

research highlights

PLANT VOLATILES

Active emission

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Plants produce a multitude of volatile organic compounds (VOCs) to serve functions in reproduction and stress response. In leaves, stomatal closing might influence the emission of volatiles after their biosynthesis, but in tissues without stomata, such as petals, volatiles are directly released from epidermal cells. Funmilayo Adebisin, Purdue University, USA, and her colleagues now show that an active transporter, rather than free diffusion, moves VOCs through the plasma membrane of epidermal cells from *Petunia hybrida* flowers.

By screening a petunia petal transcriptional data set, Adebisin *et al.* identified an adenosine triphosphate-binding cassette (ABC) transporter gene, PhABCG1, which was highly upregulated during the transition of flowers from low to high VOC emission. Transgenic petunia lines using RNA interference (RNAi) to reduce the expression level of PhABCG1 by 70–80% showed a similar reduction in total floral VOC emission, and a 101–157% increase in petal internal VOC pools. Using ¹⁴C-labelled substrates, the researchers found that heterologously expressed PhABCG1 in tobacco Bright Yellow 2 cells transported both methylbenzoate and benzyl alcohol, two important VOCs emitted from petunia flowers, suggesting a direct role for the ABC transporter in floral volatile emission. In addition, Adebisin *et al.* observed altered plasma membrane permeability of petal epidermal cells in PhABCG1 RNAi lines.

The mechanism of volatile emission still needs more investigation in a diversity of subcellular locations, cell types, organs, developmental stages and plant species. However, at least one active transporter has been found to play an important part in this fragrant process.

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