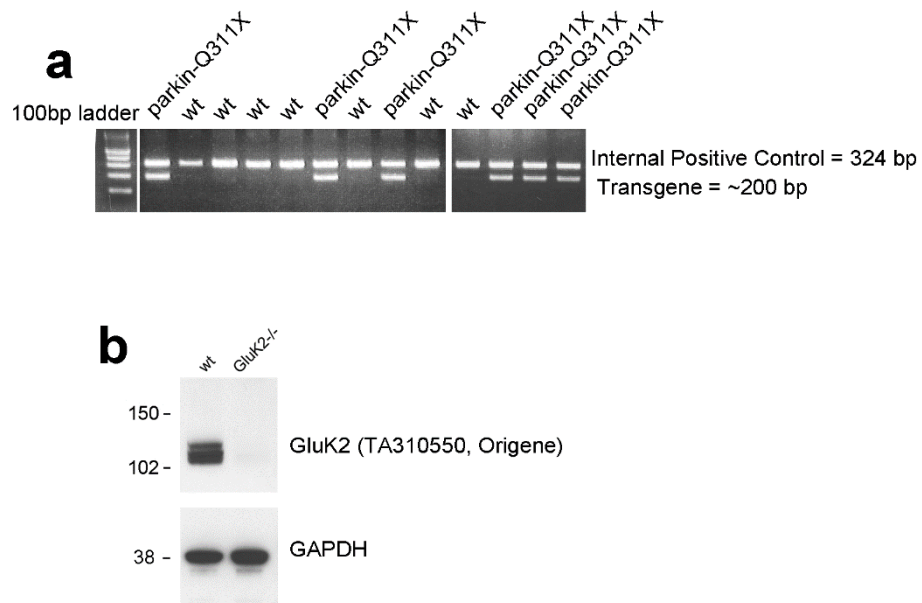
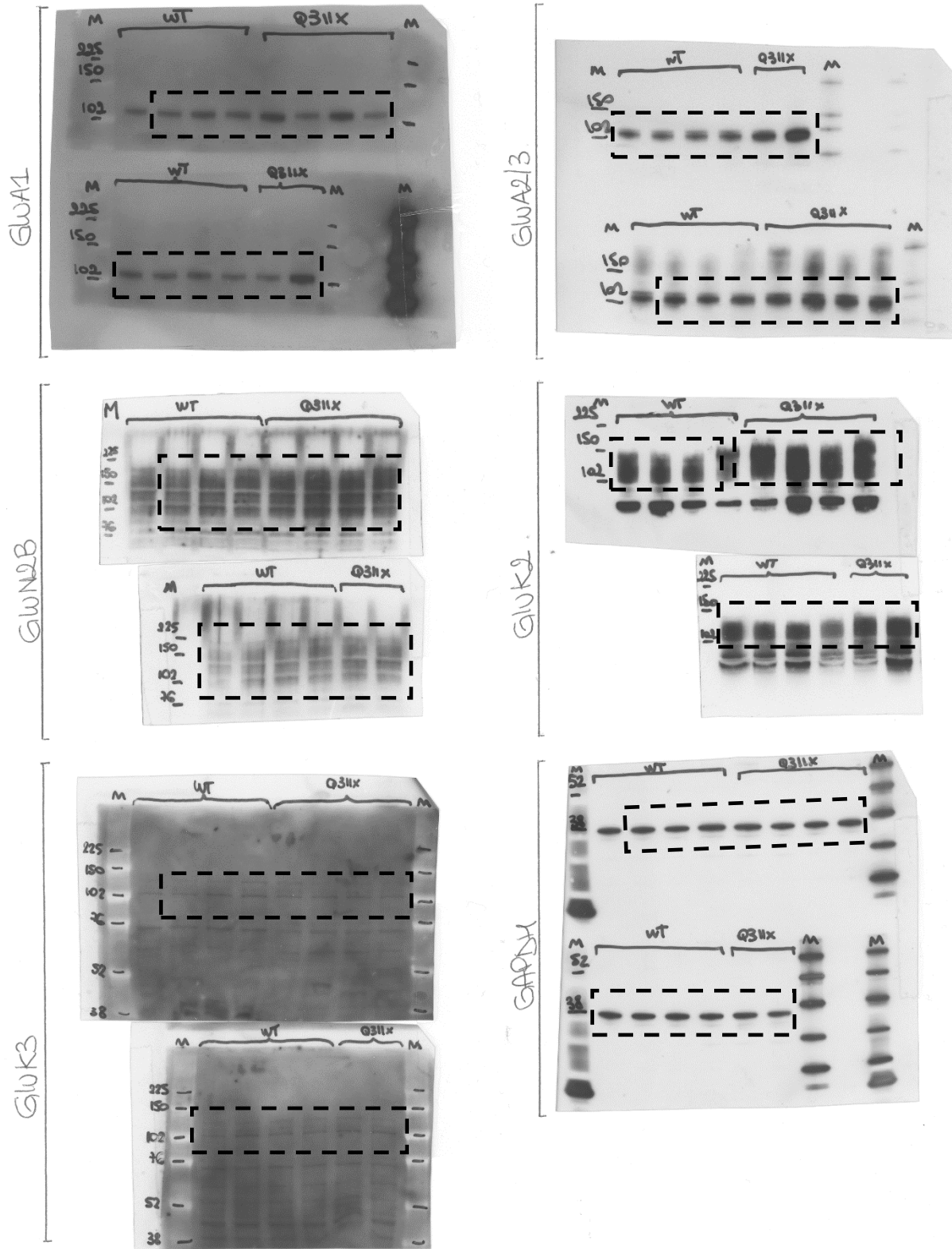


