

# 40种R2R3-MYBs的特异性景观揭示了如何通过同源二聚化靶向不同的顺式元件

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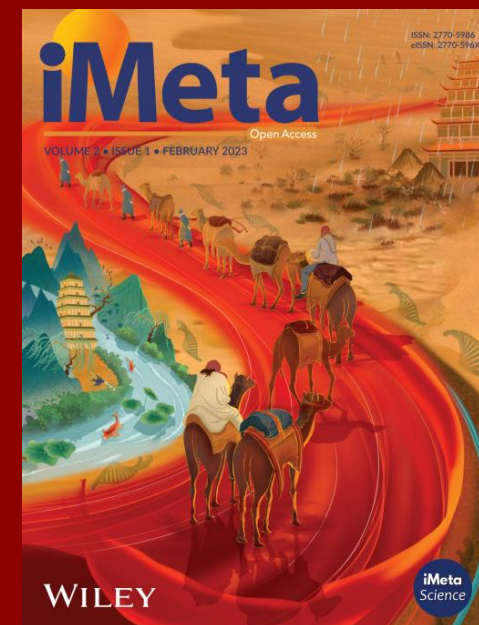
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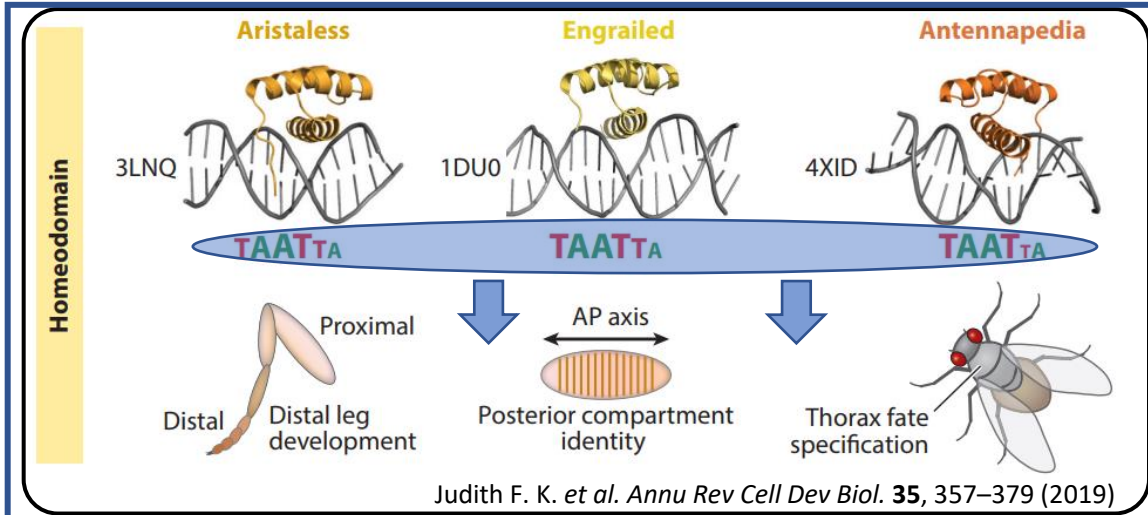
Tian Li, Hao Chen, Nana Ma, Dingkun Jiang, Jiacheng Wu, Xinfeng Zhang, et al. 2025. Specificity landscapes of 40 R2R3-MYBs reveal how paralogs target different cis-elements by homodimeric binding. *iMeta* 4: e70009.

<https://doi.org/10.1002/imt2.70009>



# 引言

## ▶ 旁系同源转录因子面临特异性悖论



ARF4	TGTC	Clade A
ARF29	TGTC	
ARF34	TGTC	
ARF16	TGTC	
ARF18	TGTC	
ARF27	TGTC	
ARF35	TGTC	
ARF7	TGTC	
ARF39	TGTCCCC	
ARF14	TGTCCCC	
ARF36	TGTCCCC	Clade B
ARF13	TGTCCCC	
ARF10	TGTCCCC	
ARF25	TGTC	

Galli, M. et al. *Nat. Commun.* **9**, 4526 (2018)

**Leaf expansion**

Treatment: None IAA NAA NPA

Wild type				
arf16				

Wilmoth, J. C. et al. *The Plant Journal* **43**, 118–130 (2005)

**Root hair formation**

G	W22 + IAA	H	arf27-1 + IAA

Dash, L. et al. *bioRxiv* (2023)

