

CURRICULUM VITAE

Personal Information

Family name, First name: **KELEMEN (BOROS) KRISZTINA**

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Education

- 2021-present **PhD** – Faculty of Chemistry and Chemical Engineering, Institute for Doctoral Studies, Doctoral School of Chemistry, Babeş-Bolyai University, Romania
Main topic: Protein-engineered biocatalysts for the synthesis of D-amino acids.
PhD Supervisors: Prof. Dr. Monica Ioana Toşa & Assoc. Prof. Dr. László-Csaba Bencze
- 2019-2021 **MSc** – Faculty of Chemistry and Chemical Engineering, Babeş-Bolyai University, Romania
Specialisation: Organic and Biochemical Processes Engineering (average grade: 10.00/10, top of the class), merit scholarship
- 20015-2019 **BSc** – Faculty of Chemistry and Chemical Engineering, Babeş-Bolyai University, Romania
Specialisation: Biochemical Engineering (average grade: 9.90/10, top 5%)

Work experience

- 01.03.2024-present *assistant researcher* within research project PNRR I8, contract nr. 760251/28.12.2023, Exploring bacterial protein-protein interactions for antibiotic research – BACPROBIO (Director: Dr. Jürgen Brem), Faculty of Chemistry and Chemical Engineering, Babeş-Bolyai University, Romania
- 07.08.2023-present *assistant researcher* within research project PNRR-760042/23.05.2023, Advanced (multi)-enzymatic synthesis and purification processes for bio-based furan derivatives – ASPIRE (Director: Prof. Dr. Anton Alexandru Kiss), Faculty of Chemistry and Chemical Engineering, Babeş-Bolyai University, Romania
- 15.09.2020-15.09.2022 *assistant researcher* within research project PN-III-P1-1.1-TE-2019-2118, Rational redesign of phenylalanine ammonia-lyases for reversing their natural selectivity – RARE-PAL (Director: Assoc. Prof. Dr. László-Csaba Bencze), Faculty of Chemistry and Chemical Engineering, Babeş-Bolyai University, Romania

Scholarships and Awards

- 2024 *Doctoral advanced fellowship* – STAR-UBB Academic Research Network of Excellence (STAR-UBB-N), project PFE-550-UBB, Babeş-Bolyai University, Romania (2 months).
- 2022-2024 *Talent management scholarship* – offered through the Collegium Talentum Programme of Hungary (scholarship program supporting the professional

development of young Hungarians and advancing their intellectual careers), administered by the 'Fundatia Sapientia' organisation, funded by contributions from the Bethlen Gábor State.

- 2021 2nd place at the 35th National Scientific Students' Associations Conference (OTDK), in the Biochemistry section (oral presentation)
- 2019-2020 *Special scholarship for scientific activity* – STAR-UBB Institute, Babeş-Bolyai University, Romania
- 2019 1st place at the 22nd Transylvanian Students Scientific Conference (ETDK) (oral presentation)
- 2019 Award Certificate for the best presentation in the Poster BSc section at the XVIth International Conference 'Students for Students'

Conferences and seminars

- 29.06.2025-03.07.2025 BioTrans 2025 – 17th International Symposium on Biocatalysis and Biotransformations, Basel, Switzerland (poster)
- 30.06.2024-03.07.2024 ECB 2024 – European Congress on Biotechnology, Rotterdam, The Netherlands (poster)
- 28.09.2023-29.09.2023 FEBS Advance Course 'Computational Approaches to Understanding and Engineering Enzyme Catalysis', Zagreb, Croatia (Poster session and 2-minute oral presentation within the event)
- 18.04.2023-19.04.2023 3rd NextGenBiocat symposium – Next Generation Biocatalysis, an International Young Investigator Symposium, Graz, Austria (poster)
- 22.06.2022-24.06.2022 13th International Symposium of the Romanian Catalysis Society - RomCat Conference 2022, Băile Govora, Romania (the conference was preceded by a Summer School 'Catalysis for Promising Future', 20-21 June 2022) (poster)
- 17.05.2021-19.05.2021 35th National Scientific Students' Associations Conference (OTDK), Biochemistry section, Budapest, Hungary (presentation)
- 23.05.2019-26.05.2019 22nd Transylvanian Students Scientific Conference (ETDK), Cluj-Napoca, Romania (presentation)
- 03.04.2019-07.04.2019 XVIth International Conference 'Students for Students', Cluj-Napoca, Romania (poster)

