Fedorova, Maria, PhD (B08, Z03)

Personal Data

Title	Dr.
First name	Maria
Name	Fedorova
Current position	Research Group Leader in Lipid Metabolism; permanent position
Current institution(s)/site(s), country	Center of Membrane Biochemistry and Lipid Research, University Hospital Dresden (UKD) and Faculty of Medicine, Technische Universität Dresden (TUD), Fetscherstr. 74, 01307 Dresden, Germany
Identifiers/ORCID	ORCID-ID: 0000-0002-4692-3885

Qualifications and Career

Stages	Periods and Details
Degree programme: Biochemistry	2004 – 2006, Master, Faculty of Biology and Soil Science, St. Petersburg State University, Russia
Doctorate: PhD thesis	10.07.2010: Supervisor: Ralf Hoffmann, *"Analysis of protein modifications formed by oxidative stress in vivo"*, Institute of Bioanalytical Chemistry, Faculty of Chemistry and Mineralogy, University of Leipzig, Germany
Stages of academic/ professional career	
2021	Research Group Leader, Lipid Metabolism: Analysis and Integration, Center of Membrane Biochemistry and Lipid Research, UKD, TUD, Dresden, Germany
2012 – 2021	Research Group Leader, Center for Biotechnology and Biomedicine, University of Leipzig, Germany
2010 – 2012	Postdoctoral Fellow, Institute of Bioanalytical Chemistry, Faculty of Chemistry and Mineralogy, University of Leipzig, Germany

Engagement in the Research System

- Co-organizer (and co-PI) of the EMBO Workshop "FERROPTOSIS: When metabolism meets cell death"
- Co-organizer of the Training School "Lipid Metabolism: From Biochemistry to Clinical Translations", 9 – 13 May 2022, Dresden, Germany
- Member of steering committee of German Research Consul (DFG) funded SPP 2306 "Ferroptosis: from Molecular Basics to Clinical Applications" (2021)
- Co-organizer (together with LIPID MAPS consortium) of the Training School in Lipidomics.12 – 16 April 2021, online
- Vice-chair (and grant application co-PI) of COST Action 19105 EpiLipidNET – Pan European Network in Lipidomics and Epilipidomics (since 2020)

- Organizer (and grant PI) of the Training School "LipoSysMed: Integration of large scale lipidomics data in systems medicine research", 18 – 22 March 2019, Leipzig, Germany

Scientific Results

Research of my group, exemplified below with 10 selected publications, is focused on development and application of mass spectrometry based lipidomics and computational solutions (see Category B) to address the diversity of natural lipidomes as well as lipid modifications (epilipidome) in pathophysiological conditions with specific focus on dysmetabolic diseases such as obesity, diabetes and chronic inflammatory disorders.

Category A, * contributed equally, # open access

1. Ni Z, Wölk M, Jukes G, Espinosa KM, Ahrends R, Aimo L, Alvarez-Jarreta J, Andrews S, Andrews R, Bridge A, Clair GC, Conroy MJ, Fahy E, Gaud C, Goracci G, Hartler J, Hoffmann N, Kopczyinki D, Korf A, Lopez-Clavijo AF, Malik A, Ackerman JM, Molenaar MR, O'Donovan C, Pluskal T, Shevchenko A, Slenter D, Siuzdak G, Kutmon M, Tsugawa H, Willighagen EL, Xia J, O'Donnell* VB, **Fedorova M***. Guiding the choice of informatics software and tools for lipidomics biomedical research applications. **Nat Methods** 2023; 20:193-204. doi: 10.1038/s41592-022-01710-0.

2. Criscuolo A, Nepachalovich P, Garcia-del Rio DF, Lange M, Ni Z, Baroni M, Cruciani G, Goracci L, Blüher M, **Fedorova M**. Analytical and computational workflow for in-depth analysis of oxidized complex lipids in blood plasma. **Nat Commun** 2022; 13:6547. doi:10.1038/s41467-022-33225-9. #

3. Lange M, Angelidou G, Ni Z, Criscuolo A, Schiller J, Blüher M, **Fedorova M**. AdipoAtlas: A reference lipidome for human white adipose tissue. Cell Rep Med 2021; 2(10):100407. doi: 10.1016/j.tem.2021.04.012. #

4. Aldrovandi M, **Fedorova M**, Conrad M. Juggling with lipids, a game of Russian roulette. **Trends Endocrinol Metab** 2021; 32(7):463-473. doi: 10.1016/j.tem.2021.04.012.