## Supplementary Figure 1



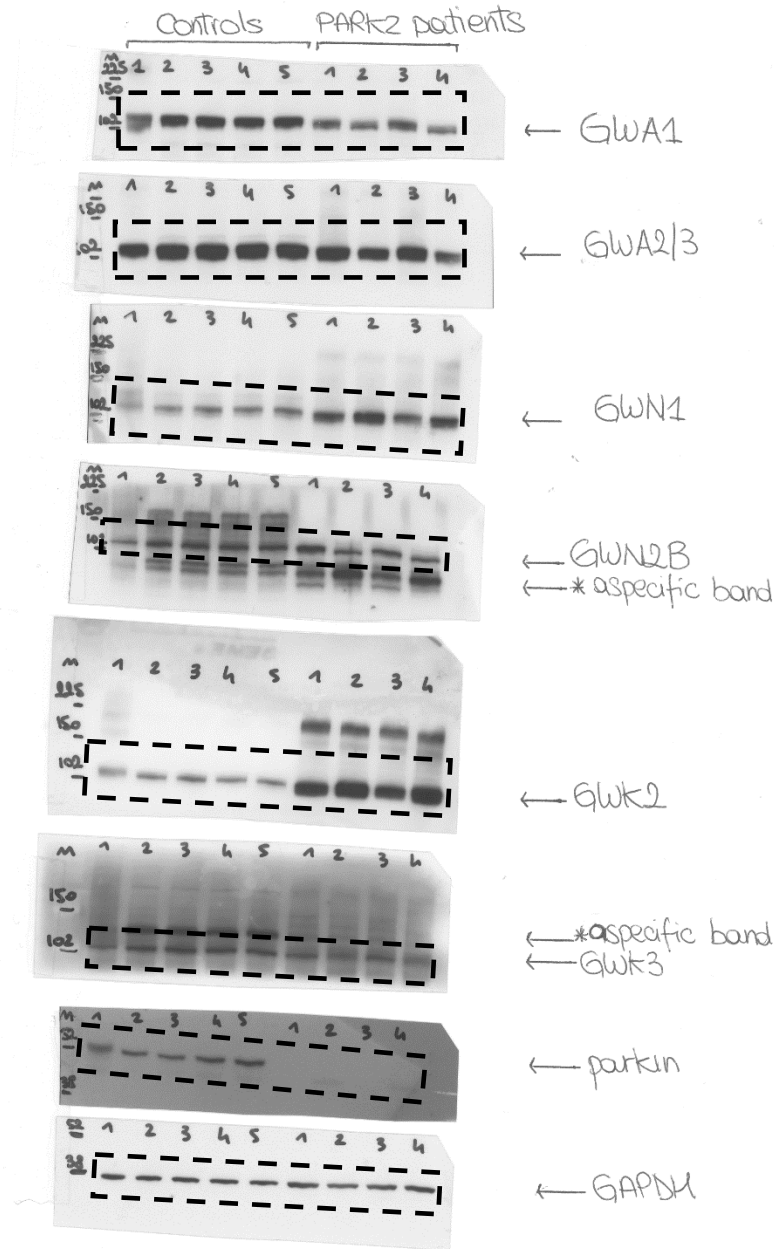
**Supplementary Figure 1. Genotyping of parkin-Q311X mice and GluK2 antibody validation.** (a) Genotyping of parkin-Q311X mice and littermate controls. The detection of the 324 bp band in all samples served as control for DNA quality and correct amplification. Band at ~200bp indicates the mutant *PARK2* transgene. (b) Whole brain lysates were prepared from wild-type and GluK2<sup>-/-</sup> mice. Western blot was performed with the antibody TA310550 (Origene). Antibody TA310550 specifically recognized GluK2.

