

BIOGRAPHICAL SKETCH

NAME: Boglarka Racz

eRA COMMONS USER NAME (credential, e.g., agency login): BORACZ

POSITION TITLE: Laboratory Manager

EDUCATION/TRAINING

| INSTITUTION AND LOCATION | DEGREE | Completion Date | FIELD OF STUDY |
|--|--------------|-----------------|--------------------------------|
| University of Pecs, Faculty of Science, Hungary | MS | 06/2024 | Biology |
| University of Pecs, Medical School, Hungary | PHD | 01/2008 | Cellular and Molecular Biology |
| Columbia University, Department of Ophthalmology, New York | Postdoctoral | 03/2015 | Drug Development |

A. Personal Statement

I am a Laboratory Manager at Dr. Daniel Heller's lab at Memorial Sloan Kettering Cancer Center, focusing on supporting nanomedicine for targeted drug delivery, diagnostic technologies for early cancer detection, and nanosensors to advance cancer research and drug discovery.

B. Positions, Scientific Appointments, and Honors

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|----------------|---|
| 2023 – present | Laboratory Manager, Memorial Sloan Kettering Cancer Center, New York, NY |
| 2015 – 2023 | Associate Research Scientist, CUMC Department of Ophthalmology, New York, NY |
| 2013 – 2015 | Postdoctoral Research Scientist, CUMC Department of Ophthalmology, New York, NY |
| 2008 – 2013 | Research Scientist, University of Pecs, Medical School, Pecs, Hungary |
| 2015 | Hot Topic Poster Award, ARVO, United States of America |
| 2013 | Hungarian Academic Junior Award, Hungary |
| 2012-2013 | Hungarian Scientific Research Fund, Hungary |
| 2009-2012 | Janos Bolyai Award, Hungary |
| 2007 | Sigma Research Award, Hungary |
| 2004 – 2008 | Neurotoxicity Society |
| 2008 – 2013 | Hungarian Biochemical Society |
| 2013 – 2022 | ARVO – The Association for Research in Vision and Ophthalmology |

C. Contributions to Science

1. My early publications focused on apoptosis signaling pathways and the anti-apoptotic effects of pituitary adenylate cyclase-activating polypeptide (PACAP) on various tissues and cell lines in both in vitro and in vivo studies.
 - a. **Racz B**, Tamas A, Kiss P, Tóth G, Gasz B, Borsiczky B, Ferencz A, Gallyas F Jr, Roth E, Reglodi D. Involvement of ERK and CREB signaling pathways in the protective effect of PACAP in

monosodium glutamate-induced retinal lesion. Ann N Y Acad Sci. 2006 Jul;1070:507-11. doi: 10.1196/annals.1317.070. PubMed PMID: 16891269.

