



**MEDri**



**UNIRI**

# Me & My HRZZ-i

Tihana Lenac Roviš

# TIHANA LENAC ROVIŠ, PHD

## *Curriculum Vitae*

### PERSONAL DATA

Researcher unique identifier(s): ResearcherID: C-5857-2018; <https://orcid.org/0000-0002-3299-1334>

Date of birth: 25.11.1978

### CURRENT POSITION

2019- **Full professor**; Center for Proteomics, MEDRI; Research interest:

Molecular mechanisms of viral immunosubversion

Development of immuno-regulatory antibodies

### PREVIOUS POSITIONS

2016-2018 **Associate professor**; Center for Proteomics, MEDRI;

2013-2014 **TALENTS FVG Fellow**; Laboratory of Prion Biology, The International School for Advanced Studies (SISSA), Trieste, Italy;

Research interest: Strategies for eliminating PrP<sup>C</sup> as the substrate for prion conversion

2009-2013 **Assistant professor**; Center for Proteomics, MEDRI;

Research interest: Immunobiology of herpesviral infection, Monoclonal antibody development

2007-2009 **2 maternity leaves**;

2002-2007 **PhD student**; Department of Histology and Embryology, MEDRI

**Short-term positions** - in frame of FP7 Marie Curie Industry-Academia Partnerships:

3 months (2014 & 2016); Genos, **SME**, Zagreb, Croatia: Protein and antibody glycoanalysis

3 months (Dec. 2015-Feb. 2016); BIA Separations, **SME**, Ajdovscina, Slovenia: Immunoaffinity purification

# TIHANA LENAC ROVIŠ, PHD

## *Curriculum Vitae*

### **TEACHING ACTIVITIES**

**Programmes:** Integrated undergraduate/graduate study of Medicine; Graduate programme for medicine-laboratory diagnostic engineers; Postgraduate programme of biomedicine; Graduate programme for drug research and development; Graduate programme for biotechnology in medicine; Undergraduate programme for pharmaceutical research and development

#### **Course coordinator**

1. Monoclonal antibodies in medicine; Doctoral Programme “Biomedicine“ (2022-)
2. Experimental antibody development; Integrated undergraduate/graduate study of Medicine (2018-)
3. Protein immunoassay methods; Integrated undergraduate/graduate study of Medicine (2018-)
4. Proteins and their modifications; Integrated undergraduate/graduate study of Medicine (2018-)
5. Proteins and recombinant proteins-production and analysis; Integrated u/g study of Medicine (2011-2017)
6. Methods in protein analysis; Graduate programme “Drug research and development“ and Graduate programme “Biotechnology in medicine“ (2012-2015)
7. Viral mechanisms of immunoevasion; Doctoral Programme “Biomedicine“ (2010)

#### **Course associate**

1. Innate immunity; Doctoral Programme “Biomedicine“ (2022-)
2. Application of research methods; Doctoral Programme “Biomedicine“ (2022-)
3. Viral pathogenesis II; Doctoral Programme “Biomedicine“ (2022-)
4. Histology and embryology; Integrated study of Medicine & Graduate study of Dental Medicine (2002-)
5. Histological techniques, Integrated undergraduate and graduate study of Medicine and Graduate programme “Diagnostic and Laboratory Medicine Engineering (2008-)
6. Molecular biology; Graduate programme “Diagnostic and Laboratory Medicine Engineering“ (2002-2014)
7. Immunology; Undergraduate programme “Pharmaceutical Research and Development“ (2012-2014)

# TIHANA LENAC ROVIŠ, PHD

## *Curriculum Vitae*

### **PUBLICATIONS**

- **40 publikacija, sve Q1**
- **1000 citata, h index 17**

# TIHANA LENAC ROVIŠ, PHD

## *Curriculum Vitae*

### ONGOING PROJECTS

#### PI:

1. Immunoregulatory role of PrP<sup>C</sup> protein in immune antiviral response and resistance to cytomegalovirus infection; **Croatian Science foundation, IP-2020-02; 2021-2024**; EUR 150.000.
2. Research Mentorship Program for a doctoral-level graduate; **Croatian Science foundation, project 6543**; 2019.-2023; 4-year PhD student salary
3. **University Project Support**, Relationship between PrP<sup>C</sup> protein and immune system during viral infection, Project uniri-biomed-18-23, EUR 5.000/year; 2019-

#### Associate:

1. Work package leader: Centre of excellence for virus immunology and vaccines, **European regional Development Fund**; 2017-2022; Total funding for the MEDRI: EUR 2.450.000
2. Development of an innovative rapid test for the diagnosis of subclinical mastitis in dairy cows; **European Structural and Investment Funds**, 2020.-2023. KK.01.1.1.04.0086 MEDRI: EUR 150.000
3. Pathogenesis of cytomegalovirus infection in the adrenal gland; **Croatian Science foundation**, IP-2020-02; 2021-2024; EUR 150.000.

# TIHANA LENAC ROVIŠ, PHD

## *Curriculum Vitae*

### COMPLETED PROJECTS

#### PI:

1. Molecular mechanisms of PVR (CD155) immunological pathways in viral and tumor pathogenesis; **Croatian Science foundation**, project 1533; 2015-2017; EUR 100.000;
2. Research Mentorship Program for a doctoral-level graduate; **Croatian Science foundation**, project 9066; 2015.-2018; 4-year PhD student salary
3. Molecular mechanisms of the cytomegaloviral regulation of the PVR protein and its interaction partners; **University of Rijeka**, Project 13.06.2.1.54, 2014-2018; EUR 27.000;

#### Associate:

Training manager: Methods for high-throughput glycoproteomic analysis; **FP7-PEOPLE-IAPP** (Industry-Academia Partnerships and Pathways); 2013-2016; MEDRI: EUR 320.000;  
Co-mentor of Marie Curie Early-stage Research Fellow: A training network for the rational design of the next generation of well-defined glycoconjugate vaccines; **MSCA-ITN-ETN/H2020**; Coordinator: Novartis Vaccines and Diagnostics S.R.L.; 2015.-2019. MEDRI EUR 248.000

# TIHANA LENAC ROVIŠ, PHD

## *Curriculum Vitae*

### COMPLETED PROJECTS

#### Associate:

Training manager: Methods for high-throughput glycoproteomic analysis; **FP7-PEOPLE-IAPP** (Industry-Academia Partnerships and Pathways); 2013-2016; MEDRI: EUR 320.000;

Co-mentor of Marie Curie Early-stage Research Fellow: A training network for the rational design of the next generation of well-defined glycoconjugate vaccines; **MSCA-ITN-ETN/H2020**; Coordinator: Novartis Vaccines and Diagnostics S.R.L.; 2015.-2019. MEDRI EUR 248.000

Monoclonal antibody bank to viral and cellular proteins; **BICRO/UTT**; 2016.-2017. MEDRI: EUR 75.000

Strengthening adaptive immunity via innate immunity: enhancing the CD8 T cell response by using the NKG2D ligand expressed in a herpesvirus vector; **FP7 ERC-2012-AdG**; 2013-2018; MEDRI: EUR 1.750.000

Networking manager; Becoming entrepreneurial: Knowledge transfer from MEDRI to the biotechnology business sector; **IPA**, 2013-2015; MEDRI: EUR 440.000;

Night of the lab out (NLO); People / **FP7-PEOPLE-2013-NIGHT**; Coordinator: Agency for Mobility and EU Programmes; 2013; Total funding for the University of Rijeka Faculty of Medicine: EUR 2.300

Viral evasion of NK cells; **National Institutes of Health (NIH) USA**; 2009-2013; MEDRI: USD 270.000

