MAC protein complex is essential for plants to protect themselves from DNA damage

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MAC5A protein (a member of MAC complex) level was controlled by 26S proteasome (26SP), a molecular machine required for protein recycling via direct interaction, said Meng Xiangxiang, first author of the study.

Through biochemical and genetic analyses, the researchers identified two protein complexes working together to protect plants from DNA damage induced by both MMS and high boron.

"This study uncovered the molecular mechanisms on how plants respond to DNA damage, and provided new clue to improve crop production and food quality," said Prof. Li Shengjun, corresponding author of the study.


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Their work was published in Plant Physiology on Nov. 4.

The researchers found that plants without functional MAC showed growth defects and were easily damaged by Methyl methanesulfonate (MMS), a chemical inducing DNA breaks.

They also found that the tolerance of these MAC mutants to high boron was decreased. High boron in soils harms crop yield and food nutrients.

MAC and 26SP regulate DNA damage response and growth/ stress adaptation. Credit: Meng Xiangxiang

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