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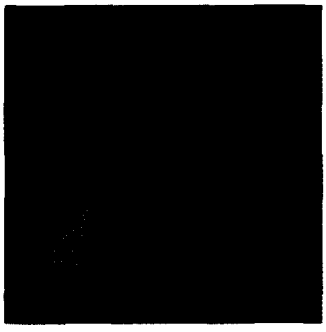
ON THE COVER



Tobacco BY-2 suspension-cultured cells are an excellent model system for deciphering the molecular signals that are necessary and sufficient to target proteins to specific plant cell organelles. On pages 185–197 of this issue, Lee et al. describe their use of this system to investigate the targeting of cottonseed isocitrate lyase (cIL) to glyoxysomes—specialized types of peroxisomes. In the experiments highlighted on the cover, two different cIL-encoding constructs were introduced into BY-2 cells by biolistic bombardment. The wild-type protein was targeted to and accumulated in glyoxysomes, as shown by the punctate immunofluorescence staining in the cells on the right. Conversely, a mutated protein lacking the three C-terminal amino acids (ARM-COOH) of wild-type cIL accumulated only in the cytoplasm (diffuse staining in the cells on the left), demonstrating that the extreme C terminus of cIL is required in vivo to target the enzyme to glyoxysomes. Interestingly, however, in BY-2 cells cobombarded with DNA constructs coding for both the mutated and wild-type cILs, both proteins accumulated in glyoxysomes. These observations indicate that the mutant proteins were "piggybacked" into glyoxysomes via an association with the wild-type cIL.

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