

---

**PERSONAL INFORMATION**

---



**Name:** Bálint Csörgő

**Date and Place of Birth:** November 24, 1982; Szeged, Hungary

**Nationality:** Hungarian

**E-mail:** [Csorgo.Balint@brc.hu](mailto:Csorgo.Balint@brc.hu) , [csorgo@embl.de](mailto:csorgo@embl.de) , [bcsorgo@gmail.com](mailto:bcsorgo@gmail.com)

**Telephone:** +36-30-580-7837, +1-415-301-8091, +49-162-774-5256

**Position:** Group Leader

**Work Address:** ELKH Biological Research Centre, Temesvári krt. 62., Szeged, Hungary, H-6726

**ORCID ID:** <https://orcid.org/0000-0003-0397-6845>

**Google Scholar:** <https://scholar.google.com/citations?user=LUD13qEAAAJ&hl=en>

---

**EDUCATION AND APPOINTMENTS**

---

**2023 - :** Group Leader, Gene Technology Research Group, Institute of Biochemistry, ELKH Biological Research Centre, Szeged, Hungary

**2021-2022:** Postdoctoral Fellow, Genome Biology Unit, The European Molecular Biology Laboratory, Heidelberg, Germany  
Advisor: Prof. Lars M. Steinmetz

**2019-2021:** Joint Postdoctoral Affiliation, Innovative Genomics Institute, University of California, Berkeley, CA, USA

**2017-2021:** Postdoctoral Fellow, Department of Microbiology and Immunology, University of California, San Francisco, CA, USA  
Advisor: Prof. Joseph Bondy-Denomy

**2013-2017:** Research associate, Institute of Biochemistry, Biological Research Centre of the Hungarian Academy of Sciences  
Advisor: Prof. Csaba Pál

**2007-2012:** Ph. D. in Microbiology and Molecular Biology, Title of Ph.D. dissertation: "Increasing the genetic stability of reduced genome *Escherichia coli* by elimination of the error-prone DNA polymerases", University of Szeged, Hungary, *summa cum laude*  
Advisor: Prof. György Pósfai

**2001-2006:** M.Sc. in Molecular Biology, University of Szeged, Hungary, *summa cum laude*

**1997-2001:** Ságvári Secondary School, Szeged, Hungary  
Ann Arbor Pioneer High School, Ann Arbor, MI, USA

## SCIENTIFIC PUBLICATIONS

---

*Asteriks\* indicates co-first-authorship, underline indicates co-corresponding-authorship*

27. Helena-Bueno K, Rybak MY, Ekemezie CL, Sullivan R, Brown CR, Dingwall C, Baslé A, Schneider C, Connolly JPR, Blaza JN, **Csőrgő B**, Moynihan P, Gagnon MG, Hill CH, Melnikov SV. A New Family of Bacterial Ribosome Hibernation Factors. *Nature*, Accepted.

26. Mozumdar D, **Csőrgő B**, Bondy-Denomy J. (2022) Genetic Manipulation of a CAST of Characters in a Microbial Community [Review]. *CRISPR Journal*, 5: DOI: 10.1089/crispr.2022.29142.dmo, PMID: 35119310

25. **Csőrgő B\***, Leon LM\*, Chau-Ly IJ, Vasquez-Rifo A, Berry JD, Mahendra C, Crawford ED, Lewis JD, Bondy-Denomy J. (2020) A compact Cascade-Cas3 system for targeted genome engineering. *Nature Methods*, 17: 1183-1190. PMID: 33077967

24. **Csőrgő B**, Nyerges Á, Pál C. (2020) Targeted mutagenesis of multiple chromosomal regions in microbes [Review]. *Current Opinion in Microbiology*, 57: 22-30. PMID: 32599531.

23. Marino M, Pinilla-Redondo R, **Csőrgő B**, Bondy-Denomy J. (2020) Anti-CRISPR protein applications: natural brakes for CRISPR-Cas technologies [Review]. *Nature Methods*, 17: 471-479. PMID: 32203383.

