

TRANSBULB: Fine mapping of *Rym16^{Hb}* by using novel molecular approaches

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Breeding of resistant barley varieties can help to minimize yield losses caused by plant diseases. The wild *Hordeum* species *H. bulbosum* makes up the secondary gene pool of barley and is a new source of resistance genes for barley breeding. Interspecific crosses of *H. vulgare* (*Hv*) and *H. bulbosum* (*Hb*) led to introgressions of *Hb* chromatin carrying novel disease resistance genes in an *Hv* genetic background. One of them is *Rym16^{Hb}* which was introgressed to barley chromosome 2HL and confers resistance to the soil-borne BaMMV/BaYMV-1/-2 virus complex.

The present study aims at the use of innovative and efficient molecular strategies based on next generation sequencing and SNP genotyping for (I) fine mapping of the resistance locus, (II) reduction of the introgression size via

homoeologous recombination and (III) the development of selection tools for plant breeders.

A total of 76 markers were mapped on the 2HL introgression, some of these were derived as TC markers based on the orthology of barley chromosome 2HL and rice chromosome Os4. Thirty-two recombinants were identified which carried *Rym16^{Hb}* on *Hb* introgressions of reduced sizes relative to the original introgression. Closely flanking markers are available for marker-assisted breeding programmes.

Field tests are underway to examine the influence of individual introgressions on crop yield. The resistance gene will be genetically fixed in DH lines, after crossing the resistant parent with different breeding lines.