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Cloning and expression of a cold-regulated gene from leafy spurge (*Euphorbia esula* L.)

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Leafy spurge (*Euphorbia esula*) is a perennial weed which is capable of acclimating to sub-freezing temperatures. We have used the differential display technique to identify and clone a cDNA for a cold regulated gene (*Cor103*) whose mRNA accumulates specifically during the cold acclimation process. The expression of *Cor103* was analyzed, and it has been determined that the RNA from this gene reaches maximal expression in less than 2 days following exposure of the plant to temperatures of 5°C, and remains at high levels in the plant for at least 30 days so long as the plant is left in the cold. RNA from *Cor103* return to control levels within 24 hours when the plant is returned to normal growing temperatures. *Cor103* transcript does not accumulate under conditions of drought or heat stress. The *Cor103* gene is induced in response to low temperatures in roots, stems and leaves, but is expressed at high levels in tissue culture at control temperatures. Southern blot analysis indicates that the *Cor103* gene is a member of a gene family. Sequence analysis indicates that the 3' end of the *Cor103* gene is extremely rich in glycine, and thus shares some homology to a group of glycine-rich RNA binding proteins, some of which have also been shown to be cold regulated.