Facile assembly and fluorescence-based screening method for heterologous expression of biosynthetic pathways in fungi.

Hoefgen S, Lin J, Fricke J, Stroe MC, Mattern DJ, Kufs JE, Hortschansky P, Brakhage AA, Hoffmeister D, Valiante V (2018) Facile assembly and fluorescence-based screening method for heterologous expression of biosynthetic pathways in fungi. *Metab Eng* 48, 44-51.

Details

PubMed OPEN ACCESS

Abstract

Heterologous expression of multi-gene biosynthetic pathways in eukaryotic hosts is limited by highly regulated individual monocistrons. Dissimilar to prokaryotes, each eukaryotic gene is strictly controlled by its own regulatory elements, such as promoter and terminator. Consequently, parallel transcription can occur only when a group of genes is synchronously activated. A strategy to circumvent this limitation is the concerted expression of multiple genes as a polycistron. By exploiting the "stop-carry on" mechanism of picornaviruses, we have designed a sophisticated, yet easy-to-assemble vector system to heterologously express multiple genes under the control of a single promoter. For facile selection of correctly transformed colonies by basic fluorescence microscopy, our vector includes a split gene for a fluorescent reporter protein. This method was successfully applied to produce the psychotropic mushroom alkaloid psilocybin in high yields by

heterologous expression of the entire biosynthetic gene cluster in the mould *Aspergillus nidulans*.

Involved units

Molecular and Applied Microbiology Axel Brakhage Read more

Pharmaceutical Microbiology Dirk Hoffmeister Read more

Biobricks of Microbial Natural Product Syntheses Vito Valiante Read more

Leibniz-HKI-Authors



Axel A. Brakhage

Details



Janis Fricke

Details



Dirk Hoffmeister

Details



Sandra Höfgen

Details



Peter Hortschansky

Details



Johann Kufs

Details



Jun Lin

Details



Derek J. Mattern

Details



Maria Stroe

Details



Vito Valiante

Details

Identifier

doi: 10.1016/j.ymben.2018.05.014

PMID: 29842926