## Supplementary Figure 2



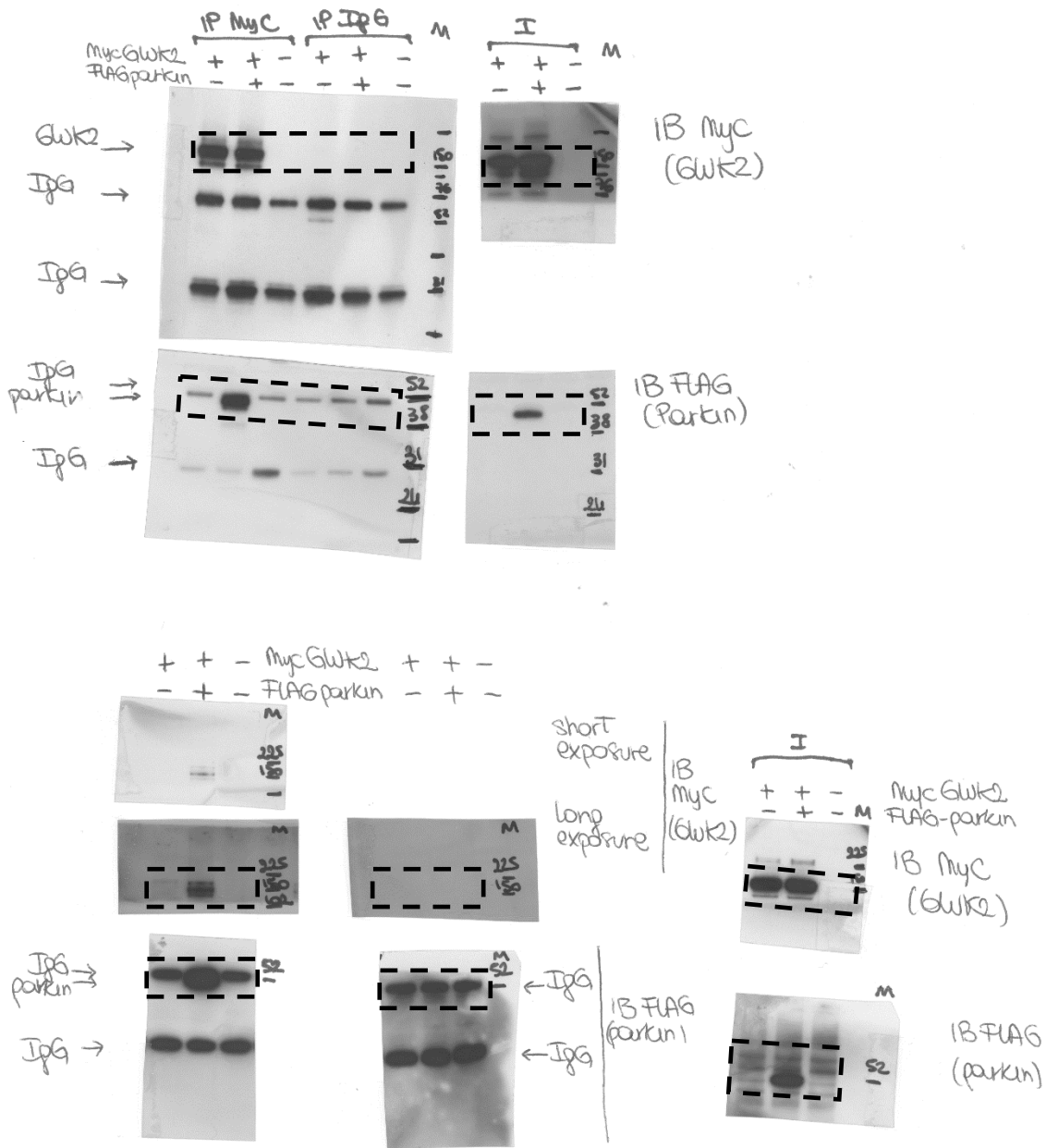
Supplementary Figure 2. Full blot images of western blots showed in Figure 1a.

### Supplementary Figure 3



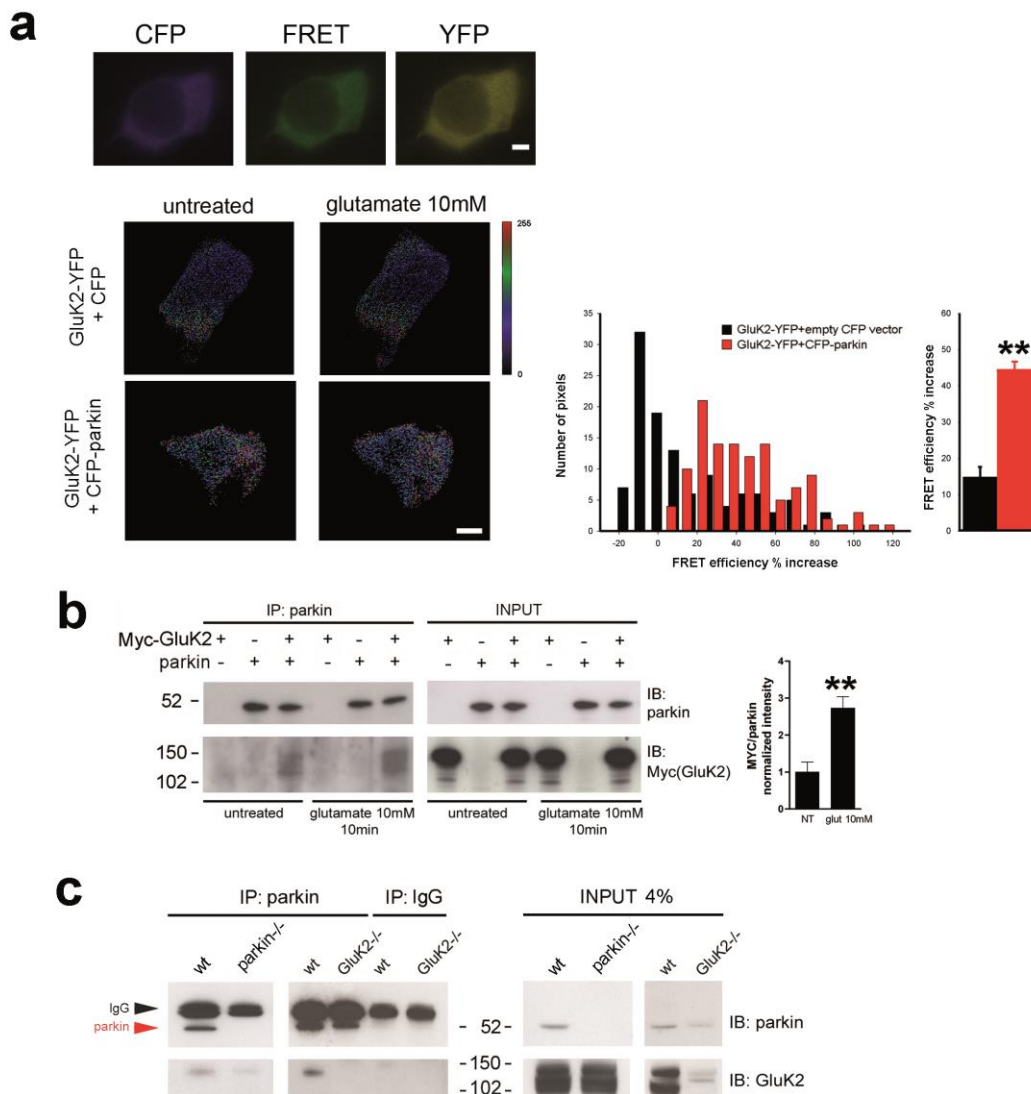
Supplementary Figure 3. Full blot images of western blots showed in Figure 1b.

