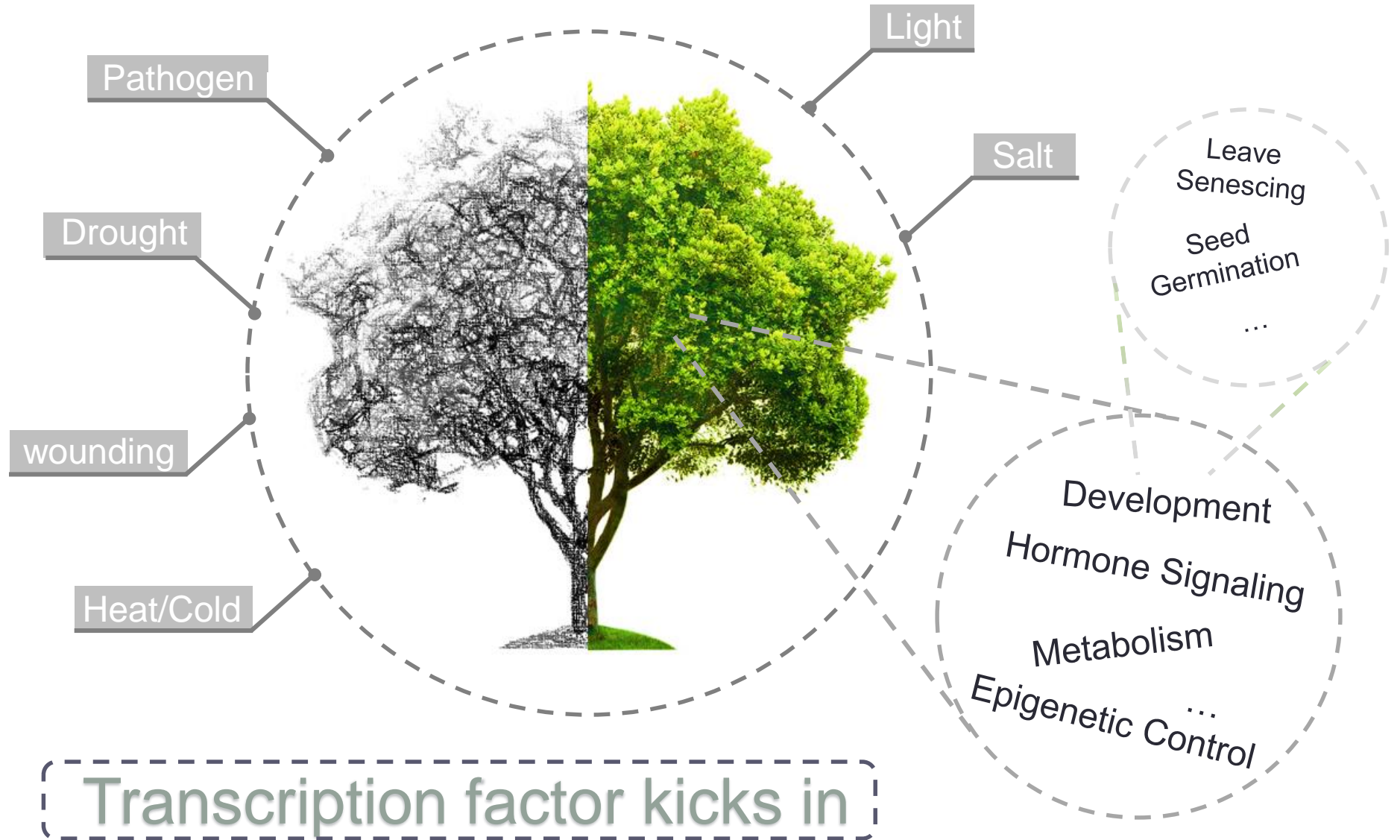


Structure Analysis of DNA Binding Domain in Transcription Factor AtWRKY 11

G09: Wenyi Yang, Minghan Huang, Wenwen Liu, Linlin Dong*

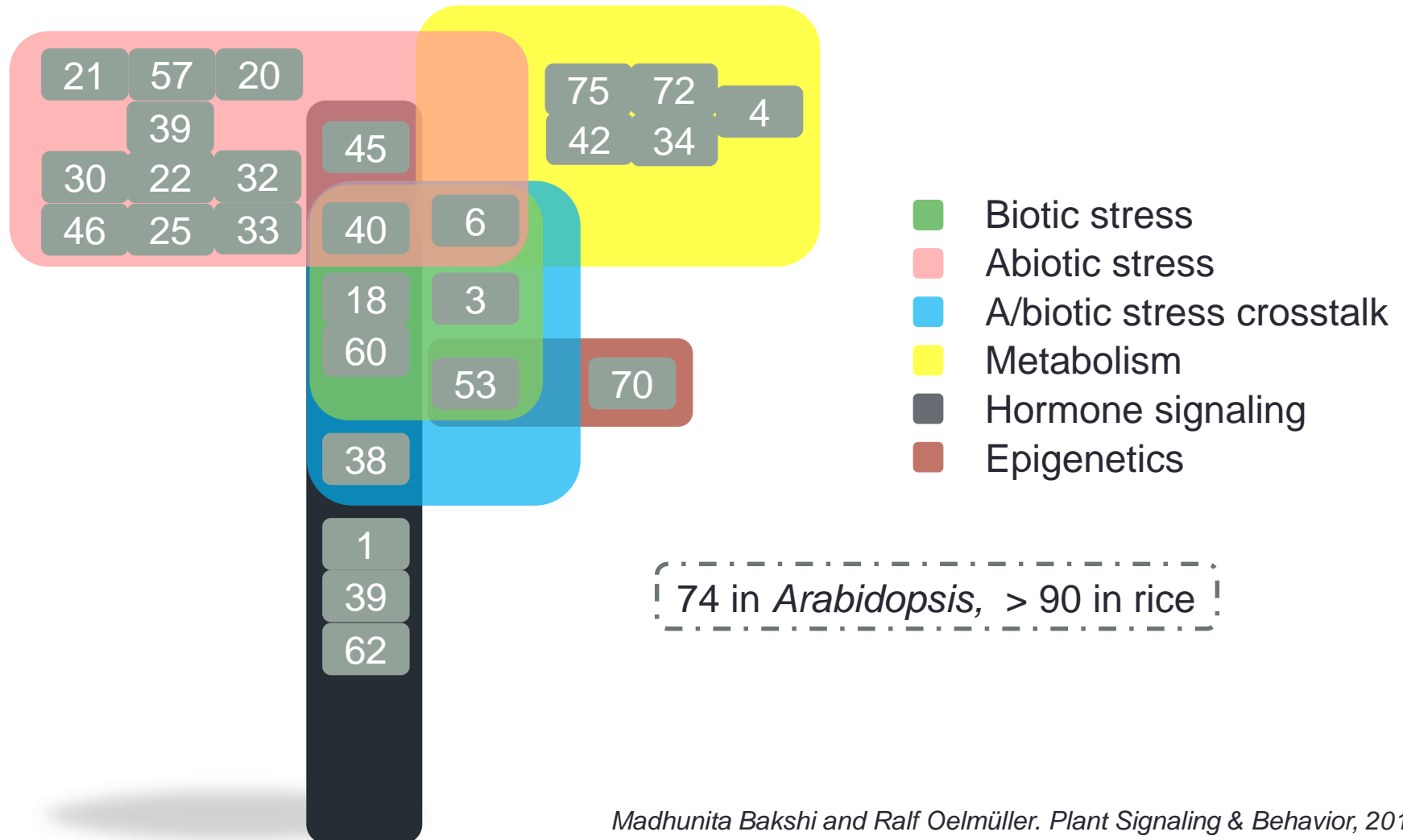
G20: Huanhuan Wang, Shuang Wu, Jianjun Yu, Haikuan Wang*

