Curriculum Vitae

Personal information

Olga Tcheremenskaia

Work experience

Positions held:

11/2022- present: Senior Researcher

02/2012-11/2022: Researcher

07/2001-02/2012: Contract Researcher

Employer's name:

Istituto Superiore di Sanità (Italian National Institute of Health), **2001-present**

viale Regina Elena 299, 00161, Rome, Italy

Main Activities and Research topics:

In silico predictive toxicology methods ((Q)SAR models, read-across, grouping), alternative methods to animal testing, NAMS, 3Rs, regulatory toxicology, toxicological risk assessment of chemical in particular for carcinogenicity and genotoxicity endpoints, development of toxicological databases and expert predictive toxicoloty systems, evaluation and development of QSAR models for OECD QSAR toolbox software, toxicological ontology and data standardisation; FAIR principles, Integrated Approach to Testing and Assessment (IATA), Adverse outcome pathway (AOP), evaluation of uncertainties, AOP and IATA internal reviewer at OECD groups, AOP coach at OECD AOP coach group, NAMs evaluation

Main Responsibilities:

Co-coordination of OECD "**(Q)SAR assessment framework project (QAF)**" (working group includes more than 40 international expert): 2021-present, the guidance is expected to be publised in October 2023. The aim of the QAF is to develop a systematic and harmonised framework for the regulatory assessment of (Q)SAR models, predictions, and results based on multiple predictions. The primary audience of the document will be regulatory authorities and their stakeholders.

Serving as an Italian representative at:

- OECD Extended Advisory Group on Molecular Screening and Toxicogenomics (EAGMST), 2014-present, including AOP OECD coaches' group (EAGMST sub-group) for Adverse Outcome Pathway proposals, 2020-present
- OECD QSAR Toolbox Management Group, 2014-present
- OECD IATA Case Studies Project, 2015-present
- OECD group on the good computational method practices (GCMP), 2021-present
- OECD Steering Group for updates on Chemicals Grouping Guidance, 2022-present

- New Advisory Group on Emerging Science in Chemicals Assessment (ESCA), nominated from April 1st , 2023

Coordination of projects:

- 2022-present: Contract: OC/EFSA/SCER/2021/05 (2022-2025): 'Update of the EFSA pesticides genotoxicity database'
- 2017-2019: Contract OC/EFSA/PRAS/2016/01: 'Evaluation of the applicability of existing (Q)SAR models for predicting the genotoxicity of pesticides and similarity analysis related with genotoxicity of pesticides for facilitating of grouping and read across'(consortium of three international partners).
- 2015-2017: Contract: OC/EFSA/PRAS/2015/02 'Development of a consolidated database covering EFSA pesticide outputs on active substances'
- 2015: Contract ECHA/2015/31 "Preparation of carcinogenicity files for integration of carcinogenicity toxicological vocabularies/ontologies within the OECD QSAR Toolbox

2022-present – **Participation** in The European Partnership for the Assessment of Risks from Chemicals (**EU_PARC**), (2022-2027):

- Task 2.2 "Next- Generation Risk Assessment" (NGRA) route,
- T 6.4.2, Project 1: Status of integration and use of New Approach Methodologies in the EU regulatory risk assessment landscape;
- T 6.4.2, Project 2: Next generation risk assessment applied in practice Implement evidence-based toxicology thinking and systematic review principles in the use of data from NAMs;
- T 6.4.2, Project 3: Landscape and readiness of computational new approach methods based on advanced ML and AI approaches for chemicals' next generation risk assessment

Education and training

09/1997-03/2001

Institution where the education or training was followed

N. N. Semenov Institute of Chemical Physics, Russian Academy of Sciences, Moscow, Russia. Address: Russia, 117977, Moscow, Kosygina st., 4

Degree or qualification obtained

PhD in Chemistry (confirmed by certificate of equivalence to the Italian Doctorate Degree, Italian Ministry of Education)

