

Curriculum Vitae – Ao. Univ.-Prof. Dr. rer. nat. Ellen L. Zechner

1 – Person / Allgemeine Angaben

Name	Ellen L. Zechner, Ao. Univ.-Prof. Dr. rer. nat.,
Nationality	USA and AUT
Address	Institute of Molecular Biosciences, University of Graz Humboldtstrasse 50, 1 st floor, 8010 Graz, Austria Phone: +43 (0) 316 380 5624, E-Mail ellen.zechner@uni-graz.at
Position	associate professor

2 – Academic Education / Akademische Ausbildung mit Abschluss

1986 -1991	Ph.D. in Molecular Biology, Sloan-Kettering Division, Cornell University, Graduate School of Medical Sciences, New York, USA
1979-1983	B.A. degree in Chemistry and Biology, Oberlin College, Oberlin, USA

3 – Scientific Degrees / Wissenschaftliche Abschlüsse

2001	Habilitation (Molecular Microbiology), University of Graz
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4 – Academic Appointments / Beruflicher Werdegang ab Studienabschluss

Sept. 2016-2020	Vice President of the Austrian Science Fund (FWF), Biology and Medicine Section
2011-Sept 2016	Austrian Science Fund (FWF), Full Member of the <i>Kuratorium</i> Fields of Genetics, Microbiology and Biotechnology
since 2015	Vice Dean of the Natural Sciences Faculty, University of Graz
since 2001	Ao. University Professor, Institute of Molecular Biosciences, University of Graz,
1999 - 2001	Assistant Professor, Institute of Molecular Biosciences, University of Graz
1994 -1999	University Assistant, Institute of Microbiology, University of Graz
1992 - 1994	Postdoctoral fellow, Institute of Microbiology, University of Graz

5 – Additional information / Sonstiges

since 2013	Advisory Board, <i>Doktoratskolleg</i> Molecular Fundamentals of Inflammation (MOLIN), Medical University of Graz
since 2016	NAWI-Graz Steering Committee, University of Graz / Technical University of Graz cooperative research and teaching program
since 2016	Supervisory Board, Doctoral Academy Graz
2009 - 2016	Spokesperson for the University of Graz core research area “Molecular Enzymology and Physiology”
2007 - 2016	Director, Doctoral School of Molecular Biology and Biochemistry, University of Graz
2006 - 2015	University of Graz representative, COIMBRA Universities’ Task Force “Doctoral Studies and Research”

2006 - 2008	Treasurer, International Society for Plasmid Biology and other Mobile Genetic Elements
since 2005	Director of the FWF-financed <i>Doktoratskolleg</i> Molecular Enzymology, University of Graz and Graz University of Technology, Austria
Since 2004	Trustee, Brian M. Wilkins Research Fund

6 – Honors - Awards / Preise und Auszeichnungen

2014/ 2015	Prizes awarded for Schneditz, G. et al. (2014) Enterotoxicity of a nonribosomal peptide causes antibiotic-associated colitis. <i>Proc Natl Acad Sci U S A</i> 111: 13181-13186 (10,000 €) Top Abstract award, United European Gastroenterologists, Berlin (4,000 €) Wewalka Prize, Salzburg
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7 – Selected externally funded projects (last 5 yrs only) / geförderte Drittmittelprojekte

2015 - 2016	BioTechMed-Graz: Bacterial Metabolite signal molecules in the intestinal microbiota: Who is talking? Who is listening? total amount of funding: 155.000,00 €
2014 - 2019	FWF: W901 Doktoratskolleg: Molecular Enzymology (Director) total amount of funding (in period 4): 5.170.000,00 € for 15 principal investigators
2011 – 2016	Stand-alone project P24016 - Austrian Science Fund (FWF) “Regulation of the initiation of bacterial type IV secretion” total amount of funding: 326.400,00 €
2011 – 2014	EFRE / Land Steiermark: “Bacterial type IV protein translocation and Catheter-associated urinary tract infections” total amount of funding: 390.000,00 €
2009 - 2012	Stand-alone project P 21434 - Austrian Science Fund (FWF) “Genetic analysis of bacterial biofilm formation and migration on urethral catheters” (co-PI with A. Reisner) total amount of funding: 276,180,00 €
2011 – 2014	FWF: W901 Doktoratskolleg: Molecular Enzymology (Director) total amount of funding (in period 3): 4.044.972,00 € for 17 principal investigators