Life of Plant



Transcription Factor: WRKY Family

Biological functions

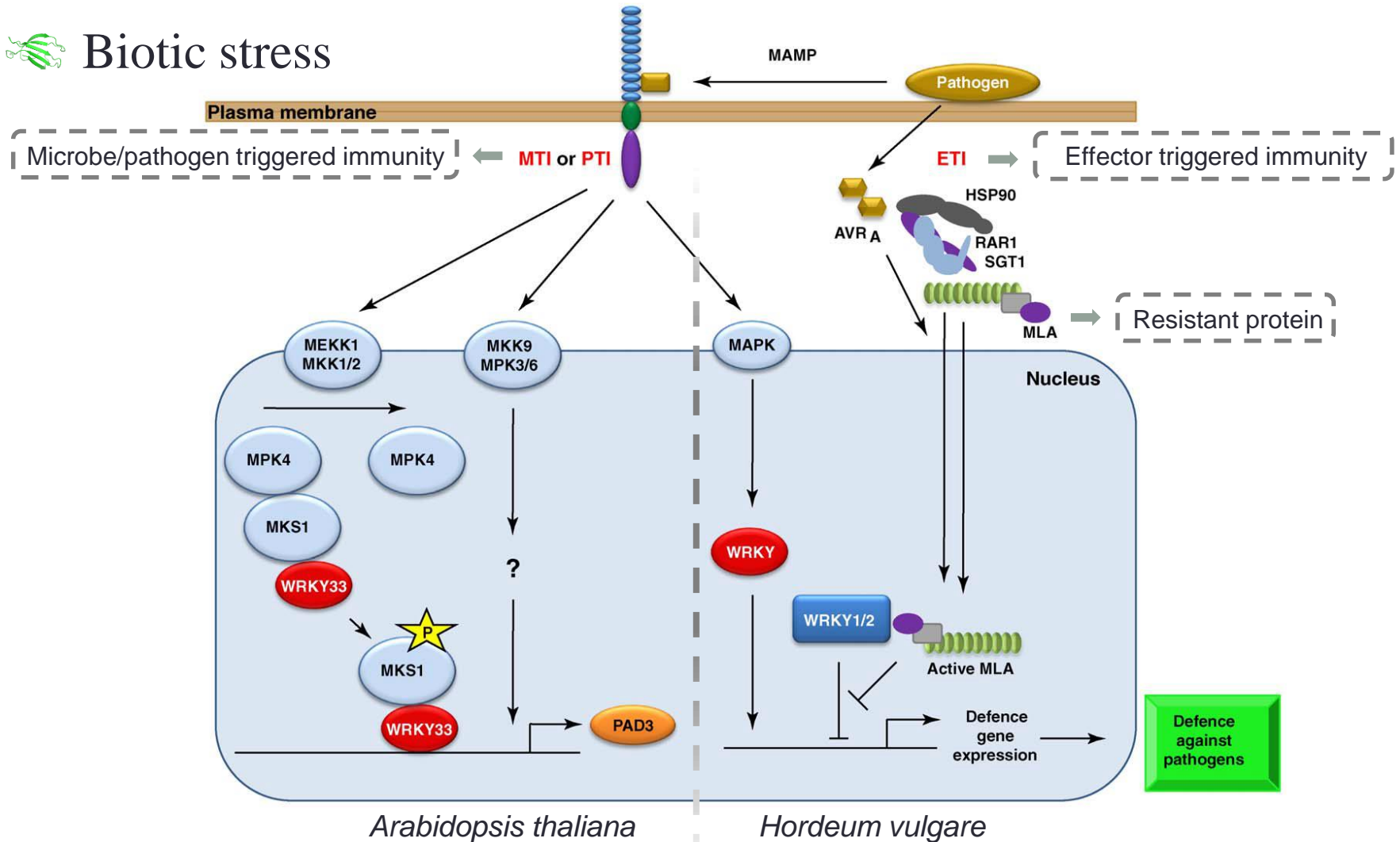


Transcription Factor: WRKY Family

Biological functions

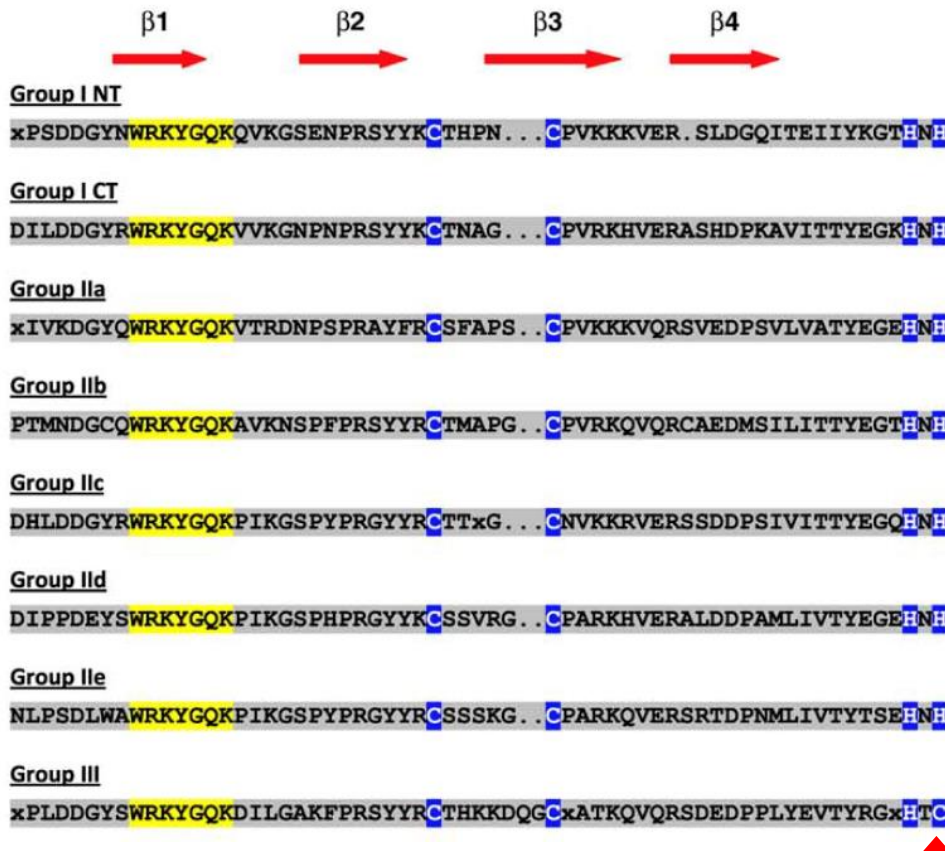


Biotic stress



Transcription Factor: WRKY Family

Sequence of DNA binding domain



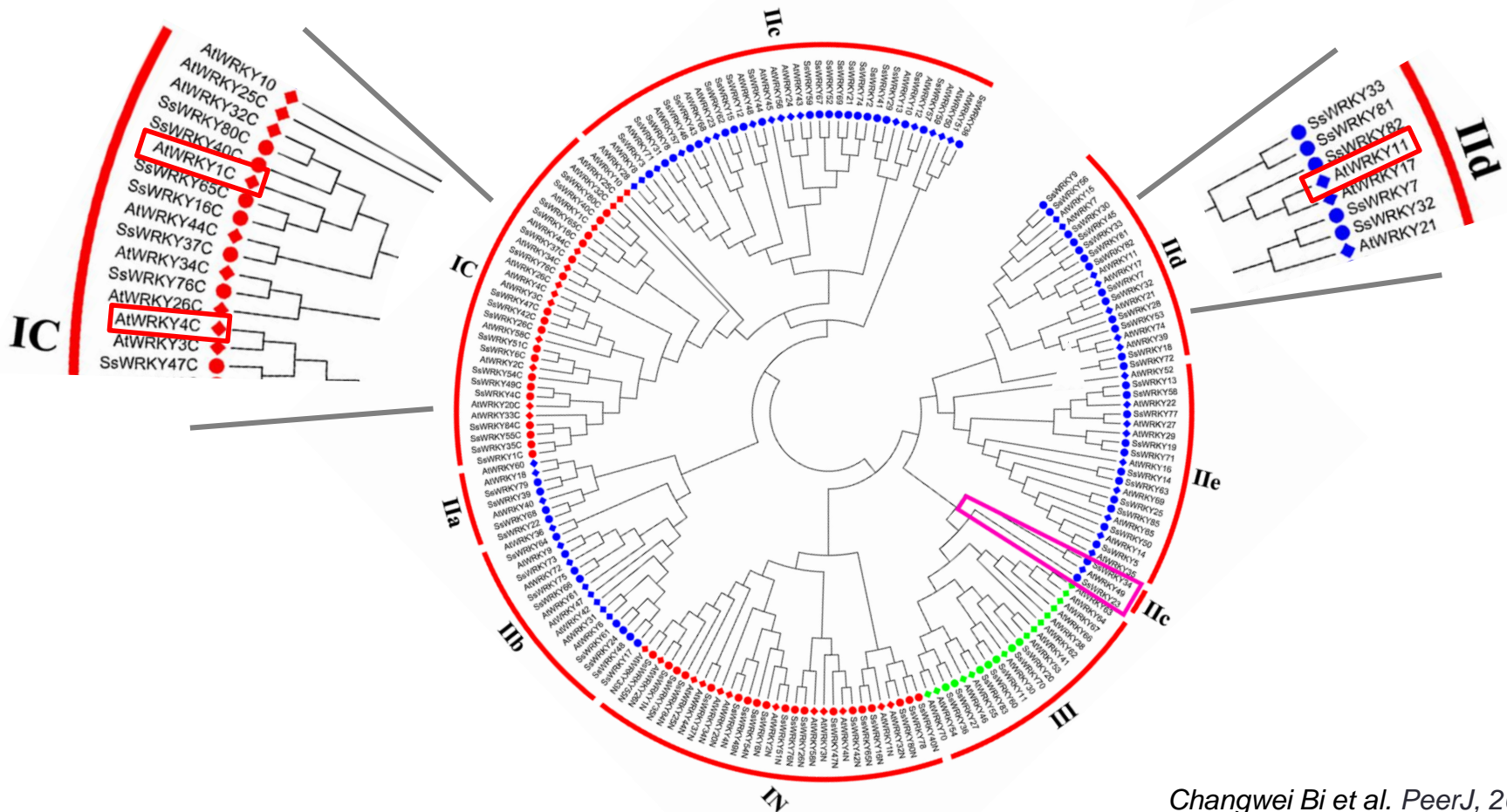
Group I: two DNA binding domains
Group II/III: **zinc finger motif**
WRKY substitutions: WRRY, WSKY, WKRY, WVKY or WKKY
Bind to W-box on DNA: TTGACC / T

