

Curriculum Vitae

Personal Data

Title	Prof. Dr.
First name	Rolf
Name	Backofen
Current position	Professor, Chair for Bioinformatics
Current institution(s)/site(s), country	Department of Computer Science, University of Freiburg, Germany
Identifiers/ORCID	orcid.org/0000-0001-8231-3323

Qualifications and Career

Stages	Periods and Details
Degree programme	1983-1989, Diploma in computer science at University of Erlangen
Doctorate	1994, Ph.D., University of Saarbrücken, Germany 1990-1994, Ph.D., DFKI Saarbrücken, Germany
Stages of academic/professional career	Since 2005, Full Professor (W3), University of Freiburg, Germany. Since 2005, Member, Center of non-coding RNA in Technology and Health, Denmark 2001-2005, Full Professor (C4), University of Jena, Germany 1996-2001, Assistant Professor (C1), University of Munich, Germany

Supplementary Career Information: not specified.

Activities in the Research System

Committees and faculty responsibilities:

Since 2019	Associate Researcher, Cluster of Excellence “Center for Integrative Biological Signaling Studies” (CIBSS), University of Freiburg
2015-2021	Coordinator, Center of Excellence in RNA Bioinformatics (own funding 9.405.217€), BMBF-initiative German network for bioinformatics infrastructure
2019-2021	Dean, Faculty of Engineering, University of Freiburg
2015-2020	Associate Editor, IEEE/ACM Transactions on Computational Biology and Bioinformatics
since 2016	Editorial Board, Bioinformatics
2011-2016	Associate Editor, BMC Bioinformatics
since 2006	Associate Editor, Algorithms for Molecular Biology
1982	Bayerische Hochbegabtenförderung

Organization of academic events: The Backofen Lab is hosting and maintaining the European Galaxy Server (started 2015 as Freiburger Galaxy Server), which is a workflow-management system for the FAIR analysis of high-throughput data. It has more than 130.000 users and provides, for free, access to more than 3000 installed tools and major public databases, as well as associated training courses. This server got recently permanent support from the Ministry of Science, Research and the Arts (MWK) and the University of Freiburg

Supervision of Researchers in Early Career Phases

Supervision of more than 30 PhD candidates. Former members of group on faculty positions: S. Will, F. Costa, M. Hiller, O. Alkhnabashi. Supervision of 36 Master thesis and 28 Bachelor thesis within the last 5 years.

Scientific Results

Category A

1. Wandera KG, Alkhnabashi OS, vi Bassett H, Mitrofanov A, Hauns S, Migur A, **Backofen R**[#], Beisel, CL[#]. Anti-CRISPR prediction using deep learning reveals an inhibitor of Cas13b nucleases. *Molecular cell* 2022; 82 (14), 2714-2726. doi: [10.1016/j.molcel.2022.05.003](https://doi.org/10.1016/j.molcel.2022.05.003)
2. Mossad O, Batut B, Yilmaz B, Dokalis N, Mezö C, Nent E, Nabavi LS, Mayer M, Maron FJM, Buescher JM, de Agüero MG, Szalay A, Lämmermann T, Macpherson AJ, Ganai-Vonarburg SC, **Backofen R**, Erny D, Prinz M, Blank T[#]. Gut microbiota drives age-related oxidative stress and mitochondrial damage in microglia via the metabolite N⁶-carboxymethyllysine. *Nat Neurosci.* 2022; 25(3):295-305. doi: [10.1038/s41593-022-01027-3](https://doi.org/10.1038/s41593-022-01027-3).
3. Aktaş T, Avşar İlik İ, Maticzka D, Bhardwaj V, Pessoa Rodrigues C, Mittler G, Manke T, **Backofen R**, Akhtar A[#]. DHX9 suppresses RNA processing defects originating from the Alu invasion of the human genome. *Nature.* 2017; 544(7648):115-119. doi: [10.1038/nature21715](https://doi.org/10.1038/nature21715).
4. Costa F, Grün D[#], **Backofen R**[#]. GraphDDP: a graph-embedding approach to detect differentiation pathways in single-cell-data using prior class knowledge. *Nat Commun.* 2018; 9(1):3685. doi: [10.1038/s41467-018-05988-7](https://doi.org/10.1038/s41467-018-05988-7).
5. Heyl F[#], **Backofen R**[#]. StoaDive: Evaluation and classification of peak profiles for sequencing data. *Gigascience.* 2021; 10(6):giab045. doi: [10.1093/gigascience/giab045](https://doi.org/10.1093/gigascience/giab045).
6. Makarova KS, Wolf YI, Iranzo J, Shmakov SA, Alkhnabashi OS, Brouns SJJ, Charpentier E, Cheng D, Haft DH, Horvath P, Moineau S, Mojica FJM, Scott D, Shah SA, Siksnys V, Terns MP, Venclovas Č, White MF, Yakunin AF, Yan W, Zhang F, Garrett RA, **Backofen R**, van der Oost J, Barrangou R, Koonin EV[#]. Evolutionary classification of CRISPR-Cas systems: a burst of class 2 and derived variants. *Nat Rev Microbiol.* 2020; 18(2):67-83. doi: [10.1038/s41579-019-0299-x](https://doi.org/10.1038/s41579-019-0299-x).
7. Makarova KS, Wolf YI, Alkhnabashi OS, Costa F, Shah SA, Saunders SJ, Barrangou R, Brouns SJ, Charpentier E, Haft DH, Horvath P, Moineau S, Mojica FJ, Terns RM, Terns MP, White MF, Yakunin AF, Garrett RA, van der Oost J, **Backofen R**, Koonin EV[#]. An updated evolutionary classification of CRISPR-Cas systems. *Nat Rev Microbiol.* 2015; 13(11):722-36. doi: [10.1038/nrmicro3569](https://doi.org/10.1038/nrmicro3569).
8. Maticzka D, Lange SJ, Costa F, **Backofen R**[#]. GraphProt: modeling binding preferences of RNA-binding proteins. *Genome Biol.* 2014; 15(1):R17. doi: [10.1186/gb-2014-15-1-r17](https://doi.org/10.1186/gb-2014-15-1-r17).
9. Lange SJ, Maticzka D, Möhl M, Gagnon JN, Brown CM, **Backofen R**[#]. Global or local? Predicting secondary structure and accessibility in mRNAs. *Nucleic Acids Res.* 2012; 40(12):5215-26. doi: [10.1093/nar/gks181](https://doi.org/10.1093/nar/gks181).
10. Mitrofanov A, Alkhnabashi OS, Shmakov SA, Makarova KS, Koonin EV, **Backofen R**[#]. CRISPRidentify: identification of CRISPR arrays using machine learning approach. *Nucleic Acids Res.* 2021; 49(4):e20. doi: [10.1093/nar/gkaa1158](https://doi.org/10.1093/nar/gkaa1158).

Patents

1. Patent Issued: **Backofen R**, **Hutter F**, Runge F. Method and Device for Ascertaining an RNA Sequence. Publication number: 20220051753

Academic Distinctions

- Member of Scientific Board, ELIXIR (European Organization for Life Science Data, since 2019).
- Member of Scientific Advisory Board, ONTOWERSE Project (2006-2007)
- CPM Best Paper Award (2009)
- Siemens Studienkreis (1990) and Doktorandenkreis (1995),

Other Information

not specified.