



Short Communication

Plasmid construction for genetic modification of dicotyledonous plants with a glycolate oxidizing pathway

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ABSTRACT. There are many kinds of dicotyledonous C_3 plants, which often release CO_2 fixed by photosynthesis and consume energy in photorespiration. In *Escherichia coli*, glycolate can be metabolized by an oxidation pathway that has some of the same compounds as dicotyledonous photorespiration. With the bacterial glycolate metabolism pathway, photorespiration of dicotyledonous plants is genetically modified for less CO_2 release and more biomass. In this study, two plasmids involved in this modification were constructed for targeting two enzymes of the glycolate oxidizing pathway, glyoxylate carboxylase and tartronic semialdehyde reductase, and glycolate dehydrogenase in *Arabidopsis thaliana* mitochondria in this pathway. All three enzymes are located in chloroplast by transit peptide derived from *Pisum sativum* small unit of Rubisco. So far, some crops have been transformed by the two plasmids. Through transformation of the two plasmids, photosynthesis of dicotyledonous plants may be promoted more easily and release less CO_2 into the atmosphere.

Key words: Plasmid construction; Dicotyledonous plants; Genetic modification; Glycolate oxidizing pathway