

Genetically engineered 'on-off switch' could activate drought tolerance in plants

An innovative 'on-off' switch added to a plant protein may one day allow farmers to prep crops for drought by spraying them with a commonly used agricultural compound.

The technique, reported on 4 February in *Nature*, works by closing tiny pores — called stomata — in leaves that let in carbon dioxide, a key ingredient in photosynthesis, but lose water in the process.

One way that plants respond to limited water is to boost levels of a hormone called abscisic acid (ABA). That hormone, in turn, reduces water loss by closing stomata.

Researchers found the proteins that sense ABA and trigger those responses. Sean Cutler, a plant biologist at the University of California, Riverside, and his team then began to explore how to put the discovery to practical use. The researchers mapped where ABA binds to one such protein receptor, and created a library containing every possible mutation at that site. They then tested their mutant receptors against a host of chemicals used in agriculture.

One, a fungicide called mandipropamid, was particularly potent at binding to the ABA receptor and causing it to change shape, as ABA itself would. Expressing the engineered receptor in a model plant, *Arabidopsis thaliana*, and in tomatoes yielded plants that, when sprayed with mandipropamid, were better able to survive water deprivation.

Even so, it is unclear how the approach will fare in agricultural crops in the field, says Cutler.

Read full, original article: [Protein tweak boosts plants' drought tolerance](#)