



Prof. Emmanuelle Charpentier

Founding, Scientific and Managing Director of the Max Planck Unit for the Science of Pathogens, Berlin; Nobel laureate in Chemistry 2020



Most important awards, prizes and academies

Lab Head and Guest Professor at the Institute of Microbiology and Genetics, University of Vienna, (2002-04); Lab Head, Assistant Professor at the Department of Microbiology, Immunobiology & Genetics, University of Vienna (2004-06); Private Docent (Microbiology) and Habilitation, Centre of Molecular Biology, University of Vienna (2006); Lab Head and Associate Professor at the Max F. Perutz Laboratories, University of Vienna (2006-09); Lab Head, Associate Professor at the Laboratory for Molecular Infection Medicine Sweden (MIMS), Umeå University (2009-13); Docent (Medical Microbiology), Umeå University (2013); Department Head at the Helmholtz Centre for Infection Research, Braunschweig and W3 Professor at the Hannover Medical School (2013-15); Lab Head and Visiting Professor at the Laboratory for Molecular Infection Medicine Sweden (MIMS), Umeå University (2014-17); Alexander von Humboldt Professor (since 2014); Scientific member of the Max Planck Society (since 2015); Director at the Max Planck Institute for Infection Biology, Berlin (2015-18); Honorary Professor at Humboldt University, Berlin (since 2016); Founding, Scientific and Managing Director of the Max Planck Unit for the Science of Pathogens, Berlin (since 2018).

The Nobel Prize in Chemistry 2020 was awarded jointly to Emmanuelle Charpentier and Jennifer A. Doudna "for the development of a method for genome editing".

Main publications

Hüsing, S., Halte M., van Look U., Guse A., Gálvez E.J.C., Charpentier E., Blair D.F., Erhardt M., Renault T.T. (2021) Controlling membrane barrier during bacterial type-III protein secretion. *Nature Communications*, 12 (1), 3999. <https://doi.org/10.1101/2020.11.25.397760>;

Beerens, D., Franch-Arroyo, S., Sullivan, T.J., Goosmann, C., Brinkmann, V., Charpentier, E. (2021) Survival strategies of *Streptococcus pyogenes* in response to phage infection. *Viruses*, 13 (4), 612. <https://doi.org/10.3390/v13040612>;

Galvez, E.J.C., Iljazovic, A., Amend, L., Lesker, T.R., Renault, T., Thiemann, S., Hao, L., Roy, U., Gronow, A., Charpentier, E., & Strowig, T. (2020). Distinct Polysaccharide Utilization Determines Interspecies Competition between Intestinal *Prevotella* spp. *Cell Host & Microbe*, 28 (6), 838-852.e6. <https://doi.org/10.1016/j.chom.2020.09.012>

Righetti, F., Materne, S. L., Boss, J., Eichner, H., Charpentier, E., & Loh, E. (2020). Characterization of a transcriptional TPP riboswitch in the human pathogen *Neisseria meningitidis*. *RNA Biology*, 17 (5), 718-730. <https://doi.org/10.1080/15476286.2020.1727188>;

Bratovic, M., Fonfara, I., Chylinski, K., Galvez, E.J.C., Sullivan, T.J., Boerno, S., Timmermann, B., Boettcher, M., & Charpentier, E. (2020). Bridge helix arginines play a critical role in Cas9 sensitivity to mismatches. *Nature Chemical Biology*, 16(5), 587-595. <https://doi.org/10.1038/s41589-020-0490-4>;

Broglia, L., Lecrivain, A.-L., Renault, T. T., Hahnke, K., Ahmed-Begrich, R., Le Rhun, A., & Charpentier, E. (2020). An RNA-seq based comparative approach reveals the transcriptome-wide interplay between 3'-to-5' exoRNases and RNase Y. *Nature Communications*, 11 (1), 1587. <https://doi.org/10.1038/s41467-020-15387-6>;

