

Biosafety Clearing-House (BCH)

LIVING MODIFIED ORGANISM (LMO)


BCH-LMO-SCBD-115777-1

[? Decisions on the LMO ? Risk Assessments](#)

LAST UPDATED: 23 NOV 2020

Living Modified Organism identity


The image below identifies the LMO through its unique identifier, trade name and a link to this page of the BCH. Click on it to download a larger image on your computer. For help on how to use it go to the LMO quick-links page.



FLO-40620-9
Moonburst™ carnation

CBD

<https://bch.cbd.int/database/record?documentID=115777>



Read barcode or type above URL into internet browser to access information on this LMO in the Biosafety Clearing-House © SCBD 2012

Name

Moonburst™ carnation

EN

Transformation event

406191

Unique identifier

FLO-40620-9

Developer(s)

- **PERSON:** STEPHEN CHANDLER | [BCH-CON-SCBD-4953-5](#)

PERSON

Stephen Chandler

Cosultant

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RELATED ORGANIZATION

Description

The modified carnation (*Dianthus caryophyllus*) was vegetatively propagated from the parental variety Moonshade™ and differs from the parent in having a flecked, bi-colour

EN

flower colour pattern. The carnation contains *Petunia hybrida* flavonoid 3'5' hydroxylase and dihydroflavonol-4 reductase, which together promote biosynthesis of delphinidin and anthocyanin pigments. The accumulation of pigments results in lavender-coloured flowers. The modified carnation additionally contains *Nicotiana tabacum* acetolactate synthase for chlorsulfuron selection during tissue culturing.

Recipient Organism or Parental Organisms

The term “Recipient organism” refers to an organism (either already modified or non-modified) that was subjected to genetic modification, whereas “Parental organisms” refers to those that were involved in cross breeding or cell fusion.

[BCH-ORGA-SCBD-4954-7](#) ORGANISM | DIANTHUS CARYOPHYLLUS (CARNATION, DIACA) |

Crops

[BCH-LMO-SCBD-14828-9](#) LIVING MODIFIED ORGANISM | FLO-40619-8 - MOONSHADE™ CARNATION |

Stephen Chandler Changes in quality and/or metabolite content - Pigmentation / Coloration Resistance to herbicides - Chlorsulfuron, Sulfonylurea Selectable marker genes and reporter genes

Point of collection or acquisition of the recipient organism or parental organisms

Moonburst™ carnation is a clone of the FLORIGENE Moonshade™ carnation.

The parental Moonshade carnation was sourced from the "UNESCO White" variety (cultivar FE 123), which contains a mutation in DFR and results in a non-functional enzyme (resulting in white flowers).

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Related LMO(s)

[BCH-LMO-SCBD-115776-1](#) | FLO-40686-3 - Moonstrike™ carnation | Stephen Chandler Changes in quality and/or metabolite content - Pigmentation / Coloration Resistance to herbicides - Chlorsulfuron, Sulfonylurea

[Show detection method\(s\)](#)

Characteristics of the modification process

Vector

pCGP1470

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Techniques used for the modification

Agrobacterium-mediated DNA transfer

Genetic elements construct

P-35S-CaMV 0.190 kb	L-cab-PETHY 0.060 kb	CS-SuRB-TOBAC 3.761 kb	T-SuRB-TOBAC 0.000 kb
P-CHS 1.157 kb	CS-F35H-PETHY 1.520 kb	T-D8 0.818 kb	
P-mac-1 1.225 kb	CS-DFR-PETHY 1.142 kb	T-mas 0.717 kb	

Introduced or modified genetic element(s)

Some of these genetic elements may be present as fragments or truncated forms. Please see notes below, where applicable.

BCH-GENE-SCBD-100287-7 CAMV 35S PROMOTER |

Promoter

BCH-GENE-SCBD-101901-3 5' UNTRANSLATED LEADER OF CHLOROPHYLL A/B-BINDING PROTEIN | (PETUNIA) |

Leader

BCH-GENE-SCBD-15177-7 ACETOHYDROXY ACID SYNTHASE GENE | (TOBACCO PLANT) |

Protein coding sequence | Resistance to herbicides (Chlorsulfuron, Sulfonylurea)

BCH-GENE-SCBD-100390-7 ACETOHYDROXY ACID SYNTHASE GENE TERMINATOR | (TOBACCO PLANT) |

Terminator

BCH-GENE-SCBD-103771-1 CHALCONE SYNTHASE GENE PROMOTER | (COMMON SNAPDRAGON, SNAPDRAGON) |

Promoter

BCH-GENE-SCBD-15010-3 FLAVONOID 3', 5' HYDROXYLASE GENE | (PETUNIA) |

Protein coding sequence | Changes in quality and/or metabolite content (Pigmentation / Coloration)

BCH-GENE-SCBD-103772-2 D8 GENE TERMINATOR | (PETUNIA) |

Terminator

BCH-GENE-SCBD-103773-1 MAC-1 PROMOTER |

Promoter

BCH-GENE-SCBD-15009-4 DIHYDROFLAVONOL-4-REDUCTASE | (PETUNIA) |

Protein coding sequence | Changes in quality and/or metabolite content (Pigmentation / Coloration)

BCH-GENE-SCBD-103774-1 MANNOPINE SYNTHASE GENE TERMINATOR |

Terminator

Notes regarding the genetic elements present in this LMO

Gene expression

The T-DNA insertion contained three gene cassettes: *Nicotiana tabacum* acetolactate synthase (ALS; acetohydroxy acid synthase), *Petunia hybrida* flavonoid 3', 5' hydroxylase (F3'5'H) and *P. hybrida* dihydroflavonol-4-reductase (DFR).

Transcription of ALS is under control of the *Cauliflower mosaic virus* (CaMV) 35S promoter and the ALS terminator. A 5' untranslated leader from *P. hybrida* chlorophyll a/b-binding protein is also transcribed, but is not expected to be translated. The leader sequence augments the level of transcription (enhances the expression) of ALS.

Transcription of F3'5'H is under control of the *Antirrhinum majus* chalcone synthase gene promoter and the *P. hybrida* D8 terminator.

Transcription of DFR is under control of the synthetic Mac-1 promoter and the *Agrobacterium tumefaciens* mannopine synthase gene terminator.

Note:

- The genetic element size of the ALS coding sequence includes the size of the terminator

EN

(3.76 kb = size of coding sequence + terminator)

- The Mac-1 promoter is a synthetic promoter compromised of *A. tumefaciens mas* promoter and CaMV enhancer sequences.

For more information, kindly refer to the parental record.

LMO characteristics

Modified traits

Resistance to herbicides

Chlorsulfuron

Sulfonylurea

Changes in quality and/or metabolite content

Pigmentation / Coloration

Common use(s) of the LMO

Ornamental

Additional Information

Other relevant website addresses and/or attached documents

? [FLORIGENE® Moonburst™](#) (English)

? [Pigment biosynthesis in flowers.docx](#) (English)

? [Flower colour and cytochromes P450.pdf](#) (English)

? [EUginus - FLO-40619-8 \(parental variety\)](#) (English)

[BCH-LMO-SCBD-115777-1](#)

Further Information

Questions about the Cartagena Protocol on Biosafety or the operation of the Biosafety Clearing-House may be directed to the Secretariat of the Convention on Biological Diversity.

Secretariat of the Convention on Biological Diversity

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