

Discovery of drought tolerance gene may be key for future crops as climate warms

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Global warming increases the amount of moisture that evaporates from land and water, leading to drought in most parts of the world. In drier regions, evapotranspiration produces periods of drought that lowers the water level in rivers, lakes, and groundwater, and reduces soil moisture in agricultural areas. As global temperature rises, the land mass affected by drought is expected to increase, with potentially devastating consequences for agriculture.

The lab of M. L. Chye PhD at University of Hong Kong has identified a gene from the model plant *Arabidopsis thaliana* which encodes an acyl-CoA-binding protein (ACBP). The gene, designated as ACBP2, can confer [drought tolerance](#) in transgenic *Arabidopsis*. Overexpression of ACBP2 (i.e. increase in ACBP2 protein in the plant) in these transgenic lines promoted stomatal closure, reduced water loss and enhanced drought tolerance.

Professor Chye said: "Drought stress adversely affects plant growth, and reduces plant yield and food production in agriculture. The stomata, found in leaves and stems, hold the key to water loss in plants and ACBP2 was observed to be expressed in the guard cells which regulate stomatal aperture. ACBP2 was induced by drought and the phytohormone, abscisic acid (ABA) which triggers a pathway in drought protection. ACBP2-overexpressing plants showed ABA-mediated reactive oxygen species (ROS) production in the guard cells, thereby promoting stomatal closure. In contrast, the *acbp2* mutant plants, which had lost ACBP2 function and served as one of the controls in the research, were more sensitive to [drought stress](#)."

Read full, original post: [Scientists discover a drought tolerance gene that may help plants fight against global warming](#)