**Leaf rust resistance gene *Lr1*, isolated from bread wheat (*Triticum aestivum* L.) is gene dosage dependant**

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In hexaploid wheat, leaf rust resistance gene *Lr1* is located at the distal end of the long arm of chromosome 5D. This gene was cloned by map-based cloning. A high resolution genetic map of the *Lr1* locus was constructed using microsatellite, resistance gene analog (RGA), BAC end (BE), and low pass (LP) markers. A physical map of the locus was constructed by screening a hexaploid wheat BAC library from cultivar Glenlea that is known to have *Lr1*. The locus comprised three RGAs (RGA567-5, RGA567-7 and RGA567-8) from a gene family related to RFLP marker Xpsr567. *Lr1* segregated with RGA567-5 while recombinants were observed for 567-7 and 567-8. Transformation of the susceptible cultivar Fielder with RGA567-5 demonstrated that it corresponds to the *Lr1* resistance gene. In addition, the candidate gene was also confirmed by virus-induced gene silencing. Twenty $T_1$ lines from resistant transgenic line $T_0$-938 were grown and tested for leaf rust resistance. A segregation ratio of 3 fully resistant, 10 partial resistant, and 7 susceptible was observed fitting a 1:2:1 ratio for a single hemizygous insertion. Transgene presence and expression correlated with the phenotype. Fully resistant $T_1$-938 lines were homozygous for *Lr1,* partially resistant $T_1$-938 lines were hemizygous and susceptible $T_1$-938 lines had lost the transgene. The resistance phenotype expressed by *Lr1* seemed therefore to be dependant on the zygosity status. $T_3$-938 sister lines with and without the transgene were further tested with 16 virulent and avirulent rust races. Rust reactions were all as expected for *Lr1* thereby providing additional evidence toward the *Lr1* identity of RGA567-5. Sequence analysis of *Lr1* indicated that it is not related to the previously isolated *Lr10* and *Lr21* genes.