S3-2

A MEMBERANE-BOUND NAC TRANSCRIPTION FACTOR REGULATES CELL CYCLE IN ARABIDOPSIS

Youn-Sung Kim,[1] Sang-Gyu Kim,[1] Jung-Eun Park,[1] Minsun Lee,[1] Mi-Hye Lim,[1] Kyung-Sook Chung,[1] Nam-Hai Chua,[2] and Chung-Mo Park[1]

[1]Graduate School of Chemistry and Molecular Engineering, Seoul National University, Seoul, 151-742, Korea
[2]Laboratory of Plant Molecular Biology, Rockefeller University, New York, New York 10021-3699, USA

Regulated liberation of membrane-tethered, dormant precursors of regulatory proteins is an intriguing activation mechanism that controls diverse cellular functions in eukaryotes. An exquisite example is the activation of membrane-bound transcription factors by controlled proteolytic cleavage. This process liberates active transcription factors that can enter the nucleus and invokes a rapid transcriptional response to the incoming stimuli. Here, we show that an NAC transcription factor (designated NTM1), associated with intracellular membranes, is activated via regulated ubiquitin/proteasome-dependent processing (RUP). In an *Arabidopsis* mutant with serrated leaves in which active NTM1 is constitutively expressed, leaf cells are enlarged, and cell proliferation is reduced. Consistent with these, a subset of *ICK* genes is remarkably up-regulated. Interestingly, the RUP-mediated activation of NTM1 is enhanced by cytokinins. We therefore propose that NTM1 activation by RUP is a molecular device for fine-tuning the cell cycle by cytokinin signals during development.

This research is supported by grants from KRF, KOSEF (R02-2003-000-10001-0), KISTEP(M1-0219-00-0003)(C.M.Park), and KOSEF(R08-2004-000-10066-0) (Y.S. Kim).