

## Jun.-Prof. Dr. Kathrin Leppek

### Personal Data

Title	Jun.-Prof. Dr. rer. nat.
First name	Kathrin
Name	Leppek
Current position	Professor (W1/2 tenure-track)
Current institution(s)/site(s), country	University Hospital Bonn, Institute of Clinical Chemistry and Clinical Pharmacology (IKCKP), Biomedical Center II, Venusberg-Campus 1, 53127 Bonn, Germany
Identifiers/ORCID	<a href="https://orcid.org/0000-0002-8012-8076">orcid.org/0000-0002-8012-8076</a>

### Qualifications and Career

<u>Stages</u>	<u>Periods and Details</u>
Degree programme	B.Sc. in Biology, Focus: Molecular Biology, 2005 – 2008, University of Heidelberg, Germany  M.Sc. in Molecular Biosciences, Major: Molecular and Cellular Biology, 2008 – 2010, University of Heidelberg, Germany
Doctorate	2010 – 2014 Mentor: G. Stoecklin, PhD in RNA, Immunology and Cancer Molecular Biology, German Cancer Research Center (DKFZ) and University of Heidelberg
Stages of academic/professional career	Since 2022 Professor (W1/2 tenure-track), Immunobiochemistry, IKCKP, University Hospital Bonn  2015 – 2021 Postdoctoral Fellow and Research Associate (M. Barna), RNA, Ribosome and Developmental Biology, Stanford University, CA, USA  2014 Postdoctoral Fellow (G. Stoecklin), DKFZ & Center for Molecular Biology (ZMBH), University of Heidelberg

### Activities in the Research System

#### **Committee involvement & activities in the field of academic self-governance:**

Since 05/2024	Scientific selection committee member for DAAD PhD and PRIME Postdoc Stipends
Since 01/2024	Steering Committee representative of the UKB medical faculty for the new interdisciplinary “Center for Crazy Ideas” at the University of Bonn
Since 01/2024	Co-organizer of official RNA Salon “Rhineland RNA Club” with Dr. Ina Huppertz (MPI Cologne) supported by the RNA Society, 10+ labs/100 members, 3x/year in Cologne, Bonn, Düsseldorf
Since 01/2024	Steering Committee representative of the UKB medical faculty for the new interdisciplinary “Center for Crazy Ideas” at the University of Bonn
Since 09/2023	Scientific Expert for Hoyng Rokh Monegier Düsseldorf for BioNTech RNA vaccine patent trial

04/2023	Day of Immunology outreach event for Bonn public
Since 2023	PI in TRA "Life and Health", University of Bonn
Since 2022	PI in ImmunoSensation <sup>2</sup> Excellence Cluster
2021	Speaker at "Cutting-Edge Cancer Research: A Webinar for Bay Area High School Students", Damon Runyon Cancer Research Foundation
2020	Initiator, organizer, and moderator of a Zoom 2-hour discussion group on Translation Regulation as part of the virtual RNA2020 conference.
2018 – 2020	Initiator/Organizer of a postdoc group supporting the organization of the Bay Area RNA Club Symposium 2018, UCSF, USA.
Since 2018	Solicited reviewer for journals: Nature Microbiology, RNA Biology, Nucleic Acids Research.

**Memberships in scientific societies:** Member of the Transdisciplinary Research Area (TRA), University of Bonn, Life and Health (since 04/2023); Member of Bonn Forum for Biomedicine (since 2022); Member of Deutscher Hochschulverband (since 2022); Member of Gesellschaft für Biochemie und Molekularbiologie (since 2022); Member of RNA Society (since 2012).

**Academic Distinctions:** Human Frontier Science Program, Early Career Award (team of 4 PIs, 1.5 Mio €, 3 years); Title: Switchable immunomodulation of mRNA transport and local translation in microglia by bioactive RNAs (03/2023 – 2026); TRA Life and Health Research Prize 2024, with Prof. Maximilian Billmann, 1 year, 50.000€ (12/2023); RNA Society 2023 Research Presentation Fellowship, \$1.000 (03/2023); RNA Society/Scaringe Postdoctoral Fellow Award 2021, \$1.000 (11/2020); "Katharine McCormick"-Advanced Postdoctoral Fellowship, Stanford (2019 – 2020); 1st Talk Prize: Bay Area RNA Club (BARC) Symposium, UCSF, USA (2018); Postdoctoral Fellowship, Damon Runyon Cancer Research Foundation (2015 – 2019); "Karl-Lohmann"-Award, Society for Biochemistry and Molecular Biology (2015); "Ruprecht-Karls"-Award (2015); 2nd place Bayer HealthCare Award, PhD Thesis Award of GBM (2015); EMBO Long-Term Postdoctoral Fellowship (2015); PhD Fellowship, Helmholtz International Graduate School for Cancer Research at DKFZ (2010 – 2013); PhD Fellowship, EMBL International PhD Program (declined, 2010); Research Fellowship (Burroughs Wellcome Fund to M.C. Hammond), Visiting Scholar, UC Berkeley, USA (2009).