Subjects/skills covered by the education

Bioorganic chemistry, Chemistry of Physiologically Active Substances

09/1991-06/1997

Institution where the education or training was followed

M. V. Lomonosov Moscow State Academy of Fine Chemical Technology, Moscow, Russia. Address: Russia, 119571, Moscow, prosp. Vernadskogo, 86

Degree or qualification obtained

Master Degree in Chemistry (confirmed by certificate of equivalence to the Italian Master's Degree, University of Rome "La Sapienza")

Subjects/skills covered by the education

Biotechnology and organic synthesis

Additional information

Publications

1. Svendsen, Camilla, Whaley, Paul, Vist, Gunn E, Husøy, Trine, Beronius, Anna, Di Consiglio, Emma, Druwe, Ingrid, Hartung, Thomas, Hatzi, Vasiliki I, Hoffmann, Sebastian, Hooijmans, Carlijn, Kass, Georges, Machera, Kyriaki, Robinson, Joshua F, Roggen, Erwin, Rooney, Andrew A, Roth, Nicolas, Spilioti, Eliana, Spyropoulou, Anastasia, **Tcheremenskaia, Olga**; Testai, Emanuela; Vinken, Mathieu; Mathisen, Gro Haarklou. (2023). Protocol for designing INVITES-IN, a tool for assessing the internal validity of in vitro studies. Zenodo. https://doi.org/10.5281/zenodo.7633627 under peer review at the Journal Evidence-Based Toxicology
2. Moretti S, Barola C, Giusepponi D, Paoletti F, Piersanti A, **Tcheremenskaia O**, Brambilla G, Galarini R. Target determination and suspect screening of legacy and emerging per- and poly-fluoro poly-ethers in wild boar liver, in Italy. Chemosphere. 2022 Nov 12;312(Pt 1):137214. doi: 10.1016/j.chemosphere.2022.137214. Epub ahead of print. PMID: 36375613.
3. Bossa C, Branchi I, Caccia B, Cisbani E, Daniele C, D'Avenio G, Esposito G, Facchiano F, Frustagli G, Gagliardi RV, Galluzzi A, Giansanti D, Gigante G, Giuliani A, Le Pera L, Mattia M, Morelli S, Moro O, Palma A, Pazienti A, Picconi O, Pizzi E, Poli C, Ruspantini I, Tait S, **Tcheremenskaia O**; Complex Systems Data Science Group. The challenge of complexity in the Big Data era: how to ride the wave of high-dimensional data revolution. Editorial. Ann Ist Super Sanita. 2022 Jul-Sep;58(3):151-153. doi: 10.4415/ANN_22_03_01. PMID: 36128961.
4. Lorenzetti, S., Battistelli, C. L., Bossa, C., Cozzini, P., Giuliani, A., Nicolotti, O., **Tcheremenskaia, O**., Calleri, M., Caloni, F., Failla, C. M., Granata, P., Kuan, M., Nevelli, F., Vitale, A. and De Angelis, I. (2021) "Application of computational methods in replacement – an IPAM webinar", ALTEX - Alternatives to animal experimentation, 38(2), pp. 348–350. doi: 10.14573/altex.2102011
5. **Olga Tcheremenskaia** & Romualdo Benigni (2021) Toward regulatory acceptance and improving the prediction confidence of in silico approaches: a case study of genotoxicity, Expert Opinion on Drug Metabolism & Toxicology, DOI: 10.1080/17425255.2021.1938540
6. Aksenova NA, **Tcheremenskaia O**, Timashev PS, Solovieva AB. Computational prediction of photosensitizers' toxicity. Journal of Porphyrins and Phthalocyanines. 2021;25(04)
7. Benigni R, Serafimova R, Parra Morte JM, Battistelli CL, Bossa C, Giuliani A, Fioravanzo E, Bassan A, Gatnik MF, Rathman J, Yang C, Mostrag-Szlichtyng A, Sacher O, **and Tcheremenskaia O.** Evaluation of the applicability of existing (Q)SAR models for predicting the genotoxicity of pesticides and similarity analysis related with genotoxicity of pesticides for facilitating of grouping and read across: An EFSA funded project. Regulatory Toxicology and Pharmacology. 2020;114. doi: 10.1016/j.yrtph.2020.104658.
8. Francescangeli F, Contavalli P, De Angelis ML, Careccia S, Signore M, Haas TL, Salaris F, Baiocchi M, Boe A, Giuliani A, **Tcheremenskaia O**, Pagliuca A, Guardiola O, Minchiotti G, Colace L, Ciardi A, D'Andrea V, La Torre F, Medema J, De Maria R, Zeuner A. A pre-existing population of ZEB2+ quiescent cells with stemness and mesenchymal features dictate chemoresistance in colorectal cancer. Journal of Experimental and Clinical Cancer Research. 2020;39(1). doi: 10.1186/s13046-019-1505-4.
9. **Tcheremenskaia O**, Battistelli CL, Giuliani A, Benigni R, Bossa C. In silico

