Dr. Joana Smirnovienė

Curriculum Vitae

Professional experience

Biotecus

Since 2022 Head of R&D

2021 – 2022 Researcher

Merkadus

Since 2021 Senior Researcher

Institute of Biotechnology, Life Sciences Center, Vilnius University

Since 2022 Scientist

2018 – 2022 Junior researcher

2011 – 2018 Research assistant

2010 – 2011 Intern

Amiloidas

Since 2021 Director

Enzymics

Since 2020 Founder

Inopa

2020 – 2021 Researcher

Kaunas Chamber Theater

2006 – 2010 Administrative assistant

Internship

2011/11 Laboratory of Inorganic and Bioinorganic Chemistry, University of Florence, Italy

Education

2016 – 2022 **Ph.D. Chemical Engineering, Vilnius University**

- L'Oréal Baltic "For Women in Science" Young Talent award in Lithuania (2021)
- Life Sciences Center scholarship for academic achievements
- Research Council of Lithuania scholarships for academic achievements
- Vilnius university one-off earmarked scholarships for academic achievements

2013 – 2015 **M.Sc. Biochemistry, Vilnius University**

- Award of Lithuanian Academy of Sciences for university students' research
- Best Master's Thesis Award from Lithuanian Society of Young Researchers
- President Kazys Grinius memorial scholarship for academic achievements
- Vilnius university scholarships for academic achievements

2009 – 2013 **B.Sc. Bioengineering, Vilnius Gediminas Technical University**

- Laureate of Top 100 Best Graduates from Vilnius Gediminas Technical University

Courses

2022/10–11 **Science Communication for Scientists** (Lithuanian Journalism Centre)

2022/09 Coursera Certificate for **Build Personal Resilience** (Macquarie University, 8AEJGBCA2L47)

2022/09 Coursera Certificate for **The Science of Well-Being** (Yale University, C45PA63ZDXQA)

2022/05 Coursera Certificate for **The Art of Negotiation** (UCI Division of Continuing Education, M2ACM3N53QLP)

2022/04 edX Verified Certificate for **Exercising Leadership: Foundational Principles** (Kennedy School of Government, Harvard University)

Research projects

2021 – 2023 EU Structural Fund project "Development of a prototype technology for evaluating the efficacy of compounds in inhibiting SARS CoV-2 recombinant viral enzymes" (01.2.2-LMT-K-718-05- 0011), implementer - "Vilnius University".

2021 – 2023 EU Structural Fund project „Establishment of R&D Technology Center and development of pharmaceutical products“ (01.2.1-LVPA-K-856-02-0063), implementer - "Merkadus".

2020 – 2022 EU Structural Fund project „Design of anti-Alzheimer‘s Drug Candidates that Inhibit BACE1 Enzymatic Activity and Aggregation of Ab Peptide“ (01.2.2-LMT-K-718-03-0003), implementer - "Vilnius University".

2020 – 2023 EU Structural Fund project „Screening for new methods for treatment of neurodegenerative disorders“ (01.2.2-LMT-K-718-03-0021), implementer - "Vilnius University".

2021 – 2022 EU Structural Fund project "Development of a medicinal analgesic ointment", implementer - "Biotecus".

2021 – 2022 EU Structural Fund project "Protease skin cream prototype" (01.2.1-MITA-T-852-02-0225), implementer - "Enzymics".

2020 – 2021 EU Structural Fund project "Development of a prototype of an antioxidant enzyme-enriched skin care product" (01.2.1-MITA-T-852-02-0111), implementer - "Inopa".

2019 – 2020 Vilnius University project "Target enzyme engineering for research of protein-small molecule interactions“ (MSF-JM-6), implementer - "Vilnius University".

2014 – 2016 Research Council of Lithuania Researcher Groups project „Protein-ligand binding volume and its application in drug design“ (MIP-004/2014), implementer - "Vilnius University".

2012 – 2015 EU Structural Fund project „Design of selective carbonic anhydrase, Hsp90, and Hsp70 inhibitors and investigation of their anticancer properties“ (VP1-3.1-ŠMM-07-K-009), implementer - "Vilnius University".

2012 – 2014 Research Council of Lithuania National Research Programme „Healthy Ageing“ „Determination of the diagnostic potential of carbonic anhydrase hCA XII, cancer cell marker“ (LIG09/2012), implementer - "Vilnius University".

Patents

Matulis, D., Zakšauskas, A., Zubrienė, A., Baranauskienė, L., Matulienė, J., Dudutienė, V., Čapkauskaitė, E, Paketurytė, V., **Smirnovienė, J.** Carbonic anhydrase inhibitors sythesized on interconnecting linker chains, US 63/120,734, 3 December 2020, *patent application*.

