



Characterization of HD-START Transcription Factors in *Arabidopsis*

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In plants, the StAR-related lipid transfer (START) lipid/sterol binding-domain is primarily found in association with a DNA-binding homeodomain (HD) motif. These HD-START transcription factors may mediate sterol signaling during plant development. In an effort to better understand the role of these proteins, we have attempted to clone and express the START domains of the *Arabidopsis* proteins GL2 and ATML1, two members of the GL2 class of HD-START proteins, as GST fusion proteins. This expression system would facilitate the purification of samples for structural analysis of the START domain as well as ligand-binding assays with plant lipid extracts. Successful overexpression in *Escherichia coli* was obtained for the GL2 START domain and for the START domain from mammalian StAR protein, which would serve as a control in ligand-binding assays. The ATML1 START domain did not exhibit strong overexpression. Attempts to purify the recombinant GL2 START domain met with difficulty due to inclusion body formation. Tests with different conditions for expression and cell lysis were performed to try to optimize the release of soluble protein, but it may be necessary to modify the expression system in order to obtain enough purified protein for analysis. Studying the structure and binding properties of these START domains will help to explain sterol signal transduction and its role in plant embryogenesis.

