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On the Cover: Fruit ripening and senescence involve hydrolysis and softening of tissues and a dramatic loss of chlorophyll. Various cellulases and proteases participate in the process. The most abundant Cys protease in green and ripe pineapple (*Ananas comosus*) fruit is bromelain, which accumulates without an inhibitory propeptide. How is bromelain temporally regulated to avoid cellular damage until the stage of development when it is needed? Cystatins are potent inhibitors of Cys proteases; however, the bromelains are enigmatically recalcitrant to inhibition by plant and animal cystatins. In this issue, Neuteboom et al. (pp. 515–527) examined a novel secreted pineapple cystatin (AcCYS1), which has a unique Ala-Glu-rich N-terminal trunk (NTT) absent in other cystatins. They show the NTT is required for complete inhibition of stem and fruit bromelain. Posttranslational cleavage of the NTT specific to ripening fruit renders the AcCYS1 inactive against fruit bromelain but not stem bromelain, thereby significantly enhancing bromelain activity in ripe fruit. Three fruit (unripe, medium ripe, and fully ripe) are shown. Removal of the NTT (brown region) of AcCYS1 and release of active bromelain (pie-shaped circle) are represented above the fruit. Cover design by David Christopher. Photography by Eun Ju Cho with assistance from Kristie Matsumoto.

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Peter V. Minorsky

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^[C] Some figures in this article are displayed in color online but in black and white in the print edition.

^[W] Indicates Web-only data.

^[OA] Open Access articles can be viewed online without a subscription.