

3. Development of The Wheat Leaf Rust Resistance Genes in Rice

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RLG(Receptor-Like protein kinase Gene) were isolated by screening rice cDNA, genomic, and BAC libraries using Q30 DNA fragment(128bp), which was isolated by mRNA differential display method, as a probe. Each *RLG* had a catalytic domain of serine-threonine protein kinase. The predicted protein sequences of *RLGs* showed identity(ranging from 22% and 83%) to *Lrk10*, which is located adjacent to a wheat leaf rust resistance gene called *Lr10*, through the overall region of amino acid sequences. The full-length cDNA *RLG8* was composed of 2,092 nucleotides and 1,854bp open reading frame. Translation of this open reading frame produced a protein of 617 amino acids with a molecular mass of 68,693Da. This predicted protein was composed of five domains: hydrophobic signal sequence, extracellular domain, transmembrane domain, charged domain, and ser/thr protein kinase domain. Southern blot analysis revealed that the genes of *RLG4* and *RLG8* were present in a single copy and two copies per rice genome. A search of current database revealed that the 36 *RLGs* were located on the telomeric region of the short arm of rice chromosome 1. The *RLG8*-transformed transgenic wheat plant showed the enhanced resistance to the wheat leaf rust.

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