

# MabZIP74 interacts with MaMAPK11-3 to regulate the transcription of *MaACO1/4* during banana fruit ripening

Shu-min Liang, Si-cen Chen, Zong-li Liu, Wei Shan, Jian-ye Chen, Wang-jin Lu, Prakash Lakshmanan and Jian-fei Kuang

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## Abstract

Fruit ripening is an economically important process of many edible fruits, which is controlled by a multi-level regulatory network coordinating the spatio-temporal expression of a large array of genes and/or proteins. In banana, ethylene orchestrates the ripening process, but the regulatory mechanism(s) controlling the expression of genes encoding ethylene biosynthesis-related enzymes is not fully understood. Here, we report the identification and characterization of a basic leucine zipper (bZIP) transcription factor *MabZIP74* from banana fruit. Its gradually decreased with the progression of banana fruit ripening, implying a negative role for *MabZIP74* in banana fruit ripening. *MabZIP74* is localized in the nucleus and displays transcriptional inhibitory activity. More specifically, *MabZIP74* was found to be a transcriptional repressor of ethylene biosynthetic genes *MaACO1* and *MaACO4*, the accumulation of which paralleled ethylene production during banana ripening. Importantly, a protein kinase MaMAPK11-3 interacted with and phosphorylated *MabZIP74*, which attenuated *MabZIP74*-mediated transcriptional repression of *MaACO1* and *MaACO4* during ripening. Taken together, our findings reveal a novel *MabZIP74*-mediated regulatory network involved in ethylene biosynthesis and fruit ripening in banana. These results advance our knowledge on fruit ripening and provide additional opportunities for genetic improvement of banana fruit ripening.