

Curriculum vitae: Alexander Vassilevski



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Education

1999– 2004	Russia, Moscow	Lomonosov Moscow State University, biological faculty, department of bioorganic chemistry	Major: Biochemistry. Graduated with honors.
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Teaching

2005– to date	Russia, Moscow	Lomonosov Moscow State University, biological faculty, department of bioorganic chemistry	Molecular mechanisms of membrane transport
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IBCh positions

2017–to date	Principal research fellow
	Senior research fellow

IBCh memberships

Scientific council

Language Proficiency

Russian, English

Awards

2016	Премия Правительства Москвы молодым ученым
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Titles

Doctor of Philosophy (Chemistry)

Grants and projects

2022–to date	-Модуляторы мутантных натриевых каналов
2020–2022	-
2020–2022	-Лиганды ионных каналов с уникальной селективностью
2019–2022	-

Publications

1. Zavarzina II, Kuzmenkov AI, Dobrokhotov NA, Maleeva EE, Korolkova YV, Peigneur S, Tytgat J, Krylov NA, **Vassilevski AA**, Chugunov AO (2024). The scorpion toxin BeKm-1 blocks hERG cardiac potassium channels

using an indispensable arginine residue. *FEBS Lett* , , [10.1002/1873-3468.14850](https://doi.org/10.1002/1873-3468.14850)

2. Ojomoko LO, Kryukova EV, Egorova NS, Salikhov AI, Epifanova LA, Denisova DA, Khomutov AR, Sukhov DA, **Vassilevski AA**, Khomutov MA, Tsetlin VI, Shelukhina IV (2023). Inhibition of nicotinic acetylcholine receptors by oligoarginine peptides and polyamine-related compounds. *Front Pharmacol* 14 (14), 1327603, [10.3389/fphar.2023.1327603](https://doi.org/10.3389/fphar.2023.1327603)
3. Oparin PB, Nikodimov SS, **Vassilevski AA** (2023). Venoms with oral toxicity towards insects. *Toxicon* 235, 107308, [10.1016/j.toxicon.2023.107308](https://doi.org/10.1016/j.toxicon.2023.107308)
4. Krylov NA, Tabakmakher VM, Yureva DA, **Vassilevski AA**, Kuzmenkov AI (2023). Kalium 3.0 is a comprehensive depository of natural, artificial, and labeled polypeptides acting on potassium channels. *Protein Sci* 32 (11), e4776, [10.1002/pro.4776](https://doi.org/10.1002/pro.4776)
5. Kuzmenkov AI, Gigolaev AM, Pinheiro-Junior EL, Peigneur S, Tytgat J, **Vassilevski AA** (2023). Methionine-isoleucine dichotomy at a key position in scorpion toxins inhibiting voltage-gated potassium channels. *Toxicon* 231, 107181, [10.1016/j.toxicon.2023.107181](https://doi.org/10.1016/j.toxicon.2023.107181)
6. Mineev KS, Chernykh MA, Motov VV, Prudnikova DA, Pavlenko DM, Kuzmenkov AI, Peigneur S, Tytgat J, **Vassilevski AA** (2023). A scorpion toxin affecting sodium channels shows double cis–trans isomerism. *FEBS Lett* 597 (18), 2358–2368, [10.1002/1873-3468.14705](https://doi.org/10.1002/1873-3468.14705)
7. Gigolaev AM, Tabakmakher VM, Peigneur S, Tytgat J, **Vassilevski AA** (2023). Structural Optimization of an α -Hairpinin Blocking Potassium Channels KV1.3. *J Evol Biochem Physiol* 59 (1), 192–199, [10.1134/S0022093023010167](https://doi.org/10.1134/S0022093023010167)
8. Gigolaev AM, Pinheiro-Junior EL, Peigneur S, Tytgat J, **Vassilevski AA** (2022). KV1.2-Selective Peptide with High Affinity. *J Evol Biochem Physiol* 58 (12), 2048–2057, [10.1134/S002209302206031X](https://doi.org/10.1134/S002209302206031X)
9. Kuzmenkov AI, Peigneur S, Nasburg JA, Mineev KS, Nikolaev MV, Pinheiro-Junior EL, Arseniev AS, Wulff H, Tytgat J, **Vassilevski AA** (2022). Apamin structure and pharmacology revisited. *Front Pharmacol* 13, 977440, [10.3389/fphar.2022.977440](https://doi.org/10.3389/fphar.2022.977440)
10. Gigolaev AM, Lushpa VA, Pinheiro-Junior EL, Tabakmakher VM, Peigneur S, Ignatova AA, Feofanov AV, Efremov RG, Mineev KS, Tytgat J, **Vassilevski AA** (2022). Artificial pore blocker acts specifically on voltage-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)
11. Kasheverov IE, Kuzmenkov AI, Kudryavtsev DS, Chudetskiy IS, Shelukhina IV, Barykin EP, Иванов Ivanov IA, Siniavin AE, Ziganshin RH, Baranov MS, Tsetlin VI, **Vassilevski AA**, Utkin YN (2021). Snake Toxins Labeled by Green Fluorescent Protein or Its Synthetic Chromophore are New Probes for Nicotinic acetylcholine Receptors. *Front Mol Biosci* 8 (8), 753283, [10.3389/fmolb.2021.753283](https://doi.org/10.3389/fmolb.2021.753283)
12. 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)
13. 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)
14. 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)
15. van Cann M, Kuzmenkov A, Isensee J, Andreev-Andrievskiy A, Peigneur S, Khusainov G, Berkut A, Tytgat J, **Vassilevski A**, Hucho T (2021). Scorpion toxin MeuNaTx α -1 sensitizes primary nociceptors by selective modulation of voltage-gated sodium channels. *FEBS J* 288 (7), 2418–2435, [10.1111/febs.15593](https://doi.org/10.1111/febs.15593)
16. Mineev KS, Kuzmenkov AI, Arseniev AS, **Vassilevski AA** (2021). Structure of MeuNaTx α -1 toxin from scorpion venom highlights the importance of the nest motif. *Proteins* 89 (8), 1055–1060, [10.1002/prot.26074](https://doi.org/10.1002/prot.26074)
17. Myshkin MY, Paramonov AS, Kulbatskii DS, Surkova EA, Berkut AA, **Vassilevski AA**, Lyukmanova EN, Kirpichnikov MP, Shenkarev ZO (2021). Voltage-Sensing Domain of the Third Repeat of Human Skeletal Muscle NaV1.4 Channel As a New Target for Spider Gating Modifier Toxins. *Acta Naturae* 13 (1), 134–139, [10.32607/actanaturae.11279](https://doi.org/10.32607/actanaturae.11279)
18. Føns S, Ledsgaard L, Nikolaev MV, **Vassilevski AA**, Sørensen CV, Chevalier MK, Fiebig M, Laustsen AH (2020). Discovery of a Recombinant Human Monoclonal Immunoglobulin G Antibody Against α -Latrotoxin From the Mediterranean Black Widow Spider (*Latrodectus tredecimguttatus*). *Front Immunol* 11, 587825,

