

Translation reinitiation is a gene-specific translational control mechanism exploiting the ability of some short upstream open reading frames (uORFs) to retain post-termination 40S ribosomal subunit on the mRNA. Reinitiation efficiency depends on cis-acting sequences surrounding the uORF, translation elongation rates on the uORF, selected initiation factors, and the intercistronic distance of the short uORF from the main ORF. Although the precise mechanism of reinitiation is still not known, great progress in elucidating some of its details has been recently made with help of the GCN4 translational control model system. Among them, involvement of eIF3 was shown to play a critical role for efficiency of this process. In particular, it was proposed that eIF3 specifically interacts with sequences located upstream of a reinitiation-permissive uORF upon termination, and that this step is instrumental in stabilizing the 40S ribosomal subunit on the mRNA to allow subsequent resumption of scanning for reinitiation downstream. In this thesis, the current knowledge of the translation reinitiation mechanism is summarized. As a typical example, the yeast transcriptional activator GCN4 has been chosen, the mRNA of which is subjected to a tight translational control via the very reinitiation mechanism.