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Place of Birth/Nat.: Heidelberg/German

Research Experience / Appointments

- 01/2022 – present **Tenure-track W1 Junior-Professor for Immunobiochemistry**
University Clinic Bonn (UKB), University of Bonn, Bonn, Germany
• Topic: Transcript-specific Translation by the Ribosome (RNA, Ribosome and Immunology)
- 01/2015 – 12/2021 **Postdoctoral Fellow/Research Associate, Stanford University, CA, USA**
• Advisor: **Maria Barna** (Department of Developmental Biology & Genetics)
• Topic: Mechanistic Characterization of 5' UTR RNA elements that confer translational specificity to shape vertebrate embryonic development. (RNA, Ribosome and Developmental Biology)
- 03/2014 – 11/2014 **Postdoctoral Fellow, DKFZ and University of Heidelberg, Germany**
German Cancer Research Center (DKFZ) and Center for Molecular Biology (ZMBH)
• Advisor: **Georg Stoecklin** (DKFZ-ZMBH Alliance)
• Topic: Structural Characterization of Roquin-CDE Complexes in CDE-mediated mRNA Decay. (RNA and Structural Biology)

Education

- 11/2010 – 03/2014 **Ph.D.** in RNA, Immunology and Cancer Molecular Biology
German Cancer Research Center (DKFZ) and University of Heidelberg, Germany
• Advisor: **Georg Stoecklin** (DKFZ-ZMBH Alliance)
• Ph.D. Thesis: RNA Affinity Purification and Characterization of Roquin Proteins in CDE-mediated mRNA Decay. 3.5 years, **summa cum laude** (Ph.D. defense 03/10/2014)
- 10/2008 – 08/2010 **M.Sc.** in Molecular Biosciences, Major: Molecular and Cellular Biology
University of Heidelberg, Germany
• Master Thesis, Georg Stoecklin: Affinity purification of Ribonucleoprotein Complexes via RNA-tags and analysis of CDE-mediated decay. grade: 1.0 (1.0 highest grade)
- 10/2005 – 06/2008 **B.Sc.** in Biology, Focus: Molecular Biology
University of Heidelberg, Germany
• Bachelor Thesis, Thomas Rausch lab (Andreas Wachter): An RNA switch controlling Transcription Factor IIIA expression by alternative splicing and NMD-mediated transcript turnover. grade: 1.3 (1.0 highest grade)

Scientific Positions

- 09/01 – 10/31/2010 **Student Research Assistant** - DKFZ-ZMBH Alliance, Germany, **Georg Stoecklin** lab
01/01 – 08/24/2010 **Master Thesis** - DKFZ, Heidelberg, Germany, **Georg Stoecklin** lab
08/18 – 12/14/2009 **Visiting Scholar** - UC Berkeley, Berkeley, CA, USA, **Ming C. Hammond** lab
06/02 – 07/10/2009 **Internship** - DKFZ, Heidelberg, Germany, **Ingrid Grummt** lab
03/03 – 04/24/2009 **Internship** - DKFZ, Heidelberg, Germany, **Georg Stoecklin** lab
06/14 – 10/31/2008 **Student Research Assistant** - Heidelberg Institute for Plant Research (HIP), now Centre for Organismal Studies (COS)), Heidelberg, Germany, **Thomas Rausch** lab
03/03 – 06/13/2008 **Bachelor Thesis** - HIP, Heidelberg, Germany, **Thomas Rausch** lab
01/07 – 01/25/2008 **Internship** - ZMBH, Heidelberg, Germany, **Victor Sourjik** lab
09/03 – 10/12/2007 **Internship** - Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany, **Uwe Strähle** lab, Institute for Genetics and Toxicology

Publications

Citations: **1271**, h-factor: 8, i10-factor: 8 (Google Scholar, June 2022)

