

# The P450-1 gene of *Gibberella fujikuroi* encodes a multifunctional enzyme in gibberellin biosynthesis

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Recent studies have shown that the genes of the gibberellin (GA) biosynthesis pathway in the fungus *Gibberella fujikuroi* are organized in a cluster of at least seven genes. P450-1 is one of four cytochrome P450 monooxygenase genes in this cluster. Disruption of the P450-1 gene in the GA-producing wild-type strain IMI 58289 led to total loss of GA production. Analysis of the P450-1-disrupted mutants indicated that GA biosynthesis was blocked immediately after ent-kaurenoic acid. The function of the P450-1 gene product was investigated further by inserting the gene into mutants of *G. fujikuroi* that lack the entire GA gene cluster; the gene was highly expressed under GA production conditions in the absence of the other GA-biosynthesis genes. Cultures of transformants containing P450-1 converted ent-[14C]kaurenoic acid efficiently into [14C]GA<sub>14</sub>, indicating that P450-1 catalyzes four sequential steps in the GA-biosynthetic pathway: 7 $\alpha$ -hydroxylation, contraction of ring B by oxidation at C-