

The inhibition of Rab gene expression in tomato fruit inhibits softening; a dissection of the developmental timing and the relative contribution of several Rab GTPases

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We have isolated a cDNA from ripe tomato fruit that shows homology to the *Arabidopsis RABA* class of GTPase genes. When expression was blocked by an antisense transgene, the softening of the fruit was strongly inhibited and the level of polygalacturonase and pectinesterase was reduced, presumably because of mis-targeting within the cell. There were also a range of phenotypic effects upon the leaves and flowers, which we explain in terms of mis-targeting of hormone transporters or hormone receptors.

We have now shown that this gene (*LeRab11a*) was expressed most strongly within the expanding pericarp and much more weakly within the mature green and ripe fruit. Similarly, although the phenotypic effect upon softening was only seen in ripe fruit, the depression of the levels of pectinesterase and β -galactosidase was more pronounced in green fruit than in ripe fruit. This suggests that the inhibition of trafficking may be affecting the structure of the cell wall long before the ethylene climacteric and production of classic softening enzymes such as polygalacturonase.

Unlike the softening effect phenotype, which is robust, some other phenotypic effects are seen only with certain transgene constructs or only in primary transformants. Because there are multiple *Rab11* genes in plants (26 in *Arabidopsis*), and significant levels of RNA are still seen on northern blots of suppressed plants, we have hypothesized that the expression of certain other related *Rab* genes, though not all of them, may be suppressed in antisense plants. We will report data on the expression patterns of different *Rab* genes in wild-type and antisense transgenic plants.