*, ** authors contributed equally

11. **Leppek K***, Byeon GW*, Kladwang W*, Wayment-Steele HK*, Kerr CH*, Xu AF**, Kim DS**, Topkar VV, Choe C, Rothschild D, Tiu GC, Wellington-Oguri R, Fujii K, Sharma E, Watkins AM, Nicol JJ, Romano J, Tunguz B, Diaz F, Cai H, Guo P, Wu J, Meng F, Shi S, Eterna Participants, Dormitzer PR, Solórzano A, Barna M‡, Das R‡. Combinatorial optimization of mRNA structure, stability, and translation for RNA-based therapeutics. *Nature Comm.* 2022 Mar;13(1): 1536,1-22. <https://doi.org/10.1038/s41467-022-28776-w>
10. **Leppek K***, Byeon GW*, Fujii K, Barna M. VELCRO-IP RNA-seq reveals ribosome expansion segment function in translation genome-wide. (*authors contributed equally) *Cell Reports*, 2021 Jan 19;34(3):108629. doi: 10.1016/j.celrep.2020.108629
9. **Leppek K**, Fujii K, Quade N, Susanto TT, Boehringer D, Lenarčič T, Xue S, Genuth NR, Ban, N, Barna M. Gene- and species-specific Hox mRNA translation by ribosome expansion segments. *Mol. Cell*, 2020 Dec 17;80(6):980-995.e13. doi: 10.1016/j.molcel.2020.10.023.
8. **Leppek K**, Barna M. An rRNA variant to deal with stress. *Nat Microbiol.* 2019 Mar;4(3):382-383. doi: 10.1038/s41564-019-0396-7.
7. **Leppek K**, Das R, Barna M. Functional 5' UTR mRNA structures in eukaryotic translation regulation and how to find them. *Nat Rev Mol Cell Biol.* 2018 Mar;19(3):158-174. doi: 10.1038/nrm.2017.103. (Epub Nov 22, 2017)
6. Simsek D, Tiu GC, Flynn RA, Byeon GW, **Leppek K**, Xu AF, Chang HY, Barna M. The Mammalian Ribosome Interactome Reveals Ribosome Functional Diversity and Heterogeneity. *Cell*. 2017 Jun 1;169(6):1051-1065.e18. doi: 10.1016/j.cell.2017.05.022.
5. Codutti L, **Leppek K**, Zálešák J, Windeisen V, Masiewicz P, Stoecklin G and Carlomagno T. A distinct, sequence-induced conformation is required for recognition of the CDE RNA by Roquin. *Structure*. 2015 Aug 4;23(8):1437-1447. doi: 10.1016/j.str.2015.06.001.
4. **Leppek K** and Stoecklin G. An optimized streptavidin-binding RNA aptamer for purification of ribonucleoprotein complexes identifies novel ARE-binding proteins. *Nucl Acids Res.* 2014 Jan;42(2):e13. doi: 10.1093/nar/gkt956. (Epub Oct 23, 2013)
3. **Leppek K**, Schott J, Reitter S, Poetz F, Hammond MC, Stoecklin G. Roquin promotes constitutive mRNA decay via a conserved class of stem-loop recognition motifs. *Cell*. 2013 May 9;153(4):869-81. doi: 10.1016/j.cell.2013.04.016. (**see Media Coverage for press release**)
2. Spasic M, Friedel CC, Schott J, Kreth J, **Leppek K**, Hofmann S, Ozgur S, Stoecklin G. Genome-wide assessment of AU-rich elements by the AREScore algorithm. *PLoS Genet.* 2012 Jan;8(1):e1002433. doi: 10.1371/journal.pgen.1002433.
1. **Leppek K**, Schott J, Stoecklin G. Protein synthesis and translational control: at eye level with the ribosome. *EMBO Rep.* 2011 Dec 1;12(12):1214-6. doi: 10.1038/embor.2011.224.

Research Funding

02/2002 – present	MEMBERSHIPS / GRANTS ImmunoSensation2 Excellence Cluster, Member
09/2020	INDEPENDENT FELLOWSHIPS Snow Medical Fellowship, ANU finalist (Australia, application by invitation, \$7 Mio/7 years)
09/2019 – 08/2020	POSTDOC FELLOWSHIPS • Katharine McCormick Advanced Postdoctoral Fellowship to Support Women in Academic Medicine, Stanford (1 year, 1 fellowship/year at Stanford, \$70.000)
10/2015 – 09/2019	• Damon Runyon Cancer Research Foundation , Postdoctoral Research Fellow (4 years, DRG-2237-15, 15 fellowships/twice a year in the US, \$238.000)
07/2015 – 09/2015	• EMBO Long-Term Postdoctoral Fellowship (2 years, ALTF 539-2015, \$90.000)

