



## Spain: Protein opens door to frost resistant crops

A team of researchers have identified a key protein in the adaptation of plants to frost, which opens the door to generating biotechnological tools to obtain crops that have a greater tolerance.

The study was conducted with the participation of Spanish researchers from the Higher Council of Scientific Research (CSIC) and the results are published in the PNAS journal.

The scientists discovered that the HOS15 protein plays a role in the adaptation of plants to low temperatures.

Frosts cause serious annual losses in the production of the harvests, especially if they happen in critical moments of the plants' development, such as seed germination or flowering, stated the CSIC in a press release.

However, it is well known that previously exposing the plants to moderate low temperatures, a process known as acclimatization, allows them to have a greater tolerance to frost.

During the process of acclimatization, the cells of the plants produce cryoprotective substances and antioxidants that protect them from freezing or from the damages that this produces.

### Genes to tolerate low temperatures

In recent decades, researchers have identified numerous genes, such as the so-called COR (cold responsive) genes, which participate in the process of acclimatization and allow the plant to tolerate low temperatures.

The current investigation has determined that the HOS15 protein plays a key role during acclimation and in the expression of COR genes.

In response to cold, HOS15 promotes the degradation of a type of histone responsible for keeping the chromatin closed and preventing the expression of the COR genes.

However, by promoting degradation, it activates the expression of COR genes and cold acclimatization, stated researchers Vicente Rubio, from the National Center for Biotechnology, and Jose Manuel Pardo, from the Institute of Plant Biochemistry and Photosynthesis (mixed center of CSIC and the University of Seville).

On the contrary, the rise in temperatures modifies the activity of HOS15, making it an inhibitor of the acclimation response to cold, they added.



"HOS15 plays a dual regulatory role in acclimatization, allowing the transition from an active state of chromatin in response to cold to a repressive one under conditions of optimal temperatures and vice versa."

Therefore, this protein is a very useful target to generate biotechnological tools aimed at obtaining crops resistant to frost, they stated.

**Lien article :** <http://www.freshplaza.com/article/195080/Spain-Protein-opens-door-to-frost-resistant-crops>