8 – Publications / Publikationen

- Gruber, CJ, Lang, S, Rajendra, VKH, Nuk, M, Raffl, S, Schildbach JF, **Zechner EL**. 2016. “Conjugative DNA transfer is enhanced by plasmid R1 partitioning proteins”. *Frontiers in Molecular Biosciences*, in press.
- Kienesberger, S., L. M. Cox, A. Livanos, X.-S. Zhang, J. Chung, G. I. Perez-Perez, G. Gorkiewicz, **E. L. Zechner** & M. J. Blaser 2016. Gastric *Helicobacter pylori* infection affects local and distant microbial populations and host responses. *Cell Rep* 14(6):1395-407 doi: 10.1016/j.celrep.2016.01.017
- Schneditz, G., J. Rentner, S. Roier, J. Pletz, K. A. Herzog, R. Bucker, H. Troeger, S. Schild, H. Weber, R. Breinbauer, G. Gorkiewicz, C. Högenauer & **E. L. Zechner**, 2014. Enterotoxicity of a nonribosomal peptide causes antibiotic-associated colitis. *Proc Natl Acad Sci U S A* 111: 13181-13186.
- Kienesberger, S., H. Sprenger, S. Wolfgruber, B. Halwachs, G. G. Thallinger, G. I. Perez-Perez, M. J. Blaser, **E. L. Zechner**, and G. Gorkiewicz. 2014. Comparative genome

- analysis of *Campylobacter fetus* subspecies revealed horizontally acquired genetic elements important for virulence and niche specificity. *PLoS One* **9**:e85491.
- Herzog, K. A., G. Schneditz, E. Leitner, G. Feierl, K. M. Hoffmann, I. Zollner-Schwetz, R. Krause, G. Gorkiewicz, **E. L. Zechner**, and C. Hogenauer, 2014. Genotypes of *Klebsiella oxytoca* Isolates from Patients with Nosocomial Pneumonia Are Distinct from Those of Isolates from Patients with Antibiotic-Associated Hemorrhagic Colitis. *J Clin Microbiol* **52**:1607-16.
- Gibert, M., Juarez, A., **Zechner, E. L.**, Madrid, C., Balsalobre, C., 2014. TrhR, TrhY and HtdA, a novel regulatory circuit that modulates conjugation of the IncHI plasmids. *Mol Microbiol*. 94: 1146-1161
- Lang, S., C. J. Gruber, S. Raffl, A. Reisner, and **EL Zechner**. 2014. A common requirement for the relaxosome of plasmid R1 in multiple activities of the conjugative type IV secretion system. *J Bacteriol* **196**: 2108-2121.
- Redzej, A., A. Ilangovan, S. Lang, C. J. Gruber, M. Topf, K. Zangger, **E. L. Zechner**, and G. Waksman. 2013. Structure of a translocation signal domain mediating conjugative transfer by type IV secretion systems. *Mol Microbiol* 89:324-333. doi: 10.1111/mmi.12275.
- Sprenger, H, **Zechner, EL**, Gorkiewicz, G, 2012. So close and yet so far - Molecular microbiology of *Campylobacter fetus* subspecies. *Eur J of Microbiol Immunol* 2012, 2 (1), 66-75. DOI:10.1556/EuJMI.2.2012.1.10
- Zechner, EL**, S Lang, and J. F. Schildbach. 2012. Assembly and mechanisms of bacterial type IV secretion machines. *Philos Trans R Soc Lond B Biol Sci* 367:1073-1087. doi: 10.1098/rstb.2011.0207
- Lang, S.; Kirchberger, P.C.; Gruber, C.J.; Redzej, A.; Raffl, S.; Zellnig, G.; Zangger, K.; **Zechner, EL**, 2011. An activation domain of plasmid R1 Tral protein delineates stages of gene transfer initiation. *Mol Microbiol*, 82 (5), 1071-1085. DOI:10.1111/j.1365-2958.2011.07872.x
- Kienesberger, S., Schober Trummler, C., Fauster, A., Lang, S., Sprenger, H., Gorkiewicz and **E. L. Zechner**. 2011. Interbacterial Macromolecular Transfer by the *Campylobacter fetus* subsp. *venerealis* Type IV Secretion System. *J. Bacteriol.* 193:744-58.
- Lang, S., K. Gruber, S. Mihajlovic, R. Arnold, C. J. Gruber, S. Steinlechner, A. Jehl, T. Rattei, K. U. Fröhlich, and **E. L. Zechner**. 2010. Molecular recognition determinants for type IV secretion of diverse families of conjugative relaxases. *Mol. Microbiol.* 78:1539-1555.
- F. de la Cruz, L.S. Frost, R.J. Meyer and **E.L. Zechner**. 2010. Conjugative DNA Metabolism in Gram-negative Bacteria" *FEMS Microbiol. Rev.* 34:18-40.
- G. Gorkiewicz, Kienesberger, S., Schober, C., Scheicher, S.R., Gully, C., Zechner, R. and **E. L. Zechner**. 2010. A Genomic Island defines subspecies-specific Virulence Features of the host adapted Pathogen *Campylobacter fetus* subsp. *venerealis*. *J. Bacteriol.* 192:502-17.
- Mihajlovic, S., Lang, S., Sut, M.V., Strohmaier, H, Gruber, C. J., Koraimann, G., Cabezon, E., Moncalián, G., de la Cruz, F. and **Zechner, E. L.** 2009. Plasmid R1 conjugative DNA processing is regulated at the coupling-protein interface. *J. Bacteriol.* 191:6877-87.
- Sut, M.V., Mihajlovic, S., Lang, S., Gruber, C.J. and **Zechner E.L.** 2009. Protein and DNA
- Blaser, M. J., Newell, D. G., Thompson, S. A., and **E. L. Zechner**. 2008. Pathogenesis of *Campylobacter fetus*. In *Campylobacter*, 3rd Ed. (I. Nachamkin, C.M. Szymanski, and M. J. Blaser, eds) ASM Press, Washington, D.C., pp401-28. ISBN-13: 9781555814373
- Kienesberger, S., Gorkiewicz, G., Joainig, M. M., Scheicher, S. R., Leitner, E., **Zechner, E. L.** 2007. Development of experimental genetic tools for *Campylobacter fetus*. *Appl Environ Microbiol.* 73, 4619-30.