Research publications

1. Matulienė, J., Žvinys, G., Petrauskas, V., Kvietkauskaitė, A., Zakšauskas, A., Shubin, K., Zubrienė, A., Baranauskienė, L., Kačenauskaitė, L., Kopanchuk, S., Veiksina, S., Paketurytė-Latvė, V., **Smirnovienė, J.**, Juozapaitienė, V., Mickevičiūtė, A., Michailovienė, V., Jachno. J„ Stravinskienė. D„ Sližienė. A„ Petrošiūtė. A„ Becker, H. M„ Kazokaitė-Adomaitienė, J., Yaromina, A., Čapkauskaitė, E., Rinken, A., Dudutienė, V., Dubois, L. J., Matulis, D. Picomolar fluorescent probes for compound affinity determination to carbonic anhydrase IX expressed in live cancer cells. *Sci Rep.* (2022) 12(1):17644.
2. **Smirnovienė, J.**, Baranauskienė, L., Zubrienė, A., Matulis, D. Stadart Operating Procedure for Enzymatic Activity Inhibition Assay. *Eur. Biophys. J.* (2021) 50, 345–352.
3. **Smirnovienė, J.**, Smirnov, A., Zakšauskas, A., Zubrienė, A., Petrauskas, V., Mickevičiūtė, A., Michailovienė, V., Čapkasukaitė, E.,Manakova, E., Gražulis, S., Baranauskienė, L., Chen, W.-Y., Ladbury, J. E., Matulis, D. Switching the Inhibitor – Enzyme Recognition Profile via Chimeric Carbonic Anhydrase XII. *ChemistryOpen* (2021) 10(5):567-580.
4. Kazokaitė, J., Becker, H. M., **Smirnovienė, J.**, Dubois, L. J., Matulis, D. Experimental approaches to identify selective picomolar inhibitors for carbonic anhydrase IX. *Curr. Med. Chem.* (2021) 28(17):3361-3384.
5. Dudutienė V., Zubrienė A., Kairys V., Smirnov A., **Smirnovienė J.**, Leitans J., Kazaks A., Tars K., Manakova L., Gražulis S., Matulis D. Isoform-Selective Enzyme Inhibitors by Exploring Pocket Size According to the Lock-and-Key Principle. *Biophys J.* (2020) 119(8):1513–1524.
6. Balandis, B., Ivanauskaitė, G., **Smirnovienė, J.**, Kantminienė, K., Matulis, D., Mickevičius, V., Zubrienė, A. Synthesis and structure–affinity relationship of chlorinated pyrrolidinone bearing benzenesulfonamides as human carbonic anhydrase inhibitors, *Bioorg. chem.* 97 (2020) 103658.
7. Kazokaitė, J., Kairys, V., **Smirnovienė, J.**, Smirnov., A., Manakova, E., Tolvanen, M., Parkkila, S., Matulis, D. Engineered Carbonic Anhydrase VI-Mimic Enzyme Switched the Structure and Affinities of Inhibitors *Sci. Rep.* (2019) 9(1):12710 .
8. **Smirnovienė, J.**, Smirnovas, V., and Matulis, D. Picomolar inhibitors of carbonic anhydrase: Importance of inhibition and binding assays. *Anal. Biochem.* 522 (2017) 61-72.
9. Toleikis, Z., Sirotkin V. A., Skvarnavičius G., **Smirnovienė, J.**, Roumestand, Ch., Matulis, D., and Petrauskas, V. Volume of Hsp90 Protein–Ligand Binding Determined by Fluorescent Pressure

Shift Assay, Densitometry, and NMR. *J. Phys. Chem. B* 120 (2016) 9903–9912.

