

# Identification and Evolution of transcription factors in Stramenopiles

Francisco Buitrago Florez, Silvia Restrepo, Diego Riaño Pachón

# Stramenopiles



Golden Algae



*Phytophthora*



Diatoms



*Saprolegnia*

# Heterotrophic

*P. infestans*



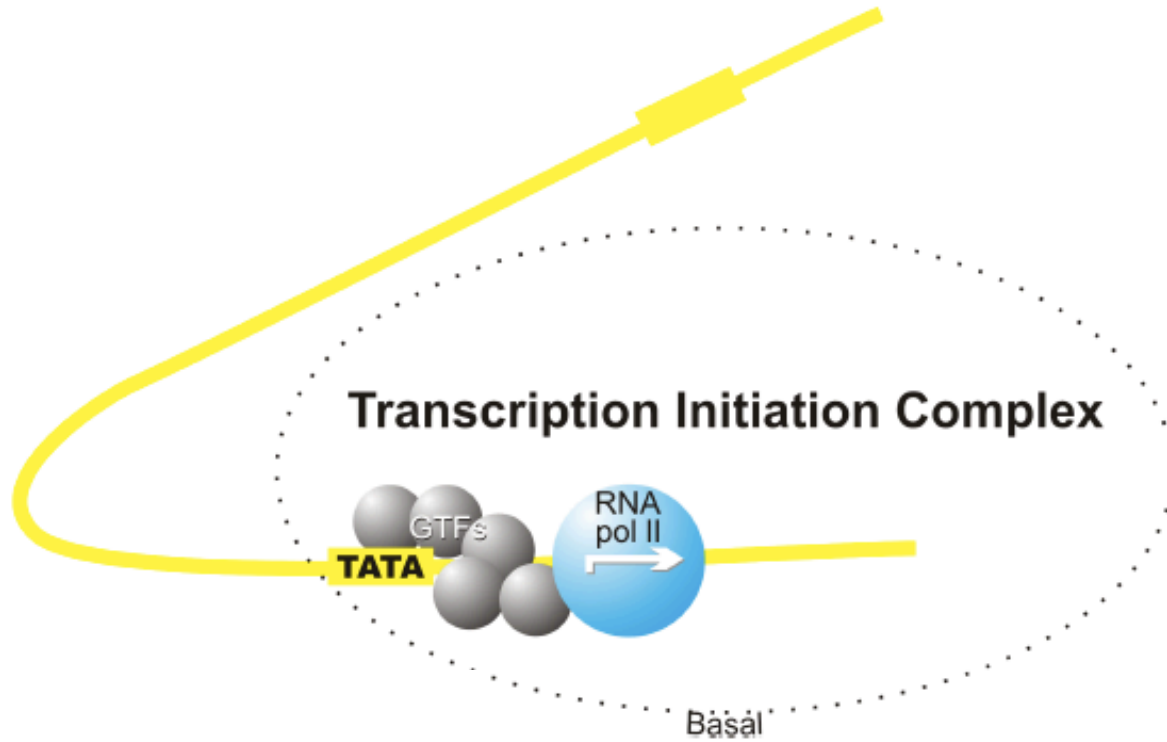
*S. parasitica*



# Biological Question

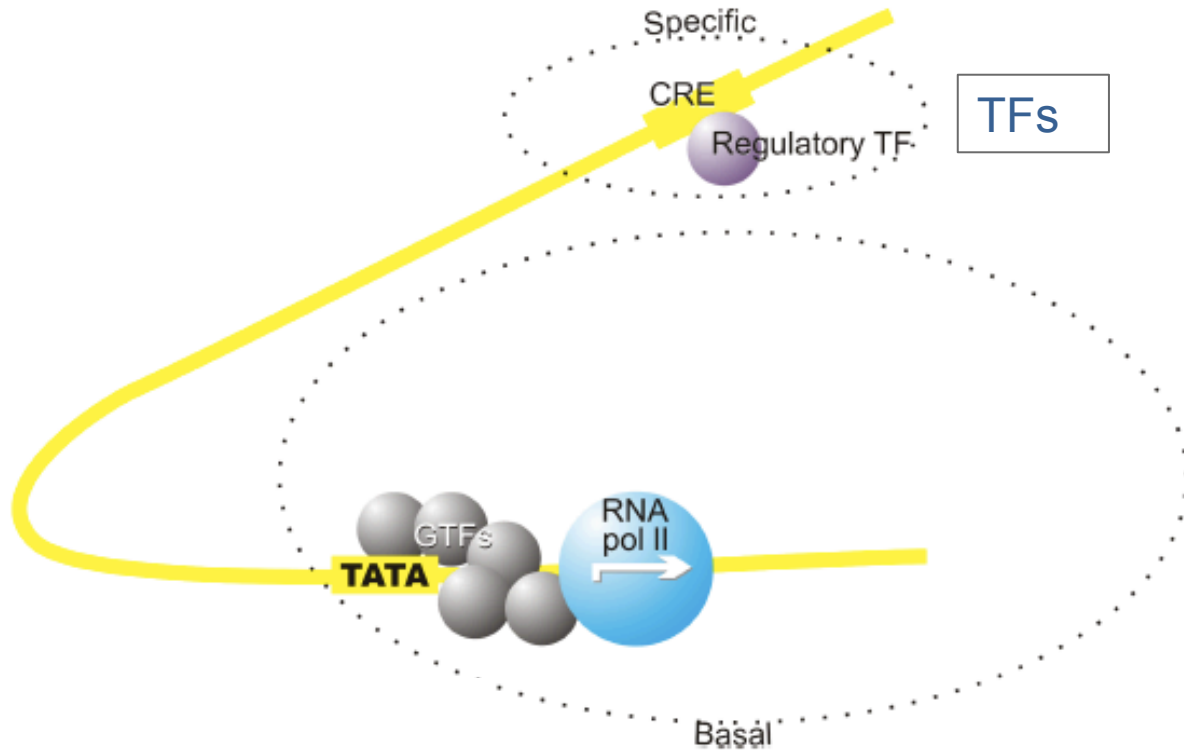
- Mechanisms?
- Transcription regulation  
Networks
  - Biological Reprogramming