- b. **Racz B**, Gallyas F Jr, Kiss P, Toth G, Hegyi O, Gasz B, Borsiczky B, Ferencz A, Roth E, Tamas A, Lengvari I, Lubics A, Reglodi D. The neuroprotective effects of PACAP in monosodium glutamate-induced retinal lesion involve inhibition of proapoptotic signaling pathways. Regul Pept. 2006 Nov 15;137(1-2):20-6. doi: 10.1016/j.regpep.2006.02.009. Epub 2006 Aug 30. PubMed PMID: 16945433.
 - c. **Racz B**, Gasz B, Borsiczky B, Gallyas F Jr, Tamas A, Jozsa R, Lubics A, Kiss P, Roth E, Ferencz A, Toth G, Hegyi O, Wittmann I, Lengvari I, Somogyvari-Vigh A, Reglodi D. Protective effects of pituitary adenylate cyclase activating polypeptide in endothelial cells against oxidative stress-induced apoptosis. Gen Comp Endocrinol. 2007 Aug-Sep;153(1-3):115-23. doi: 10.1016/j.ygcen.2006.12.006. Epub 2006 Dec 27. PubMed PMID: 17270184.
 - d. **Racz B**, Gallyas F Jr, Kiss P, Tamas A, Lubics A, Lengvari I, Roth E, Toth G, Hegyi O, Verzal Z, Fabricsek C, Reglodi D. Effects of pituitary adenylate cyclase activating polypeptide (PACAP) on the PKA-Bad-14-3-3 signaling pathway in glutamate-induced retinal injury in neonatal rats. Neurotox Res. 2007 Sep;12(2):95-104. doi: 10.1007/BF03033918. PubMed PMID: 17967733.
 - e. **Racz B**, Gasz B, Gallyas F Jr, Kiss P, Tamas A, Szanto Z, Lubics A, Lengvari I, Toth G, Hegyi O, Roth E, Reglodi D. PKA-Bad-14-3-3 and Akt-Bad-14-3-3 signaling pathways are involved in the protective effects of PACAP against ischemia/reperfusion-induced cardiomyocyte apoptosis. Regul Pept. 2008 Jan 10;145(1-3):105-15. doi: 10.1016/j.regpep.2007.09.015. Epub 2007 Sep 18. PubMed PMID: 17981349.
 - f. **Racz B**, Reglodi D, Horvath G, Szigeti A, Balatonyi B, Roth E, Weber G, Alotti N, Toth G, Gasz B. Protective effect of PACAP against doxorubicin-induced cell death in cardiomyocyte culture. J Mol Neurosci. 2010 Nov;42(3):419-27. doi: 10.1007/s12031-010-9349-6. Epub 2010 Apr 20. PubMed PMID: 20405239.
2. Later, our team successfully discovered a new mechanism for regulating the extra-nuclear effects of PARP-1.
- a. **Racz B**, Hanto K, Tapodi A, Solti I, Kalman N, Jakus P, Kovacs K, Debreceni B, Gallyas F Jr, Sumegi B. Regulation of MKP-1 expression and MAPK activation by PARP-1 in oxidative stress: a new mechanism for the cytoplasmic effect of PARP-1 activation. Free Radic Biol Med. 2010 Dec 15;49(12):1978-88. doi: 10.1016/j.freeradbiomed.2010.09.026. Epub 2010 Oct 16. PubMed PMID: 20920579.
 - b. Hocsak E, Szabo V, Kalman N, Antus C, Cseh A, Sumegi K, Eros K, Hegedus Z, Gallyas F Jr, Sumegi B, **Racz B**. PARP inhibition protects mitochondria and reduces ROS production via PARP-1-ATF4-MKP-1-MAPK retrograde pathway. Free Radic Biol Med. 2017 Jul;108:770-784. doi: 10.1016/j.freeradbiomed.2017.04.018. Epub 2017 Apr 27. PubMed PMID: 28457938.
3. Our team, at Columbia University in Dr. Petrukhin's lab, is focused on inhibiting lipofuscin accumulation in the retina, which contributes to degeneration in age-related macular degeneration (AMD) and Stargardt's disease (STGD). The toxic component A2E, formed non-enzymatically as a by-product of the visual cycle, is linked to cell damage in retinal pigment epithelium (RPE) and photoreceptors. Inhibiting A2E formation may delay visual loss in patients with dry AMD and STGD. We were working on clinical and translational research related to Age-Related Macular Degeneration and Stargardt Disease at Columbia University in Dr. Petrukhin's lab. The therapy, known as LBS-008 (formerly BPN-14967), shows promise for treating other retinal degenerative diseases such as Stargardt disease, a rare inherited condition that causes vision loss during childhood and young adulthood. LBS-008 (Tinlarebant) is currently in Phase 3 clinical trials for both adolescent Stargardt disease (STGD1) and geographic atrophy (GA) associated with dry age-related macular degeneration (AMD).
- a. **Racz B**, Varadi A, Kong J, Allikmets R, Pearson PG, Johnson G, Cioffi CL, Petrukhin K. A non-retinoid antagonist of retinol-binding protein 4 rescues phenotype in a model of Stargardt disease without inhibiting the visual cycle. J Biol Chem. 2018 Jul 20;293(29):11574-11588. doi: 10.1074/jbc.RA118.002062. Epub 2018 Jun 5. PubMed PMID: 29871924; PubMed Central PMCID: PMC6065170.

