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Sandra Sobocanec

Date of birth: 30/05/1975 | **Nationality:** Croatian | **Phone number:** (+385) 14561082 (Work) |

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https://www.irb.hr/eng/About-RBI/People/Sandra-Sobocanec |

Address: 10090, Zagreb, Croatia (Home)

WORK EXPERIENCE

SENIOR RESEARCH ASSOCIATE – RUĐER BOŠKOVIĆ INSTITUTE – 2013 – Current – ZAGREB, CROATIA

RESEARCH ASSOCIATE – RUĐER BOŠKOVIĆ INSTITUTE – 2008 – 2013 – ZAGREB, CROATIA

RESEARCH ASSISTANT – RUĐER BOŠKOVIĆ INSTITUTE – 1999 – 2008 – ZAGREB, CROATIA

EDUCATION AND TRAINING

2006 Zagreb, Croatia
PHD IN BIOLOGICAL SCIENCES Faculty of Science, University of Zagreb

Website https://www.pmf.unizg.hr/biol/en

2003 Zagreb, Croatia
MSC IN BIOLOGICAL SCIENCES Faculty of Science, University of Zagreb

Website https://www.pmf.unizg.hr/biol/en

1999 Zagreb, Croatia
GRADUATE IN BIOLOGICAL SCIENCES Faculty of Science, University of Zagreb

Website https://www.pmf.unizg.hr/biol/en

2013 Zagreb, Croatia
FELASA EQUIVALENT CAT. C LICENCE Faculty of Science, University of Zagreb

Website https://www.pmf.unizg.hr/biol/en

LANGUAGE SKILLS

Mother tongue(s): **CROATIAN**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	C2	C1	C1	C1	C2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

PROJECTS

01/01/2026 – CURRENT
Exploring the Potential of Novel Supplements for Elite Training Performance [P3-SUPREME]

European Structural and Investment Funds - EU IRI S3 - PK.1.1.12.0135. - Principial Investigator

01/01/2026 – CURRENT
Investigation of Sirtuin 3 as a modulator of sex differences in the progression of MAFLD in obesity

Scientific and Technological Collaboration between Austria and Croatia - Principal Investigator

14/12/2023 – CURRENT
Investigating sex-specific metabolic effect of Sirtuin 3 in obesity-related diseases - Obese Sirt

Croatian Science Foundation Project (IP-2020-10-4806) - Principial Investigator

Link https://www.irb.hr/eng/Divisions/Division-of-Molecular-Medicine/Laboratory-for-Metabolism-and-Aging/Projects/Investigating-sex-specific-metabolic-effects-of-Sirtuin-3-in-obesity-related-diseases-Obese-Sirt

2020 – 2023
EU OPKK IRI 2 Project No. 01.2.1.02.0090

"ONE - Research and development of meals for the survival of the new generation"; Project Collaborator

Link https://bit.ly/3LRmNsW

2016 – 2018
EU OPKK IRI Project No. KK 01.2.1.01.0017.

„Cedevita Healthy OTG" - the development of the new, healthier and low-calorie instant vitamin drink"; Project Collaborator

Link https://bit.ly/3z6qsjF

2015 – 2019
Croatian Science Foundation Project (grant No. 4533)

„Sirtuin3 as a mediator of mitochondrial function in estrogen-dependent resistance to hyperoxia and high-fat diet"; Project Collaborator

Link https://bit.ly/3Ot8SLH

HONOURS AND AWARDS

2021
RBI Award for best scientific paper – Institute Ruđer Bošković

Annual award for best scientific publication in Antioxidants (2020)

2019
RBI Award for best scientific paper – Institute Ruđer Bošković

Annual award for best scientific publications in eLife (2018).

2019
RBI Award for best scientific paper – Institute Ruđer Bošković

Annual award for best scientific publications in Aging US (2018).

2017
RBI Award for best scientific paper – Institute Ruđer Bošković

Annual award for best scientific publication in Redox Biology (2016).

2022
Invited lecture – HDIR

The Conference of the Croatian Association for Cancer Research „HDIR-6 Targeting cancer", Zagreb, Croatia

2018
Invited lecture – The COST Action

The COST Action CA 15133, Zagreb, Croatia

2016
Invited lecture – Croatian Society of Biochemistry and Molecular Biology

Congress of the Croatian Society of Biochemistry and Molecular Biology, Zadar, Croatia

PUBLICATIONS

2025
SIRT3-Mediated Mitochondrial Regulation and Driver Tissues in Systemic Aging

This review discusses how age-related decline of the mitochondrial deacetylase SIRT3 contributes to mitochondrial dysfunction, redox imbalance, metabolic decline, and inflammation. It highlights selected “driver tissues” — including liver, adipose tissue, vascular endothelium, bone-marrow macrophages, and ovary — as potential sources of systemic pro-aging signals such as cytokines, oxidized metabolites, extracellular vesicles, and mitochondrial DNA. The review proposes that preserving SIRT3 activity and its NAD^+-dependent network may help maintain mitochondrial quality, limit chronic inflammation, and slow the systemic spread of aging-related dysfunction.

Authors: Šešelja K et al. | **Journal Name**: Genes | **Volume, Issue and Pages**: 2025 Dec 15;16(12):1497 | **Publisher**: MDPI

2025
Mitochondrial Sirt3 in Kidney Aging: Sex-Specific Links to Metabolic Homeostasis and Oxidative Stress

The findings emphasize the sex-specific function of Sirt3 in regulating mitochondrial activity, energy metabolism, and oxidative stress in the murine kidney, with male mice exhibiting a greater reliance on Sirt3 for metabolic stability.

