KOSMOS Vol. 65, 3, 399–410, 2016

INVOLVEMENT OF LOW MOLECULAR WEIGHT REGULATORY RNAS (siRNAS AND miRNAS) IN REGULATION OF AUXIN SIGNAL TRANSDUCTION PATHWAY

PAULINA GLAZIŃSKA, MILENA KULASEK, MICHAŁ GRZECA, WALDEMAR WOJCIECHOWSKI, KATARZYNA MARCINIAK, EMILIA WILMOWICZ, JAN KOPCEWICZ

Chair of Plant Physiology and Biotechnology, Faculty of Biology and Environmental Protection, Nicolaus Copernicus University, Lwowska 1 Street, 87 100 Torun; e-mail: Paulina.Glazińska@umk.pl, milena.kulasek@gmail.com, michal.grzeca@gmail.com, wwojc@umk.pl, marciniak@umk.pl, emwil@umk.pl, kopcew@umk.pl

Summary

Auxin affects almost all of the growth and development processes in plants. The auxin signal transduction pathway involves a number of proteins, among which the key elements are: TAAR auxin receptors (TIR1 and AFB1-3), AUX/IAA auxin response repressors and Auxin Response Factor (ARF) transcription factors. The activity of genes encoding some components of this pathway is affected by regulatory low-molecular-weight RNAs - miRNA (micro RNA) and siRNA (short-interfering RNA) - endogenous non-coding 20-25 nucleotides long small RNA (sRNA), differing in the way of formation (precursor molecules and biosynthesis pathways) and function. TIR1 and AFB1-3 contain miR393 target sequence and siTAAR secondary target site. IAA28 transcripts are targeted by miR847. Expression of ARF10, ARF16 i ARF17 is directly controlled by miR160, ARF6 and ARF8 by miR167, and ARF2-4 indirectly by miR390 through TAS3-derived ta-siRNAs. sRNAs influence primarily the tissue and temporal localization of described components of the auxin signal transduction pathway.