22. Kintses B, Jangir PK, Fekete G, Számel M, Méhi O, Spohn R, Daruka L, Martins A, Hosseinnia A, GagariNova A, Kim S, Phanse S, **Csőrgő B**, Györkei Á, Ari E, Lázár V, Nagy I, Babu M, Pál C, Papp B. (2019) Chemical-genetic profiling reveals limited cross-resistance between antimicrobial peptides with different modes of action. *Nature Communications*, 10(1):5731. PMID: 31844052.

21. Spohn R, Daruka L, Lázár V, Martins A, Vidovics F, Grézal G, Méhi O, Kintses B, Számel M, Jangir PK, **Csőrgő B**, Györkei Á, Bódi Z, Faragó Á, Bodai L, Földesi I, Kata D, Maróti G, Pap B, Wirth R, Papp B, Pál C. (2019) Integrated evolutionary analysis reveals antimicrobial peptides with limited resistance. *Nature Communications*, 10(1):4538. PMID: 31586049.

20. Apjok G, Boross G, Nyerges Á, Fekete G, Lázár V, Papp B, Pál C, **Csőrgő B**. (2019) Limited evolutionary conservation of the phenotypic effects of antibiotic resistance mutations. *Molecular Biology and Evolution*, 36(8):1601-1611. PMID: 31058961.

19. Kaminski Strauss S, Schirman D, Jona G, Brooks AN, Kunjapur AM, Nguyen Ba AN, Flint A, Solt A, Mershin A, Dixit A, Yona AH, **Csőrgő B**, Busby BP, Hennig BP, Pál C, Schraivogel D, Schultz D, Wernick DG, Agashe D, Levi D, Zabezhinsky D, Russ D, Sass E, Tamar E, Herz E, Levy ED, Church GM, Yelin I, Nachman I, Gerst JE, Georgeson JM, Adamala KP, Steinmetz LM, Rüksam M, Ralser M, Klutstein M, Desai MM, Walunjkar N, Yin N, Aharon Hefetz N, Jakimo N, Snitser O, Adini O, Kumar P, Soo Hoo Smith R, Zeidan R, Hazan R, Rak R, Kishony R, Johnson S, Nouriel S, Vonesch SC, Foster S, Dagan T, Wein T, Karydis T, Wannier TM, Stiles T, Olin-

Sandoval V, Mueller WF, Bar-On YM, Dahan O, Pilpel Y. (2019) Evolthon: A community endeavor to evolve lab evolution. *PLoS Biology*, 17(3): e3000182. PMID: 30925180.

18. Nyerges Á, **Csörgő B**, Draskovits G, Kintsés B, Szili P, Ferenc G, Révész T, Ari E, Nagy I, Bálint B, Vásárhelyi BM, Bihari P, Számel M, Balogh D, Papp H, Kalapis D, Papp B, Pál C. (2018) Predicting the evolution of antibiotic resistance by directed mutagenesis at multiple loci. *Proceedings of the National Academy of Sciences of the USA*, 115(25): E5726-E5735. PMID: 29871954.

17. Lázár V, Martins A, Spohn R, Daruka L, Grézal G, Fekete G, Számel M, Jangir PK, Kintsés B, **Csörgő B**, Nyerges Á, Györkei Á, Kincses A, Dér A, Walter F, Deli M, Urbán E, Hegedűs Z, Olajos G, Méhi O, Bálint B, Nagy I, Martinek T, Papp B, and Pál C. (2018) Antibiotic-resistant bacteria show widespread collateral sensitivity to antimicrobial peptides. *Nature Microbiology*, 3(6): 718-731. PMID: 29795541.

16. Bódi Z, Farkas Z, Nevozhay D, Kalapis D, Lázár V, **Csörgő B**, Nyerges Á, Szamecz B, Fekete G, Papp B, Araújo H, Oliveira JL, Moura G, Santos MAS, Székely T, Balázs G and Pál C. (2017) Phenotypic heterogeneity guides adaptive evolution. *PLoS Biology*, 15(6): e1002607. PMID: 28486496.

