV (2017). Conformational transitions and interactions underlying the function of membrane embedded receptor protein kinases. *BIOCHIM BIOPHYS ACTA* 1859 (9), 1417–1429, [10.1016/j.bbamem.2017.01.025](https://doi.org/10.1016/j.bbamem.2017.01.025)
  45. **Bocharov EV**, Mineev KS, Pavlov KV, Akimov SA, Kuznetsov AS, Efremov RG, Arseniev AS (2017). Helix–helix interactions in membrane domains of bitopic proteins: Specificity and role of lipid environment. *BIOCHIM*



*BIOPHYS ACTA* 1859 (4), 561–576, [10.1016/j.bbamem.2016.10.024](https://doi.org/10.1016/j.bbamem.2016.10.024)

46. **Bocharov EV**, Bragin PE, Pavlov KV, Bocharova OV, Mineev KS, Polyansky AA, Volynsky PE, Efremov RG, Arseniev AS (2017). The Conformation of the Epidermal Growth Factor Receptor Transmembrane Domain Dimer Dynamically Adapts to the Local Membrane Environment. *Biochemistry* 56 (12), 1697–1705, [10.1021/acs.biochem.6b01085](https://doi.org/10.1021/acs.biochem.6b01085)
47. Ou SHI, Schrock AB, **Bocharov EV**, Klempner SJ, Haddad CK, Steinecker G, Johnson M, Gitlitz BJ, Chung J, Campreggher PV, Ross JS, Stephens PJ, Miller VA, Suh JH, Ali SM, Velcheti V (2017). HER2 Transmembrane Domain (TMD) Mutations (V659/G660) That Stabilize Homo- and Heterodimerization Are Rare Oncogenic Drivers in Lung Adenocarcinoma That Respond to Afatinib. *J Thorac Oncol* 12 (3), 446–457, [10.1016/j.jtho.2016.11.2224](https://doi.org/10.1016/j.jtho.2016.11.2224)
48. Maurice P, Baud S, Bocharova OV, **Bocharov EV**, Kuznetsov AS, Kawecki C, Bocquet O, Romier B, Gorisse L, Ghirardi M, Duca L, Blaise S, Martiny L, Dauchez M, Efremov RG, Debelle L (2016). New Insights into Molecular Organization of Human Neuraminidase-1: Transmembrane Topology and Dimerization Ability. *Sci Rep* 6, 38363, [10.1038/srep38363](https://doi.org/10.1038/srep38363)
49. Altukhov DA, Talyzina AA, Agapova YK, Vlaskina AV, Korzhenevskiy DA, **Bocharov EV**, Rakitina TV, Timofeev VI, Popov VO (2016). Enhanced conformational flexibility of the histone-like (HU) protein from *Mycoplasma gallisepticum*. *J Biomol Struct Dyn* 36 (1), 45–53, [10.1080/07391102.2016.1264893](https://doi.org/10.1080/07391102.2016.1264893)
50. Ou SHI, Schrock AB, **Bocharov EV**, Klempner SJ, Haddad CK, Steinecker G, Johnson M, Gitlitz B, Chung J, Campreggher P, Ross JS, Stephens PJ, Miller VA, Suh J, Ali SM, Velcheti V (2016). HER2 V659 and G660 transmembrane mutations that stabilize homo- and hetero-dimerization are rare oncogenic drivers in lung adenocarcinoma that are clinically responsive to afatinib. *Ann Oncol* 27, vi439, [10.1093/annonc/mdw383.67](https://doi.org/10.1093/annonc/mdw383.67)
51. (конференция) Lesovoy DM, **Bocharov EV**, Volynsky PE, Mineev KS, Bragin PE, Bocharova OV, Arseniev AS (2016). Methyl 13C relaxation as a sensor of intra- and inter-molecular interactions of membrane proteins. *XXVIIth International conference on Magnetic Resonance in Biological Systems, Kyoto, Japan*, 196.