# Supplementary Figure 4



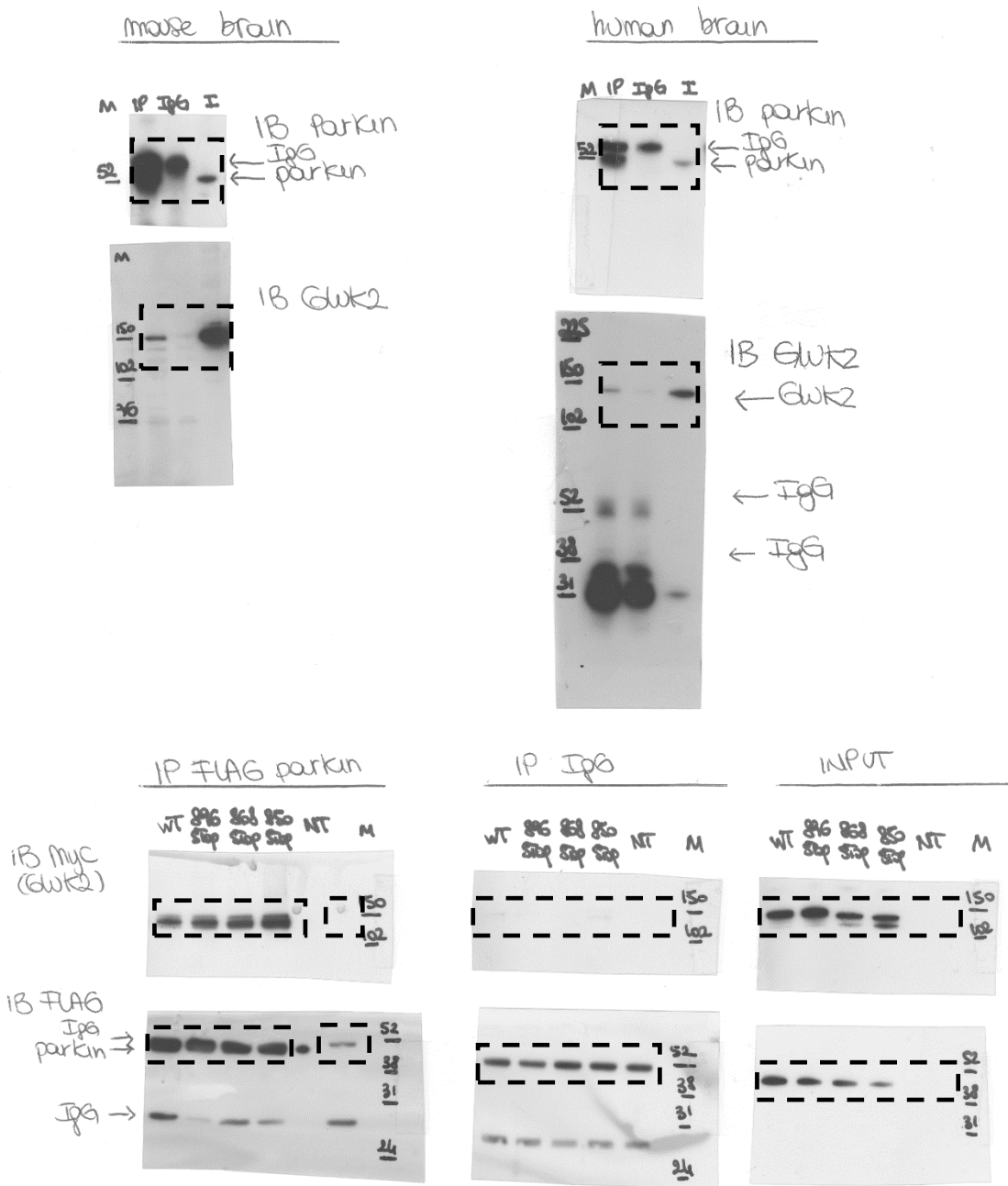
Supplementary Figure 4. Full blot images of western blots showed in Figure 2a.

