

Philip V. Toukach

Born in 1976.

Education: Russian University of Chemical Technology, 1998

Languages: Russian (native), English (full professional)

Academic degrees (Zelinsky Institute of Organic Chemistry, Russ. Acad. Scis.):

PhD, 2001, in organic chemistry

thesis: "Computer-assisted NMR-spectroscopic structural studies of *Proteus* glycopolymers"

ScD, 2019, in bioorganic chemistry

thesis: "Information technologies in structural glycochemistry and glycobiology"

Academic rank: associate professor, 2010.

Positions:

2001-present: Zelinsky Institute of Organic Chemistry, Russian Academy of Sciences (Russia), *senior scientist*

2002-2016: Lomonosov Moscow Academy of Fine Chemical Technology (Russia), *associate professor*

2012-2018: Lomonosov Moscow State University (Russia), *lecturer*

2002-2005: Borstel Forschungszentrum (Germany), *invited scientist*

2006-2009: Deutsches Krebsforschungszentrum (Germany), *invited scientist*

2003-2019: Moscow Chemical Lyceum, Russian Academy of Sciences (Russia), *IT specialist*

2000-present: freelancer, *studio photographer and polygraphy designer*

Major activities:

1. Leadership in a glycoinformatic software project (Carbohydrate Structure Database, <http://csdb.glycoscience.ru>)
2. Structural elucidation of natural glycopolymers and glycoconjugates by the NMR methods
3. The NMR course in the university and scientific supervision

Major fields of research:

1. Carbohydrate databases and general glycoinformatics;
2. Automated prediction of carbohydrate structure basing on the NMR data;
3. Theoretical modeling of the NMR observables of carbohydrates;
4. NMR elucidation of structure of natural carbohydrates;

Publications, conferences, grants:

85 articles in peer-reviewed referenced scientific journals;

3 book chapters and 7 educational textbooks (NMR);

41 attended international symposia;

Multiple grants by Russian Federation for Basic Research, International Soros Scientific & Educational Program, and other (ISTC, ISF, INTAS, Polish. Acad. Scis., Rus. President Grant, Russian Science Foundation)

Publication and grant list: <http://toukach.ru/publist.htm>

Total citations: 1920 (of them, 1020 since 2014)

Hirsh index: 22 (total), 15 (since 2014)

Lecturing (own courses):

Moscow State University "NMR spectroscopy" (since 2013)

Moscow Acad. Of Fine Chem. Technology "NMR spectroscopy in biochemical research" (2002-2016), "Digital photography and image processing" (2012-2015)

Higher Chem. College, Russ. Acad. Scis. "NMR spectroscopy for chemists" (1998-2003 and since 2014)

Russ. Univ. of Chem. Technology: "Personal computer usage and system administration" (2000-2002)

Web-programming (PHP, SQL, JS) (since 2010)

Photography (since 2010)

Selected publications: (5-year impact factors on the date of publication are in parentheses)

