

Curriculum Vitae

Personal Data

Title	Prof. Dr.
First name	Ruth E.
Name	Ley
Current position	Managing Director, Director
Current institution	Max Planck Institute for Biology, Tübingen, Germany
Identifiers/ORCID	0000-0002-9087-1672

Qualifications and Career

1992	B.A., Integrative Biology, University of California at Berkeley, USA
2001	Ph.D., Ecology and Evolutionary Biology, University of Colorado at Boulder, USA
2001 - 2004	Postdoctoral Researcher, University of Colorado at Boulder, USA
2004 - 2005	Postdoctoral Researcher, Washington University School of Medicine, USA
2005 - 2007	Instructor, Washington University School of Medicine, USA
2007 - 2008	Research Assistant Professor, Washington University School of Medicine, USA
2008 - 2013	Assistant Professor, Dept. Microbiology, Cornell University, USA
2013 - 2018	Associate Professor, Dept. Microbiology, Cornell University, USA
2014 - 2018	Associate Professor, Dept. Molecular Biology and Genetics, Cornell University, USA
Since 2016	Director, Department of Microbiome Science, MPI for for Biology, Tübingen, Germany
Since 2016	Honorary Professor, Faculty of Medicine, Eberhard Karls University, Tübingen, Germany
Since 2018	Deputy Speaker, Cluster of Excellence CMFI, University of Tübingen
Since 2020	Managing Director, MPI for, Tübingen, Germany

Engagement in the Research System

Membership in Professional Organizations:

German National Academy of Sciences, Leopoldina (elected); European Molecular Biology Organization (elected); American Society for Microbiology (elected); European Society for Microbiology (elected)

Grants: Investigator on 16 grants to Cornell University (2008-2016), including 2 NIH RO1s as lead PI, totalling over 8 million USD. Deputy Speaker for DFG Cluster of Excellence CMFI to University of Tübingen (2018-present).

Reviewer activities: Funding agencies: ERC, NIH, NSF. Journals: Cell, Nature, Science, Science Immunology, Nature Microbiology, Cell Host and Microbe, PNAS, etc.

Selected trainees:

Taichi Suzuki (post doc): Assistant Professor, Arizona State University
Elizabeth Johnson (post doc): Assistant Professor, Cornell University
Angela Poole (post doc): Assistant Professor, Cornell University

Sara Di Rienzi (post doc): Assistant Professor, Baylor College of Medicine

Omry Koren (post doc): Professor, Bar Ilan University

Selected conference activities:

- Co-Chair, 75th Mosbacher Kolloquium “The Microbiome – From Understanding to Modulation”, 2024
- Member, Scientific Council of the Institut Pasteur, Paris, France, 2020-2023
- Co-Chair, Cell Symposium: Infection Biology in the Age of the Microbiome, Paris, 2023
- Executive Board, Jung Foundation, Hamburg, Germany, 2022-present
- Chair, Keystone Conference “The Human Microbiome: Ecology and Evolution”, Banff, Canada, 2022

Hiring and other Academic Committee Memberships: Max Planck Society, University of Tübingen, Cornell University.

Selected Teaching: EMBO course “New Microbiology” 2019; Cornell University Undergraduate course “The human microbiome” taught annually from 2010-2016.

Five Recent Selected Invited Talks:

- Keynote, CMI International Microbiome Meeting. San Diego, CA. Feb 2020.
- Keynote, FISEB/ILANIT 2020 Meeting, Eilat, Israel. Feb 2020.
- Keynote, Microbiome Virtual International Forum (Premiere Session Atlantic), 2021.
- Keystone Symposium “The Human Microbiome: Ecology and Evolution”, Banff, Dec. 2022
- Dr. Paul Janssen Award Symposium, The New York Academy of Sciences, Feb. 2023.

Scientific Results

Category A - For the selected primary peer-reviewed articles listed below, Ruth Ley was the project lead and principal investigator (last and corresponding author).