10. Zubrienė, A., **Smirnovienė, J.**, Smirnov, A., Morkūnaitė, V., Michailovienė, V., Jachno, J., Juozapaitienė, V., Norvaišas, P., Manakova, E., Gražulis, S., and Matulis, D. Intrinsic thermodynamics of 4-substituted-2,3,5,6- tetrafluorobenezenesulfonamides binding to carbonic anhydrases by isothermal titration calorimetry. *Biophys. Chem.* 205 (2015) 51–65.
11. Dudutienė, V., Zubrienė, A., Smirnov, A., Timm, D. D., **Smirnovienė, J.**, Kazokaitė, J., Michailovienė, V., Zakšauskas, A., Manakova, E., Gražulis, S., and Matulis, D. Functionalization of fluorinated benzenesulfonamides and their inhibitory properties of carbonic anhydrases. *Chem. Med. Chem.* (2015) 662–687.
12. Kazokaitė, J., Milinavičiūtė, G., **Smirnovienė, J.**, Matulienė, J., Matulis, D. Intrinsic Binding of 4-Substituted-2,3,5,6-tetrafluorobenezenesulfonamides to Native and Recombinant Human Carbonic Anhydrase VI. *FEBS J.* (2015) 972–983.
13. Morkūnaitė, V., **Gylytė, J.**, Zubrienė, A., Baranauskienė, L., Kišonaitė, M., Michailovienė, V., Juozapaitienė, V., Todd, M. J., and Matulis, D. Intrinsic thermodynamics of sulfonamide inhibitor binding to human carbonic anhydrases I and II. *J. Enz. Inhib. Med. Chem.* (2015) 204–211.
14. Dudutienė, V., Matulienė, J., Smirnov, A., Timm, D. D., Zubrienė, A., Baranauskienė, L., Morkūnaitė, V., **Smirnovienė, J.**, Michailovienė, V., Juozapaitienė, V., Mickevičiūtė, A., Kazokaitė, J., Bakšytė, S., Kasiliauskaitė, A., Jachno, J., Revuckienė, J., Kišonaitė, M., Pilipuitytė, V., Ivanauskaitė, E., Milinavičiūtė, G., Smirnovas, V., Petrikaitė, V., Kairys, V., Petrauskas, V., Norvaišas, P., Lingė, D., Gibieža, P., Čapkauskaitė, E., Zakšauskas, A., Kazlauskas, E., Manakova, E., Gražulis, S., Ladbury, J. E., and Matulis, D. Discovery and characterization of novel selective CAIX inhibitors. *J. Med. Chem.* (2014) 9435–9446.
15. Kišonaitė, M., Zubrienė, A., Čapkauskaitė, E., Smirnov, A., **Smirnovienė, J.**, Kairys, V., Michailovienė, V., Manakova, E., Gražulis, S., Tumkevičius, S., and Matulis, D. Intrinsic thermodynamics and structure correlation of benzenesulfonamides with a pyrimidine moiety binding to carbonic anhydrases I, II, VII, XII, and XIII. *PLoS One* 9 (12) (2014), e114106.
16. Zubrienė, A., Čapkauskaitė, E., **Gylytė, J.,** Kišonaitė, M., Tumkevičius, S., Matulis, D. Benzenesulfonamides with benzimidazole moiety as inhibitors of carbonic anhydrases I, II, VII, XII and XIII. *J. Enz. Inhib. Med. Chem.* (2014) 124–131.
17. Čapkauskaitė, E., Zubrienė, A., Smirnov, A., Torresan, J., Kišonaitė, M., Kazokaitė, J., **Gylytė, J.**, Michailovienė, V., Jogaitė, V., Manakova,E. , Gražulis, S., Tumkevičius, S., and Matulis, D. Benzenesulfonamides with pyrimidine moiety as inhibitors of human carbonic anhydrases I, II, VI, VII, XII, and XIII. *Bioorg. Med. Chem.*, 21 (2013) 6937–6947.
18. Dudutienė, V., Zubrienė, A., Smirnov, A., **Gylytė, J.,** Timm, D. D., Manakova, E., Gražulis, S.,Matulis, D. 4-Substituted-2,3,5,6-Tetrafluorobenzenesulfonamides as Inhibitors of Carbonic Anhydrases I, II, VII, XII, and XIII. *Bioorg. Med. Chem.*, 21 (2013) 2093–2106.
19. Petrauskas, V., **Gylytė, J.,** Toleikis, Z., Cimmperman, P., Matulis, D. Volume of Hsp90 ligand binding and the unfolding phase diagram as a function of pressure and temperature. *Eur. Biophys. J.*, 42 (2013) 355–362.
20. Jogaitė, V., Zubrienė, A., Michailovienė, V., **Gylytė, J.,** Morkūnaitė, V., Matulis, D. Characterization of Human Carbonic Anhydrase XII Stability and Inhibitor Binding. *Bioorg. Med. Chem.*, 21 (2013) 1431–1436.

Conference proceedings

1. Skvarnavičius G., Toleikis, Z., Grigaliūnas M., **Smirnovienė, J.**, Norvaišas, P., Cimmperman, P., Matulis, D., and Petrauskas, V. High pressure spectrofluorimetry - a tool to determine protein-ligand binding volume. *J. Phys.: Conf. Ser.*, 950 (2017) 042001.

