

**Title** *InPSR26* encoding a putative membrane protein is involved in programmed cell death during petal senescence of Japanese morning glory (*Ipomoea nil*)

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**Keyword** flower senescence; programmed cell death; morning glory

#### **Abstract**

The onset and progression of petal senescence, which is a type of programmed cell death (PCD), are tightly controlled by multiple genes. Genes showing changes in expression during petal senescence in Japanese morning glory (*Ipomoea nil*) were isolated and examined to elucidate their function in PCD. We show here that a putative membrane protein, InPSR26, regulates progression of PCD during petal senescence in *I. nil*. *InPSR26* is most abundantly expressed in petal limbs and its transcript level increases prior to visible senescence symptoms. Transgenic plants with reduced *InSPR26* expression (SPR26r lines) showed accelerated petal wilting, with PCD symptoms including cell collapse, ion and anthocyanin leakage and DNA degradation, in petals compared to wild-type plants. Transcript levels of autophagy-related genes (*InATG4* and *InATG8*) were reduced in the petals of PSR26r plants. These results suggest that InPSR26 acts to delay the progression of PCD during petal senescence, possibly through regulation of the autophagic process.