15. Umenhoffer K, Draskovits G, Nyerges Á, Karcagi I, Bogos B, Tímár E, **Csörgő B**, Herczeg R, Nagy I, Fehér T, Pál C, Pósfai G. (2017) Genome-wide abolishment of mobile genetic elements using genome shuffling and CRISPR/Cas-assisted MAGE allows the efficient stabilization of a bacterial chassis. *ACS Synthetic Biology*, doi: 10.1021/acssynbio.6b00378. PMID: 28426191.

14. **Csörgő, B.**, Nyerges Á., Pósfai G., and Fehér T. (2016) System-level genome editing in microbes [Review]. *Current Opinion in Microbiology*, 33, 113-122. PMID: 27472027.

13. Szappanos, B.\* , Fritzenmeier, C. J.\* , **Csörgő, B.\***, Lázár, V., Lu, X., Fekete, G., Balázs, B., Herczeg, R., Nagy, I., Notebaart, R., Lercher, M., Pál, C., Papp, B. (2016) Adaptive evolution of complex innovations through stepwise metabolic niche expansion. *Nature Communications*, 7, 11607. PMID: 27197754.

12. Nyerges, Á.\* , **Csörgő, B.\***, Nagy, I., Balázs, B., Bihari, P., Lázár, V., Apjok, G., Umenhoffer, K., Bogos, B., Pósfai, G., and Pál, C. (2016) A highly precise and portable genome engineering method allows comparison of mutational effects across bacterial species. *Proceedings of the National Academy of Sciences of the USA*, 113(9), 2502-2507. PMID: 26884157.

11. Notebaart, R.A., Szappanos, B., Kintsés, B., Pál, F., Györkei, Á., Bogos, B., Lázár, V., Spohn, R., **Csörgő, B.**, Wagner, A., Ruppín, E., Pál C., and Papp B. (2014) Network-level architecture and the evolutionary potential of underground metabolism. *Proceedings of the National Academy of Sciences of the USA*, 111(32), 11762–11767. PMID: 25071190.

10. Méhi, O., Bogos, B., **Csörgő, B.**, Pál, F., Nyerges, Á., Papp, B. and Pál, C. (2014) Perturbation of Iron Homeostasis Promotes the Evolution of Antibiotic Resistance. *Molecular Biology and Evolution*, 31(10), 2793–2804. PMID: 25063442.

9. Lázár, V., Nagy, I., Spohn, R., **Csörgő, B.**, Györkei, Á., Nyerges, Á., Horváth, B., Vörös, A., Busa-Fekete, R., Hrtyan, M., Bogos B., Méhi O., Fekete G., Szappanos B., Kégl B., Papp B., and

Pál C. (2014) Genome-wide analysis captures the determinants of the antibiotic cross-resistance interaction network. *Nature Communications*, 5, 4352. PMID: 25000950.

8. Nyerges, Á.\*, **Csörgő, B.\***, Nagy, I., Latinovics, D., Szamecz, B., Pósfai, G. and Pál, C. (2014) Conditional DNA repair mutants enable highly precise genome engineering. *Nucleic Acids Research*, 42(8), e62. PMID: 24500200.

7. Lázár, V., Singh, G.P., Spohn, R., Nagy, I., Horváth, B., Hrtyan, M., Busa-Fekete, R., Bogos, B., Méhi, O., **Csörgő, B.**, Pósfai G., Fekete G., Szappanos B., Kégl B., Papp B., and Pál C. (2013) Bacterial evolution of antibiotic hypersensitivity. *Molecular Systems Biology*, 9, 700. PMID: 24169403.

6. Méhi, O., Bogos, B., **Csörgő, B.** and Pál, C. (2013) Genomewide screen for modulators of evolvability under toxic antibiotic exposure. *Antimicrobial Agents and Chemotherapy*, 57, 3453–3456. PMID: 23669383.

5. Fehér, T., Bogos, B., Méhi, O., Fekete, G., **Csörgő, B.**, Kovács, K., Pósfai, G., Papp, B., Hurst, L.D. and Pál, C. (2012) Competition between transposable elements and mutator genes in bacteria. *Molecular Biology and Evolution*, 29, 3153–3159. PMID: 22527906.

