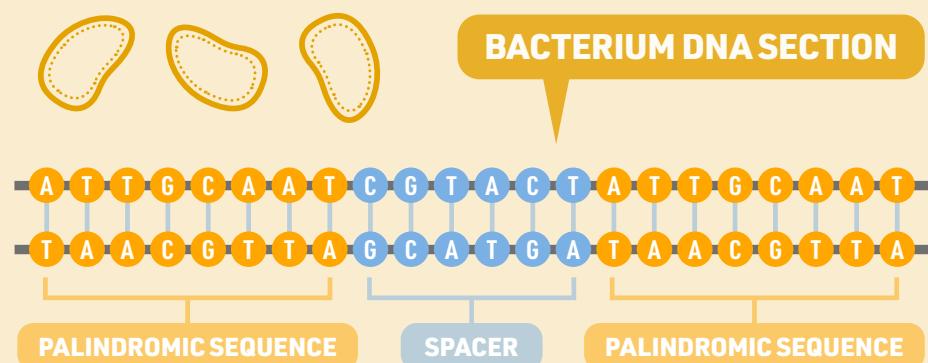


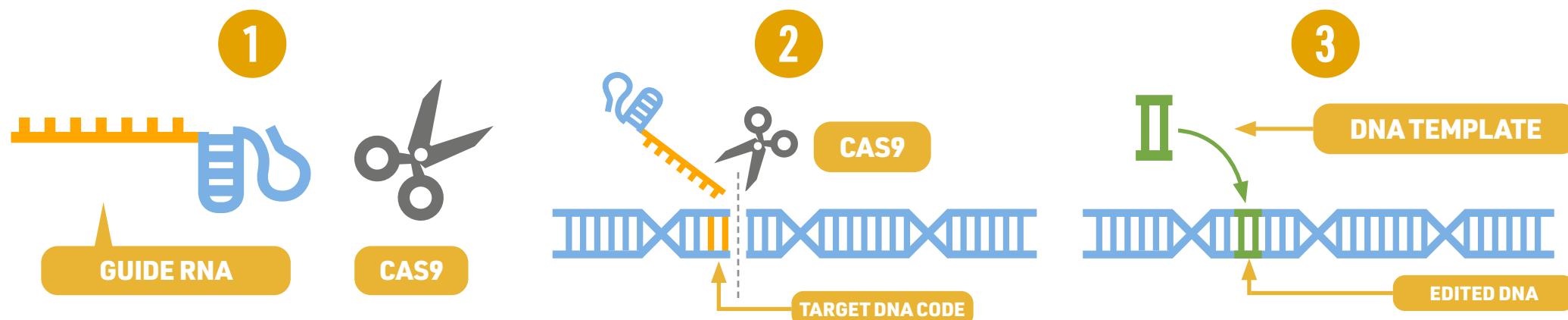
# 2020 NOBEL PRIZE IN CHEMISTRY



The Nobel Prize in Chemistry 2020 was awarded to **Emmanuelle Charpentier** and **Jennifer A. Doudna** for the development of CRISPR-Cas9 genetic scissors, a method for genome editing.



CRISPR stands for clustered regularly interspaced short palindromic repeats. It refers to repeated sequences in bacteria and archaea DNA. These sequences are part of an immune system; if a bacterium survives a viral infection, it adds a section of the virus genetic code to the CRISPR region of its own to serve as a memory in case it's infected again. **Charpentier** and **Doudna** saw that this could be used as a gene editing tool.



The first step in the CRISPR gene editing process is the creation of a strand of guide RNA. This matches the DNA sequence where we want to make a cut. A scissor protein, Cas9, binds to the guide RNA.

The guide RNA searches for the target section of DNA and transports the scissor protein to it. The scissor protein cuts the DNA at this point.

The cell will try and repair the cut DNA. This process is error-prone, disrupting the gene function. If we add a template, the cell will use this to carry out the repair, allowing us to edit the genetic code.



## WHY DOES THIS RESEARCH MATTER?

The ability to edit genomes has already found uses in plant breeding. Therapies which use it to treat some types of cancer are already in clinical trials, and it's hoped it may lead to cures for inherited diseases.

Nobel Prize in Chemistry press release: <https://www.nobelprize.org/uploads/2020/10/press-chemistryprize2020.pdf>