

# FMO, HSP20 and RPW8 gene families in *Gossypium raimondii*

*How these gene families may be related to resistance to pathogens*

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# Flavin dependent monooxygenases (FMO)

## Auxin biosynthesis

Plant growth,  
Cell division, differentiation and elongation  
Tropism



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## Glucosinolates biosynthesis Crucifers or Brassicales

### Glucosinolate

wounding

Isothiocyanates, nitriles  
antimicrobials against pathogens  
Deterrents towards generalist  
herbivores  
Attractants for herbivores

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Resistance to Pathogens

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## Resistance to Pathogens

FMO1 (*Arabidopsis thaliana*)

Overexpression increases resistance to *Pseudomonas syringae* pv. *tomato*

*Hyaloperonospora parasitica*

Upregulated, systemically, both by avirulent or virulent strains

At the site of pathogen attack, similar resistance in FMO mutant/ wild type  
necessary for SAR (systemic acquired resistance)

basal resistance

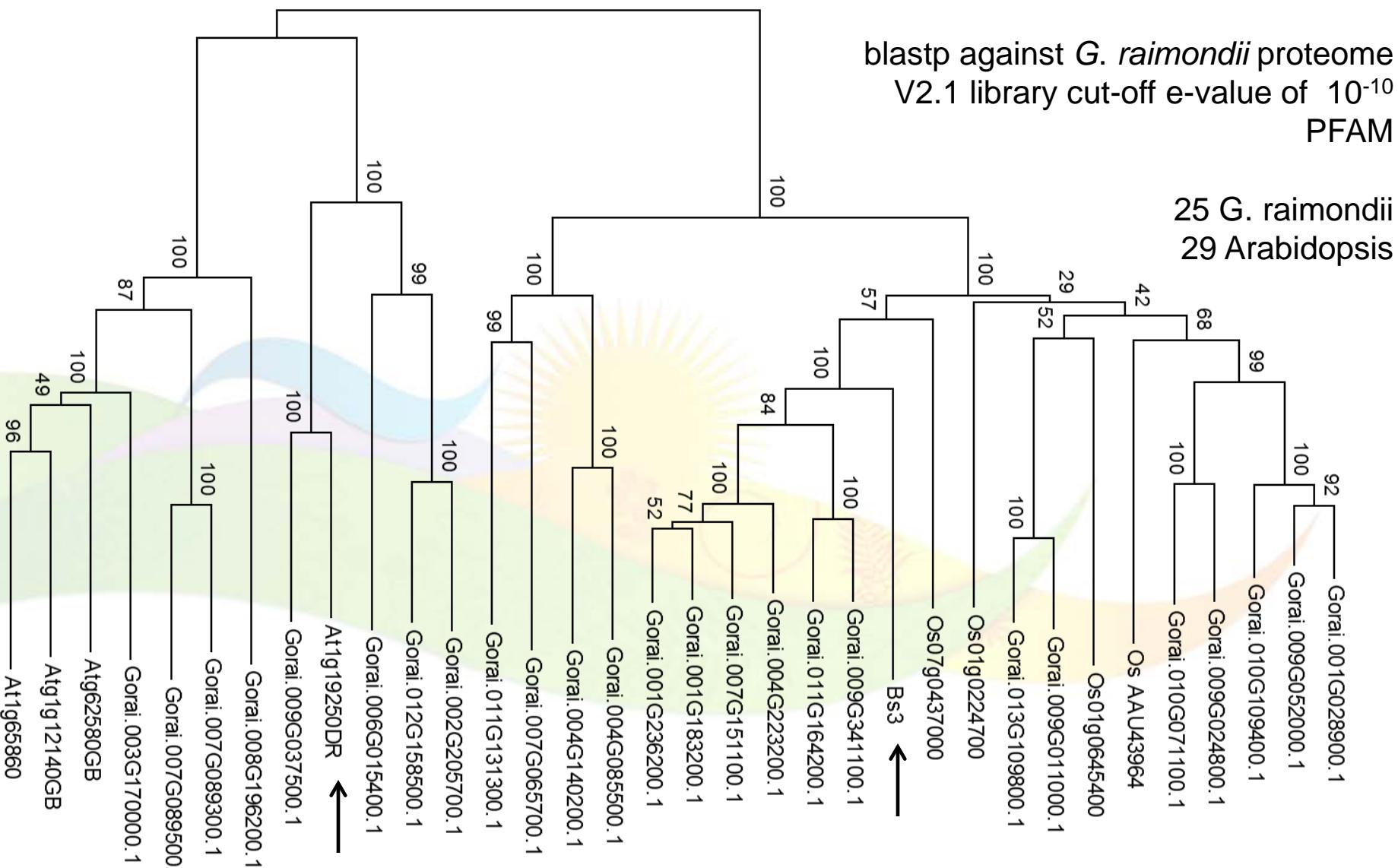
Bs3 (Pepper)

