

Roles of OsWRKY Transcription Factors in Plant Disease Resistance

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WRKY-type proteins are a plant-specific transcription factors. Most WRKY transcription factors known so far play major roles in the regulation of genes associated with pathogen defense responses. Many AtWRKYs are known to function as a transcriptional regulator of pathogen defense responses because they bind specifically to the W-box (TTGACC) that exists in several pathogenesis related (PR) gene promoters, resulting in enhanced resistance to pathogen attack. To explore roles of OsWRKYs in plant disease resistance, several OsWRKY genes were isolated from rice (*Oryza sativa*) either by a differential screening or RT-PCR based on the database. Among OsWRKYs three of them which is up-regulated upon either the infection with *Xanthomonas oryzae pv.oryzae* or SA treatment were studied further. For three OsWRKYs their DNA binding characteristics were confirmed by yeast one hybrid assay using the W-box. Their transcriptional activity were also determined in yeast and rice. In order to investigate their involvements of three OsWRKYs in plant disease resistance they are overexpressed in Arabidopsis and rice. The extent of disease resistance of transgenic plants overexpressing OsWRKYs respectively to pathogen were assessed. For an OsWRKY transgenic plant expressing OsWRKY-RI (RNA interference) were made and then characterized. OsWRKY-RI transgenic plants showed enhanced susceptibility to pathogens and the reduction in the expression level of defense related gene compared to non-transgenic plants, indicating that this OsWRKY functions as a positive transcriptional regulator of plant defense response. More about OsWRKYs will be discussed in detail.