# Regulation



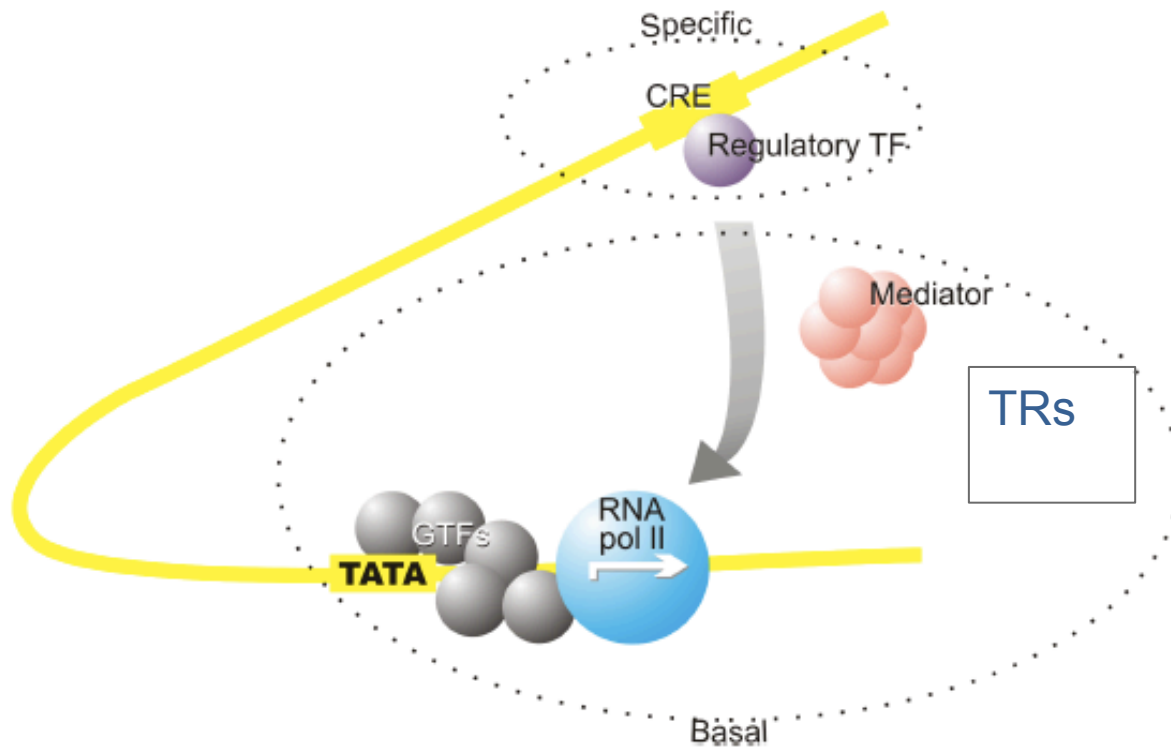
Modificado de Komberg 2007, PNAS:104,12995-61. Cortesía Diego Riaño-Pachon, 2011

# Regulation



Modificado de Komberg 2007, PNAS:104,12995-61. Cortesía Diego Riaño-Pachon, 2011

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# Identification?