4. **Csörgő, B.**, Fehér, T., Tímár, E., Blattner, F.R. and Pósfai, G. (2012) Low-mutation-rate, reduced-genome Escherichia coli: an improved host for faithful maintenance of engineered genetic constructs. *Microbial Cell Factories*, 11, 11. PMID: 22264280.

3. Fehér, T., Karcagi, I., Gyórfy, Z., Umenhoffer, K., **Csörgő, B.** and Pósfai, G. (2008) Scarless engineering of the Escherichia coli genome. *Methods in Molecular Biology, Microbial Gene Essentiality: Protocols and Bioinformatics*, 416, 251–259. PMID: 18392972.

2. Durfee, T., Nelson, R., Baldwin, S., Plunkett, G., Burland, V., Mau, B., Petrosino, J.F., Qin, X., Muzny, D.M., Ayele, M., Gibbs, R. A., **Csörgő, B.**, Pósfai, G., Weinstock, G.M and Blattner, F.R. (2008) The Complete Genome Sequence of Escherichia coli DH10B: Insights into the Biology of a Laboratory Workhorse. *Journal of Bacteriology*, 190, 2597–2606. PMID: 18245285.

1. **Csörgő, B.** and Pósfai, G. (2007) Directed homologous recombination for genome engineering in Escherichia coli. *Acta Biologica Hungarica*, 58, 1–10. PMID: 18297790.

## PATENTS

---

3. “CRISPR-Cas3 for making genomic deletions” US patent application no. 62/865085  
Inventors: Joseph Bondy-Denomy, Lina M. Leon, **Bálint Csörgő**

2. “Mutagenizing Intracellular Nucleic Acids” US Patent no. US 10669537 B2  
Inventors: Ákos Nyerges, **Bálint Csörgő**, Bálint Kintsés, Csaba Pál

1. “Reduced genome bacteria with improved genetic stability” International Patent: No. PCT/US2012/61027, US patent no. 9340791  
Inventors: Frederick R. Blattner, **Bálint Csörgő**, György Pósfai

## TEACHING EXPERIENCE

---

**2018-2021:** Mentorship of a graduate student and lab technician, University of California, San Francisco

**2014-2017:** Mentorship of one PhD. and two Msc. students at the Biological Research Centre of the Hungarian Academy of Sciences

**2014:** mentor for iGEM-HS Competition, team “Hungenious”, awarded prize for “Best Experimental Measurement”

**2006-2016:** Introduction to Molecular Biology Practical Course, Advanced Molecular Biology Practical Course, Synthetic and Systems Biology Lecture Series; Department of Biochemistry and Molecular Biology, University of Szeged

## SCIENTIFIC AWARDS AND GRANTS

---

**2023-2028:** Lendület Grant of the Hungarian Academy of Sciences

**2022-2025:** Bólyai Scholarship of the Hungarian Academy of Sciences (declined)

**2019-2022:** Marie Skłodowska-Curie Individual Global Fellowship (MSCA-GIF)

**2017-2018:** Eötvös Fellowship of the Republic of Hungary

**2016:** Albert Szent-Györgyi Young Investigator Award of the New York Hungarian Scientific Society

**2015:** EMBO-EMBL Symposium for Eukaryotic Synthetic Biology, Heidelberg, Germany, Best Poster Prize

**2015:** EMBO-EMBL Symposia Travel Grant

**2015:** Young Investigator Award of the Hungarian Academy of Sciences

**2014:** EMBO-ESF Symposia Travel Grant

**2013-2016:** Post-doctoral Grant of the Hungarian National Research Foundation (OTKA-PD)

**2013:** Qualitas Biologica Foundation, Szeged; Best doctoral thesis prize

**2010:** FEBS Travel Grant

**2009-2012:** Young Investigator Scholarship of the Hungarian Academy of Sciences

**2009:** International Life Sciences Students’ Conference, Kiev, Ukraine; Best Presentation Prize

**2005:** National Student Scientific Competition (OTDK), Pécs, Hungary: First prize in the category of Microbial Genetics

