

Publications

Selected Publications

Gálvez EJC, Iljazovic A, Amend L, Lesker TR, Renault T, Thiemann S, Hao L, Roy U, Gronow A, Charpentier E and Strowig T. 2020. Distinct polysaccharide utilization determines interspecies competition between intestinal *Prevotella* spp. *Cell Host Microbe* **5**:1931-3128(20)30515-1.

[PubMed Link](#)

Broglia L, Lécrivain AL, Renault TT, Hahnke K, Ahmed-Begrich R, Le Rhun A and Charpentier E. 2020. An RNA-seq based comparative approach reveals the transcriptome-wide interplay between 3'-to-5' exoRNases and RNase Y. *Nat. Commun.* **11**(1):1587.

[PubMed Link](#)

Bratovič M, Fonfara I, Chylinski K, Gálvez EJC, Sullivan TJ, Boerno S, Timmermann B, Boettcher M and Charpentier E. 2020. Bridge helix arginines play a critical role in Cas9 sensitivity to mismatches. *Nat. Chem. Biol.* **16**(5):587-595.

[PubMed Link](#)

Righetti F, Materne SL, Boss J, Eichner H, Charpentier E and Loh E. 2020. Characterization of a transcriptional TPP riboswitch in the human pathogen *Neisseria meningitidis*. *RNA Biol.* **17**(5):718-730.

[PubMed Link](#)

Makarova KS, Wolf YI, Iranzo J, Shmakov SA, Alkhnbashi OS, Brouns SJJ, Charpentier E, Cheng D, Haft DH, Horvath P, Moineau S, Mojica FJM, Scott D, Shah SA, Siksnyš V, Terns MP, Venclovas Č, White MF, Yakunin AF, Yan W, Zhang F, Garrett RA, Backofen R, van der Oost J, Barrangou R and Koonin EV. 2020. Evolutionary classification of CRISPR-Cas systems: a burst of class 2 and derived variants. *Nat. Rev. Microbiol.* **18**(2):67-83.

[PubMed Link](#)

Ratner HK, Escalera-Maurer A, Le Rhun A, Jaggavarapu S, Wozniak JE, Crispell EK, Charpentier E and Weiss DS. 2019. Catalytically Active Cas9 Mediates Transcriptional Interference to Facilitate Bacterial Virulence. *Mol. Cell* **75**(3):498-510.

[PubMed Link](#)

Davies K and Charpentier E. 2019. Finding her niche: an interview with Emmanuelle Charpentier. *CRISPR J.* **2**:17-22.

[PubMed Link](#)

Charpentier E, Elsholz A and Marchfelder A. 2019. CRISPR-Cas: more than 10 years and still full of mysteries. *RNA Biol.* **16**(4):377-379.

[PubMed Link](#)

Lander ES, Baylis F, Zhang F, Charpentier E, Berg P, Bourgain C, Friedrich B, Joung JK, Li J, Liu D, Naldini L, Nie JB, Qiu R, Schoene-Seifert B, Shao F, Terry S, Wei W and Winnacker EL. 2019. Adopt a moratorium on heritable genome editing. *Nature* 567(7747):165-168.

[PubMed Link](#)

Le Rhun A, Escalera-Maurer A, Bratovič M and Charpentier E. 2019. CRISPR-Cas in *Streptococcus pyogenes*. *RNA Biol.* 16(4):380-389.

[PubMed Link](#)

Lécrivain AL, Le Rhun A, Renault TT, Ahmed-Begrich R, Hahnke K and Charpentier E. 2018. *In vivo* 3'-to-5' exoribonuclease targetomes of *Streptococcus pyogenes*. *Proc. Natl. Acad. Sci. U. S. A.* 115(46):11814-11819.

[PubMed Link](#)

Broglia L, Materne S, Lécrivain AL, Hahnke K, Le Rhun A and Charpentier E. 2018. RNase Y-mediated regulation of the streptococcal pyrogenic exotoxin B. *RNA Biol.* 15(10):1336-1347.