New strong CMV–promoter for protein and RNA production; **BICRO**; 2012-2013; MEDRI: EUR 50.000

The Center for Antibody Production Rijeka: Upgrading the Central Research and Service Infrastructure for the South Eastern Region of Europe; **EU FP7-REGPOT**; 2009-2012; MEDRI: EUR 620.000

The function of the NK killer receptor Nkp46 in CMV and Influenza infection; 2009-2010; **Croatia-Israel joint research program**

The development of a model for immunotherapy of viral infections; 2008-2011; The National Foundation for Science, Higher Education and Technological Development of the Republic of Croatia

Transcriptomic Approach to Viral Disease Research; 2007-2010; Unity Through Knowledge Fund (**UKF**)

Molecular mechanisms of immune evasion by cytomegalovirus; 2007-2011; **The National Foundation for Science, Higher Education and Technological Development of the Republic of Croatia**

Scientific mentor of the experimental part of the ITN-fellow's training: Natural Killer Cell-Mediated Anti-Viral and Anti Tumor Defense and Therapy; 2006-2009; **EU FP6 MC Research Training Networks**

Establishment of high-throughput monoclonal antibody production and hybridoma bank; 2006-2008; **FP6-2002-INCO-WBC/SSA-3**

Regulation of NK-cell receptors by herpes viruses; 2002-2006; **Ministry of science and technology of the Republic of Croatia**