Transcription Factor: WRKY Family

WRKY11



Classification

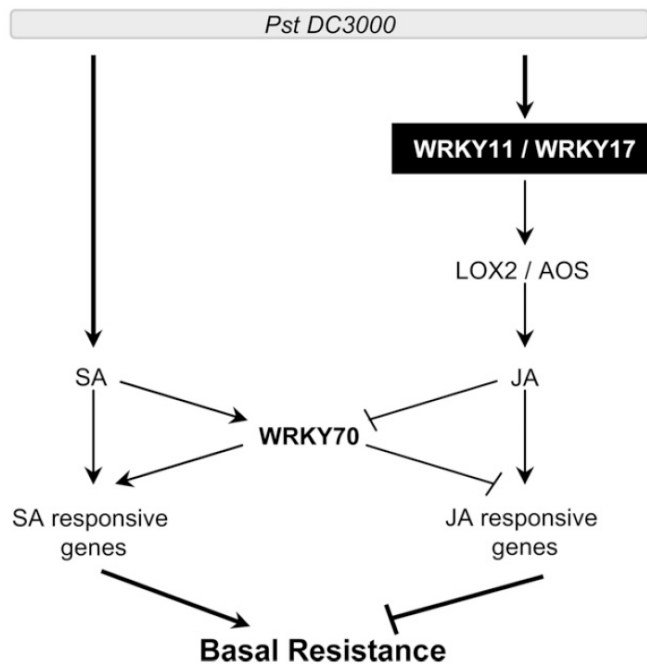


Transcription Factor: WRKY Family

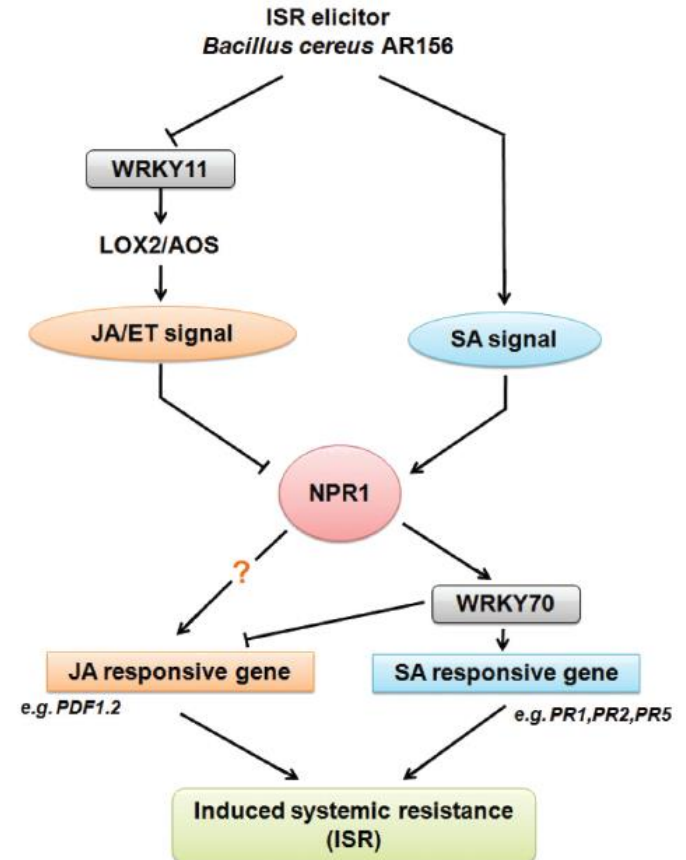
WRKY11



Biological function



WRKY11 and WRKY17 works in a redundant manner to negatively regulate basal resistance



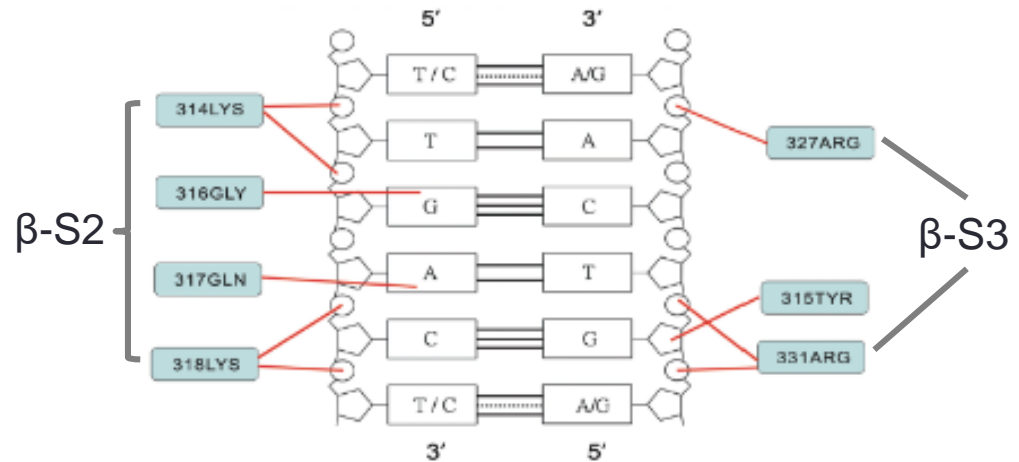
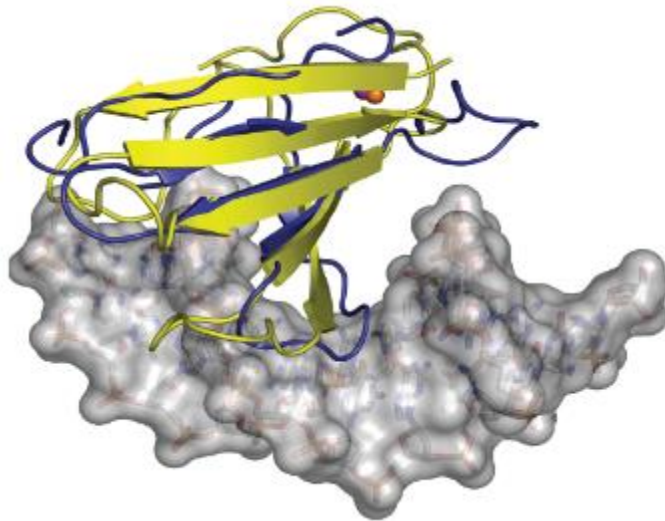
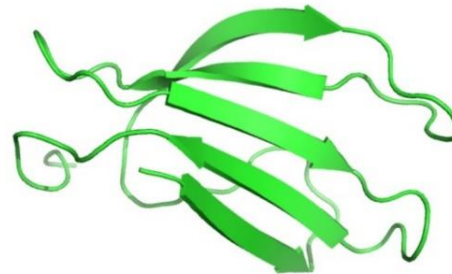
WRKY11 and WRKY70 works in an antagonistic manner to control ISR

Transcription Factor: WRKY Family

3D structure of DNA binding domain



WRKY1 C-terminal



WRKY1-DNA W-box interaction

Yamasaki K et al. *Trends Plant Sci*, 2013.

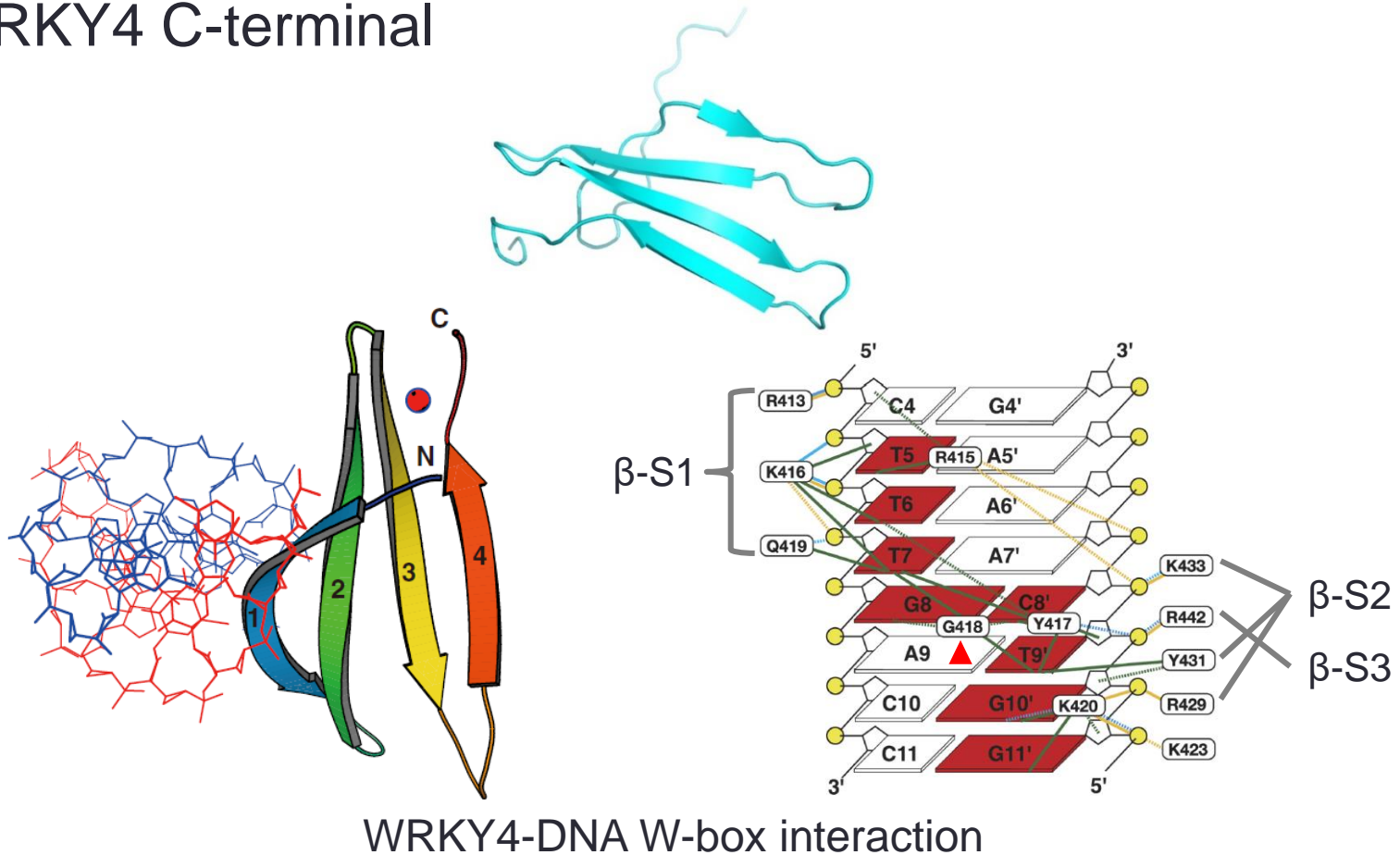
Ming-Rui Duan et al. *Nucleic Acids Research*, 2007

