Ivan Plyushchenko

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Education

2017-22 PhD (Chemistry) — Lomonosov Moscow State University
Moscow, Russia

2011-17 MSc (Chemistry), GPA: 93.4 — Lomonosov Moscow State University
Moscow, Russia

Key Publications

2022 Deep learning for retention time prediction in reversed-phase liquid chromatography — ES Fedorova, DD Matyushin, IV Plyushchenko, AN Stavrianidi, AK Buryak
Journal of Chromatography A

2022 Hopomics: Humulus lupulus Brewing Cultivars Classification Based on LC-MS Profiling and Nested Feature Selection — YA Ikhalaynen, IV Plyushchenko, IA Rodin
Metabolites

2021 Omics Untargeted Key Script: R-Based Software Toolbox for Untargeted Metabolomics with Bladder Cancer Biomarkers Discovery Case Study — IV Plyushchenko, ES Fedorova, NV Potoldykova, KA Polyakovskiy, ...
Journal of Proteome Research

2021 Untargeted and targeted analysis of sarin poisoning biomarkers in rat urine by liquid chromatography and tandem mass spectrometry — MF Vokuev*, TM Baygildiev*, IV Plyushchenko*, YA Ikhalaynen, ...
Analytical and Bioanalytical Chemistry

2020 An approach for feature selection with data modelling in LC-MS metabolomics — I Plyushchenko, D Shakhmatov, T Bolotnik, T Baygildiev, PN Nesterenko, ...
Analytical methods

Grants and Awards

2018-22 Russian Foundation for Basic Research — Participant
3 grants

2017-21 Russian Science Foundation — Participant
2 grants

2022 Winner of the competition of works contributing to the solution of problems of the Development Program of Moscow State University in the nomination 'Outstanding scientific articles'
Moscow, Russia

2022 Competition of the Russian Academy of Sciences of scientific works of young scientists in chromatography in honor of the 150th anniversary of the birth M.S. Tsvet
Moscow, Russia

2019 The Association for Mass Spectrometry & Advances in the Clinical Lab (MSACL) Conference EU Travel Grant
Salzburg, Austria

2018 International Mass Spectrometry Conference Fellowship
Florence, Italy

2017 The Association for Mass Spectrometry & Advances in the Clinical Lab (MSACL) Conference EU Travel Grant
Salzburg, Austria

Professional Experience

2025.01-now
Postdoctoral Fellow
University of Haifa, Department of Marine Biology

2022.12-2024.12
Graduate Researcher
Technion - Israel Institute of Technology, Biology Faculty

2022.03-2022.11
Postdoctoral Research Fellow
Lomonosov Moscow State University, Chemistry Department

2017.07-2022.02
Junior Research Associate
Lomonosov Moscow State University, Chemistry Department

2016.05-2017.06
Lab Technician
Lomonosov Moscow State University, Chemistry Department

2015.05-2018.06
Analytical Chemist
Analytical centre of Lomonosov Moscow State University

Skills & Proficiencies

Instruments & techniques:

- MS: SCAN, SIM, MRM, DDA, DIA, PASEF, TIMS
- LC: RP, HILIC
- Nano LC: Evosep One (Evosep)
- LC-MS: IT-TOF (Shimadzu); Orbitrap Exploris 120, Orbitrap Q Exactive (Thermo); QTRAP 3200 (Sciex); 6470 (Agilent); timsTOF Pro (Bruker)
- LC-DAD: 1100, 1200, 1290 Infinity (Agilent); Ultimate 3000 (Dionex); LC 20 (Shimadzu); Vanquish (Thermo)
- LC-FLD: 1200 (Agilent); Ultimate 3000 (Dionex)
- CE-UV: G1600AX, 7100 (Agilent)
- GC-MS: GCMS-QP 2010 with SHS (Shimadzu); 7890 B (Agilent)
- GC-FID: GC-2010 (Shimadzu)

Basic lab skills:

