

Biosafety Clearing-House (BCH)

LIVING MODIFIED ORGANISM (LMO)

BCH-LMO-SCBD-111078-1 EN DE

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

LAST UPDATED: 20 OCT 2016

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.



CBD

<https://bch.cbd.int/database/record?documentID=111078>

Potato modified for altered phytochrome B expression



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

Name

Potato modified for altered phytochrome B expression

EN

Transformation event

DARA5 and DARA12

Developer(s)

- **PERSON:** TU MÜNCHEN | [BCH-CON-SCBD-103100-2](#)

PERSON

TU München

Lehrstuhl für Pflanzenzüchtung, Wissenschaftszentrum Weihenstephan für Ernährung,
Landnutzung und Umwelt, Technische Universität München

Alte Akademie 8

Freising, Bayern

85354, Germany

Phone: +49 8161 71 -3422, +49 8161 71 -3258

Fax: +49 8161 71-3900

Email: chris.schoen@wzw.tum.de, bork@wzw.tum.de, manuela.hochschulte@wzw.tum.de

Website: <http://www.wzw.tum.de/plantbreeding/index.php?id=startseite&L=0>,
<http://www.wzw.tum.de>

RELATED ORGANIZATION

Description

Potato plants are modified to constitutively express the phytochrome B gene from *Arabidopsis*

EN

thaliana which codes for a regulatory photoreceptor which exists in two forms that are reversibly interconvertible by light: the Pr form that absorbs maximally in the red region of the spectrum and the Pfr form that absorbs maximally in the far-red region. Photoconversion of Pr to Pfr induces an array of morphogenetic responses, whereas reconversion of Pfr to Pr cancels the induction of those responses.

As a result of the genetic modification, the anthocyanin and chlorophyll synthesis is enhanced and the photosynthesis rate is increased in the transgenic plants. Furthermore, a number of morphological and physiological changes take place, such as reduced apical dominance, shorter internodes, dwarfism, delayed senescence, thicker stems, starch deposits and increased specific weight in the stems and leaves, smaller leaves, elongation of the palisade parenchyma cells, enhanced root formation, increased number of tubers and increased tuber yield.

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-12106-6](#) ORGANISM | SOLANUM TUBEROSUM (POTATO, SOLTU) |
Crops

Characteristics of the modification process

Vector

pMAB316::pTiB6S3-SE EN

Techniques used for the modification

Agrobacterium-mediated DNA transfer

Genetic elements construct

P-35S-CaMV 0.000 kb	CS-phyB-ARATH 0.000 kb	T-nos-RHIRD 0.000 kb
P-nos-RHIRD 0.000 kb	CS-nptII-ECOLX 0.000 kb	T-nos-RHIRD 0.000 kb
P-nos-RHIRD 0.000 kb	CS-nos 0.000 kb	T-nos-RHIRD 0.000 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-111073-1](#) PHYTOCHROME B GENE | (THALE CRESS) |
Protein coding sequence | Changes in physiology and/or production (Growth rate, Photoperiod response,

Yield), Changes in quality and/or metabolite content (Flavonoids (e.g. anthocyanin), Pigmentation / Coloration)

[BCH-GENE-SCBD-100269-8](#) NOPALINE SYNTHASE GENE TERMINATOR |

Terminator

[BCH-GENE-SCBD-100270-6](#) NOPALINE SYNTHASE GENE PROMOTER |

Promoter

[BCH-GENE-SCBD-15001-5](#) NEOMYCIN PHOSPHOTRANSFERASE II | (BACTERIA) |

Protein coding sequence | Resistance to antibiotics (Kanamycin)

[BCH-GENE-SCBD-15171-5](#) NOPALINE SYNTHASE GENE |

Protein coding sequence | Selectable marker genes and reporter genes

[BCH-GENE-SCBD-15033-8](#) 3''(9)-O-AMINOGLYCOSIDE ADENYLTRANSFERASE | (BACTERIA) |

Protein coding sequence | Resistance to antibiotics (Streptomycin)

LMO characteristics

Modified traits

Resistance to antibiotics

Kanamycin

Streptomycin

Changes in physiology and/or production

Growth rate

Photoperiod response

Yield

Changes in quality and/or metabolite content

Flavonoids (e.g. anthocyanin)

Pigmentation / Coloration

Common use(s) of the LMO

Research

Additional Information

Additional Information

As a major transcription regulator in plants, phytochrome B (PhyB) affects the transcription of a variety of genes. Therefore, while not directly affected by the transformation, the regulation of genes involved in a variety of different physiological and morphological characteristics and metabolic pathways is altered by the elevated PhyB levels in the transgenic plants, such as the phytohormone balance, circadian regulation, regulation of flowering and seed germination, photosynthesis, phototropism and gravitropism, defense responses, the response to cold and the response to visible red and blue light.

Other relevant website addresses and/or attached documents

? [UniProtKB - PhyB - P14713 \(PHYB_ARATH\)](#) (*English*)

? [UniProtKB - PhyB - P14713 \(PHYB_ARATH\)](#) (*German*)

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