

How to make trees grow bigger and quicker

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Scientists at The University of Manchester have discovered a way to make trees grow bigger and faster, which could increase supplies of renewable resources and help trees cope with the effects of climate change.

In the study, published in *Current Biology*, the team successfully manipulated two [genes](#) in poplar trees in order to make them grow larger and more quickly than usual.

Professor Simon Turner from the Faculty of Life Sciences led the research: "The rate at which trees grow is determined by the rate of cell division in the stem. We have identified two genes that are able to drive [cell division](#) in the stem and so override the normal growth pattern.

"Although, this needs be tested in the field, this discovery paves the way for generating trees that grow more quickly and so will contribute to meeting the needs for increased plant biomass as a renewable source of biofuels, chemicals and materials while minimising further CO2 release into the atmosphere."

The genes, called PXY and CLE, control the growth of a tree trunk. When overexpressed, making them more active than in their normal state, the trees grew twice as fast as normal and were taller, wider and had more leaves.

As well as the potential to increase biomass supplies for the growing biofuel and industrial biotechnology sectors, the discovery could help

plants deal with the environmental consequences of [climate change](#).

Professor Turner adds: "Our work offers the possibility we may be able to maintain a fast growth rate even in the face of adverse and changeable environmental conditions that all plants are likely to be faced with.

"Most plants, including crops, respond to adverse environmental conditions with lower growth rates that result in correspondingly lower yields. Understanding how the plants respond to environmental signals and to what extent we are able to manipulate them to override these signals is likely to be very important for continued improvements to crop performance. In future it may be possible that manipulating the expression of the PXY and CLE genes can override environmental signals that normally alter plant growth.

"This is something that needs to be tested in the field, but offers a potential way forward for what is one of the most pressing challenges of the day."

The team now plans to work with a forest products company to test their findings in the field.

The work builds on a previous study from 2010 in which the team identified the role of the genes involved, in the plant Arabidopsis.

More information: "Wood formation in trees is increased by manipulating PXY-regulated cell division." www.cell.com/current-biology/p...fExtended/S0960-9822%2815%2900162-1

Provided by University of Manchester

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