

# Breakthrough: 'Global warming gene'

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The molecular mechanism which makes some plants grow more rapidly when the temperature rises has been identified by researchers at the University of Bristol in a paper published today in *Proceedings of the National Academy of Sciences (PNAS)*.

Scientists at the University of Bristol, along with their colleagues in Minnesota and at the John Innes Centre in Norwich, have recently published exciting new research in the journal *PNAS*, which increases our knowledge about the way in which rising temperatures affect plant growth.

Just a small a change in [temperature](#) (from 20 C - 28 C) is enough to cause a striking change in plant height. According to Dr Kerry Franklin, who led the Bristol team, “Small elevations in ambient temperature

promote the rapid elongation of plant stems, which can have negative impacts on plant stability and crop yields”.

In a previous study, published in *Current Biology*, the Franklin lab found that this response is missing in plants that lack the gene PHYTOCHROME INTERACTING FACTOR 4 (PIF4). The new study shows that PIF4 can increase the production of the plant growth hormone auxin and that it is this that leads to the exaggerated height of plants grown at high temperature. The team have further shown that this then leads to the activation of auxin-responsive genes in stems, providing a key mechanistic insight into this important growth response.

Although we are still at the early stages understanding how temperature effects [plant growth](#), this paper offers tantalising prospects by which science may be able to alleviate some of the damaging effects of global warming. In Dr Franklin’s words, “With global temperatures predicted to continue rising in the near future, understanding how plants respond to small changes in ambient temperature will be fundamental to establishing efficient crop production strategies over coming decades”.

**More information:** Franklin KA, Lee S-H, Patel D, Kumar VS, Spartz AK, Gu C, Ye S, Yu P, Breen G, Cohen JD, Wigge PA and Gray WM. (2011) PHYTOCHROME INTERACTING FACTOR 4 regulates auxin biosynthesis at high temperature. *PNAS*

Provided by University of Bristol

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