Makarova, K.S., Wolf, Y., Iranzo, J., Shmakov, S.A., Alkhnbashi, O.S., Brouns, S.J.J., Charpentier, E., Cheng, D., Haft, D.H., Horvath, P., Moineau, S., Mojica, F.J.M., Scott, D., Shah, S.A., Siksny, V., Terns, M.P., Venclovas, C., White, M.F., Yakunin, A.F., ... Koonin, E. (2020). Evolutionary classification of CRISPR-Cas systems: A burst of class 2 and derived variants. *Nature Reviews Microbiology*, 18 (2), 67-83. <https://doi.org/10.1038/s41579-019-0299-x>;

Ratner, H.K., Escalera-Maurer, A., Le Rhun, A., Jaggavarapu, S., Wozniak, J.E., Crispell, E.K., Charpentier, E., & Weiss, D.S. (2019). Catalytically Active Cas9 Mediates Transcriptional Interference to Facilitate Bacterial Virulence. *Molecular Cell*, 75(3), 498-510. <https://doi.org/10.1016/j.molcel.2019.05.029>;

Le Rhun, A., Escalera-Maurer, A., Bratovic, M., & Charpentier, E. (2019). CRISPR-Cas in *Streptococcus pyogenes*. *RNA Biology*, 16(4), 380–389. <https://doi.org/10.1080/15476286.2019.1582974>;

Charpentier, E., Elsholz, A., & Marchfelder, A. (2019). CRISPR-Cas: More than ten years and still full of mysteries. *RNA Biology*, 16(4), 377-379. <https://doi.org/10.1080/15476286.2019.1591659>;

Davies, K., & Charpentier, E. (2019). Finding Her Niche: An Interview with Emmanuelle Charpentier. *CRISPR Journal*, 2(1), 17–22. <https://doi.org/10.1089/crispr.2019.29042.kda>;

Lander, E., Baylis, F., Zhang, F., Charpentier, E., & Berg, P. (2019). Adopt a moratorium on heritable genome editing. *Nature*, 567(7747), 165–168. <https://doi.org/10.1038/d41586-019-00726->

5; Lecrivain, A.-L., Le Rhun, A., Renault, T.T., Ahmed-Begrich, R., Hahnke, K., & Charpentier, E. (2018). In vivo 3'-to-5' exonuclease targetomes of *Streptococcus pyogenes*. *Proceedings of the National Academy of Sciences of the United States of America*, 115 (46), 11814–11819. <https://doi.org/10.1073/pnas.1809663115>; Broglia, L., Materne, S., Lecrivain, A.-L., Hahnke, K., Le Rhun, A., & Charpentier, E. (2018). RNase Y-mediated regulation of the streptococcal pyrogenic exotoxin B. *RNA Biology*, 15 (10), 1336–1347. <https://doi.org/10.1080/15476286.2018.1532253>; Tsatsaronis, J. A., Franch-Arroyo, S., Resch, U., & Charpentier, E. (2018). Extracellular Vesicle RNA: A Universal Mediator of Microbial Communication? *Trends in Microbiology*, 26 (5), 401-410. <https://doi.org/10.1016/j.tim.2018.02.009>; Hille, F., Richter, H., Wong, S. P., Bratovic, M., Ressel, S., & Charpentier, E. (2018). The Biology of CRISPR-Cas: Backward and Forward. *Cell*, 172 (6), 1239-1259. <https://doi.org/10.1016/j.cell.2017.11.032>; Labuhn, M., Adams, F.F., Ng, M., Knoess, S., Schambach, A., Charpentier, E.M., Schwarzer, A., Mateo, J.L., Klusmann, J.-H., & Heckl, D. (2018). Refined sgRNA efficacy prediction improves large- and small-scale CRISPR-Cas9 applications. *Nucleic Acids Research*, 46 (3), 1375-1385. <https://doi.org/10.1093/nar/gkx1268>; Charpentier, E. (2018). Spotlight on... Emmanuelle Charpentier. *FEMS Microbiology Letters*, 365 (4), fnx271. <https://doi.org/10.1093/femsle/fnx271>.