

Abstract

TCTP is a conserved eukaryotic protein involved in regulation of multiple cellular processes, such as translation, cell cycle and cell death. Apart from its intracellular functions, TCTP is secreted and participates in human immune response. Dimerization via a terminal cysteine residue is critical for its extracellular function. Multiple sequence alignment of eukaryotic TCTPs revealed that terminal cysteine residue is conserved not only in animals but also in green plant lineage. In contrast to animal model organisms, knowledge about TCTP in plants is limited. *Arabidopsis thaliana* genome harbors two TCTP paralogs, *TCTP1* and *TCTP2*. *TCTP1* expression is highly upregulated in pollen. Previously published studies pointed to its role in embryo development, pollen tube growth and targeting. Using mutant characterization and analysis of subcellular localization, the role of *TCTP1* in plant reproduction was investigated in this thesis. Recombinant *Arabidopsis thaliana* TCTP1 protein was produced along with its potential interacting partners BRL2 and TTL3 in heterologous *Escherichia coli* system. *tctp-1* T-DNA line characterization pointed to TCTP1 role in pollen tube growth. It was expressed in mature pollen and pollen tube under native promoter and localized to the cytoplasm. Recombinant AtTCTP1 formed dimers *in vitro* and mutation of terminal cysteine residue inhibited dimer formation, suggesting a similar dimerization mechanism in animal and plant TCTP. Future experiments will show if TCTP1 dimerization is important for its function in plant development and physiology.