

Interplay in the control of trichome development and cuticle formation in *Nicotiana tabacum*.

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Trichomes and cuticle are protective epidermal specializations that help plants cope with challenging environmental conditions. Plants have developed gene networks to efficiently connect the build-up of these two epidermal protective layers. We were primarily interested in studying the development of glandular trichomes in *Nicotiana tabacum*. However, the study of several mutants and overexpressing lines of transcription factors from the MYB, ZINC FINGER and MADS family revealed a clear cuticle phenotype.

Detailed characterization of the transcriptional targets of these transcription factors could shed some light on the genetic interplay existing between trichome and cuticle formation in *Nicotiana tabacum*. Controlling trichome development, the biosynthesis of trichome-derived specialized metabolites as well as cuticle biosynthesis and deposition processes can be viewed as different aspects of a common defensive strategy adopted by plants to protect themselves from environmental stresses. Given the existence of several trichome developmental pathways depending on the plant species and the types of trichomes, genetic interactions between cuticle formation and trichome development are complex to decipher and to generalize. In addition to fundamental new insights on the regulation of these processes, identifying key transcriptional switches controlling both processes could also facilitate more applied investigations aiming at improving crop resistance to environmental stresses.