







PERSONAL INFORMATION

Maja Herak Bosnar



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-  Skype mherakbosnar

Sex Female | Date of birth 11/08/1969 | Nationality Croatian

WORK EXPERIENCE

- 2018.* Rudjer Bošković Institute  
Senior Scientist  
coordination and organization of scientific research in the field of Nme protein family, supervising diploma and doctoral students, teaching, management
- 2013-2018* Rudjer Bošković Institute  
Senior research associate

  - coordination and organization of scientific research in the field of Nme protein family, supervising diploma and doctoral students, teaching, management
- 2002-2013* Rudjer Bošković Institute  
Postdoctoral fellow, research associate

  - project PI, research in the field of Nme family of proteins, teaching
- 1993-2002* Croatian Academy of Sciences and Arts  
PhD student, postdoctoral fellow

  - research

EDUCATION AND TRAINING

- May 2002 **Ph.D. in Natural Sciences**  
Faculty of Science, University of Zagreb  
Light microscopy, image analysis, teaching, coordination of research
- 1993-1996 **M.Sc. in Molecular and Cellular Biology**  
Faculty of Science, University of Zagreb  
Advanced molecular biology techniques, data analysis, scientific paper writing, teaching
- 1984-1989 **B.Sc. in Molecular Biology**  
Faculty of Science, University of Zagreb  
Molecular biology and protein biochemistry

PERSONAL SKILLS

Mother tongue(s) Croatian

Other language(s)

UNDERSTANDING		SPEAKING		WRITING
Listening	Reading	Spoken interaction	Spoken production	

English	C2	C2	C2	C2	C2
Replace with name of language certificate. Enter level if known.					
Italian	A2	A2	A2	A2	
Replace with name of language certificate. Enter level if known.					

Levels: A1/A2: Basic user - B1/B2: Independent user - C1/C2 Proficient user  
[Common European Framework of Reference for Languages](#)

Communication skills

- Excellent communication skills gained through work as a biology teacher for perennial exams, lecturers in several courses at Universities, teacher and lecturer in methodology courses, work package leader for Recruitment in a FP7/Regpot project, mentor of 5 diploma, 5 doctoral students and 3 postdoctoral fellows.

Organisational / managerial skills

- Principal investigator of four scientific projects, work package leader of one EU project (FP7 Regpot), member of organization committees of several national and international conferences (see additional information)

Job-related skills

- Methods in cell and molecular biology such as cell culture manipulation, PCR, protein analysis techniques, transfection and stable clone preparation, immunofluorescence, fluorescent microscopy etc.

Digital competence

SELF-ASSESSMENT				
Information processing	Communication	Content creation	Safety	Problem solving
Proficient user	Independent user	Independent user	Independent user	Basic user

Levels: Basic user - Independent user - Proficient user  
[Digital competences - Self-assessment grid](#)

Replace with name of ICT-certificate(s)  
 good command of office suite (word processor, spread sheet, presentation software)  
 good command of image analysis software

Driving licence

B

Publications

Beljan S+, Herak Bosnar M+, Četković H+. Rho Family of Ras-Like GTPases in Early-Branching Animals. *Cells* 9: 2279, 2020. +equal contribution

Radić M, Šoštar M, Weber I, Četković H, Slade N, Herak Bosnar M\*. The Subcellular Localization and Oligomerization Preferences of NME1/NME2 upon Radiation-Induced DNA Damage, *Int J Mol Sci* 21: 2363, 2020.

Perina D, Korolija M, Mikoč A, Halasz M, Herak Bosnar M, Četković. Characterization of Nme5-Like Gene/Protein from the Red Alga *Chondrus Crispus*. *Mar. Drugs* 18: 13, 2020.

Ozretić P, Hanžić N, Proust B, Sabol M, Trnski D, Radić M, Musani V, Ciribilli Y, Milas I, Puljiz Z, Herak Bosnar M, Levanat S, Slade N. Expression profiles of p53/p73, NME and GLI families in metastatic melanoma tissue and cell lines // *Scientific Reports*, 1: 12470, 9 2019.

