

## Supplementary Data

# The p23 of citrus tristeza virus interacts with host FKBP-type peptidyl-prolyl cis-trans isomerase 17-2 and is involved in the intracellular movement of the viral coat protein

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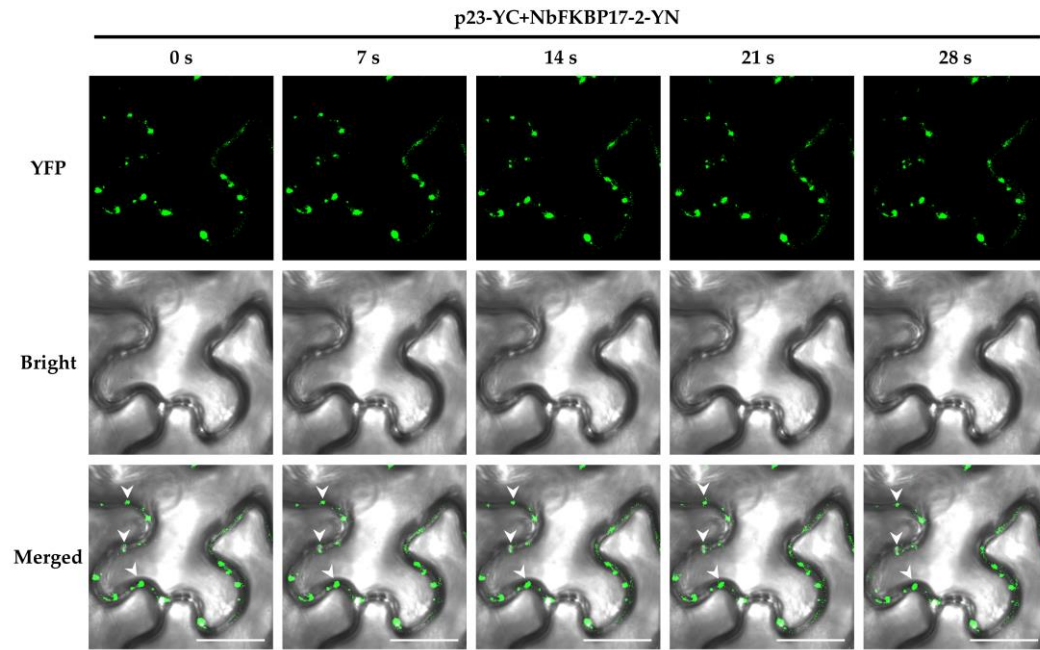
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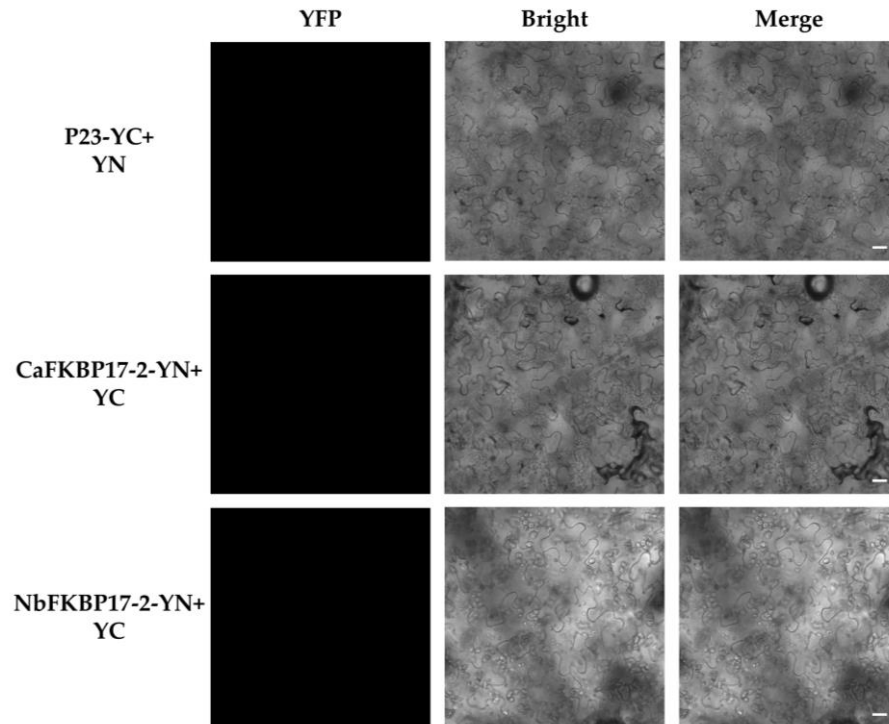
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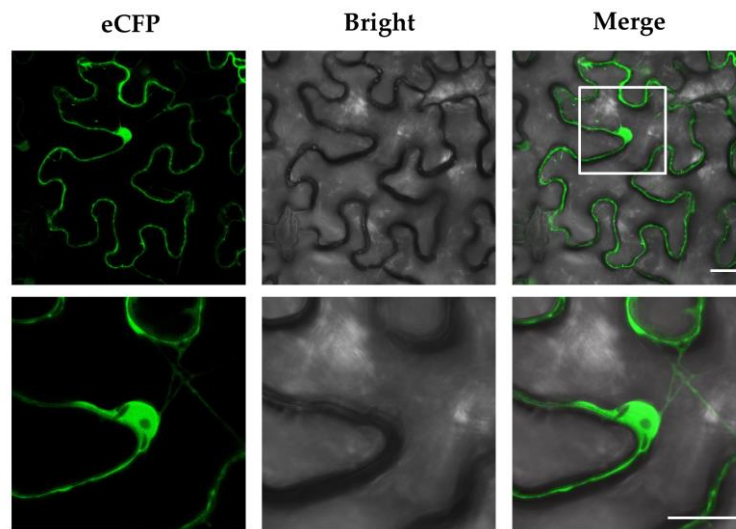
† These authors contributed equally to this work.