approaches for prediction of genotoxic and carcinogenic potential of cosmetic ingredients. Computational Toxicology. 2019;11:91-100. doi: 10.1016/j.comtox.2019.03.005.

10. Honma M, Kitazawa A, Cayley A, Williams RV, Barber C, Hanser T, Saiakhov R, Chakravarti S, Myatt GJ, Cross KP, Benfenati E, Raitano G, Mekenyan O, Petkov P, Bossa C, Benigni R, Battistelli CL, Giuliani A, **Tcheremenskaia O**, DeMeo C, Norinder U, Koga H, Jose C, Jeliazkova N, Kochev N, Paskaleva V, Yang C, Daga PR, Clark RD, Rathman J. Improvement of quantitative structure-activity relationship (QSAR) tools for predicting Ames mutagenicity: Outcomes of the Ames/QSAR International Challenge Project. Mutagenesis. 2019;34(1):41-8. doi: 10.1093/mutage/gey031.

11. Benigni R, Laura Battistelli C, Bossa C, Giuliani A, Fioravanzo E, Bassan A, Fuart Gatnik M, Rathman J, Yang C, **and Tcheremenskaia O**. Evaluation of the applicability of existing (Q)SAR models for predicting the genotoxicity of pesticides and similarity analysis related with genotoxicity of pesticides for facilitating of grouping and read across. EFSA Supporting Publications. 2019;16(3):1598E. doi: https://doi.org/10.2903/sp.efsa.2019.EN-1598.

12. Bossa C, Benigni R, **Tcheremenskaia O**, Battistelli CL. (Q)SAR methods for predicting genotoxicity and carcinogenicity: Scientific rationale and regulatory frameworks. Methods in Molecular Biology2018. p. 447-73.

13. Benigni R, Battistelli CL, Bossa C, Giuliani A, **Tcheremenskaia O**. Endocrine Disruptors: Data-based survey of in vivo tests, predictive models and the Adverse Outcome Pathway. Regulatory Toxicology and Pharmacology. 2017;86:18-24. doi: 10.1016/j.yrtph.2017.02.013.

14. Benigni R, Bossa C, **Tcheremenskaia O.** A data-based exploration of the adverse outcome pathway for skin sensitization points to the necessary requirements for its prediction with alternative methods. Regulatory Toxicology and Pharmacology. 2016;78:45-52. doi: 10.1016/j.yrtph.2016.04.003.

15. Benigni R, Bossa C, **Tcheremenskaia O**, Battistelli CL, Giuliani A. The Syrian hamster embryo cells transformation assay identifies efficiently nongenotoxic carcinogens, and can contribute to alternative, integrated testing strategies. Mutation Research - Genetic Toxicology and Environmental Mutagenesis. 2015;779:35-8. doi: 10.1016/j.mrgentox.2015.02.001.

16. Benigni R, Battistelli CL, Bossa C, Giuliani A, **Tcheremenskaia O**. Alternative Toxicity Testing: Analyses on Skin Sensitization, ToxCast Phases i and II, and Carcinogenicity Provide Indications on How to Model Mechanisms Linked to Adverse Outcome Pathways. Journal of Environmental Science and Health - Part C Environmental Carcinogenesis and Ecotoxicology Reviews. 2015;33(4):422-43. doi: 10.1080/10590501.2015.1096885.

