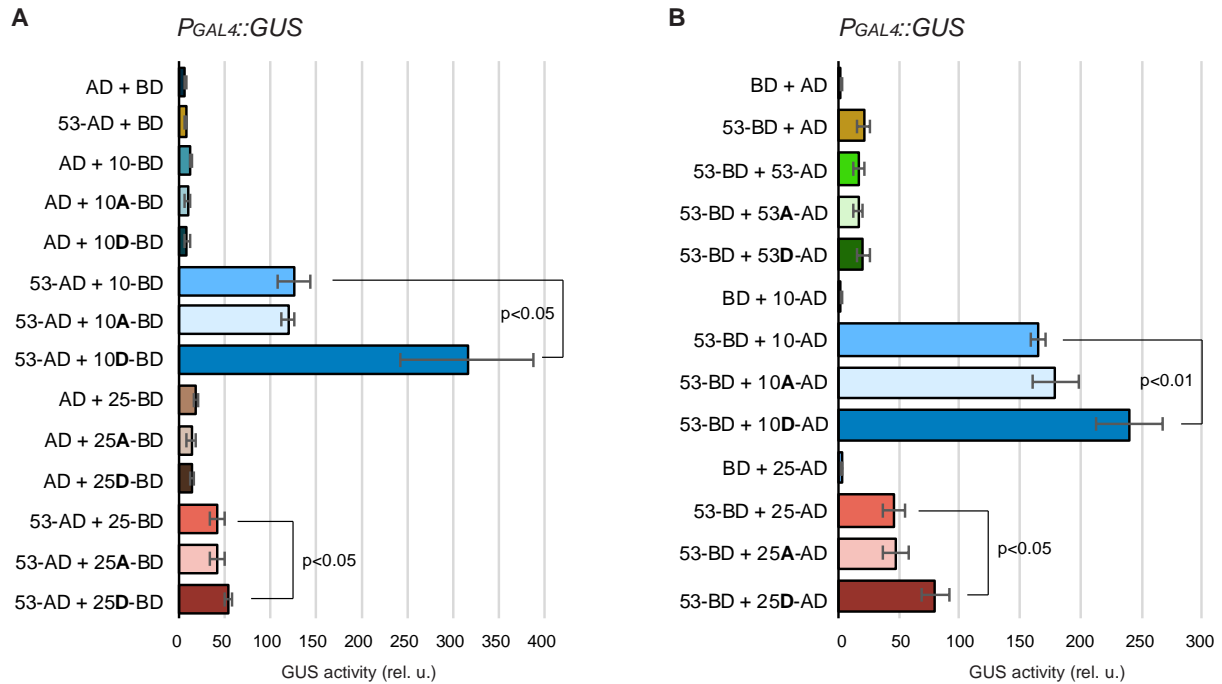**Supplementary Figures**

Fig. S1. Analysis of the heterodimerization of bZIP53 with bZIP10 and 25 by *protoplast two-hybrid* assay. $P_{GAL4}:GUS$ is used as reporter. (A) bZIP53 is fused to GAL4 activation domain (AD); bZIP10, 25 and their mutated forms are fused to GAL4 DNA-binding domain (BD). (B) Reciprocal assays applying bZIP53 as BD-fusion, and bZIP10, 25, their mutated forms and bZIP53 mutated forms as AD-fusions. **A**: substitution of Ser15 and Ser19 to Ala, **D**: substitution of Ser15 and Ser19 to Asp.
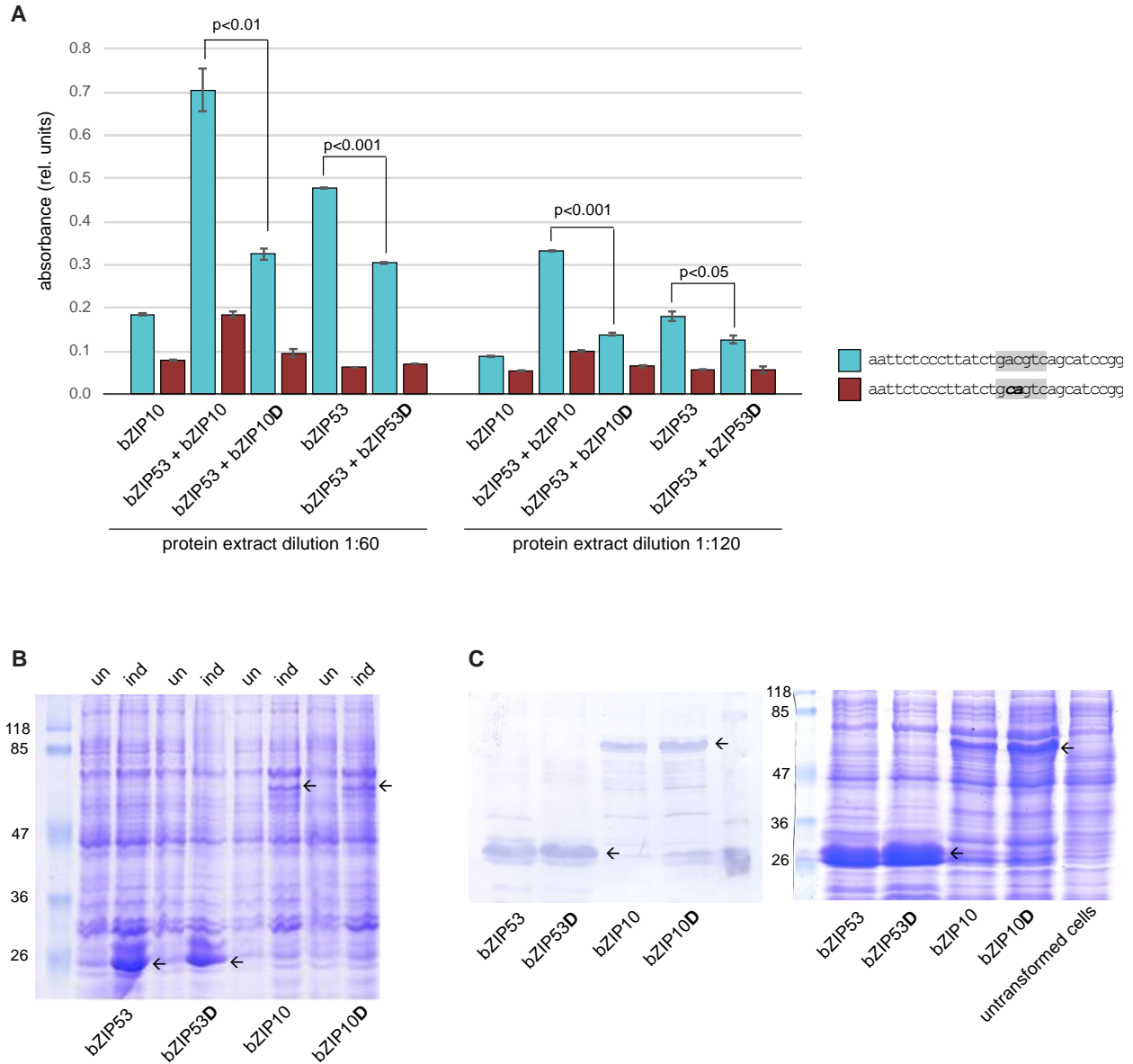
Fig. S2. Binding of bZIP heterodimers to the cognate DNA sequence. (A) DPI-ELISA of the interaction of the bZIP53-bZIP10 heterodimers and corresponding mutated forms to the C-box (blue bars) and mutated C-box (dark-red bars). The recombinant C-terminally His-tagged proteins were extracted from *E. coli* under denatured conditions in the DNA-binding buffer containing 6 M urea, mixed as indicated on the X-axis and heated for 3-4 min at 50°C, following by stepwise dilutions in the DNA-binding buffer. The final protein dilutions were 1:60 and 1:120. Data are presented as mean values $\pm$ standard deviation (StD); n=2. (B) The expression of the recombinant proteins was verified by the Coomassie staining of total protein extracts separated by SDS-polyacrylamide gels. (C) The detection of corresponding bZIP proteins (indicated by arrows) in the denatured extracts by the Coomassie staining (right panel) and western blotting using monoclonal mouse anti-His antibody (Roche) and anti-mouse-AP conjugate (BioRad). **D**: substitution of Ser15,Ser19 to Asp; un: uninduced; ind: induced.

Supplementary Tables

Table S1: Primer sequences used for Gateway cloning and mutagenesis.

