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[\[Botany\] The Defective Proteasome but Not Substrate Recognition Function Is Responsible for the Null Phenotypes of the Arabidopsis Proteasome Subunit RPN10: Academia Sinica](#)

[Botany] The Defective Proteasome but Not Substrate Recognition Function Is Responsible for the Null Phenotypes of the Arabidopsis Proteasome Subunit RPN10: Academia Sinica ([Chinese Version](#))

Academia Sinica - IPMB Highlights (2011/07/20) The group at the Institute of Plant and Microbial Biology, Academia Sinica, led by Research Fellow Hongyong FU, characterized major Arabidopsis ubiquitin receptors by using protein-protein interaction and genetic approaches. This study shows that proteasome substrate recognition pathways are redundant and, interestingly, the Arabidopsis proteasome subunit RPN10 maintains the proteasome structural integrity, which is critical for vegetative and reproductive growth. The results have been published in Plant Cell.

Ubiquitin/26S proteasome-mediated proteolysis is a vital regulatory mechanism in almost all aspects of plant growth and development. Ubiquitylated protein substrates are recognized by distinct pathways mediated by multiple and evolutionarily conserved ubiquitin receptors. By biochemical characterization, Hongyong FU's group demonstrated clear divergence of major recognition pathways across species, suggesting their functional and mechanistic divergence in different species (FATIMABABY et al., 2010; FU et al., 2010). To dissect the complexity and functional roles of the distinct substrate recognition pathways in Arabidopsis, Hongyong FU's group further characterized major ubiquitin receptors, including the proteasome subunits RPN10 and RPN13 and the UBL and UBA domain-containing factors such as RAD23, DSK2, DDI1, and NUB1, using protein-protein interaction and genetic approaches. The results have been published in Plant Cell (LIN et al., 2011).

This study shows that the major ubiquitin receptors involved in targeting ubiquitylated proteins for proteasome-mediated proteolysis are functionally redundant in Arabidopsis. Interestingly, in addition to playing a redundant role in substrate recognition, the Arabidopsis proteasome subunit RPN10 maintains the structural integrity of the proteasome, which is critical for vegetative and reproductive growth.

Reference:

[Academia Sinica - IPMB Highlights 2011/07/20](#)

[National Science Council International Cooperation Sci-Tech Newsbrief](#)

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