





Biosafety Clearing-House (BCH)

LIVING MODIFIED ORGANISM (LMO)

BCH-LMO-SCBD-259218-1

? Decisions on the LMO ? Risk Assessments

LAST UPDATED: 11 FEB 2022

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. https://bch.cbd.int/database/record?documentID=259218 IND-1ØØ15-7 Chymosin-producing safflower Read barcode or type above URL into internet browser to access information on this LMO in the Biosafety Cleaning-House @ SCBD 2012

Name

Chymosin-producing safflower

Transformation event

IND-10015-7

Unique identifier

IND-1ØØ15-7

Developer(s)

- ORGANIZATION: INDEAR S.A. | BCH-CON-AR-243704-1

ORGANIZATION

INDEAR S.A. Rosario Argentina Phone: (+54) 0341-486 1100 Email: info@indear.com

Description

The safflower (*Carthamus tinctorius L.*) was modified for the production of *Bos taurus* chymosin in seed tissues. The enzyme is used in the production of cheese products to coagulate (clot) milk. In addition to the production of the enzyme, the safflower expresses *Streptomyces viridochromogenes* phosphinothricin N-acetyaltransferase for glufosinate selection during transformation.

ΕN

Recipient Organism or Parental Organisms



ΕN

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-112725-1 ORGANISM | CARTHAMUS TINCTORIUS (SAFFLOWER, CARTI)

Crops

Related LMO(s)

BCH-LMO-SCBD-259217-1 IND-1ØØØ3-4 - Chymosin-producing safflower | INDEAR S.A. | Resistance to herbicides (Glufosinate), Selectable marker genes and reporter genes, Use in industrial applications

Characteristics of the modification process

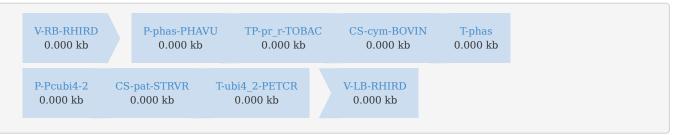
Vector

pSBS2165

Techniques used for the modification

Agrobacterium-mediated DNA transfer

Genetic elements construct



EN

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-101416-6 TI PLASMID RIGHT BORDER REPEAT

Plasmid vector

BCH-GENE-SCBD-259197-1 PHASEOLIN PROMOTER | PHASEOLUS VULGARIS (STRING BEAN, FRENCH BEAN, KIDNEY BEAN, COMMON BEAN , PHAVU)

Promoter

BCH-GENE-SCBD-259199-1 PATHOGENESIS-RELATED PROTEIN R TRANSIT PEPTIDE | NICOTIANA

TABACUM (TOBACCO, TOBAC)

Transit signal

BCH-GENE-SCBD-259200-1 CHYMOSIN | BOS TAURUS - COW, CATTLE, BULL, AUROCH, OXEN,

BULLOCKS

Protein coding sequence | Use in industrial applications

BCH-GENE-SCBD-259201-1 UBIQUITIN TERMINATOR | PETROSELINUM CRISPUM - PARSLEY

Terminator

BCH-GENE-SCBD-115654-2 UBIQUITIN 4-2 PROMOTER - PETROSELINUM CRISPUM - PARSLEY BCH-GENE-SCBD-15002-4 PHOSPHINOTHRICIN N-ACETYLTRANSFERASE GENE Protein coding sequence | Resistance to herbicides (Glufosinate)

BCH-GENE-SCBD-101415-9 TI PLASMID LEFT BORDER REPEAT

Plasmid vector

BCH-GENE-SCBD-104364-1 PHASEOLIN 3' TERMINATOR | (STRING BEAN, FRENCH BEAN, KIDNEY BEAN, COMMON BEAN)

Terminator

Notes regarding the genetic elements present in this LMO

The modified safflower contains two gene cassettes: *Bos taurus* chymosin (*cym*) and *Streptomyces viridochromogenes* phosphinothricin N-acetyltransferase (*pat*).

The *cym* coding sequence is under control of the *Phaseolus vulgaris* phaseolin promoter and terminator. The coding sequence additionally contains a pathogenesis-related protein R transit peptide, which will direct the CYM protein to the apoplast of seed tissues. Expression of the *cym* coding sequence is expected to be restricted to seed tissues.

The *pat* coding sequence is under control of the *Petroselinum crispum* ubiquitin promoter and terminator. Due to the constitutive nature of the promoter, high levels are transcription are expected.

EN

Note:

- Southern blot indicated that the genome contain a single T-DNA insertion.
- Sequencing and PCR analyses indicated that the sequences are intact and without rearrangements.
- Sequencing analysis additionally indicated that no vector backbone sequences were integrated into the safflower genome.

LMO characteristics

Modified traits

Resistance to herbicides Glufosinate Use in industrial applications Enzyme production Selectable marker genes and reporter genes

Common use(s) of the LMO

Pharmaceutical

Additional Information

Other relevant website addresses and/or attached documents

? EUginius - IND-10015-7 safflower (English)

PDD exp 38916_16 Cártamo firmado 27 04 17.pdf (English)

? CA2381438C - Commercial production of chymosin in plants.pdf (*English*)

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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 413 rue Saint-Jacques, suite 800 Montreal, Québec, H2Y 1N9 Canada Fax: +1 514 288-6588 Email: secretariat@cbd.int