

Plant power: The ultimate way to 'go green'?

February 2 2012

Researchers are turning to plants and solar power in the search for new sources of renewable and sustainable energy that can support the transition from rapidly depleting fossil fuels to a bio-based society. An article published by Cell Press in the February 8th issue of *Trends in Plant Science* discusses innovative strategies for harnessing and rerouting the chemical reactions associated with photosynthesis to efficiently produce highly valuable products.

Photosynthesis is a <u>biological process</u> that uses <u>energy from the sun</u> to produce biomass that may be used as "food", such as sugars, or that can be further processed into bio-fuels. Plants, algae and some bacteria rely on <u>photosynthesis</u> to convert sunlight into <u>chemical energy</u>, and scientists are looking for ways to tap into this natural power source.

"Plants are known to produce more than 200,000 often structurally complex bioactive natural products," explains study author, Dr. Birger Lindberg Møller, from the University of Copenhagen. "Many are valuable to humans, for example as pharmaceuticals, but are present in very low amounts or are quite difficult to isolate."

In their review, Dr. Møller and colleagues discuss approaches for utilizing and optimizing the overall solar light conversion efficiency by tapping directly into the notoriously efficient photosynthetic reactions and modifying the standard carbon flux towards formation of new end products. They describe novel strategies to facilitate light-driven synthesis of useful, high-value chemicals and biofuels.



"Sunlight is the most abundant renewable energy source on Earth," says Dr. Møller. "Synthetic biology approaches, in which known photosynthetic pathways are combined, reassembled and configured into new biosynthetic systems that evolution did not provide, constitute exciting means to develop new environmentally benign production systems to meet some of the global challenges we are facing on our planet."

The PhD student Kenneth Jensen who did most of the experimental work has now moved to the Danish biotech company Novozymes, a company which is market leading with respect to enzymes for biofuel production.

More information: Light-driven chemical synthesis, *Trends in Plant Science*, in press.

Provided by Cell Press

Citation: Plant power: The ultimate way to 'go green'? (2012, February 2) retrieved 3 May 2024 from <u>https://phys.org/news/2012-02-power-ultimate-green.html</u>

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