## Supplementary Figure 5



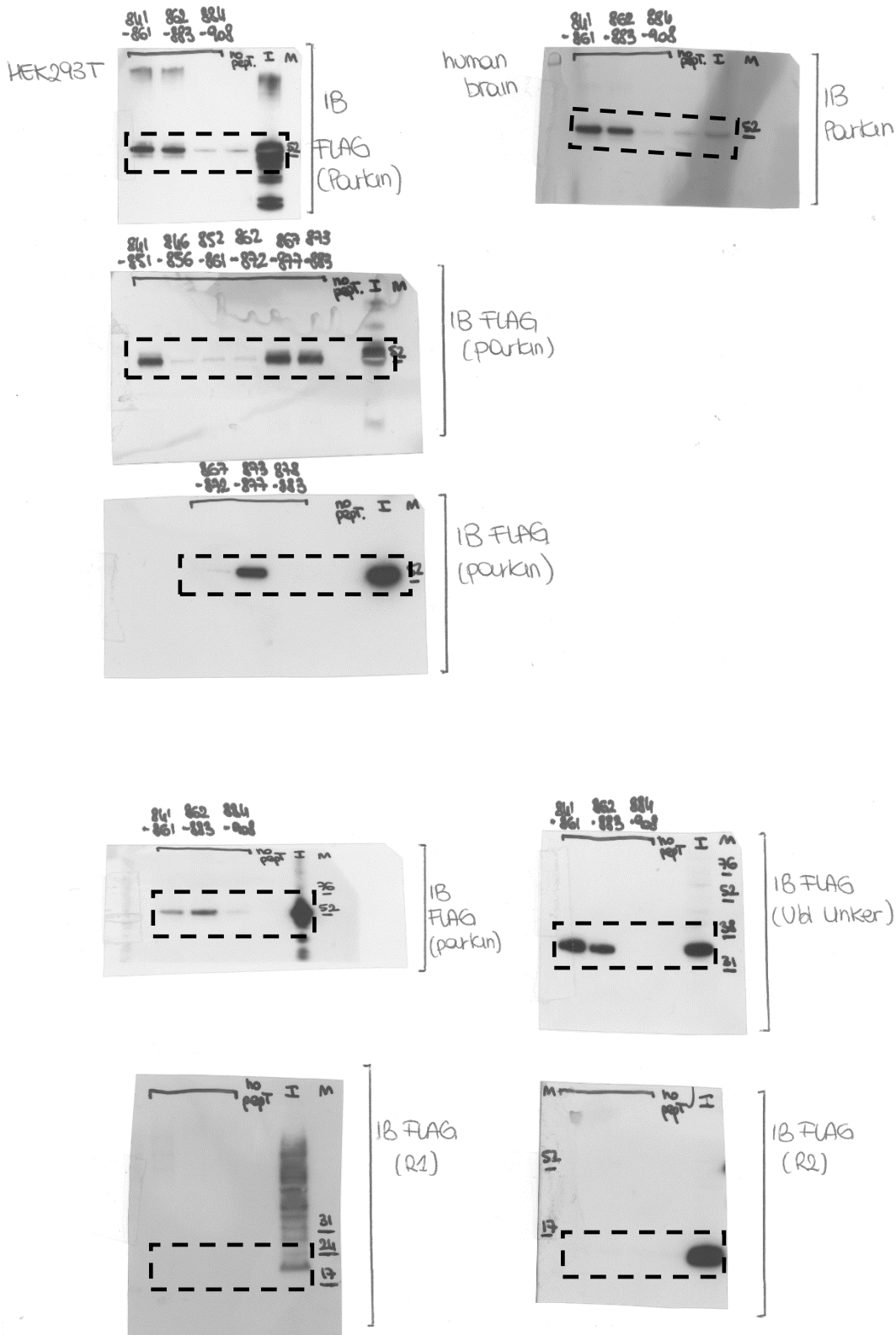
**Supplementary Figure 5. KAR stimulation increases parkin-GluK2a interaction.** (a) FRET analyses in HEK293T cells transfected with CFP-parkin and GluK2a-YFP. The graphs represent FRET efficiency increase upon glutamate treatment (Mann-Whitney Rank sum test,  $P=0.001$ , Degrees of freedom = 117 Mann-Whitney U statistic = 2834; Bar is 10  $\mu\text{m}$ ). Error bars indicate  $\pm$ s.e.m. (b) Western blots of co-immunoprecipitation experiments from HEK293T cells transfected with parkin and Myc-GluK2a under basal condition and after treatment with 10 mM glutamate for 10 min. The histogram represents the densitometer values of samples transfected with parkin and Myc-GluK2a immunoprecipitated with parkin antibody. Data derive from four independent experiments (NT  $1.00 \pm 0.27$  vs glutamate treated  $2.70 \pm 0.31$ , two-tailed unpaired t test,  $**P=0.0061$   $t=4.1353$  with 6 degrees of freedom). Error bars indicate  $\pm$ s.e.m. (c) Representative western blot of coimmunoprecipitations between endogenous parkin and GluK2 in brain lysates from wt-mouse, GluK2<sup>-/-</sup> mouse and parkin<sup>-/-</sup> mouse. The data show that GluK2 coimmunoprecipitates with parkin in wild-type tissues whereas coimmunoprecipitation signal is absent in lysates from parkin<sup>-/-</sup> mouse and GluK2<sup>-/-</sup> mouse. The image is representative of three independent experiments.

# Supplementary Figure 6



Supplementary Figure 6. Full blot images of western blots showed in Figure 2b-c.