# We & My HRZZ-i



## 5 Faculty members

**Prof. dr. sc. Stipan Jonjić**

Prof. dr. sc. Tihana Lenac Roviš

Izv. prof. dr. sc. Vanda Juranić Lisnić

Izv. prof. dr. sc. Berislav Lisnić

Doc. dr. sc. Ilija Brizić

## 7 Post docs

Dr. sc. Marija Mazor

Dr. sc. Paola Kučan Brlić

Dr. sc. Jelena Železnjak

Dr. sc. Maja Cokarić Brdovčak

Dr. sc. Lea Hiršl

Dr. sc. Marina Pribanić Matešić

## 10 PhD students

Tina Jenuš

Daria Kveštak

Dubravka Karner

Carmen Rožmanić

Andrea Mihalić

Fran Krstanović

Gian Pietro Pietri

Magdalena Medved

Marko Šustić

Jelena Materljan

## 3 Laboratory engineers

Karmela Miklić

Suzana Malić

Leonarda Mikša

## 3 Grant managers

Ines Nenadić

Antonija Šarlija

Cristina Paulović



# We & My HRZZ-i



CENTER FOR  
PROTEOMICS



Raspisan natječaj HRZZ-a



**'Igre gladi  
neka počnu'**



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Jelena Materljan

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Suzana Malić

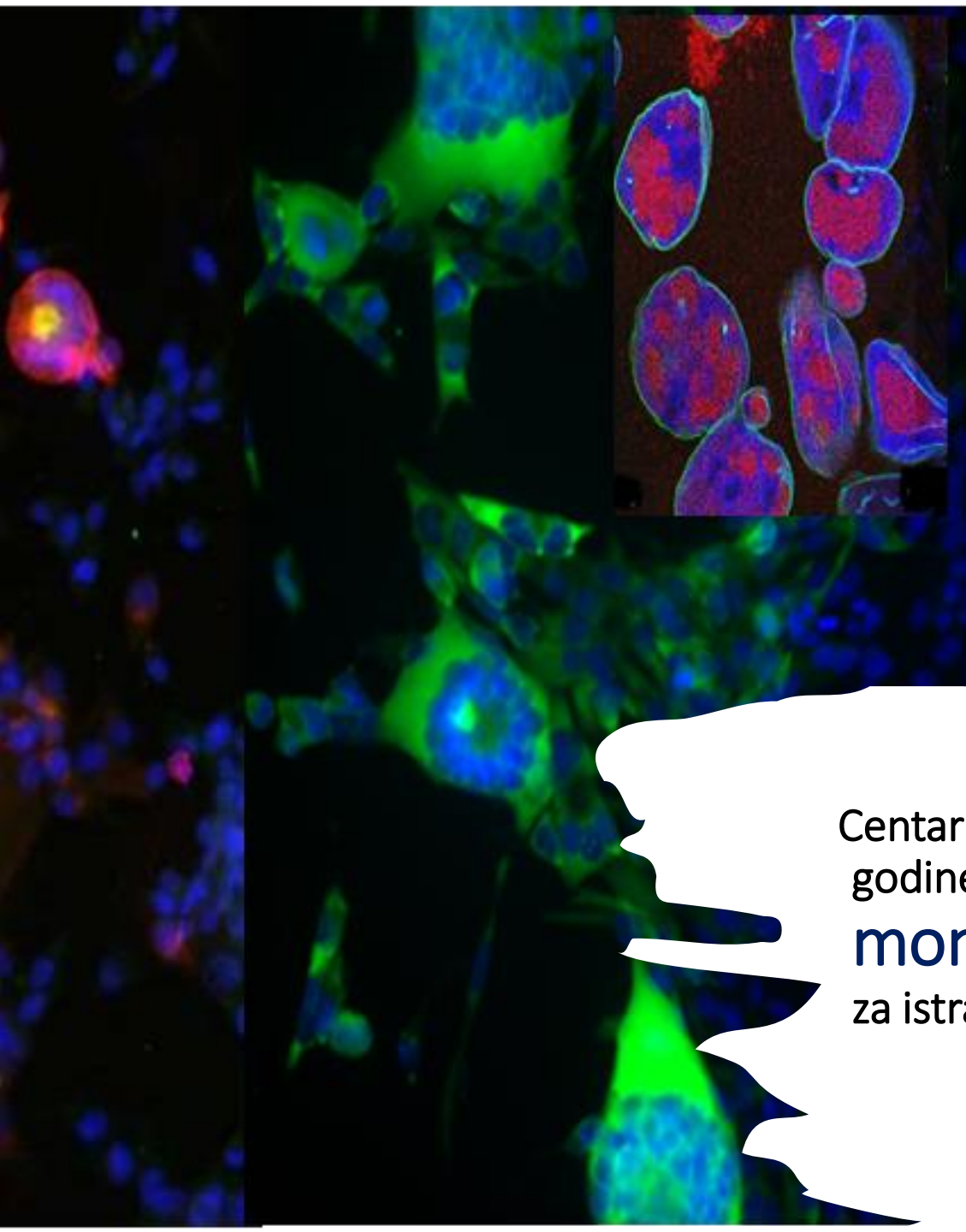
Leonarda Mikša

## **3 Grant managers**

Ines Nenadić

Antonija Šarlija

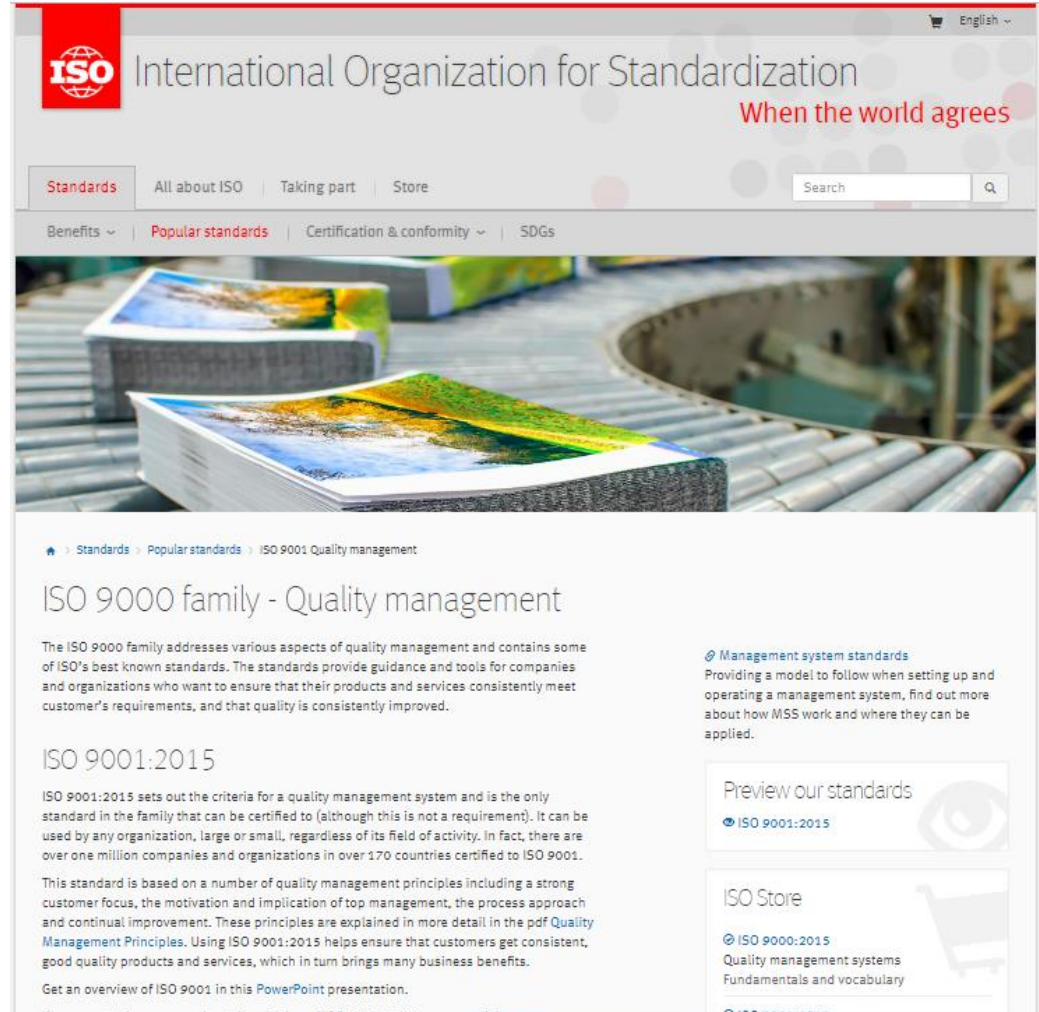
Cristina Paulović



CENTER FOR  
PROTEOMICS

Centar za proteomiku osnovan je 2006.  
godine s misijom proizvodnje  
**monoklonskih protutijela**  
za istraživanje, dijagnostiku i terapiju

# • ISO 9001 Certifikat



The screenshot shows the ISO website's navigation menu with 'Standards' selected. The main content area features a banner image of ISO standards books on a conveyor belt. The page title is 'ISO 9000 family - Quality management'. The text describes the ISO 9000 family as a set of quality management standards. A specific section for 'ISO 9001:2015' is highlighted, detailing its scope and principles. A sidebar on the right offers a 'Preview our standards' section with a link to 'ISO 9001:2015' and an 'ISO Store' section with a link to 'ISO 9000:2015 Quality management systems Fundamentals and vocabulary'.

ISO 9000 family - Quality management

The ISO 9000 family addresses various aspects of quality management and contains some of ISO's best known standards. The standards provide guidance and tools for companies and organizations who want to ensure that their products and services consistently meet customer's requirements, and that quality is consistently improved.

**ISO 9001:2015**

ISO 9001:2015 sets out the criteria for a quality management system and is the only standard in the family that can be certified to (although this is not a requirement). It can be used by any organization, large or small, regardless of its field of activity. In fact, there are over one million companies and organizations in over 170 countries certified to ISO 9001.

This standard is based on a number of quality management principles including a strong customer focus, the motivation and implication of top management, the process approach and continual improvement. These principles are explained in more detail in the pdf [Quality Management Principles](#). Using ISO 9001:2015 helps ensure that customers get consistent, good quality products and services, which in turn brings many business benefits.

Get an overview of ISO 9001 in this [PowerPoint presentation](#).

**Management system standards**  
Providing a model to follow when setting up and operating a management system, find out more about how MSS work and where they can be applied.


**Preview our standards**  
[ISO 9001:2015](#)

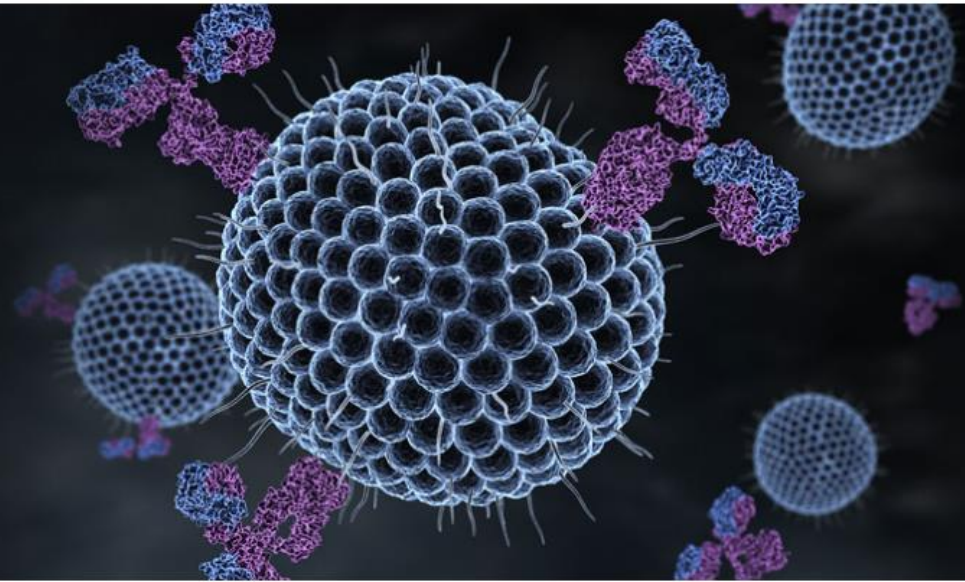
**ISO Store**  
[ISO 9000:2015](#)  
Quality management systems  
Fundamentals and vocabulary

# ONLINE STORE

## CENTER FOR PROTEOMICS

The Center generates mAbs of the highest quality, which have been demanded by industrial and academic users worldwide due to their great significance in the studies of pathogenesis of viral disease.

 [VIEW OUR PRODUCTS](#)



### ADVANCED SEARCH

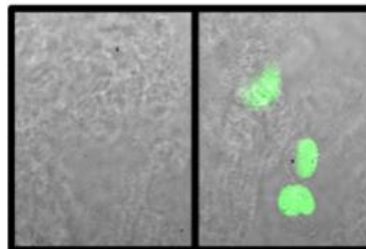
Search by keyword

#### Reactivity

- Human (8)
- Human cytomegalovirus (3)
- Mouse (1)
- Murine cytomegalovirus (15)
- Varicella zoster virus (40)

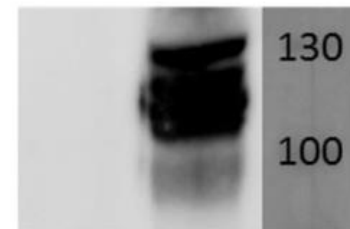
#### Tested Applications

### TOP SELLING ANTIBODIES

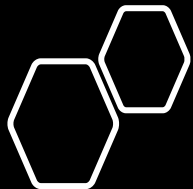


Anti-m123/IE1 (MCMV)

**a**   **b**



Anti-M55/gB (MCMV)



Interesenti:



Licence



Uredi za transfer tehnologije



Ascenion is the technology transfer partner of leading life science-institutes of the Helmholtz and Leibniz Associations and university clinics.