17. Benigni R, Bossa C, **Tcheremenskaia O.** In vitro cell transformation assays for an integrated, alternative assessment of carcinogenicity: A data-based analysis. Mutagenesis. 2013;28(1):107-16. doi: 10.1093/mutage/ges059.

18. Benigni R, Bossa C, **Tcheremenskaia O.** Nongenotoxic carcinogenicity of chemicals: Mechanisms of action and early recognition through a new set of structural alerts. Chemical Reviews. 2013;113(5):2940-57. doi: 10.1021/cr300206t.

19. Benigni R, Bossa C, Battistelli CL, **Tcheremenskaia O**. IARC Classes 1

and 2 carcinogens are successfully identified by an alternative strategy that detects DNA-reactivity and cell transformation ability of chemicals. Mutation Research - Genetic Toxicology and Environmental Mutagenesis. 2013;758(1-2):56-61. doi: 10.1016/j.mrgentox.2013.09.006.

20. Benigni R, Battistelli CL, Bossa C, **Tcheremenskaia O**, Crettaz P. New perspectives in toxicological information management, and the role of ISSTOX databases in assessing chemical mutagenicity and carcinogenicity. Mutagenesis. 2013;28(4):401-9. doi: 10.1093/mutage/get016.

21. Benigni R, Battistelli CL, Bossa C, Colafranceschi M, **Tcheremenskaia O**. Mutagenicity, carcinogenicity, and other end points. Methods in Molecular Biology2013. p. 67-98.

22. **Tcheremenskaia O**, Benigni R, Nikolova I, Jeliazkova N, Escher SE, Batke M, Baier T, Poroikov V, Lagunin A, Rautenberg M, Hardy B. OpenTox predictive toxicology framework: Toxicological ontology and semantic media wiki-based OpenToxipedia. Journal of Biomedical Semantics. 2012;3(1). doi: 10.1186/2041-1480-3-S1-S7.

23. Benigni R, Bossa C, **Tcheremenskaia O**, Battistelli CL, Crettaz P. The new ISSMIC database on in vivo micronucleus and its role in assessing genotoxicity testing strategies. Mutagenesis. 2012;27(1):87-92. doi: 10.1093/mutage/ger064.

24. Benigni R, Bossa C, **Tcheremenskaia O**, Giuliani A. Alternatives to the carcinogenicity bioassay: In silico methods, and the in vitro and in vivo mutagenicity assays. Expert Opinion on Drug Metabolism and Toxicology. 2010;6(7):809-19. doi: 10.1517/17425255.2010.486400.

25. Benigni R, Bossa C, Giuliani A, **Tcheremenskaia O**. Exploring in vitro/in vivo correlation: Lessons learned from analyzing phase i results of the us EPA's toxcast project. Journal of Environmental Science and Health - Part C Environmental Carcinogenesis and Ecotoxicology Reviews. 2010;28(4):272-86. doi: 10.1080/10590501.2010.525781.

26. Tcheremenskaia O, Giuliani A, Tomasi M. PROFALIGN algorithm identifies the regions containing folding determinants by scoring pairs of hydrophobic profiles of remotely related proteins. Journal of Computational Biology. 2008;15(4):445-55. doi: 10.1089/cmb.2007.0100.

27. Tcheremenskaia O, Marucci G, De Petris S, Ruggeri FM, Dovecar D, Sternak SL, Matyasova I, Dhimolea MK, Mladenova Z, Fiore L, Kraigher A, Bujko M, Trkov M, Bukovski-Simonoski S, Lukic-Grlic A, Sojkova N, Pazdiora P, Kakarriqi E, Bino S, Bebeci D, Korsun N, Gyurova S. Molecular epidemiology of rotavirus in Central and Southeastern Europe. Journal of Clinical Microbiology. 2007;45(7):2197-204. doi: 10.1128/JCM.00484-07.

