

Stealing nature's photosynthetic secrets

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Credit: Bhaskar Pyakurel <http://bit.ly/RLovML>

(Phys.org)—The prospect of creating clean, renewable hydrogen fuel is closer than ever after a breakthrough in our understanding of photosynthesis.

Professors Rob Stranger and Ron Pace from the Research School of Chemistry in the ANU College of Physical and Mathematical Sciences used computer modelling to reveal the molecular structure of the photosynthesis reaction site in plants. This is where sunlight is used to convert water into its components – hydrogen and oxygen.

For the first time, they have identified the specific [water molecules](#) in a plant's photosystem that are converted into oxygen.

Their results, published in [Angewandte Chemie](#), are important for the

insight they offer into how we could develop an alternative fuel source from water by mimicking the natural photosynthetic process.

"The part of the plant's photosystem that is important to this process is called the oxygen-evolving-complex (OEC)," said Professor Stranger.

"If we can steal nature's secrets and understand how the OEC performs its chemistry, then we can learn to make hydrogen much more efficiently. And hydrogen is the fuel for a totally [renewable fuel](#) future."

Professor Pace said that while scientists know the OEC contains four [manganese atoms](#) and a calcium atom, they have been trying for decades to determine the exact structure of the system and how it works.

"Our work confirms the OEC structure and means researchers can progress new fuel developments based on photosynthesis."

Provided by Australian National University

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