Herak Bosnar M\*, Radić M, Četković H. A young researcher's guide to NME/Nm23/NDP Kinase, *Periodicum biologorum* 120: 3, 2018.

Četković H+, Halasz M+, Herak Bosnar M+: Sponges: A Reservoir of Genes Implicated in Human Cancer. *Marine Drugs*, 16: 20 2018 +equal contribution

- Ćetković H, Harcet M, Roller M, Herak Bosnar M\*. A survey of metastasis suppressors in Metazoa. *Lab Invest*, 98: 554, 2018
- Ćetković H, Herak Bosnar M, Perina D, Mikoč A, Deželjin M, Belužić R, Bilandžija H, Ruiz-Trillo I, Harcet M. Characterization of a group I Nme protein of *Capsaspora owczarzaki*—a close unicellular relative of animals, *Lab Invest*, 98: 304, 2018
- Herak Bosnar M\*, Radić M, Ćetković H. A young researcher's guide to Nm23/Nme/NDP kinase. *Periodicum biologorum*, 120: 3, 2018
- Stojanovic N, Brozovic A, Majhen D, Herak Bosnar M, Fritz G, Osmak M, Ambriovic-Ristov A. Integrin  $\alpha\beta 3$  expression in tongue squamous cell carcinoma cells Cal27 confers anticancer drug resistance through loss of pSrc(Y418). *BBA-Molecular Cell Research*, 1863: 1968, 2016
- Cetkovic H, Perina D, Harcet M, Mikoc A, Herak Bosnar M\*. Nme family of proteins – clues from simple animals. *N-S Arch Pharmacol* 388: 133, 2015
- Franczalsky L, Monostori E, Farkas, Z, Pourkarimi E, Masoudi N, Hargitai B, Herak Bosnar M, Dezeljin M, Zsakaj A, Vellai T, Mehta A, Takacz-Vellai, K. NDK-1, the Homolog of NM23-H1/H<sup>n</sup> regulates cell migration and apoptotic engulfment in *C. elegans*. *PLoS One*, 9,e92687, 2014
- Horvat T, Dezeljin M, Redzic I, Barisic D, Herak Bosnar M, Lauc G, Zoldos V. Reversibility of membrane N-Glycome of HeLa cells upon treatment with epigenetic inhibitors. *PLoS One*, 8, e54672.2013.
- Deželjin M, Herak Bosnar M\*. Metastasis - recent scientific insights and challenging new therapeutic approaches. *Periodicum biologorum* 114: 453, 2012.
- Horvat T, Mužinić I, Barišić D, Herak Bosnar M, Zoldoš V. Epigenetic modulation of HeLa cell membrane N-glycome. *BBA general subjects*, 1820, SI, 1412, 2012.
- Annesley SJ, Bago R, Herak Bosnar M, Filić V, Marinović M, Weber I, Mehta A, Fisher PR. *Dictyostelium discoideum* nucleoside diphosphate kinase C plays a negative regulatory role in phagocytosis, macropinocytosis and exocytosis. *PLoS One*, 6:e26024. 2011.
- Perina D+, Herak Bosnar M\*+, Mikoč A, Müller WEG, Ćetković H. Characterization of Nme6-like gene/protein from marine sponge *Suberites domuncula*. *N-S Arch Pharmacol* 384:451, 2011. +Equal contribution
- Perina D, Herak Bosnar M, Bago R, Mikoč A, Harcet M, Deželjin M, Ćetković H. Sponge non-metastatic Group I Nme gene/protein - structure and function is conserved from sponges to humans. *BMC Evol Biol* 11:87, 2011.
- Peršec Z, Peršec J, Sović T, Romić T, Bosnar Herak M, Hrgović M. Case Report: Metastatic Prostate Cancer in Asymptomatic Patient with Initial Prostate Specific Antigen (PSA) Serum Concentration of 21380ng/ml, *Onkologie* 33: 110, 2010.
- Bago R, Pavelić J, Maravić Vlahoviček G, Herak Bosnar M. Nm23-H1 promotes adhesion of CAL 27 cells in vitro. *Mol Carcinogen* 48: 779, 2009.
- Herak Bosnar M\*, Bago R, Ćetković H. Subcellular localization of Nm23/NDPK A and B isoforms: A reflection of their biological function? *Mol Cell Biochem*, 329: 63, 2009
- Deželjin M, Herak Bosnar M\*, Dubravčić K, Bago R, Pavelić J. The utilization of pEGFP reporter system in cell-cycle analysis of adherent cells. *Periodicum biologorum*. 110: 73-76, 2008
- Herak Bosnar M\*, Dubravčić K, Bago R, Pavelić J. Head and neck tumor cells exhibit altered proliferation upon overexpression of nm23 genes. *Croatica Chem Acta* 81, 183, 2008
- Herak Bosnar M\*, Bago R, Konjevoda P, Pavelić J. Gene expression profiling of Nm23-H2 overexpressing CAL 27 cells using DNA microarray. *Neoplasma* 55: 447, 2008
- Herak Bosnar M\*, Bago R, Gall-Trošelj K, Streichert T, Pavelić J. Downstream targets of Nm23-H1: gene expression profiling of CAL 27 cells using DNA microarray, *Mol Carcinogen* 45: 627, 2006

