

Some insights into the transcriptional regulation of stomatal activity

Dr. Massimo Galbiati

Istituto di Biologia e Biotecnologia Agraria - IBBA -
Consiglio Nazionale delle Ricerche - CNR -

Monday, November 27, 2023
4 pm – 5:30 pm, E131



Stomata are epidermal pores formed by pairs of specialized guard cells, which regulate gas exchanges between the plant and the atmosphere. Modulation of transcription has emerged as an important level of regulation of stomatal activity. We identified the AtMYB60 transcription factor as a positive regulator of stomatal opening. The *atmyb60-1* mutant shows reduced stomatal aperture and accumulates increased levels of oxylipins in guard cells, including 12-oxo-phytodienoic acid (12-OPDA), jasmonic acid (JA) and jasmonoyl-l-isooleucine (JA-Ile). Our results indicate that 12-OPDA triggers stomatal closure independently of JA and cooperatively with abscisic acid (ABA) in *atmyb60-1*. Our study highlights the relevance of oxylipin metabolism in stomatal regulation and indicates AtMYB60 as a transcriptional integrator of ABA and oxylipin responses in guard cells. Considering the strong conservation of the AtMYB60 regulatory network between Arabidopsis and distantly related species, including tobacco, tomato and grape, engineering of the AtMYB60-dependent oxylipin biosynthetic pathway could provide an attractive strategy for enhancing crop survival and productivity under stress.

Contact : Toshinori Kinoshita (Grad. Sch. Sci., Biol. Sci.,
ITbM)

kinoshita@bio.nagoya-u.ac.jp