- b. Cioffi CL, **Racz B**, Varadi A, Freeman EE, Conlon MP, Chen P, Zhu L, Kitchen DB, Barnes KD, Martin WH, Pearson PG, Johnson G, Blaner WS, Petrukhin K. Design, Synthesis, and Preclinical Efficacy of Novel Nonretinoid Antagonists of Retinol-Binding Protein 4 in the Mouse Model of Hepatic Steatosis. *J Med Chem.* 2019 Jun 13;62(11):5470-5500. doi: 10.1021/acs.jmedchem.9b00352. Epub 2019 May 28. PubMed PMID: 31079449; PubMed Central PMCID: PMC6737539.
 - c. **Racz B**, Varadi A, Pearson PG, Petrukhin K. Comparative pharmacokinetics and pharmacodynamics of the advanced Retinol-Binding Protein 4 antagonist in dog and cynomolgus monkey. *PLoS One.* 2020;15(1):e0228291. doi: 10.1371/journal.pone.0228291. eCollection 2020. PubMed PMID: 31978148; PubMed Central PMCID: PMC6980506.
 - d. Cioffi CL, Muthuraman P, Raja A, Varadi A, **Racz B**, Petrukhin K. Discovery of Bispecific Antagonists of Retinol Binding Protein 4 That Stabilize Transthyretin Tetramers: Scaffolding Hopping, Optimization, and Preclinical Pharmacological Evaluation as a Potential Therapy for Two Common Age-Related Comorbidities. *J Med Chem.* 2020 Oct 8;63(19):11054-11084. doi: 10.1021/acs.jmedchem.0c00996. Epub 2020 Sep 17. PubMed PMID: 32878437; PubMed Central PMCID: PMC9578044.
 - e. Cioffi CL, Raja A, Muthuraman P, Jayaraman A, Jayakumar S, Varadi A, **Racz B**, Petrukhin K. Identification of Transthyretin Tetramer Kinetic Stabilizers That Are Capable of Inhibiting the Retinol-Dependent Retinol Binding Protein 4-Transthyretin Interaction: Potential Novel Therapeutics for Macular Degeneration, Transthyretin Amyloidosis, and Their Common Age-Related Comorbidities. *J Med Chem.* 2021 Jul 8;64(13):9010-9041. doi: 10.1021/acs.jmedchem.1c00099. Epub 2021 Jun 17. PubMed PMID: 34138572; PubMed Central PMCID: PMC9578043.
4. In Dr. Heller's Cancer Nanomedicine Laboratory at MSKCC, we focus on developing nanotechnologies to advance research, diagnosis, and treatment of cancer and related diseases. Our work includes creating drug delivery systems that target therapies directly to disease sites, improving diagnostic methods to detect diseases earlier, and designing nanosensors to speed up the discovery of new treatments.
- a. Ruiz SB, Tylawsky DE, Shah J, Saoi M, Cuevas B, Desai S, **Racz B**, Perea AM, Izawa-Ishiguro AR, Cross J, Heller DA. Phospholipase PAFAH2 Mediates Ferroptosis Surveillance and Lipid Remodeling to Promote Resistance in KEAP1 Mutant Cancers. *ACS Chem Biol.* 2025 Jul 18;20(7):1739-1755. doi: 10.1021/acscchembio.5c00273. Epub 2025 Jul 2. PubMed PMID: 40600963.

Complete List of Published Work in MyBibliography:

<https://www.ncbi.nlm.nih.gov/myncbi/boglarka.racz.1/bibliography/public/>