[PubMed Link](#)

Tsatsaronis JA, Franch-Arroyo S, Resch U and Charpentier E. 2018. Extracellular Vesicle RNA: A universal mediator of microbial communication? *Trends Microbiol.* 26(5):401-410.

[PubMed Link](#)

Hille F, Richter H, Wong SP, Bratovič M, Ressel S and Charpentier E. 2018. The biology of CRISPR-Cas: Backward and forward. *Cell* 172(6):1239-1259.

[PubMed Link](#)

Charpentier E. 2018. Spotlight on... Emmanuelle Charpentier. *FEMS Microbiol. Lett.* 365(4).

[PubMed Link](#)

Labuhn M, Adams FF, Ng M, Knoess S, Schambach A, Charpentier EM, Schwarzer A, Mateo JL, Klusmann JH and Heckl D. 2018. Refined sgRNA efficacy prediction improves large- and small-scale CRISPR-Cas9 applications. *Nucleic Acids Res.* 46(3):1375-1385.

[PubMed Link](#)

Hurwitz JL, Jones BG, Charpentier E and Woodland DL. 2018. Hypothesis: RNA and DNA Viral Sequence Integration into Mammalian Host Genome Supports Long-Term B Cell and T Cell Adaptive Immunity. *Viral Immunol.* 30(9):628-632.

[PubMed Link](#)

Fabiani FD, Renault TT, Peters B, Dietsche T, Gálvez EJC, Guse A, Freier K, Charpentier E, Strowig T, Franz-Wachtel M, Macek B, Wagner S, Hensel M and Erhardt M. 2017. A flagellum-specific chaperone facilitates assembly of the core type III export apparatus of the bacterial

flagellum. *PLoS Biol.* 15(8):e2002267.

[PubMed Link](#)

Elsholz AKW, Birk MS, Charpentier E and Turgay K. 2017. Functional diversity of AAA+ protease complexes in *Bacillus subtilis*. *Front. Mol. Biosci.* 4:44.

[PubMed Link](#)

Reimer J, Knöss S, Labuhn M, Charpentier E, Göhring G, Schlegelberger B, Klusmann JH and Heckl D. 2017. CRISPR-Cas9-induced t(11;19)/MLL-ENL translocations initiate leukemia in human hematopoietic progenitor cells *in vivo*. *Haematologica* 102(9):1558-1566.

[PubMed Link](#)

Richter F, Fonfara I, Gelfert R, Nack J, Charpentier E and Möglich A. 2017. Switchable Cas9. *Curr. Opin. Biotechnol.* 48:119-126.

[PubMed Link](#)

Renault TT, Abraham AO, Bergmiller T, Paradis G, Rainville S, Charpentier E, Guet CC, Tu Y, Namba K, Keener JP, Minamino T and Erhardt M. 2017. Bacterial flagella grow through an injection-diffusion mechanism. *Elife* e23136.

[PubMed Link](#)

Le Rhun A, Lécrivain AL, Reimegård J, Proux-Wéra E, Broglia L, Della Beffa C and Charpentier E. 2017. Identification of endoribonuclease specific cleavage positions reveals novel targets of RNase III in *Streptococcus pyogenes*. *Nucleic Acids Res.* 45(5):2329-2340.

[PubMed Link](#)

Eggenschwiler R, Moslem M, Fráguas MS, Galla M, Papp O, Naujock M, Fonfara I, Gensch I, Wähner A, Beh-Pajooch A, Mussolino C, Tauscher M, Steinemann D, Wegner F, Petri S, Schambach A, Charpentier E, Cathomen T and Cantz T. 2016. Improved bi-allelic modification of a transcriptionally silent locus in patient-derived iPSC by Cas9 nickase. *Sci Rep.* 6:38198.

[PubMed Link](#)

Resch U, Tsatsaronis JA, Le Rhun A, Stübiger G, Rohde M, Kasvandik S, Holzmeister S, Tinnefeld P, Wai SN and Charpentier E. 2016. A two-component regulatory system impacts extracellular membrane-derived vesicle production in group A streptococcus. *MBio* 7(6):e00207-e00216.