Transcription Factor: WRKY Family

3D structure of DNA binding domain



WRKY4 C-terminal

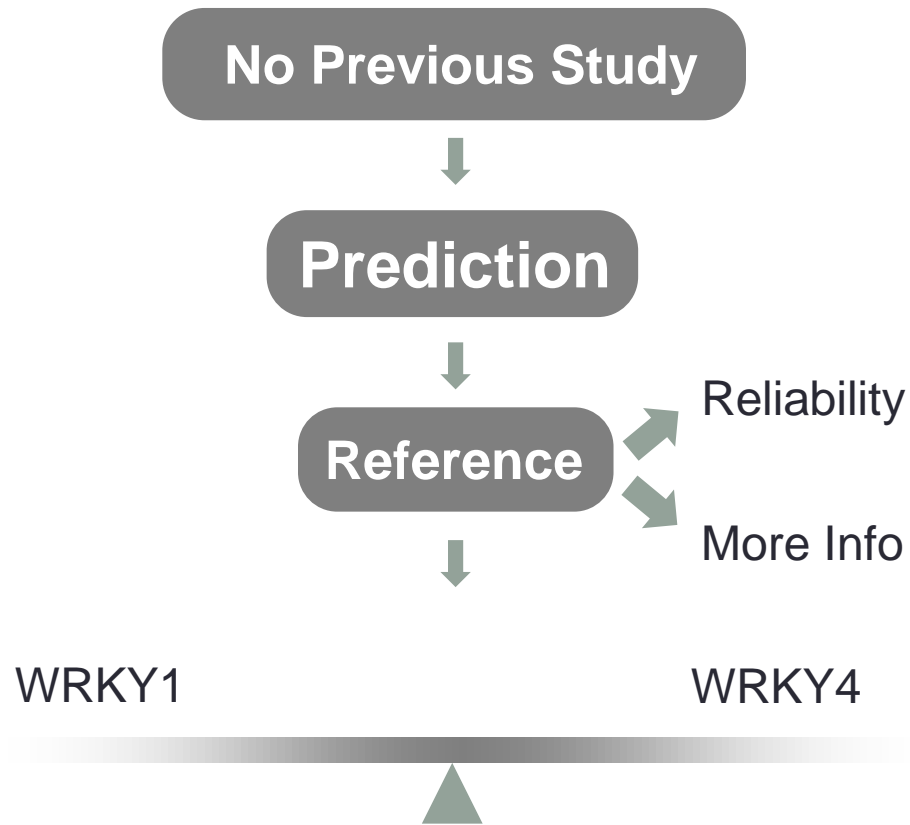


Yamasaki K et al. *Trends Plant Sci*, 2013.

Yamasaki K et al. *The journal of biological chemistry*, 2012.

