CURRICULUM VITAE

Dr. Inga Songailiene

Research scientist

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Major research interest

CRISPR-Cas systems, toxin-antitoxin modules, bacterial defense mechanisms, bacteriophages, protein-nucleic acid interactions, structural biology

Education

2013-2021	PhD studies on CRISPR-Cas and toxin-antitoxin systems. The PhD thesis defended based on 5 publications.
2011-2013	MSc in Biochemistry *magna cum laude*, Vilnius University.
2007-2011	BSc in Biochemistry *cum laude*, Vilnius University.

Employment positions

2021-present	***Research scientist*** *and* ***lecturer*** *at Vilnius University,* *group leader prof. Virginijus Siksnys* My responsibilities include writing and management of grants and scientific publications, designing of experiments, data analysis, supervising undergraduate students and teaching a course “CRISPR-Cas biology and applications”
2022-present	***Associate research scientist*** *at EMBL-Partnership institute, Vilnius University,* *group leader dr. L. Malinauskaite* My responsibilities include design and implementation of experiments, data analysis, grant applications, supervision of students
2017-2021	*Junior scientist*
2013-2017	*Research assistant*
2010-2013	*Research technician*

Invited conference talks

2022	Lithuanian Business Forum 2022, a speaker in a panel discussion “A role of innovations facing COVID pandemic”.
2022	iNEXT conference, selected short talk, Warsaw, Poland.
2021	Songailiene I, Juozapaitis J, Tamulaitiene G, Sasnauskas G, Venclovas C, Siksnys V “HEPN-MNT toxin-antitoxin as a bacterial ATP sensor”. 2021 Open Readings, Lithuania.

Oral presentations

2021	Songailiene I, Juozapaitis J, Tamulaitiene G, Sasnauskas G, Venclovas C, Siksnys V, “HEPN-MNT toxin-antitoxin as a proposed bacterial ATP sensor”, 2021 EMBO meeting “New approaches and concepts in microbiology”, June 7-9, virtual conference.
2017	Songailiene I, Rutkauskas M, Sinkunas T, Seidel R, Siksnys V, “Target recognition by Cascade complexes bearing altered length crRNA”, FEBS Young Scientist Forum 2017, Israel.

2018	Songailiene I, Rutkauskas M, Sinkunas T, Seidel R, Siksnys V, “Target search by CRISPR-Cas Cascade complex”, FEBS Young Scientist Forum, 2018 and Lithuanian Academy of Sciences, Vilnius.
2016	Songailiene I, Sinkunas T, Rutkauskas M, Seidel R ir Siksnys V, “Cascade complex reconstitution in vitro and R-loop formation by single molecule experiments”, Coins 2016, Lithuania.

Scientific projects

2022-2025	***Research scientist, major implementer*** A project “Functional and structural studies of novel HEPN-domain-containing bacterial antiphage defense systems” founded by Research Council of Lithuania, project PI dr. G. Sasnauskas.
2020-2022	***Junior scientist, major implementer*** A project “Search of Anti-CRISPR proteins and research of their action” founded by Research Council of Lithuania, project PI dr. T. Sinkunas.
2017-2020	***Junior scientist, major implementer*** A project “Characterization of type I-F CRISPR-Cas system and its practical applications” founded by Research Council of Lithuania, project PI dr. G. Tamulaitiene.

Courses and workshops

2022	Practical 4-days hand-on training on sample preparation for cryo-EM and operation of Glacios 200kV TEM, Vilnius
2014	Fundamentals of modern methods of biocrystallography Biocrys2, Oreiras, Portugal. A week-long course with focus on crystallization and X-ray data analysis.
2012	Insubria International Summer School for Heath and Biosciences, Como, Italy. A 4-days general course on methods for biochemistry and structural biology.

Research internships

2023 May	5-days internship at Thermo Fisher NanoPort (Netherlands) to collect cryo-EM data
2015 December	Understanding the concepts of single molecule experiments under supervision of prof. Ralf Seidel, University of Leipzig.
2010 June-October	ERASMUS laboratory practice at the University of Bristol, School of Biomedical Sciences, supervisor prof. H. Mellor.

Teaching

2017-present	“CRISPR-Cas biology and applications“ course for MSc Biochemistry and Medical genetics. 80 academic hours per semester.

