

Genetic engineering in hops

Gene transfer – advantages

- fast and directed transfer of single genes
⇒ improvement of resistance without changing quality traits
- transfer of genes beyond typical genetic resources as wild hops
⇒ no cross-breeding limitations

Methods

(a) indirect transfer by soilborne bacteria
(*Agrobacterium tumefaciens*)



(b) direct transfer by gene gun
(= particle bombardment)



Transfer of shoot internodes



Regeneration of plants

State of the art

transgenic Saazer
in the greenhouse

with expression
of GUS reporter
gene



Transgenic 'Saazer'

Objectives - resistance to fungal pathogens

obtained by a transfer of genes coding
for chitinolytic enzymes



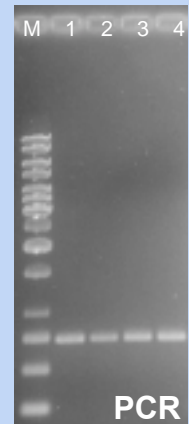
Powdery mildew

Detection of transgenic tissue and transgenic plants

- GUS staining
- PCR (Polymerase Chain Reaction)
- Southern Blot (not shown)



GUS staining



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