Herak Bosnar M\*, de Gunzburg J, Bago R, Brečević L, Weber I, Pavelić J. Subcellular localization of A and B NDPK subunits in head and neck tumor cell lines. *Exp Cell Res* 298: 275, 2004

Popović-Hadžija M, Hrašćan R, Herak Bosnar M, Zeljko Ž, Hadžija M, Čadež J, Pavelić K, Kapitanović S. Infrequent alterations of the DPC4 tumor-suppressor gene in renal cell carcinoma, *Urol Res* 32: 229, 2004

Pavelić J, Herak Bosnar M, Kralj M. Gene therapy: concept, current status, moral and ethical aspects. *Periodicum Biologorum* 106: 239, 2004

Pavelić J, Zeljko Ž, Herak Bosnar M. Molecular Genetic Aspects of Prostate Transition Zone Lesions. *Urology* 62: 607, 2003

Pavelić K, Hadžija M, Bedrica Lj, Pavelić J, Đikić I, Katić M, Kralj M, Herak Bosnar M, Kapitanović S, Poljak-Blaži M, Križanac Š, Stojković, Jurin M, Subotić B, Čolić M. Natural zeolite clinoptilolite: new adjuvant in anticancer therapy. *J Mol Med* 78: 708, 2001

Pavelić K, Čabrijan T, Hrašćan R, Vrkljan M, Lipovac M, Kapitanović S, Gall-Trošelj K, Herak Bosnar M, Tomac A, Gršković B, Karapandža N, Pavelić LJ, Krušlin B, Spaventi Š, Pavelić J. Molecular pathology of hemangiopericytomas accompanied by severe hypoglycemia: oncogenes, tumor-suppressor genes and the insulin-like growth factor family. *J. Cancer Res Clin Oncol* 124: 307, 1998

Pavelić J, Herak Bosnar M, Gall-Trošelj K. Limitations of p53 gene intron 6 Msp I RFLP analysis. *Eur J Cancer* 34: 941, 1998

Herak Bosnar M, Pavelić K, Hrašćan R, Zeljko Ž, Krhen I, Mareković Z, Križanac Š, Pavelić J. Loss of heterozygosity of the nm23-H1 gene in human renal cell carcinoma. *J Cancer Res Clin Oncol* 123: 485, 1997

Herak Bosnar M, Pavelić K, Križanac Š, Slobodnjak Z, Pavelić J. Squamous cell lung carcinoma: the role of nm23-H1 gene. *J Mol Med* 75: 609, 1997

Pavelić J, Gall-Trošelj K, Herak Bosnar M, Kardum MM, Pavelić K. PCR amplification of DNA from archival specimens. A methodological approach. *Neoplasma* 43: 75, 1996

## Projects

2019-2020 – **principal investigator** -2019-2020- PI: Mitochondrial NME proteins: candidates for orchestrating mitochondrial shape and cell life and death– French-Croatian bilateral project “Cogito”