### Subfamily VIII R2R3-MYBs

**MYB13: Cotyledon response UV-B**

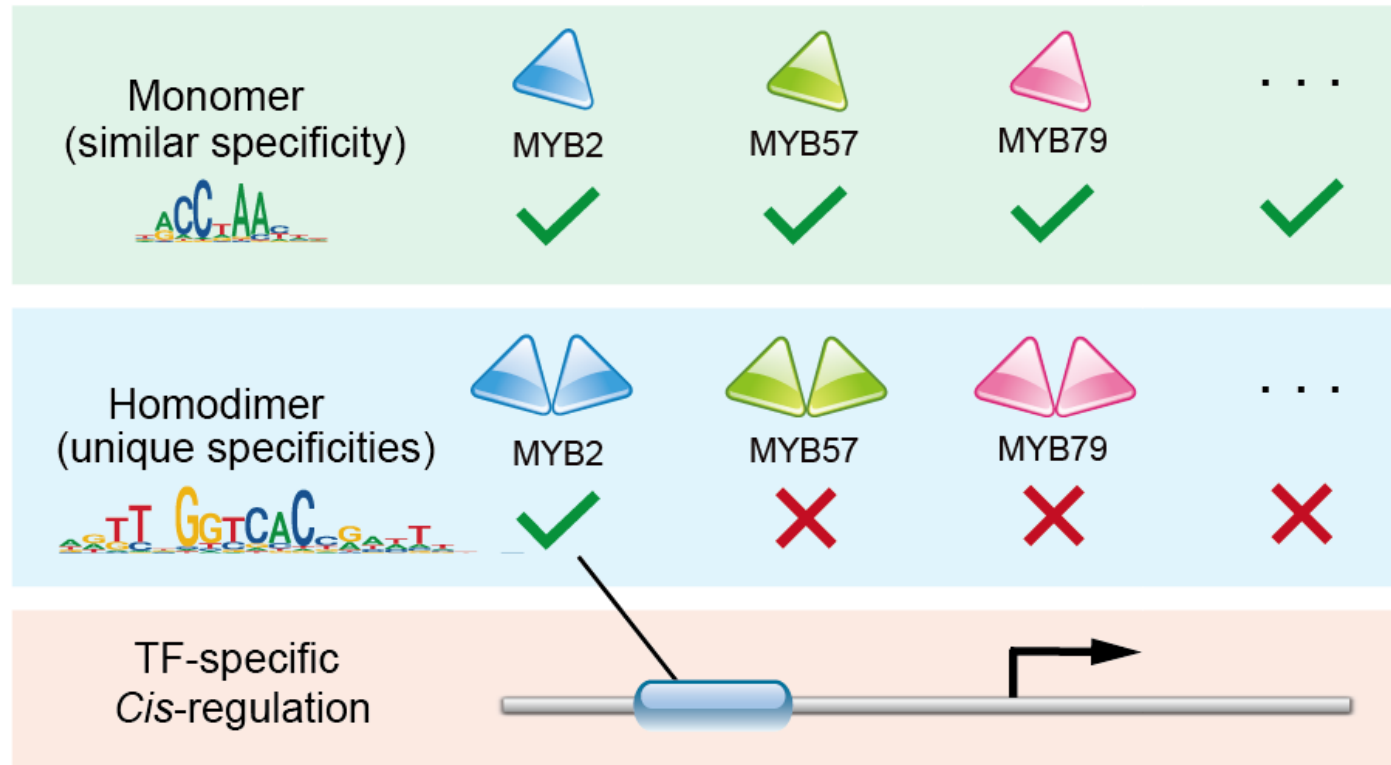
**MYB83: Stem cell wall formation**

O'Malley, R. C. et al. *Cell* **165**, 1280–1292 (2016)



# 亮点

## Specificity Landscape of 40 R2R3-MYBs



- 揭示同源二聚化新机制使真核生物能够据此区分旁系同源TFs
- 迄今最大规模的植物SELEX数据集揭示了40个第VIII亚家族R2R3-MYBs的DNA结合序列偏好
- 发现并命名了高特异性的AtMYBs，即CCWAA-box