Authors: Šimunić et al. | **Journal Name**: RedoXplore | **Volume, Issue and Pages**: Sep 30;2(1). | **Publisher**: PUBLISHER

2025
Assessment of Oxidative Stress and Associated Biomarkers in Wild Avian Species

Reactive oxygen species (ROS) are natural products of metabolism and environmental or physiological stress, but their excessive accumulation can overwhelm antioxidant defenses and cause oxidative stress. In wild birds, this balance is regulated by enzymatic and non-enzymatic antioxidants and influences health, reproduction, survival, migration, disease progression, and overall fitness. This review summarizes the mechanisms of oxidative stress in wild birds and highlights the role of antioxidant defenses in maintaining health and promoting longevity.

Authors: Faraguna S et al. | **Journal Name**: Animals | **Volume, Issue and Pages**: 15 (9) 2013 | **Publisher**: MDPI

2024
Sirtuin 3 drives sex-specific responses to age-related changes in mouse embryonic fibroblasts

This study investigated how loss of mitochondrial Sirt3 affects mitochondrial function, metabolism, and cellular aging in male and female mouse embryonic fibroblasts exposed to etoposide-induced DNA damage. The results showed that Sirt3 contributes to sex-specific responses to genotoxic stress, with female Sirt3-deficient cells showing greater vulnerability, while male cells appeared more adapted to stress. These findings highlight Sirt3 as a potential sex-specific target in aging-related diseases associated with DNA damage and cellular senescence.

Authors: Šimunić E et al. | **Journal Name**: Mechanisms of Ageing and Development | **Volume, Issue and Pages**: 2024 Oct 11 | **Publisher**: Elsevier

2024
Gene Expression Profiling Reveals Fundamental Sex-Specific Differences in SIRT3-Mediated Redox and Metabolic Signaling in Mouse Embryonic Fibroblasts

This study investigated hormone-independent, sex-specific effects of Sirt3 loss using mRNA sequencing in male and female Sirt3 WT and KO mouse embryonic fibroblasts. Loss of Sirt3 caused distinct changes in global gene expression and basal metabolic pathways, with male cells showing HIF-1α activation, increased reliance on glycolysis and fatty acid

metabolism, and signs of mitochondrial and endoplasmic reticulum stress. In contrast, female cells partially compensated through higher antioxidant enzyme expression, highlighting the importance of considering sex-specific Sirt3 signaling in future research.

Authors: Belužić R et al. | **Journal Name**: International Journal of Molecular Sciences | **Volume, Issue and Pages**: Mar 30;25(7): 3868. | **Publisher**: MDPI

2021
https://pubmed.ncbi.nlm.nih.gov/33924115/

This study investigated how Sirt3 and ovarian hormone depletion affect hepatic responses to 10 weeks of standard- or high-fat diet feeding in female mice. Ovariectomy increased Sirt3 expression and supported lipid metabolism and mitochondrial function in WT mice, while combined ovariectomy and Sirt3 loss impaired fatty acid metabolism, Complex II-driven respiration, antioxidant responses, and increased lipid damage. Overall, the findings suggest that protection against HFD-induced liver metabolic stress in females depends on the combined action of ovarian hormones and Sirt3.

Authors: Pinterić M et al. | **Journal Name**: International Journal of Molecular Sciences | **Volume, Issue and Pages**: Apr 20;22(8): 4277. | **Publisher**: MDPI

2021
Impaired Retromer Function in Niemann-Pick Type C Disease Is Dependent on Intracellular Cholesterol Accumulation

This study investigated whether retromer dysfunction contributes to the pathogenesis of Niemann-Pick type C disease, a rare neurodegenerative disorder caused by intracellular cholesterol accumulation. Using NPC1-deficient cell, neuronal, and mouse models, the authors showed that cholesterol accumulation impairs retromer transport and distribution early in disease progression, including during the presymptomatic stage. The findings suggest that restoring retromer function may represent a potential therapeutic strategy for NPC.

Authors: Dominko K et al. | **Journal Name**: International Journal of Molecular Sciences | **Volume, Issue and Pages**: Dec 9;22(24):13256 | **Publisher**: MDPI

For complete list see https://pubmed.ncbi.nlm.nih.gov/?term=Sobo%C4%8Danec+S&sort=date

PROFFESIONAL TRAINING

02/2016 – 03/2016
Max Planck Institute for Biology of Aging, Cologne, Germany

professional training in Bioinformatics - InnoMol Enhancement of the Innovation Potential in SEE through new Molecular
Solutions in Research and Development

01/2008 – 01/2008
University of Manchester, Great Britain

professional training in Biostatistics - Training School in the Experimental Design and Statistical Analysis of Biomedical Experiments

MANAGEMENT AND LEADERSHIP SKILLS

2019.

Ivana Kučar, bacc. Mol.Biol., graduate thesis - mentorship
2019. Dora Marčinko, bacc. Mol.Biol., graduate thesis - mentorship
2017. Grazia Davidović, bacc. Mol. Biol., graduate thesis - mentorship
2015. Antonija Perović, spec. med. Biochem, doctoral thesis - comentorship
2013. Anita Vidović, Faculty of Science, University of Zagreb, doctoral thesis - mentorship
2011. Željka M Šafranko, Faculty of Science, University of Zagreb, doctoral thesis - mentorship

COMMUNICATION AND INTERPERSONAL SKILLS

2009-present:

Elective course „Biotechnology and Drug Research", Department of Biotechnology, University of Rijeka

2009-2010: Doctoral study, course "Methods for measuring nitric oxide in biological systems", Faculty of Pharmacy and Biochemistry, University of Zagreb
2006: Postgraduate study, course „Neuroimmunology", Faculty of Science, University of Zagreb