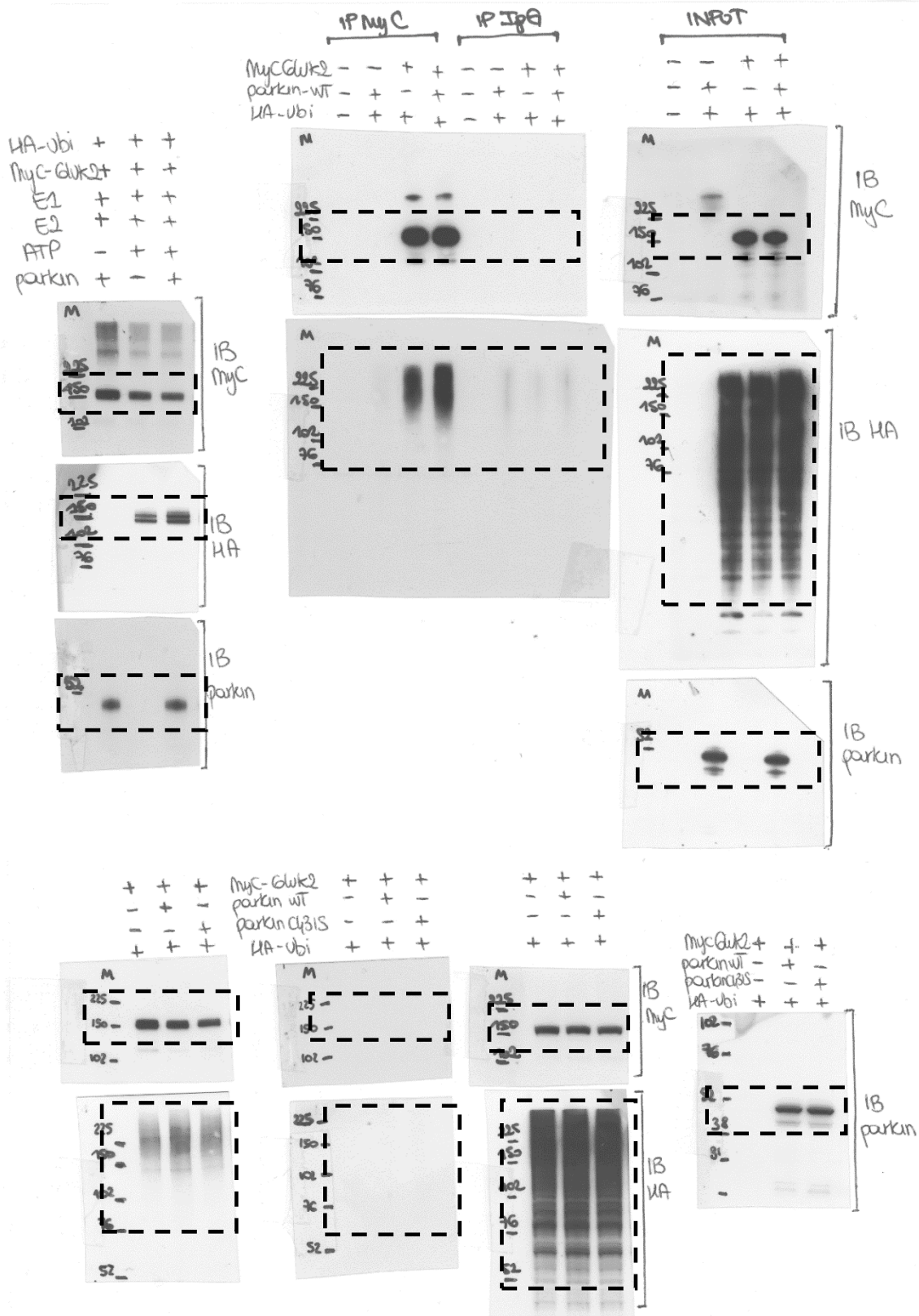
# Supplementary Figure 7



Supplementary Figure 7. Full blot images of western blots showed in Figure 2d-e.



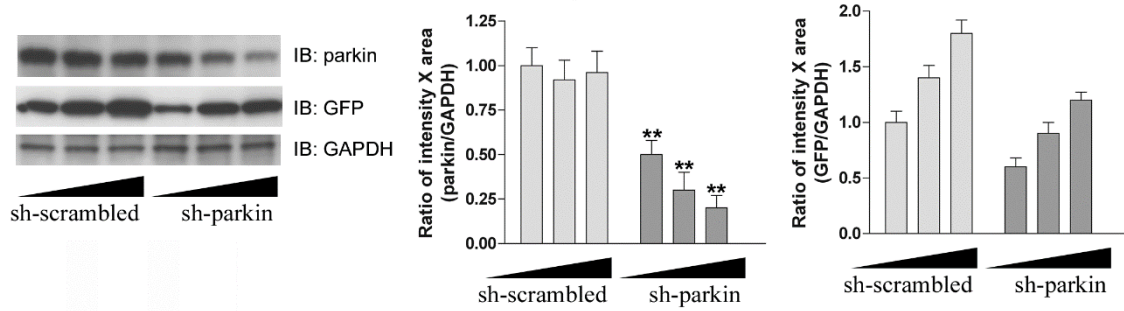
# Supplementary Figure 8



Supplementary Figure 8. Full blot images of western blots showed in Figure 3a-b.



