

Scientists discover 'switch' in plants to create flowers

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Flowering is the most crucial act that plants undergo, as the fruits of such labor include crops on which the world depends, and seeds from which the next generation grows.

While classic experiments have demonstrated that plants are able to adjust the timing of their flowering in response to environmental conditions, such as light, temperature and the availability of nutrients, very little has been known about what exactly triggers plants to make flowers instead of leaves, under various environmental conditions.

Now, a study by a team of researchers from the National University of Singapore (NUS) has discovered how this happens. The team, led by Associate Professor Yu Hao from the Department of Biological Sciences at the NUS Faculty of Science, has identified a protein that is essential for flowering under normal light conditions. The team's findings are published April 17 in the online, open-access journal [PLoS Biology](#).

To identify the element that triggers the process of flowering in plants, Prof Yu and his colleagues undertook a study that spanned around five years, in which they scanned for proteins in plants using a process called yeast two-hybrid screening. After scanning around 3 million samples, the researchers identified a molecule they dubbed FT-INTERACTING PROTEIN 1 (FTIP1).

The researchers found that plants with mutant, non-functional versions of the FTIP1 gene flowered much later under normal light conditions

(around 16 hours of light per day). When such mutants were given a working version of this gene, their [flowering time](#) was restored largely back to normal.

These findings suggest that FTIP1 is key to how flowering is controlled by light and imply that FTIP1, and genes similar to it, could be used as [molecular markers](#) for both classical [plant breeding](#) and for targeted [genetic modification](#) for desirable flowering traits, with the aim of increasing [crop yields](#) in changing environments.

Further studies from Prof Yu and his team hint that a group of FTIP1-like proteins are involved in a wide range of plant developmental processes. They are now working to uncover the other factors that are critical in controlling flowering and other key developmental processes in plants.

More information: Liu L, Liu C, Hou X, Xi W, Shen L, et al. (2012) FTIP1 Is an Essential Regulator Required for Florigen Transport. PLoS Biol 10(4): e1001313. [doi:10.1371/journal.pbio.1001313](https://doi.org/10.1371/journal.pbio.1001313)

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