

EXPRESSING MULTIPLE GENES FROM A SINGLE TRANSCRIPT IN ALGAE AND PLANTS

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PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	12,590,314	03/31/2026	2020-168

BRIEF DESCRIPTION

Green algae have been promoted as vehicles for the production of biofuels, pharmaceuticals, food additives, vaccines, and for toxic substance remediation, and many plants are the focus of efforts to produce drought tolerant, pest resistant, or more nutritious crops. Many of these engineering efforts rely on expression of multiple transgenes (e.g. in a multistep metabolic pathway to avoid accumulation of a toxic intermediate). It can also be useful to produce two or more proteins in a particular stoichiometry, as in a heterodimer that requires equimolar production of two polypeptides. Whether the goal is to express one transgene, or several, most efforts to transform plants and algae require cotransformation of the gene of interest with a selectable marker, such as a gene that confers resistance to a drug or herbicide, or complements an auxotrophy. Unfortunately, commonly used methods for co-transformation of algae and other plants are very inefficient.

UC Berkeley investigators have developed a method for polycistronic gene expression, and show how to achieve this using the organism's own sequences, without recourse to viral elements or other foreign elements, which is important for any technology where bioproducts are generated, since these may be used on humans (cosmetics) or in humans (food additives), especially crop technology.

SUGGESTED USES

- 1) Increasing the number of transformants that express the gene of interest.
- 2) Maintaining expression of the gene of interest.
- 3) Increasing expression of the gene of interest.
- 4) Expression of a multimer, such as heterotrimer or heterodimer, particularly wherein the subunits are advantageously expressed in predetermined stoichiometry, such as 2:1 or 1:1 or 1:1:2, etc..
- 5) Expression of two or more proteins that catalyze different steps in a metabolic pathway.

RELATED MATERIALS

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OTHER INFORMATION

CATEGORIZED AS

» **Agriculture & Animal Science**

» Other

» **Biotechnology**

» Genomics

» Other

RELATED CASES

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