

CURRICULUM VITAE

NAME István N. HUSZÁR

DATE/PLACE OF BIRTH 17th March 1991, Nyíregyháza (Hungary)

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EDUCATION

2005 – 2010. **Zrínyi Ilona Secondary School** (Nyíregyháza, Hungary)
2010 – **Semmelweis University – Faculty of Medicine** (Budapest, Hungary)

LANGUAGE SKILLS

2008. **German** intermediate-level (B2) certificate
2011. **English** advanced-level (C1) certificate

RESEARCH

2010 – **Semmelweis University – Dept. of Biophysics and Radiation Biology**
Nonequilibrium-state processes at hydrophilic polymer – water interfaces
Supervisors: Miklós Kellermayer, M.D., Ph.D., D.Sc., Zsolt Mártonfalvi, Ph.D.

TEACHING EXPERIENCE

2012 – **Semmelweis University – Dept. of Biophysics and Radiation Biology**
Dean-appointed undergraduate teaching assistant

SKILLS

Programming languages (Pascal, Object Pascal, Visual Basic, HTML)

ACADEMIC COMPETITION RESULTS

2009. **National Secondary School Academic Competition ('OKTV')** *Subject: Physics (highest division)* **18th place**
2011. **Semmelweis University – Medical Biophysics Competition** **3rd prize**
2014. **Semmelweis University – Otorhinolaryngology Competition** **1st place**

STUDENT CONFERENCE RESULTS

2012. **Semmelweis University – Students' Conference** **2nd prize**
2012. **17th Korányi Frigyes Scientific Forum** **2nd prize**
2013. **18th Korányi Frigyes Scientific Forum** **Special Award**
2014. **Semmelweis University – Students' Conference** **1st prize**
2014. **19th Korányi Frigyes Scientific Forum** **1st prize**
2015. **20th Korányi Frigyes Scientific Forum** **1st prize**
2015. **32nd National Conference of Students' Scientific Associations ('OTDK') – Medicine and Health Sciences** **2nd prize**

MEMBERSHIPS

- 2010 – Semmelweis University – **Korányi Frigyes College for Advanced Studies**
2011 – Semmelweis University – **Kerpel-Fronius Ödön Talent-Nurturing Programme – List of Excellency**
2015 – Semmelweis University – **Students' Scientific Association Council**
2015 – **Biophysical Society**

PRIZES AND FUNDS WON

2013. Semmelweis University – **'Magister' Subsidy for Laboratory Chemicals** *204,000 HUF*
2015. Semmelweis University – **Rector's contest of dissertations** *1st prize*
2015. **Stephen W. Kuffler Research Scholarship** *250,000 HUF*

PUBLICATIONS

RESEARCH ARTICLES

2014. Huszár, I.N.; Mártonfalvi, Z.; Laki, A.J.; Iván, K.; Kellermayer, M. **Exclusion-Zone Dynamics Explored with Microfluidics and Optical Tweezers.** *Entropy* 2014, 16, 4322-4337. [doi:10.3390/e16084322](https://doi.org/10.3390/e16084322)

ORAL PRESENTATIONS

2013. **[Nonequilibrium-State Processes at Hydrophilic Polymer – Water Interfaces]** [in Hungarian] (*24th Congress of the Hungarian Biophysical Society, Veszprém, Hungary, 27-30th August 2013.*)
2013. **Kinetics of Exclusion Zone Formation** (*The Eighth Annual Conference on the Physics, Chemistry and Biology of Water, Borovets, Bulgaria 22-25th October 2013.*) *Best poster presenter's honorary speech.*
2014. **[Interfacial Exclusion Phase in the Acidic Environment of the Nafion Polymer]** [in Hungarian] (*Astellas 1st National Young Researcher Symposium, Pécs, Hungary, 24th September 2014.*)
2015. **Kinetics of Exclusion Zone Formation and Nafion-Induced Acidic Transition** (*Symposium in Memory of Tamás Roska, Budapest, Hungary, 23-24th June 2015.*)

POSTERS

2013. **Kinetics of Exclusion Zone Formation** (*The Eighth Annual Conference on the Physics, Chemistry and Biology of Water, Borovets, Bulgaria, 22-25th October 2013.*) *Best Poster's Award.*
2014. **Kinetics of Exclusion Zone Formation** (*From Medicine to Bionics 2nd European PhD Conference, Budapest, Hungary, 9-10th May 2014.*)
2015. **Red Blood Cell Behavior within the Exclusion Zone** (*59th Annual Meeting of the Biophysical Society, Baltimore, MD, USA, 7-11th February 2015.*)
2015. **[How do Red Blood Cells Behave in the Vicinity of the Nafion Polymer?]** [in Hungarian] (*45th Membrane Transport Conference, Sümeg, Hungary, 19-22nd May 2015.*)

RESEARCH INTEREST

We are working at the Department of Biophysics and Radiation Biology of Semmelweis University under the supervision of Prof. Dr. Miklós Keller Mayer. Our research is focused on the so-called **hydrophilic interfacial exclusion-zone phenomenon** and related **innovations in the field of bionics**. The *exclusion phenomenon* consists in aqueous solutes (e.g. dye molecules, microspheres) getting excluded from the vicinity of a given hydrophilic surface relatively quickly (on the scale of seconds or minutes) to create a crystal-clear surface boundary phase (termed *exclusion zone*) of remarkable depth (even as large as 1 mm). Ex vivo muscle tissue has been observed to create exclusion zones as well, and even bacteria are subjected to particle exclusion. Using a custom-built video microscope, a microfluidic cell and a newly developed computer program, we were among the first researchers to recognise diffusive patterns behind the phenomenon. Our ongoing research aims at the development of a new lightweight *lab-on-a-chip cell separating device* that makes use of the exclusion principle and therefore needs no external source of power for operation.