# Transcription Factors



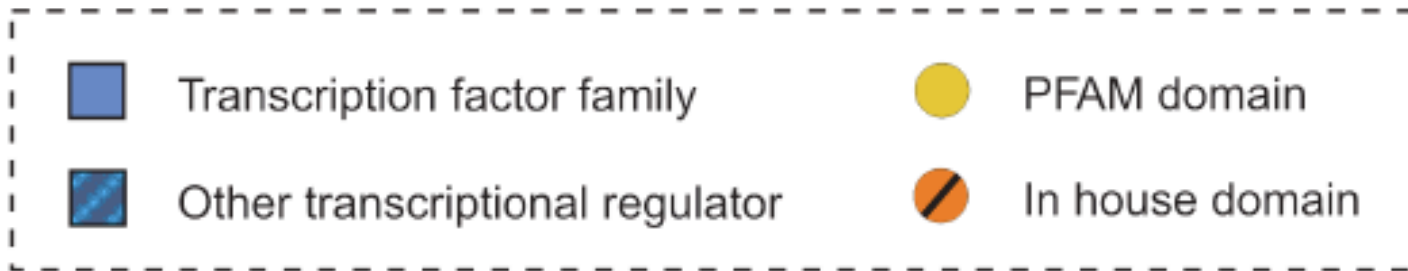
**DBD** DNA-binding domain

**SSD** Signal sensing domain

**TAD** Transactivation domain

Courtesy from Diego Riaño

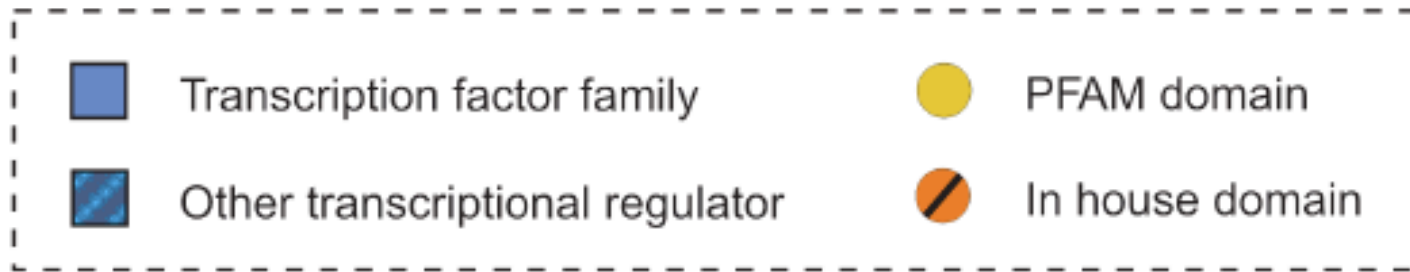
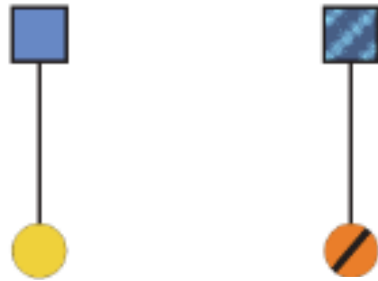
# Rules



*Modified from Riaño-Pachón et al. 2007. BMC Bioinformatics 8:42*

Cortesía Diego Riaño-Pachon, 2011

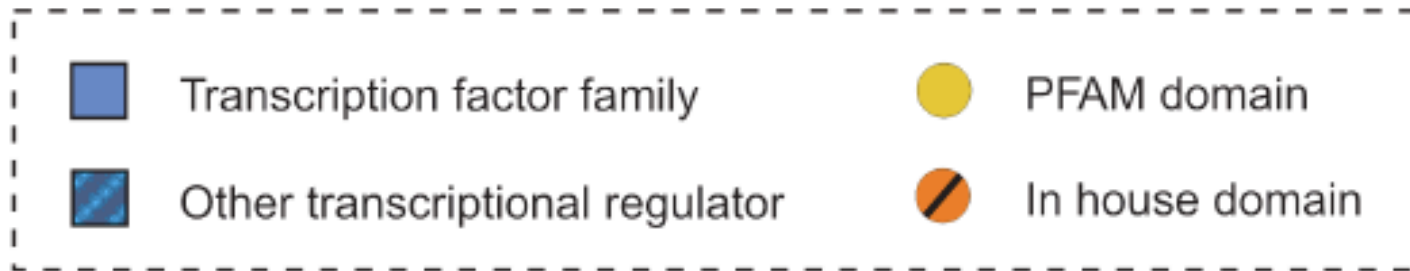
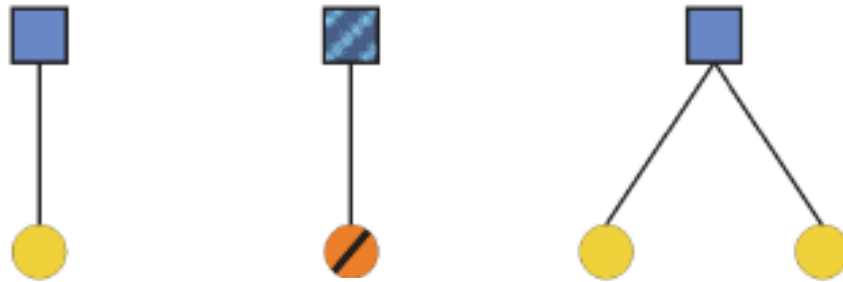
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Cortesía Diego Riaño-Pachon, 2011

