

Breakthrough in bio-solar energy

A bio-solar breakthrough to produce cheap and efficient energy by tapping the plant's photosynthetic process has been achieved, claim scientists. Barry D. Bruce, professor of biochemistry at the University of Tennessee, worked with researchers from MIT and Ecole Polytechnique Federale, Switzerland to develop a process to improve the efficiency of generating electric power using molecular structures from plants.

To produce the energy, the scientists harnessed the power of a key component of photosynthesis known as photosystem-I (PSI) from blue-green algae. This complex was then bioengineered to specifically interact with a semi-conductor so that, when illuminated, the process of photosynthesis produced electricity.

“This system is a preferred method of sustainable energy because it is clean and it is potentially very efficient,” said Bruce, named one of “Ten Revolutionaries that May Change the World” by Forbes magazine in 2007 for his early work, which first demonstrated biosolar electricity generation.

“As opposed to conventional photovoltaic solar power systems, we are using renewable biological materials rather than toxic chemicals to generate energy,” said Bruce, reported the journal Nature: Scientific Reports, citing a Tennessee varsity statement. “Likewise, our system will require less time, land, water and input of fossil fuels to produce energy than most biofuels,” he added.

Because of the engineered properties, the system self-assembles and is much easier to re-create than Bruce's earlier work. In fact, the approach is simple enough that it can be replicated in most labs-allowing others around the world to work toward further optimization. “Because the system is so cheap and simple, my hope is that this system will develop with additional improvements to lead to a green, sustainable energy source,” said Bruce (India Current Affairs 4-2-12).