Distributeri



Explore. Bioreagents.

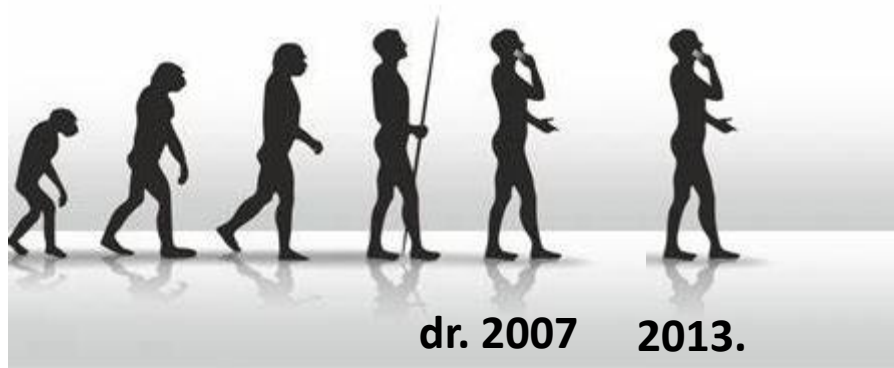
Biorbyt is delighted to have been honored with a Queen's Award for Enterprise for its outstanding achievements in international trade.

Patenti



**3 PCT patent applications** (1+2 under evaluation)  
2 tumor immunotherapy (Nectin Therapeutics, SME, Jerusalem, Israel);  
1 viral immunotherapy (Universitätsklinikum Freiburg, Germany)

# MC Incoming Talents FVG Mobility Fellowship (2013-2015)



dr. 2007

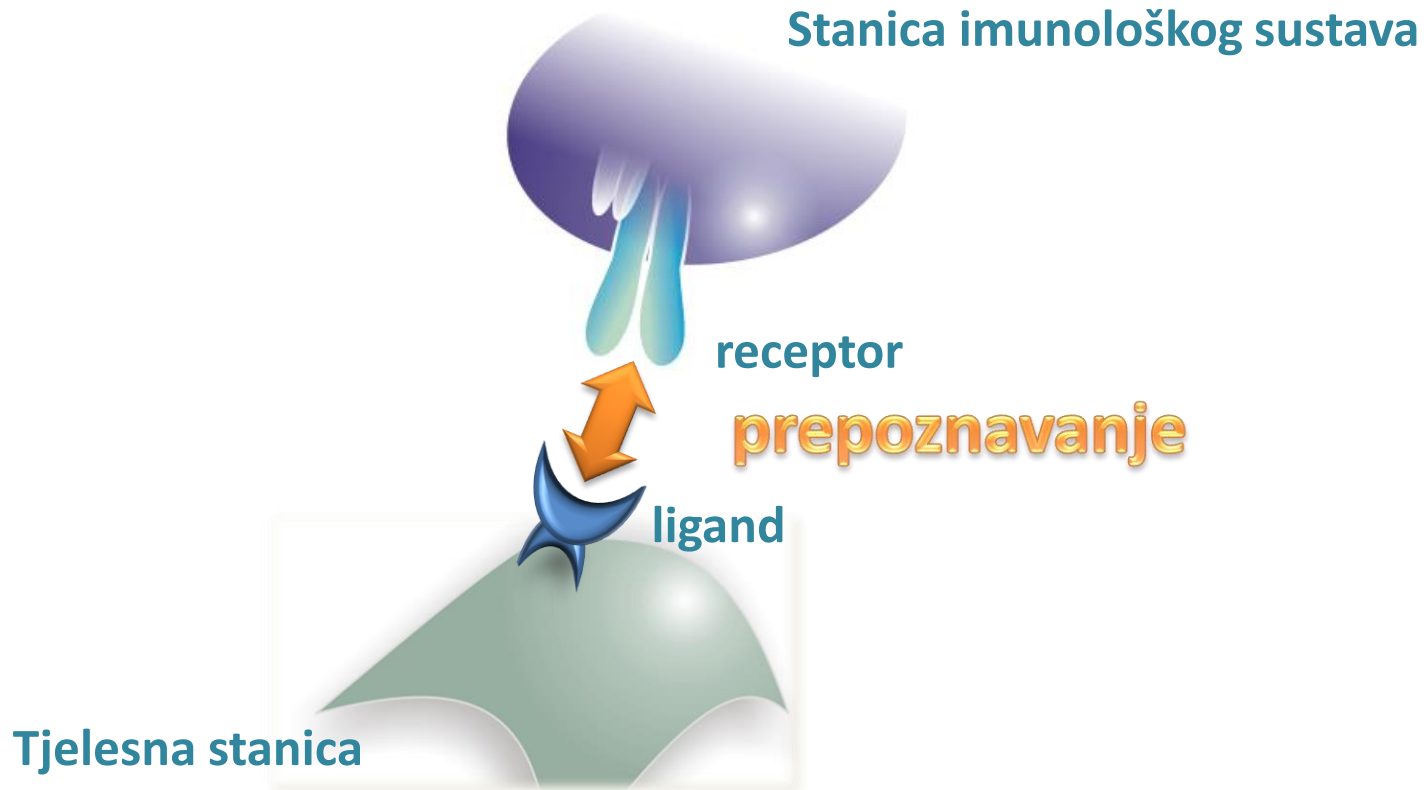
2013.

