

**Title** Petal senescence: new concepts for ageing cells  
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#### **Abstract**

Senescence in flower petals can be regarded as a form of programmed cell death (PCD), being a process where cells or tissues are broken down in an orderly and predictable manner, whereby nutrients are re-used by other cells, tissues or plant parts. The process of petal senescence shows many similarities to autophagic PCD in animal cells including a massive breakdown of protein, DNA and RNA, the formation of autophagic vacuoles for the breakdown of cytoplasm and organelles therein and, the eventual rupture of these vacuoles that kills the cell. Chromatin condensation and DNA and nuclear fragmentation (traditionally considered being apoptotic-like features) are observed in both autophagic animal cells and in senescing petal cells. We present a conceptual model underlying petal senescence that integrates elements that have been associated with both apoptotic and autophagic types of PCD.