

Biosafety Clearing-House (BCH)

LIVING MODIFIED ORGANISM (LMO)

BCH-LMO-SCBD-111616-1 EN DE

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

LAST UPDATED: 07 FEB 2017

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.



Potato modified for increased tuber weight

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

<https://bch.cbd.int/database/record?documentID=111616>



Name

Potato modified for increased tuber weight

EN

Transformation event

35S-alphaUMPS 21, 35S-alphaUMPS 26, 35S-alphaUMPS 29, 35S-alphaUMPS 73

Developer(s)

- **ORGANIZATION:** MAX PLANCK INSTITUTE OF MOLECULAR PLANT PHYSIOLOGY | [BCH-CON-DE-49374-2](#)

ORGANIZATION

Max Planck Institute of Molecular Plant Physiology
Max-Planck-Institut für Molekulare Pflanzenphysiologie
Am Mühlenberg 1
Potsdam
14476 , Germany
Phone: +49 331 567 - 80
Fax: +49 331 567 - 84 08
Email: contact@mpimp-golm.mpg.de
Website: <http://www-de.mpimp-golm.mpg.de/>

Description

The genetically modified potatoes were transformed to constitutively express the cDNA coding of uridine monophosphate synthase (UMPS) from *Solanum tuberosum* in an antisense orientation. This results in the downregulation of endogenous UMPS which is expected to lead to a reduction in the de novo synthesis of uridine monophosphate (UMP).

EN

The resulting altered UMP ratio indirectly influences starch biosynthesis. In wild-type plants, a portion of the cellular glucose-1-phosphate is not used for starch biosynthesis but is converted to sucrose with the help of UDP-glucose-pyrophosphorylase (UGPase) and sucrose synthase. UGPase needs UTP for the synthesis of UDP-glucose. The reduced de novo synthesis of UMP would, by extension, lead to a reduced UTP content and therefore prevent the reconversion of glucose-1-phosphate to sucrose. More glucose-1-phosphate will, therefore, be available for starch biosynthesis, resulting in a 10-20% increase in tuber weight maintaining a constant density.

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

Related LMO(s)

[BCH-LMO-SCBD-111615-1](#) | Potato modified for increased tuber weight | Changes in physiology and/or production - Yield Resistance to antibiotics - Kanamycin

Characteristics of the modification process

Vector

Derivative of pBIN19

EN

Techniques used for the modification

Agrobacterium-mediated DNA transfer

Genetic elements construct

P-35S-CaMV 0.000 kb CS-umps-SOL. 0.000 kb T-ocs-RHIRD 0.000 kb

P-nos-RHIRD 0.000 kb CS-nptII-ECOLX 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-111569-1](#) URIDINE MONOPHOSPHATE SYNTHASE GENE | (POTATO) |

Protein coding sequence | Changes in physiology and/or production (Yield)

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

Terminator

[BCH-GENE-SCBD-100271-5](#) OCTOPINE SYNTHASE GENE TERMINATOR |

Terminator

LMO characteristics

Modified traits

Resistance to antibiotics

Kanamycin

Changes in physiology and/or production

Yield

Common use(s) of the LMO

Research

[BCH-LMO-SCBD-111616-1](#)

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

413 rue Saint-Jacques, suite 800

Montreal, Québec, H2Y 1N9

Canada

Fax: +1 514 288-6588

Email: secretariat@cbd.int