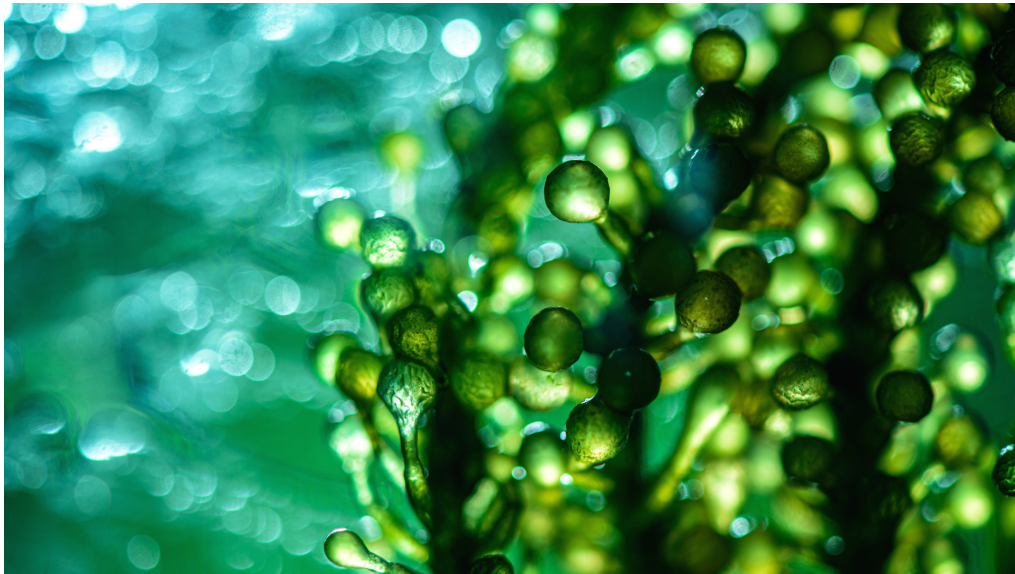


Electronics

Breakthrough technology promotes artificial photosynthesis

taylorbutterfield • 15 hours ago



Researchers at Nanyang Technological University in Singapore have developed a technology that promotes artificial photosynthesis. This allows you to generate more energy.

The algae that cover the surface of ponds and oceans are rich in variety and may open up the possibility of increasing the effectiveness of artificial photosynthesis and promoting the production of more energy and less waste.

New research done by [Nanyang Technological University](#) Researchers have shown that coating droplets with algae proteins can significantly improve the light harvesting and energy conversion properties of algae by up to a factor of three. This energy is generated when algae perform photosynthesis. Photosynthesis is the process used by plants, algae, and certain bacteria to use the energy from sunlight to convert it into chemical energy.

Power generation by artificial photosynthesis

By simulating how plants convert sunlight into energy, artificial photosynthesis has the potential to become an environmentally friendly method of producing electricity that is independent of non-renewable fossil fuels and natural gas. Due to the low conversion rate of natural energy from sunlight to electricity, it may be possible to commercialize artificial photosynthesis by increasing the total amount of electricity generated.

The study, led by Assistant Professor Chen Yu-Cheng of the Department of Electrical and Electronic Engineering, studied certain types of proteins in red algae. Known as phycobiliproteins, these proteins play a role in absorbing light in the intracellular algae and initiating photosynthesis.

Phycobiliproteins collect light energy from the entire spectral range of the wavelength of light, such as those that are difficult for chlorophyll to absorb, and convert it into electricity.

Assistant Professor Chen explains: "Phycobiliproteins have potential applications in biotechnology and solid-state devices due to their unique luminescent and photosynthetic properties. The artificial photosynthetic harvesting complexes uses light energy to generate electricity. Our efforts to develop organic devices for power generation are ongoing."

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Sustainable energy from sunlight

This group's research could lead to new ecological methods of producing electricity from sunlight that are independent of non-renewable fossil fuels and natural gas. New bio-inspired technologies based on phycobiliproteins can be used to create more effective solar cells and pave the way for more efficient artificial photosynthesis.

Adopting algae as a bioenergy source is a popular source of sustainability and renewable energy, as the use of algae can reduce the number of toxic by-products generated in the production of solar panels. The topic.

Researchers' findings have been published in the journal *ACS Applied Materials Interfaces*..

Artificial photosynthesis aims to recreate the natural biological process by which plants convert sunlight into chemical energy. The goal is to determine how to make energy renewable, reliable, and storable in a destructive way without impacting the environment.

Make bioenergy more efficient

One of the difficulties of artificial photosynthesis is that it produces energy as effectively as other solar energy sources such as solar panels. On average, solar panel efficiency is 15-20%, while artificial photosynthesis efficiency is currently estimated at 4.5%.

Chen added: "Artificial photosynthesis is not very efficient. **Solar cell** With power generation. However, it is more renewable and sustainable. Extracting energy from algae light-harvesting proteins has attracted a great deal of interest in the field of bioenergy due to the growing interest in environmentally friendly and renewable technologies. "

He predicts one possible use of "algae farms" where densely growing algae in water bodies eventually fuse with large liquid crystal droplets to produce floating generators.

"The microdroplets used in our droplets, which can be applied to generate energy. Algae play although some may think that their growth is unsightly. Our findings show

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that what can be considered "biopower" is biopower. It shows that there is a way to convert it to, "Chen concludes.

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