## Supplementary Figure 9



### Supplementary Figure 9. Endogenous parkin silencing in primary neurons by lentivirus

**encoding short hairpin RNA.** Western blot of total lysates from hippocampal neurons infected

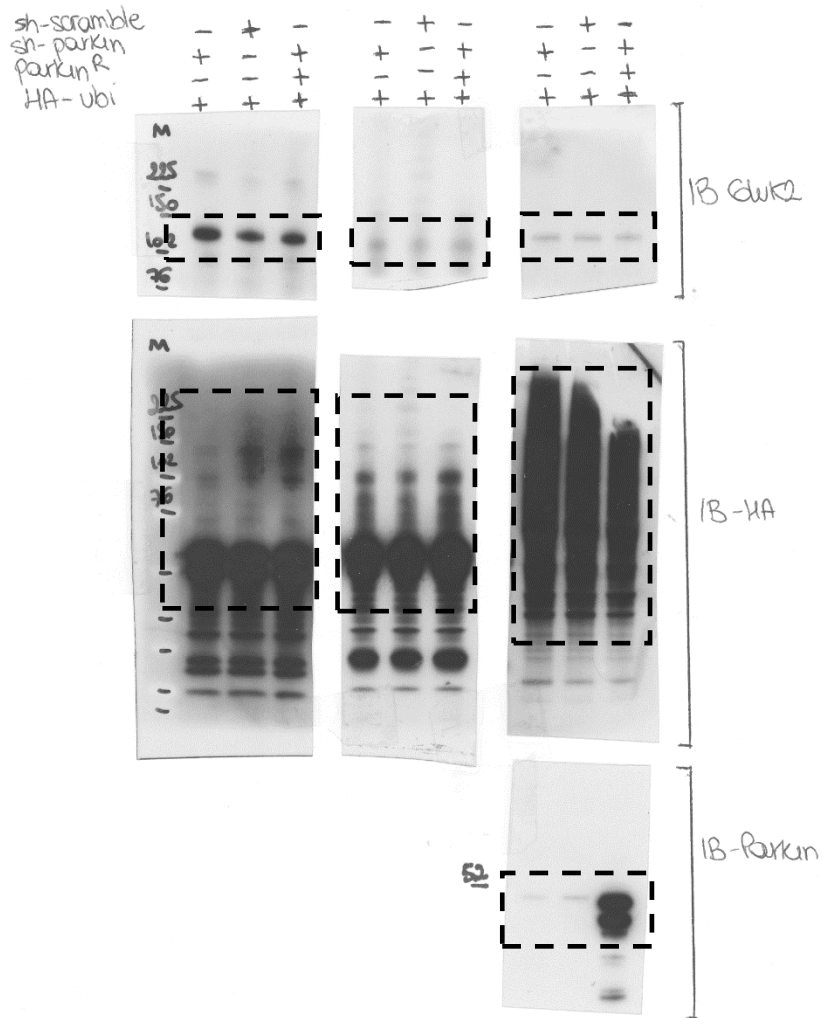
with increasing amounts (1, 2 and 3  $\mu\text{l}/1.8 \text{ cm}^2$  well) of lentiviral particles encoding bicistronic

GFP-shRNA-parkin or GFP-shRNA-scrambled. Densitometry analysis shows a dose-dependent

decrease in parkin expression (\*\* $P < 0.01$  vs scrambled) and a dose-dependent GFP expression

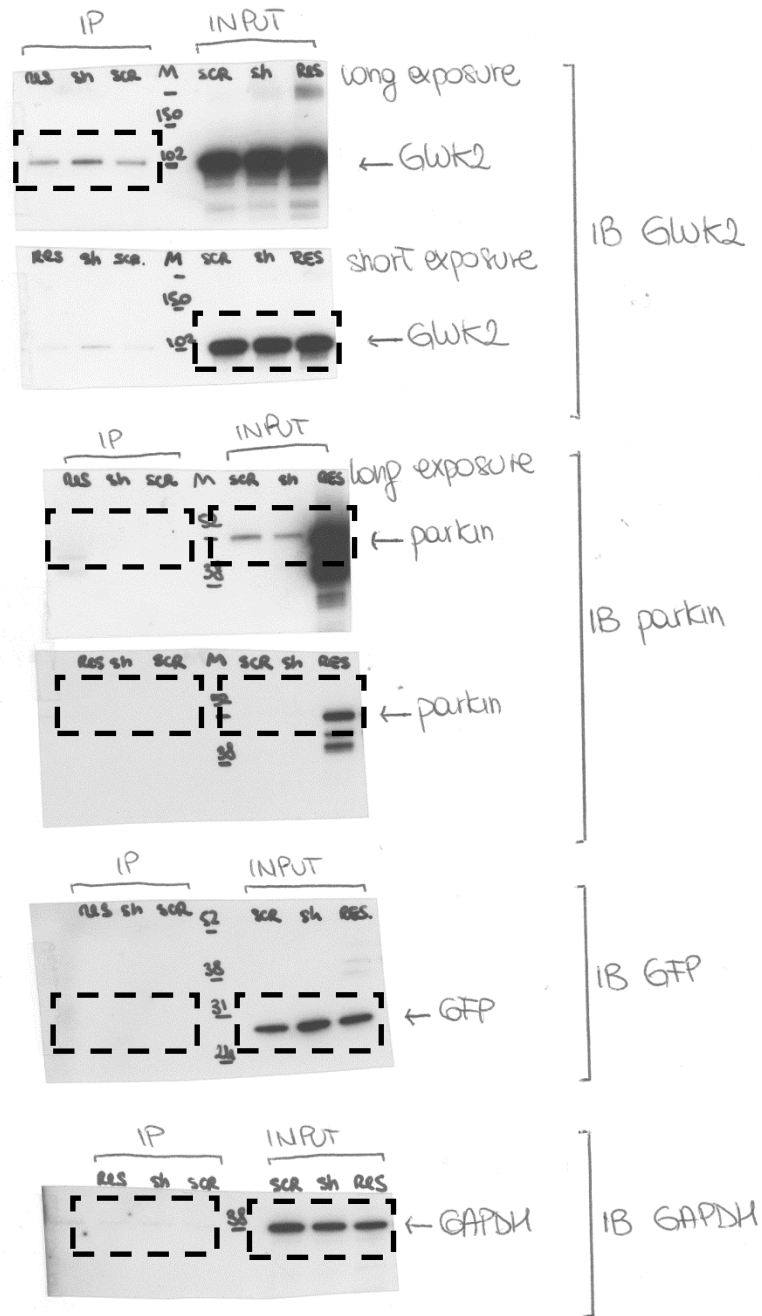
increase. The image is representative of three independent experiments. Error bars indicate  $\pm$ s.e.m.

