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How plants cope with the damaging effects of UV radiation

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Because of their dependence on sunlight for photosynthesis, plants are also exposed to the DNA-damaging effects of ultraviolet (UV) radiation. In the 15 March *Genes and Development*, Roman Ulm of the [Friedrich Miescher Institute](#) in Basel and co-workers report on how plants cope with genotoxic stresses, such as UV radiation ([Genes Dev](#) 2001, **15**:699-709).

Ulm *et al.* identified a mutation in *Arabidopsis thaliana*, *mkp1*, that results in hypersensitivity to the DNA-damaging agent MMS (methyl methanesulphonate) and to UV-C radiation. MMS at 120 parts per million was lethal to *Arabidopsis* mutants, whereas wild-type plants could tolerate higher concentrations of the drug; UV-C radiation (55 J/m²) arrested the growth of mutant roots but had no effect on wild-type roots. In the absence of genotoxic stresses, the mutants were indistinguishable from their wild-type counterparts, suggesting that the *MKP1* gene has a specific role in the stress response.

The gene that is disrupted in the *mkp1* mutant is normally transcribed into a 3 kb mRNA that encodes a MAP (mitogen-activated protein) kinase phosphatase. These enzymes have been linked to stress responses in mammalian cells.

References

1. Friedrich Miescher Institute, [<http://www.fmi.ch/>]
2. Ulm R, Revenkova E, di Sansebastiano G-P, *et al*: Mitogen-activated protein kinase phosphatase is required for genotoxic stress relief in *Arabidopsis*. *Genes Dev* 2001, 15:699-709., [<http://www.genesdev.org/>]