Transcription Factor: WRKY11

3D structure of DNA binding domain



Transcription Factor: WRKY11

3D structure of DNA binding domain

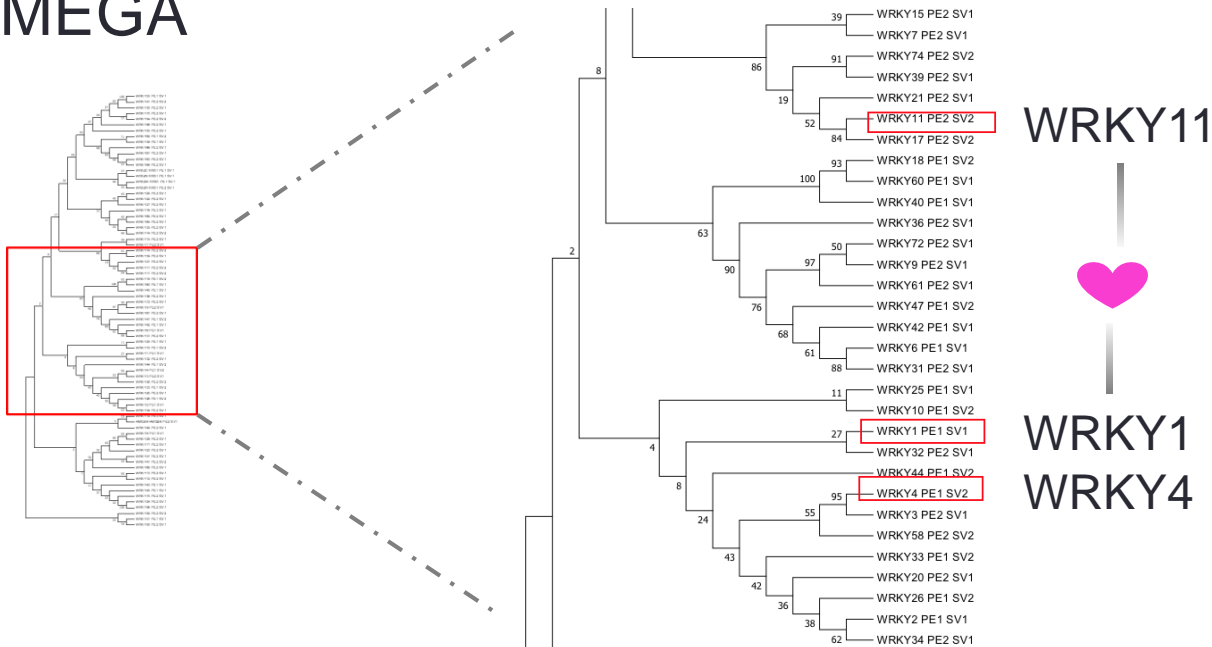


BLAST

<input type="checkbox"/>	RecName: Full=Probable WRKY transcription factor 50; AltName: Full=WRKY DNA-binding protein 50	82.0	82.0	95%	6e-22	55%	Q8VWQ5.1
<input type="checkbox"/>	RecName: Full=WRKY transcription factor 1; AltName: Full=Transcription factor ZAP1; AltName: Full=WRKY DNA-binding protein 1; AltName: Full=Z	85.1	137	95%	1e-21	59%	Q9SI37.1
<input type="checkbox"/>	RecName: Full=Probable WRKY transcription factor 16; AltName: Full=WRKY DNA-binding protein 16	84.7	84.7	85%	2e-21	58%	Q9FL92.1
<input type="checkbox"/>	RecName: Full=Probable WRKY transcription factor 20; AltName: Full=WRKY DNA-binding protein 20	84.3	138	94%	2e-21	62%	Q93WV0.1
<input type="checkbox"/>	RecName: Full=Probable WRKY transcription factor 29; AltName: Full=WRKY DNA-binding protein 29	82.4	82.4	95%	5e-21	55%	Q9SUS1.1
<input type="checkbox"/>	RecName: Full=Probable WRKY transcription factor 4; AltName: Full=WRKY DNA-binding protein 4	82.8	151	94%	8e-21	59%	Q9XI90.2



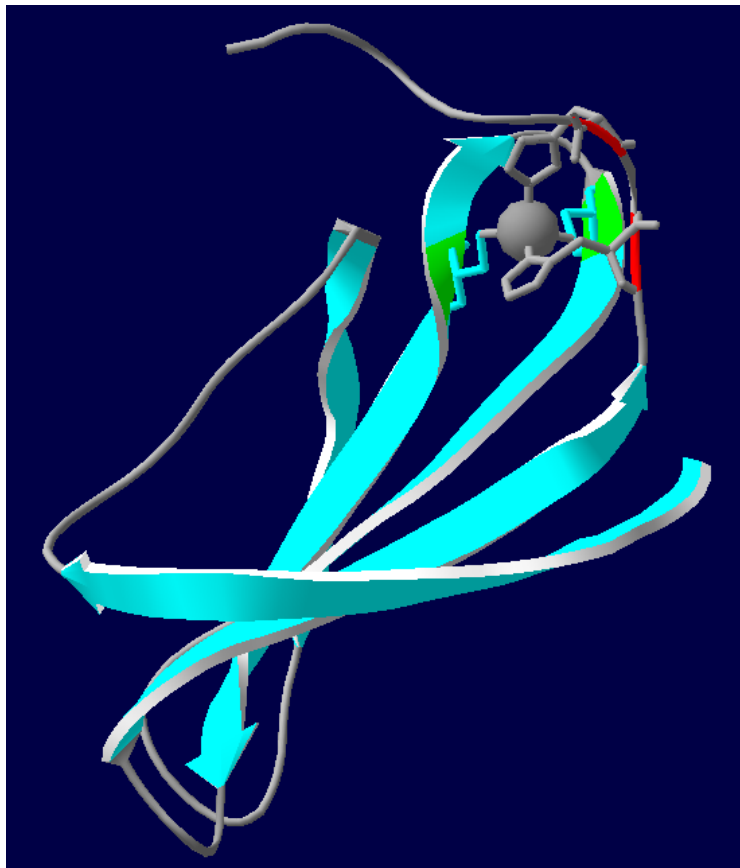
MEGA



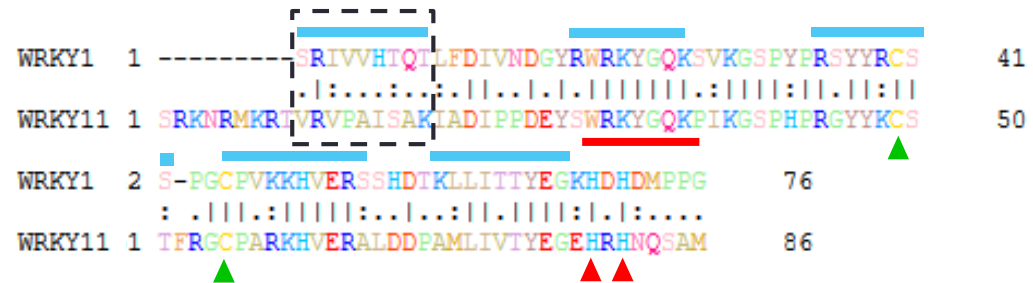
Transcription Factor: WRKY1

3D structure of DNA binding domain

 WRKY1



 Needle



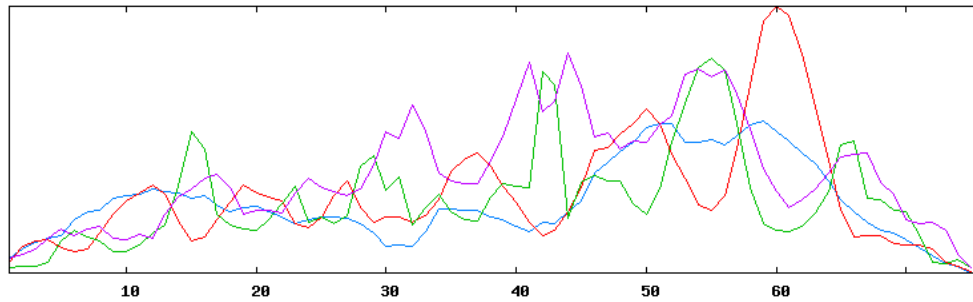
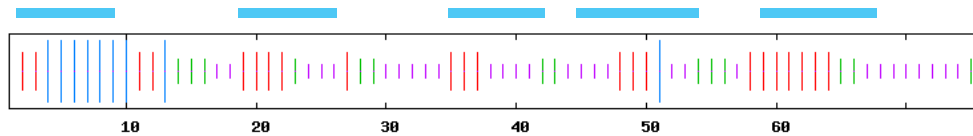
Transcription Factor: WRKY11

3D structure of DNA binding domain

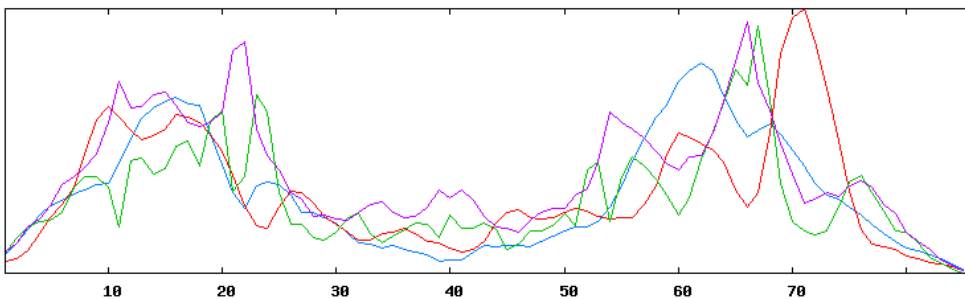
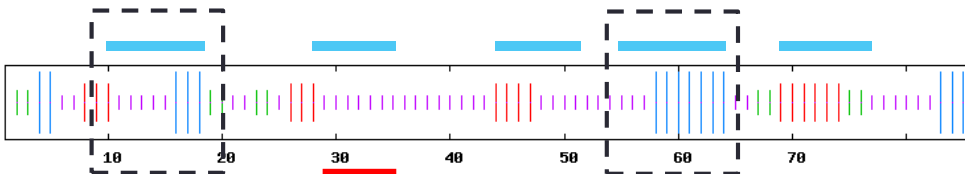


