

## Curriculum vitae: Peter Dubovskii

### Address

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

### Contacts

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### Education

1994–1995	Japan, Kobe	Kobe University	post-doctoral fellowship
1987–1989	USSR, Moscow	Lomonosov Institute of Fine Chemical Technology	PhD
1979–1984	USSR, Moscow	Moscow Institute of Engineering Physics	distinction diploma

### IBCh positions

2018–to date	Senior research fellow
	Research fellow

### Skills

I am proficient in optical (IR-, CD-, fluorescence spectroscopy) and radiospectroscopy (NMR, ESR) techniques for studying the structure of membrane-active compounds, as well as their interaction with lipid and biomembranes. I have programming skills in Python.

### Language Proficiency

Russian (native), English (confident user), German, French, Japanese (reading and translation with dictionary)

### Scientific interests

Polypeptide toxins: structure and interaction with lipid and biomembranes.

### Scientific societies' membership

Member of the Biochemical Society of the USSR (then Russia).

### Titles

Doctor of Philosophy (Chemistry)

### Publications

1. **Dubovskii PV**, Utkin YN (2024). Specific Amino Acid Residues in the Three Loops of Snake Cytotoxins Determine Their Membrane Activity and Provide a Rationale for a New Classification of These Toxins. *Toxins (Basel)* 16 (6), 262, [10.3390/toxins16060262](https://doi.org/10.3390/toxins16060262)
2. Dubova M, **Dubovskii V**, Utkin N, Samygina R (2024). Effect of Microgravity on the Crystallization of Cardiotoxin from the Venom of Spectacled Cobra *Naja naja*. *Cryst. Rep* 68 (6), 900–904, [10.1134/S1063774523601144](https://doi.org/10.1134/S1063774523601144)
3. Дубова КМ, **Дубовский ПВ**, Уткин ЮН, Самыгина ВР (2023). ВЛИЯНИЕ МИКРОГРАВИТАЦИИ НА КРИСТАЛЛИЗАЦИЮ КАРДИОТОКСИНА ИЗ ЯДА ОЧКОВОЙ КОБРЫ *Naja naja*. *Кристаллография* 68 (6), 902–906, [10.31857/S0023476123600465](https://doi.org/10.31857/S0023476123600465)
4. **Dubovskii PV**, Ignatova AA, Alekseeva AS, Starkov VG, Boldyrev IA, Feofanov AV, Utkin YN (2023). Membrane-Disrupting Activity of Cobra Cytotoxins Is Determined by Configuration of the N-Terminal Loop. *Toxins (Basel)* 15 (1), 6, [10.3390/toxins15010006](https://doi.org/10.3390/toxins15010006)
5. **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)
6. Dubinnyi MA, **Dubovskii PV**, Starkov VG, Utkin YN (2021). Corrigendum to “The omega-loop of cobra cytotoxins tolerates multiple amino acid substitutions” [Biochem. Biophys. Res. Commun. 558 (2021) 141–146]. *Biochem Biophys Res Commun* 579, 188, [10.1016/j.bbrc.2021.09.077](https://doi.org/10.1016/j.bbrc.2021.09.077)
  7. Dubinnyi A, **Dubovskii V**, Starkov G, Utkin N (2021). The omega-loop of cobra cytotoxins tolerates multiple amino acid substitutions. *Biochem Biophys Res Commun* 558, 141–146, [10.1016/j.bbrc.2021.04.069](https://doi.org/10.1016/j.bbrc.2021.04.069)
  8. 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)
  9. **Dubovskii PV**, Ignatova AA, Feofanov AV, Utkin YN, Efremov RG (2020). Antibacterial activity of cardiotoxin-like basic polypeptide from cobra venom. *Bioorg Med Chem Lett* 30 (3), 126890, [10.1016/j.bmcl.2019.126890](https://doi.org/10.1016/j.bmcl.2019.126890)
  10. **Dubovskii PV**, Efremov RG (2018). The role of hydrophobic /hydrophilic balance in the activity of structurally flexible vs rigid cytolytic polypeptides and analogues developed on their basis. *Expert Rev Proteomics* 15 (11), 873–886, [10.1080/14789450.2018.1537786](https://doi.org/10.1080/14789450.2018.1537786)
