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Title

ClpC, A ATP-Dependent Chloroplast Protease (Clp), Is Involved In Iron Metabolism in Arabidopsis

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We identified a spontaneous mutant derived from the wild-type Col-0 whose cotyledons displayed yellow when germinated in normal MS medium (Fig 1A). This mutant's true leaf was green in normal MS medium (Fig 1B), but its' young leaf appeared pale green after transplanted it to the soil (Fig 1C). Interestingly, this pale green phenotype can be specifically rescued by watering iron (Fig 1D), so this mutant was named *irm1* (iron-rescued-mutant1).



Approximately 3200 chlorosis F2 mutant progeny were genotyped to map the *irm1* mutation to an 150-kb interval at the bottom of chromosome V. Comparisons with the known genomic sequence from Col-0 revealed that *ClpC* in *irm1* contains a G-for-A substitution at nucleotide 2317, resulting in a substitution the glycine at position 773 in the protein to an Arginine acid.

To determine if the loss function of IRM1 affected the expression of the iron-regulated gene, the expression of *AtFRO2* and *AtIRT1* in root and *AtFRO6/7* and *AtFRO8* in shoot were examined. As shown in Figure 2, the expressions of *AtFRO2* and *AtIRT1* in mutant were the same as the wild type, but the expression of *AtFRO8* in mutant were significantly higher than that of the wild type.

