

## Ronald MICURA

born 1970 in Linz (Austria)

*Professor for Organic Chemistry  
and Chemical Biology*  
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**Main Areas of Research:** Ribonucleic acids (RNA chemistry, RNA biophysics, RNA biochemistry)

### Education and Professional Experience

since 2008	Full Professor for Organic Chemistry
2007	Offer of a Professorship Bioorganic Chemistry (Full Professor), Institute of Organic Chemistry, University of Linz (Austria), declined
2004 – 2008	Full Professor (non-tenure) for Organic Chemistry, Institute of Organic Chemistry, University of Innsbruck
2002	Habilitation in Organic Chemistry, Institute of Organic Chemistry, University of Innsbruck
2002 – 2004	Group leader, Institute of Organic Chemistry, University of Innsbruck, Austria
1999 – 2002	Group leader at the Universität Linz, Academic Guest at ETH Zürich (Switzerland) and The Scripps Research Institute (CA, USA)
1996 – 1998	Postdoctoral research fellow with Professor Albert Eschenmoser at ETH Zürich (Switzerland) and The Scripps Research Institute (CA, USA)
1993 – 1995	Doctoral research and Dr. tech. in Organic Chemistry (supervisor: Professor Karl Grubmayr), University of Linz (Austria)
1993	Diploma in Chemistry, University of Linz (Austria)
1988 – 1993	Studies of Chemistry at the University of Linz (Austria)

### Professional Activities

since 2021	Head of Center for Molecular Biosciences Innsbruck CMBI, <a href="http://www.uibk.ac.at/cmbi">http://www.uibk.ac.at/cmbi</a> (Deputy head, 2008-2021)
2005-2008/2013-2021	Head of the Institute of Organic Chemistry, University of Innsbruck
2008-2017	Board member of the Austrian Science Fund FWF (Reporter for Organic Chemistry; <i>Kuratorium</i> )

Reviewer for **science agencies** (e.g. Deutsche Forschungsgemeinschaft DFG, SNF (Switzerland), INSERM-cnrs (France), ANR (France), NWO (The Netherlands) and **science journals** (J Am Chem Soc, Angew Chem Int Ed, Nature, Nat Chem Biol, Nat Chem, Nat Commun, Nat Methods, Nat Struct Mol Biol, Proc Natl Acad Sci USA, Nucleic Acids Res, Chemistry Eur J, Chem Comm, Chem Sci, ACS Chem Biol, RNA, RNA Biol, etc.)

### Honors, Awards, Scientific Achievements, Fellowships

since 2011	Full Member of the Austrian Academy of Sciences (corresponding member 2008 – 2011)
2005	Ignaz L. Lieben Award (Austrian Academy of Sciences)
2003	Novartis Award for Chemistry
2003	JSP Bürgenstock Fellowship
1999 – 2002	APART fellowship (Austrian Academy of Sciences)
1996 – 1998	Erwin Schrödinger fellowship (Austrian Science Fund FWF)
1996	PhD Thesis Award (Austrian Chemical Society, GÖCH)

## Editorships

Chemistry – A European Journal; ChemBioChem; ChemPlusChem; Chemical Monthly (Editorial Advisory Boards)

## Publications

WebOfScience (August 2021): >142 publications, citations >4846 (>4198 without self-citations), average citations per item 34.1, h-index 41; Google Scholar: citations: > 6839, h-index 47; see also <https://www.uibk.ac.at/organic/micura/publications/>

## Most important research projects funded (last five years)

2020 – 2023	Austrian Science Fund FWF; SFB RNA-Deco, subproject F8011 'Engineering of riboswitches into tools for RNA methylation and labeling'
2019 – 2023	Austrian Science Fund FWF; project P31691 'Understanding hatchet ribozymes'
2018 – 2022	Vienna Science and Technology Fund WWTF, Co-applicant; 'Elucidating sister chromatid structure by chemical DNA labeling and conformational capture'
2017 – 2022	FFG R&D Infrastructure Funding ("RNA Hot-Spot": High-end NMR equipment for structural chemistry to explore biomolecules and interactions with small-molecule ligands (for 400&700 MHz NMR instrumentation)

## Five most important international key collaborations (for joint publications see: <http://rna.micura.at>)

Dr. **Aiming Ren**, Zhejiang University, China (collaboration on RNA structural biology); Prof. **Scott C. Blanchard**, Weill Cornell Medical College, NY, USA (collaboration on smFRET); Prof. **Dinshaw J. Patel**, MSKCC, NY, USA (collaboration on structural biology of RNA and RNA complexes); Prof. **Yury Polikanov**, University of Illinois at Chicago, USA (collaboration on RNA-peptide conjugates to study ribosomal complexes); Prof. **Eric Ennifar**, CNRS Strasbourg, France (collaboration on X-ray crystallography of small nucleic acids);