52. Bocharova OV, Urban AS, Nadezhdin KD, **Bocharov EV**, Arseniev AS (2016). Cell-free expression of the APP transmembrane fragments with Alzheimer's disease mutations using algal amino acid mixture for structural NMR studies. *Protein Expr Purif* 123, 105–111, [10.1016/j.pep.2016.04.004](https://doi.org/10.1016/j.pep.2016.04.004)
53. Altukhov DA, Agapova YK, Vlaskina AV, Korzhenevskiy DA, Nikolaeva AY, Frank-Kamenetskaya AM, **Bocharov EV**, Rakitina TV (2016). Preparation of the recombinant HU-proteins from *S. melliferum* and *M. gallisepticum* and of their complexes with DS-DNA for structural NMR experiments. *Moscow University Chemistry Bulletin* 71 (4), 221–226, [10.3103/S0027131416040027](https://doi.org/10.3103/S0027131416040027)
54. **Bocharov EV**, Lesovoy DM, Pavlov KV, Pustovalova YE, Bocharova OV, Arseniev AS (2016). Alternative packing of EGFR transmembrane domain suggests that protein-lipid interactions underlie signal conduction across membrane. *BIOCHIM BIOPHYS ACTA* 1858 (6), 1254–1261, [10.1016/j.bbamem.2016.02.023](https://doi.org/10.1016/j.bbamem.2016.02.023)
55. Bocharova OV, Bragin PE, **Bocharov EV**, Mineev KS, Goncharuk SA, Arseniev AS (2016). Cell-free expression and purification of the fragments of the receptor tyrosine kinases of the EGFR family, containing the transmembrane domain with the juxtamembrane region, for structural studies. *Biochem (Mosc) Suppl Ser A Membr Cell Biol* 10 (2), 142–149, [10.1134/S1990747816020045](https://doi.org/10.1134/S1990747816020045)
56. Bragin PE, Mineev KS, Bocharova OV, Volynsky PE, **Bocharov EV**, Arseniev AS (2016). HER2 Transmembrane Domain Dimerization Coupled with Self-Association of Membrane-Embedded Cytoplasmic Juxtamembrane Regions. *J Mol Biol* 428 (1), 52–61, [10.1016/j.jmb.2015.11.007](https://doi.org/10.1016/j.jmb.2015.11.007)
57. Bocharova OV, Bragin PE, **Bocharov EV**, Mineev KS, Goncharuk SA, Arseniev AS (2016). Cell Free expression and purification of the fragments of the receptor tyrosine kinases of the EGFR Family, containing the transmembrane domain with the juxtamembrane region, for structural studies. *BIOL MEMBRANY* 33 (2), 124–132, [10.7868/S0233475516020043](https://doi.org/10.7868/S0233475516020043)
58. Mikov AN, Fedorova IM, Potapieva NN, Maleeva EE, Andreev YA, Zaitsev AV, Kim KK, **Bocharov EV**, Bozin TN, Altukhov DA, Lipkin AV, Kozlov SA, Tikhonov DB, Grishin EV (2015). ω-Tbo-IT1-New Inhibitor of Insect Calcium Channels Isolated from Spider Venom. *Sci Rep* 5, 17232, [10.1038/srep17232](https://doi.org/10.1038/srep17232)
59. Zolotarev A, Dadayan AK, Kost NV, Voevodina ME, Sokolov OY, Kozik VS, Shram SI, Azev VN, **Bocharov EV**, Bogachouk AP, Lipkin VM, Myasoedov NF (2015). The Qualitative Analysis of the Amide Derivative of HLDF-6 Peptide and Its Metabolites with the Use of Tritium- and Deuterium-Labeled Derivatives. *Bioorg Khim* 41 (6), 644–656, [10.7868/s0132342315060202](https://doi.org/10.7868/s0132342315060202)

60. Bocharova OV, Kuzmichev PK, Urban AS, Goncharuk SA, **Bocharov EV**, Arsenyev AS (2015). Preparation of growth hormone receptor GHR-(254-298) transmembrane fragments in a cell-free expression system for structural studies. *Russ. J. Bioorganic Chem.* 41 (6), 631–637, [10.1134/S1068162015060047](https://doi.org/10.1134/S1068162015060047)
61. Zolotarev YA, Dadayan AK, Kost NV, Voevodina ME, Sokolov OY, Kozik VS, Shram SI, Azev VN, **Bocharov EV**, Bogachouk AP, Lipkin VM, Myasoedov NF (2015). The qualitative analysis of the amide of the HLDF-6 peptide and its metabolites in tissues of laboratory animals with the use of tritium-labeled and deuterium-labeled derivatives. *Russ. J. Bioorganic Chem.* 41 (6), 578–589, [10.1134/S1068162015060205](https://doi.org/10.1134/S1068162015060205)
62. Mineev KS, Panova SV, Bocharova OV, **Bocharov EV**, Arseniev AS (2015). The Membrane Mimetic Affects the Spatial Structure and Mobility of EGFR Transmembrane and Juxtamembrane Domains. *Biochemistry* 54 (41), 6295–6298, [10.1021/acs.biochem.5b00851](https://doi.org/10.1021/acs.biochem.5b00851)
63. (конференция) Lesovoy DM, Nolde SB, **Bocharov EV**, Dubinnyi MA, Arseniev AS (2015). Graphical interpretation of side-chain  $^{13}\text{C}$  relaxation data. Applications to verification of theoretical molecular dynamic trajectories and interactions of membrane proteins. , 25.