Secondary structure

WRKY1



WRKY11



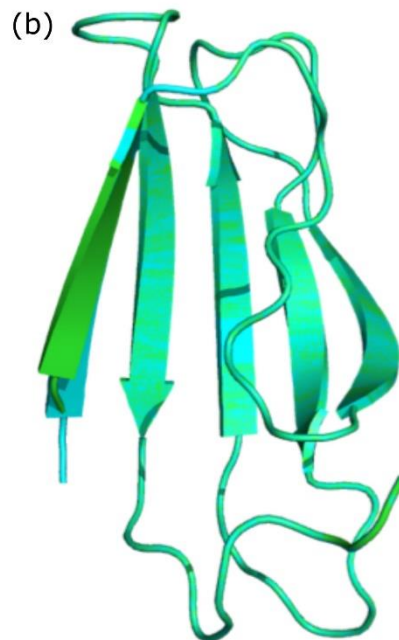
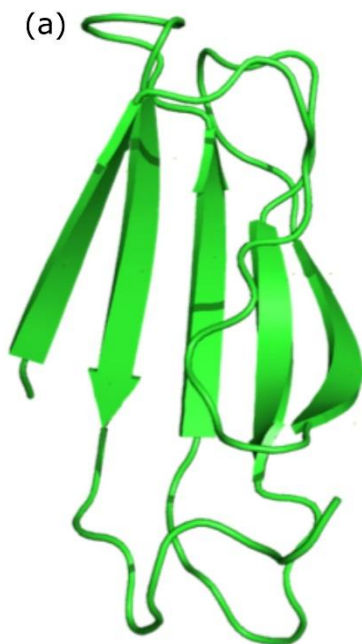
WRKY1 2 S-PGCPVKKHVERSSF
: .|||.:.|||.:.
WRKY11 1 TFRGCPARKHVERALI



Transcription Factor: WRKY11

3D structure of DNA binding domain

 3D structure prediction



Confidence and coverage

Confidence: **100.0%** Coverage: **82%**

75 residues (82% of your sequence) have been modelled with 100.0% confidence by the single highest scoring template.