Ph.D. FELLOWSHIPS

- 11/2010 – 11/2013 • **Ph.D. Stipend**, DKFZ Helmholtz Intern. Grad. School for Cancer Res. (3 years, accepted)
- 09/2010 • **Ph.D. Stipend**, EMBL International PhD Program (3 years, declined)
- 08/2009 – 12/2009 • **Research Stipend** (Burroughs Wellcome Fund to M.C. Hammond), Visiting Scholar, UC Berkeley, USA (4 months)

Awards / Honors

- 11/2020 • **RNA Society/Scaringe Postdoctoral Fellow Award 2021**
- 11/2019 • **Damon Runyon Dale F. Frey Award for Breakthrough Scientists, Finalist** (3 awarded, 4th/12), NYC
- 12/2018 • 1st Talk Prize: Bay Area RNA Club (BARC) Symposium, UCSF, CA, USA
- 05/2015 • **Karl-Lohmann Award** of the Society for Biochemistry and Molecular Biology (GBM), **best PhD Thesis in Biological Chemistry in 2014** (<https://de.wikipedia.org/wiki/Karl-Lohmann-Preis>)
- 02/2015 • **Ruprecht-Karls Award, best PhD Thesis in 2014** in the Faculty of Natural Sciences and Mathematics at Heidelberg University (http://www.foerderer.uni-hd.de/stiftung/preise_archiv.html)
- 01/2015 • **2nd place Bayer HealthCare Award** (Promotionspreis), PhD Thesis Award of GBM, (2nd of 31)
- 06/2014 • Poster Award: Non-coding RNA – From Basic Mechanisms to Cancer, DKFZ, Heidelberg, Germany
- 06/2012 • Travel Award: 17th Annual Meeting of the RNA Society 2012, Ann Arbor, USA
- 02/2012 • Poster Award: 2nd Heidelberg Forum For Young Life Scientists, Heidelberg, Germany
- 11/2010 • Image Award: DKFZ-ZMBH Alliance Retreat, Image of the Year 2010, Heidelberg, Germany

Patents

- 05/2020 • **Kathrin Leppek**, Maria Barna: “Systems and Methods for Enhancing Gene Expression”
Application: 63/022,898; 63/022,901
- 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

Scientific Presentations and Conferences

INVITED TALKS / OTHER

- 05/2022 • University of Bonn, TRA Life Health “TRA2 - Life and Health Matter(s)”, Flash Talk (Invited Talk)
- 04/2022 • University of Giessen, Biochemistry, RTG2355 Guest Lecture (Invited Talk)
- 04/2022 • Hunters College CUNY, Hunter Belfer Seminar Series, NYC, USA, Guest Lecture (Invited Talk, Virtual)
- 03/2022 • IMMEI institute (UKB) Introduction Seminar (Invited Talk, Virtual)
- 02/2022 • ImmunoSensation2 Inaugural Member Lecture (Invited Talk, Virtual)
- 01/2022 • TransRegio TRR237 Nucleic Acid Immunity, Guest Seminar (Invited Talk, Virtual)
- 05/2020 • 25th Annual Meeting of the RNA Society 2020 (Virtual, Participation)
- 11/2019 • Damon Runyon Dale F. Frey Award for Breakthrough Scientists, NYC, NY, USA (Invited Talk)
- 12/2018 • Columbia University, NYC – Biophysics Department, NYC, NY, USA (Invited Talk)
- 09/2017 • Nature Publishing Group San Francisco, Invited Discussion on “Success in Science” (Participation)
- 08/2017 • GAIN (German Academic International Network) Conference, San Francisco, CA, USA (Participation)
- 06/2017 • Miroculus (Start-up), San Francisco, Friday Seminar, San Francisco, CA, USA (Invited Talk)
- 08/2015 • GAIN Conference, San Francisco, CA, USA (Participation)