- K.S. Egorova, Ph.V. Toukach "**Glycoinformatics: bridging isolated islands in the sea of data**" (*Angewandte Chemie International Edition* 2018, ePub ahead of print, DOI [10.1002/anie.201803576](https://doi.org/10.1002/anie.201803576)) (12.0)
- R.R. Kapaev, Ph.V. Toukach "**GRASS: semi-automated NMR-based structure elucidation of saccharides**" (*Bioinformatics* 2018, 34(6):957-963, DOI [10.1093/bioinformatics/btx696](https://doi.org/10.1093/bioinformatics/btx696)) (7.3)
- I.Yu. Chernyshov, Ph.V. Toukach "**REStLESS: automated translation of glycan sequences from residue-based notation to SMILES and atomic coordinates**" (*Bioinformatics* 2018, 34(15):2679-2681, DOI [10.1093/bioinformatics/bty168](https://doi.org/10.1093/bioinformatics/bty168)) (7.3)
- Ph. Toukach, K. Egorova "**Carbohydrate Structure Database (CSDB): examples of usage**" (in "*A Practical Guide to Using Glycomics Databases*", ed: K.F. Aoki-Kinoshita, Springer Japan 2017, ch.5:75-113, ISBN 978-4-431-56452-2, DOI [10.1007/978-4-431-56454-6_5](https://doi.org/10.1007/978-4-431-56454-6_5))
- K.S. Egorova, Ph.V. Toukach "**CSDB_GT : a new curated database on glycosyltransferases**" (*Glycobiology* 2017, 27(4):285-290, DOI [10.1093/glycob/cww137](https://doi.org/10.1093/glycob/cww137)) (3.5)
- Ph.V. Toukach, K.S. Egorova "**Carbohydrate Structure Database merged from bacterial, archaeal, plant and fungal parts**" (*Nucleic Acid Research* 2016, 44(D1):D1229-D1236, DOI [10.1093/nar/gkv840](https://doi.org/10.1093/nar/gkv840)) (10.2)
- K.S. Egorova, A.N. Kondakova, Ph.V. Toukach "**Carbohydrate Structure Database: tools for statistical analysis of bacterial, plant and fungal glycomes**" (*Database* 2015, bav073, DOI [10.1093/database/bav073](https://doi.org/10.1093/database/bav073)) (4.5)
- Ph. Toukach, K. Egorova "**Bacterial, Plant, and Fungal Carbohydrate Structure Databases: daily usage**" (in "*Glycoinformatics*", eds: T. Lütke, M. Frank, series: *Methods in Molecular Biology*, v. 1273. Springer Berlin / Humana Press 2015, ch.5:55-85, ISBN 978-1-4939-2342-7, DOI [10.1007/978-1-4939-2343-4_5](https://doi.org/10.1007/978-1-4939-2343-4_5))
- R.R. Kapaev, Ph.V. Toukach "**Improved carbohydrate structure generalization scheme for ¹H and ¹³C NMR simulations**" (*Analytical Chemistry* 2015, 87(14):7006–7010, DOI: [10.1021/acs.analchem.5b01413](https://doi.org/10.1021/acs.analchem.5b01413)) (5.8)
- R.R. Kapaev, K.S. Egorova, Ph.V. Toukach "**Carbohydrate structure generalization scheme for database-driven simulation of experimental observables, such as NMR chemical shifts**" (*Journal of Chemical Information and Modeling* 2014, 54(9):2594–2611, DOI [10.1021/ci500267u](https://doi.org/10.1021/ci500267u)) (4.1)
- Ph. Toukach, K. Egorova "**Bacterial, Plant, and Fungal Carbohydrate Structure Database (CSDB)**" (in "*Glycoscience: Biology and Medicine*", eds: T. Endo, P.H. Seeberger, G.W. Hart, C-H. Wong, N. Taniguchi, Springer Japan 2014, ch. 29: 241-250, ISBN 978-4-431-54840-9, DOI [10.1007/978-4-431-54841-6_24](https://doi.org/10.1007/978-4-431-54841-6_24))
- F.V. Toukach, V.P. Ananikov "**Recent advances in computational predictions of NMR parameters for structure elucidation of carbohydrates: methods and limitations**" (*Chemical Society Reviews* 2013, 42:8376-8415, DOI [10.1039/C3CS60073D](https://doi.org/10.1039/C3CS60073D)) (30.2)
- K.S. Egorova, Ph.V. Toukach "**Critical analysis of CCSD data quality**" (*Journal of Chemical Information and Modeling* 2012, 52(11):2812-2814, DOI [10.1021/ci3002815](https://doi.org/10.1021/ci3002815)) (4.1)
- Ph. Toukach "**Bacterial Carbohydrate Structure Database 3: Principles and Realization**" (*Journal of Chemical Information and Modeling* 2011, 51(1):159-170, DOI [10.1021/ci100150d](https://doi.org/10.1021/ci100150d)) (4.1)
- Ph. Toukach, H. Joshi, R. Ranzinger, Yu. Knirel, C.-W. von der Lieth "**Sharing of worldwide distributed carbohydrate-related digital resources: online connection of the Bacterial Carbohydrate Structure DataBase and GLYCOSCIENCES.de**" (*Nucleic Acid Research* 2007, 35:D280-D286, DOI [10.1093/nar/gkl883](https://doi.org/10.1093/nar/gkl883)) (8.9)
- B.A. Dmitriev, F.V. Toukach, S. Ehlers "**Towards a comprehensive view of the bacterial cell wall**" (*Trends in Microbiology* 2005, 13(12):569-574, DOI [10.1016/j.tim.2005.10.001](https://doi.org/10.1016/j.tim.2005.10.001)) (9.0)

Hobbies:

Autonomous motorized off-road expeditions to wild regions;

Photography (own studio) and image design;

Contacts:

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