

Engineering plants to rapidly repair heat damage could preserve crop yields as climate changes

As plants convert sunlight into sugar, their cells are playing with fire. Photosynthesis generates chemical byproducts that can damage the light-converting machinery itself—and the hotter the weather, the more likely the process is to run amok as some chemical reactions accelerate and others slow.

Now, a team of geneticists has engineered plants so they can better repair heat damage, an advance that could help preserve crop yields as global warming makes heat waves more common. And in a surprise, the change made plants more productive at normal temperatures.

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The team found that modified *Arabidopsis* seedlings could survive extreme heat in the lab—8.5 hours at 41°C—that killed most of the control plants. The same *Arabidopsis* gene also protected tobacco and rice. In all three species, photosynthesis and growth decreased less than in the surviving control plants. And in 2017, when Shanghai exceeded 36°C for 18 days, transgenic rice planted in test [plots yielded 8% to 10% more grain than control plants](#), the team reports in *Nature Plants*.

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