Assistant  
professor

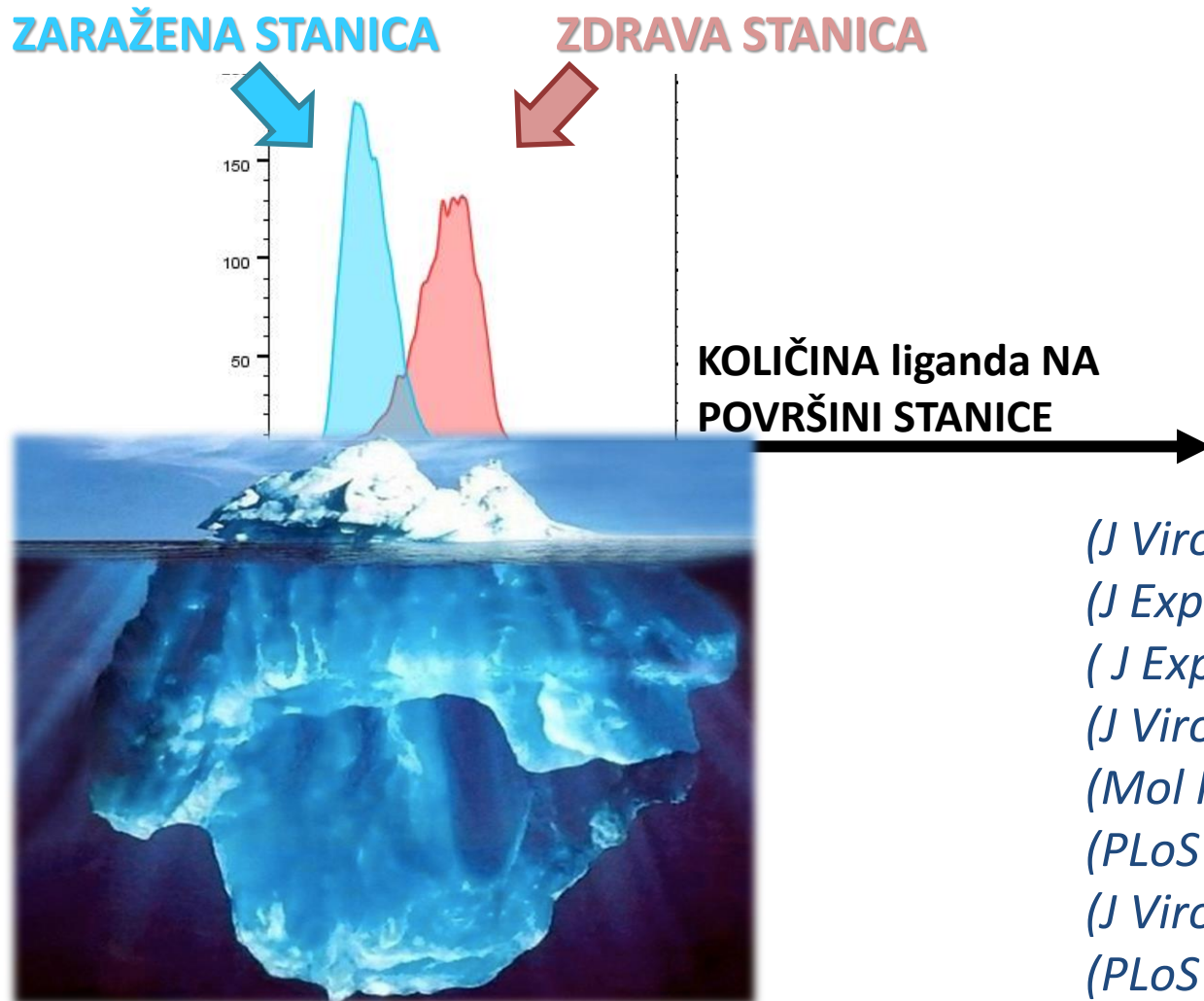
## Uspostavna potpora HRZZ (2015-2017)

Molekularni mehanizmi  
imunološkog djelovanja  
proteina PVR u virusnoj i  
tumorskoj patogenezi

# Tema znanstvenog istraživanja



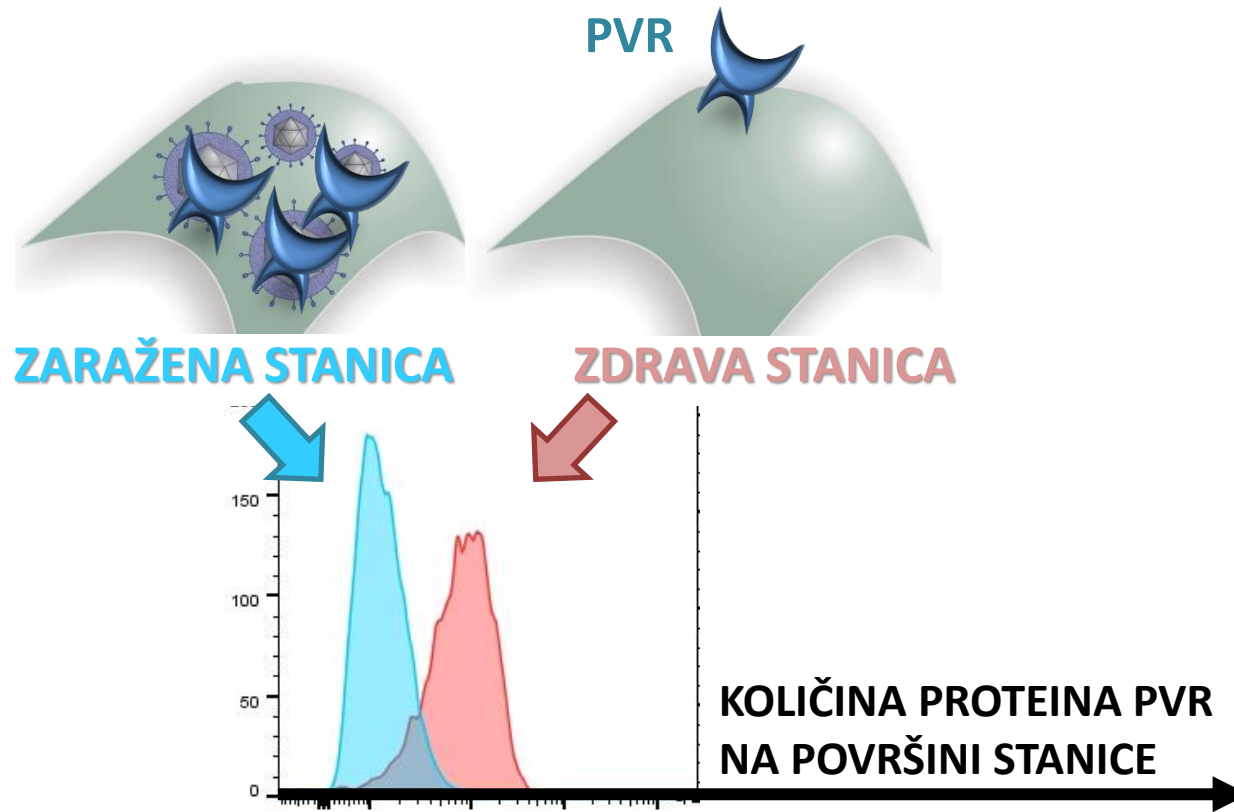
# Virus sprečava pojavu 'opasnih' liganada na površini



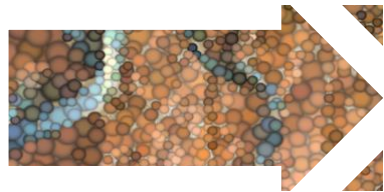
(*J Virol*, 2005)  
(*J Exp Med*, 2005)  
(*J Exp Med*, 2006)  
(*J Virol*, 2009)  
(*Mol Immunol*, 2009)  
(*PLoS Path*, 2014 )  
(*J Virol*, 2014)  
(*PLoS Path*, 2016 )  
(*J Exp Med*, 2016)