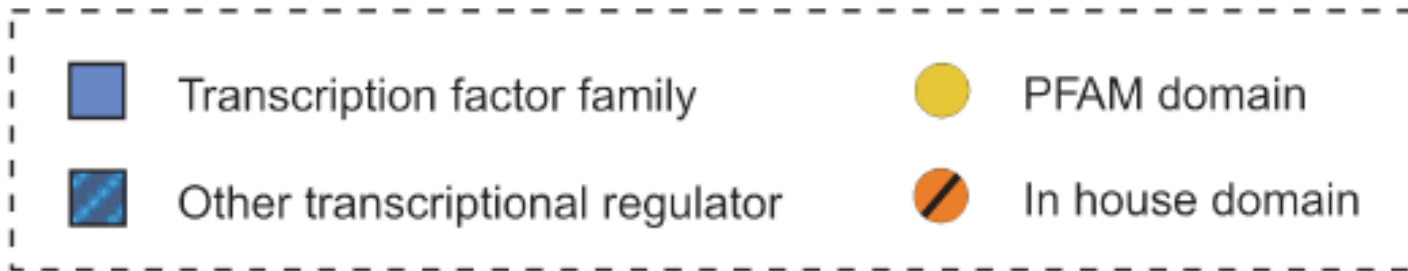
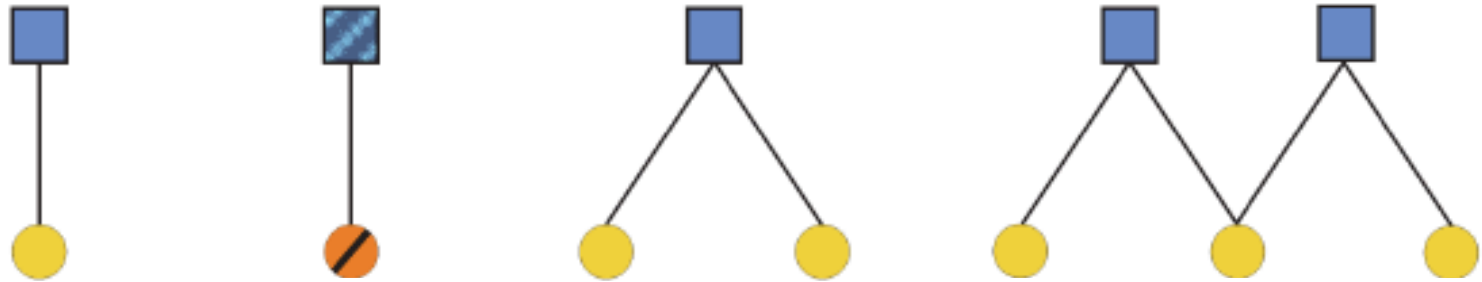
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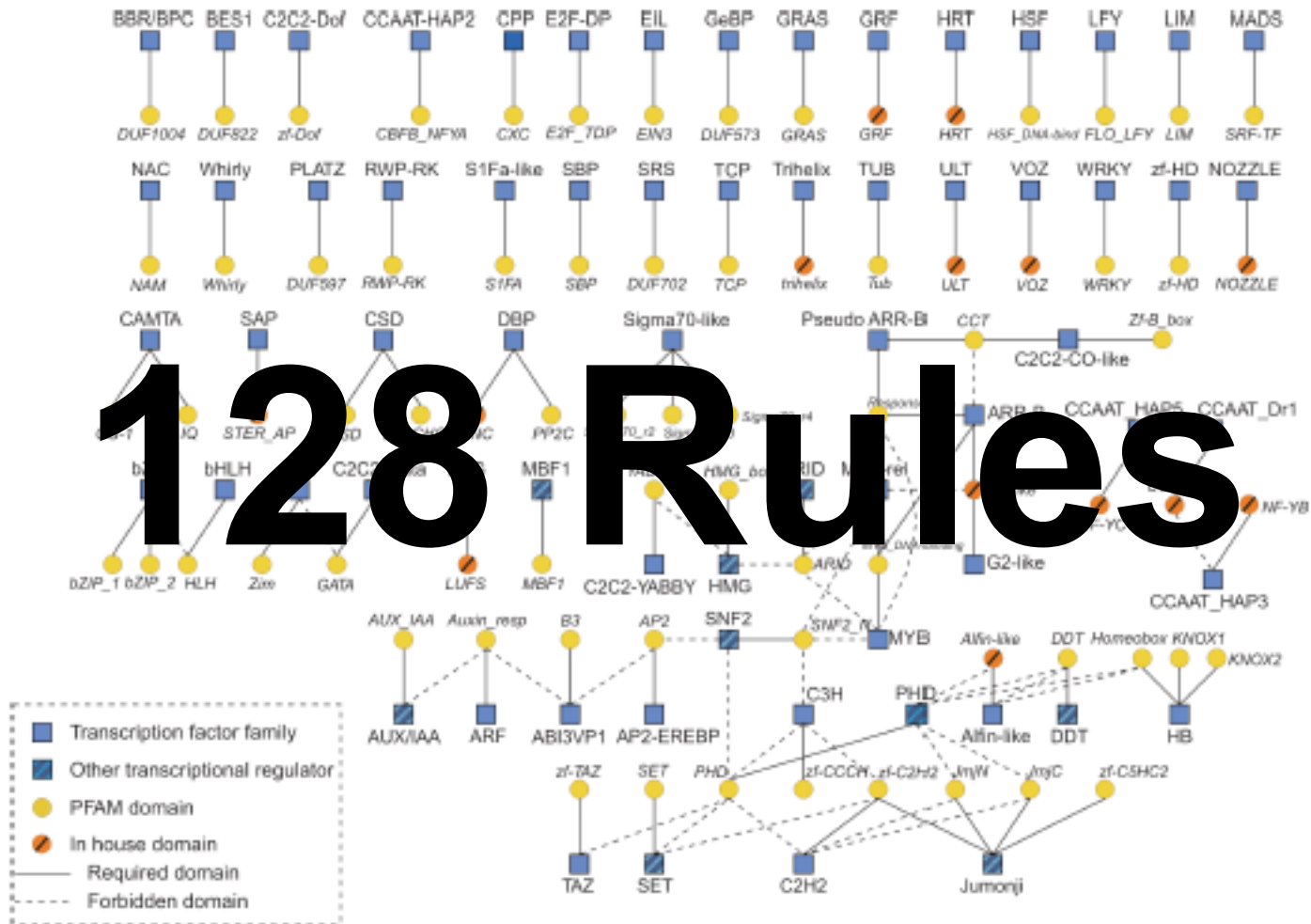
Cortesía Diego Riaño-Pachon, 2011