Construct	Primer Sequences
pENTR/bZIP53	```5'- CACCATGGGGTCGTTGCAAATG -3'``` ```5'- GCAATCAAACATATCTGCAGAAGCTCTGATT -3'```
Construct and mutation	
bZIP10^{S15,19A}	```5'-AATCGTGAGGCAGCTAGGCGAGCTAGAAGGAGAA-3'``` ```5'-TTCTCCTTCTAGCTCGCCTAGCTGCCTCACGATT-3'```
bZIP10^{S15,19D}	```5'-AATCGTGAGGATGCTAGGCGAGATAGAAGGAGAA-3'``` ```5'-TTCTCCTTCTATCTCGCCTAGCATCCTCACGATT-3'```
bZIP25^{S15,19A}	```5'-GAAGCCGCTAGGCGCGCTAGGAGAAGAAAGCAAG-3'``` ```5'-CTTGCTTTCTTCTCCTAGCGCGCCTAGCGGCTTC-3'```
bZIP25^{S15,19D}	```5'-GAAGACGCTAGGCGCGATAGGAGAAGAAAGCAAG-3'``` ```5'-CTTGCTTTCTTCTCCTATCGCGCCTAGCGTCTTC-3'```
bZIP53^{S15,19A}	```5'-AGAGAAGCTGCTCGGAGGGCAAGGATGAGGAAAC-3'``` ```5'-GTTTCCTCATCCTTGCCCTCCGAGCAGCTTCTCT-3'```
bZIP53^{S15,19D}	```5'-AGAGAAGATGCTCGGAGGGATAGGATGAGGAAAC-3'``` ```5'-GTTTCCTCATCCTATCCCTCCGAGCATCTTCTCT-3'```

Table S2: Primer sequences used for qPCR.

Gene	Primer Sequence	Product size (nt)
ProDH1	```GCTGCCAAATCTTTACCAACA``` ```TGAAGTTCGGACTTTTGTATTCC```	127
ProDH2	```AGCTACGCATAACACAGACTCG``` ```TTATTGATCCCTAGCTCACTTGC```	66
BCAT2	```TCACAAATTATGCGCCAGTT``` ```CGAGATAAAGAACGTCTGAAAACC```	75
bZIP53	```CAATGTCTTGAGGGCACAGG``` ```TGCATTGGACAAGGCATCTG```	156
UBI10	```TCACCGGAAAGACCATCACT``` ```CGGTGGGATACCCTCTTTG```	92
EF-1-alpha	```GTAACAAGATGGATGCCACCACCCC``` ```TCCCTCGAATCCAGAGATTGGCACA```	140

Table S3: Oligonucleotides used for the protein-DNA binding assay.

Oligo-label	Sequence
C-box	`5'-biotAATTCTCCCTTATCTGACGTCAGCATCCGG-3'` `      3'-TTAAGAGGGAATAGACTGCAGTCGTAGGCC-5'`
C-mut	`5'-biotAATTCTCCCTTATCTGCAGTCAGCATCCGG-3'` `      3'-TTAAGAGGGAATAGACGTCAGTCGTAGGCC-5'`

Table S4: Accession numbers of gene sequences used in this study.

Gene name	Accession number*
bZIP10	At4G02640
bZIP25	At3G54620
bZIP53	AT3G62420
BCAT2	AT1G10070
ProDH1	AT3G30775
ProDH2	AT5G38710
EF-1-alpha	AT5G60390
UBQ10	AT4G05320

*Sequence data can be found in the Arabidopsis Genome Initiative or GenBank/EMBL databases

Tabe S5. Summary of amino acid analysis in seven weeks old *Arabidopsis* leaf rosettes harvested at the dawn (µM/mg of dry weight).

a. a.	Col-0			mean	StDev	bZIP53ox					mean	StDev	p
Ala	22,82	18,26	28,08	**23,05**	3,35	18,97	23,13	17,88	18,62	16,54	**19,03**	1,64	0,164
Arg	8,91	8,73	6,16	**7,93**	1,18	5,90	5,58	6,05	6,13	6,02	**5,94**	0,16	0,023
Asn	22,40	16,70	19,38	**19,49**	1,94	26,02	21,34	19,83	21,51	20,48	**21,84**	1,68	0,261
Asp	68,99	59,30	75,25	**67,84**	5,70	48,15	61,96	46,87	47,90	55,58	**52,09**	5,34	0,022
Gln	46,74	31,69	45,84	**41,42**	6,49	74,99	84,41	83,77	58,20	76,27	**75,53**	7,15	0,003
Glu	186,37	185,74	188,15	**186,75**	0,93	165,01	159,12	135,03	144,62	155,66	**151,89**	9,65	0,003
Gly	5,79	5,28	5,79	**5,62**	0,23	1,98	3,64	2,84	2,71	5,25	**3,28**	0,93	0,021
His	4,56	4,36	2,77	**3,90**	0,75	2,22	1,96	2,06	2,00	2,20	**2,09**	0,10	0,005
Ile	3,56	3,74	2,62	**3,31**	0,46	0,90	1,21	1,31	1,35	1,26	**1,21**	0,12	0,000
Leu	4,67	5,03	3,64	**4,45**	0,54	1,67	1,56	0,64	1,79	1,95	**1,52**	0,35	0,000
Lys	3,53	3,46	3,18	**3,39**	0,14	1,66	1,48	1,98	1,72	2,12	**1,79**	0,21	0,000
Met/Cys	0,46	1,08	0,82	**0,79**	0,22	0,46	0,73	0,95	0,45	1,13	**0,74**	0,24	0,840
Phe	2,86	3,26	2,98	**3,03**	0,15	1,62	1,66	0,88	1,79	1,78	**1,55**	0,27	0,001
Pro	8,97	8,96	7,83	**8,59**	0,50	5,38	5,10	4,22	5,02	4,12	**4,77**	0,48	0,000
Ser	38,59	37,98	37,57	**38,05**	0,36	27,27	24,86	31,59	31,63	33,08	**29,69**	2,90	0,007
Thr	21,42	20,10	25,39	**22,30**	2,06	25,23	28,15	31,87	38,77	37,63	**32,33**	4,69	0,035
Tyr	1,55	1,82	1,18	**1,52**	0,22	0,31	0,59	1,13	0,76	0,74	**0,71**	0,21	0,011
Val	6,06	9,52	5,26	**6,95**	1,72	3,68	0,10	0,10	0,10	0,10	**0,82**	1,14	0,004
total	458,26	425,02	461,89	**448,39**	15,58	411,39	426,58	389,00	385,06	421,90	**406,79**	15,80	0,026