CONFERENCES – ORAL

- 06/2021 • 26th Annual Meeting of the RNA Society 2021 (Virtual) – Scaringe Postdoc Award Invited Talk
- 07/2020 • EternaCon (Eternagame Convention), OpenVaccine project, (Virtual)
- 12/2018 • Bay Area RNA Club (BARC) Symposium, Genentech Hall, UCSF, CA, USA
- 05/2018 • 23rd Annual Meeting of the RNA Society 2018, Berkeley, CA, USA
- 09/2015 • ZMBH Alumni Forum, 30th Anniversary, Heidelberg, Germany
- 07/2015 • 40th FEBS Congress – The Biochemical Basis of Life, Berlin, Germany
- 06/2013 • 18th Annual Meeting of the RNA Society 2013, Davos, Switzerland
- 06/2012 • 17th Annual Meeting of the RNA Society 2012, Ann Arbor, Michigan, USA
- 09/2011 • EMBO Conference Series “Protein Synthesis and Translational Control”, Heidelberg, Germany

CONFERENCES – POSTER

- 06/2022 • EMBO Workshop: “RNA: Structure meets Function”, Akersberga, Sweden
- 10/2020 • EMBO/EMBL Symposium: “The Complex Life of mRNA”, Heidelberg, Germany, (Virtual)
- 09/2020 • EMBO Conference Series “Protein Synthesis and Translational Control”, CSHL, NY, USA (Virtual)
- 01/2019 • Ribosome – Structure and Function 2019, Merida, Yucatan, Mexico

- 09/2017 • EMBO Conference Series “Protein Synthesis and Translational Control”, Heidelberg, Germany
- 09/2015 • EMBO Conference Series “Protein Synthesis and Translational Control”, Heidelberg, Germany
- 11/2014 • SFB1036 Intern. Conf. “Mol. Mech. of Cellular Surveillance and Damage Responses”, Heidelberg, Germany
- 10/2014 • TERM13: Tiny European RNA Meeting 2014, Paris, France
- 10/2014 • EMBO/EMBL Symposium: “The Complex Life of mRNA”, Heidelberg, Germany
- 06/2014 • Non-coding RNA – From Basic Mechanisms to Cancer, Heidelberg, Germany
- 12/2012 • Cell Symposium “Functional RNAs”, Sitges, Spain
- 02/2012 • 2nd Heidelberg Forum For Young Life Scientists, Heidelberg, Germany

INTERNAL SYMPOSIA

- 06/2022 • ICCCP Institute Retreat, Monschau, Germany (Talk)
- 05/2022 • ImmunoSensation2 Cluster Retreat, Marseille, France (Participation)
- 12/2020 • Bay Area RNA Club (BARC) Symposium, (Virtual), (Participation)
- 09/2020 • Stanford Genetics Department Retreat, Stanford, CA, (Virtual), (Poster)
- 07/2020 • Joint ITI CCHI U19/Gates/DRC Research Meeting (Institute for Immunity, Transplantation and Infection (ITI); Cooperative Centers on Human Immunology (CCHI); Bill & Melinda Gates Foundation; Stanford Diabetes Research Center (SDRC)), Stanford, CA, (Virtual), (Talk)
- 12/2019 • Bay Area RNA Club (BARC) Symposium, Genentech Hall, UCSF (Participation)
- 09/2019 • Stanford Genetics Department Retreat, Monterey, CA (Poster)
- 10/2018 • Developmental Biology Department Data Discussion (3D), Stanford, CA (Talk)
- 09/2018 • Stanford Developmental Biology Department Retreat, Monterey, CA (Talk)
- 09/2018 • Bay Area Postdoc Symposium, Berkeley Lawrence Lab, CA, USA (Participation)
- 06/2018 • EMBO Fellows Retreat, Heidelberg, Germany (Talk)
- 12/2017 • Bay Area RNA Club (BARC) Symposium, Genentech Hall, UCSF (Participation)
- 09/2017 • Damon Runyon Fellows Retreat 2017, Boston, MA, USA (3rd year, Talk)
- 09/2017 • Stanford Genetics Department Retreat, Monterey, CA (Poster)
- 06/2017 • Bay Area Postdoc Symposium, Buck Institute, Novato, CA (Participation)
- 11/2016 • EMBO Fellows Retreat, Boston, MA (Poster)
- 09/2016 • Stanford Genetics Department Retreat, Monterey, CA (Poster)
- 09/2016 • Stanford Developmental Biology Department Retreat, Monterey, CA (Poster)
- 09/2015 • Damon Runyon Fellows Retreat 2015, San Jose, CA, USA (1st year, Poster)
- 07/2015 • Bay Area RNA Club Symposium, Genentech Hall, UCSF (Participation)
- 07/2013 • DKFZ Career Day, Science Communication (Participation)
- 03/2013 • Internal RNA@DKFZ Meeting, DKFZ, Heidelberg, Germany (Talk)
- 02/2013 • DKFZ-ZMBH Alliance Retreat, Kloster Schöntal, Germany (Poster)
- 07/2012 • Internal RNA@DKFZ Meeting, DKFZ, Heidelberg, Germany (Poster)
- 05/2012 • RNA Labs Retreat (Stoecklin, Mühlemann, Bühler), Miglieglia, Switzerland (Talk)
- 12/2011 • DKFZ PhD Poster Presentation, Heidelberg, Germany
- 11/2011 • DKFZ-ZMBH Alliance Seminar Series, Heidelberg, Germany (Talk)
- 07/2011 • DKFZ PhD Retreat, Weil der Stadt, Germany (Poster)
- 05/2011 • ZMBH PhD Retreat, Rothenburg ob der Tauber, Germany (Talk)
- 11/2010 • DKFZ-ZMBH Alliance Retreat, Altleiningen, Germany (Talk)
- 06/2008 • B.Sc. Graduation Ceremony, Bachelor Thesis Poster Presentation (Poster)

