



## A drought stress inducible plant promoter

Abiotic stresses, which include drought, salinity, cold and extreme temperatures cause extensive losses to agricultural crop production. It is estimated that these losses can be as high as seventy percent. These losses could be dramatically reduced if the crops were able to tolerate drought conditions.

Stress-inducible promoters have previously been identified, but there is a shortage of efficient promoters for gene expression that display favourable characteristics in their native plants as well as in xenogenic species. The Psap1D promoter offers advantage over constitutive promoters to produce genetically modified drought tolerant crops.

The Psap1D promoter causes an increase in expression of genes under its control during adverse climatic conditions. The promoter induces expression at a level about six times higher than under unstressed conditions.

### Benefits

- The promoter is relatively short, which is an important consideration in the creation of genetically modified organisms. This allows for better transformation efficiency and increased stability
- The promoter is inducible under drought stress, which circumvents where the target protein is continuously produced. Expression of genes in large amounts at times when they are not needed is metabolically taxing to the plant
- Expression returns to baseline upon rehydration
- The promoter is functional in both monocots and dicots

### Technical description

Psap1D is derived from Psap1, which is a promoter isolated from the resurrection plant, *Xerophyta viscosa*. Psap1D is 1103 base pairs long as compared to the full length promoter (2083 base pairs). The reduction in size has been accomplished by removing an internal section of the promoter, which is not required for normal activity.

**Keywords:**  
Genetically modified crops, Drought tolerance, Plant yield

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**Technology Readiness Level:**  
7 - Tested in multiple crops

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