

A new protein variant that controls reproduction and growth in plants

Scientific Achievement

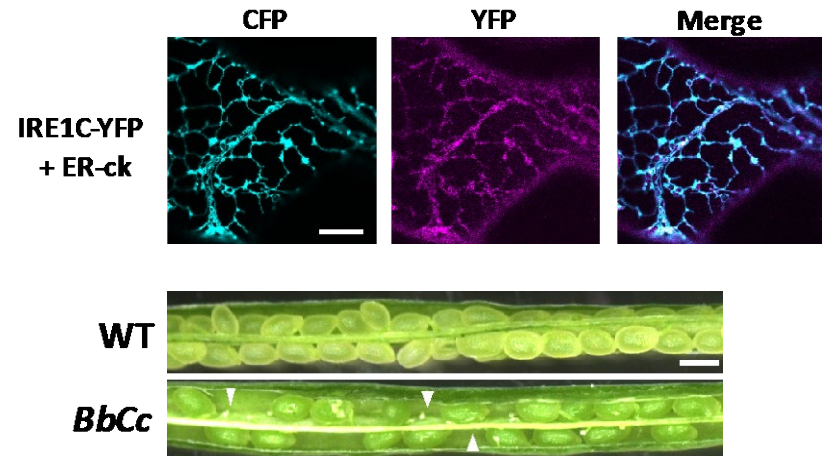
The protein IRE1C, which is a variant of the conserved IRE1 family, is indispensable for producing plant reproductive cells when another variant, IRE1B, is depleted.

Significance and Impact

IRE1 proteins are ubiquitous in eukaryotes. They control physiological growth and stress response in the endoplasmic reticulum (ER) of eukaryotic organisms. This work has identified a unique IRE1 variant.

Research Details

- IRE1C lacks the ER luminal domain compared with IRE1A and IRE1B, but it remains to have the kinase and ribonuclease domain. *IRE1C* is expressed throughout the plants at a low expression level.
- Confocal microscopy shows that IRE1C localizes to the ER just like the other two homologs.
- No *ire1b ire1c* homozygous alleles could be obtained, while *ire1a ire1c* mutant is viable as WT. Reciprocal crosses showed non-Mendelian segregation ratio between *ire1b+/- ire1c+/-* and WT, suggesting IRE1C is involved in gametogenesis when IRE1B is depleted.
- Phenotypic assay of *ire1c* mutants under ER stress conditions indicated that IRE1C is not essential in the ER stress activated UPR.



Top: Representative images of transient expression of ER-ck, IRE1C-YFP or both constructs in tobacco leaves showing IRE1C localizes on ER. Scale bar = 10 μ m.

Bottom: The siliques of the *ire1b+/- c+/-* showed gaps with abnormal seed development, indicated by white arrowhead. Scale bar = 100 μ m;

Pu Y, Ruberti C, Angelos ER, Brandizzi F. *Plant Direct*; Nov 2019; doi: 10.1002/pld3.187; [Read pub](#)

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