Teaching / Mentoring

INDEPENDENT SUPERVISION

- 03/2022- present • Mr. Martin Haimann, Master Student, Master Thesis, Biochemistry, 6 months

STUDENT SUPERVISION

- 10/2012, 2013, 2014 • Master Program, RNA Methods Practical Course Supervision and Grading, 1 week/year
- 05/2012 – 12/2012 • Mr. Fabian Poetz, Bachelor Student, Lab Rotation, DKFZ, 6 months
- 03/2011 – 09/2011 • Ms. Sonja Reitter, Master Student, Master Thesis, DKFZ, 6 months
- 12/2010 – 02/2011 • Ms. Ivana Cado, Master Student, Lab Rotation, DKFZ, 2 months
- 11/2009 • Ms. Stephanie Jones, Mr. Scott Hickey, Graduate Students, Lab Rotation, UC Berkeley, 1 month

LECTURES

- 2010-2014 • RNA Journal Club, DKFZ-ZMBH Alliance, 1 lecture/year
- 2010-2014 • Joint RNA Lab Meetings (Stoecklin & Diederichs labs), 1 lecture/year
- 12/2012 • DKFZ PhD Program, Lecture Series “Biology for Non-Biologists”, 1 lecture

Other Scientific Contributions

- 2012 • Active member of the **RNA Society** since 2012

2018 • **Reviewed/previewed** a paper for *Nature Immunology* (Leppek K, and Barna M., *Nat Microbiol.* 2019)

