Stomata development in plants unraveled -- a valuable discovery for environmental research

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Gent researchers at VIB have unraveled the action mechanism of the main plant hormone that regulates the development of stomata. This breakthrough has important implications for environmental research and for the protection of plants against disease and stress. The study has been published in the prestigious science journal *Nature Cell Biology*.

Plants breathe through stomata

Plant leaves are protected from drying out by an airtight wax layer. They breathe and release water through microscopic pores called stomata. Every year 40% of atmospheric CO_2 and twice the volume of water found in our atmosphere pass through these pores. This means that stomata are not only important for plant development but also for our climate!

It's no surprise then that these pores appear to be strictly regulated by plants. Stomata react extremely fast to internal plant signals and changes in the environment. When rain is scarce, for example, the pores will close to prevent the plant from wasting water while an automatic drought protection mechanism is triggered into action.

Brassinosteroids, a class of plant hormones, play an important role in determining the number of leaf stomata, but the underlying mechanism was until now not well understood.

Brassinosteroids are crucial plant hormones

Controlling multiple aspects of plant growth and development, brassinosteroids are omnipresent in the plant kingdom. The hormones have a positive effect on the quality and productivity of crops and increase their resistance to stress and disease.

Scientist Jenny Russinova and her team, who are associated with both VIB and Ghent University, study the action mechanisms of brassinosteroids. A recent breakthrough led them to conclude that the latter also affect the number of stomata. Plants without the hormone develop many fewer stomata. The opposite is also true: more brassinosteroids dramatically increase the number of pores.

Scientific breakthrough: action mechanism deciphered!

The VIB scientists are the first to unravel the action mechanism. They were able to determine how the various agents work together to form new stomata. Their experiments showed that brassinosteroids exert direct action on speechless, the transcription factor that initiates the development of stomata. Their action allows for a multitude of different interactions. This exemplifies the strictly orchestrated regulation of stomata development, which is able to react very quickly to environmental changes or internal plant signals The study has been published in the prestigious science journal Nature Cell Biology.

Provided by VIB (the Flanders Institute for Biotechnology)

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