



**Figure S1.** In the assessment of senescence markers in the SNc, the levels of LaminB1 and HMGB1 are lower in neurons in  $\alpha$ -syn PFF-injected brains than PBS-treated ones, whereas the levels of p21 in neurons are increased with  $\alpha$ -syn PFF. In the SNc, the label intensity of  $\beta$ -III-tubulin was decreased in PFF-injected SNc due to  $\alpha$ -syn PFF injection (n=6/group). The intensities of LaminB1 and HMGB1 in neurons (A,B&D) were reduced, however, the levels of p21 were enhanced in neurons with  $\alpha$ -syn PFF (C,D). DAPI stain (blue) was also used to indicate the location of nucleus. The label intensities of LaminB1, HMGB1 and p21 were quantified in  $\beta$ -III-tubulin-positive neurons, based on double-labels in a blinded manner. In quantification, PBS injected SNc region was used as a relative label intensity (100%, n=5/group) in mean $\pm$ SEM and applied to unpaired Student's t-test for statistical significance. \*\*\*\*:p<0.0001. Size bar: 100 $\mu$ m.