[10.3389/fimmu.2020.587825](https://doi.org/10.3389/fimmu.2020.587825)

19. 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)
20. **(conference) Vassilevski A** (2020). P2X3 receptor antagonists from spider venom. *Toxicon* 177 Suppl 1, S3, [10.1016/j.toxicon.2019.10.017](https://doi.org/10.1016/j.toxicon.2019.10.017)
21. **(conference) Kasheverov IE, Oparin PB, Vassilevski AA, Ivanov IA, Tsetlin VI, Utkin YN** (2020). Channel blockers from scorpion venoms inhibit nicotinic acetylcholine receptors. *Toxicon* 177 Suppl 1, S11, [10.1016/j.toxicon.2019.10.049](https://doi.org/10.1016/j.toxicon.2019.10.049)
22. **(book) Dunaevsky YE, Khadeeva NV, Vassilevski AA, Domash VI, Belozersky MA** (2020). Proteinase Inhibitors From Buckwheat (*Fagopyrum esculentum* Moench) Seeds. , 521–532, [10.1016/B978-0-12-818553-7.00036-X](https://doi.org/10.1016/B978-0-12-818553-7.00036-X)
23. Кузьменков АИ, Пеньёр С, Титгат Я, **Василевский АА** (2019). Фармакологическая характеристика пептидных лигандов калиевых каналов MeKTx13-2 и MeKTx13-3 из яда скорпиона *Mesobuthus eupeus*. *Russ Fiziol Zh Im I M Sechenova* 105 (11), 1452–1462, [10.1134/S0869813919110074](https://doi.org/10.1134/S0869813919110074)
24. Berkut AA, Chugunov AO, Mineev KS, Peigneur S, Tabakmakher VM, Krylov NA, Oparin PB, Lihonosova AF, Novikova EV, Arseniev AS, Grishin EV, Tytgat J, Efremov RG, **Vassilevski AA** (2019). Protein Surface Topography as a tool to enhance the selective activity of a potassium channel blocker. *J Biol Chem* 294 (48), 18349–18359, [10.1074/jbc.RA119.010494](https://doi.org/10.1074/jbc.RA119.010494)
25. Myshkin MY, Männikkö R, Krumkacheva OA, Kulbatskii DS, Chugunov AO, Berkut AA, Paramonov AS, Shulepko MA, Fedin MV, Hanna MG, Kullmann DM, Bagryanskaya EG, Arseniev AS, Kirpichnikov MP, Lyukmanova EN, **Vassilevski AA, Shenkarev ZO** (2019). Cell-Free Expression of Sodium Channel Domains for Pharmacology Studies. Noncanonical Spider Toxin Binding Site in the Second Voltage-Sensing Domain of Human Nav1.4 Channel. *Front Pharmacol* 10, 953, [10.3389/fphar.2019.00953](https://doi.org/10.3389/fphar.2019.00953)
26. Kasheverov IE, Oparin PB, Zhmak MN, Egorova NS, Ivanov IA, Gigolaev AM, Nekrasova OV, Serebryakova MV, Kudryavtsev DS, Prokopev NA, Hoang AN, Tsetlin VI, **Vassilevski AA, Utkin YN** (2019). Scorpion toxins interact with nicotinic acetylcholine receptors. *FEBS Lett* 593 (19), 2779–2789, [10.1002/1873-3468.13530](https://doi.org/10.1002/1873-3468.13530)
27. Tabakmakher VM, Krylov NA, Kuzmenkov AI, Efremov RG, **Vassilevski AA** (2019). Kalium 2.0, a comprehensive database of polypeptide ligands of potassium channels. *Sci Data* 6 (1), 73, [10.1038/s41597-019-0074-x](https://doi.org/10.1038/s41597-019-0074-x)
28. Shenkarev ZO, Shulepko MA, Peigneur S, Myshkin MY, Berkut AA, **Vassilevski AA, Tytgat J, Lyukmanova EN, Kirpichnikov MP** (2019). Recombinant Production and Structure-Function Study of the Ts1 Toxin from the Brazilian Scorpion *Tityus serrulatus*. *Dokl Biochem Biophys* 484 (1), 9–12, [10.1134/S1607672919010034](https://doi.org/10.1134/S1607672919010034)
29. Utkin Y, **Vassilevski A, Kudryavtsev D, Undheim EAB** (2019). Editorial: Animal Toxins as Comprehensive Pharmacological Tools to Identify Diverse Ion Channels. *Front Pharmacol* 10 (APR), 423, [10.3389/fphar.2019.00423](https://doi.org/10.3389/fphar.2019.00423)
30. Kuzmenkov AI, Nekrasova OV, Peigneur S, Tabakmakher VM, Gigolaev AM, Fradkov AF, Kudryashova KS, Chugunov AO, Efremov RG, Tytgat J, Feofanov AV, **Vassilevski AA** (2018). K1.2 channel-specific blocker from *Mesobuthus eupeus* scorpion venom: Structural basis of selectivity. *Neuropharmacology* 143, 228–238, [10.1016/j.neuropharm.2018.09.030](https://doi.org/10.1016/j.neuropharm.2018.09.030)
31. Kuldyushev NA, Mineev KS, Berkut AA, Peigneur S, Arseniev AS, Tytgat J, Grishin EV, **Vassilevski AA** (2018). Refined structure of BeM9 reveals arginine hand, an overlooked structural motif in scorpion toxins affecting sodium channels. *Proteins* 86 (10), 1117–1122, [10.1002/prot.25583](https://doi.org/10.1002/prot.25583)
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33. Männikkö R, Shenkarev ZO, Thor MG, Berkut AA, Myshkin MY, Paramonov AS, Kulbatskii DS, Kuzmin DA, Castañeda MS, King L, Wilson ER, Lyukmanova EN, Kirpichnikov MP, Schorge S, Bosmans F, Hanna MG, Kullmann DM, **Vassilevski AA** (2018). Spider toxin inhibits gating pore currents underlying periodic paralysis. *Proc Natl Acad Sci U S A* 115 (17), 4495–4500, [10.1073/pnas.1720185115](https://doi.org/10.1073/pnas.1720185115)
34. Andreev-Andrievskiy A, Popova A, Lagereva E, Osipov D, Berkut A, Grishin E, **Vassilevski A** (2017). Pharmacological analysis of Poecilotheria spider venoms in mice provides clues for human treatment. *Toxicon* 138, 59–67, [10.1016/j.toxicon.2017.08.013](https://doi.org/10.1016/j.toxicon.2017.08.013)