- Reisner, A., Krogfelt, K. A., Klein, B. M., **Zechner, E. L.**, Molin, S. 2006. In vitro biofilm formation of commensal and pathogenic *Escherichia coli* strains: impact of environmental and genetic factors. *J Bacteriol.* 188, 3572-81.
- Reisner, A., Holler, B. M., Molin, S., **Zechner, E. L.** 2006. Synergistic effects in mixed *Escherichia coli* biofilms: conjugative plasmid transfer drives biofilm expansion. *J Bacteriol.* 188, 3582-8.
- Reisner A, Krogfelt KA, Klein BM, **Zechner EL**, Molin S. In vitro biofilm formation of commensal and pathogenic *Escherichia coli* strains: impact of environmental and genetic factors. *J Bacteriol.* 2006 May;188(10):3572-81.
- Fernandez-Lopez R, Machón C, Longshaw CM, Martin S, Molin S, **Zechner EL**, Espinosa M, Lanka E, de la Cruz F. Unsaturated fatty acids are inhibitors of bacterial conjugation. *Microbiology.* 2005 Nov;151(Pt 11):3517-26.
- Csitkovits VC, Dermić D, **Zechner EL.** Concomitant reconstitution of Tral-catalyzed DNA transesterase and DNA helicase activity in vitro. *J Biol Chem.* 2004 Oct 29;279(44):45477-84. Epub 2004 Aug 17.
- Zechner EL**, Bailey MJ. The Horizontal Gene Pool: an ESF workshop summary. *Plasmid.* 2004 Mar;51(2):67-74.
- Csitkovits VC, **Zechner EL.** Extent of single-stranded DNA required for efficient Tral helicase activity in vitro. *J Biol Chem.* 2003 Dec 5;278(49):48696-703. Epub 2003 Sep 23.
- Gorkiewicz G, Feierl G, Schober C, Dieber F, Köfer J, Zechner R, **Zechner EL.** Species-specific identification of campylobacters by partial 16S rRNA gene sequencing. *J Clin Microbiol.* 2003 Jun;41(6):2537-46.
- Reisner A, Haagensen JA, Schembri MA, **Zechner EL**, Molin S. Development and maturation of *Escherichia coli* K-12 biofilms. *Mol Microbiol.* 2003 May;48(4):933-46.
- Reisner A, Molin S, **Zechner EL.** Recombinogenic engineering of conjugative plasmids with fluorescent marker cassettes. *FEMS Microbiol Ecol.* 2002 Nov 1;42(2):251-9. doi: 10.1111/j.1574-6941.2002.tb01015.x.
- Gorkiewicz G, Feierl G, Zechner R, **Zechner EL.** Transmission of *Campylobacter hyointestinalis* from a pig to a human. *J Clin Microbiol.* 2002 Jul;40(7):2601-5.
- Schröder G, Krause S, **Zechner EL**, Traxler B, Yeo HJ, Lurz R, Waksman G, Lanka E. TraG-like proteins of DNA transfer systems and of the *Helicobacter pylori* type IV secretion system: inner membrane gate for exported substrates? *J Bacteriol.* 2002 May;184(10):2767-79.
- Karl W, Bamberger M, **Zechner EL.** Transfer protein TraY of plasmid R1 stimulates Tral-catalyzed oriT cleavage in vivo. *J Bacteriol.* 2001 Feb;183(3):909-14.
- Grohmann E, Moscoso M, **Zechner EL**, del Solar G, Espinosa M. In vivo definition of the functional origin of leading strand replication on the lactococcal plasmid pFX2. *Mol Gen Genet.* 1998 Oct;260(1):38-47.
- Strohmaier H, Noiges R, Kotschan S, Sawers G, Högenauer G, **Zechner EL**, Koraimann G. Signal transduction and bacterial conjugation: characterization of the role of ArcA in regulating conjugative transfer of the resistance plasmid R1. *J Mol Biol.* 1998 Mar 27;277(2):309-16.
- Kupelwieser G, Schwab M, Högenauer G, Koraimann G, **Zechner EL.** Transfer protein TraM stimulates Tral-catalyzed cleavage of the transfer origin of plasmid R1 in vivo. *J Mol Biol.* 1998 Jan 9;275(1):81-94.
- Pölzleitner E, **Zechner EL**, Renner W, Fratte R, Jauk B, Högenauer G, Koraimann G. TraM of plasmid R1 controls transfer gene expression as an integrated control element in a complex regulatory network. *Mol Microbiol.* 1997 Aug;25(3):495-507.

