



Contact Information

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Give CRISPR a chance!

The 2020 Nobel Prize Award in Chemistry makes us to rethink the potential of genome editing for sustainable agriculture and food production in the European region.

The recent Nobel Prize Award in Chemistry reminds us the importance of science and its applications in our everyday life but also lead us to reopen a dialogue for the exploitation of genome editing technologies within the European framework.

Emmanuelle Charpentier and Jennifer A. Doudna, awarded with the 2020 Nobel Prize in Chemistry, are two of the people behind the revolutionary discovery of the CRISPR/Cas9 genetic scissors. The CRISPR/Cas9 system naturally occurs in bacteria as part of their immune response system against viruses. The protein Cas9 is an enzyme that acts like a pair of molecular scissors, capable of cutting strands of DNA, only by recognizing a specific DNA sequence on a targeted location. Once the DNA is cut, researchers exploit the cell's own DNA repair machinery to add or delete fragments of genetic material, or to make changes to the DNA by replacing an existing segment with a customized DNA sequence.

As Claes Gustafsson, chair of the Nobel Committee for Chemistry, said “there is enormous power in this genetic tool, which affects us all. It has not only revolutionised basic science, it is expected to lead to ground-breaking new medical treatments, but also resulted in innovative crops”.

We need to think the crucial role of these new technologies in our aim to fulfil the European Green Deal's targets for sustainable agriculture and food production. Our planet is facing unprecedented

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challenges because of a rising, more affluent world population, while biodiversity is diminishing at an alarming pace and the average temperature on earth continues to rise. To meet these global challenges, we will have to shift our mentality and lifestyle, to increase investments in knowledge creation and facilitate the use of innovative technologies. This also means that **agriculture** and **food production** must become more sustainable. Besides that, we need to develop a highly productive and sustainable recovery from the COVID-19 crisis, with an agriculture that is less dependent on imports from outside the EU.

CRISPR and precision breeding is a **powerful addition to our toolbox to meet such global challenges of sustainable development**. CRISPR has far reaching applications such as increasing the diversity of crops, the reduction of the use of pesticides, the development of novel bioprocesses, the further development of healthy food and many more.

The ability to use genome editing is crucial for the welfare and food security of European citizens. The scientists involved in the OMIC Engine National Research Infrastructure in the AgroFood Sector are actively involved in many applications of the technology in a variety of different organisms, contributing to the scientific being. In addition, the **Department of Biochemistry & Biotechnology** of the University of Thessaly belongs to the **European Sustainable Agriculture through Genome Editing (EU-SAGE) network** with members from 132 European research institutes and associations that have joined forces to provide information about genome editing. In parallel, the network promotes the development of European and EU member state policies that will enable the use of genome editing for sustainable agriculture and food production.

Learn more about the network at www.omic_engine.gr and <https://www.eu-sage.eu/>.

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