# 特异性结合景观揭示高选择性的CCWAA-box MYBs

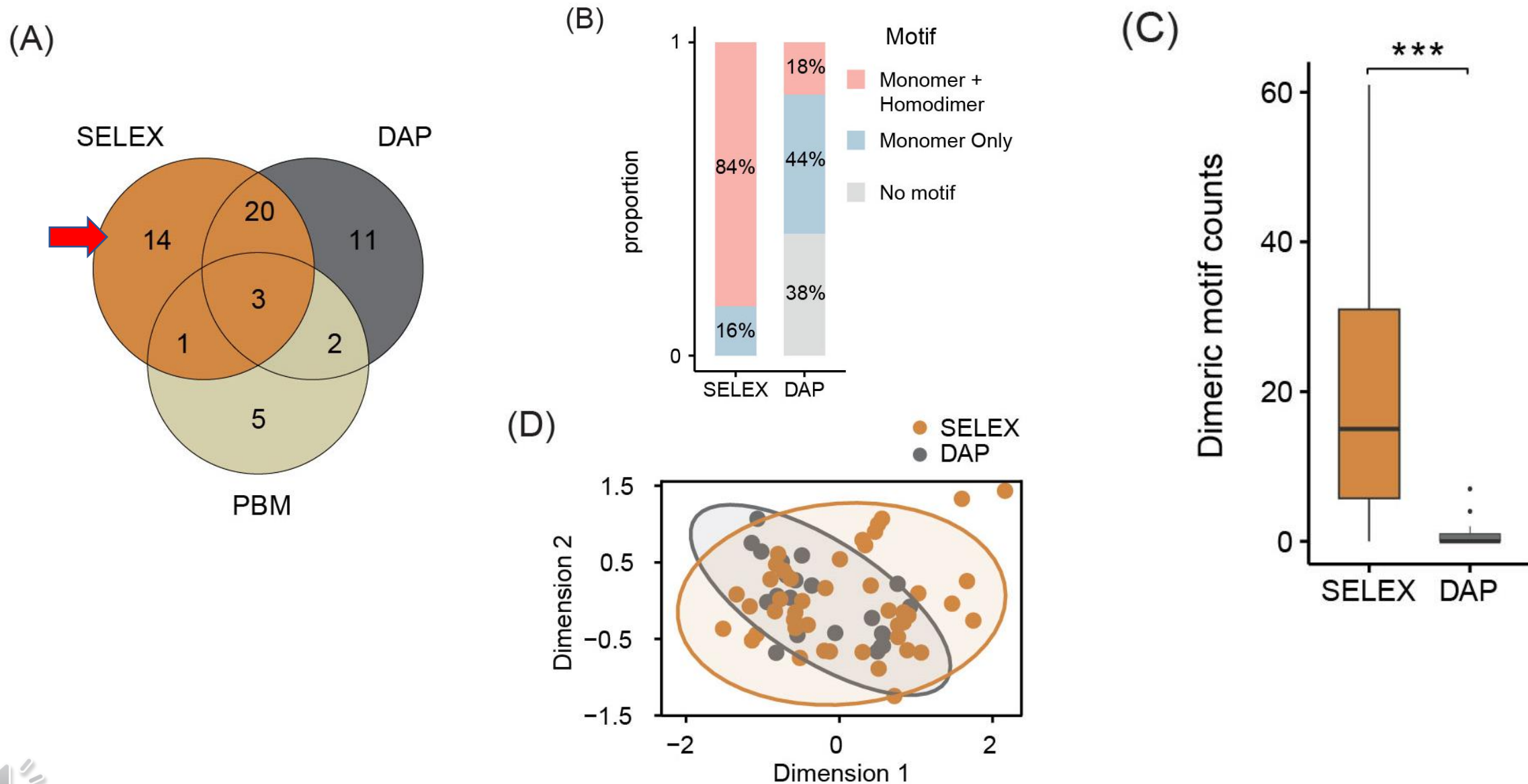


图1 第VIII亚家族R2R3-MYBs的结合特异性景观



# 特异性结合景观揭示高选择性的CCWAA-box MYBs