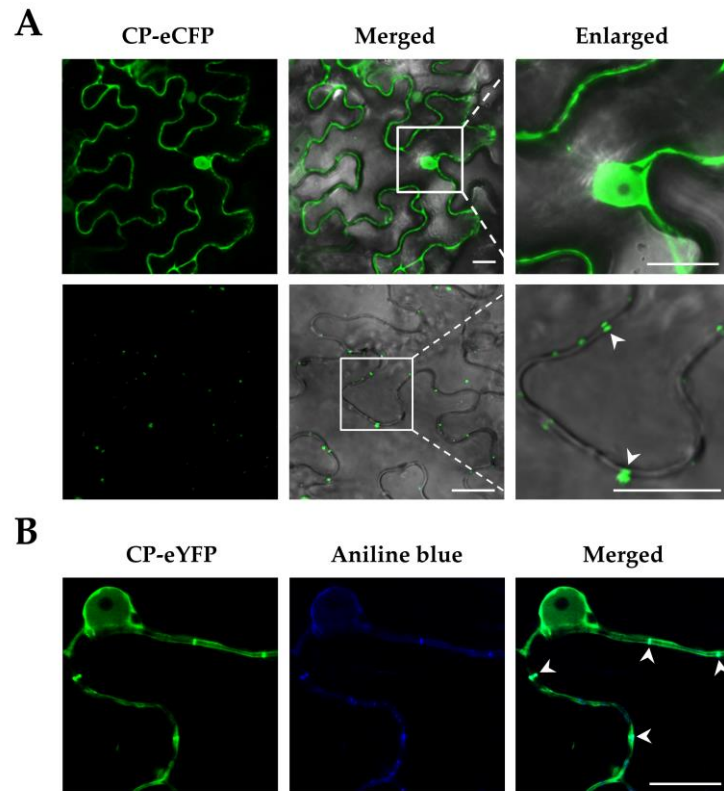
**Supplementary Figure 1.** Time-lapse images of p23/NbFKBP17-2 interaction complexes. Confocal images were taken at 48 hpi. Bars, 20  $\mu$ m.