1. Clasen SJ, Bell MEW, Borbón A, Lee DH, Henseler ZM, de la Cuesta-Zuluaga J, Parys K, Zou J, Wang Y, Altmannova V, Youngblut ND, Weir JR, Gewirtz AT, Belkhadir Y, **Ley RE**. 2023. Silent recognition of flagellins from human gut commensal bacteria by Toll-like receptor 5. *Science Immunology* eabq7001. DOI: [10.1126/sciimmunol.abq7001](https://doi.org/10.1126/sciimmunol.abq7001)
2. Suzuki TA, Fitzstevens JL, Schmidt VT, Enav H, Huus KE, Mbong Ngwese M, Griebshammer A, Pfeleiderer A, Adegbite BR, Zinsou JF, Esen M, Velavan TP, Adegnika AA, Song LH, Spector TD, Muehlbauer AL, Marchi N, Kang H, Maier L, Blekman R, Ségurel L, Ko G, Youngblut ND, Kremsner P, **Ley RE**. 2022. Codiversification of gut microbiota with humans. *Science*: 16;377(6612):1328-1332. DOI: [10.1126/science.abm7759](https://doi.org/10.1126/science.abm7759)
3. Heaven, S. L., H H. Le, P. Tang, A. Baslé, C. Mirretta Barone, D. Long Vu, J. L. Waters, J. Marles-Wright, E. L. Johnson, D. J. Campopiano, **Ley RE**. 2022. Characterization of inositol lipid metabolism in gut-associated Bacteroidetes. *Nature Microbiology* 7: 986–1000 DOI: [10.1038/s41564-022-01152-6](https://doi.org/10.1038/s41564-022-01152-6)
4. Di Rienzi S, Johnson E, Waters JL, Kennedy EA, Jacobson J, Lawrence P, Wang DH, Worgall TS, Brenna JT, **Ley RE**. 2021. The microbiome affects liver sphingolipids and plasma fatty acids in a murine model of the Western diet based on soybean oil. *The Journal of Nutritional Biochemistry* 97: 108808. DOI: [10.1016/j.jnutbio.2021.108808](https://doi.org/10.1016/j.jnutbio.2021.108808)

5. Youngblut ND, Reischer GH, Dauser S, Maisch S, Walzer C, Stalder G, Farnleitner AH, **Ley RE**. Vertebrate host phylogeny influences gut archaeal diversity. *Nature Microbiology* 6: 1443–1454. DOI: [10.1038/s41564-021-00980-2](https://doi.org/10.1038/s41564-021-00980-2)
6. Johnson EL, Heaver SL, Waters JL, Kim BI, Bretin A, Goodman AL, Gewirtz AT, Worgall TS and **Ley RE**. 2020. Sphingolipids produced by gut bacteria enter host metabolic pathways impacting ceramide levels. *Nature Communications* 11:2471 DOI: [10.1038/s41467-020-16274-w](https://doi.org/10.1038/s41467-020-16274-w)
7. Poole AC, Goodrich JK, Youngblut ND, Luque GG, Ruaud A, Sutter JL, Waters JL, Shi Q, El-Hadidi M, Johnson LM, Bar HY, Huson DH, Booth JG, **Ley RE**. 2019. Human salivary amylase gene copy number impacts oral and gut microbiomes. *Cell Host & Microbe* 25: 553-564. DOI: [10.1016/j.chom.2019.03.001](https://doi.org/10.1016/j.chom.2019.03.001)
8. Goodrich JK, Waters JL, Poole AC, Sutter JL, Koren O, Blekhman R, Beaumont M, Van Treuren W, Knight R, Bell JT, Spector TD, Clark AG, **Ley RE**. 2014. Human genetics shape the gut microbiome. *Cell* 159: 789-799. DOI: [10.1016/j.cell.2014.09.053](https://doi.org/10.1016/j.cell.2014.09.053)
9. Koren O, Knights D, Gonzalez A, Waldron L, Segata N, Knight R, Huttenhower C, **Ley RE**. 2013. A guide to Enterotypes across the human body: A meta-analysis of microbial community structures in human microbiome datasets. *PLoS Comput Biol* 9: e1002863. (2013). DOI: [10.1371/journal.pcbi.1002863](https://doi.org/10.1371/journal.pcbi.1002863)
10. Koren O, Goodrich JK, Cullender TC, Spor A, Laitinen K, Backhed H, Gonzalez A, Werner JJ, Angenent LT, Knight R, Backhed F, Isolauri E, Salminen S, **Ley RE**. 2012. Remodeling of the gut microbiome and metabolic changes during pregnancy. *Cell* 150: 1-11. DOI: [10.1016/j.cell.2012.07.008](https://doi.org/10.1016/j.cell.2012.07.008)

Category B - The following include reviews and commentaries spanning my career working on the microbiome.