# Rules



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Cortesía Diego Riaño-Pachon, 2011

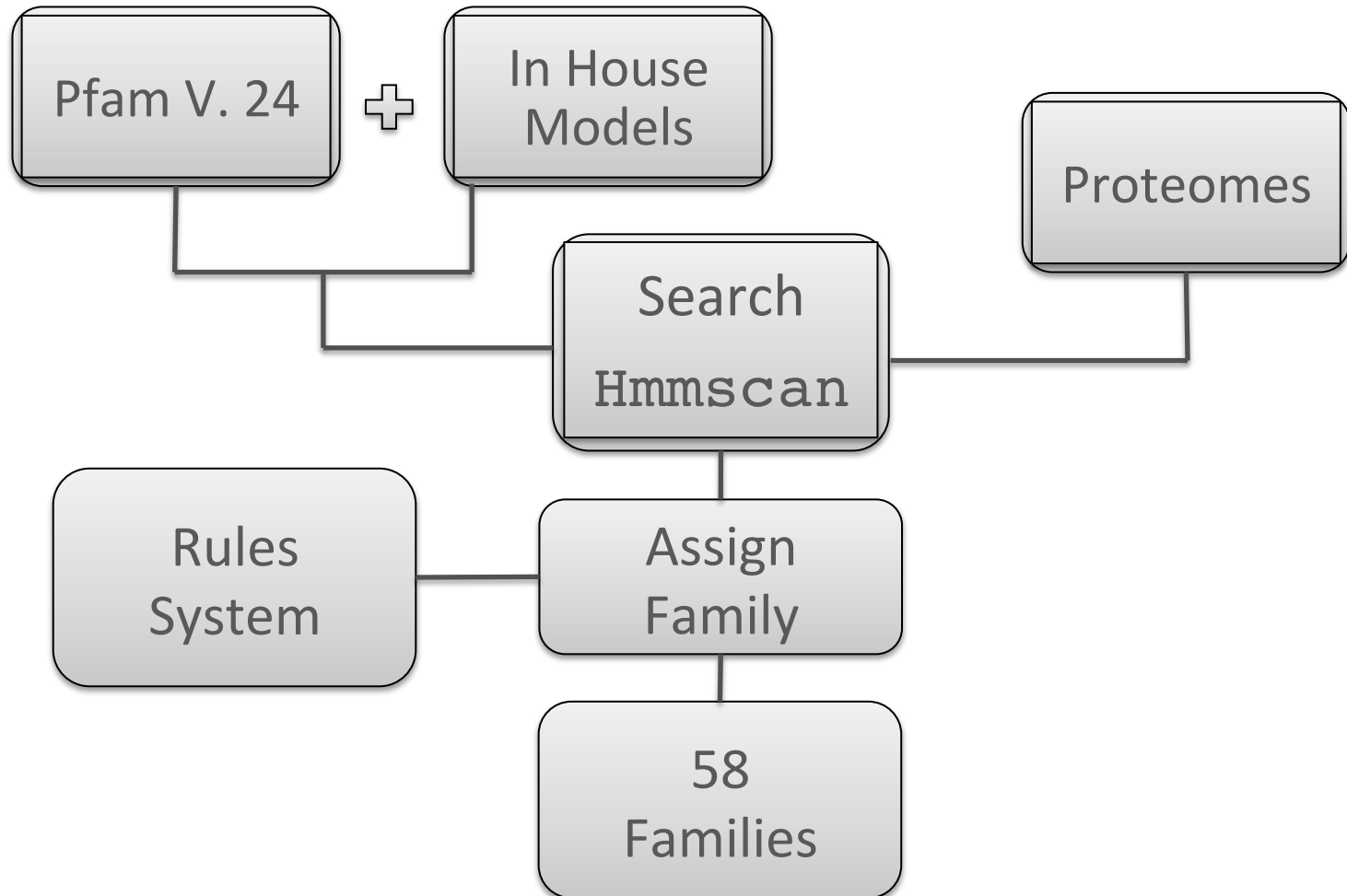


Modified from Riaño-Pachón *et al.* 2007. *BMC Bioinformatics* 8:42

# Stramenopiles

Organism	Size	Genes	Proteins	spurce
<i>P. infestans</i>	237 Mb	18179	18140	BROAD
<i>P. ramorum</i>	65 Mb	15743	16066	DOE-JGI
<i>P. capsici</i>	64 Mb	19805	15919	DOE-JGI
<i>P. sojae</i>	86 Mb	19027	19276	DOE-JGI
<i>S. parasitica</i>	53.09 Mb	20113	20088	BROAD
<i>H. parasitica</i>	82.05 Mb	14567	14565	BROAD
<i>P. ultimum</i>	44.91 Mb	15291	12614	BROAD
<i>T. pseudonana</i>	32 Mb	11397	11318	DOE-JGI
<i>P. Tricornutum</i>	28 Mb	10489	10389	DOE-JGI

