

## Curriculum vitae: Elena Markvicheva

### Address

Shemyakin–Ovchinnikov Institute of bioorganic chemistry RAS, Moscow, Russia

### Contacts

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### IBCh positions

2019–to date	Principal research fellow
	Leading research fellow

### Scientific interests

Her scientific interests are focused on elaboration of novel polymer biomaterials for biomedical applications (controlled drug delivery systems, nanoencapsulation of bioactive peptides; immobilized mammalian cells, biodegradable scaffolds (fibers, hydrogels, microcarriers) for tissue repair.

### Scientific societies' membership

She is a member of several scientific international societies and Coordinator (Head of Russian branch of Bioencapsulation Research Group) in Russia as well as an expert in international COST programs (840 и 865).

### Titles

Doctor of Science (Chemistry)

### Grants and projects

2021–2023	<a href="#">New multitarget fusion proteins based on highly specific mutant variant TRAIL DR5-B with effector peptides targeted to various signaling pathways affecting tumor development</a>
2018–2020	-

### Publications

1. Yagolovich AV, Isakova AA, Artykov AA, Vorontsova YV, Mazur DV, Antipova NV, Pavlyukov MS, Shakhparonov MI, Gileva AM, **Markvicheva EA**, Plotnikova EA, Pankratov AA, Kirpichnikov MP, Gasparian ME, Dolgikh DA (2024). Correction: Yagolovich et al. DR5-Selective TRAIL Variant DR5-B Functionalized with Tumor-Penetrating iRGD Peptide for Enhanced Antitumor Activity against Glioblastoma. 2022, , 12687. *Int J Mol Sci* 25 (10), , [10.3390/ijms25105334](#)
2. Drozdova M, Makhonina A, Gladkikh D, Artyukhov A, Bryukhanov L, Mezhuiev Y, Lozinsky V, **Markvicheva E** (2024). Hydroxyapatite-loaded macroporous calcium alginate hydrogels: Preparation, characterization, and in vitro evaluation. *Biopolymers* 115 (4), e23583, [10.1002/bip.23583](#)
3. Yagolovich AV, Kuskov AN, Kulikov PP, Bagrov DV, Petrova PA, Kukovyakina EV, Isakova AA, Khan II, Pokrovsky VS, Nosyrev AE, Stamati PC, **Markvicheva EA**, Gasparian ME, Spandidos DA, Tsatsakis AM (2024). Assessment of the effects of amphiphilic poly (N-vinylpyrrolidone) nanoparticles loaded with bortezomib on glioblastoma cell lines and zebrafish embryos. *Biomed Rep* 20 (3), 37, [10.3892/br.2024.1725](#)
4. Mishchenko EV, Gileva AM, **Markvicheva EA**, Koroleva MY (2023). Nanoemulsions and Solid Lipid Nanoparticles with Encapsulated Doxorubicin and Thymoquinone. *Colloid Journal of the USSR (English Translation of Kolloidnyi Zhurnal)* 85 (5), 736–745, [10.1134/S1061933X23600707](#)
5. Afanasyeva KA, Gileva AM, **Markvicheva EA**, Budanova UA, Sebyakin YL (2023). Glycolipotriptide (N-Lactitol-Gly)2-LysC16 and Its Fluorescently Labeled Analog for Visualizing Vector Systems for the Delivery of Biologically Active Substances to Target Cells. *Moscow University Chemistry Bulletin* 78 (5), 283–291,

[10.3103/S0027131423050036](https://doi.org/10.3103/S0027131423050036)

