Philip V. Toukach

Born in 1976.
Education: Russian University of Chemical Technology, 1998
Languages: Russian (native), English (full professional)

Academic rank: associate professor, 2010.
Academic degrees:
PhD, 2001, in organic chemistry
thesis: "Computer-assisted NMR-spectroscopic structural studies of *Proteus* glycopolymers"
ScD (habilitation), 2019, in bioorganic chemistry
thesis: "Information technologies in structural glycochemistry and glycobiology"

Positions:
2001-present: Zelinsky Institute of Organic Chemistry, Russian Academy of Sciences, *leading researcher*
2021-present: National Research University Higher School of Economics, *professor*
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*
2000-2020: 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:
100 articles in peer-reviewed referenced scientific journals;
3 book chapters and 7 educational textbooks (NMR);
49 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: ~3400 (of them, ~2000 since 2018)
Hirsh index: 27 (total), 20 (since 2017)

Lecturing (own courses)**:**
National Research University Higher School of Economics, Chem. Fac. "NMR spectroscopy" (since 2021)
Moscow State University "NMR spectroscopy" (2014-2019)
Moscow Acad. Of Fine Chem. Technology "NMR spectroscopy in biochemical research" (2002-2016), "Digital photography and image processing" (2012-2015)
Higher Chemical College, Russ. Acad. Scis. "NMR spectroscopy for chemists" (1998-2003 and 2014-2020)
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: *(impact factors on the date of publication are in parentheses)*

- Ph.V. Toukach, K.S. Egorova **"Source files of the Carbohydrate Structure Database: the way to sophisticated analysis of natural glycans"** *(Scientific Data, 2022, 9:131, DOI:* 10.1038/s41597-022-01186-9*)* (6.4)

- A.Y. Bochkov, Ph.V. Toukach **"CSDB/SNFG Structure Editor: an online glycan builder with 2D and 3D structure visualization"** *(Journal of Chemical Information and Modeling, 2021, 61(10): 4940-4948, DOI:* 10.1021/acs.jcim.1c00917 (4.5)

- K.S. Egorova, N.S. Smirnova, Ph.V. Toukach **"CSDB_GT, a curated glycosyltransferase database with close-to-full coverage on the most studied species"** *(Glycobiology, 2021, 31(5):524-529, DOI:* 10.1093/glycob/cwaa107*)* (4.1)

- Ph.V. Toukach, K.S. Egorova **"New features of CSDB Linear, as compared to other carbohydrate notations"** *(Journal of Chemical Information and Modeling, 2020, 60(3):1276-1289, DOI* 10.1021/acs.jcim.9b00744*)* (4.5)

- S.I. Scherbinina, Ph.V. Toukach **"Three-dimensional structures of carbohydrates and where to find them"** *(International Journal of Molecular Science, 2020, 21(20): 7702, DOI* 10.3390/ijms21207702*)* (4.7)

- K.S. Egorova, Ph.V. Toukach **"Glycoinformatics: bridging isolated islands in the sea of data"** *(Angewandte Chemie International Edition 2018, 57:14986-14990, DOI* 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*)* (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*)* (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*)*

- 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*)* (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*)* (4.5)

- R.R. Kapaev, Ph.V. Toukach **"Improved carbohydrate structure generalization scheme for ^{1}H and ^{13}C NMR simulations"** *(Analytical Chemistry 2015, 87(14):7006–7010, DOI:* 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*)* (4.1)

- 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*)* (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*)* (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*)* (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*)* (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*)* (9.0)

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