S1-1

Biological function of *CpSlt2*, an ortholog of the cell wall integrity (CWI) MAPK of *Saccharomyces cerevisiae*, in the chestnut blight fungus *Cryphonectria parasitica*

Kum-Kang So[1], Yo-Han Ko[1], Jeesun Chun[1], Jung-Mi Kim[2], and Dae-Hyuk Kim[1,*]

*[1]Department of Molecular Biology, Department of Bioactive Material Sciences, Institute for Molecular Biology and Genetics, Chonbuk National University, Jeonju, Chonbuk, 54896, Korea; [2]Department of Bio-Environmental Chemistry, Institute of Life Science and Natural Resources, Wonkwang University, Iksan, Chonbuk, 54538, Korea; *Email: dhkim@jbnu.ac.kr*

Cryphonectria parasitica, chestnut blight fungus, has a characteristic of decreasing pathogenicity when infected with Cryphonectria hypovirus 1. *C. parasitica* is known to be one of the most representative model systems used to observe the interaction between viruses, plants and fungi. The mitogen-activated protein kinase (MAPK) pathway, which is well conserved in various organisms ranging from yeast to humans, functions in relaying phosphorylation-dependent signals within MAPK cascades to diverse cellular functions involved in the regulation of pheromone, cell wall integrity, and osmotolerance in filamentous fungi. Several genes in the MAPK pathway were revealed to be regulated by hypovirus, or to be involved in pathogenicity in *C. parasitica*. Among these pathways, the CWI pathway has aroused interest because *CpBck1*, an ortholog of yeast Bck1 (a CWI MAPKKK), was previously reported to be involved in cell wall integrity and sectorization. Interestingly, sporadic sectorization was observed in the *CpBck1* mutant and sectored phenotypes were stably inherited in the progeny that were successively transferred from sectored mycelia. In this study, we analyzed the biological function of *CpSlt2*, downstream gene of *CpBck1*, to confirm whether the sectorization phenomenon occurred in the specific single gene or cell wall integrity (CWI) pathway. As results, the *CpSlt2*-null mutant exhibited marked changes in colonial growth, near absence of conidiation and aerial hyphae, abnormal pigmentation, CWI-related phenotypic defects, and dramatically impaired virulence. As cultivation of the mutant strains progressed, the majority of the colonies showed sporadic sectorization and mycelia from the sectored area stably maintained the sectored phenotype. These results suggest that the unique sectorization is CWI pathway-specific, though the components in the same CWI pathway have common and specific functions.