64. (конференция) Lesovoy DM, Nolde SB, **Bocharov EV**, Lyukmanova EN, Arseniev AS (2014). Protein side chains dynamics in silico verified by NMR experiments. *Euromar 2014* , 368.
65. Mineev KS, Lesovoy DM, Usmanova DR, Goncharuk SA, Shulepko MA, Lyukmanova EN, Kirpichnikov MP, **Bocharov EV**, Arseniev AS (2014). NMR-based approach to measure the free energy of transmembrane helix-helix interactions. *BIOCHIM BIOPHYS ACTA* 1838 (1), 164–172, [10.1016/j.bbamem.2013.08.021](https://doi.org/10.1016/j.bbamem.2013.08.021)
66. Sharonov GV, **Bocharov EV**, Kolosov PM, Astapova MV, Arseniev AS, Feofanov AV (2014). Point mutations in dimerization motifs of the transmembrane domain stabilize active or inactive state of the EphA2 receptor tyrosine kinase. *J Biol Chem* 289 (21), 14955–14964, [10.1074/jbc.M114.558783](https://doi.org/10.1074/jbc.M114.558783)
67. Kim YV, Gasparian ME, **Bocharov EV**, Chertkova RV, Tkach EN, Dolgikh DA, Kirpichnikov MP (2014). New Strategy for High-Level Expression and Purification of Biologically Active Monomeric TGF- $\beta$ 1/C77S in *Escherichia coli*. *Mol Biotechnol* 57 (2), 160–171, [10.1007/s12033-014-9812-7](https://doi.org/10.1007/s12033-014-9812-7)
68. **Bocharov EV**, Lesovoy DM, Goncharuk SA, Goncharuk MV, Hristova K, Arseniev AS (2013). Structure of FGFR3 transmembrane domain dimer: Implications for signaling and human pathologies. *Structure* 21 (11), 2087–2093, [10.1016/j.str.2013.08.026](https://doi.org/10.1016/j.str.2013.08.026)
69. Bocharova OV, Urban AS, Nadezhdin KD, **Bocharov EV**, Arseniev AS (2013). Bacterial and cell-free production of APP671-726 containing amyloid precursor protein transmembrane and metal-binding domains. *Biochemistry (Mosc)* 78 (11), 1263–1271, [10.1134/S0006297913110060](https://doi.org/10.1134/S0006297913110060)
70. Bibilashvili RS, Sidorova MV, Molokoedov AS, Bepalova ZD, **Bocharov EV**, Efremov EE, Sharf TV, Rogova MM, Mironova NA, Zikov KA, Golitsyn SP (2013). Novel conformational peptide antigen which simulates an immunodominant epitope of the 2nd extracellular loop of  $\beta$ 1-adrenoreceptor: Computer simulation, synthesis, spatial structure. *Russ. J. Bioorganic Chem.* 39 (6), 588–599, [10.1134/S1068162013060034](https://doi.org/10.1134/S1068162013060034)
71. Zolotarev YA, Dadayan AK, Borisov YA, Kozik VS, Nazimov IV, Ziganshin RH, **Bocharov EV**, Chizhov AO, Myasoedov NF (2013). New development in the solid-state isotope exchange with spillover hydrogen in organic compounds. *J Phys Chem C Nanomater Interfaces* 117 (33), 16878–16884, [10.1021/jp4015299](https://doi.org/10.1021/jp4015299)
72. Volynsky PE, Polyansky AA, Fakhrutdinova GN, **Bocharov EV**, Efremov RG (2013). Role of dimerization efficiency of transmembrane domains in activation of fibroblast growth factor receptor 3. *J Am Chem Soc* 135 (22), 8105–8108, [10.1021/ja4011942](https://doi.org/10.1021/ja4011942)
