Vaccines to protect plants against viruses

CSIC and the Polytechnic University of Valencia have developed a new generation of highly specific RNA-based vaccines that can be applied to plants in a non-transgenic manner to control diseases caused by viruses, as an alternative to current treatments based on traditional pesticides. This new technology will contribute to optimize the productivity and quality of crops in an environment-friendly way.

Industrial partners from the agrochemical and crop breeding industry are being sought to collaborate through the co-development of a market application based on the offered technology in the framework of a patent licence agreement.

An offer for Patent Licensing

New generation of highly specific RNA-based vaccines, as an alternative to current treatments based on traditional pesticides

The technology allows the simultaneous inactivation of multiple genes of a pathogen in a highly specific and non-transgenic manner, thanks to small RNA molecules called synthetic tasi-RNAs (syntasi-RNAs) produced by an innocuous virus applied to plants through spraying. Importantly, the size of the precursor molecules of the syntasi-RNAs has been reduced considerably without affecting the activity of the syntasi-RNA produced.

These treatments could be used to protect crops against various types of pathogens, such as viruses, constituting a new generation of vaccines in which a plant extract would be used to infect the plant with a innocous virus that produces syntasi-RNAs that specifically inactivate a pathogenic virus.

Response of *Nicotiana benthamiana* plants infected with Tomato Spotted Wilt Virus (TSWV) to different treatments based on our RNA technology.

Main innovations and advantages

- Custom design adapted to the plant species and virus of interest.
- "Multitarget" technology that allows the simultaneous inactivation of multiple genes of the pathogen, thereby minimizing the risk of emergence of resistant viruses.
- Multiple or continued treatments are not required as a single application is sufficient in a more cost-effective manner.
- The main applications are focused on the control of plant viruses.

Patent Status

Priority patent application filed suitable for international extension.

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