



Award
2019 LUI Che Woo Prize - Welfare Betterment Prize

Dr. Jennifer Doudna, Biochemist, Co-discoverer of CRISPR-Cas9

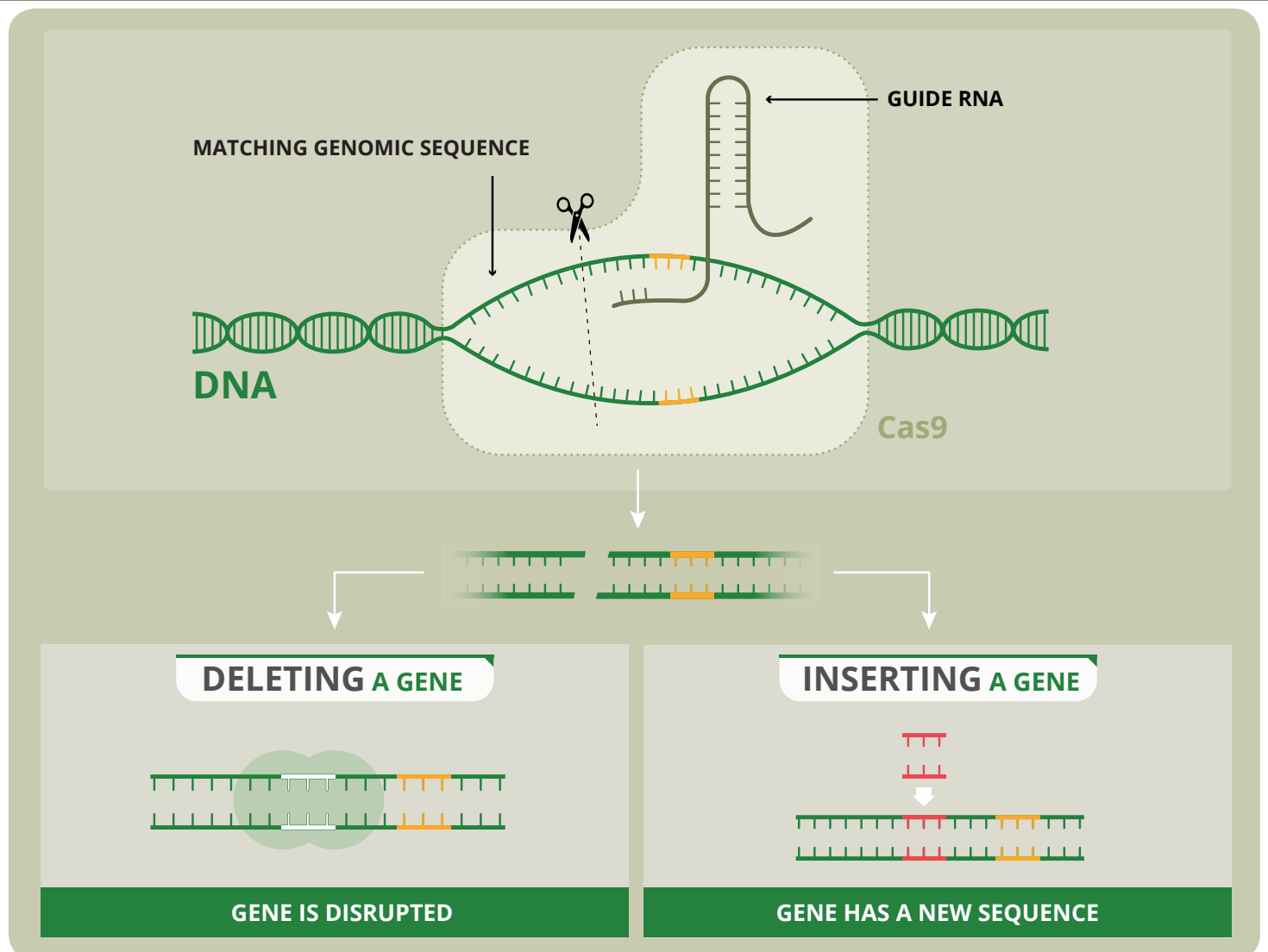
An internationally renowned professor of chemistry and molecular and cell biology at UC Berkeley, Dr. Jennifer Doudna played a key role in one of the most monumental scientific discoveries of our time – a genome editing technology called CRISPR-Cas9 that allows scientists to make precise changes to DNA, the code of life. From treating and curing disease to enhancing agricultural productivity, this revolutionary technology has quickly created new possibilities for improving human welfare.

Giving Hope to Millions

Genome editing technologies enable scientists to change an organism's DNA by adding, removing or altering the genetic material at a particular location within the genome. First described as a genome editing tool in 2012 by Dr. Jennifer Doudna and her colleagues, the CRISPR-Cas9 technology is faster, cheaper, more accurate and more efficient than other gene editing methods.

Scientists are now exploring the application of CRISPR genome editing in a wide variety of diseases. The technology could be the key to correcting the mutation responsible for single-gene disorders such as cystic fibrosis or sickle cell disease, giving hope to millions worldwide who suffer from inherited genetic conditions. Because the CRISPR-Cas9 technology can rapidly engineer immune cells for therapeutic application, it also may provide new strategies for treating or preventing complex diseases such as cancer, heart disease and HIV.

What is CRISPR-Cas9?



A Leading Scientific Mind of Her Generation

Dr. Doudna grew up in Hilo, Hawaii, where she first became interested in the chemistry of living systems. After completing her bachelor's degree in chemistry, she went on to Harvard University where she finished a biochemistry doctorate under the supervision of future Nobel winner Jack Szostak. Her doctoral research focused on ribonucleic acid (RNA).

Dr. Doudna's road to what would become the CRISPR-Cas9 breakthrough began in the early 2000s when she was studying RNA molecules and considered how single-celled bacteria came to produce an RNA-guided adaptive immune system. She continued to look into the concept of bacterial immune systems and eventually discovered that the Cas9 protein could be programmed to find and cut any sequence of DNA in animal and plant cells.

Advocating Safety and Responsibility

As with many other scientific discoveries at their early stages, there is uncertainty about the way CRISPR-Cas9 technology might be used in the future. Therefore, Dr. Doudna supports the development of a robust framework to regulate the safe and responsible use of CRISPR-Cas9 technology. At the second International Summit on Human Genome Editing in November 2018 in Hong Kong, she reaffirmed this position and joined other summit-goers in calling for rigorous standards and international cooperation to be applied in clinical trials.



“It’s very important to understand that the CRISPR technology has the potential to do many beneficial things for society.”

– Dr. Jennifer Doudna

The Guardian

Genetic Innovation in Agriculture

The CRISPR–Cas9 editing system has significant potential across many areas of biology and technology – including agriculture. Because it is able to perform efficient single and multiplex gene editing in plants, the technology could help to generate plants that are resistant to climate change and crops with higher nutritional value. This has significant implications for the health of people around the globe, and agricultural development has been cited by Dr. Doudna as the area where the CRISPR-Cas9 discovery may have the most immediate impact.