

# How plants see light

January 19 2018

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Thale cress plant. Credit: Thomas Kunz

Plants react sensitively to changes in their surroundings and possess the ability to adapt to them. They use the photoreceptor protein phytochrome B to see light and then regulate processes such as seed germination, seedling development, longitudinal growth and flower formation. A team led by Prof. Dr. Andreas Hiltbrunner from the Institute of Biology II at the University of Freiburg has recently conducted a study that shows that both proteins PCH1 and PCHL influence this receptors' photosensitivity. The researchers recently published their findings in the journal *Nature Communications*.

Phytochrome B measures the light spectrum, which varies depending on the surroundings. The [protein](#) works like a kind of switch: the bright red light of sunlight activates phytochrome B, while it is inactivated by far-red light which is abundant in canopy shade. However, it can also switch from the active form to the inactive ground state independently of light. You would call this process dark reversion. It influences the amount of protein available in the active state, thereby affecting the plant's [light](#) perception.

In their study, the scientists determined that there are two proteins in the thale cress plant, PCH1 and PCHL, which bind to phytochrome B and influence the activity of the receptor. Using a special method of spectroscopy, the researchers showed that the dark reversion of phytochrome B is almost completely suppressed when the amount of PCH1 or PCHL is increased, while the process is accelerated when PCH1 and PCHL are missing. By allowing the plants to regulate the change from the active to the inactive state, they can adapt the

photosensitivity of the [phytochrome](#) B photoreceptor to different conditions.

**More information:** Beatrix Enderle et al. PCH1 and PCHL promote photomorphogenesis in plants by controlling phytochrome B dark reversion, *Nature Communications* (2017). [DOI: 10.1038/s41467-017-02311-8](#)

Provided by Albert Ludwigs University of Freiburg

Citation: How plants see light (2018, January 19) retrieved 27 April 2024 from <https://phys.org/news/2018-01-how-plants-see-light.html>

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