Publications

- 2025 **K. Boros**, A. E. Iszlai, L. E. Barabás, L. C. Bencze, M. I. Toşa, Site-specifically immobilized D-amino acid dehydrogenase for the synthesis of D-phenylalanine, *New Biotechnol.*, **2025**. (Accepted for publication on 20th September 2025)
- R. B. Tomoiagă, L. C. Nagy, **K. Boros**, M. E. Moisă, L. C. Bencze, Engineered biocatalysts for the asymmetric synthesis of D-phenylalanines, *ACS Catal.*, **2025**, *15*, 7361–7389. <https://doi.org/10.1021/acscatal.5c00837>
- K. Boros**, B. E. Nagy, R. B. Tomoiagă, R. Tótós, M. I. Toşa, C. Paizs, L. C. Bencze, Fine-tuning enzyme activity assays for monitoring the enzymatic hydrolysis of PET, *Sci. Rep.*, **2025**, *15*, 1877. <https://doi.org/10.1038/s41598-024-84177-7>
- 2024 **K. Boros**, L. Gal, C. A. Gal, M. Wäscher, R. B. Tomoiagă, M. I. Toşa, J. Pietruszka, L. C. Bencze. Immobilization of D-amino acid dehydrogenase from *Ureibacillus thermosphaericus*. *Process Biochem.*, **2024**, *140*, 45-55. <https://doi.org/10.1016/j.procbio.2024.02.014>

- R. B. Tomoiagă, G. Ágoston, **K. Boros**, L. C. Nagy, M. I. Tosa, C. Paizs, L. C. Bencze, The biocatalytic potential of aromatic ammonia-lyase from *Loktanella atrilutea*, *ChemBioChem*, **2024**, e202400011. <https://doi.org/10.1002/cbic.202400011>
- 2023 R. B. Tomoiagă, M. Ursu, **K. Boros**, C. L. Nagy, L. C. Bencze. Ancestral L-amino acid oxidase: from substrate scope exploration to phenylalanine ammonia-lyase assay. *J. Biotechnol.*, **2023**, 377, 43-52. <https://doi.org/10.1016/j.jbiotec.2023.10.006>
- 2022 **K. Boros**, I. Horváth, C. Rotaru, R. B. Tomoiagă, M. I. Toşa, L. C. Bencze. PETase from *Ideonella sakaiensis*: towards facile bacterial expression system. *Rom. Biotechnol. Lett.*, **2022**, 28, 3507-3516. <https://doi.org/10.25083/rbl/28.3/3507.3516>
- 2021 **K. Boros**, M. E. Moisă, C. L. Nagy, C. Paizs, M. I. Toşa, L. C. Bencze. Robust, site-specifically immobilized phenylalanine ammonia-lyases for the enantioselective ammonia addition of cinnamic acids. *Catal. Sci. Technol.*, **2021**, 11, 5553-5563. <https://doi.org/10.1039/D1CY00195G>

Job-related skills

Proper knowledge in: biocatalysis, enzymology, protein and genetic engineering with *competences in:* molecular cloning, site-directed mutagenesis, directed evolution, expression and purification of enzymes, protein immobilization, enzymatic kinetic studies, protein crystallization, and *skills related to different techniques:* High Performance Liquid Chromatography (HPLC), Fast Protein Chromatography (FPLC), UV-VIS spectroscopy, gel electrophoresis (SDS-PAGE, agarose gels), Western-Blot (WB), Polymerase Chain Reaction (PCR), Differential Scanning Fluorimetry (DSF and NanoDSF).

Computer and computational skills: Microsoft Office, ChemOffice, GraphPad, PyMOL, SnapGene, Mega-X, multiple alignments, and several other online protein engineering-related tools.

Good organizational and teamwork skills, good time management. Good communication abilities and relationship-building skills.

Language skills

Mother tongue: Hungarian; proficient user (C2) in Romanian and (C1) in English, independent user (B2) in German.

Memberships

- 2015-2016 active member of the faculty's students' associations (Organizația Studenților Chimiști-OSC, Kolozsvári Magyar Ifjú Kémikusok Szövetsége-KOMIX)
- 2008-present member of the Hungarian Scout Association in Romania (Romániai Magyar Cserkészszövetség, RMCSSZ)

2025.09.01. Cluj-Napoca, Romania