73. Beloglazova IB, Beabealashvili RS, Gursky YG, **Bocharov EV**, Mineev KS, Parfenova EV, Tkachuk VA (2013). Structural investigations of recombinant urokinase growth factor-like domain. *Biochemistry (Mosc)* 78 (5), 517–530, [10.1134/S0006297913050106](https://doi.org/10.1134/S0006297913050106)
74. Bocharova OV, **Bocharov EV**, Mineev KS, Dubinnyi MA, Arseniev AS (2013). Preparation of pro-oncogenic mutant forms V659E and V659Q of the transmembrane domain of receptor protein kinase ErbB2 for structural studies. *Biochem (Mosc) Suppl Ser A Membr Cell Biol* 7 (2), 91–99, [10.1134/S1990747813010029](https://doi.org/10.1134/S1990747813010029)
75. **Bocharov EV**, Mineev KS, Goncharuk MV, Arseniev AS (2012). Structural and thermodynamic insight into the process of "weak" dimerization of the ErbB4 transmembrane domain by solution NMR. *BIOCHIM BIOPHYS ACTA* 1818 (9), 2158–2170, [10.1016/j.bbamem.2012.05.001](https://doi.org/10.1016/j.bbamem.2012.05.001)
76. Nolde SB, Lesovoy DM, **Bocharov EV**, Lyukmanova EN, Arseniev AS (2012). Evaluating the performance of fixed charge AMBER force fields in modelling of pH-dependent NMR data of Neurotoxin II: Side chains in focus. , 207.

77. Nadezhdin KD, Bocharova OV, **Bocharov EV**, Arseniev AS (2012). Dimeric structure of transmembrane domain of amyloid precursor protein in micellar environment. *FEBS Lett* 586 (12), 1687–1692, [10.1016/j.febslet.2012.04.062](https://doi.org/10.1016/j.febslet.2012.04.062)
78. Goncharuk MV, Schulga AA, Ermolyuk YS, Tkach EN, Goncharuk SA, Pustovalova YE, Mineev KS, **Bocharov EV**, Maslennikov IV, Arseniev AS, Kirpichnikov MP (2011). Bacterial synthesis, purification, and solubilization of transmembrane segments of ErbB family receptors. *Mol Biol* 45 (5), 823–832, [10.1134/S0026893311040066](https://doi.org/10.1134/S0026893311040066)
79. Goncharuk MV, Shulga AA, Ermoliuk IS, Tkach EN, Goncharuk SA, Pustovalova IE, Mineev KS, **Bocharov EV**, Maslennikov IV, Arseniev AS, Kirpichnikov MP (2011). [Bacterial synthesis, purification, and solubilization of transmembrane segments of ErbB family members]. *Mol Biol (Mosk)* 45 (5), 892–902.
80. (конференция) Lesovoy DM, **Bocharov EV**, Mayzel ML, Goncharuk SA, Goncharuk MV, Volynsky PE, Efremov RG, Arseniev AS (2011). Structural and dynamical model of transmembrane domain of fibroblast growth factor receptor 3. *EUROMAR 2011*, 191.
81. Goncharuk SA, Goncharuk MV, Mayzel ML, Lesovoy DM, Chupin VV, **Bocharov EV**, Arseniev AS, Kirpichnikov MP (2011). Bacterial Synthesis and Purification of Normal and Mutant Forms of Human FGFR3 Transmembrane Segment. *Acta Naturae* 3 (3), 77–84.
82. Mineev KS, **Bocharov EV**, Volynsky PE, Goncharuk MV, Tkach EN, Ermolyuk YS, Schulga AA, Chupin VV, Maslennikov IV, Efremov RG, Arseniev AS (2011). Dimeric structure of the transmembrane domain of glycophorin a in lipidic and detergent environments. *Acta Naturae* 3 (2), 90–8.