- Grohmann E, **Zechner EL**, Espinosa M. Determination of specific DNA strand discontinuities with nucleotide resolution in exponentially growing bacteria harboring rolling circle-replicating plasmids. *FEMS Microbiol Lett.* 1997 Jul 15;152(2):363-9.
- Zechner EL**, Prüger H, Grohmann E, Espinosa M, Högenauer G. Specific cleavage of chromosomal and plasmid DNA strands in gram-positive and gram-negative bacteria can be detected with nucleotide resolution. *Proc Natl Acad Sci U S A.* 1997 Jul 8;94(14):7435-40.
- Wu CA, **Zechner EL**, Hughes AJ Jr, Franden MA, McHenry CS, Marians KJ. Coordinated leading- and lagging-strand synthesis at the Escherichia coli DNA replication fork. IV. Reconstitution of an asymmetric, dimeric DNA polymerase III holoenzyme. *J Biol Chem.* 1992 Feb 25;267(6):4064-73.
- Wu CA, **Zechner EL**, Reems JA, McHenry CS, Marians KJ. Coordinated leading- and lagging-strand synthesis at the Escherichia coli DNA replication fork. V. Primase action regulates the cycle of Okazaki fragment synthesis. *J Biol Chem.* 1992 Feb 25;267(6):4074-83.
- Zechner EL**, Wu CA, Marians KJ. Coordinated leading- and lagging-strand synthesis at the Escherichia coli DNA replication fork. II. Frequency of primer synthesis and efficiency of primer utilization control Okazaki fragment size. *J Biol Chem.* 1992 Feb 25;267(6):4045-53.
- Wu CA, **Zechner EL**, Marians KJ. Coordinated leading- and lagging-strand synthesis at the Escherichia coli DNA replication fork. I. Multiple effectors act to modulate Okazaki fragment size. *J Biol Chem.* 1992 Feb 25;267(6):4030-44.
- Zechner EL**, Wu CA, Marians KJ. Coordinated leading- and lagging-strand synthesis at the Escherichia coli DNA replication fork. III. A polymerase-primase interaction governs primer size. *J Biol Chem.* 1992 Feb 25;267(6):4054-63.