ABSTRACT

From RNA-to-protein, translation initiation and protein synthesis is mediated by trans-acting factors that recognize mRNA features common to almost all eukaryotes. Eukaryotic translation initiation factor 3 complex (eIF3) is a highly conserved protein complex that recognizes 5'-CAP elements of the mRNA to initiate translation. eIF3 consists of nine subunits, three of them having two isoforms: eIF3A, eIF2B1, eIF3B2, eIF3C1, eIF3C2, eIF3D, eIF3E, eIF3F, eIF3G1, eIF3G2, eIF3H and eIF3K. This work deals with functional characterization, expression and subcellular localization of eIF3B1, eIF3B2 and eIF3E in *Arabidopsis thaliana* male gametophyte and interaction of eIF3E with the Constitutive photomorphogenesis 9 (COP9) complex as a regulatory complex of eIF3E post-translational control. Here we show that depletion of *eif3b1* or *eif3b2* is not gametophytic lethal and that the two protein might function redundantly, whereas, knockout of eIF3E causes male gametophyte lethality. Interestingly, *eif3b1* show post-fertilization defects during embryogenesis, suggesting that its redundancy with eIF3B2 is restricted to the gametophyte. Gene expression studies revealed high expression of eIF3 subunits in actively dividing zones of leaf primordia, root meristem and root elongation zones as well as in the vegetative cell and sperm cells of the male gametophyte. The localization of the all three subunits was prominent around the vegetative cell membrane, in the vegetative cytosol in punctuate form as well as potentially in sperm cell membranes or sperm cells cytosol but not in any of the cells nuclei. Most intriguing, it was established that COP9 core subunit CSN7 (FUS5) and CSN1 (FUS6) are not essential in the male gametophyte and that the mechanism of eIF3E post-translational turnover by COP9 is not conserved in pollen.

Key words: plants, *Arabidopsis thaliana*, gametophyte, male gametophyte, pollen, pollen grain, pollen tube, silique, translation, mRNA, eukaryotic initiation factor 3, translation initiation factor 3, eIF3, constitutive photomorphogenesis, COP9 signalosome, CSN, transmission, expression, protein localization, konckout mutation