

Biosafety Clearing-House (BCH)

GENETIC ELEMENT (GENE)

BCH-GENE-SCBD-48073-8

LAST UPDATED: 05 MAY 2016

General information

Name of genetic element

Acetohydroxy acid synthase gene

EN

Alternate genetic element name(s) (synonym(s))

Acetolactate Synthase (ALS) gene

EN

Abbreviation

CS-ahas-ARATH

EN

Category

Protein coding sequence

Is this genetic element a synthetic molecule?

No

Donor organism

Donor organism(s)

[BCH-ORGA-SCBD-12098-4](#) ORGANISM | ARABIDOPSIS THALIANA (THALE CRESS, MOUSE-EAR CRESS, ARABIDOPSIS, ARATH) |

Plants

Characteristics of the protein coding sequence

Name of the protein expressed by the coding sequence

Acetohydroxy acid synthase

EN

Biological function of the protein

AHAS is an essential enzyme for many organisms as it catalyzes the first step in the biosynthesis of the branched-chain amino acids valine, isoleucine, and leucine.

A common mutant form of the ahas gene was isolated from a herbicide-resistant Arabidopsis thaliana which differs from the wild type gene by only a single base pair. A "G" to "A" point mutation results in a single amino acid substitution in which the serine residue at position 653 is replaced by asparagine (S653N)

EN

Tests using the mutant isoform of the ahas gene showed that it confers tolerance to sulfonylurea herbicides in plants. The ahas mutant isoform may, therefore, be used as a selectable marker in transgenic plants.

Related trait(s) or use(s) in biotechnology

Resistance to herbicides
Imidazolinone
Sulfonylurea

Additional Information

Other relevant website addresses and/or attached documents

- ? [Andersson, M. et al. 2003: A novel selection system for potato transformation using a mutated AHAS gene. Plant Cell Rep., 22: 261-267. \(English \)](#)
- ? [Sathasivan, K. et al. 1991: Molecular basis of imidazolinone herbicide resistance in Arabidopsis thaliana var. Colombia. Plant Physiol., 97: 1044-1050. \(English \)](#)
- ? [Lee, Y.-T., and Duggleby, R.G. 2000: Mutagenesis studies on the sensitivity of Escherichia coli acetohydroxyacid synthase II to herbicides and valine. Biochem. J., 350: 69-73. \(English \)](#)
- ? [Acetohydroxyacid Synthase.pdf \(English \)](#)
- ? [Herbicide resistant forms of Arabidopsis thaliana acetohydroxyacid synthase characterization of the catalytic properties and sensitivity to inhibitors of four defined mutants..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

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