[PubMed Link](#)

Richter F, Fonfara I, Bouazza B, Schumacher CH, Bratovič M, Charpentier E and Möglich A. 2016. Engineering of temperature- and light-switchable Cas9 variants. *Nucleic Acids Res.* 44(20):10003-10014.

[PubMed Link](#)

Hille F and Charpentier E. 2016. CRISPR-Cas: biology, mechanisms and relevance. *Philos. Trans. R. Soc. Lond. B. Biol. Sci.* 371(1707):20150496.

[PubMed Link](#)

Labenski V, Suerth JD, Barczak E, Heckl D, Levy C, Bernadin O, Charpentier E, Williams DA, Fehse B, Verhoeyen E and Schambach A. 2016. Alpharetroviral self-inactivating vectors produced by a superinfection-resistant stable packaging cell line allow genetic modification of primary human T lymphocytes. *Biomaterials* 97:97-109.
[PubMed Link](#)

Fonfara I, Richter H, Bratovič M, Le Rhun A and Charpentier E. 2016. The CRISPR-associated DNA-cleaving enzyme Cpf1 also processes precursor CRISPR RNA. *Nature* 532(7600):517-521.
[PubMed Link](#)

Sternberg SH, Richter H, Charpentier E and Qimron U. 2016. Adaptation in CRISPR-Cas systems. *Mol. Cell* 61(6):797-808.
[PubMed Link](#)

Le Rhun A, Beer YY, Reimegård J, Chylinski K and Charpentier E. 2016. RNA sequencing uncovers antisense RNAs and novel small RNAs in *Streptococcus pyogenes*. *RNA Biol.* 13(2):177-195.
[PubMed Link](#)

Makarova KS, Wolf YI, Alkhnbashi OS, Costa F, Shah SA, Saunders SJ, Barrangou R, Brouns SJ, Charpentier E, Haft DH, Horvath P, Moineau S, Mojica FJ, Terns RM, Terns MP, White MF, Yakunin AF, Garrett RA, van der Oost J, Backofen R and Koonin EV. 2015. An updated evolutionary classification of CRISPR-Cas systems. *Nat. Rev. Microbiol.* 13(11):722-736.
[PubMed Link](#)

Charpentier E and Hess WR. 2015. Editorial: RNA in bacteria: biogenesis, regulatory mechanisms and functions. *FEMS Microbiol. Rev.* 39(3):277-279.
[PubMed Link](#)

Heckl D and Charpentier E. 2015. Toward whole-transcriptome editing with CRISPR-Cas9. *Mol. Cell* 58(4):560-562.
[PubMed Link](#)

Charpentier E, Richter H, van der Oost J and White MF. 2015. Biogenesis pathways of RNA guides in archaeal and bacterial CRISPR-Cas adaptive immunity. *FEMS Microbiol. Rev.* 39(3):428-441.
[PubMed Link](#)

Bosley KS, Botchan M, Bredenoord AL, Carroll D, Charo RA, Charpentier E, Cohen R, Corn J, Doudna JA, Feng G, Greely HT, Isasi R, Ji W, Kim JS, Knoppers B, Lanphier E, Li J, Lovell-Badge R, Martin GS2, Moreno J, Naldini L, Pera M, Perry AC, Venter JC, Zhang F and Zhou Q. 2015. CRISPR germline engineering-the community speaks. *Nat. Biotechnol.* 33(5):478-486.
[PubMed Link](#)

Plagens A, Richter H, Charpentier E and Randau L. 2015. DNA and RNA interference mechanisms by CRISPR-Cas surveillance complexes. *FEMS Microbiol. Rev.* 39(3):442-463.

[PubMed Link](#)

Charpentier E. 2015. CRISPR-Cas9: how research on a bacterial RNA-guided mechanism opened new perspectives in biotechnology and biomedicine. *EMBO Mol. Med.* 7(4):363-365.