28. Cheremenskaya OV, Solov'eva AB, Ponomarev GV, Timashev SF. The kinetics of the decomposition of hydrogen peroxide catalyzed by monomeric and dimeric metalloporphyrins. Russian Journal of Physical Chemistry A. 2001;75(10):1633-7.

29. Cheremenskaya OV, Solov'eva AB, Ponomarev GV, Timashev SF. Kinetics of the decomposition of hydrogen peroxide catalyzed by monomeric and dimeric metalloporphyrins. Zhurnal Fizicheskoj Khimii. 2001;75(10):1787-92.

30. Glagolev NN, SoloV'eva AB, Kiryukhin YI, Evstigneeva RP, Luzgina VN, Cheremenskaya OV, Pechenkin AV. Characteristics of Cholesterol Photooxidation in the Presence of Metal-Free Tetraphenylporthyrin. Russian Journal of Physical Chemistry A. 1999;73(3):470-5.

31. Glagolev NN, Solov'eva AB, Kiryukhin YI, Evstigneeva RP, Luzgina VN, Cheremenskaya OV, Pechenkin AV. Characteristics of cholesterol photooxidation in the presence of metaldehyde free tetraphenylporthyrin. Zhurnal Fizicheskoi Khimii. 1999;73(3):548-53.

32. Cheremenskaya OV, Solov'eva AB, Borovkov VV, Ponomarev GV, Yashunskii DV, Timashev SF. Kinetics of hydroxylation of cholesterol in the presence of the ethane-bridged Mn-Cu-Bis(etioporphyrinate) heterodimer. Russian Journal of Physical Chemistry A. 1999;73(12):2048-50.

33. Solov'eva AB, Cheremenskaya OV, Borovkov VV, Ponomarev GV, Timashev SF. Kinetic characteristics of hydroxylation of cholesterol in the presence of dimeric manganese porphyrinates. Russian Journal of Physical Chemistry A. 1998;72(9):1444-8.

34. Solov'eva AB, Cheremenskaya OV, Borovkov VV, Ponomarev GV, Timashev SF. Kinetic patterns of hydroxylation of cholesterol in the presence of dimeric manganese porphyrinates. Zhurnal Fizicheskoi Khimii. 1998;72(9):1601-6.

35. Borovkov VV, Solovieva AB, Cheremenskaya OV, Belkina NV. Enhancement of catalytic efficiency of metalloporphyrin-reductant-molecular oxygen biomimetic system by aminoacid external ligands. Journal of Molecular Catalysis A: Chemical. 1997;120(1-3):L1-L4. doi: 10.1016/S1381-1169(97)00003-4.

36. Solov'eva AB, Cheremenskaya OV, Belkina NV, Evstigneeva RP, Zheltukhina GA, Borovkov VV. The effect of amino acids on the rate of hydroxylation of cholesterol catalyzed by Mn and Fe porphyrinates. Russian Chemical Bulletin. 1996;45(12):2850-3. doi: 10.1007/BF01430659.

Projects

1. 2022-2025 Project of European Food Safety Authority (EFSA): OC/: Contract: OC/EFSA/SCER/2021/05**: 'Update of the EFSA pesticides genotoxicity database', Role: Project Coordinator**

2. 2022-2027 role: Participant, The European Partnership for the Assessment of Risks from Chemicals (EU_PARC), participation at WPs and Tasks on AOP and IATA development, on NAMs validity and on facilitating of regulatory acceptance of NAMs and on data management.