- Extraction from liquid & solid media
- SPE, LLE, Soxhlet extraction, centrifugation, membrane filtering
- UV/Vis analysis, pH measurement
- Preparation of calibration curves, QC/QA programs performing, daily maintenance
- Maintenance of mammalian cell lines and bacterial cultures

Programming, Software & Bioinformatics tools:

- R language independent user
- tidyverse, tidymass, RforMassSpectrometry families of packages
- xcms, CAMERA, IPO, MSnbase, MSstats, Biostrings, seqinr, rcdk, caret, H2O, keras, xgboost, ggplot2, dplyr, data.table, RMarkdown, plotly
- tool development list: URL
- full list of R packages that is used for metabolomics processing: URL
- GUI software: MetaboAnalyst, MS-DIAL, MZmine, MS-FINDER, SIRIUS+CSI:FingerID, CFM-ID, MetFrag, GNPS, Open Babel, PathVisio, FragPipe, DIA-NN, Alphapept
- Vendor Software: LabSolutions (Shimadzu); XCalibur, FreeStyle, Compound Discoverer (Thermo); OpenLab, MassHunter, ChemStation (Agilent); Compass HyStar, OtofControl (Bruker)

Certificates & Courses

2025 Introduction to Metabolomics
Technion, Faculty of Medicine
- 24h

2019 Data Science 201: Going Further With R: Tackling Clinical Laboratory Data Manipulation and Modeling
The Association for Mass Spectrometry & Advances in the Clinical Lab (MSACL) Conference EU
- 16 hrs

2017 Metabolomics 202: Approaches, Applications and Challenges
The Association for Mass Spectrometry & Advances in the Clinical Lab (MSACL) Conference EU
- 16 hrs

Teaching and Mentorship

2018-22 Mentoring undergraduates students of Lomonosov Moscow State University, Faculty of Chemistry, including two students' thesis supervision

2018-20 Practical and theoretical classes on analytical chemistry for students of Lomonosov Moscow State University, Faculty of Biology

2016-19 Agilent advanced training courses at the Analytical centre of Lomonosov Moscow State University in LC, LC-MS

Current Journal Roles

Biomedical Chromatography	Peer Reviewer
Journal of Analytical Chemistry	Peer Reviewer
BMC Medicine	Peer Reviewer
Journal of Food Composition and Analysis	Peer Reviewer
Scientific Reports	Peer Reviewer
PLOS Computational Biology	Peer Reviewer
BMC Infectious Diseases	Peer Reviewer
PLOS One	Peer Reviewer
Proteome Science	Peer Reviewer
Journal of Proteome Research	Peer Reviewer
Scientific Data	Peer Reviewer
BMC Bioinformatics	Peer Reviewer
BMC gastroenterology	Peer Reviewer
Nutrition & metabolism	Peer Reviewer
npj Systems Biology and Applications	Peer Reviewer
Journal of Computational Chemistry	Peer Reviewer

Publication List

2023 Glyphosate Effects on Some Characteristics of Biological Activity and Phytotoxicity of Soddy-Podzolic Soil in a Short-Term Model Experiment NV Kostina, MV Gorlenko, KA Mazurov, OI Filippova, IV Plyushchenko, ...
Eurasian Soil Science

2022 Deep learning for retention time prediction in reversed-phase liquid chromatography ES Fedorova, DD Matyushin, IV Plyushchenko, AN Stavrianidi, AK Buryak
Journal of Chromatography A

2022 Hopomics: Humulus lupulus Brewing Cultivars Classification Based on LC-MS Profiling and Nested Feature Selection YA Ikhalaynen, IV Plyushchenko, IA Rodin
Metabolites

2021 Fused 1,2-Diboraoxazoles Based on closo-Decaborate Anion–Novel Members of Diboroheterocycle Class VV Voinova, NA Selivanov, IV Plyushchenko, MF Vokuev, AY Bykov, ...
Molecules