## Scientific Results

### **Category A** (\* corresponding author)

1. **K. Leppek**, G.W. Byeon, W. Kladwang, H.K. Wayment-Steele, C.H. Kerr, A.F. Xu, D.S. Kim, V.V. Topkar, C. Choe, D. Rothschild, G.C. Tiu, R. Wellington-Oguri, K. Fujii, E. Sharma, A.M. Watkins, J.J. Nicol, J. Romano, B. Tunguz, E. Participants, P.R. Dormitzer, A. Solórzano, M. Barna\*, R. Das\* "Combinatorial optimization of mRNA structure, stability, and translation for RNA-based therapeutics" *Nat. Commun.* **2022**, 13, 1536. DOI: [10.1038/s41467-022-28776-w](https://doi.org/10.1038/s41467-022-28776-w).
2. **K. Leppek**, G.W. Byeon, K. Fujii, M. Barna\* "VELCRO-IP RNA-seq reveals ribosome expansion segment function in translation genome-wide" *Cell Rep.* **2021**, 34, 108629. DOI: [10.1016/j.celrep.2020.108629](https://doi.org/10.1016/j.celrep.2020.108629).
3. **K. Leppek**, K. Fujii, N. Quade, T.T. Susanto, D. Boehringer, T. Lenarčič, S. Xue, N.R. Genuth, N. Ban\*, M. Barna\* "Gene- and species-specific Hox mRNA translation by ribosome expansion segments" *Mol. Cell* **2020**, 80, 980–995. DOI: [10.1016/j.molcel.2020.10.023](https://doi.org/10.1016/j.molcel.2020.10.023).

4. **K. Leppek**, M. Barna\* “An rRNA variant to deal with stress” *Nat. Microbiol.* **2019**, 4, 382–383. DOI: [10.1038/s41564-019-0396-7](https://doi.org/10.1038/s41564-019-0396-7).
5. **K. Leppek**, R. Das\*, M. Barna\* “Functional 5’ UTR mRNA structures in eukaryotic translation regulation and how to find them” *Nat. Rev. Mol. Cell Biol.* **2018**, 19, 158–174. DOI: [10.1038/nrm.2017.103](https://doi.org/10.1038/nrm.2017.103).
6. D. Simsek, G.C. Tiu, R.A. Flynn, G.W. Byeon, **K. Leppek**, A.F. Xu, H.Y. Chang, M. Barna\* “The Mammalian Ribo-interactome Reveals Ribosome Functional Diversity and Heterogeneity” *Cell* **2017**, 169, 1051–1065. DOI: [10.1016/j.cell.2017.05.022](https://doi.org/10.1016/j.cell.2017.05.022).
7. L. Codutti, **K. Leppek**, J. Zálešák, V. Windeisen, P. Masiewicz, G. Stoecklin, T. Carlomagno\* “A distinct, sequence-induced conformation is required for recognition of the Constitutive Decay Element RNA by Roquin” *Structure* **2015**, 23, 1437–1447. DOI: [10.1016/j.str.2015.06.001](https://doi.org/10.1016/j.str.2015.06.001).
8. **K. Leppek**, G. Stoecklin\* “An optimized streptavidin-binding RNA aptamer for purification of ribonucleoprotein complexes identifies novel ARE-binding proteins” *Nucleic Acids Res.* **2014**, 42, e13. DOI: [10.1093/nar/gkt956](https://doi.org/10.1093/nar/gkt956).
9. **K. Leppek**, J. Schott, S. Reitter, F. Poetz, M.C. Hammond, G. Stoecklin\* “Roquin promotes constitutive mRNA decay via a conserved class of stem-loop recognition motifs” *Cell* **2013**, 153, 869–881. DOI: [10.1016/j.cell.2013.04.016](https://doi.org/10.1016/j.cell.2013.04.016).
10. **K. Leppek**, J. Schott, G. Stoecklin\* “Protein synthesis and translational control: at eye level with the ribosome” *EMBO Rep.* **2011**, 12, 1214–1216. DOI: [10.1038/embor.2011.224](https://doi.org/10.1038/embor.2011.224).

## Category B

### Patents

1. 05/2020: **Kathrin Leppek**, Maria Barna: “Systems and Methods for Enhancing Gene Expression” Application: 63/022,898.
2. 05/2020: **Kathrin Leppek**, Maria Barna: “Systems and Methods for Enhancing Gene Expression” Application: 63/022,901.
3. 08/2020: **Kathrin Leppek**, Gun Woo Byeon, Maria Barna: “Systems and Methods for Producing RNA Constructs with Increased Translation and Stability” Application: 63/072,669.
4. 05/2022: Maria Barna, Rhiju Das, **Kathrin Leppek**, Gun Woo Byeon, Eesha Sharma: “Systems and methods to assess RNA stability” Application US17/456,353; US20220162588A1.
5. Maria Barna, **Kathrin Leppek**, Gun Woo Byeon: “Systems and Methods for Producing RNA Constructs with Increased Translation and Stability” 11/2022; Application US17/463,466; US11492611B2 05/2023; Application US18/053,324; US20230159915A1
6. 08/2023: Maria Barna, **Kathrin Leppek**, Gun Woo Byeon: “Systems and methods to assess RNA stability” Application US17/454,795; US11739317B2.

7. Maria Barna, **Kathrin Leppek**: “Systems and Methods for Enhancing Gene Expression”  
01/2024: Application US17/998,789; US20240002864A1  
02/2024: Application US17/998,788; US20240043835A1  
11/2021: Worldwide applications; WO2021231503A2.