

Student Worksheet – Chemistry Prize 2020

The genetic scissors: a tool for rewriting the code of life



The 2020 Nobel Prize in Chemistry is awarded for the discovery of one of gene technology's sharpest tools: the CRISPR/Cas9 genetic scissors. Researchers can use these scissors to change the DNA of living organisms, which is a great benefit to basic research about how genes work. The technology can also be used in the development of food crops, for example, and can lead to innovative medical treatments.

The prize will be shared by microbiologist Emmanuelle Charpentier and biochemist Jennifer A. Doudna. In 2012, they made the discovery for which the Nobel Prize is awarded and which would soon revolutionise research on how life works.

Emmanuelle Charpentier and Jennifer A. Doudna did research on the immune systems of bacteria. They discovered that the bacteria have a clever way of fighting viruses. Just like people, bacteria can be infected by viruses, so they need a way to defend themselves. The researchers discovered that bacteria can recognize virus DNA and cut it apart to make the virus harmless. The cut is made with a genetic scissors known as CRISPR/Cas9. The two researchers realised that the bacteria's clever genetic scissors could be used to make changes to the genetic code – that is, the genome – of other living organisms besides bacteria.

Today the genetic scissors are used to change the DNA of cells and laboratory animals for the purpose of understanding how different genes function. Thanks to the genetic scissors, medical researchers are on the way to making a dream come true: curing serious diseases. But there are also risks that the technology could be misused. So we need to have ethical discussions and rules to govern its use.

Vocabulary

GENE TECHNOLOGY Technologies used to influence and change genes.

PLANT BREEDING Changing the traits of plants to better meet human needs.

What do you think?

What is the most interesting part of the laureates' work?

Alfred Nobel wanted the Nobel Prizes to be awarded to people who worked for the greatest benefit to humankind. What is the greatest benefit of the laureates' contributions?