2016-2021 - **principal investigator**- Structure, Function and Evolution of Nme6/Nm23-H6 protein (Croatian Science Foundation)

2014-2019 - **collaborator**- New protein networks for novel therapeutic avenues in human melanoma, PI dr.sc. Neda Slade, Croatian Scientific Foundation

2013-2016 - **work package leader** -FP7-Regpot project „Enhancement of the Innovation Potential in SEE through new Molecular Solutions in Research and Development“ InnoMol– coordinator: dr.sc. Oliver Vugrek

2007-2011 - **principal investigator** - The role of nm23 genes in oral squamous cell carcinoma, Ministry of Science, Technology and Sports, Republic of Croatia

2009-2010 - **principal investigator** - The study of intracellular localization and dynamics of NDPK A and B subunits (Nm23-H1 and Nm23-H2) – French-Croatian bilateral project “Cogito”

2008 - **principal investigator**- The role of nm23 genes in oral squamous cell carcinoma, Lutrija Hrvatske (Croatian Lottery)

2002 - 2006 - **collaborator**, “Gene therapy using tumor-suppressor genes“ Ministry of Science, Technology and Sports, Republic of Croatia, principal investigator dr. sc. Jasminka Pavelić

1996-2002- **collaborator**, projekt MZOŠ „Human tumor DNA bank“ – Ministry of Science, Technology

and Sports, Republic of Croatia, principal investigator acad. Šime Spaventi

1993 -1996 - **collaborator** – „Formation of human tumor bank for basic research“ - Ministry of Science, Technology and Sports, Republic of Croatia, principal investigator, acad. Šime Spaventi

#### Mentorships

##### Doctoral thesis:

1. Ružica Bago: The role of nm23-H1 in control of CAL 27 cell adhesion, thesis defended 2007.
2. Zoran Peršec: The role of nm23-H1 in prostate cancer cells during the process of lipid peroxidation, thesis defended 2010.
3. Martina Deželjin: The effect of nm23 gene expression level on metastatic potential of tumor cells in vitro, thesis defended 2011.
4. Martina Radić: Protein interactions of p53 and characterization of cells resistant to targeted therapy by vemurafenib in human melanoma, thesis defended 2021.
5. Bastien Proust: in progress

##### Graduate thesis:

1. Nikolina Nakić: Formation of stable CAL 27 clones constitutively expressing the mutated form of nm23-H2, thesis defended 2007.
2. Ivana Barabaš: Formation of CAL 27 clones with permanently silenced nm23-H2 gene, thesis defended 2011.
3. Lucija Ačkar: NME6 protein localisation and anti-NME6 antibody testing, thesis defended 2018.
4. Ivana Bobić: Characterization of human melanoma cell phenotype after vemurafenib treatment, thesis defended 2019.
5. Ivan Bradić: Interactions between p53 and p53, NME and GLI protein family Members, thesis defended 2019.

**Associate Supervisor of 6 graduate thesis** (Mirjana Marijana Kardum 1994., Maja Jazvinščak 1996., Mario Štefanović 1996., Sanja Bačić 1997., Alen Piljić 2002., Željka Mačak Šafranko 2004.)

#### Honours and rewards

**Annual reward of the Ruđer Bošković Institute** for the scientific publication “Četković H, Herak Bosnar M, Perina D, Mikoč A, Deželjin M, Belužić R, Bilandžija H, Ruiz-Trillo I, Harcet M. Characterization of a group I Nme protein of *Capsaspora owczarzakii*—a close unicellular relative of animals, *Lab Invest* 98, 304–314, 2018.

**Annual reward “Josip Juraj Strossmayer“ for the best scientific publication (Croatian Academy of Science and Arts and Zagreb Fair), 2007, for the textbook:**

*Metode u molekularnoj biologiji* (Methods in Molecular Biology) (editors): Andreja Ambriović Ristov, Anamaria Brozović, Branka Bruvo Mađarić, Helena Četković, Maja Herak Bosnar, Dubravka Hranilović, Silva Katušić Hećimović, Nevenka Meštrović Radan, Snježana Mihaljević, Neda Slade and Dušica Vujaklija, publisher: Institut Ruđer Bošković, Zagreb, 2007.