  11. **Dubovskii PV**, Ignatova AA, Volynsky PE, Ivanov IA, Zhmak MN, Feofanov AV, Efremov RG (2018). Improving therapeutic potential of antibacterial spider venom peptides: coarse-grain molecular dynamics guided approach. *Future Med Chem* 10 (19), 2309–2322, [10.4155/fmc-2018-0170](https://doi.org/10.4155/fmc-2018-0170)
  12. **Dubovskii PV**, Dubinnyi MA, Volynsky PE, Pustovalova YE, Konshina AG, Utkin YN, Arseniev AS, Efremov RG (2017). Impact of membrane partitioning on the spatial structure of an S-type cobra cytotoxin. *J Biomol Struct Dyn* 36 (13), 1–16, [10.1080/07391102.2017.1389662](https://doi.org/10.1080/07391102.2017.1389662)
  13. Thien TV, Anh HN, Trang NTT, Trung PV, Khoa NC, Osipov AV, **Dubovskii PV**, Ivanov IA, Arseniev AS, Tsetlin VI, Utkin YN (2017). Low-molecular-weight compounds with anticoagulant activity from the scorpion *Heterometrus laoticus* venom. *Dokl Biochem Biophys* 476 (1), 316–319, [10.1134/S1607672917050052](https://doi.org/10.1134/S1607672917050052)
  14. **Dubovskii PV**, Dubinnyi MA, Konshina AG, Kazakova ED, Sorokoumova GM, Ilyasova TM, Shulepko MA, Chertkova RV, Lyukmanova EN, Dolgikh DA, Arseniev AS, Efremov RG (2017). Structural and Dynamic Portraits of Recombinant and Native Cytotoxin I from *Naja oxiana*: How Close Are They? *Biochemistry* 56 (34), 4468–4477, [10.1021/acs.biochem.7b00453](https://doi.org/10.1021/acs.biochem.7b00453)
  15. Thien TV, Anh HN, Trang NTT, Trung PV, Khoa NC, Osipov AV, **Dubovskii PV**, Ivanov A, Arseniev S, Tsetlin I, Utkin YN (2017). Low-Molecular Compounds with Anticoagulant Activity from Scorpion *Heterometrus laoticus* Venom. *Dokl Biochem Biophys* 476 (4), 476–479, [10.7868/S086956521728026X](https://doi.org/10.7868/S086956521728026X)
  16. Shulepko MA, Lyukmanova EN, Shenkarev ZO, **Dubovskii PV**, Astapova MV, Feofanov AV, Arseniev AS, Utkin YN, Kirpichnikov MP, Dolgikh DA (2017). Towards universal approach for bacterial production of three-finger Ly6/uPAR proteins: Case study of cytotoxin I from cobra *N. oxiana*. *Protein Expr Purif* 130, 13–20, [10.1016/j.pep.2016.09.021](https://doi.org/10.1016/j.pep.2016.09.021)
  17. **Dubovskii PV**, Vassilevski AA, Kozlov SA, Feofanov AV, Grishin EV, Efremov RG (2015). Latarcins: 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)
  18. **Dubovskii PV**, Utkin YN (2015). Antiproliferative activity of cobra venom cytotoxins. *Curr Top Med Chem* 15 (7), 638–648, [10.2174/1568026615666150217113011](https://doi.org/10.2174/1568026615666150217113011)
  19. **Dubovskii PV**, Vorontsova OV, Utkin YN, Arseniev AS, Efremov RG, Feofanov AV (2015). Cobra cytotoxins: Determinants of antibacterial activity. *MENDELEEV COMMUN* 25 (1), 70–71, [10.1016/j.mencom.2015.01.026](https://doi.org/10.1016/j.mencom.2015.01.026)
  20. **Дубовский ПВ**, Уткин ЮН (2014). Цитотоксины кобр: структурная организация и антибактериальная активность. *Acta Naturae* 6 (3), 12–19.
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  22. Babailov SP, **Dubovskii PV**, Zapolotsky EN (2014). Paramagnetic lanthanides as magnetic resonance thermo-sensors and probes of molecular dynamics: Holmium-DOTA complex. *Polyhedron* 79, 277–283, [10.1016/j.poly.2014.04.067](https://doi.org/10.1016/j.poly.2014.04.067)
  23. **Dubovskii PV**, Utkin YN (2014). Cobra cytotoxins: structural organization and antibacterial activity. *Acta Naturae* 6 (3), 11–8.
  24. Kuznetsov AS, **Dubovskii PV**, Vorontsova OV, Feofanov AV, Efremov RG (2014). Interaction of linear