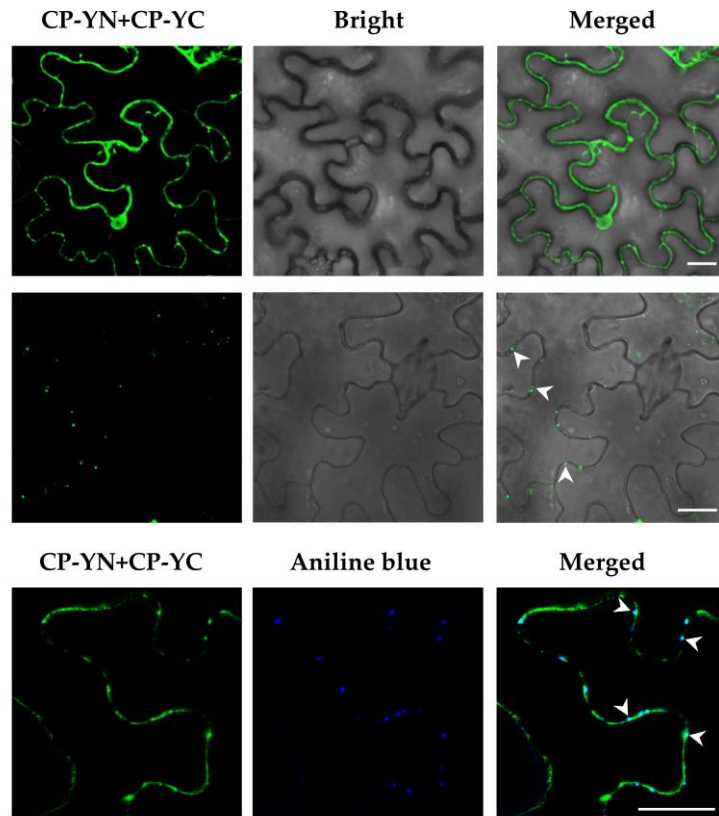
**Supplementary Figure 2.** Bimolecular-fluorescence complementation assay on the interactions between p23-YC and unfused N-terminal of YFP (YN) and between FKBP17-2-YN and unfused C-terminal of YFP (YC) in *Nicotiana benthamiana* cells. Confocal images were taken at 48 hpi. Bars, 20  $\mu$ m.



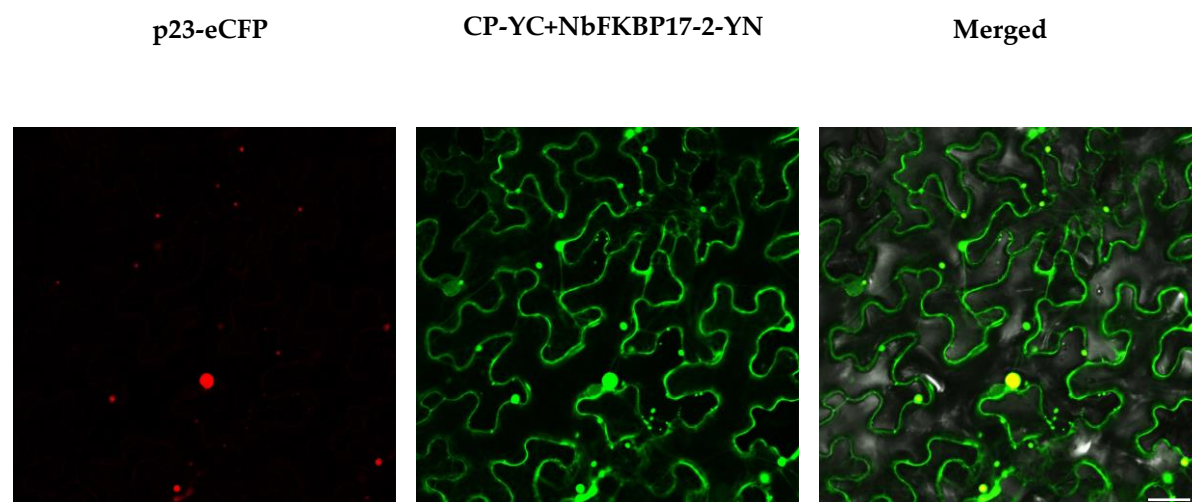
**Supplementary Figure 3.** Subcellular localization analyses of enhanced cyan fluorescent protein (eCFP) in *Nicotiana benthamiana* cells. Confocal images were taken at 48 hpi. Bars, 20  $\mu\text{m}$ .



**Supplementary Figure 4.** Subcellular localization analyses of CTV CP in *Nicotiana benthamiana* cells. **(A)** Subcellular localization of CP-eCFP. **(B)** Subcellular co-localization of CP-eYFP with aniline blue stained callose at plasmodesmata (PD). Arrow heads pointed to PD. Confocal images were taken at 48 hpi. Bars, 20  $\mu$ m.



**Supplementary Figure 5.** Bimolecular-fluorescence complementation assay of CTV CP self-interaction in *Nicotiana benthamiana* cells. Aniline blue stained callose at plasmodesmata (PD) was used as a marker. Arrow heads pointed to PD. Confocal images were taken at 48 hpi. Bars, 20  $\mu\text{m}$ .