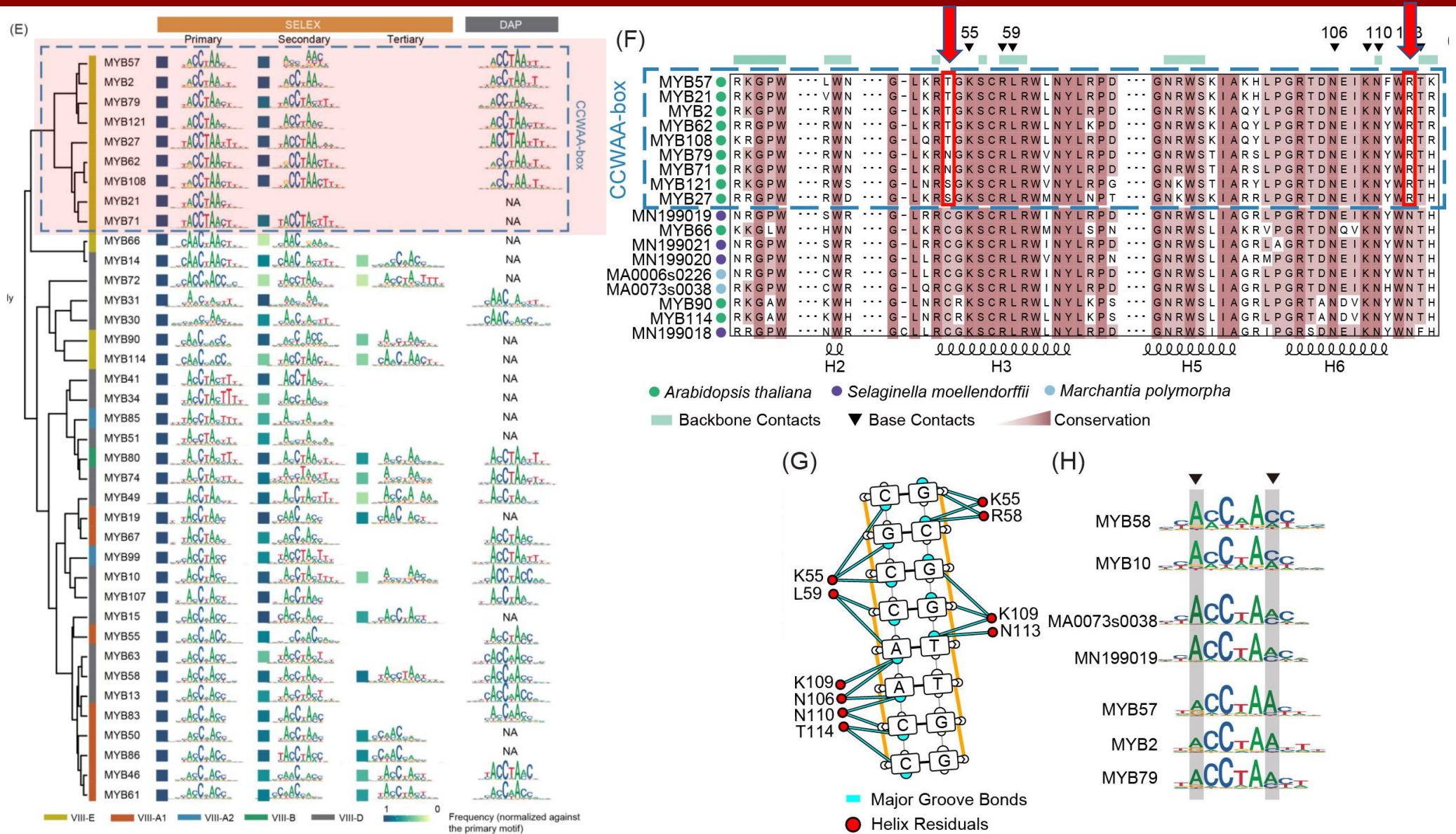


图1 第VIII亚家族R2R3-MYBs的结合特异性景观



# 邻近AtMYB2同源二聚体结合特异性改变



图2 紧密间距的AtMYB2同源二聚体的特异性变化



# 结合特异性改变是AtMYB2独有特性