6. Kildeeva N, Sazhnev N, Drozdova M, Zakharova V, Svidchenko E, Surin N, **Markvicheva E** (2023). Approaches to Obtaining Water-Insoluble Fibrous Matrices from Regenerated Fibroin. *Technologies (Basel)* 11 (5), 146, [10.3390/technologies11050146](https://doi.org/10.3390/technologies11050146)
7. Agapova OI, Efimov AE, Mochalov KE, Solovyeva DO, Gileva AM, **Markvicheva EA**, Yakovlev DV, Lyundup AV, Oleinikov VA, Agapov II, Gautier SV (2023). Correlative Fluorescent Scanning Probe Nanotomography Used to Study the Intracellular Distribution of Doxorubicin in MCF-7 Human Breast Adenocarcinoma Cells. *Dokl Biol Sci* 509 (1), 103–106, [10.1134/S0012496623700266](https://doi.org/10.1134/S0012496623700266)
8. Drozdova M, Vodyakova M, Tolstova T, Chernogortseva M, Sazhnev N, Demina T, Aksenova N, Timashev P, Kildeeva N, **Markvicheva E** (2023). Composite Hydrogels Based on Cross-Linked Chitosan and Low Molecular Weight Hyaluronic Acid for Tissue Engineering. *Polymers (Basel)* 15 (10), 2371, [10.3390/polym15102371](https://doi.org/10.3390/polym15102371)
9. Gileva A, Trushina D, Yagolovich A, Gasparian M, Kurbanova L, Smirnov I, Burov S, **Markvicheva E** (2023). Doxorubicin-Loaded Polyelectrolyte Multilayer Capsules Modified with Antitumor DR5-Specific TRAIL Variant for Targeted Drug Delivery to Tumor Cells. *Nanomaterials (Basel)* 13 (5), , [10.3390/nano13050902](https://doi.org/10.3390/nano13050902)
10. Tolstova T, Drozdova M, Popyrina T, Matveeva D, Demina T, Akopova T, Andreeva E, **Markvicheva E** (2023). Preparation and In Vitro Evaluation of Chitosan-g-Oligolactide Based Films and Macroporous Hydrogels for Tissue Engineering. *Polymers (Basel)* 15 (4), 907, [10.3390/polym15040907](https://doi.org/10.3390/polym15040907)
11. Drozdova MG, Demina TS, Dregval OA, Gaidar AI, Andreeva ER, Zelenetskii AN, Akopova TA, **Markvicheva EA** (2022). Macroporous Hyaluronic Acid/Chitosan Polyelectrolyte Complex-Based Hydrogels Loaded with Hydroxyapatite Nanoparticles: Preparation, Characterization and In Vitro Evaluation. *Polysaccharides* 3 (4), 745–760, [10.3390/polysaccharides3040043](https://doi.org/10.3390/polysaccharides3040043)
12. Yagolovich AV, Isakova AA, Artykov AA, Vorontsova YV, Mazur DV, Antipova NV, Pavlyukov MS, Shakhparonov MI, Gileva AM, **Markvicheva EA**, Plotnikova EA, Pankratov AA, Kirpichnikov MP, Gasparian ME, Dolgikh DA (2022). DR5-Selective TRAIL Variant DR5-B Functionalized with Tumor-Penetrating iRGD Peptide for Enhanced Antitumor Activity against Glioblastoma. *Int J Mol Sci* 23 (20), , [10.3390/ijms232012687](https://doi.org/10.3390/ijms232012687)
13. Sazhnev NA, Kildeeva NR, Drozdova MG, **Markvicheva EA** (2022). Fibrous Scaffolds for Tissue Engineering Electrospun from Fibroin-Containing Solutions. *FIBRE CHEM+* 53 (6), 370–372, [10.1007/s10692-022-10303-8](https://doi.org/10.1007/s10692-022-10303-8)
14. Yagolovich A, Kuskov A, Kulikov P, Kurbanova L, Bagrov D, Artykov A, Gasparian M, Sizova S, Oleinikov V, Gileva A, Kirpichnikov M, Dolgikh D, **Markvicheva E** (2021). Amphiphilic Poly(N-vinylpyrrolidone) Nanoparticles Conjugated with DR5-Specific Antitumor Cytokine DR5-B for Targeted Delivery to Cancer Cells. *Pharmaceutics* 13 (9), , [10.3390/pharmaceutics13091413](https://doi.org/10.3390/pharmaceutics13091413)
15. Kuskov A, Selina O, Kulikov P, Imatdinov I, Balysheva V, Kryukov A, Shtilman M, **Markvicheva E** (2021). Amphiphilic Poly(N-Vinylpyrrolidone) Nanoparticles Loaded with DNA Plasmids Encoding Gn and Gc Glycoproteins of the Rift Valley Fever Virus: Preparation and in Vivo Evaluation. *ACS Applied Bio Materials* 4 (8), 6084–6092, [10.1021/acsabm.1c00426](https://doi.org/10.1021/acsabm.1c00426)
16. Borodina T, Gileva A, Akasov R, Trushina D, Burov S, Klyachko N, González-Alfaro Y, Bukreeva T, **Markvicheva E** (2020). Fabrication and evaluation of nanocontainers for lipophilic anticancer drug delivery in 3D in vitro model. *J Biomed Mater Res B Appl Biomater* 109 (4), 527–537, [10.1002/jbm.b.34721](https://doi.org/10.1002/jbm.b.34721)
17. Gretskeya NM, Gamisonia AM, Dudina PV, Zakharov SS, Sherstyanykh G, Akasov R, Burov S, Serkov IV, Akimov MG, Bezuglov VV, **Markvicheva E** (2020). Novel bexarotene derivatives: Synthesis and cytotoxicity evaluation for glioma cells in 2D and 3D in vitro models. *Eur J Pharmacol* 883, 173346, [10.1016/j.ejphar.2020.173346](https://doi.org/10.1016/j.ejphar.2020.173346)
18. Demina TS, Drozdova MG, Sevrin C, Compère P, Akopova TA, **Markvicheva E**, Grandfils C (2020). Biodegradable Cell Microcarriers Based on Chitosan/Polyester Graft-Copolymers. *Molecules* 25 (8), , [10.3390/molecules25081949](https://doi.org/10.3390/molecules25081949)
19. Selina O, Imatdinov I, Balysheva V, Akasov R, Kryukov A, Balyshev V, **Markvicheva E** (2020). Microencapsulated plasmids expressing Gn and Gc glycoproteins of Rift Valley Fever virus enhance humoral immune response in mice. *Biotechnol Lett* 42 (4), 529–536, [10.1007/s10529-020-02816-1](https://doi.org/10.1007/s10529-020-02816-1)
20. Sami M, Samuel V, Qorri B, Haq S, Burov SV, **Markvicheva E**, Harless W, Szewczuk MR (2020). A triple combination of metformin, acetylsalicylic acid, and oseltamivir phosphate impacts tumour spheroid viability