**Supplementary Figure 6.** Dynamic image of colocalization of CP/NbFKBP17-2 interaction complexes with p23-eCFP.

**Supplementary Table 1. Primers used in this study.**

Primer	Sequence (5'– 3')	Experiment
CTV p23-F	ATGGACGATACTAGCGGACAAAC	Gene cloning
CTV p23-R	GATGAAGTGGTGTTCACGG	
CTV CP-F	ATGGACGACGAAACAAAGAAATTG	
CTV CP-R	TCAACGTGTGTTGAATTTCCCA	
CaFKBP17-2-F	ATGGCTACTTTCTTTGGATCTCC	
CaFKBP17-2-R	AGCTGGTGCAATGGA	
NbFKBP17-2-F	ATGGCAGCCTTGTTTGGA	
NbFKBP17-2-R	AGCAGGTGCAATAGA	
CTV p23- <i>Sfi</i> I-F	CAGAGT <u>GGCCATTACGGCC</u> ATGGACGATACTAGCGGACAA	Yeast two hybrid
CTV p23- <i>Sfi</i> I-R	CGACAT <u>GGCCGAGGCGGCC</u> AAGATGAAGTGGTGTTCACGG	
CaFKBP17-2- <i>Sfi</i> I-F	CAGAGT <u>GGCCATTACGGCC</u> ATGGCTACTTTCTTTGGATCTCC	
CaFKBP17-2- <i>Sfi</i> I-R	CGACAT <u>GGCCGAGGCGGCC</u> AAAGCTGGTGCAATGGA	
NbFKBP17-2- <i>Sfi</i> I-F	CAGAGT <u>GGCCATTACGGCC</u> ATGGCAGCCTTGTTTGGA	
NbFKBP17-2- <i>Sfi</i> I-R	CGACAT <u>GGCCGAGGCGGCC</u> AAAGCAGGTGCAATAGA	
CTV p23- <i>Xba</i> I-F	CCTCTAGAATGGACGATACTAGCGGACAA	Subcellular Localization
CTV p23- <i>Bam</i> HI-R	GGGGATCCGATGAAGTGGTGTTCACGG	
CTV CP- <i>Xba</i> I-F	GCTCTAGAATGGACGACGAAACAAAGAAATTG	
CTV CP- <i>Bam</i> HI-R	CGGGATCCACGTGTGTTGAATTTCCCA	
CaFKBP17-2- <i>Xba</i> I-F	CCTCTAGAATGGCTACTTTCTTTGGATCTCC	
CaFKBP17-2- <i>Bam</i> HI-R	GGGGATCCAGCTGGTGCAATGGA	
NbFKBP17-2- <i>Xba</i> I-F	CCTCTAGAATGGCAGCCTTGTTTGGA	
NbFKBP17-2- <i>Bam</i> HI-R	GGGGATCCAGCAGGTGCAATAGA	
<i>att</i> B1	GGGGACAAGTTTGTACAAAAAAGCAGGCT	BiFC
<i>att</i> B2	GGGGACCACTTTGTACAAGAAAGCTGGGT	
CTV p23- <i>att</i> B1-F	<u>AAAAAGCAGGCTCC</u> ATGGACGATACTAGCGGACAA	
CTV p23- <i>att</i> B2-R	<u>AGAAAGCTGGGT</u> AGATGAAGTGGTGTTCACGG	
CTV CP- <i>att</i> B1-F	<u>AAAAAGCAGGCTCC</u> ATGGACGACGAAACAAAGAAATTG	
CTV CP- <i>att</i> B2-R	<u>AGAAAGCTGGGT</u> CACGTGTGTTGAATTTCCCA	
CaFKBP17-2- <i>att</i> B1-F	<u>AAAAAGCAGGCTCC</u> ATGGCTACTTTCTTTGGATCTCC	



CaFKBP17-2- <i>attB2</i> -R	<u>AGAAAGCTGGGTA</u> AGCTGGTGCAATGGA	
NbFKBP17-2- <i>attB1</i> -F	<u>AAAAAGCAGGCTCC</u> ATGGCAGCCTTGTTTGGA	
NbFKBP17-2- <i>attB2</i> -R	<u>AGAAAGCTGGGTA</u> AGCAGGTGCAATAGA	
TRV2-NbFKBP17-2-F	<u>CCTCTAGACT</u> CCTCCTCCTCAGCCACCA	VIGS
TRV2-NbFKBP17-2-R	<u>GGGGATCCC</u> CAGCACCAAGGCCAAATC	
NbFKBP17-2-qrt-F	GGCCAGGGGACTTAGTTGTGA	RT-qPCR
NbFKBP17-2-qrt-R	AATCTGCTCCTTCCTCACCAA	
CTV-qrt-F	CACTAATTTGATCTGTGAACG	
CTV-qrt-R	GCGAAGGCAAACATCCTGACTC	
NbActin- qrt-F	CAATCCAGACACTGTACTTTCTCTC	
NbActin- qrt-R	AAGCTGCAGGTATCCATGAGACTA	