

# Free CRISPR - Cas patent licences

WUR is going to grant licences for five patents in the field of CRISPR-Cas free of charge to NGOs that aim to improve the global food supply on a non-profit basis. What can they do with those patents? Text Albert Sikkema

**W**UR president Louise Fresco announced this plan at the Opening of the Academic Year on 6 September. The patents are based on research by microbiologist John van der Oost. Van der Oost did his research on the immune system of bacteria with funding from the Dutch Research Council NWO. 'I was given that NWO money for something else entirely, but during the study we shifted our focus and quite quickly discovered that we could use the defence system of bacteria against viruses for DNA modifications in all organisms. I am happy that I was allowed to use that grant flexibly.' Years later, and again with funding from NWO, Van der Oost discovered a thermophile bacterium in a compost heap in Ede that had a stable CRISPR-Cas9 system for DNA modifications. His research generated five patents registered in the names of WUR and NWO. He hopes that non-profit organizations will use them to develop new drought-resistant and salt-tolerant plants, for example.

## How did Van der Oost come up with the idea of making his patents freely available?

One evening he saw his colleague Christa Testerink, professor of Plant Physiology, talking on TV about her research on salt-tolerant crops and her collaboration with the International Rice Research Institute (IRRI)

in the Philippines. Van der Oost was disappointed that European plant-breeding companies don't use CRISPR-Cas to develop improved plant varieties and he thought, maybe the IRRI would be interested. That proved to be the case.

The plan was worked out in discussion with patent expert Paul van Helvert, WUR President Louise Fresco, director of the Plant Sciences Group Ernst van den Ende, and plant biotechnologist Richard Visser.

## But Van der Oost's patents are managed by the Broad Institute in the US, aren't they?

They are. WUR received a large sum of money four years ago from Editas Medicine, an American biotech company that wanted to use the enzyme Cas12, patented by Van der Oost, for medical purposes. WUR put the Cas12 patent under the management of the Broad Institute, part of Massachusetts Institute of Technology. The five patents that Van der Oost, NWO and WUR are now making available are not managed in the US. No one has previously granted licences for CRISPR-Cas patents free of charge.

## What do the American patent-holders think of this move?

That's an unknown factor. Van der Oost hopes the research institutes with a lot of CRISPR patents will follow his example. His aim is that the CRISPR technology should not only be used by wealthy companies. He also hopes his action will lead to a broad acceptance of the CRISPR-Cas technology and gene editing in society.

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There is a lot of legal action regarding CRISPR-Cas



John van der Oost at the Opening of the Academic Year. Photo Guy Ackermans

### What is CRISPR-Cas a solution for?

Mainly for modifying complex characteristics in plants. Drought resistance and salt tolerance, for example – both characteristics involving a great many genes. With traditional plant-breeding, you stand very little chance of breeding in and activating 10 important genes. With the help of CRISPR-Cas, you can edit those 10 genes specifically.

### Is CRISPR-Cas a technological or natural process?

CRISPR-Cas is a defence mechanism that bacteria use against viruses in nature and was discovered there. Between 60 and 70 different CRISPR systems that have been discovered to date, including the one discovered in a compost heap in Ede. Each different CRISPR system allows researchers like Van der Oost to develop applications with which they can modify the DNA of plants and animals. These applications are technological. ■

### WHAT IS THE SCOPE OF THE WAGENINGEN CRISPR-CAS PATENTS?

Will WUR's five patents cover enough technology that NGOs really can use them to develop better plants? Or will they need other licenses too?

It's complicated, says Wageningen patent expert Paul van Helvert. WUR holds five patents in the so-called "Thermo-Cas-family". WUR says these patents are independent, which means no additional patents are required to apply this technology. 'Whether additional technology is needed that falls under other patents depends on the specific application', says Van Helvert.

Moreover, WUR will need to monitor the independence and scope of the patents continuously. Another patent holder could contest the scope of the Wageningen patents. There is a lot of legal action regarding CRISPR-Cas. There haven't been any court around this 'Thermo-Cas family' yet, but that may change.

WUR has submitted patent applications for the five patents in 14 countries, which amounts to 70 patenting procedures. This is necessary because patent legislation and the renewal procedures differ per country. Some procedures have been finalized, while others are still pending.

Patent procedures take many years, and throughout that time, a third party can contest the patent. If you wait until the patent has been granted everywhere, it will already be up for renewal in some countries. So patent holders and licensees enter into an agreement based on an estimate to ensure that investments in further development are protected.

In summary: NGOs will be able to develop improved plants with the Wageningen patents independently of other patents until there is proof to the contrary.