# Supplementary Figure 10



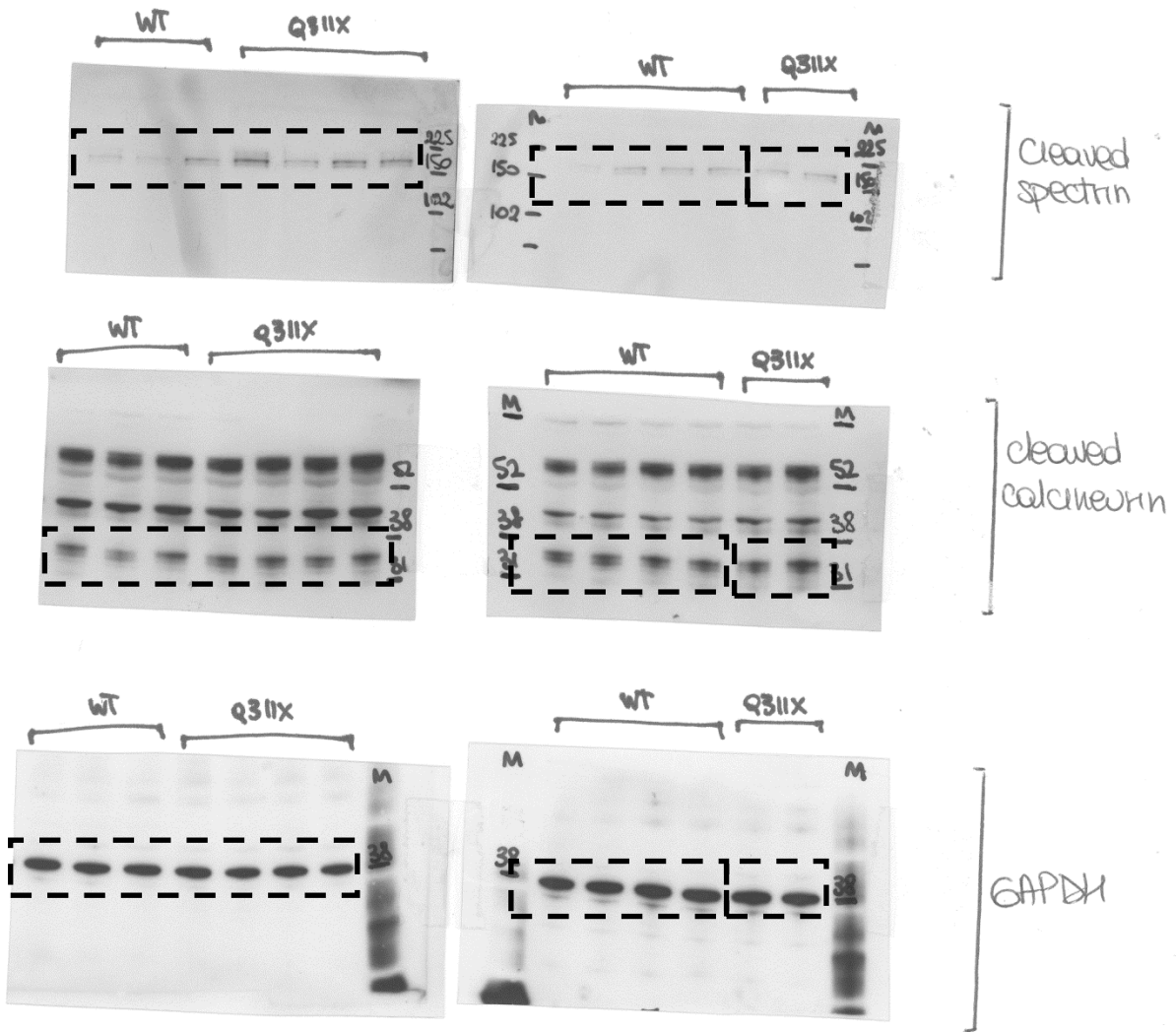
Supplementary Figure 10. Full blot images of western blots showed in Figure 3c.

# Supplementary figure 11



Supplementary Figure 11. Full blot images of western blots showed in Figure 4a.

# Supplementary Figure 12



Supplementary Figure 12. Full blot images of western blots showed in Figure 4e.

### Supplementary Table 1

Demographic and genetic data of the subjects included in the study.

SUBJECTS	AGE	SEX	DURATION	MUTATION
CONTROL 1	50	MALE		
CONTROL 2	65	MALE		
CONTROL 3	70	FEMALE		
CONTROL 4	45	FEMALE		
CONTROL 5	63	MALE		
ARJP PATIENT 1	63	MALE	30	PARK2 EXON 3 DELETION
ARJP PATIENT 2	68	MALE	35	PARK2 EXON 3 DELETION
ARJP PATIENT 3	62	MALE	38	PARK2 EXON 4 DELETION
ARJP PATIENT 4	71	FEMALE	49	PARK2 EXON 2/3 DELETION