- cationic peptides with phospholipid membranes and polymers of sialic acid. *Biochemistry (Mosc)* 79 (5), 459–468, [10.1134/S0006297914050101](https://doi.org/10.1134/S0006297914050101)
25. **Dubovskii PV**, Utkin YN (2014). Cobra cytotoxins: Structural organization and antibacterial activity. *Acta Naturae* 6 (22), 11–18, [10.32607/20758251-2014-6-3-11-18](https://doi.org/10.32607/20758251-2014-6-3-11-18)
  26. **Dubovskii PV**, Konshina AG, Efremov RG (2014). Cobra cardiotoxins: Membrane interactions and pharmacological potential. *Curr Med Chem* 21 (3), 270–287, [10.2174/09298673113206660315](https://doi.org/10.2174/09298673113206660315)
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  28. **Dubovskii PV** (2012). Unusual titration of the membrane-bound artificial hemagglutinin fusion peptide. *Eur Biophys J* 41 (12), 1077–1084, [10.1007/s00249-012-0867-8](https://doi.org/10.1007/s00249-012-0867-8)
  29. Semenova AA, Chugunov AO, **Dubovskii PV**, Chupin VV, Volynsky PE, Boldyrev IA (2012). The role of chain rigidity in lipid self-association: Comparative study of dihexanoyl- and disorbyl-phosphatidylcholines. *Chem Phys Lipids* 165 (4), 382–386, [10.1016/j.chemphyslip.2011.12.004](https://doi.org/10.1016/j.chemphyslip.2011.12.004)
  30. **Dubovskii PV**, Vassilevski AA, Samsonova OV, Egorova NS, Kozlov SA, Feofanov AV, Arseniev AS, Grishin EV (2011). Novel lynx spider toxin shares common molecular architecture with defense peptides from frog skin. *FEBS J* 278 (22), 4382–4393, [10.1111/j.1742-4658.2011.08361.x](https://doi.org/10.1111/j.1742-4658.2011.08361.x)
  31. **Dubovskii PV**, Vassilevski AA, Slavokhotova AA, Odintsova TI, Grishin EV, Egorov TA, Arseniev AS (2011). Solution structure of a defense peptide from wheat with a 10-cysteine motif. *Biochem Biophys Res Commun* 411 (1), 14–18, [10.1016/j.bbrc.2011.06.058](https://doi.org/10.1016/j.bbrc.2011.06.058)
  32. **Dubovskii PV**, Volynsky PE, Polyansky AA, Karpunin DV, Chupin VV, Efremov RG, Arseniev AS (2008). Three-dimensional structure/hydrophobicity of laticins specifies their mode of membrane activity. *Biochemistry* 47 (11), 3525–3533, [10.1021/bi702203w](https://doi.org/10.1021/bi702203w)
  33. Vassilevski AA, Kozlov SA, Zhmak MN, Kudelina IA, **Dubovskii PV**, Shatursky OY, Arseniev AS, Grishin EV (2007). Synthetic analogues of antimicrobial peptides from the venom of the Central Asian spider *Lachesana tarabaei*. *Russ. J. Bioorganic Chem.* 33 (4), 376–382, [10.1134/S1068162007040024](https://doi.org/10.1134/S1068162007040024)
  34. **Dubovskii PV**, Volynsky PE, Polyansky AA, Chupin VV, Efremov RG, Arseniev AS (2006). Spatial structure and activity mechanism of a novel spider antimicrobial peptide. *Biochemistry* 45 (35), 10759–10767, [10.1021/bi060635w](https://doi.org/10.1021/bi060635w)
  35. Dubinnyi MA, Lesovoy DM, **Dubovskii PV**, Chupin VV, Arseniev AS (2006). Modeling of <sup>31</sup>P-NMR spectra of magnetically oriented phospholipid liposomes: A new analytical solution. *Solid State Nucl Magn Reson* 29 (4), 305–311, [10.1016/j.ssnmr.2005.10.009](https://doi.org/10.1016/j.ssnmr.2005.10.009)
  36. **Dubovskii PV**, Lesovoy DM, Dubinnyi MA, Konshina AG, Utkin YN, Efremov RG, Arseniev AS (2005). Interaction of three-finger toxins with phospholipid membranes: Comparison of S- and P-type cytotoxins. *Biochem J* 387 (3), 807–815, [10.1042/BJ20041814](https://doi.org/10.1042/BJ20041814)
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  38. **Dubovskii PV**, Zhmak MN, Maksaev GI, Arseniev AS (2004). New water-soluble analog of the fusion peptide of influenza virus hemagglutinin: synthesis and properties. *Bioorg Khim* 30 (2), 221–223.
  39. **Dubovskii PV**, Zhmak MN, Maksaev GI, Arseniev AS (2004). A new water-soluble analogue of the fusion peptide of influenza virus hemagglutinin: Synthesis and properties. *Russ. J. Bioorganic Chem.* 30 (2), 196–198, [10.1023/B:RUBI.0000023108.05741.17](https://doi.org/10.1023/B:RUBI.0000023108.05741.17)
  40. Alexeev TA, Dergousova NI, Shibanova ED, Azeeva EA, Kryukova EV, Balashova TA, **Dubovskii PV**, Arseniev AS, Tsetlin VI (2003). 5-Fluorotryptophan-Containing N-Terminal Domain of the  $\alpha$ -Subunit of the *Torpedo californica* Acetylcholine Receptor: Preparation in *Escherichia coli* and <sup>19</sup>F NMR Study. *Russ. J. Bioorganic Chem.* 29 (4), 351–357, [10.1023/A:1024997017191](https://doi.org/10.1023/A:1024997017191)
  41. Alekseev TA, Dergousova NI, Shibanova ED, Azeeva EA, Kriukova EV, Balashova TA, **Dubovskii PV**, Arseniev AS, Tsetlin VI (2003). 5-fluoro-tryptophan-containing N-terminal domain of the  $\alpha$ -subunit of the *Torpedo californica* acetylcholine receptor: preparation in *E. coli* and <sup>19</sup>F NMR study. *Bioorg Khim* 29 (4), 384–390.
  42. **Dubovskii PV**, Lesovoy DM, Dubinnyi MA, Utkin YN, Arseniev AS (2003). Interaction of the P-type

