Regulation of the mechanosensitive gene PtaZFP2

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Regulation of the mechano-sensitive gene *PtaZFP2*

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In their natural environment, plants are continuously exposed to wind loads, characterized by a high variability of frequencies and intensities. In response to mechanical loadings, plants exhibit generally a decrease in longitudinal growth, an increase in diameter growth and in rooting. This syndrome of growth responses has been called thigmomorphogenesis. In order to grow in continuously changing windy conditions, plants may have to develop acclimation processes. However, molecular mechanisms involved in plant acclimation to recurring and successive mechanical loadings are not well characterized.

Recently, through the analysis of the short-time effects of quantified stem bending on young poplars, we demonstrated the rapid induction of *PtaZFP2* expression, a gene encoding a putative Cys2/His2 zinc finger transcription factor. The *PtaZFP2* transcripts accumulate 10 min after a single bending and only in strained tissues. The relative abundance of *PtaZFP2* transcripts was linearly correlated with the amount of applied mechanical solicitation. By comparing the effect of successive bending on this early mechano-sensitive gene, our results indicate that *PtaZFP2* mRNA accumulate to a lesser extent after two bendings than after a single one. These results clearly show a partial desensitization of plants to recurrent successive bendings.

Our objectives are now to identify molecular actors upstream *PtaZFP2* in order to understand its regulation in the mechano-sensing pathway. Furthermore, to characterize the kinetics of accommodation processes and the tissues involved in mechano-sensing, the effect of single and repeated bending are studied, at the protein level, on PtaZFP2 accumulation and localization.