POST-TRANSCRIPTIONAL GENE SILENCING IN PLANTS

Summary

Post-transcriptional gene silencing, also known as RNA interference (RNAi), is a natural phenomenon which has been found to occur in a number of species. This process is induced by double stranded RNA (dsRNA) and results in degradation of homologous mRNA. The silencing is triggered by viral or endogenous aberrant nucleic acids. Regardless the inducing factor the process involves dsRNA that is recognized in induction step by the Dicer nuclease and cleaved to small interfering RNA (siRNA). Depending of their size the siRNA molecules may drive mRNA degradation or can be involved in the systemic silencing. The mechanism of the post-transcriptional gene silencing is complicated and involves a set of enzymes including viral or cellular RNA-dependent RNA polymerases catalysing production of dsRNA which is then recognized by the Dicer nuclease.

The main function of post-transcriptional gene silencing in plants is the antiviral defense. This role of RNAi is confirmed by the fact that some viruses encode RNA silencing supressors.