35. Kuzmenkov AI, **Vassilevski AA** (2017). Labelled animal toxins as selective molecular markers of ion channels: Applications in neurobiology and beyond. *Neurosci Lett* 679, 15–23, [10.1016/j.neulet.2017.10.050](https://doi.org/10.1016/j.neulet.2017.10.050)
36. Kuldyshev NA, Berkut AA, Peigneur S, Tytgat J, Grishin EV, **Vassilevski AA** (2017). Design of sodium channel ligands with defined selectivity – a case study in scorpion alpha-toxins. *FEBS Lett* 591 (20), 3414–3420, [10.1002/1873-3468.12839](https://doi.org/10.1002/1873-3468.12839)
37. Kuzmenkov AI, Peigneur S, Chugunov AO, Tabakmakher VM, Efremov RG, Tytgat J, Grishin EV, **Vassilevski AA** (2017). C-Terminal residues in small potassium channel blockers OdK1 and OSK3 from scorpion venom fine-tune the selectivity. *BIOCHIM BIOPHYS ACTA* 1865 (5), 465–472, [10.1016/j.bbapap.2017.02.001](https://doi.org/10.1016/j.bbapap.2017.02.001)
38. Nadezhdin KD, Romanovskaia DD, Sachkova MY, Oparin PB, Kovalchuk SI, Grishin EV, Arseniev AS, **Vassilevski AA** (2017). Modular toxin from the lynx spider *Oxyopes takobius*: Structure of spiderine domains in solution and membrane-mimicking environment. *Protein Sci* 26 (3), 611–616, [10.1002/pro.3101](https://doi.org/10.1002/pro.3101)
39. Kuzmenkov AI, Nekrasova OV, Kudryashova KS, Peigneur S, Tytgat J, Stepanov AV, Kirpichnikov MP, Grishin EV, Feofanov AV, **Vassilevski AA** (2016). Fluorescent protein-scorpion toxin chimera is a convenient molecular tool for studies of potassium channels. *Sci Rep* 6, 33314, [10.1038/srep33314](https://doi.org/10.1038/srep33314)
40. Oparin PB, Nadezhdin KD, Berkut AA, Arseniev AS, Grishin EV, **Vassilevski AA** (2016). Structure of purotoxin-2 from Wolf spider: Modular design and membrane-Assisted mode of action in arachnid toxins. *Biochem J* 473 (19), 3113–3126, [10.1042/BCJ20160573](https://doi.org/10.1042/BCJ20160573)
41. Kuzmenkov AI, Krylov NA, Chugunov AO, Grishin EV, **Vassilevski AA** (2016). Kalium: A database of potassium channel toxins from scorpion venom. *Database (Oxford)* 2016, baw056, [10.1093/database/baw056](https://doi.org/10.1093/database/baw056)
42. Kuzmenkov AI, Sachkova MY, Kovalchuk SI, Grishin EV, **Vassilevski AA** (2016). Lachesana tarabaei, an expert in membrane-Active toxins. *Biochem J* 473 (16), 2495–2506, [10.1042/BCJ20160436](https://doi.org/10.1042/BCJ20160436)
43. Kuzmenkov AI, Grishin EV, **Vassilevski AA** (2015). Diversity of Potassium Channel Ligands: Focus on Scorpion Toxins. *Biochemistry (Mosc)* 80 (13), 1764–1799, [10.1134/S0006297915130118](https://doi.org/10.1134/S0006297915130118)
44. Dubovskii PV, **Vassilevski AA**, Kozlov SA, Feofanov AV, Grishin EV, Efremov RG (2015). Latareins: Versatile spider venom peptides. *Cell Mol Life Sci* 72 (23), 4501–4522, [10.1007/s00018-015-2016-x](https://doi.org/10.1007/s00018-015-2016-x)