a. a.	bZIP53^{S15,19A}ox					mean	StDev	p	p	StDev	mean	bZIP53^{S15,19D}ox				
Ala	13,02	16,87	17,07	16,46	16,15	**15,91**	1,16	0,021	0,578	1,64	**21,62**	21,87	20,11	22,59	19,03	24,52
Arg	8,41	7,66	7,10	7,47	8,03	**7,73**	0,39	0,789	0,427	1,52	**9,00**	11,24	10,55	7,98	7,09	8,14
Asn	21,61	24,21	23,74	25,27	33,23	**25,61**	3,05	0,081	0,022	6,11	**33,09**	28,83	25,65	29,53	41,51	39,95
Asp	63,04	68,69	57,96	66,85	61,49	**63,61**	3,33	0,356	0,066	6,61	**81,60**	77,19	85,11	78,56	72,51	94,63
Gln	54,46	65,45	62,78	69,04	60,69	**62,49**	3,93	0,005	0,055	43,32	**112,05**	78,98	76,31	72,56	169,39	162,99
Glu	211,16	203,54	185,89	214,10	207,50	**204,44**	7,78	0,037	0,880	11,24	**185,22**	176,43	185,18	174,11	177,07	213,33
Gly	1,72	2,22	1,79	3,55	2,13	**2,28**	0,51	0,000	0,457	1,45	**4,77**	7,42	3,93	5,76	3,48	3,28
His	3,00	2,48	2,85	2,55	3,31	**2,84**	0,26	0,061	0,268	0,53	**4,59**	5,08	4,72	4,10	3,75	5,30
Ile	2,48	1,97	1,96	1,97	2,75	**2,23**	0,31	0,018	0,176	1,08	**4,75**	7,31	4,06	4,89	3,50	3,99
Leu	2,93	2,12	2,17	2,10	2,76	**2,41**	0,34	0,002	0,166	1,16	**6,09**	8,99	5,26	6,00	4,98	5,21
Lys	3,32	2,43	2,31	2,17	3,01	**2,65**	0,41	0,050	0,110	0,97	**4,97**	7,34	3,72	5,02	4,18	4,61
Met/Cys	0,80	0,35	2,38	0,67	0,70	**0,98**	0,56	0,710	0,300	0,10	**0,62**	0,47	0,55	0,57	0,67	0,82
Phe	2,76	2,30	2,54	2,73	3,55	**2,78**	0,31	0,415	0,097	0,54	**3,97**	5,33	3,29	3,71	3,62	3,92
Pro	3,95	2,92	3,65	1,94	1,96	**2,88**	0,75	0,000	0,047	0,99	**10,97**	12,99	8,71	11,37	10,77	11,01
Ser	37,45	37,08	28,28	29,85	32,10	**32,95**	3,45	0,087	0,066	6,33	**48,33**	57,29	39,17	46,02	55,21	43,97
Thr	37,40	42,77	35,67	45,58	47,20	**41,73**	4,15	0,001	0,019	2,34	**28,94**	29,55	27,11	30,91	24,92	32,20
Tyr	1,14	0,82	0,74	1,14	1,14	**1,00**	0,17	0,027	0,250	0,52	**2,13**	3,43	1,48	2,14	2,01	1,59
Val	5,17	0,10	0,11	0,10	4,07	**1,91**	2,17	0,029	0,255	1,36	**8,70**	10,95	6,85	9,86	8,46	7,39
total	473,82	483,97	438,99	493,57	491,78	**477,08**	16,02	0,127	0,023	54,45	**571,43**	550,72	511,77	515,67	612,15	666,83