- cardiotoxin with phospholipid membranes. 270 (9), 2038–2046, [10.1046/j.1432-1033.2003.03580.x](#)
43. Efremov RG, Volynsky PE, Nolde DE, **Dubovskii PV**, Arseniev AS (2002). Interaction of cardiotoxins with membranes: A molecular modeling study. *Biophys J* 83 (1), 144–153, [10.1016/S0006-3495\(02\)75156-4](#)
  44. Dubinnyi MA, **Dubovskii PV**, Utkin YN, Simonova TN, Barsukov LI, Arseniev AS (2001). An ESR Study of the Cytotoxin II Interaction with Model Membranes. *Russ. J. Bioorganic Chem.* 27 (2), 84–94, [10.1023/A:1011329002584](#)
  45. Utkin YN, **Dubovskii PV**, Dubinnyi MA, Zharavin VA, Simonova TN, Barsukov LI, Arseniev AS (2001). The Naja oxiana venom cytotoxin II spin-labeled at Lys35 for the EPR study of its interaction with phospholipid membranes. *Bioorg Khim* 25 (12), 930–932.
  46. Iwade M, Asakura T, **Dubovskii PV**, Yamada H, Akasaka K, Williamson MP (2001). Pressure-dependent changes in the structure of the melittin  $\alpha$ -helix determined by NMR. *J Biomol NMR* 19 (2), 115–124, [10.1023/A:1008392327013](#)
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  49. Orekhov VY, **Dubovskii PV**, Yamada H, Akasaka K, Arseniev AS (2000). Pressure effect on the dynamics of an isolated  $\alpha$ -helix studied by  $^{15}\text{N}$ - $^1\text{H}$  NMR relaxation. *J Biomol NMR* 17 (3), 257–263, [10.1023/A:1008346414720](#)
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  51. Kalbitzer HR, Görler A, Li H, **Dubovskii PV**, Hengstenberg W, Kowolik C, Yamada H, Akasaka K (2000).  $^{15}\text{N}$  and  $^1\text{H}$  NMR study of histidine containing protein (HPr) from *Staphylococcus carnosus* at high pressure. *Protein Sci* 9 (4), 693–703, [10.1110/ps.9.4.693](#)
  52. Utkin YN, **Dubovskii PV**, Dubinnyi MA, Zharavin VA, Simonova TN, Barsukov LI, Arseniev AS (1999). The Naja oxiana venom cytotoxin II spin-labeled at Lys35 for the EPR study of its interaction with phospholipid membranes. *Russ. J. Bioorganic Chem.* 25 (12), 828–829.
  53. Efremov RG, Nolde DE, Volynsky PE, Chernyavsky AA, **Dubovskii PV**, Arseniev AS (1999). Factors important for fusogenic activity of peptides: Molecular modeling study of analogs of fusion peptide of influenza virus hemagglutinin. *FEBS Lett* 462 (12), 205–210, [10.1016/S0014-5793\(99\)01505-7](#)
  54. Lurie E, Kaplun A, Vassilenko I, **Dubovskii P**, Shvets V (1995). Interaction of N-(2-hydroxybenzyl)- $\omega$ -amino carbonic acids, novel amphipathic fatty acid derivatives, with membrane: partition coefficients. *BIOCHIM BIOPHYS ACTA* 1235 (2), 256–262, [10.1016/0005-2736\(95\)80012-5](#)