Analysis of PR Gene derived Pathogen-Inducible synthetic Promoters in the Crop Sugar Beet

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Different promising strategies to engineer fungal resistance of plants have been developed in the last years. A prerequisite for many concepts is the requirement of pathogen-inducible promoters, which restrict the expression of defence responses to the local infection site.

The development of synthetic pathogen-inducible promoters exclusively containing well defined regulatory cis-elements of PR genes has been described (Rushton et al., 2002). Using the DNA elements W, S, D, Gst1 and E17, a large set of artificial promoters with different properties have been designed. Here we describe the analysis of these promoters in sugar beet after

infection with the fungal pathogen *Cercospora beticola* under in-vitro and greenhouse conditions. Depending on the combination and number of cis-elements, the promoters differed in mediating the strength of reporter gene expression, pathogen inducibility and basal activity. Promoters constructed as chimeric regulatory elements containing two different cis-elements were superior to promoters consisting of a single type of cis-element. In summary, we have identified a set of promoters with different suitable abilities for the development of fungal resistant sugar beets.