45. Kuzmenkov AI, **Vassilevski AA**, Kudryashova KS, Nekrasova OV, Peigneur S, Tytgat J, Feofanov AV, Kirpichnikov MP, Grishin EV (2015). Variability of potassium channel blockers in *Mesobuthus eupeus* scorpion venom with focus on Kv1.1: An integrated transcriptomic and proteomic study. *J Biol Chem* 290 (19), 12195–12209, [10.1074/jbc.M115.637611](https://doi.org/10.1074/jbc.M115.637611)
46. (conference) Feofanov AV, Kudryashova KS, Nekrasova OV, **Vassilevski AA**, Kuzmenkov AI, Korolkova YV, Grishin EV, Kirpichnikov MP (2015). Quantitative confocal microscopy analysis as a basis for search and study of potassium kv1.X channel blockers. *Springer Proceedings in Physics* 164 (6), 249–254, [10.1007/978-3-319-16919-4_32](https://doi.org/10.1007/978-3-319-16919-4_32)
47. Berkut AA, Peigneur S, Myshkin MY, Paramonov AS, Lyukmanova EN, Arseniev AS, Grishin EV, Tytgat J, Shenkarev ZO, **Vassilevski AA** (2015). Structure of membrane-active toxin from crab spider *Heriades melloteei* suggests parallel evolution of sodium channel gating modifiers in Araneomorphae and Mygalomorphae. *J Biol Chem* 290 (1), 492–504, [10.1074/jbc.M114.595678](https://doi.org/10.1074/jbc.M114.595678)
48. Berkut AA, Usmanova DR, Peigneur S, Oparin PB, Mineev KS, Odintsova TI, Tytgat J, Arseniev AS, Grishin EV, **Vassilevski AA** (2014). Structural similarity between defense peptide from wheat and scorpion neurotoxin permits rational functional design. *J Biol Chem* 289 (20), 14331–14340, [10.1074/jbc.M113.530477](https://doi.org/10.1074/jbc.M113.530477)
49. Sachkova MY, Slavokhotova AA, Grishin EV, **Vassilevski AA** (2014). Genes and evolution of two-domain toxins from lynx spider venom. *FEBS Lett* 588 (5), 740–745, [10.1016/j.febslet.2014.01.018](https://doi.org/10.1016/j.febslet.2014.01.018)
50. Sachkova MY, Slavokhotova AA, Grishin EV, **Vassilevski AA** (2014). Structure of the yellow sac spider *Cheiracanthium puncturum* genes provides clues to evolution of insecticidal two-domain knottin toxins. *Insect Mol Biol* 23 (4), 527–538, [10.1111/imb.12097](https://doi.org/10.1111/imb.12097)
51. Slavokhotova AA, Rogozhin EA, Musolyamov AK, Andreev YA, Oparin PB, Berkut AA, **Vassilevski AA**, Egorov TA, Grishin EV, Odintsova TI (2014). Novel antifungal α -hairpin peptide from *Stellaria media* seeds: Structure, biosynthesis, gene structure and evolution. *Plant Mol Biol* 84 (12), 189–202, [10.1007/s11103-013-0127-z](https://doi.org/10.1007/s11103-013-0127-z)
52. Slavokhotova AA, Naumann TA, Price NPJ, Rogozhin EA, Andreev YA, **Vassilevski AA**, Odintsova TI (2014). Novel mode of action of plant defense peptides - hevein-like antimicrobial peptides from wheat inhibit