83. Nadezhdin KD, Bocharova OV, **Bocharov EV**, Arseniev AS (2011). Structural and dynamic study of the transmembrane domain of the amyloid precursor protein. *Acta Naturae* 3 (1), 69–76.
84. Mineev KS, **Bocharov EV**, Pustovalova YE, Bocharova OV, Chupin VV, Arseniev AS (2010). Spatial Structure of the Transmembrane Domain Heterodimer of ErbB1 and ErbB2 Receptor Tyrosine Kinases. *J Mol Biol* 400 (2), 231–243, [10.1016/j.jmb.2010.05.016](https://doi.org/10.1016/j.jmb.2010.05.016)
85. **Bocharov EV**, Mayzel ML, Volynsky PE, Mineev KS, Tkach EN, Ermolyuk YS, Schulga AA, Efremov RG, Arseniev AS (2010). Left-handed dimer of EphA2 transmembrane domain: Helix packing diversity among receptor tyrosine kinases. *Biophys J* 98 (5), 881–889, [10.1016/j.bpj.2009.11.008](https://doi.org/10.1016/j.bpj.2009.11.008)
86. **Bocharov EV**, Volynsky PE, Pavlov KV, Efremov RG, Arseniev AS (2010). Structure elucidation of dimeric transmembrane domains of bitopic proteins. *Cell Adh Migr* 4 (2), 284–298, [10.4161/cam.4.2.11930](https://doi.org/10.4161/cam.4.2.11930)
87. Bocharova OV, Nadezhdin KD, **Bocharov EV**, Arseniev AS (2010). Expression and purification of a recombinant transmembrane domain amyloid precursor protein associated with Alzheimer's disease. *Russ. J. Bioorganic Chem.* 36 (1), 97–103, [10.1134/S1068162010010103](https://doi.org/10.1134/S1068162010010103)
88. Goncharuk SA, Shulga AA, Ermolyuk YS, Kuzmichev PK, Sobol VA, **Bocharov EV**, Chupin VV, Arseniev AS, Kirpichnikov MP (2009). Bacterial synthesis, purification, and solubilization of membrane protein KCNE3, a regulator of voltage-gated potassium channels. *Biochemistry (Mosc)* 74 (12), 1344–1349, [10.1134/S0006297909120074](https://doi.org/10.1134/S0006297909120074)
89. Lesovoy DM, **Bocharov EV**, Lyukmanova EN, Kosinsky YA, Shulepko MA, Dolgikh DA, Kirpichnikov MP, Efremov RG, Arseniev AS (2009). Specific membrane binding of neurotoxin II can facilitate its delivery to acetylcholine receptor. *Biophys J* 97 (7), 2089–2097, [10.1016/j.bpj.2009.07.037](https://doi.org/10.1016/j.bpj.2009.07.037)
90. Krabben L, van Rossum BJ, Jehle S, **Bocharov E**, Lyukmanova EN, Schulga AA, Arseniev A, Hucho F, Oeschinat H (2009). Loop 3 of Short Neurotoxin II is an Additional Interaction Site with Membrane-bound Nicotinic Acetylcholine Receptor as Detected by Solid-state NMR Spectroscopy. *J Mol Biol* 390 (4), 662–671, [10.1016/j.jmb.2009.05.016](https://doi.org/10.1016/j.jmb.2009.05.016)
91. **Bocharov EV**, Pavlov KV, Blommers MJJ, Arvinte T, Arseniev AS (2008). Modulation of the bioactive conformation of transforming growth factor  $\beta$ : possible implications of cation binding for biological function. *Top Curr Chem (J)* 273, 155–181, [10.1007/128200717](https://doi.org/10.1007/128200717)
92. **Bocharov EV**, Mayzel ML, Volynsky PE, Goncharuk MV, Ermolyuk YS, Schulga AA, Artemenko EO, Efremov RG, Arseniev AS (2008). Spatial structure and pH-dependent conformational diversity of dimeric transmembrane domain of the receptor tyrosine kinase EphA1. *J Biol Chem* 283 (43), 29385–29395, [10.1074/jbc.M803089200](https://doi.org/10.1074/jbc.M803089200)
93. **Bocharov EV**, Mineev KS, Volynsky PE, Ermolyuk YS, Tkach EN, Sobol AG, Chupin VV, Kirpichnikov MP, Efremov RG, Arseniev AS (2008). Spatial structure of the dimeric transmembrane domain of the growth factor



- receptor ErbB2 presumably corresponding to the receptor active state. *J Biol Chem* 283 (11), 6950–6956, [10.1074/jbc.M709202200](https://doi.org/10.1074/jbc.M709202200)