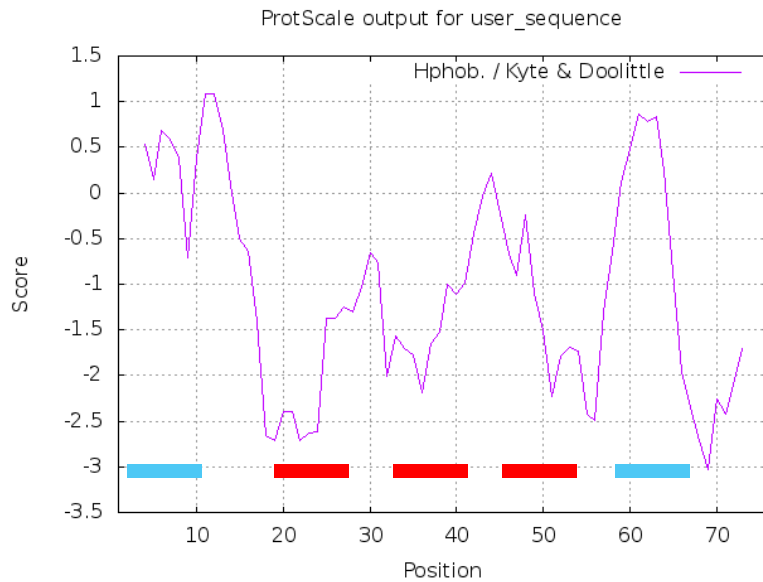
Transcription Factor: WRKY11

3D structure of DNA binding domain

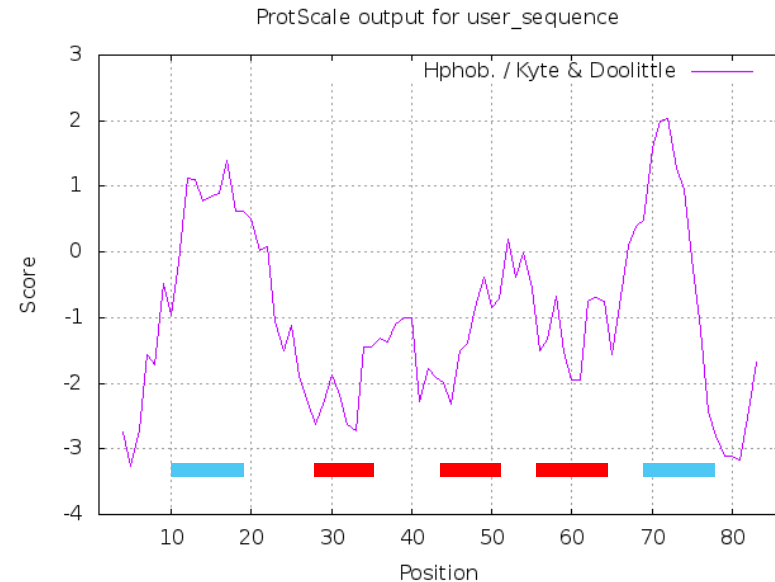


Hydrophobicity & Hydrophilia

Word size: 7



WRKY1



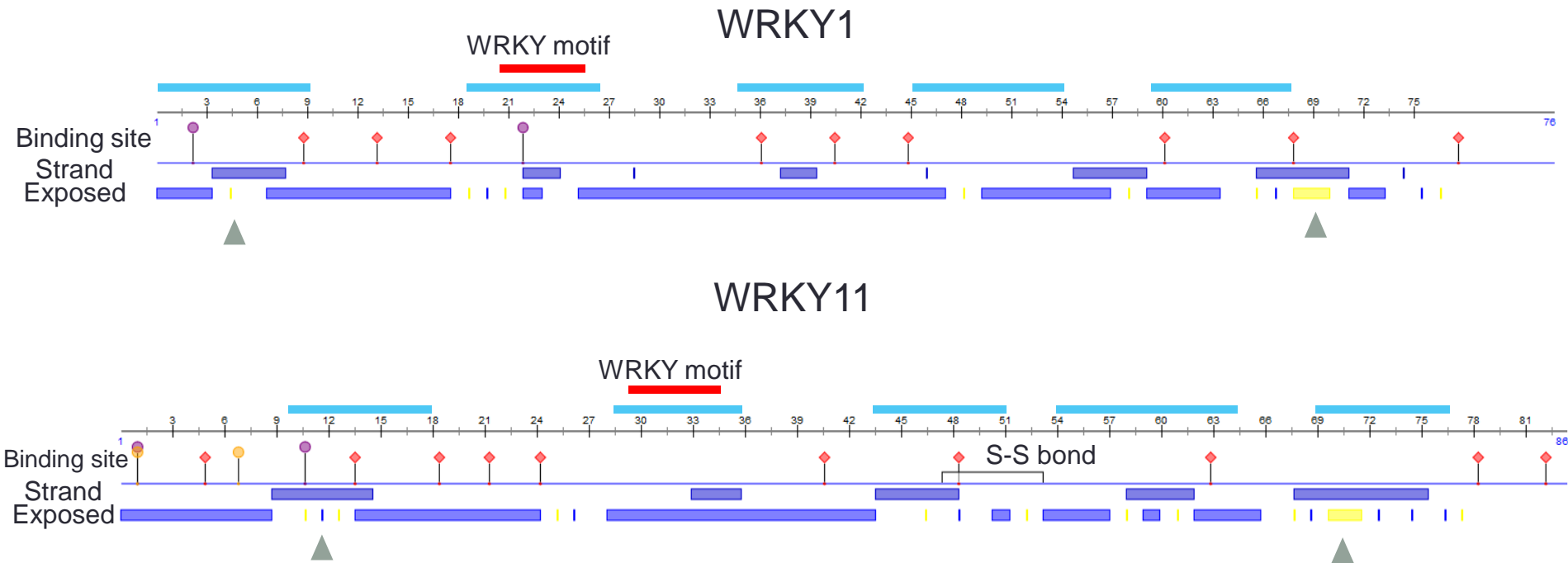
WRKY11

Transcription Factor: WRKY11

3D structure of DNA binding domain



Binding sites



Transcription Factor: WRKY11

3D structure of DNA binding domain

Summary 1

1. WRKY11 DBD may have 4 β -strands
2. The strand 1-3 of WRKY11 DBD may interact with DNA W-box
3. The strand 4 of WRKY11 DBD may be deeply buried

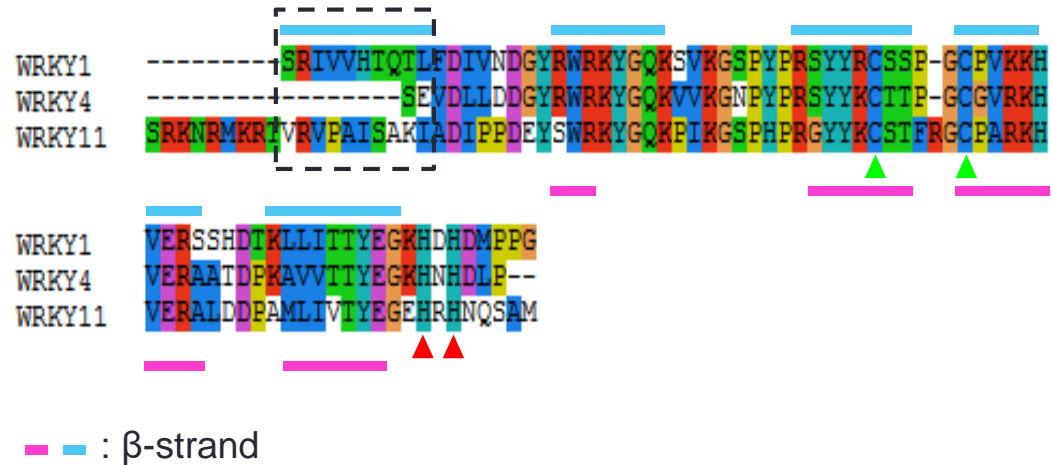
Transcription Factor: WRKY11