*Xanthomonas campestris* pv. *vesicatoria*

Recognition specificity in Bs3 promoters by binding AvrBs3

Hypersensitive response

# Flavin dependent monooxygenases (FMO)



# HSP - heat shock proteins

Chaperones

for folding or  
stabilization of  
disease resistance  
genes

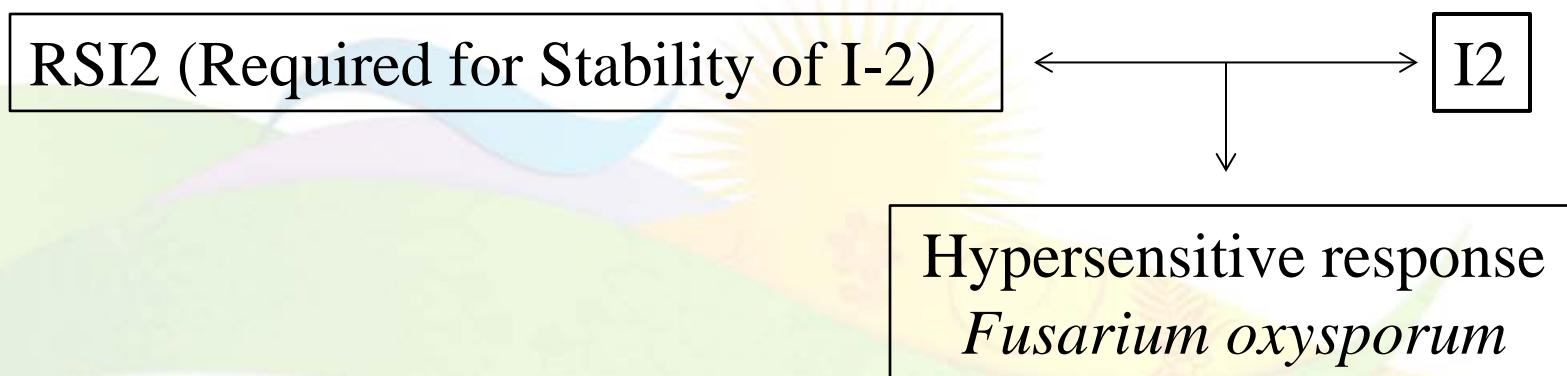
Heat,  
salt,  
alcohol,  
chilling  
oxidative injury or  
heavy metals,

