

# Artificial control of starch synthesis in plants

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A research group is the first in the world to identify the gene that controls starch synthesis in plants. Their study, entitled "CO<sub>2</sub> Responsive CCT protein, CRCT Is a Positive Regulator of Starch Synthesis in Vegetative Organs of Rice," was published in the American academic journal *Plant Physiology* on February 25. The results of their study will be useful not only to increase rice yield, but also to produce high starch containing plants for biofuel.

## Research background

The rise in carbon dioxide (CO<sub>2</sub>) [concentration](#) in the atmosphere has recently become a social issue. In contrast, as CO<sub>2</sub> is used to make starch by means of photosynthesis, elevated atmospheric CO<sub>2</sub> is beneficial for plants. In fact, when a crop is grown under high CO<sub>2</sub> concentration, starch synthesis is promoted, growth becomes more vigorous and plant yield rises. However, it is still unknown how plants adapt to changes in CO<sub>2</sub> concentration at the genetic level and how starch synthetic capacity is regulated.

## Research Focus

The research group analyzed in detail the expression level of the genes in rice plants grown under high CO<sub>2</sub> concentration. By doing so, they discovered that the gene named CO<sub>2</sub> Responsive CCT Protein (CRCT), whose exact function is still unknown, is more actively expressed when CO<sub>2</sub> concentration is high. The CRCT protein contains a structure called the CCT domain that is commonly found in proteins involved in

regulating gene expression. The group decided to pursue this study with the assumption that CRCT contributes to the regulation of genes involved in plant adaptation to changes in CO<sub>2</sub> concentration in their environment.

**More information:** "CO<sub>2</sub> Responsive CCT protein, CRCT Is a Positive Regulator of Starch Synthesis in Vegetative Organs of Rice." *Plant Physiol.* pp.00021.2015; First Published on February 25, 2015; [DOI: 10.1104/pp.15.00021](https://doi.org/10.1104/pp.15.00021)

Provided by Kobe University

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