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SrpkF* participates in the early phase cellobiose- and cellulose-responsive induction of the cellulase genes in *Aspergillus aculeatus

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Purpose: The goal is to identify new regulator(s) controlling the expression of cellulase genes in *Aspergillus aculeatus* that produces a number of cellulose- and hemicellulose-degrading enzymes.

Methods: Factors controlling the expression of cellulase genes were screened from the T-DNA inserted mutant library of *A. aculeatus*. We identified serine-arginine protein kinase-like gene (*srpkF*) as a new regulator. To figure out the function of *SrpkF* on the gene expression in response to cellulose, the effect of deletion and overexpression of *srpkF* were assessed by quantifying the expression of the cellulase genes.

Results and conclusions: The expression of *srpkF* elevated under the carbon starvation and in the presence of Avicel 98 and 44 times higher, respectively, than that in the presence of glucose. The expression levels of FIII-avicelase (*cbhl*) and FIIb-xylanase (*xynIb*) genes were reduced to 37 and 19% by the deletion of *srpkF* in the presence of Avicel, respectively. However, the deletion of *srpkF* did not affected for the expression of *xynIb* in response to xylose. The expression of *srpkF* was 9 times higher in OE-*srpkF* than that in MR12 in the presence of Avicel. Overexpression of *srpkF* significantly increased the *cbhl* and *cmc2* expression at the early phase of induction in response to cellobiose but not *xynIb* in response to xylose. These results suggested that *SrpkF* was produced under the carbon starvation condition and contribute to the early phase of induction in response to cellulosic carbon sources.