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Metabolic engineering for improved hydroxy fatty acid production in *Lesquerella*

Hydroxy fatty acids (HFA) from plant seed triacylglycerols (TAGs, oil molecule) are widely used in manufacturing industrial products, such as lubricants, plasticizers and surfactants. Castor oil has 90% HFA which occupies all three sn positions of most TAGs, while *Lesquerella* oil contains 60% HFA mostly located at sn-1 and sn-3 of TAGs. In order to improve HFA levels in *Lesquerella* seeds, castor lysophosphatidic acid acyltransferase 2 genes (*RcLPAT2*) capable of acylating HFA to the sn-2 position of TAGs was introduced into *Lesquerella* under the control of the seed specific napin promoter from *Brassica napus*. Analysis of transgenic *Lesquerella* seed TAGs showed that *RcLPAT2* was able to incorporate HFA to the sn-2 position of TAG and consequently, oil accumulated more of TAGs with all three sn positions occupied by HFA. The results enhanced our understanding of plant lipid metabolism and provided invaluable guidance for future research not only for enhancing HFA content in *Lesquerella*, but also for HFA production in other oilseed crops.

Biography

Grace Chen completed her PhD from University of Wisconsin at Madison, and her Post-doctoral studies from University of California-Plant Gene Expression Center. She has published more than 44 papers in reputed journals and is globally recognized as an expert on Oilseed Biotechnology.

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