2021 Development of ELISA formats for polymyxin B monitoring in serum of critically ill patients MA Burkin, IA Galvidis, YA Surovoy, IV Plyushchenko, IA Rodin, ...
Journal of Pharmaceutical and Biomedical Analysis

2021 Omics Untargeted Key Script: R-Based Software Toolbox for Untargeted Metabolomics with Bladder Cancer Biomarkers Discovery Case Study IV Plyushchenko, ES Fedorova, NV Potoldykova, KA Polyakovskiy, ...
Journal of Proteome Research

2021 Algorithm of Combining Chromatography–Mass Spectrometry Untargeted Profiling and Multivariate Analysis for Identification of Marker Substances in Samples of Complex Composition IV Plyushchenko, DG Shakhmatov, IA Rodin
Inorganic Materials

2021 Untargeted and targeted analysis of sarin poisoning biomarkers in rat urine by liquid chromatography and tandem mass spectrometry MF Vokuev*, TM Baygildiev*, IV Plyushchenko*, YA Ikhalaynen, ...
Analytical and Bioanalytical Chemistry

2020 The degradation of glyphosate and its effect on the microbial community of agro-sod–podzolic soil under short-term model experiment conditions NA Kulikova, AD Zhelezova, OI Filippova, IV Plyushchenko, IA Rodin
Moscow University Soil Science Bulletin

2020 An approach for feature selection with data modelling in LC-MS metabolomics I Plyushchenko, D Shakhmatov, T Bolotnik, T Baygildiev, PN Nesterenko, ...
Analytical methods

2020 Monoammonium phosphate effects on glyphosate in soils: mobilization, phytotoxicity, and alteration of the microbial community NA Kulikova, AD Zhelezova, MG Voropanov, OI Filippova, IV Plyushchenko, ...
Eurasian Soil Science

2019 Use of chemometric methods of data analysis for the identification and typification of petroleum and petroleum products TA Bolotnik, YV Timchenko, IV Plyushchenko, VV Levkina, AV Pirogov, ...
Journal of Analytical Chemistry

2018 Identification of spillages of semi-volatile hydrocarbon fuels in soils by gas chromatography–mass spectrometry TA Bolotnik, IV Plyushchenko, AD Smolenkov, AV Pirogov, MV Popik, ...
Journal of Analytical Chemistry

Conferences

2023 Untargeted urinary metabolomics for identification of bladder cancer biomarkers using HPLC-MS Euroanalysis XXI, Geneva, Switzerland

2022 Application of gradient boosting machine for signal processing in LC-MS metabolomics 13th Winter Symposium on Chemometrics, Russia

2022 Untargeted metabolomics study of Humulus lupulus brewing cultivars, for genetic origin classification task 13th Winter Symposium on Chemometrics, Russia

2021 Describing metabolome diversity between Humulus lupulus genetic origin groups using UHPLC-MS/MS The 69th Annual Conference on Mass Spectrometry of MSSJ, Japan

2020 Humulus lupulus LC-MS untargeted profiling study for geographic origin classification task 4th International Symposium on Phytochemicals in Medicine and Food, Xi'an, China

2019 Comparison of the kinetics of dyes degradation of handwritten strokes subjected to different types of artificial aging and studied using chromatography mass-spectrometry and statistical data processing 48th International Symposium on High-Performance Liquid Phase Separations and Related Techniques, Milan, Italy

2019 Bioassay Classification Study via LC-MS and Machine Learning in Conjunction with Dimensionality Reduction MSACL 2019 EU, Salzburg, Austria

2018 Typical LC-MS metabolomics workflow for profiling urine samples of patients with colorectal cancer XXII International Mass Spectrometry Conference, Florence, Italy

2017 Simple & Robust Approach in Urinary Metabolomics Based on UPLC-MS for Preoperative Colorectal Cancer Diagnostics MSACL 2017 EU, Salzburg, Austria

2016 Complexation of sulfo-ß-cyclodextrin with fenoterol. Electrophoretic and spectroscopic study VIIIth International Symposium Design and Synthesis of Supramolecular Architectures, Kazan, Russia