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Apoptosis and disease in plants

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The hypersensitive response (HR) of plants to pathogenic infection involves a form of programmed cell death, but the molecular mechanisms remain unclear. In the June 5 *Proceedings of the National Academy of Sciences*, Dickman *et al.* describe the use of transgenic plants expressing known anti-apoptotic genes from animals to explore the role of apoptosis in host defence (*Proc Natl Acad Sci USA* 2001, **98**:6957-6962). They generated tobacco plants expressing human *bcl-2*, human *bcl-xl*, nematode *ced-9* or baculovirus *op-iap*. All of the transgenes conferred resistance to fungal phytopathogens and to tomato spotted wilt virus. The anti-apoptotic transgenes also inhibited DNA laddering (a marker of apoptosis) following tobacco plant infection with necrotrophic fungi. This 'comparative pathobiology' approach demonstrates that plant-pathogen interactions induce cell death that resembles animal apoptosis. These transgenic plants will be important to studies of the mechanisms of plant cell death and to the development of disease-resistant crops.

References

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6. An apoptosis-inhibiting baculovirus gene with a zinc finger-like motif.