1. **Ley RE**. 2022. The human microbiome: there is much left to do. *Nature* 606: 435. DOI: [10.1038/d41586-022-01610-5](https://doi.org/10.1038/d41586-022-01610-5)
2. Enav H, Bäckhed F, **Ley RE**. The developing infant gut microbiome: A strain-level view. 2022. *Cell Host & Microbe* 30: 627-638. DOI: [10.1016/j.chom.2022.04.009](https://doi.org/10.1016/j.chom.2022.04.009)
3. Suzuki T and **Ley RE**. 2020. The role of the microbiota in human genetic adaptation. *Science* 370 eaaz6827. DOI: [10.1126/science.aaz6827](https://doi.org/10.1126/science.aaz6827)
4. Goodrich JK, Davenport ER, Clark AG and **Ley RE**. 2017. The relationship between the human genome and microbiome comes into view. *Annu Rev Genet.* 51: 413-433. DOI: [10.1146/annurev-genet-110711-155532](https://doi.org/10.1146/annurev-genet-110711-155532)
5. Goodrich JK, Davenport ER, Waters JL, Clark AG and **Ley RE**. 2016. Cross-species comparisons of host genetic associations with the microbiome. *Science* 352: 532-535. DOI: [10.1126/science.aad9379](https://doi.org/10.1126/science.aad9379)
6. **Ley RE**. 2015. The Gene-Microbe Link. *Nature* 518: S7. DOI: [10.1038/518S7a](https://doi.org/10.1038/518S7a)
7. Goodrich J. K., Di Renzi S. C., Poole A. C., Koren O., Walters W. A., Caporaso G., Knight R. and **Ley RE**. 2014. Conducting a Microbiome Study. *Cell* 17: 250-262. DOI: [10.1016/j.cell.2014.06.037](https://doi.org/10.1016/j.cell.2014.06.037)
8. Koren O. and Ley R. E.: The human intestinal microbiota and microbiome. Textbook of Gastroenterology, Sixth edition. Blackwell Publishing, 2014.
9. **Ley RE**, Peterson DA and Gordon JI. 2006: An extended view of ourselves: ecological and evolutionary forces that shape microbial diversity and genome content in the human intestine. *Cell* 124: 837-848. doi: [10.1016/j.cell.2006.02.017](https://doi.org/10.1016/j.cell.2006.02.017).

10. *Bäckhed FR, ***Ley RE**, Sonnenburg JL, Peterson DA and Gordon JI. 2005. Host-bacterial mutualism in the human intestine. *Science* 307: 1915-192. * co-first.
DOI: [10.1126/science.110481](https://doi.org/10.1126/science.110481)

Academic Distinctions (selected)

2021	Member, Scientific Advisory Board, Jung Foundation
2020	Otto Bayer Award
2020	German National Academy of Sciences, Leopoldina, Elected Member
2020-2023	Scientific Council Member, Institut Pasteur
2019	EMBO, Elected Member
2019	American Academy of Microbiology, Elected Fellow
2018	Ernst Jung Prize for Medicine
2018	Deputy Speaker – CMFI Cluster of Excellence, University of Tübingen
2018	European Academy of Microbiology, Elected Member
2017-2022	Thompson ISI Highly Cited Researcher
2016	Max Planck Society, Elected Scientific Member
2014	Young Investigator’s Award, International Society for Microbial Ecology
2010	Fellowship in Science and Engineering, David and Lucile Packard Foundation
2010	NIH Director’s New Innovator Award
2009	Hartwell Investigator, The Hartwell Foundation
2009	Beckman Young Investigator, Arnold and Mabel Beckman Foundation
2009	Pew Biomedical Scholar (declined)
2001	NASA Astrobiology Research Associateship, National Research Council