

Artificial Photons

Plants are capable of making their own food through a process called photosynthesis. The process occurs in a specialised cell structure called chloroplast. Inside the chloroplast there is a plant pigment called chlorophyll that absorbs light. People often associate photosynthesis with direct sunlight, but the truth is, artificial lights can also induce photosynthesis. Artificial lights from light emitting diodes (LEDs) carry an array of light intensities and colours that are appropriate for growing plants. This application can be even more profitable when plants are grown in a controlled environment. The different light intensities and colours of LEDs such as white, red, and blue provide different energy wavelengths that can be harvested by plant photosynthetic machinery. Hence, each colour can directly influence photosynthesis and give a different response to plant growth and development. The white LED that mimics natural light can provide plants with a combination of all light spectrums. In contrast, the red LED and blue LED are monochromatic, meaning that they both consist of only one single light spectrum. The LED is energy saving and has a cool-emitting surface compared to fluorescent lamps. These benefits allow researchers to grow plants in jars containing appropriate nutrients and in a sterile medium. This technique is known as plant tissue culture that can generate hundreds to thousands of identical plants for a sustainable future.

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