

1-23. Coat Protein Gene-Mediated Resistance to Barely Yellow Mosaic Virus-HN and Barely Mild Mosaic Virus-Kor in Transgenic Barely

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Barely yellow mosaic (BaYMV) and barely mild mosaic (BaMMV) bymoviruses are both transmitted by the soil-inhabiting fungus *Polymyxa graminis*, and are responsible for economic losses in barley crops in Asia and Europe. Because chemical control of the vector is ineffective, the losses can only be prevented by growing resistant barley cultivars. The objective of this study is to produce resistant barley plants by transformation with viral coat protein(cp) genes. Resistance tests of T1 plants transformed with the BaYMV CP gene showed that at least four independent lines had clear resistance to BaYMV but two other lines were highly susceptible with severe symptoms. The CP gene was detected in all resistant T1 plants by genomic PCR. Most of T2 progenies derived from the resistant T1 lines also showed resistance. In contrast, only one out of 21 independent T2 lines transformed with the BaMMV CP gene tested showed clear resistance to BaMMV, and others were very susceptible. Further analyses of resistance and CP gene expression are in progress.

1-24. Localization of Single Chain Fv Antibodies (scFv) in Transgenic Tobacco Plants Showing Resistance against Tomato Bushy Stunt Virus

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To develop an effective protection strategy against tomato bushy stunt virus (TBSV), tobacco plants expressing single-chain Fv antibodies (scFv), were established. A previous had shown that the replication activity of viral replicase was inhibited by the selected scFvs. Moreover, no systemic symptom was found after virus inoculation on leaves of wt *N. benthamiana* infiltrated with an Agrobacterium suspension resulting in expression of the scFvs. However, control plants showed systemic symptoms. In this study the localization of the scFvs within two transgenic plant lines, (CP28H3, CP-P55) was demonstrated using immunogold labelling. The gold particles, indicating the presence of scFv, were mostly found in the cytoplasm of the plant cells including chloroplasts and in the cell walls. However, they were hardly found in the vacuole, nucleoplasm and intercellular spaces. Gold particles often accumulated in either the cytosol or chloroplasts showing a specific labeling. There was no difference in type of gold labeling between both transgenic lines. The localization of the scFv in the cytoplasm further conforms the inhibition of the RNA-dependent RNA polymerase (RdRp) by the selected scFv because it is known that the RdRp is localized to membraneous cytosolic structures.