Primary transcripts of microRNAs encode regulatory peptides

MicroRNAs are small RNAs (approximately 21 nucleotides) that control most biological processes, negatively regulating the expression of many target genes. They are present in plants and animals, including humans, in which they are involved in many diseases when their expression is deregulated. MicroRNAs are derived from primary transcripts, which are larger RNA molecules produced by transcription of the DNA. Primary transcripts of microRNAs have long been regarded as non-coding RNAs.

We have shown that the primary transcripts encode small regulatory peptides (miPEPs). These miPEPs are naturally produced by plants and are specific to each microRNA. The miPEPs activate transcription of their associated microRNAs. Thus the treatment of plants by miPEPs increases the amount of microRNAs produced by these plants. By carefully choosing the target microRNAs, we can improve plant development, which allows to consider many agricultural applications.

Fig.above: *Left,* A. thaliana plants *without miPEP / right with miPEP.*

Background: *Immunolocalization of miPEP171b in lateral root primordium of* Medicago truncatula

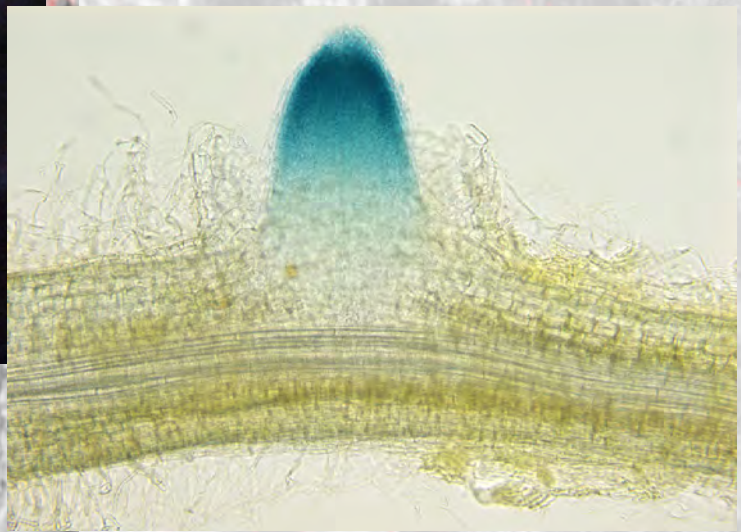

Fig. above: *expression of the miPEP171b in lateral root primordium of* Medicago truncatula

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