3D structure of DNA binding domain

 WRKY4



 Emma



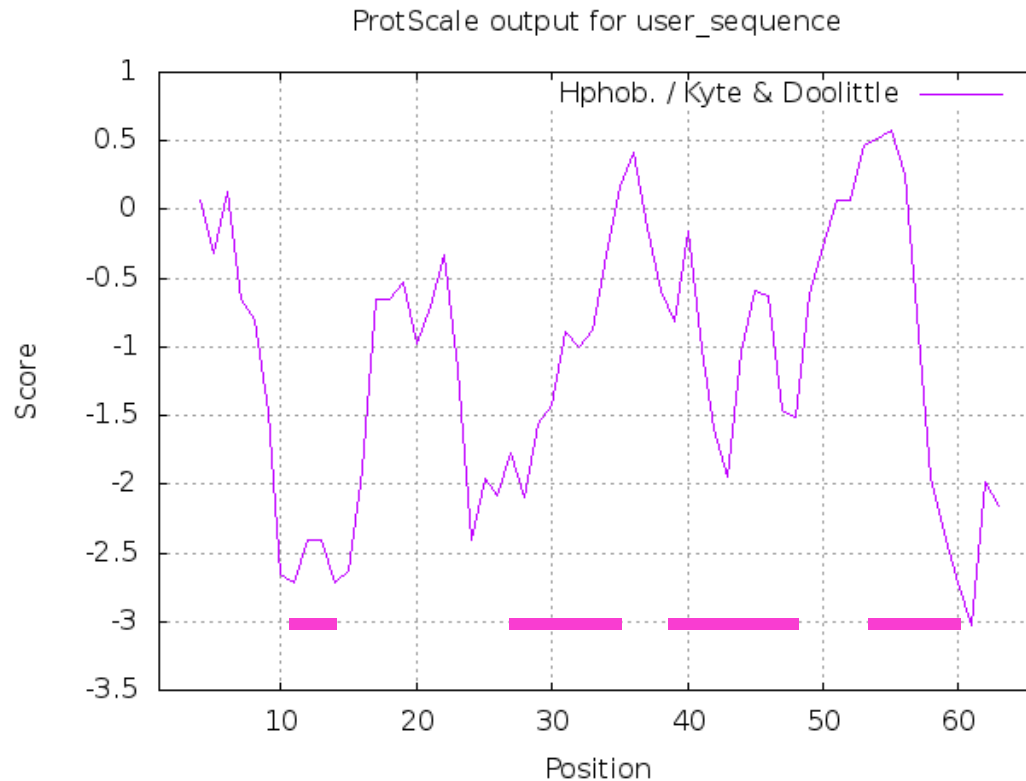
Transcription Factor: WRKY11

3D structure of DNA binding domain



Hydrophobicity & Hydrophilia

Word size: 1



WRKY4

Transcription Factor: WRKY11

3D structure of DNA binding domain



Binding sites



▼ : WRKY1

▼ : WRKY4

Transcription Factor: WRKY11

3D structure of DNA binding domain

Conclusion

1. WRKY11 DBD may have 4 β -strands
 2. The strand 1-3 of WRKY11 DBD may interact with DNA W-box
 3. The strand 4 of WRKY11 DBD may be deeply buried
-
4. The DNA binding site of WRKY11 DBD may include WRKY motif (K253、Y254、G255、Q256、K257); R266、R270

THANKS !

Q & A