

Scientists shed further new light on biomass breakdown

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Scientists at the University of York are part of a research team which has found that a recently discovered family of enzymes can degrade resistant forms of starch.

Earlier research established that the enzymes – lytic polysaccharide monooxygenases (LPMOs) – are able to degrade hard-to-digest biomass into its constituent sugars.

But the enzymes—which are secreted by both fungi and bacteria – have now also been shown to have the ability to 'chip away' at other intractable materials such as resistant forms of starch.

Starch is a polysaccharide that is highly prevalent in both food and plants. Determining the way it is broken down by an LPMO now offers potential for utilising this starch in new ways, potentially including the production of biofuels.

An international team of researchers, led by Professor Paul Walton and Professor Gideon Davies of the Department of Chemistry at York, carried out the research which is published in *Nature Communications*.

The team – which also included scientists from France (CNRS Marseille), Denmark (University of Copenhagen) and the UK (University of Cambridge) – undertook a detailed investigation of a new class of LPMO enzymes use oxygen from the air to initiate a highly reactive oxidation process that allows a resistant form of starch to be

broken down. The researchers used a range of analytical techniques to investigate the characteristics of the enzymes.

The continuing York research into LPMOs, which is led by Professor Walton and Professor Davies, is part of Critical Enzymes for Sustainable Biofuels from Cellulose (CESBIC), a collaborative project funded by the European Research Area Industrial Biotechnology network (ERA-IB). Professor Walton said:

"The ability of this class of enzymes to degrade a normally resistant form of starch offers the potential to valorize this important material. Discovering the characteristics of these enzymes will help to extend the use of starch."

Provided by University of York

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