94. Kivero AD, **Bocharov EV**, Doroshenko VG, Sobol AG, Dubinnyi MA, Arseniev AS (2008). 2D [<sup>1</sup>H, <sup>13</sup>C] NMR study of carbon fluxes during glucose utilization by *Escherichia coli* MG1655. *APPL BIOCHEM MICRO+* 44 (2), 151–157, [10.1007/s10438-008-2004-0](https://doi.org/10.1007/s10438-008-2004-0)
  95. Shenkarev ZO, Paramonov AS, Nadezhdin KD, **Bocharov EV**, Kudelina IA, Skladnev DA, Tagaev AA, Yakimenko ZA, Ovchinnikova TV, Arseniev AS (2007). Antiamoebin I in methanol solution: Rapid exchange between right-handed and left-handed 310-helical conformations. *Chem Biodivers* 4 (6), 1219–1242, [10.1002/cbdv.200790106](https://doi.org/10.1002/cbdv.200790106)
  96. **Bocharov EV**, Pustovalova YE, Pavlov KV, Volynsky PE, Goncharuk MV, Ermolyuk YS, Karpunin DV, Schulga AA, Kirpichnikov MP, Efremov RG, Maslennikov IV, Arseniev AS (2007). Unique dimeric structure of BNip3 transmembrane domain suggests membrane permeabilization as a cell death trigger. *J Biol Chem* 282 (22), 16256–16266, [10.1074/jbc.M701745200](https://doi.org/10.1074/jbc.M701745200)
  97. Volynsky PE, **Bocharov EV**, Nolde DE, Vereschaga YA, Mayzel ML, Mineev KS, Mineeva EA, Pustovalova YE, Gagnidze IA, Efremov RG, Arseniev AS (2006). Solution of the spatial structure of dimeric transmembrane domains of proteins by heteronuclear NMR spectroscopy and molecular modeling. *Biophysics (Oxf)* 51 (1), 23–27, [10.1134/S0006350906070050](https://doi.org/10.1134/S0006350906070050)
  98. Shirokova EA, Jasko MV, Khandazhinskaya AL, Ivanov AV, Yanvarev DV, Skoblov YS, Mitkevich VA, **Bocharov EV**, Pronyaeva TR, Fedyuk NV, Kukhanova MK, Pokrovsky AG (2004). Uncharged AZT and D4T derivatives of phosphonoformic and phosphonoacetic acids as anti-HIV pronucleosides. *J Med Chem* 47 (14), 3606–3614, [10.1021/jm0310176](https://doi.org/10.1021/jm0310176)
  99. Krabben L, Van Rossum BJ, Castellani F, **Bocharov E**, Schulga AA, Arseniev AS, Weise C, Hucho F, Oschkinat H (2004). Towards structure determination of neurotoxin II bound to nicotinic acetylcholine receptor: A solid-state NMR approach. *FEBS Lett* 564 (3), 319–324, [10.1016/S0014-5793\(04\)00252-2](https://doi.org/10.1016/S0014-5793(04)00252-2)
  100. **Bocharov EV**, Sobol AG, Pavlov KV, Korzhnev DM, Jaravine VA, Gudkov AT, Arseniev AS (2004). From Structure and Dynamics of Protein L7/L12 to Molecular Switching in Ribosome. *J Biol Chem* 279 (17), 17697–17706, [10.1074/jbc.M313384200](https://doi.org/10.1074/jbc.M313384200)
  101. Zolotarev YA, Dadayan AK, **Bocharov EV**, Borisov YA, Vaskovsky BV, Dorokhova EM, Myasoedov NF (2003). New development in the tritium labelling of peptides and proteins using solid catalytic isotopic exchange with spillover-tritium. *Amino Acids* 24 (3), 325–333, [10.1007/s00726-002-0404-7](https://doi.org/10.1007/s00726-002-0404-7)
  102. Zolotarev YA, Dadayan AK, Borisov YA, Dorokhova EM, Kozik VS, Vtyurin NN, **Bocharov EV**, Ziganshin RN, Lunina NA, Kostrov SV, Ovchinnikova TV, Myasoedov NF (2003). The effect of three-dimensional structure on the solid state isotope exchange of hydrogen in polypeptides with spillover hydrogen. *Bioorg Chem* 31 (6), 453–463, [10.1016/j.bioorg.2003.08.001](https://doi.org/10.1016/j.bioorg.2003.08.001)
  103. **Bocharov EV**, Lyukmanova EN, Ermolyuk YaS, Shulga AA, Pluzhnikov KA, Dolgikh DA, Kirpichnikov MP, Arseniev AS (2003). Resonance assignment of <sup>13</sup>C-<sup>15</sup>N-labeled snake neurotoxin II from *Naja oxiana*. 24, 247–254.
