

References: Gene Editing Is Not Precise or Predictable

These articles are just some of the studies verifying that gene editing is not the precise and predictable technology that the industry describes. On the contrary, a single successful gene edit can be accompanied by hundreds of thousands of mutations, deletions, and additions. These are not the natural mutations that accompany natural breeding. Some have the potential to do damage, yet very few scientists properly evaluate the collateral damage and implications from their gene editing experiments.

Repair of double-strand breaks induced by CRISPR–Cas9 leads to large deletions and complex rearrangements.

Michael Kosicki, Kärt Tomberg & Allan Bradley
Nature Biotechnology, 16 July 2018
<https://www.nature.com/articles/nbt.4192>

CRISPR/Cas9 targeting events cause complex deletions and insertions at 17 sites in the mouse genome.

Shin HY^{1,2}, Wang C¹, Lee HK^{1,3}, Yoo KH^{1,4}, Zeng X¹, Kuhns T¹, Yang CM¹, Mohr T¹, Liu C⁵, Hennighausen L¹.
<https://www.ncbi.nlm.nih.gov/pubmed/28561021>

CRISPR/Cas9-mediated genome editing induces exon skipping by alternative splicing or exon deletion.

Haiwei Mou†, Jordan L. Smith†, Lingtao Peng, Hao Yin, Jill Moore, Xiao-Ou Zhang, Chun-Qing Song, Ankur Sheel, Qiongqiong Wu, Deniz M. Ozata, Yingxiang Li, Daniel G. Anderson, Charles P. Emerson, Erik J. Sontheimer, Melissa J. MooreEmail author, Zhiping WengEmail author and Wen Xue
<https://genomebiology.biomedcentral.com/articles/10.1186/s13059-017-1237-8>

Characteristics of genome editing mutations in cereal crops. *Trends in Plant Science* 22:38–52.

Zhu C, Bortesi L, Baysal C, Twyman RM, Fischer R, Capell T, Schillberg S and Christou P (2017).

<https://www.ncbi.nlm.nih.gov/pubmed/27645899>

Achieving plant CRISPR targeting that limits off-target effects.

Wolt JD, Wang K, Sashital D and Lawrence-Dill CJ (2016). *The Plant Genome* 9:
doi: 10.3835/plantgenome2016.05.0047

<https://www.ncbi.nlm.nih.gov/pubmed/27902801>