# Identification and Clasification





# Database

Models

Genes

Proteins

TFs/TRs  
Families

**StramenoTFDB**

Rules

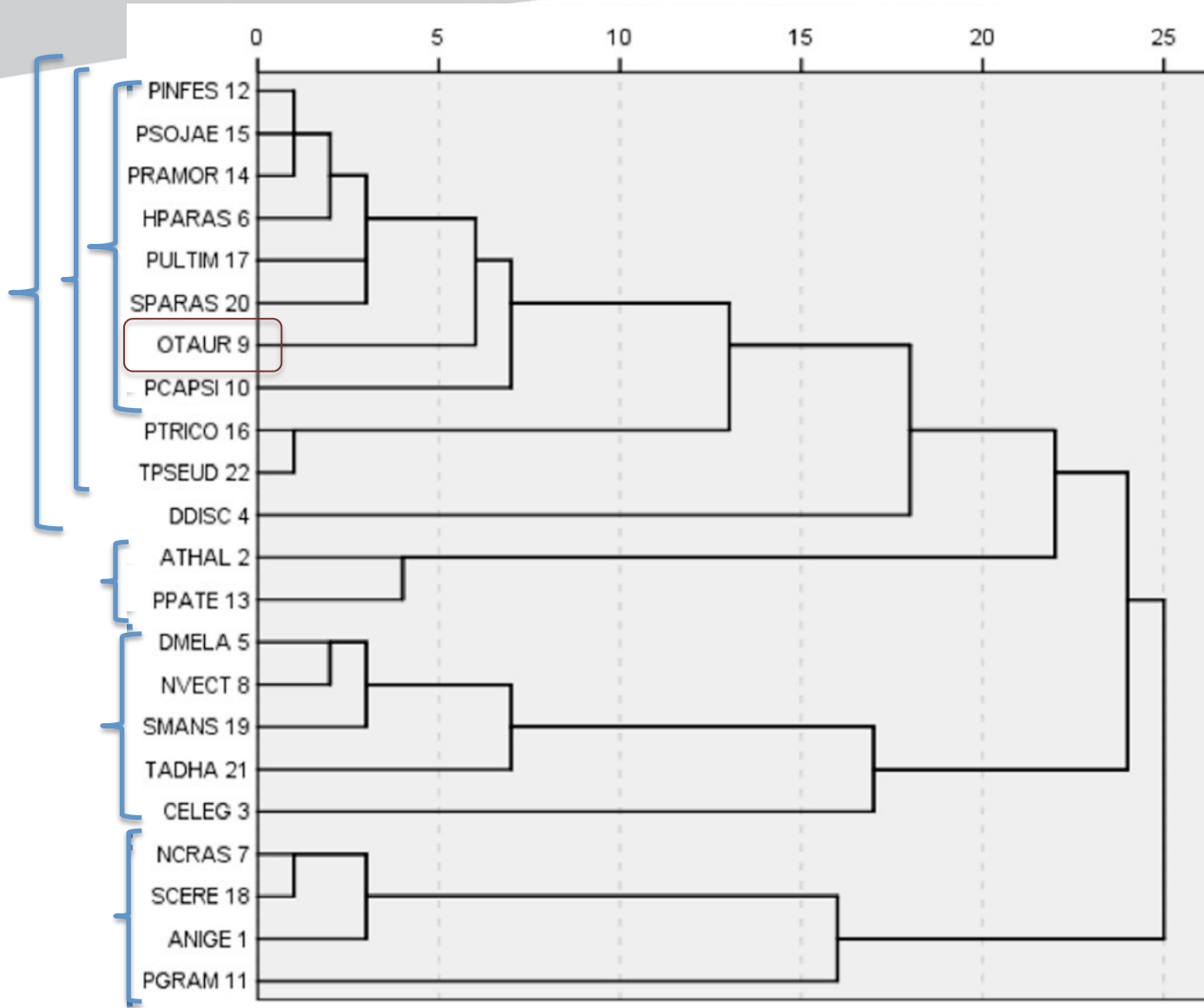
Databases

Related  
Literature

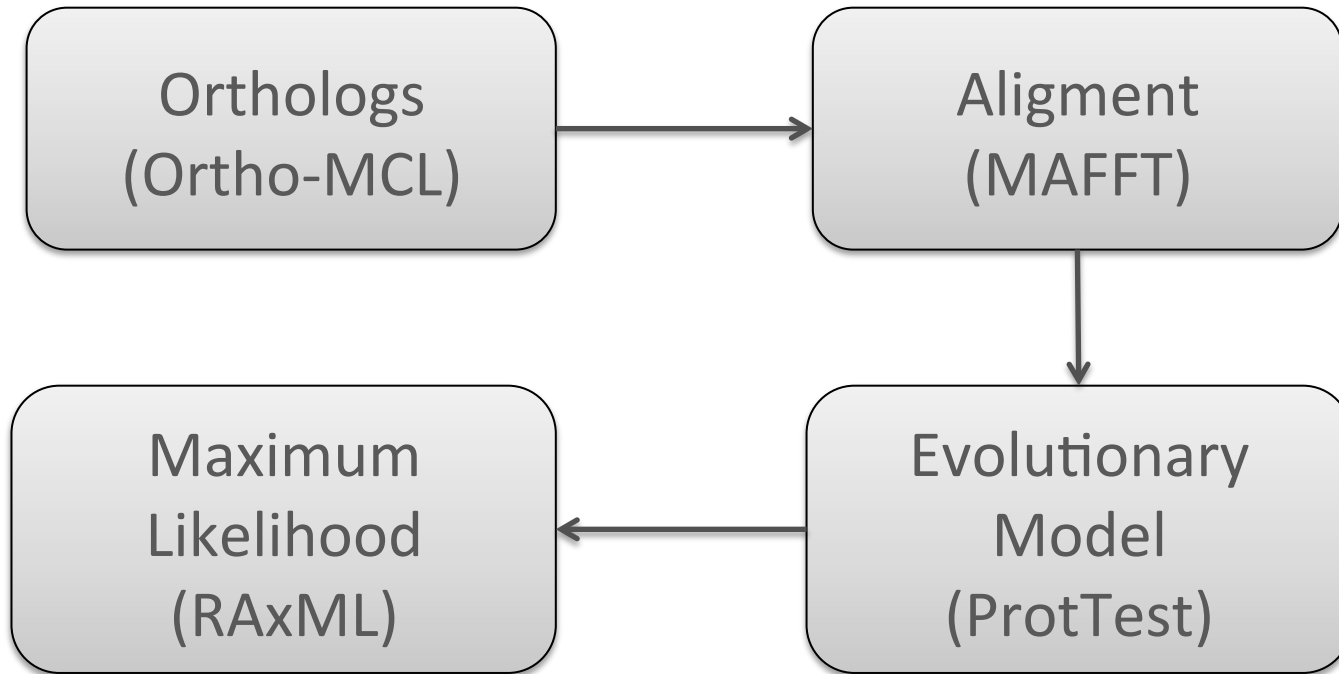
Expression  
data



# Dendrogram

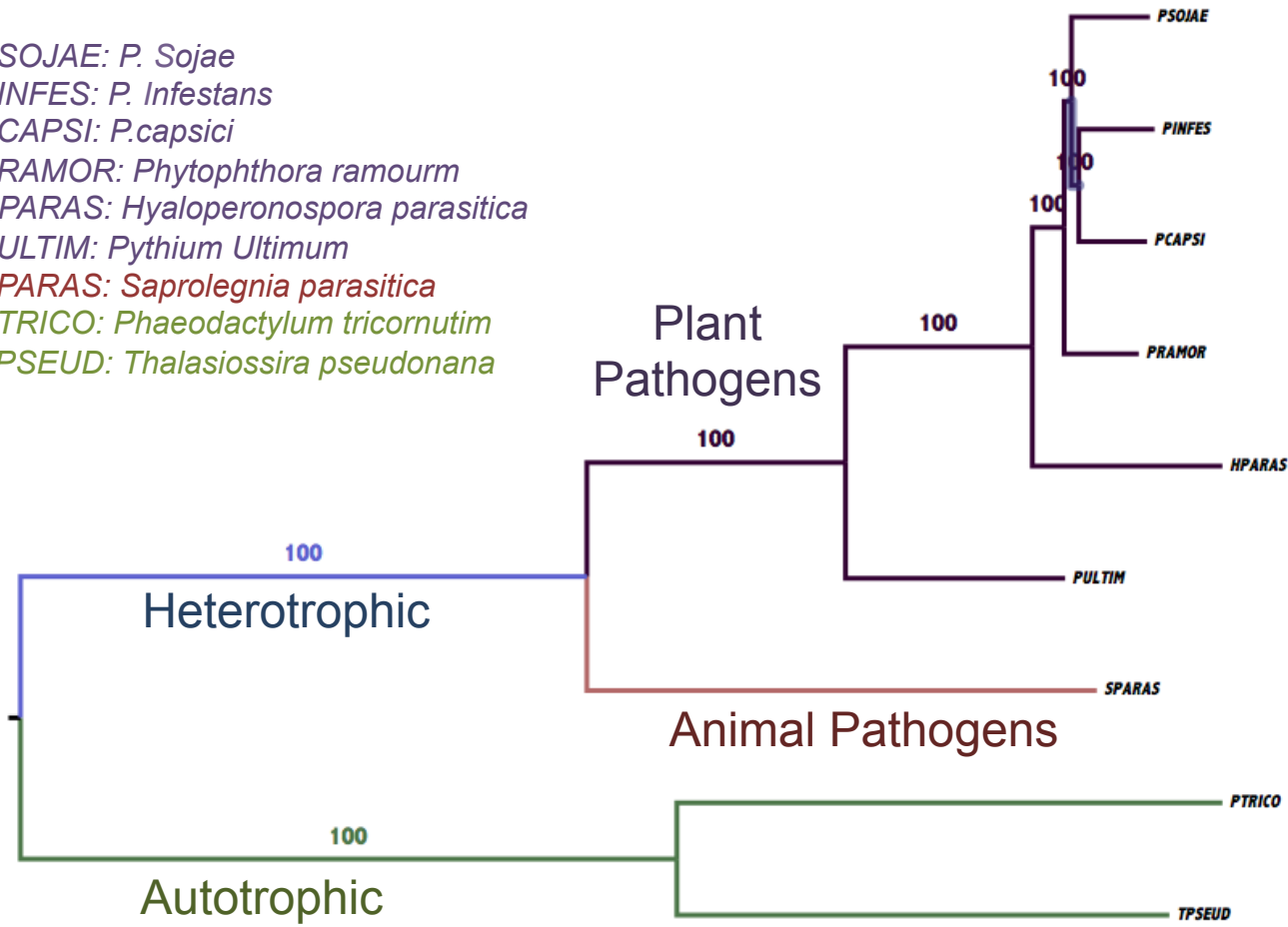


