



## **ABSTRACT**

*“Control of developmental plasticity and robustness  
by small RNAs in Arabidopsis”*

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Plants adapt to their environment by forming new organs throughout their entire postembryonic life. The harmonious growth of these organs in response to morphogenetic signals is essential. Lateral roots unceasingly branch from the main root in response to local auxin maxima. How a local maximum translates to a robust pattern of gene activation ensuring the proper growth of the newly formed root is not known. The TAS3-derived trans-acting siRNAs (ta-siRNAs) belong to a plant-specific class of endogenous small RNAs, whose biogenesis requires the initial microRNA 390 (miR390)-mediated cleavage of the TAS3 precursor by AGO7. The ta-siRNAs target mRNAs encoding ARF3/ETTIN and ARF4 which are transcription factors of the AUXIN RESPONSE FACTORS that mediate the effects of auxin. I will present recent results establishing that auxin maxima at the sites of lateral root initiation promote localised production of miR390, allowing the formation of ta-siARFs to subsequently inhibit ARF3/4 activity in the incipient primordia. In turn, ARF3 and ARF4 contribute both positively and negatively to miR390 accumulation. These results support a model in which small RNAs employ target genes to regulate their own production.