

Biosafety Clearing-House (BCH)

GENETIC ELEMENT (GENE)

BCH-GENE-SCBD-14973-6

LAST UPDATED: 23 FEB 2021

General information

Name of genetic element

Barnase

EN

Abbreviation

CS-barnase-BACAM

EN

Category

Protein coding sequence

Is this genetic element a synthetic molecule?

No

Donor organism

Donor organism(s)

[BCH-ORGA-SCBD-12122-6](#) ORGANISM | BACILLUS AMYLOLIQUEFACIENS (BACAM) |

Bacteria

Characteristics of the protein coding sequence

Name of the protein expressed by the coding sequence

Barnase ribonuclease inhibitor

EN

Biological function of the protein

Barnase is a bacterial protein that has ribonuclease activity. It is lethal to the cell when expressed without its inhibitor barstar. The inhibitor binds to and occludes the ribonuclease active site, preventing barnase from damaging the cell's RNA after it has been synthesized but before it has been secreted.

Barnase catalyzes hydrolysis at diribonucleotide GpN sites. Cleavage occurs in two steps using a general acid-base mechanism: a cyclic intermediate is formed during the first transesterification step, which is then hydrolysed to release the cleaved RNA.

When synthesised by plants it causes male sterility by producing a ribonuclease enzyme (RNase) that interferes with RNA production in specific cells of the pollen sac, thus disrupting

EN

their normal cell functioning and preventing the development of pollen which lead to male sterility.

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

Changes in physiology and/or production
Reproduction
Male sterility

Additional Information

Other relevant website addresses and/or attached documents

? [Barnase- Wikipedia](#) (*English*)

[BCH-GENE-SCBD-14973-6](#)

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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