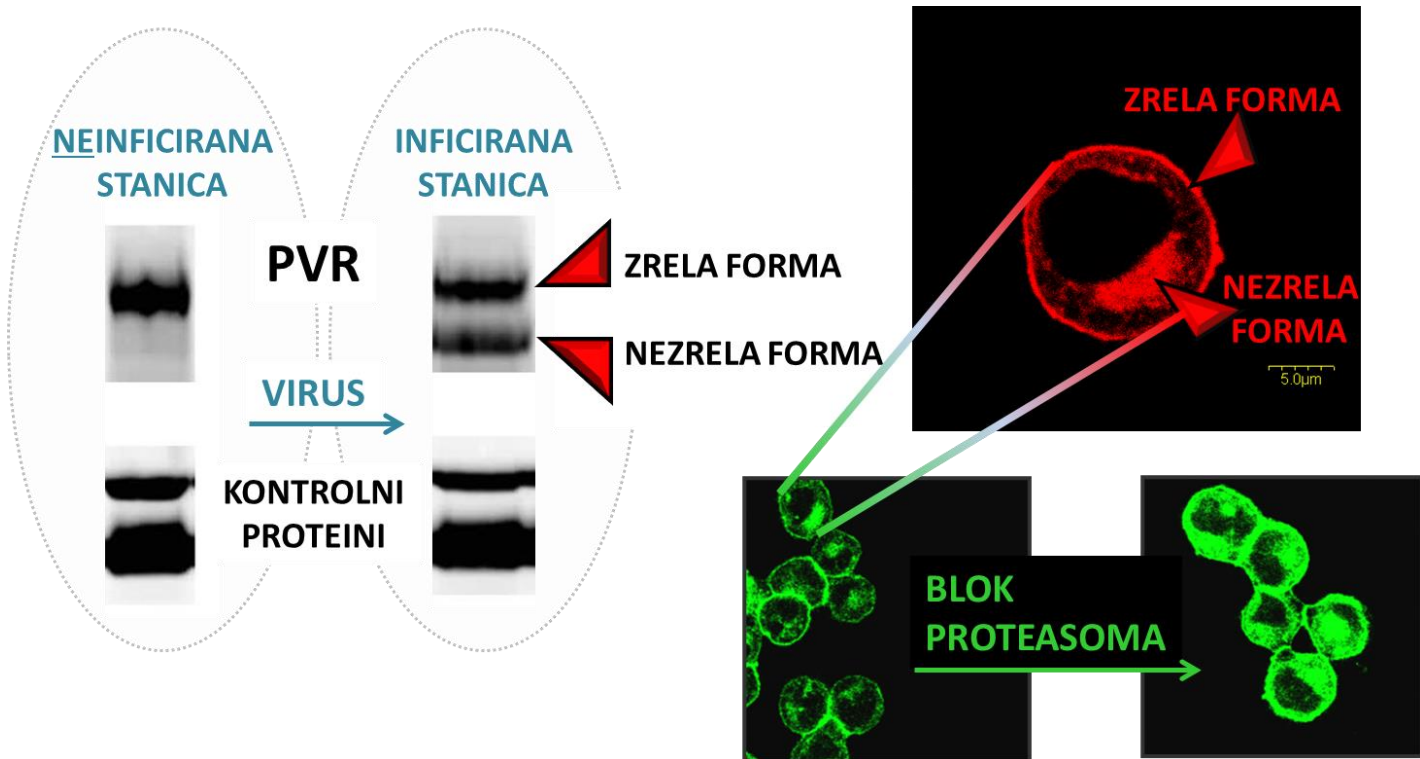
# Virus sprečava pojavu proteina PVR na površini



**KAKO?** Kojim molekularnim mehanizmom



*Inflammatory monocytes and NK cells play a crucial role in DNAM-1-dependent control of cytomegalovirus infection*

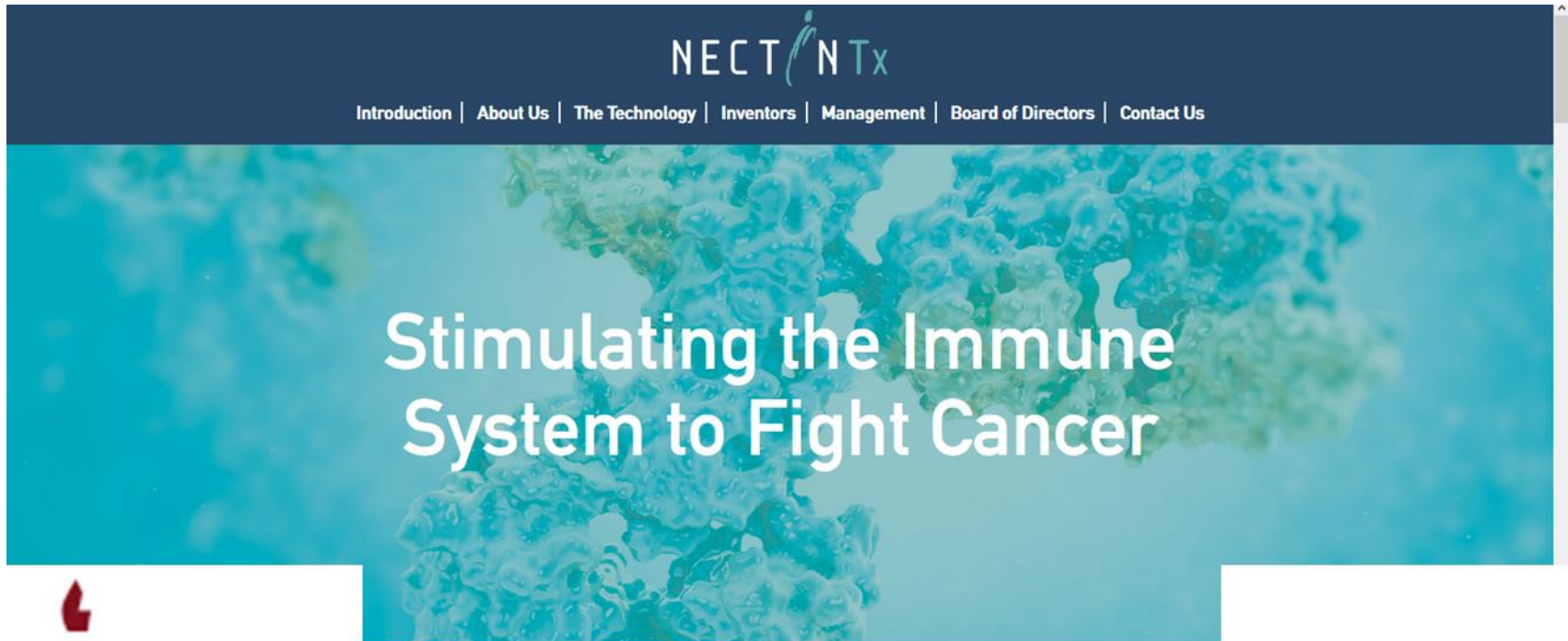


*Cytomegalovirus protein m154 perturbs the adaptor protein-1 compartment mediating broad-spectrum immune evasion*



# Mnogi tumori imaju povećanu količinu proteina PVR

Što je povezano i s lošijom prognozom

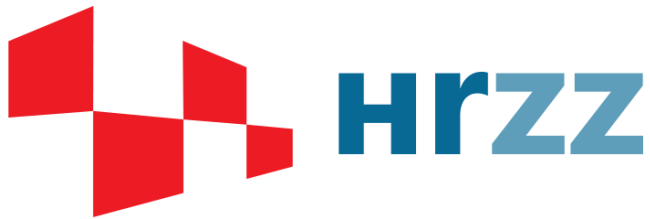


<http://www.nectintx.com/>

# Ishod uspostavnog HRZZ projekta



Imunoregulatorna  
uloga proteina PrP<sup>C</sup> u  
imunološkom  
antivirusnom  
odgovoru i otpornosti  
na citomegalovirusnu  
infekciju



**2021.**

**Full  
professor**

Timely  
State of the art  
Cutting edge  
Great impact on society  
...

## Uvjerljiv problem

Posebno dramatičan problem današnjice ostaje prirođena infekcija Humanim citomegalovirusom (HCMV), obzirom da je virus u stanju prodrijeti do mozga, a upotreba postojećih antivirusnih lijekova je ograničena zbog mogućih težih oštećenja ploda.

Naša grupa već više od deset godina istražuje učinak CMV-a na razvoj, upalu i oštećenja mozga koristeći mišji model prirođene CMV-infekcije (MCMV), koji rezultira posljedicama vrlo sličnim onima uočenim kod infekcije ljudi s HCMV-om.

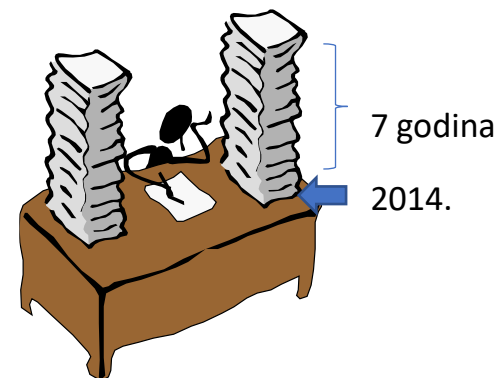
Naša je hipoteza kako protein PrP<sup>C</sup> predstavlja molekulu kandidata čije bi istraživanje moglo pridonijeti razumijevanju i smanjenju trajnih oštećenja mozga uslijed prirođene HCMV-infekcije.



