

Arabidopsis ClpD N-terminal domain is highly divergent from ClpC1

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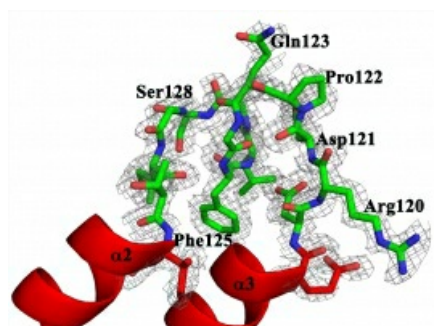
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Molecular chaperones target irreversibly damaged proteins and play a pivotal role in maintaining proteostasis. The caseinolytic protease machinery associated chaperone protein ClpC is present in bacteria, plants and other eukaryotes, whereas ClpD is unique to plants. Plant ClpC and ClpD proteins get localized into chloroplast stroma. Herein, we report high resolution crystal structures of the N-terminal domain of *Arabidopsis thaliana* ClpC1 and ClpD. AtClpC1 has the typical N-terminal repeat domain organization like other known Clp chaperones, whereas, AtClpD deviates from this and have only seven alpha-helices in its N-terminal domain. In addition, the loop connecting the two halves of AtClpD NTD is longer and covers the region which in case of AtClpC1 is thought to contribute to adaptor protein interaction. Coincidentally, no adaptor proteins have been reported for AtClpD. Taken together, the N-terminal domain of AtClpD has a divergent structural organization compared to any known Clp chaperones and this hints towards its specific role during plant stress conditions, as opposed to that in the maintenance of chloroplastic homeostasis by AtClpC1.

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