I2 (tomato) *Fusarium oxysporum*

# HSP - heat shock proteins

sHSP heat shock proteins from 12 to 43 Kda

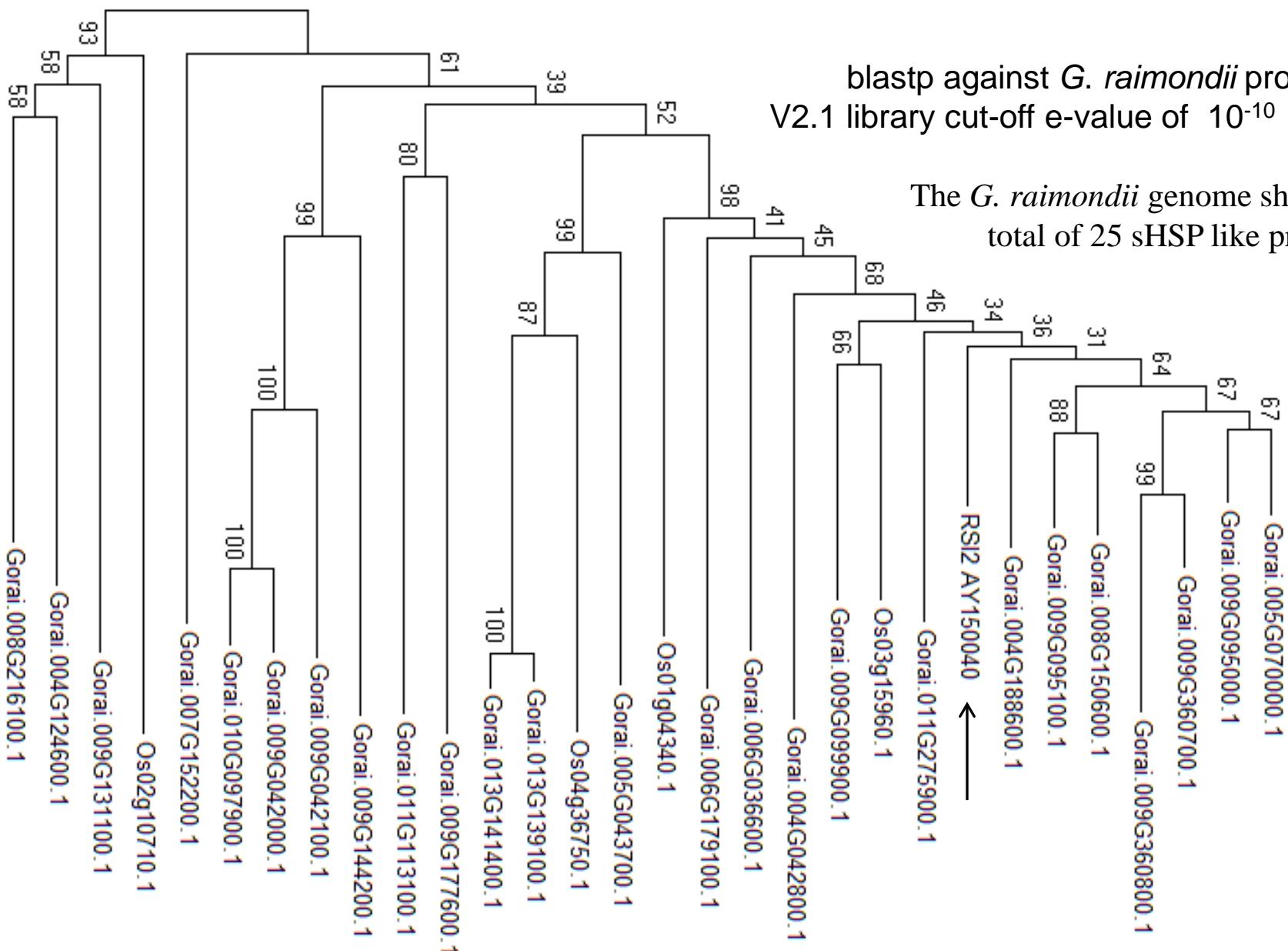
Tomato



# sHSP

blastp against *G. raimondii* proteome  
V2.1 library cut-off e-value of  $10^{-10}$  PFAM

The *G. raimondii* genome showed a total of 25 sHSP like proteins.



## RPW8

# Resistance to powdery mildew Arabidopsis

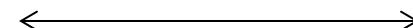
For species (Ascomycete)

*Golovinomyces cruciferarum*

*Golovinomyces cichoracearum*

*Golovinomyces orontii*

*Oidium lycopersici*

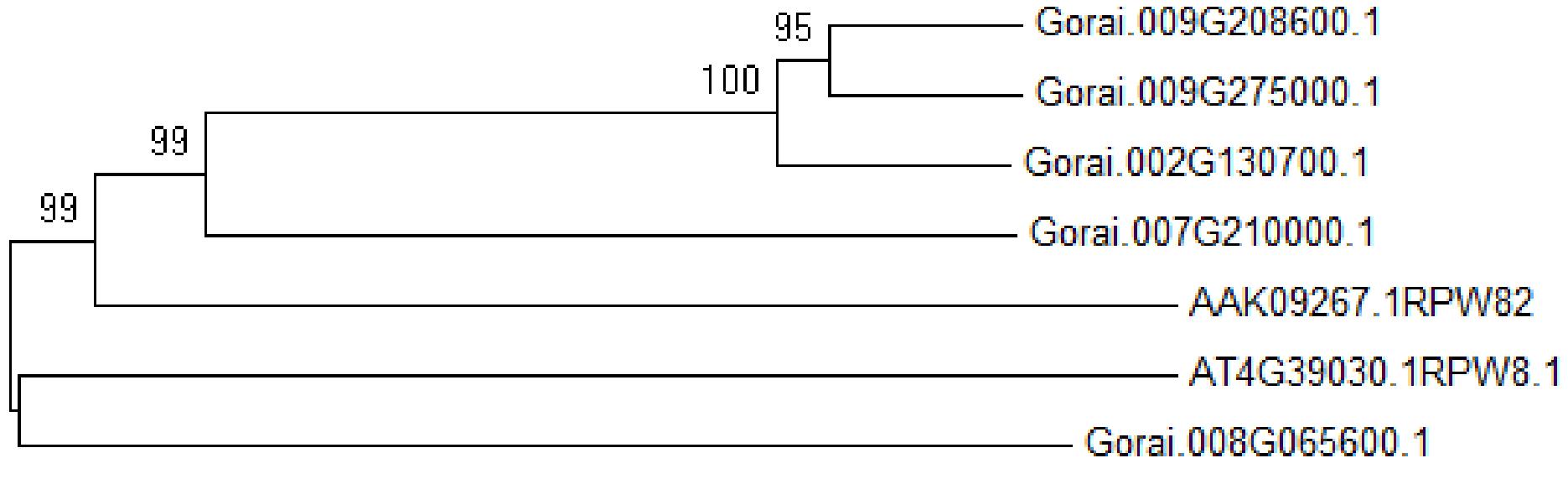


RPW8.1  
RPW8.2

Salicylic  
acid

Hypersensitive  
response

## RPW8



0.1

blastp against *G. raimondii* proteome  
V2.1 library cut-off e-value of  $10^{-10}$   
PFAM

The *G. raimondii* genome showed a total of 5 RPW8 like proteins.