Ako je ikako moguće,  
neki preliminarni  
rezultat/opservacija



**Gle! barem nitko  
nije testirao ulogu  
PrP<sup>C</sup> u CMV  
infekciji**





## Tim pristaša

**Dr. sc. [REDACTED]**, vrstan je poznavatelj imunoeseja i animalnih modela. Ona će doprinijeti in vivo analizama na kongenitalnom modelu CMV-infekcije te analizi imunološkog odgovora u mozgu. Očekivani angažman na projektu je 40%.

**Laboratorijske inženjerke** će se uključiti u aktivnosti s 30% angažmana i to u: proizvodnju protutijela, virusa, proteina, in vivo i biokemijske eseje.

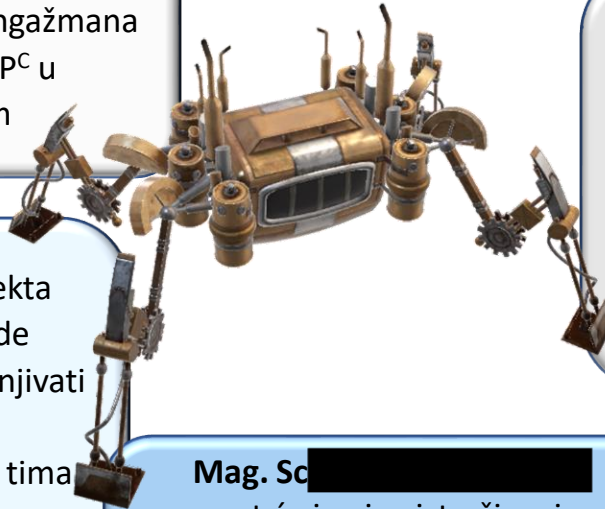
**Dr. sc. [REDACTED]**, dr. med je neurokirurg i dugogodišnji suradnik koji je upravo obranio doktorat u području imunologije. S 10% angažmana podupriet će otkrivanje uloge proteina PrP<sup>C</sup> u neuroinflamaciji i oštećenju mozga tijekom prirodene virusne infekcije.

**Poslijedoktorand (TBD, 100%)**, pružit će podršku Ciljevima 1 -4 u drugoj fazi projekta kada mnogo mišjih sojeva i podataka bude trebalo analizirati. Pri odabiru će se ocjenjivati izvrsnost, no neće se zahtijevati neka specifična ekspertiza obzirom da članovi tima dobro pokrivaju sve aspekte predviđenog eksperimentalnog prikupljanja podataka i metoda potrebnih za njihovu obradu.

**Mag. Sc. [REDACTED]** provest će in vivo istraživanja na MCMV modelu kongenitalne HCMV infekcije te biokemijske eseje i protočnu citometriju stanica ex vivo i in vitro

**Dr. sc. [REDACTED]**, s iskustvom u molekularnoj i staničnoj biologiji te imunoflorescenci posvetit će 30% radnog vremena projektu. Osigurat će virusne mutante (MCMV i HCMV), konstrukte za proizvodnju rekombinantnih proteina te će pomoći analize transkripata i transkriptoma.

**Iskusni projektni menadžer/specijalist za transfer tehnologije (MEDRI),** angažman od 10%.



## Highlight of the project

**Dr. sc. M. Hasan,**

stručnjakinja u različitim  
vrstama imunofenotipiziranja i  
molekularnog profiliranja u  
kontekstu translacijskih  
istraživanja

Ona će planirati i provoditi  
pokuse koji uključuju:

high-resolution-analize single-  
cell transkriptoma

Multiplex immunoeseje

Imaging Flow Cytometer

ImageStreamMARKII



## Iskustvo u pisanju projekata



Postoje određeni ključni rezultati za svaki cilj koje mislimo postići, svojevrsni 'milestoni' čije ostvarivanje u određenoj točki projekta osigurava opravdanost predviđenog plana istraživanja, čime se umanjuje i rizik od neuspješne provedbe projekta. Ključni znanstveni rezultati (milestoni) su:

Za Cilj 1:

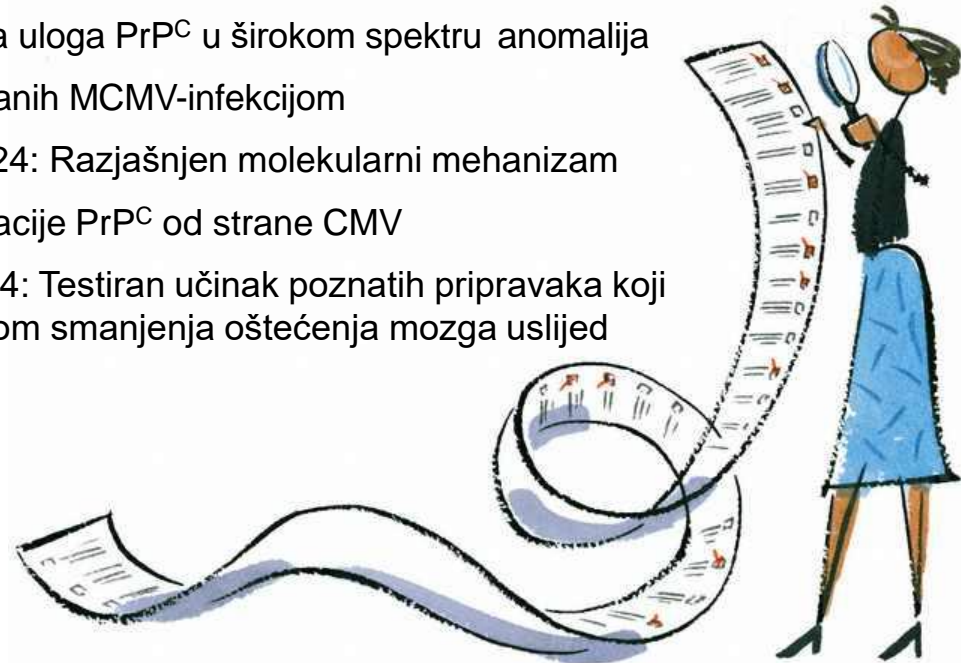
u mjesecu M12: Utvrđen PrP<sup>C</sup>-ovisni fenotip u modelu prirodene infekcije CMV-om

u mjesecu M24: Određene imune stanice regulirane od strane PrP<sup>C</sup> tijekom neuroinflamacije

u mjesecu M36: Ispitana uloga PrP<sup>C</sup> u širokom spektru anomalija izazvanih MCMV-infekcijom

Za Cilj 2: u mjesecu M24: Razjašnjen molekularni mehanizam regulacije PrP<sup>C</sup> od strane CMV

Za Cilj 3: u mjesecu M44: Testiran učinak poznatih pripravaka koji djeluju na PrP<sup>C</sup> sa svrhom smanjenja oštećenja mozga uslijed MCMV-infekcije