[PubMed Link](#)

Doudna JA and Charpentier E. 2014. The new frontier of genome engineering with CRISPR-Cas9. *Science* 346(6213):1258096.

[PubMed Link](#)

Latvala S, Mäkelä SM, Miettinen M, Charpentier E and Julkunen I. 2014. Dynamin inhibition interferes with inflammasome activation and cytokine gene expression in *Streptococcus pyogenes*-infected human macrophages. *Clin. Exp. Immunol.* 178(2):320-333.

[PubMed Link](#)

Charpentier E and Marraffini LA. 2014. Harnessing CRISPR-Cas9 immunity for genetic engineering. *Curr. Opin. Microbiol.* 19:114-119.

[PubMed Link](#)

Charpentier E and Marraffini LA. 2014. Novel technologies in microbiology: Recent advances in techniques in microbiology. *Curr. Opin. Microbiol.* 19:viii-x.

[PubMed Link](#)

Chylinski K, Makarova KS, Charpentier E and Koonin EV. 2014. Classification and evolution of type II CRISPR-Cas systems. *Nucleic Acids Res.* 42(10):6091-6105.

[PubMed Link](#)

Jinek M, Jiang F, Taylor DW, Stenberg SH, Kaya E, Ma E, Anders C, Hauer M, Zhou K, Lin S, Kaplan M, Iavarone AT, Charpentier E, Nogales E and Doudna JA. 2014. Structures of Cas9 endonucleases reveal RNA-mediated conformational activation. *Science* 343(6176):1247997.

[PubMed Link](#)

Fonfara I, Le Rhun A, Chylinski K, Makarova KS, Lécrivain AL, Bzdrenga J, Koonin EV and Charpentier E. 2014. Phylogeny of Cas9 determines functional exchangeability of dual-RNA and Cas9 among orthologous type II CRISPR-Cas systems. *Nucleic Acids Res.* 42(4):2577-2590.

[PubMed Link](#)

Fuhrmann J, Mierzwa B, Trentini DB, Spiess S, Lehner A, Charpentier E and Clausen T. 2013. Structural basis for recognizing phosphoarginine and evolving residue-specific protein phosphatases in Gram-positive bacteria. *Cell Rep.* 3(6):1832-1839.

[PubMed Link](#)

Chylinski K, Le Rhun A and Charpentier E. 2013. The tracrRNA and Cas9 families of type II CRISPR-Cas immunity systems. *RNA Biol.* **10(5):726-737.**

[PubMed Link](#)

Charpentier E and Doudna JA. 2013. Biotechnology: Rewriting a genome. *Nature* **495(7439):50-51.**

[PubMed Link](#)

Fineran PC and Charpentier E. 2012. Memory of viral infections by CRISPR-Cas adaptive immune systems: acquisition of new information. *Virology* **434(2):202-209.**

[PubMed Link](#)

Jinek M, Chylinski K, Fonfara I, Hauer M, Doudna JA and Charpentier E. 2012. A programmable dual-RNA guided DNA endonuclease in adaptive bacterial immunity. *Science* **337(6096):816-821.**

[PubMed Link](#)

Le Rhun A and Charpentier E. 2012. Small RNAs in streptococci. *RNA Biol.* **9(4):414-426.**

[PubMed Link](#)

Makarova KS, Haft DH, Barrangou R, Brouns SJ, Charpentier E, Horvath P, Moineau S, Mojica FJ, Wolf YI, Yakunin A, van der Oost J and Koonin EV. 2011. Evolution and classification of the CRISPR/Cas systems. *Nat. Rev. Microbiol.* **9(6):467-477.**

[PubMed Link](#)

Deltcheva E, Chylinski K, Sharma C, Gonzales K, Chao Y, Pirzada ZA, Eckert M, Vogel J and Charpentier E. 2011. CRISPR RNA maturation by *trans*-encoded small RNA and host factor RNase III. *Nature* **471(7340):602-607.**

[PubMed Link](#)