#### Memberships

##### Memberships in science organizations and bodies:

Member of the Scientific Council of Ruđer Bošković Institute 2016-today (vice president, 2019-today)  
 Member of the Committee for Doctoral Studies of Biology, University of Zagreb, 2015-2018  
 Member of the Oversight Committee of Croatian Association for Cancer Research (branch of the EACR) – 2015-today  
 Member of the Executive Committee of Croatian Society of Biochemistry and Molecular Biology – 2013-2021  
 Vice President of the Croatian Microscopical Society-2020-today

##### Membership in scientific societies:

Croatian Microscopical Society (2014.-today)  
 Croatian Association for Cancer Research (branch of the EACR) 2009 - today  
 Croatian Biological Society 2007.-today  
 Croatian Society of Biochemistry and Molecular Biology, 1996.-today  
 Hrvatsko Society of Human Genetics, 1994.-today  
 European Urology Association, 1995-2000.

#### Reviewing

##### Scientific reviewer for journals:

Apoptosis  
 Naunyn-Schmiedeberg's Archives of Pharmacology  
 Laboratory Investigation  
 Periodicum Biologorum  
 Journal of Investigative genomics  
 International Journal of Molecular Sciences  
 Molecules

##### Scientific reviewer for foundations:

Croatian Ministry for Science Education and Sports (2006)  
Croatian Scientific Foundation (2018, 2019, 2020)

#### Teaching

2008 - present: Molekularne osnove metastaziranja (Molecular Basis of Metastasis Formation), doctoral study in Molecular Bioscience, University Josip Juraj Strossmayer Osijek), University in Dubrovnik and Rudjer Bošković Institute

2010 - present: Biologija tumorskih stanica (Tumor Cell Biology), doctoral study in Biology, Faculty of Science, University of Zagreb

#### Invited lectures at conferences

1. "nm23 gene – a target for gene therapy?" – 3rds Croatian Congress in Pharmacology, Zagreb, Croatia, September 18-21, 2001.
2. Methods of visualization of gene products in living cells (GFP) (in Croatian) – 21st Memorial Meeting in Honor of Professor S. Saltikow, Zagreb, Croatia, October 10, 2003.
3. Subcellular localization of Nm23/NDPK subunits in HEp-2 cells\_ 2nd Croatian Congress on Microscopy, Topusko, Croatia, May, 18-21, 2006.
4. Herak Bosnar, Maja; de Gunzburg, Jean; Bago, Ružica; Weber, Igor; Pavelić, Jasminka; Perina, Dragutin; Mikoč, Andreja; Četković, Helena.; Subcellular localization of NDPKs: How far is a sponge from a human? 7th International Congress of the NDP Kinase/NM23/Awd Family, Dundee, UK, 2007.
5. Herak Bosnar, Maja; de Gunzburg, J.; Bago, Ružica; Brečević, Lukrecija; Weber, Igor; Pavelić, Jasminka. NM23/NDPK Subunits in Head and Neck Tumor Cells : Where do they go? // Proceedings of Abstracts of the 12th World Congress on Advances in Oncology and 10th International Symposium of Molecular Medicine and Cancer Chemoprevention Symposium Heraklion, Crete, Greece, October 2007.
6. Herak Bosnar, Maja; Perina, Dragutin; Bago, Ružica; Mikoč, Andreja; Harcet, Matija; Deželjin, Martina; Četković, Helena. Characterization of ancestral-type Grope I Nm23 gene/protein - structure and function is conserved from sponges to humans // 8th International Congress of the NDP kinase/Nm23/awd Family-From Basic Science to Clinical Application 2010. Heidelberg, Germany, October 25-28, 2010.
7. Herak Bosnar, Maja; Perina, Drago; Harcet, Matija; Mikoč, Andreja; Deželjin, Martina; Četković, Helena. Nme family members in non-bilaterian Metazoans. 9<sup>th</sup> International Congress on the NDP kinase/Nm23/ awd Family. A new frontier in cell and cancer biology. Boston July31-August 4, 2013.
8. Herak Bosnar Maja, Perina Drago, Harcet Matija, Mikoš Andreja, Bago Ružica, Deželjin Martina, Četković Helena. The metastasis suppressor gene family Nme/Nm23/NDPK lessons from model organisms. HDIR-4: From bench to Clinic: Forth Meeting of the Croatian Association for Cancer Research, HDIR (Hrvatsko društvo za istraživanje raka, national branch of EACR) with international participation, November 3-4, 2016, Zagreb, Croatia
9. Herak Bosnar, Maja, Perina Drago, Harcet Matija, Mikoš Andreja, Bago Ružica, Deželjin Martina, Četković Helena. NME/NM23/ NDPK from unicellular eukaryotes to humans. FEBS3+ From molecules to living organisms, 2-5- 2018. Siofok, Hungary
10. Herak Bosnar, Maja and Helena Četković: NME6- a step further in understanding the Group II family members