- fungal metalloproteases. *FEBS J* 281 (20), 4754–4764, [10.1111/febs.13015](https://doi.org/10.1111/febs.13015)
53. Arzamasov AA, **Vassilevski AA**, Grishin EV (2014). Chlorotoxin and related peptides: Short insect toxins from scorpion venom. *Russ. J. Bioorganic Chem.* 40 (4), 359–369, [10.1134/S1068162014040013](https://doi.org/10.1134/S1068162014040013)
 54. Pluzhnikov KA, Kozlov SA, **Vassilevski AA**, Vorontsova OV, Feofanov AV, Grishin EV (2014). Linear antimicrobial peptides from *Ectatomma quadridens* ant venom. *Biochimie* 107 (PB), 211–215, [10.1016/j.biochi.2014.09.012](https://doi.org/10.1016/j.biochi.2014.09.012)
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 57. Utkina LL, Andreev YA, Rogozhin EA, Korostyleva TV, Slavokhotova AA, Oparin PB, **Vassilevski AA**, Grishin EV, Egorov TA, Odintsova TI (2013). Genes encoding 4-Cys antimicrobial peptides in wheat *Triticum kiharae* Dorof. et Migush.: Multimodular structural organization, intraspecific variability, distribution and role in defence. *FEBS J* 280 (15), 3594–3608, [10.1111/febs.12349](https://doi.org/10.1111/febs.12349)
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