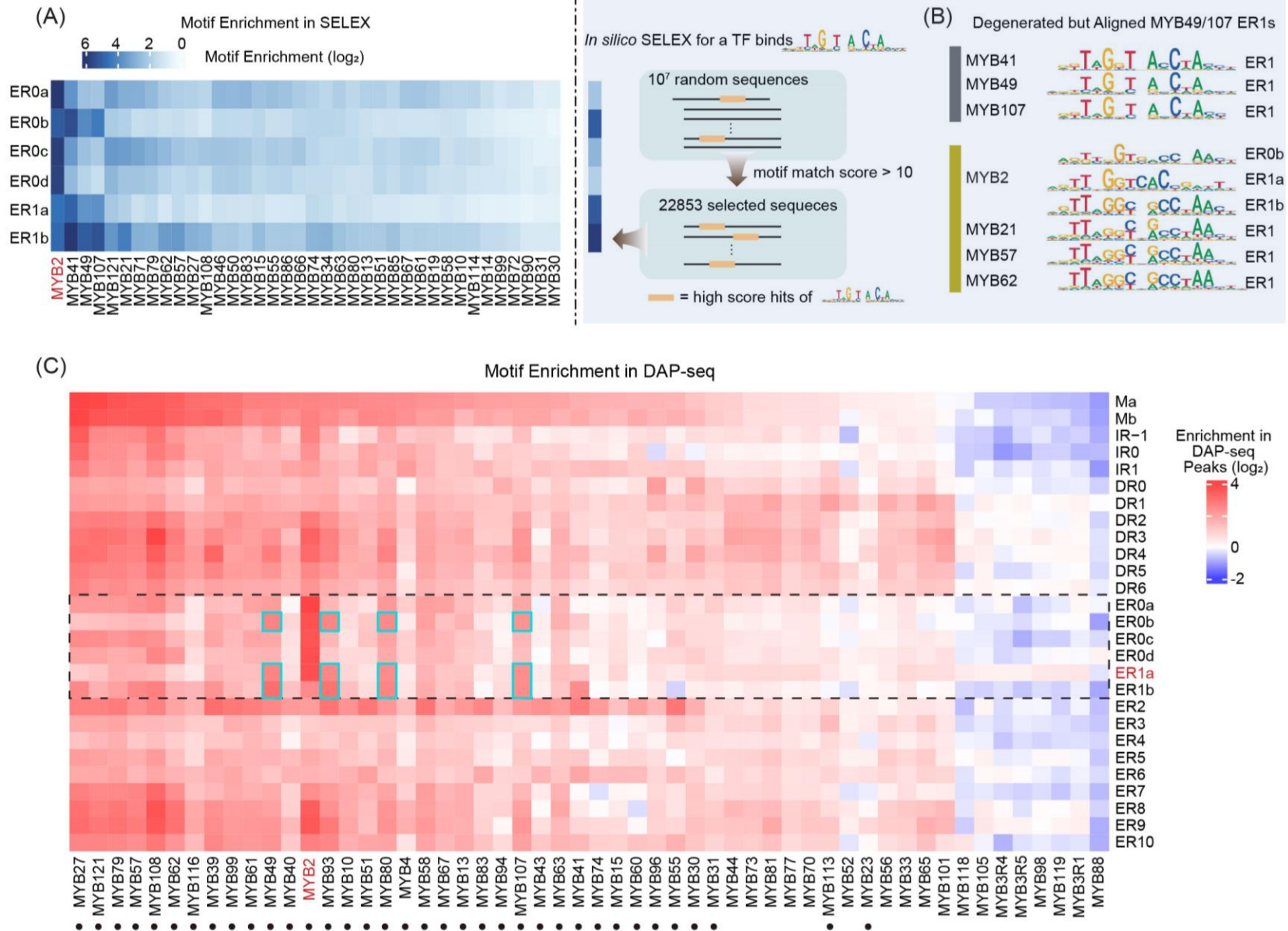


图3 特异性改变是AtMYB2的独有特性

# 结合特异性改变使AtMYB2识别额外基因组位点

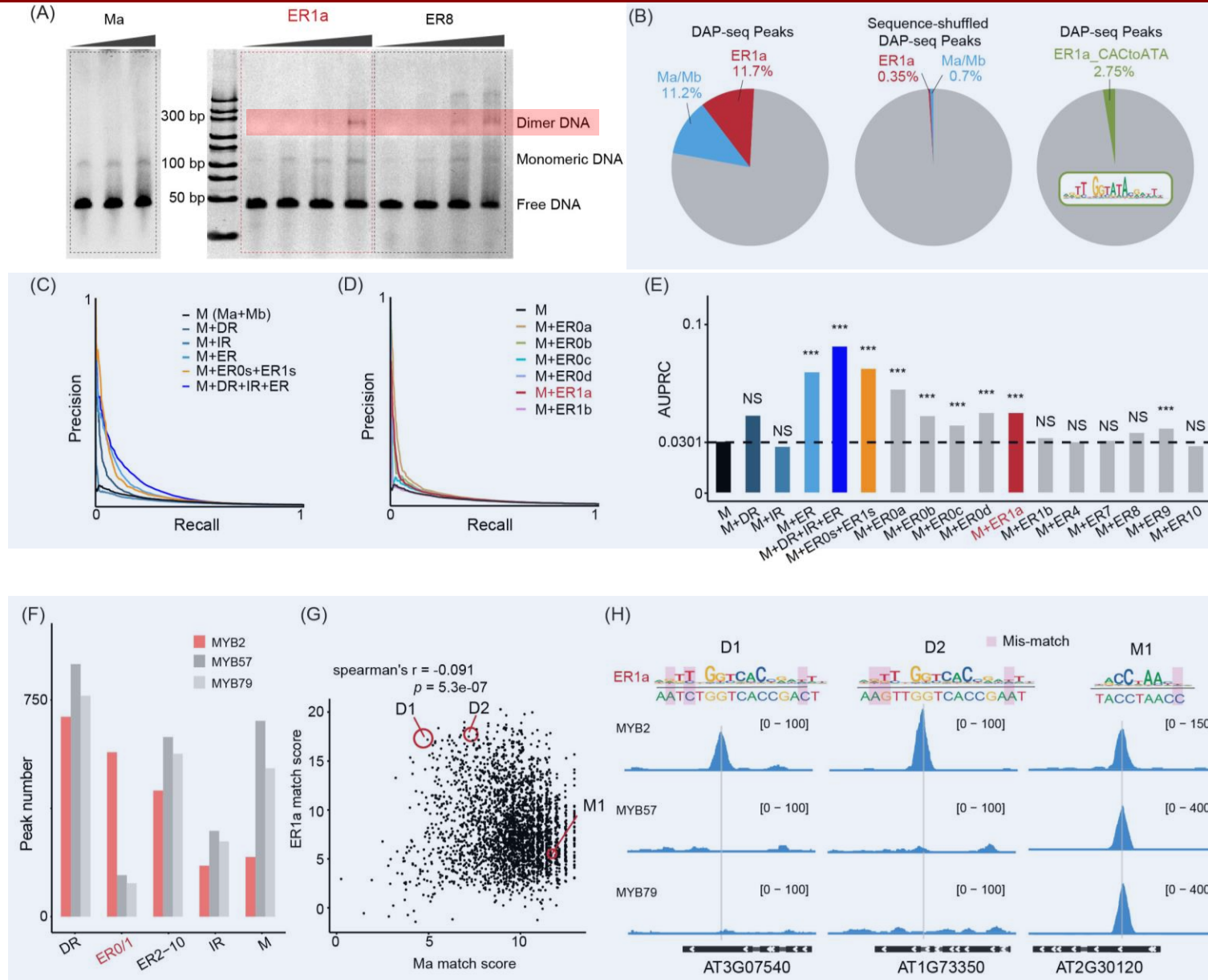