Participation at conferences and schools

- **3rd Baltic Biophysics Conference.** (2022) Vilnius, Lithuania (local organizing committee member, oral presentation);
- Conference of Estonian, Latvian and Lithuanian Biochemical Societies **FEBS3+** (2022) Tallinn, Estonia (poster presentation);
- **XXI Conference of the International Society for Biological Calorimetry (ISBC)** (2022) Vilnius, Lithuania (poster presentation);
- 17th international conference of life sciences **"The COINS".** (2022) online (poster jury member);
- **Arqus PhD Week for Careers outside Academia.** (2021) Graz, Austria;
- **13th European Biophysics Conference.** (2021) Vienna, Austria (poster presentation);
- **16th international conference of life sciences "The COINS".** (2021) online (poster jury member);
- **Life Sciences Start-up MasterClass.** (2020) Vilnius, Lithuania;
- Cambridge and MIT programme **"Idea to innovation (i2i)"**. (2020) Online course (pitching);
- The fourth COST-sponsored ARBRE-MOBIEU plenary meeting **"Living Molecules: towards Integrative Biophysics of the Cell"**. (2020) Prague, Czechia (*trawel grant*, flash poster presentation);
- 6th Prague-Weizmann Summer School **„Advances in Drug Discovery. Drug discovery and development from basic research through preclinical to clinical phases."** (2019) Prague, Czechia (*trawel grant*, poster presentation);
- **Affinity.** (2019) Stockholm, Sweden (poster presentation);
- **Engaging in Research Policy Discussions.** An event for early career researchers from the Baltic region. (2019) Tallinn, Estonia (*Wellcome Trust trawel grant*, oral presentation);
- **FEBS3+ conference of Latvian, Lithuanian and Estonian Biochemical Societies** (2019) Riga, Latvia (*FEBS trawel grant*, oral presentation);
- **Lithuanian chemists conference "Chemistry and Chemical Technology** (2019) Vilnius, Lithuania (poster presentation);
- **62nd international conference for students of physics and natural sciences "Open Readings 2019".** (2019) Vilnius, Lithuania (poster presentation);
- **14th international conference of life sciences "The COINS 2019".** (2019) Vilnius, Lithuania (poster presentation);
- **Baltic Biophysics Conference.** (2018) Kaunas, Lithuania (poster presentation);
- **Carbonic Anhydrase Minisymposium.** (2018) Vilnius, Lithuania;
- **Life Sciences Baltics.** (2018) Vilnius, Lithuania;
- **15th International Conference of Lithuanian Biochemical Society.** (2018) Dubingiai, Lithuania (poster presentation);
- **Life Sciences Baltics.** (2016) Vilnius, Lithuania;
- **14th International Conference of Lithuanian Biochemical Society.** (2016) Druskininkai, Lithuania (poster presentation);
- **12th Greta Pifat Mrzljak International School of Biophysics.** (2014) Primošten, Croatia (*trawel award*, oral and poster presentations);
- **Life Sciences Baltics.** (2014) Vilnius, Lithuania;
- **13h International Conference of Lithuanian Biochemical Society.** (2014) Birštonas, Lithuania (poster presentation);
- **57th Scientific Conference for Young Students of Physics and Natural Sciences "Open Readings".** (2014) Vilnius Lithuania (poster presentation);

- **58th Biophysical Society Annual Meeting.** (2014) San Francisco, California, USA (poster presentation);
- **2nd Central and Eastern European Conference on Thermal Analysis and Calorimetry (CEEC-TAC2).** (2013) Vilnius, Lithuania (poster presentation);
- **33rd European School of Medicinal Chemistry.** (2013) Urbino, Italy (*trawel award*, poster presentation);
- **56th Scientific Conference for Young Students of Physics and Natural Sciences "Open Readings".** (2013) Vilnius, Lithuania (oral presentation);
- School of the COST Action CM0804 **"Software Tools in Chemical Biology".** (2013) Espoo, Finland;
- **57th Biophysical Society Annual Meeting.** (2013) Philadelphia, Pennsylvania, USA (poster presentation);
- Meeting of the COST Action CM0804 **"Chemical Biology with Natural Products".** (2012) Salerno, Italy (poster presentation);
- **Life Sciences Baltics.** (2012) Vilnius, Lithuania;
- **17th International Society of Biological Calorimetry (ISBC) Conference.** (2012) Leipzig, Germany (poster presentation);
- **22nd Jyväskylä Summer School.** "Drug discovery" course, (2012) Jyväskylä, Finland;
- **The 9th International Conference on Carbonic Anhydrases.** (2012) Antalya, Turkey (poster presentation);

Pedagogical activities

- Supervision of 1 bachelor's thesis (2020).
- 7 invited lectures for school children (2021 – 2022).

Science promotion activities

- 1 interview on the TV show (2021);
- 5 interviews in news portals and magazines (2021);
- Participation at Vilnius University Science Communication Competition "Science Sprint" (2022).
- Participation at podcast "Mokslo sriuba" (2022).