  104. **Bocharov EV**, Lyukmanova EN, Ermolyuk YS, Schulga AA, Pluzhnikov KA, Dolgikh DA, Kirpichnikov MP, Arseniev AS (2003). Resonance Assignment of <sup>13</sup>C-<sup>15</sup>N-Labeled Snake Neurotoxin II from *Naja oxiana*. *Appl Magn Reson* 24 (2), 247–254, [10.1007/BF03166664](https://doi.org/10.1007/BF03166664)
  105. **Bocharov EV**, Korzhnev DM, Blommers MJJ, Arvinte T, Orekhov VY, Billeter M, Arseniev AS (2002). Dynamics-modulated biological activity of transforming growth factor β3. *J Biol Chem* 277 (48), 46273–46279, [10.1074/jbc.M206274200](https://doi.org/10.1074/jbc.M206274200)
  106. Korolkova YV, **Bocharov EV**, Angelo K, Maslennikov IV, Grinenko OV, Lipkin AV, Nosyreva ED, Pluzhnikov KA, Olesen SP, Arseniev AS, Grishin EV (2002). New binding site on common molecular scaffold provides HERG channel specificity of scorpion toxin BeKm-1. *J Biol Chem* 277 (45), 43104–43109, [10.1074/jbc.M204083200](https://doi.org/10.1074/jbc.M204083200)
  107. Zolotarev YA, **Bocharov EV**, Dadayan AK, Kasheverov IE, Zhmak MN, Maslennikov IV, Borisov YA, Arseniev AS, Myasoedov NF, Tsetlin VI (2001). The solid-state catalytic isotope exchange of hydrogen in α-conotoxin G1 by the tritium spillover. *Bioorg Khim* 26 (8), 591–592.
  108. Korzhnev DM, **Bocharov EV**, Zhuravlyova AV, Orekhov VY, Ovchinnikova TV, Billeter M, Arseniev AS (2001). Backbone dynamics of the channel-forming antibiotic zervamicin IIB studied by <sup>15</sup>N NMR relaxation.

*FEBS Lett* 495 (12), 52–55, [10.1016/S0014-5793\(01\)02363-8](https://doi.org/10.1016/S0014-5793(01)02363-8)

109. Korzhnev DM, **Bocharov EV**, Zhuravlyova AV, Tischenko EV, Reibarkh MY, Ermolyuk YS, Schulga AA, Kirpichnikov MP, Billeter M, Arseniev AS (2001). <sup>1</sup>H, <sup>13</sup>C and <sup>15</sup>N resonance assignment for barnase. *Appl Magn Reson* 21 (2), 195–201, [10.1007/BF03162451](https://doi.org/10.1007/BF03162451)
110. Dubovskii PV, Dementieva DV, **Bocharov EV**, Utkin YN, Arseniev AS (2001). Membrane binding motif of the P-type cardiotoxin. *J Mol Biol* 305 (1), 137–149, [10.1006/jmbi.2000.4283](https://doi.org/10.1006/jmbi.2000.4283)
111. Zolotarev YA, **Bocharov EV**, Dadayan AK, Kasheverov IE, Zhmak MN, Maslennikov IV, Borisov YA, Arseniev AS, Myasoedov NF, Tsetlin VI (2000). The solid-state catalytic isotope exchange of hydrogen in  $\alpha$ -conotoxin G1 by the tritium spillover. *Bioorg Khim* 26 (8), 587–592.