5. Lange M, **Fedorova M**. Evaluation of lipid quantification accuracy using HILIC and RPLC MS on the example of NIST® SRM® 1950 metabolites in human plasma. **Anal Bioanal Chem** 2020; 412(15):3573-3584. doi: 10.1007/s00216-020-02576-x. #

6. Ni Z, Goracci L, Cruciani G, **Fedorova M**. Computational solutions in redox lipidomics - Current strategies and future perspectives. **Free Radic Biol Med** 2019; 144:110-123. doi: 10.1016/j.freeradbiomed.2019.04.027. #

7. Coliva G, Duarte S, Pérez-Sala D, **Fedorova M**. Impact of inhibition of the autophagy-lysosomal pathway on biomolecules carbonylation and proteome regulation in rat cardiac cells. **Redox Biol** 2019; 23:101123. doi: 10.1016/j.redox.2019.101123. #

8. Ni Z, Angelidou G, Hoffmann R, **Fedorova M**. LPPtiger software for lipidome-specific prediction and identification of oxidized phospholipids from LC-MS datasets. **Sci Rep** 2017; 7(1):15138. doi: 10.1038/s41598-017-15363-z. #

9. Griesser E, Vemula V, Raulien N, Wagner U, Reeg S, Grune T, **Fedorova M**. Cross-talk between lipid and protein carbonylation in a dynamic cardiomyocyte model of mild nitroxidative stress. **Redox Biol** 2017; 11:438-455. doi: 10.1016/j.redox.2016.12.028. #

10. Vemula V, Ni Z, **Fedorova M**. Fluorescence labeling of carbonylated lipids and proteins in cells using coumarin-hydrazide. **Redox Biol** 2015; 5:195-204. doi: 10.1016/j.redox.2015.04.006. #

Category B
Pre-prints:
1. Freitas FP, Nepachalovich P, Puentes L, Zilka O, Inague A, Lorenz S, Kunz V, Nehring H, Xavier da Silva TN, Chen Z, Doll S, Schmitz W, Imming P, Miyamoto S, Klein-Seetharaman J, Kumar L, Genaro-Mattos TC, Mirnics K, Meierjohann S, Kroiss M, Weigand I, Bommert K, Bargou R, Garcia-Saez A, Pratt D, **Fedorova M**, Wehmann A, Horling A, Bornkamm G, Conrad M, Angeli JPF. 7-Dehydrocholesterol is an endogenous suppressor of ferroptosis. **BioRxi** 2022; doi: 10.21203/rs.3.rs-943221/v1.
2. Trautenberg LC, **Fedorova M**, Brankatschk M. Insulin regulates systemic lipid traffic in starving animals. **BioRxiv** 2022; doi: 10.1101/2022.05.09.491148.
3. Ni Z, **Fedorova M**. LipidLynxX: a data transfer hub to support integration of large scale lipidomics datasets. **BioRxiv** 2020; doi: 10.1101/2020.04.09.033894.

Open Access datasets:
1. Open Access dataset "AdipoAtlas: A Reference Lipidome for Human White Adipose Tissue" at Metabolomics Workbench ST001738, doi: 10.21228/M8ZM49.
2. Open Access dataset "Epilipidomics platform for holistic profiling of oxidized complex lipids in blood plasma of obese individuals" at MassIVE MSV000088608, doi: 10.25345/C5SG5C.

Open Access software:
1. LipidLynxX https://github.com/SysMedOs/LipidLynxX
2. LipidHunter https://github.com/SysMedOs/lipidhunter
3. LPPtiger2 https://github.com/LMAI-TUD/lpptiger2
4. AdipoAtlasScripts https://github.com/SysMedOs/AdipoAtlasScripts
5. StarCats https://github.com/SysMedOs/StarCats

Academic Distinctions

- BMBF funded consortium "FERROPath: Ferroptosis as a common underlying pathomechanism in tissue ischemia/reperfusion injury" PI, Coordinator (2022 – 2025)
- Research grant within DFG funded Special Priority Program 2306 "Understanding dynamics of lipid metabolism and oxidation in ferroptotic cell death program" PI (2021 – 2024)
- Vice-chair of Action funded by European Cooperation in Science and Technology (COST) "EpiLipidNET - Pan-European Network in Lipidomics and Epilipidomics", co-PI (2020 – 2024)
- EU Horizon 2020, Marie Sklodowska-Curie Actions Innovative Training Network "Mass spectrometry training in protein lipoxidation analysis for inflammation", Co-PI (2020 – 2024)