   In particular:

   T2.2 "Next- Generation Risk Assessment" (NGRA) route,

   T6.4. 2.Project 1: Status of integration and use of New Approach Methodologies in the EU regulatory risk assessment landscape;
   T6.4. 2 Project 2: Next generation risk assessment applied in practice Implement evidence-based toxicology thinking and systematic review principles in the use of data from NAMs;
   T6.4. 2 Project 3: Landscape and readiness of computational new approach methods based on advanced ML and AI approaches for chemicals' next generation risk assessment

3. 2017-2019 Project of European Food Safety Authority (EFSA): OC/EFSA/PRAS/2016/01: '**Evaluation of the applicability of existing (Q)SAR models for predicting the genotoxicity of pesticides and similarity analysis related with genotoxicity of pesticides for facilitating of grouping and read across' Role: Project Manager**

4. 2015-2018 Project of European Food Safety Authority (EFSA): OC/EFSA/PRAS/2015/02 '**Development of a consolidated database covering EFSA pesticide outputs on active substances' Role: Project**

Coordinator

5. 2015 Project ECHA/2015/31 "Preparation of carcinogenicity files for integration of carcinogenicity toxicological vocabularies/ontologies within the OECD QSAR Toolbox, Role: Project Coordinator

6. From 2016-2020- 689341-2 INTCATCH H2020-WATER-2015 "**Development and application of Novel, Integrated Tools for monitoring and managing Catchments" (2026-2020) Role: Responsible for data standardization within the Project**

7. 2011-2013 Multiple framework contract with re-opening of competition for the provision of scientific support services – **ONTOLOGY (ECHA/2011/25)** coordinated by ECHA and OECD. The role of our team was to implement the controlled vocabularies (Ontologies) suitable for the standardization and harmonization of the toxicity data in the OECD QSAR Toolbox for six different toxicity endpoints, including carcinogenicity and the AOP-related data for the skin sensitization, Role: Scientist

8. 2013-2014 **Scientific Review of the QSAR Toolbox and usability improvements** (Project **ECHA/2013/167**) coordinated by ECHA and OECD. The ISS team has performed an extensive review and reliability estimation of datasets, profilers, grouping methods and in silico methods for data gap filling included in the OECD QSAR Toolbox, with particular interest for the genotoxicity endpoint, Role: Scientist

9. ISS—Swiss Federal Office of Public Health: '**Construction of a chemical relational database on in vitro Micronucleus assay results'**. 2013. Role: Data Scientist

10. ISS- Swiss Federal Office of Public Health, '**Construction of a chemical relational database on BIOCIDES'**. 2012. Role: Scientist

11. 2009-2011, OpenTox - **An Open Source Predictive Toxicology Framework**, European Commission, FP7 Project, Reference Number Health-F5-2008-200787 The ISS team has led the WP "Toxicity Databases", Role: coordinator the OpenTox Ontology Working Group within the Project.

Memberships

Serving as an Italian representative at

- OECD Extended Advisory Group on Molecular Screening and Toxicogenomics (EAGMST), 2014-present, including AOP OECD coaches' group (EAGMST sub-group) for Adverse Outcome Pathway proposals, 2020-present
- OECD QSAR Toolbox Management Group, 2014-present
- OECD IATA Case Studies Project, 2015-present
- OECD group on the good computational method practices (GCMP), 2021-present
- OECD Steering Group for updates on Chemicals Grouping Guidance, 2022-present
- ew Advisory Group on Emerging Science in Chemicals Assessment (ESCA), nominated from April 1st , 202

Among my resent scientific communications are the oral presentations at the The UK Health Security Agency (UK HSA),The British Toxicology Society (BTS) Workshop on Current Status of New Approach Methodologies (NAMs) for Regulatory Purposes (2021) and at Opentox conference (2021).

Other Relevant Information

Computer skills and competences
Database development, SMILES/SMARTS chemical structure codification, IUCLID, Knime, ChemDraw, Cambridge soft ChemOffice, ACD/ChemFolder,

Statistica (StatSoft), Microsoft Office, Visual Basic and Visual Basic for Application, Microsoft Visual Studio, Development of the decision tree and expert systems (profilers) for mutagenicity and carcinogenicity prediction, business analysis and drafting of documentation for software products.

Teaching activity

- several lectures conducting for IPAM (Italian Platform for Alternative Methods) on AOP concepts and on OECD (Q)SAR Toolbox software (theorical and practical lessons)
- tutoring activity of students from Department of Industrial Engineering (INEG) of Arkansas University on toxicological data management (2020-2022Serving as an internal reviewer for AOP and IATA