#### Scientometry

521 citations in 34 scientific papers, h-index 13

#### Organization of conferences

**Main organizer**, chair of the Organizing Committee and a member of the Scientific Committee of the 10<sup>th</sup> International Congress of the NDP Kinase/Nm23/awd Gene Family, October 9-13 2016, Dubrovnik, Croatia

#### Member of the organizing committee:

1. New Aspects in Molecular Medicine 3, Molecular Endocrinology, September 8-9, 1996, Zagreb, Croatia
2. 2<sup>nd</sup> International Conference on Signal Transduction, May 26-31, 2000, Cavtat-Dubrovnik,



Croatia

3. 1<sup>st</sup> International Conference on Mechanisms of Action of Nutraceuticals, October 14-19, 2001, Zagreb, Croatia
4. 3<sup>rd</sup> International Conference on Signal Transduction, May 17-23, 2002, Cavtat-Dubrovnik, Croatia
5. HDBMB 2014, The Interplay of Biomolecules (biannual meeting of Croatian FEBS branch), September 24-27, 2014, Zadar Croatia

**Member of the scientific committee:**

1. Second Meeting of the Croatian Association for Cancer Research, HDIR (Hrvatsko društvo za istraživanje raka, national branch of EACR) with international participation, November 8-9, 2012, Zagreb, Croatia
2. Third Meeting of the Croatian Association for Cancer Research, HDIR (Hrvatsko društvo za istraživanje raka, national branch of EACR) with international participation, November 6-7, 2014, Zagreb, Croatia
3. HDBMB 2014, The Interplay of Biomolecules (biannual meeting of Croatian FEBS branch), September 24-27, 2014, Zadar Croatia
4. HDBMB2016 on the occasion of the 40th Anniversary, (biannual meeting of Croatian FEBS branch), June 1-4, 2016, Split, Croatia
5. Forth Meeting of the Croatian Association for Cancer Research, HDIR (Hrvatsko društvo za istraživanje raka, national branch of EACR) with international participation, November 3-4, 2016, Zagreb, Croatia
6. Fifth Meeting of the Croatian Association for Cancer Research, HDIR (Hrvatsko društvo za istraživanje raka, national branch of EACR) with international participation, November 8-10, 2018, Zagreb, Croatia
7. HDBMB2019 Crossroads in Life Sciences, September 25-28 Lovran, Hrvatska
8. FEBS2021 The 45<sup>th</sup> FEBS Congress, July 3-8 2021, Ljubljana, Slovenia

**Other activities**

- Scientific reviewer for 6 high-school textbooks in biology (Publisher "Neodidacta d.o.o., Zagreb")
- Lecturing in courses organized by Ruđer Bošković Institute „Tečajevi u biologiji i medicini“ (Courses in Biology and Medicine)-2005-2015
- Active participation in promotion of science (RBI Open Days 2010, 2013; scientific and popular lecture series at RBI "Science for Public", lecturer at "Science Festival" 2019)
- Perennial lecturer for university entrance exams (1996-2004)