and upends chemoresistance in triple-negative breast cancer. *Drug Des Devel Ther* 14, 1995–2019, [10.2147/DDDT.S242514](https://doi.org/10.2147/DDDT.S242514)

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22. Ryabaya OO, Prokofieva AA, Khochenkov DA, Akasov RA, Burov SV, **Markvicheva EA**, Stepanova EV (2019). The role of epithelial-to-mesenchymal transition and autophagy in antitumoral response of melanoma cell lines to target inhibition of mek and mtor kinases. *Siberian Journal of Oncology* 18 (3), 54–63, [10.21294/1814-4861-2019-18-3-54-63](https://doi.org/10.21294/1814-4861-2019-18-3-54-63)
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24. Ryabaya O, Prokofieva A, Akasov R, Khochenkov D, Emelyanova M, Burov S, **Markvicheva E**, Inshakov A, Stepanova E (2019). Metformin increases antitumor activity of MEK inhibitor binimetinib in 2D and 3D models of human metastatic melanoma cells. *Biomed Pharmacother* 109, 2548–2560, [10.1016/j.biopha.2018.11.109](https://doi.org/10.1016/j.biopha.2018.11.109)
25. Sazhnev NA, Drozdova MG, Rodionov IA, Kildeeva NR, Balabanova TV, **Markvicheva EA**, Lozinsky VI (2018). Preparation of Chitosan Cryostructures with Controlled Porous Morphology and Their Use as 3D-Scaffolds for the Cultivation of Animal Cells. *APPL BIOCHEM MICRO+* 54 (5), 459–467, [10.1134/S0003683818050162](https://doi.org/10.1134/S0003683818050162)
26. Li X, Sami M, Decarlo A, Burov SV, Akasov R, **Markvicheva E**, Malardier-Jugroot C, Szwczuk MR (2018). Functionalized folic acid-conjugated amphiphilic alternating copolymer actively targets 3D multicellular tumour spheroids and delivers the hydrophobic drug to the inner core. *Nanomaterials (Basel)* 8 (8), , [10.3390/nano8080588](https://doi.org/10.3390/nano8080588)
27. Koloskova OO, Gileva AM, Drozdova MG, Grechihina MV, Suzina NE, Budanova UA, Sebyakin YL, Kudlay DA, Shilovskiy IP, Sapozhnikov AM, Kovalenko EI, **Markvicheva EA**, Khaitov MR (2018). Effect of lipopeptide structure on gene delivery system properties: Evaluation in 2D and 3D in vitro models. *Colloids Surf B Biointerfaces* 167, 328–336, [10.1016/j.colsurfb.2018.04.003](https://doi.org/10.1016/j.colsurfb.2018.04.003)
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29. (conference) Trushina DB, Bukreeva TV, Borodina T, Khovankina AV, Akasov RA, **Markvicheva EA** (2017). Biodegradable containers based on nanostructured polycrystals obtained by controlled crystallization. *Acta Crystallogr A Found Adv* 73, C1286.
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34. Kildeeva NR, Kasatkina MA, Drozdova MG, Demina TS, Uspenskii SA, Mikhailov SN, **Markvicheva EA** (2016). Biodegradable scaffolds based on chitosan: Preparation, properties, and use for the cultivation of animal cells. *APPL BIOCHEM MICRO+* 52 (5), 515–524, [10.1134/S0003683816050094](https://doi.org/10.1134/S0003683816050094)
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38. Akasov R, Haq S, Haxho F, Samuel V, Burov SV, **Markvicheva E**, Neufeld RJ, Szewczuk MR (2016). Sialylation transmorphifies human breast and pancreatic cancer cells into 3D multicellular tumor spheroids using cyclic RGD-peptide induced self-assembly. *Oncotarget* 7 (40), 66119–66134, [10.18632/oncotarget.11868](https://doi.org/10.18632/oncotarget.11868)
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