Languages

Lithuanian (native), English (fluent working proficiency, C1), German (basics, A2)

Membership in academic organizations

Lithuanian Biochemical Society *Board member*

Organization of conferences

2023	iNEXT-Discovery 2nd Regional Structural Biology Meeting, June 1-2, Vilnius
2020, 2018	Life sciences conference organized by PhD students' "Vita Scientia", Vilnius, Lithuania
2018	Lithuanian Biochemical Society bi-annual conference, Young Scientist Day
2016	Lithuanian Biochemical Society bi-annual conference, Young Scientist Day

Fellowships and awards

2022-2023	The Lithuanian Academy of Sciences Young Scientist Scholarship
2017-2018 2016-2017	Research Council of Lithuania scholarship for PhD students for academic achievements
2018	Best oral presentation award, at conference of The Lithuanian Academy of Sciences, Vilnius.
2016	Best oral presentation award, international conference the Coins 2016.
2014-2015	World Federation of Scientists scholarship
2011	Prof. Martynas Yčas scholarship for undergraduate students who actively contribute to research activities

Scientific collaborations

2021-present	**Dr. E. Koonin** and **dr. K. Makarova** from NCBI, USA on identification of new bacterial defense systems. Outcome – started collaborative experiments, prepared draft.
2017-present	**Dr. S. Sulčius** from Nature Research Center, Lithuania and Technion Israel Institute of Technology, Israel, on analysis of CRISPR-Cas and toxin-antitoxin systems from cyanobacteria. Outcome – one scientific publication.
2015-present	**Prof. R. Seidel** from University of Leipzig, on characterization of CRISPR-Cas systems by single molecule assays. Outcome – three published papers, two submitted papers.

Publications

1. Rutkauskas M, Sinkunas T, **Songailiene I**, Tikhomirova MS, Siksnys V, Seidel R. Directional R-Loop Formation by the CRISPR-Cas Surveillance Complex Cascade Provides Efficient Off-Target Site Rejection. Cell Rep. 2015 Mar 10;10(9):1534-1543. doi: 10.1016/j.celrep.2015.01.067.
2. Tamulaitiene G, Jovaisaite V, Tamulaitis G, **Songailiene I**, Manakova E, Zaremba M, Grazulis S, Xu SY, Siksnys V. Restriction endonuclease AgeI is a monomer which dimerizes to cleave DNA. Nucleic Acids Res. 2017 Apr 7;45(6):3547-3558. doi: 10.1093/nar/gkw1310.
3. **Songailiene I***, Rutkauskas M*, Sinkunas T, Manakova E, Wittig S, Schmidt C, Siksnys V, Seidel R. Decision-Making in Cascade Complexes Harboring crRNAs of Altered Length. Cell Rep. 2019 Sep 17;28(12):3157-3166.e4. doi: 10.1016/j.celrep.2019.08.033
4. Wittig S, **Songailiene I**, Schmidt C. Formation and Stoichiometry of CRISPR-Cascade Complexes with Varying Spacer Lengths Revealed by Native Mass Spectrometry. J Am Soc Mass Spectrom. 2020 Mar 4;31(3):538-546. doi: 10.1021/jasms.9b00011.
5. Tuminauskaite D*, Norkunaite D*, Fiodorovaite M, Tumas S, **Songailiene I**, Tamulaitiene G, Sinkunas T. DNA interference is controlled by an R-loop length in a type I-F1 CRISPR-Cas system. BMC biology. 2020 Jun 15;18(1):65. doi: 10.1186/s12915-020-00799-z.
6. **Songailiene I***, Juozapaitis J*, Tamulaitiene G, Ruksenaite A, Sulčius S, Sasnauskas G, Venclovas Č, Siksnys V. HEPN-MNT toxin-antitoxin system: the toxin is neutralized by OligoAMPylation. Mol Cell, 2020 Dec 17;80(6):955-970.e7. doi: 10.1016/j.molcel.2020.11.034. Epub 2020 Dec 7.
7. Rutkauskas M, **Songailiene I**, Irmisch P, Kemmerich F, Sinkunas T, Siksnys V, Seidel R. A quantitative model for the dynamics of target recognition and off-target rejection by the CRISPR-Cas Cascade complex. Nature communications, 2022. doi: 10.1038/s41467-022-35116-5 Available also in *biorxiv*: *https://doi.org/10.1101/2022.01.26.477710*
8. Kauert D, Madariaga-Marcos J, Rutkauskas M, Wulfken A, **Songailiene I**, Sinkunas T, Siksnys V, Seidel R. The energy landscape for R-loop formation by the CRISPR-Cas Cascade complex. Nature Structural & Molecular Biology, accepted for publication.
9. Aldag P, Rutkauskas M, Madariaga Marcos J, **Songailiene I**, Sinkunas T, Kemmerich F, Kauert D, Siksnys V, Seidel R. Dynamic interplay between target search and recognition for a Type I CRISPR-Cas system. Nature communications, accepted for publication.