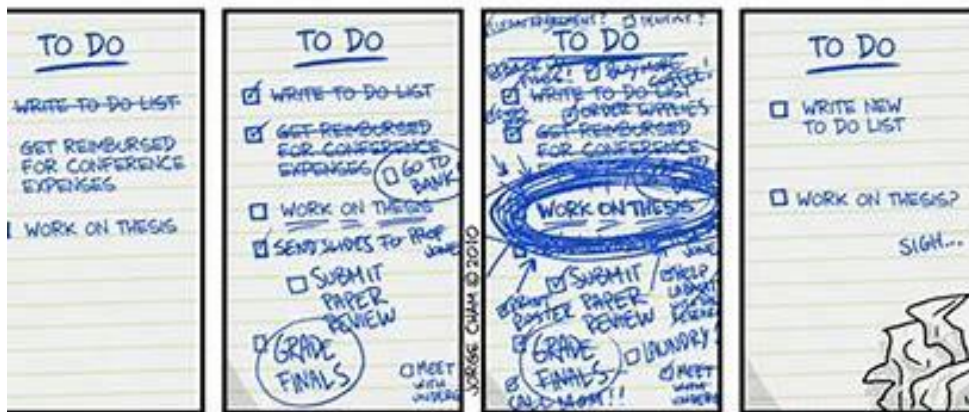


Instrumenti/strojevi –  
nema značajnijih  
sredstava

# 1. godina

Consumables, standardni,  
Štala – 45 000 kn /period

## YOUR "TO DO" LIST



WWW.PHDCOMICS.COM

Sudjelovanje na međunarodnim zn.  
konferencijama u RH i inozemstvu

- U prvoj godini troškove preusmjeravam  
na objavu revijalnog članka



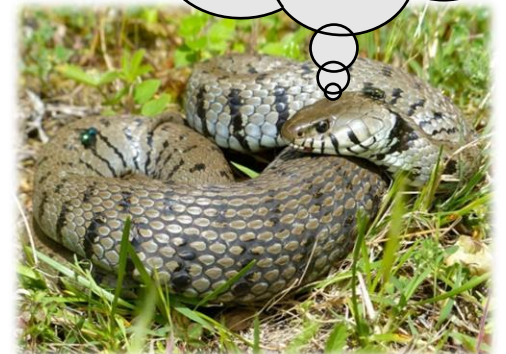
Usavršavanje na Institut Pasteur, Pariz, "Single cell RNA-Seq",  
trajanje: 2 tjedna, broj suradnika 1

Reagencije za Single-Cell Analysis (155 000 kn)

Rado bih da dio razgovora bude o tome kako konkretno riješiti  
financijsko pitanje, to me pitanje poprilično muči. Da li bi oni prihvatili  
platiti račun koji bi im poslao Institut Pasteur? To bi bilo  
najjednostavnije i najjeftinije rjesenje, mislim. Molim te provjeri ako  
možeš.

Ne želim: Usluga,  
Podugovaranje usluge  
genetski modificiranog miša

Ja rado  
modificiram  
miša



# Ishod Istraživačkog HRZZ projekta (1.godina)



HRZZ  
doktorand



VIF  
(UNIRI)



BUDUĆI projekti,  
aktivno iskustvo  
glavnog istraživača  
je pozitivna stvar u  
životopisu



Revijalni rad



Suradnja s  
Pasteur Institut

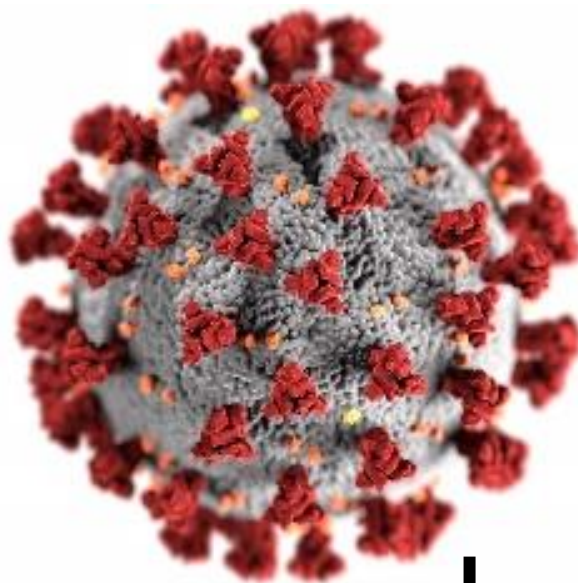


(novi) post-  
doktorand  
TBD

Stražić Geljić I, Kucan Brlić P, Musak L, Karner D, Ambriović-Ristov A, Jonjić S, Schu P, Rović TL. Viral Interactions with Adaptor-Protein Complexes: A Ubiquitous Trait among Viral Species. *Int J Mol Sci*. 2021 May 17;22(10):5274. doi: 10.3390/ijms22105274.

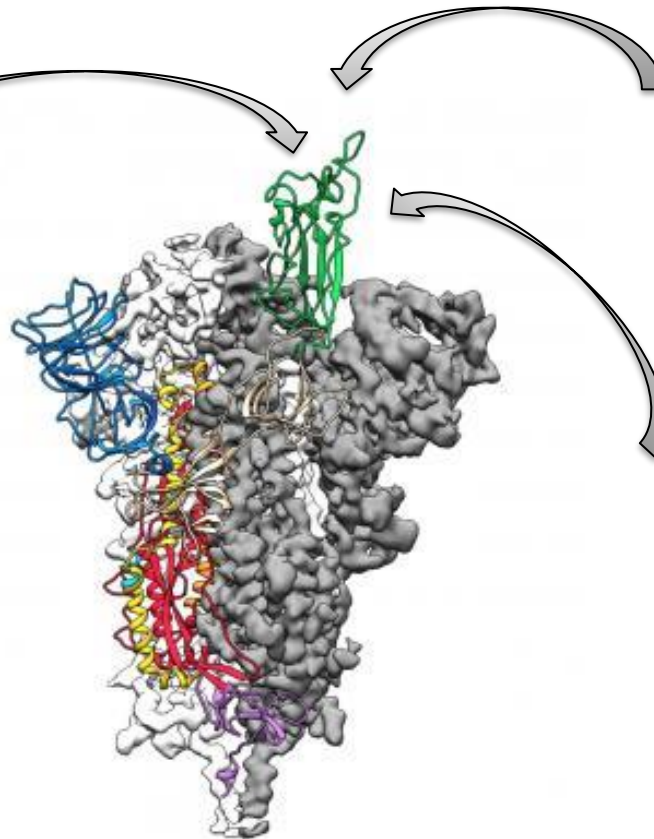
## SARS-CoV-2

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+ 3 HRZZ projects awarded

**Bamlanivimab plus etesevimab:** To su neutralizirajuća protutijela koja se vežu na različite dijelove RBD SARS-CoV-2.



**Sotrovimab:** Ovo mAb izvorno je identificirano 2003. od osobe koja je preboljela SARS-CoV. Cilja dio u RBD koji je sačuvan između SARS-CoV i SARS-CoV-2.

**Casirivimab plus imdevimab:** To su neutralizirajuća protutijela koja se vežu na različite dijelove RBD SARS-CoV-2.

**protein SARS-CoV-2 Spike**

**Domena za vezanje receptora (RBD), dio šiljka koji se veže na stanicu domaćina, obojena je zelenom bojom.**

*Credit: Credit: UT Austin, McLellan Lab*



2005



2021

- više od 150 prijava na projekte
- 48% uspješnosti
- 56 zaposlenika, 31 financirano iz projekata
- godišnji proračun grupe od 1,5 milijuna eura (projekti i aktivnosti prijenosa tehnologije)

Neuspjeh je samo ako  
nisi opet prijavio!



*Z. Lenac, Oblaci and Učkom*



Hvala djelatnicima Centra za proteomiku i Zavoda za histologiju i embriologiju, Medicinskog fakulteta, Sveučilišta u našoj Rijeci