## Ten most important invitations (last ten years)

- 'Synthetic RNA Chemistry'; Telluride Workshop on Nucleic Acid Chemistry, 26.07.2018, Telluride, CO, USA.
- 'On the mechanism of ribozymes – and a short note on cellular RNA dynamics (TUC-seq). 52nd European Symposium on Biological and Organic Chemistry (ESBOC), 19.05.2018, Gregynog, Wales, UK.
- 'Mechanistic aspects of recently discovered ribozyme classes'; *7th Cambridge Symposium on Nucleic Acids Chemistry and Biology*, 3.9.-6.9.2017, Cambridge, United Kingdom.
- 'Chemically modified RNA to explore riboswitch and ribozyme function'; *6th EuCheMS Chemistry Congress*; topic plenary lecture, 11.9.-16.9.2016, Sevilla, Spain.
- 'Chemically modified RNA to explore riboswitch and ribozyme function'; *22th International Round Table on Nucleosides, Nucleotides and Nucleic Acids (XXII IRT)*; 18.07.-22.07.2016, Paris, France.
- 'Modifying RNA to explore riboswitch and ribozyme function'; *The Epitranscriptome, EMBL Conference*, 20.4.-22.4.2016, Heidelberg, Germany.
- 'Chemistry and Biophysics of mRNA Riboswitches', *Gordon Research Conference on RNA Editing and Modification*, 8.3-13.3.2015, Il Ciocco, Italy.
- 'The dynamics of RNA as key to understanding gene regulation mediated by mRNA riboswitches'; 26.9.-30.9.2012, *Chemical Biology 2012, EMBL Conference*, Heidelberg, Germany.
- 'Synthetic modified RNA – Probes to Study Riboswitch and Ribosome Function'; 16.11.2012, *IOCB Invited Lectures*, Czech Academy of Science, Prague, Cech Republic.
- 'Ligand Recognition of Riboswitches'; 5.6.-10.6.2011, *XVth Symposium on Chemistry of Nucleic Acid Components*, Cesky Krumlov, Cech Republic.
- 'Synthetic Manipulation of RNA: On Riboswitch Folding and Ribosome Mechanisms'; 12.4.2011, *University of California, Berkeley* - Department of Chemistry, Berkeley, USA

**Ten Most Important Publications** (*Google Scholar citations 08-2021*)

10. L. Flemmich, S. Heel, S. Moreno, K. Breuker, R. **Micura**; 'A natural riboswitch scaffold with self-methylation activity'; *Nat. Commun.* **2021**, *12*, 3877.  
*This work reveals the methyltransferase activity of a present-day riboswitch for the first time.*
9. O. A. Krasheninina, J. Thaler, M. E. Erlacher, R. Micura\*; 'Amine-to-azide conversion on native RNA via metal-free diazo transfer opens new avenues for RNA manipulations'; *Angew. Chem. Int. Ed.* **2021**, *60*, 6970-6974.  
*This work paves the way for bioconjugation of complex RNA-peptide conjugates and pulldown/enrichment of cellular RNA with aliphatic amine modifications.*
8. C. Riml, T. Amort, D. Rieder, C. Gasser, A. Lusser, **R. Micura**; 'Osmium-mediated 4sU-to-C transformation as key to study RNA dynamics by sequencing (TUC-seq)'; *Angew. Chem. Int. Ed.* **2017**, *56*, 13479-13483. (46 citations)  
*This work introduces a novel RNA sequencing approach to explore cellular RNA dynamics via metabolic labeling and chemical nucleoside conversions; see News&Views by M. A. P. Baptista, L. Dölken. Nat. Methods 2018,15, 171-172.*
7. S. Neuner, C. Falschlunger, E. Fuchs, M. Himmelstoss, A. Ren, D.J. Patel, R. **Micura**; 'Atom-specific mutagenesis reveals structural and catalytic roles for active site-adenosine and Mg<sup>2+</sup> in pistol ribozyme'; *Angew. Chem. Int. Ed.* **2017**, *56*, 15954-15958. (20 citations)  
*This work reveals the chemical mechanism of the 2015 discovered ribozyme.*
6. M. Kosutic, S. Neuner, A. Ren, S. Flür, C. Wunderlich, E. Mairhofer, N. Vusurovic, J. Seikowski, K. Breuker, C. Höbartner, D.J. Patel, C. Kreutz, R. **Micura**; 'A Mini-Twister Variant and Impact of Residues/Cations on the Phosphodiester Cleavage of this Ribozyme Class'; *Angew. Chem. Int. Ed.* **2015**, *54*, 15128-15233. (53 citations)  
*This work reveals the chemical mechanism of the 2014 discovered ribozyme.*
5. A. Haller, R. B. Altman, M. Soulière, S. C. Blanchard, R. **Micura**; 'Folding and ligand recognition of the TPP riboswitch aptamer at single-molecule resolution'; *Proc. Nat. Acad. Sci. USA* **2013**, *110*, 4188-4193. (102 citations)  
*This work reveals remote dynamic coupling of structural subunits of a folded RNA for the first time.*
4. K. Fauster, M. Hartl, T. Santner, M. Aigner, C. Kreutz, K. Bister, E. Ennifar, R. **Micura**; 2-Azido RNA, a Versatile Tool for Chemical Biology: Synthesis, X-ray Structure, siRNA Applications, Click Labeling; *ACS Chem. Biol.* **2012**, *7*, 581-589. (114 citations)
3. M. Soulière, A. Haller, R. Rieder, R. **Micura**; 'A powerful approach for the selection of 2-aminopurine substitution sites to investigate RNA folding'; *J. Am. Chem. Soc.* **2011**, *133*, 16161-16167. (47 citations)  
*This work demonstrates that SHAPE probing is most powerful to select suitable positions for labeling without knowledge of the three-dimensional RNA structure.*
2. A. Haller, U. Rieder, M. Aigner, S. C. Blanchard, R. **Micura**; 'Conformational capture of the SAM-II riboswitch'; *Nat. Chem. Biol.* **2011**, *7*, 393-400. (170 citations)
1. R. Rieder, K. Lang, D. Graber, R. **Micura**; 'Ligand-Induced Folding of the Adenosine Deaminase A-Riboswitch and Implications on Riboswitch Translational Control'; *ChemBiochem* **2007**, *8*, 896-902. (191 citations)  
*This work introduces a fluorescence spectroscopic approach (2APfold) to disclose ligand-induced conformational changes of single nucleotides within large RNA folds and to reveal the underlying kinetic parameters (exemplified for riboswitches).*