图4 特异性改变使AtMYB2能够识别额外的基因组位点



# AtMYB2结合特异性改变可激活转录

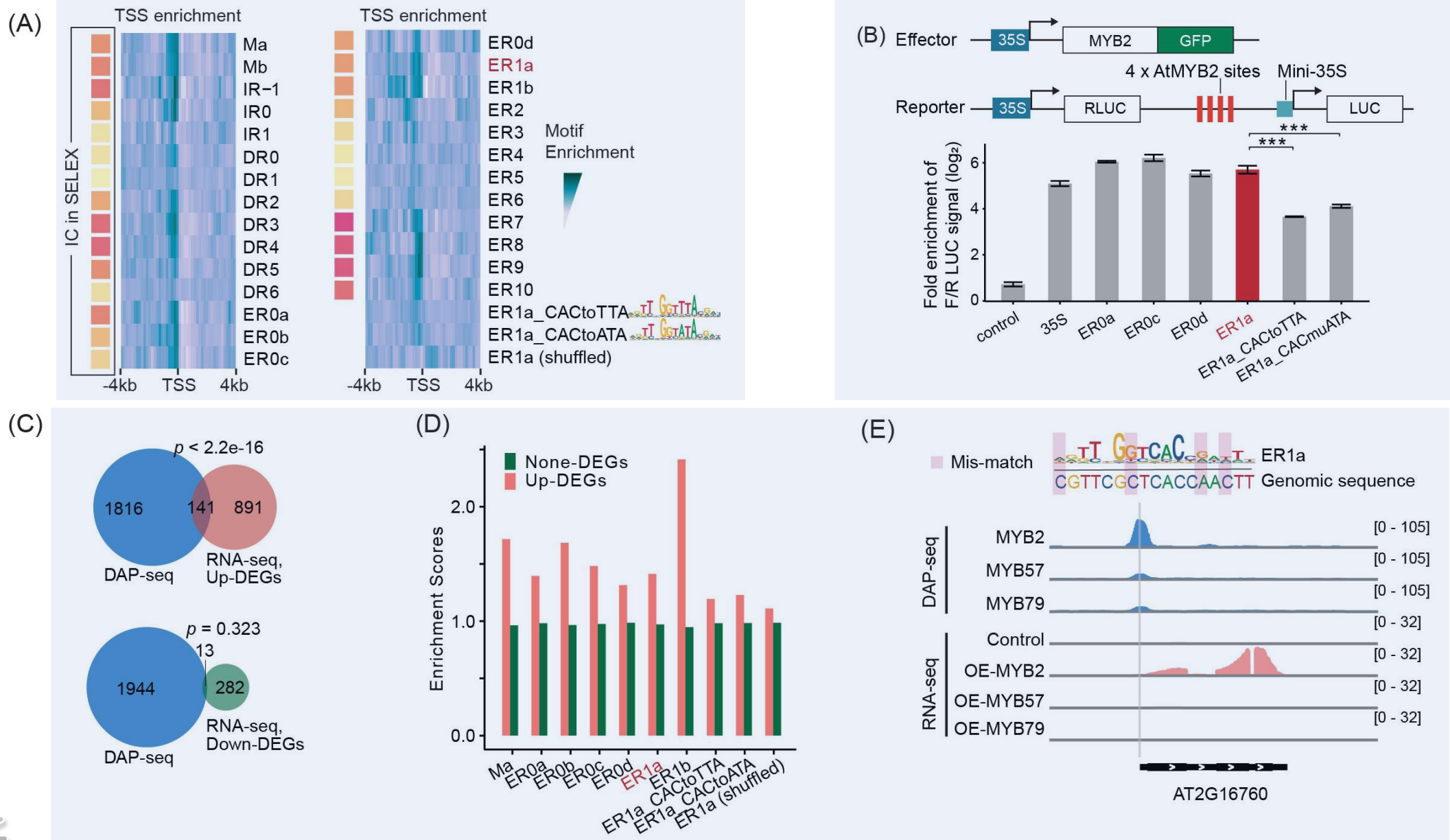


图5 AtMYB2的特异性改变具有激活转录功能



# AtMYB2结合特异性改变可激活转录

