

Abstract

After transcription, mRNA translation is another highly regulated process in gene expression. In plants, translation regulation plays an important role during progametic phase, fertilization and seed development, where synthesized transcripts are stored and selectively translated later in development. Translation regulation is also broadly used in stress responses as a fast and flexible tool to change gene expression; therefore, it plays an essential role in the survival strategy of sessile organisms like plants. Both regulation of the global translational rate as well as selective regulation of specific transcripts modulate the final gene expression response. Most of the regulatory mechanisms are concentrated in the stage of initiation, which is facilitated by several translation initiation factors. Eukaryotic translation initiation factor 3 (eIF3) is the largest and most complex of these factors, consisting of 12 conserved subunits. Its key function in the initiation is to scaffold the formation of the translation initiation complex and in the scanning mechanism accuracy. In past decades, additional eIF3 functions were discovered acting upon the whole translation cycle, including its importance in global and specific translation regulation. The aim of this work is to review eIF3 functions and to discuss current evidence for eIF3-mediated translation regulation in flowering plants.