Media Coverage

- 07/2022 • **The Ribozone Podcast** (Episode 12): Making the Transition from Postdoc to PI with Dr. Kathrin Leppek. <https://podcasts.apple.com/us/podcast/episode-12-making-the-transition-from-postdoc-to-pi/id1629937580?i=1000567715281>
- 05/2022 • **News Article** Damon Runyon Cancer Research Foundation: Toward new and improved mRNA vaccines. <https://www.damonrunyon.org/our-impact/new-discoveries/entries/6746/Toward%20new%20and%20improved%20mRNA%20vaccines>
- 10/2021 • **Fifty Years Translation Podcast** (Season 3, Episode 6): Screening for Enhanced RNA Vaccines with Kathrin Leppek, Gun Byeon, and Hannah Wayment-Steele. <https://fiftyyears.com/translation-podcast/2021/10/14/screening-for-enhanced-rna-vaccines-with-kathrin-leppek-gun-byeon-hannah-wayment-steele>
- 07/2021 • **News Article** Badische Neuste Nachrichten (BNN): Kampf gegen Corona: Wie eine Forscherin aus Bretten mRNA-Impfstoffe verbessert. <https://bnn.de/nachrichten/baden-wuerttemberg/kampf-gegen-corona-wie-eine-forscherin-aus-bretten-mrna-impfstoffe-verbessert>
- 04/2021 • **Stanford SoM SCOPE Blog**: Stabilizing RNA molecules to strengthen vaccines — including for COVID-19. <https://scopeblog.stanford.edu/2021/04/05/stabilizing-rna-molecules-to-strengthen-vaccines-including-for-covid-19/?sf141833328=1>
- 12/2019 • **RNA Society Member Spotlight**: Chun Kim and Olivia Rissland profiled me as a postdoc member of the RNA Society for their online spotlight series. <https://www.rnasociety.org/dr-kathrin-leppek>
- 05/2013 • **DKFZ Press Release** for Ph.D. work publication in *Cell*: Hairpin Serving As Gene Control. <https://www.dkfz.de/en/presse/pressemitteilungen/2013/dkfz-pm-13-29-Hairpin-Serving-As-Gene-Control.php>

Outreach / Leadership / Functions

- 03/2020 – 03/2022 • **COVID-19 mRNA Vaccine Project**
I lead a team of 7 postdocs/students from M. Barna's lab (Stanford) that, together with the R. Das lab (Stanford), optimized the stability and expression of mRNA vaccines for COVID-19 in close collaboration with the citizen-science Eterna RNA folding videogame community (OpenVaccine Project) and from 01/2021-01/2022 with Pfizer.
- 04/2021 • **Speaker** at "Cutting-Edge Cancer Research: A Webinar for Bay Area High School Students" virtual event for the Damon Runyon Cancer Research Foundation
- 06/2020 • **Initiator, organizer and moderator** of a 2-hour Zoom discussion group on Translation Regulation as part of the virtual **RNA2020 conference** (115 scientists worldwide).
- 12/2018 – 2020 • **Initiator/organizer** of a postdoc group supporting the organization and planning of the **Bay Area RNA Club Symposium 2018**, UCSF, CA, USA: secured funding from the RNA Society and bay area companies for mentor lunch/poster/talk prizes and meeting report for RNA Society newsletter.
- 10/2018 • Represented scientists supported by the Damon Runyon Cancer Research Foundation in a team in the **Runyon Up Stair Climb For Cancer Research**, Salesforce Tower, San Francisco. I personally ranked #7 and our team #6 for top donations to \$200.000 donated.
- 05/2017 • Represented the Damon Runyon Cancer Research Foundation at a **benefit performance** of the musical Hamilton in San Francisco that raised nearly \$1 Mio. to support cancer research.
- 05/2013, 2014 • Volunteer helper at "DKFZ läuft für die Krebsforschung" (Run for Cancer Research)
- 06/2011 • Volunteer helper at "UniMeile" representing University of Heidelberg to the public
- LANGUAGES**
- German (native), English (fluent), French (basic)

Advanced Training

- Stanford, CA, USA**
- 08/2020 • Creating Connections: An Introduction to the Alda Method® (Alan Alda Center for Communicative Science, at Stony Brook University) (1 session)
- 04/2020 • Preparation for Faculty Careers (2 months, weekly lecture series)
- 01/2019 • Scientific Management Series (lecture series)
- 04/2018 • Women Leadership Workshop: Improv Thinking with Speechless (1 session)
- 11/2016 • Improv for Communication II, 4-week workshop (4 sessions)
- 04/2016 • Improv for Communication I, 4-week workshop (4 sessions)
- EMBL, Heidelberg, Germany**

05/2012

• EMBL Advanced Course “Next Generation Sequencing Data Analysis”, 1 week

Collaborations

Ongoing:

Daniel F. Jarosz (Stanford); Rhiju Das (Stanford)

Past:

Philip R. Dormitzer (Pfizer); Nenad Ban (ETH Zürich); Howard Y. Chang (Stanford); Teresa Carlomagno (EMBL/Hannover University); Ming C. Hammond (UC Berkeley/University of Utah), Irmgard Sinning (Heidelberg University)

Bonn, 06/2022