**2004-2006:** Scholarship of the Republic of Hungary

## ORAL PRESENTATIONS (CONFERENCES/SEMINARS)

---

**2023:** Typas Lab Seminar, EMBL, Heidelberg, Germany

**2023:** SCMB, invited speaker, SRM University Andhra Pradesh, Amaravati, India

**2023:** BRC Institute of Genetics Seminar, Szeged, Hungary

**2022:** EMBL Postdoc Retreat, invited speaker, Prague, Czech Republic

**2021:** CRISPR 2021 Conference Pasteur Institute, virtual

**2021:** Harvard Medical School Genome Engineering Seminar Series, virtual

**2021:** Bay Area Microbial Pathogenesis Symposium, virtual

**2021:** Keystone Symposia, Precision Engineering of the Genome, virtual

**2019:** UCSF I-Micro Retreat, San Francisco, CA, USA  
**2019:** EMBO-EMBL New Approaches and Concepts in Microbiology, Heidelberg, Germany  
**2019:** ASM Microbe, San Francisco, CA, USA  
**2019:** Seed Lab Seminar, University of California, Berkeley, CA, USA  
**2018:** Steinmetz Lab Seminar, Stanford University, CA, USA  
**2017:** Westra Lab Seminar, University of Exeter, UK  
**2016:** Lu Lab Seminar, Massachusetts Institute of Technology, MA, USA  
**2016:** Weizmann Institute of Science Genome Evolution Conference, Rehovot, Israel  
**2015:** International Synthetic and Systems Biology Summer School, Taormina, Italy  
**2015:** EMBO-EMBL Symposium for Eukaryotic Synthetic Biology, Heidelberg, Germany  
**2015:** Hungarian Molecular Life Sciences Conference, Eger, Hungary  
**2014:** EMBO-ESF Synthetic Biology of Antibiotic Production II, Sant Feliu de Guíxols, Spain  
**2011:** Hungarian Biochemical Society Conference, Pécs, Hungary  
**2010:** EMBO-FEBS Host-Microbe Interactions, Spetses, Greece  
**2009:** International Life Sciences Students' Conference, Kiev, Ukraine  
**2008:** Hungarian Biochemical Society Conference, Szeged, Hungary

## AD HOC REVIEWER

---

Scientific Journals:

*eLife, Gene Reports, Genes, MethodsX, Molecular Biology and Evolution, Nature Communications, Nature Ecology and Evolution, Nature Methods, Nucleic Acids Research, PNAS, PLOS One, RNA Biology, Scientific Reports, The CRISPR Journal*

Funding Agencies:

*Graduate Women in Science (GWIS) National Fellowship Program, Polish National Science Foundation*

## SKILLS

---

Genome editing of various phage, bacteria, and yeast using a variety of techniques; cloning; DNA, RNA, protein isolation; RT-qPCR; Next-generation sequencing, Western blotting; high-throughput laboratory evolution; chemogenomic screening; experience with liquid-handling robots; high-throughput data analysis; scientific writing; teaching

## LANGUAGES

---

Hungarian (native proficiency)  
English (native proficiency)  
French (intermediate proficiency)

## REFERENCES

---

György Pósfai, Ph.D., [posfai.gyorgy@brc.mta.hu](mailto:posfai.gyorgy@brc.mta.hu)  
Csaba Pál, Ph.D., [pal.csaba@brc.mta.hu](mailto:pal.csaba@brc.mta.hu)  
Balázs Papp, Ph.D., [papp.balazs@brc.mta.hu](mailto:papp.balazs@brc.mta.hu)  
Joseph Bondy-Denomy, Ph.D., [Joseph.Bondy-Denomy@ucsf.edu](mailto:Joseph.Bondy-Denomy@ucsf.edu)

Lars M. Steinmetz, Ph.D., [larsms@embl.de](mailto:larsms@embl.de)