# Phylogenomic Reconstruccion 781 Genes!

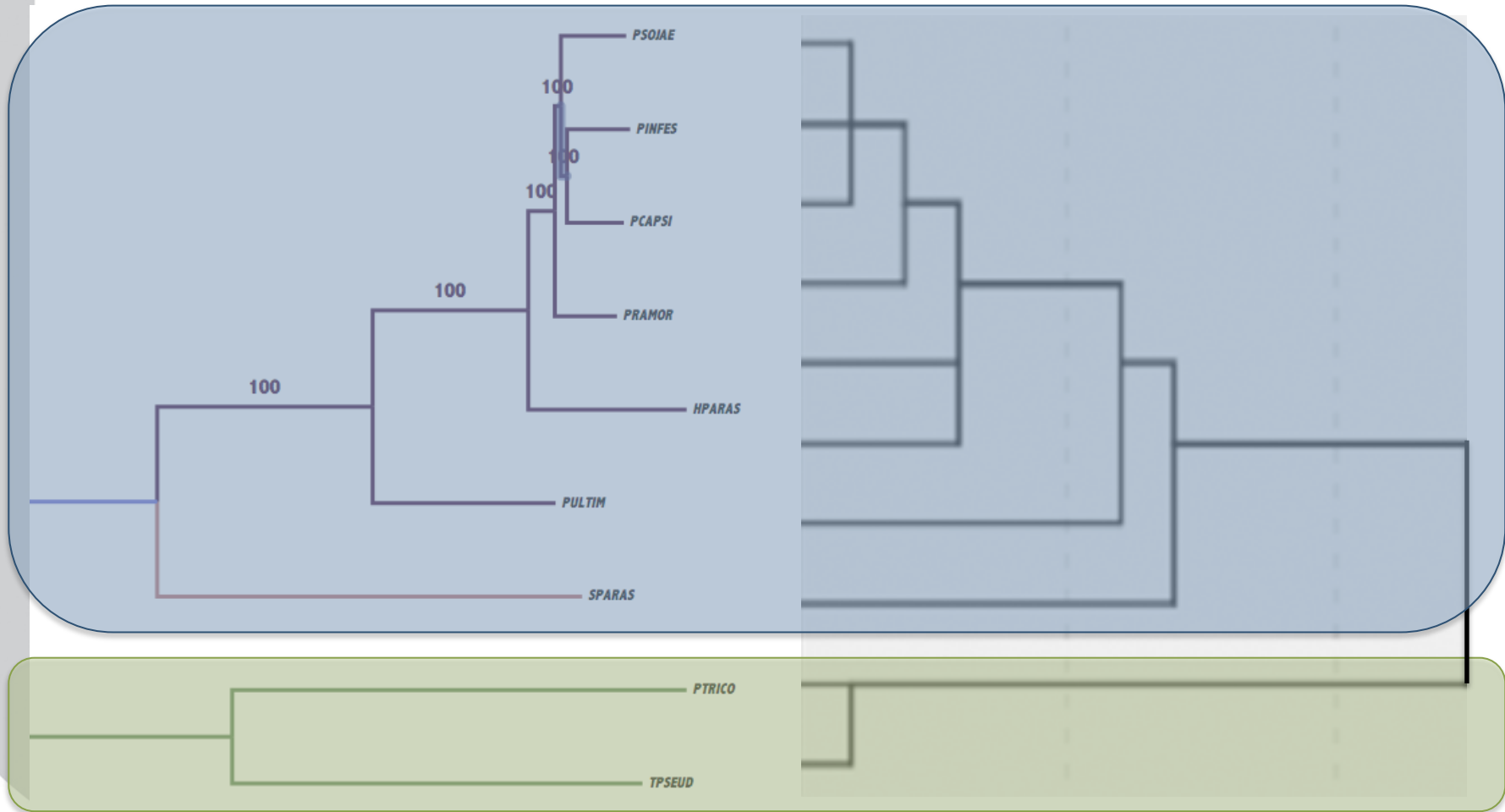


# Phylogenomic Reconstruccion

PSOJAE: *P. Sojae*  
 PINFES: *P. Infestans*  
 PCAPSI: *P. capsici*  
 PRAMOR: *Phytophthora ramourm*  
 HPARAS: *Hyaloperonospora parasitica*  
 PULTIM: *Pythium Ultim*  
 SPARAS: *Saprolegnia parasitica*  
 PTRICO: *Phaeodactylum tricornutum*  
 TPSEUD: *Thalassiosira pseudonana*



# Phylogenetical Signal!



# Outlook

- Deep Analysis TFs/TRs families
- Web Interface
- Phylogenetic independent contrasts (PIC)
- qPCR
- **Inference of gene regulatory networks**

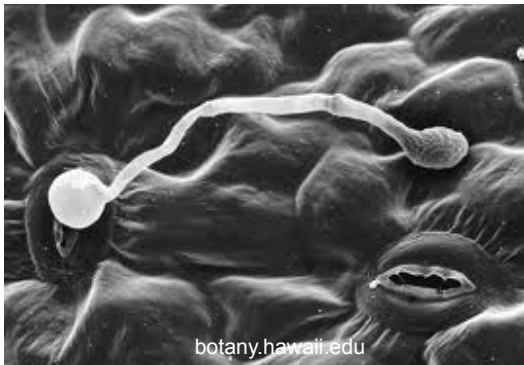
# Acknowledgements

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# Thanks!





# Questions?

