

**Brassinosteroid insensitive mutant 5 (*bin5*) encodes Putative Topoisomerase VI
Genes in *Arabidopsis thaliana***

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Plant steroid hormone brassinosteroids (BRs) play important roles during plant growth and development. Unlike animal steroids that predominantly use nuclear receptors to directly activate target gene expression, genetically identified BR receptor BRI1 is a membrane-bound receptor kinase. To reveal the molecular mechanisms of BRI1 signaling, additional BR-insensitive mutants *bin3* and *bin5* with many characteristics of *bri1* mutant were identified and characterized. The mutants are partially insensitive to BR treatments, suggesting that the underlying gene products may either transduce or modulate BR signaling. Bin5 shares significant homology with archaeon topoisomerase VI subunit A and yeast SPO11 while Bin3 is the only eukaryotic homolog of the archaeobacterial topoisomerase VI subunit B. Our microarray data show that many BR-regulated gene expression are down-regulated in the mutants, suggesting that Bin3 and Bin5 may constitute a potential *Arabidopsis* topoisomerase VI and modulate BR-regulated gene expression.