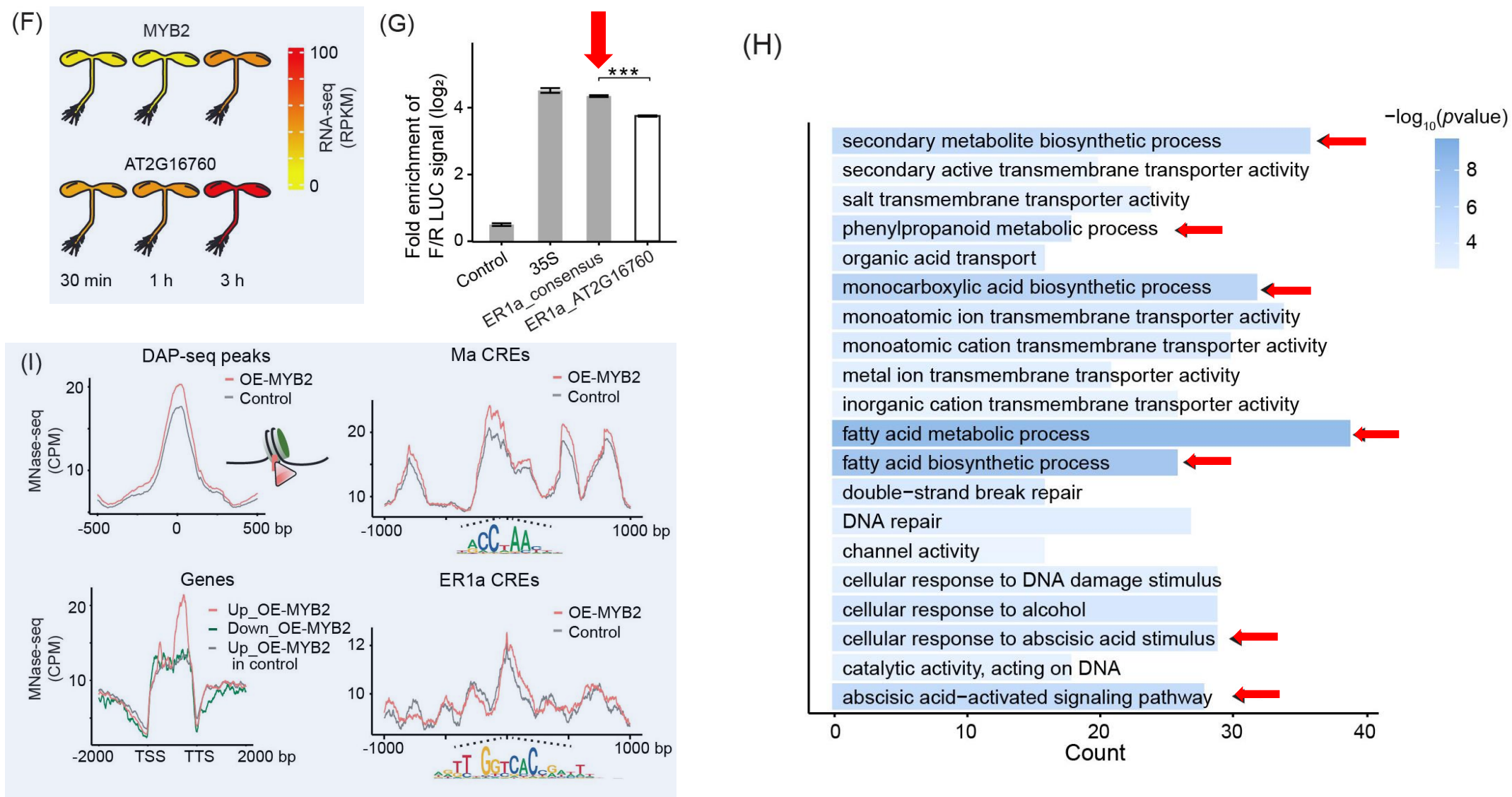


图5 AtMYB2的特异性改变具有激活转录功能



# AtMYB2结合特异性改变在进化中保守

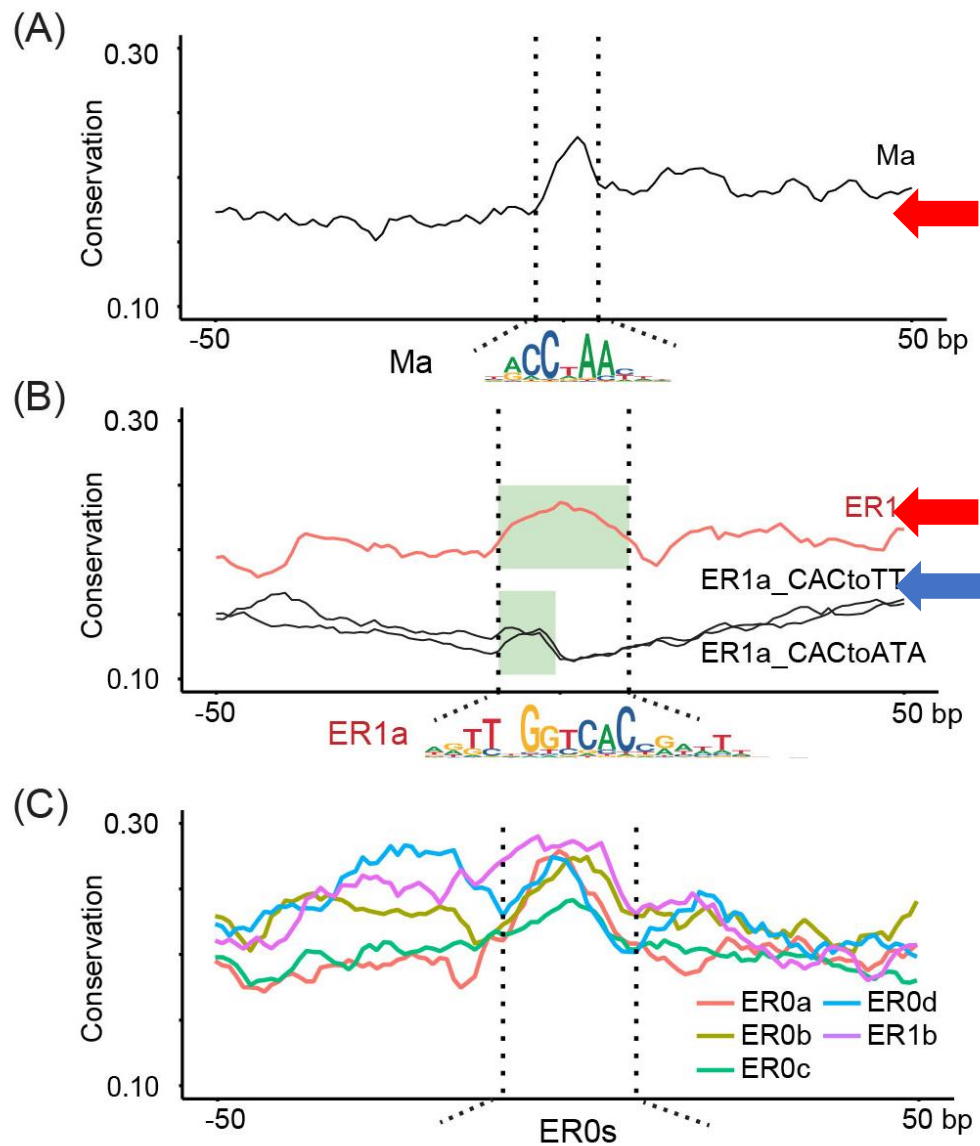
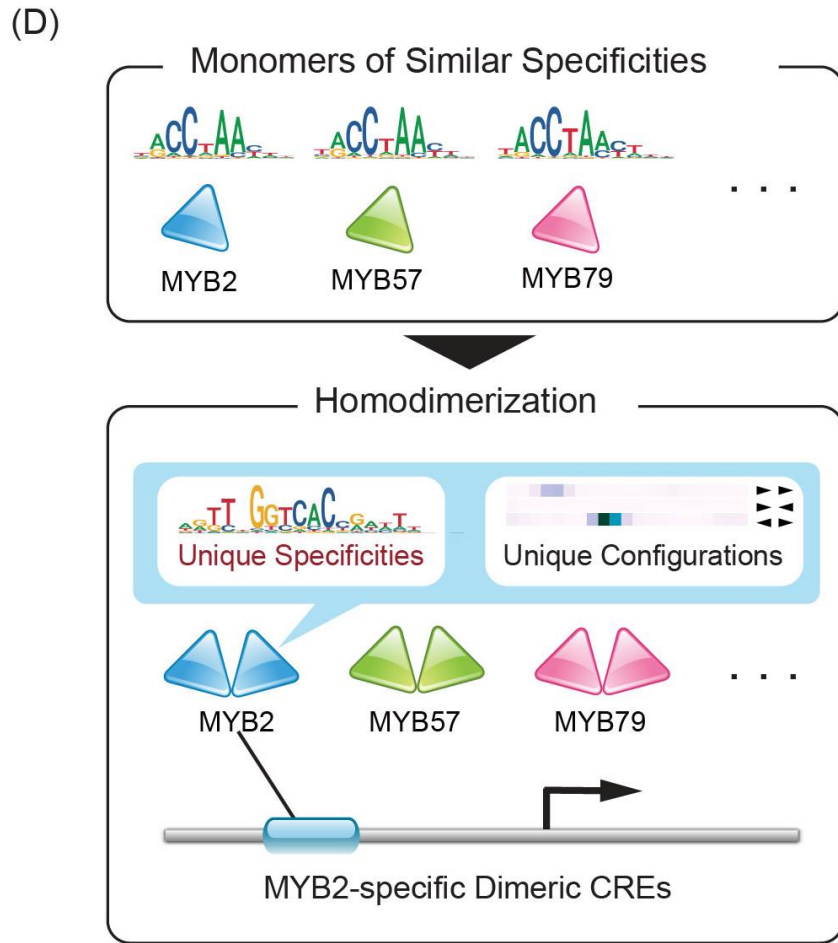


图6 AtMYB2的特异性改变在进化中保守



# 总结



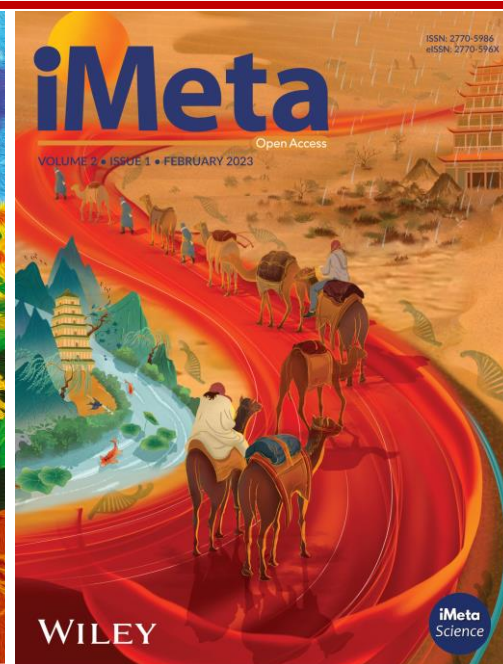
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