112. Zolotarev YA, **Bocharov EV**, Dadayan AK, Kasheverov IE, Zhmak MN, Maslennikov IV, Borisov YA, Arseniev AS, Myasoedov NF, Tsetlin VI (2000). The solid-state catalytic isotope exchange of hydrogen in  $\alpha$ -conotoxin G1 by the tritium spillover. *Russ. J. Bioorganic Chem.* 26 (8), 527–531, [10.1007/bf02758624](https://doi.org/10.1007/bf02758624)
113. **Bocharov EV**, Blommers MJJ, Kuhla J, Arvinte T, Bürgi R, Arseniev AS (2000). Letter to the editor: Sequence-specific <sup>1</sup>H and <sup>15</sup>N assignment and secondary structure of transforming growth factor  $\beta$ 3 [1]. *J Biomol NMR* 16 (2), 179–180, [10.1023/A:1008315600134](https://doi.org/10.1023/A:1008315600134)
114. Uversky VN, Abdullaev ZK, Arseniev AS, **Bocharov EV**, Dolgikh DA, Latypov RF, Melnik TN, Vassilenko KS, Kirpichnikov MP (1999). Structure and stability of recombinant protein depend on the extra N-terminal methionine residue: S6 permutin from direct and fusion expression systems. *Biochim Biophys Acta* 1432 (2), 324–332, [10.1016/S0167-4838\(99\)00096-5](https://doi.org/10.1016/S0167-4838(99)00096-5)
115. Dementieva DV, **Bocharov EV**, Arseniev AS (1999). Two forms of cytotoxin II (cardiotoxin) from *Naja naja oxiana* in aqueous solution. Spatial structures with tightly bound water molecules. 263 (1), 152–162, [10.1046/j.1432-1327.1999.00478.x](https://doi.org/10.1046/j.1432-1327.1999.00478.x)
116. Reibarkh MY, Nolde DE, Vasilieva LI, **Bocharov EV**, Shulga AA, Kirpichnikov MP, Arseniev AS (1998). Three-dimensional structure of binase in solution. *FEBS Lett* 431 (2), 250–254, [10.1016/S0014-5793\(98\)00765-0](https://doi.org/10.1016/S0014-5793(98)00765-0)
117. **Bocharov EV**, Gudkov AT, Budovskaya EV, Arseniev AS (1998). Conformational independence of N- and C-domains in ribosomal protein L7/L12 and in the complex with protein L10. *FEBS Lett* 423 (3), 347–350, [10.1016/S0014-5793\(98\)00121-5](https://doi.org/10.1016/S0014-5793(98)00121-5)
118. Latypov RF, Abdullaev ZK, Badretdinov AY, **Bocharov EV**, Melnik TN, Afasizheva IY, Arseniev AS, Dolgikh DA, Uversky VN, Finkelstein AV, Kirpichnikov MP (1998). Circular permutation of the *Thermus thermophilus* ribosomal protein S6 imparting to it the topology of the artificial protein albebetin. *Mol Biol* 32 (1), 109–116.
119. Reibarkh MY, Nolde DE, **Bocharov EV**, Vasileva LI, Shulga AA, Kirpichnikov MP, Arseniev AS (1997). The Secondary Structure of Binase in Solution Determined by <sup>1</sup>H NMR. *Bioorg Khim* 23 (10), 794.
120. Reibarkh MY, Nolde DE, **Bocharov EV**, Vasileva LI, Shulga AA, Kirpichnikov MP, Arseniev AS (1997). The secondary structure of binase in solution determined by <sup>1</sup>H NMR. *Russ. J. Bioorganic Chem.* 23 (10), 706–717.
121. **Bocharov EV**, Gudkov AT, Arseniev AS (1996). Topology of the secondary structure elements of ribosomal protein L7/L12 from *E. coli* in solution. *FEBS Lett* 379 (3), 291–294, [10.1016/0014-5793\(95\)01531-0](https://doi.org/10.1016/0014-5793(95)01531-0)