

SUPPLEMENTARY INFORMATION

Activity of the hypothalamic neuropeptide Y increases in adult and decreases in old rats

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Supplementary Figure 1: Changes in daily food intake of different age groups (aged 3, 6, 12, 18 or 24 months) of male Wistar rats before and during the course of a 7-day intracerebroventricular (ICV) infusion of NPY.

Dark coloums indicate NPY-treated groups, white coloums indicate food intake (FI) of age-matched PFS-treated (pyrogen-free saline) controls. All data are expressed as mean $\pm$ S.E.M. Asterisks indicate significant differences between the NPY-treated and control animals shown by repeated-measures ANOVA. The length of the line shows the duration of the difference.

Results of the statistical analysis:

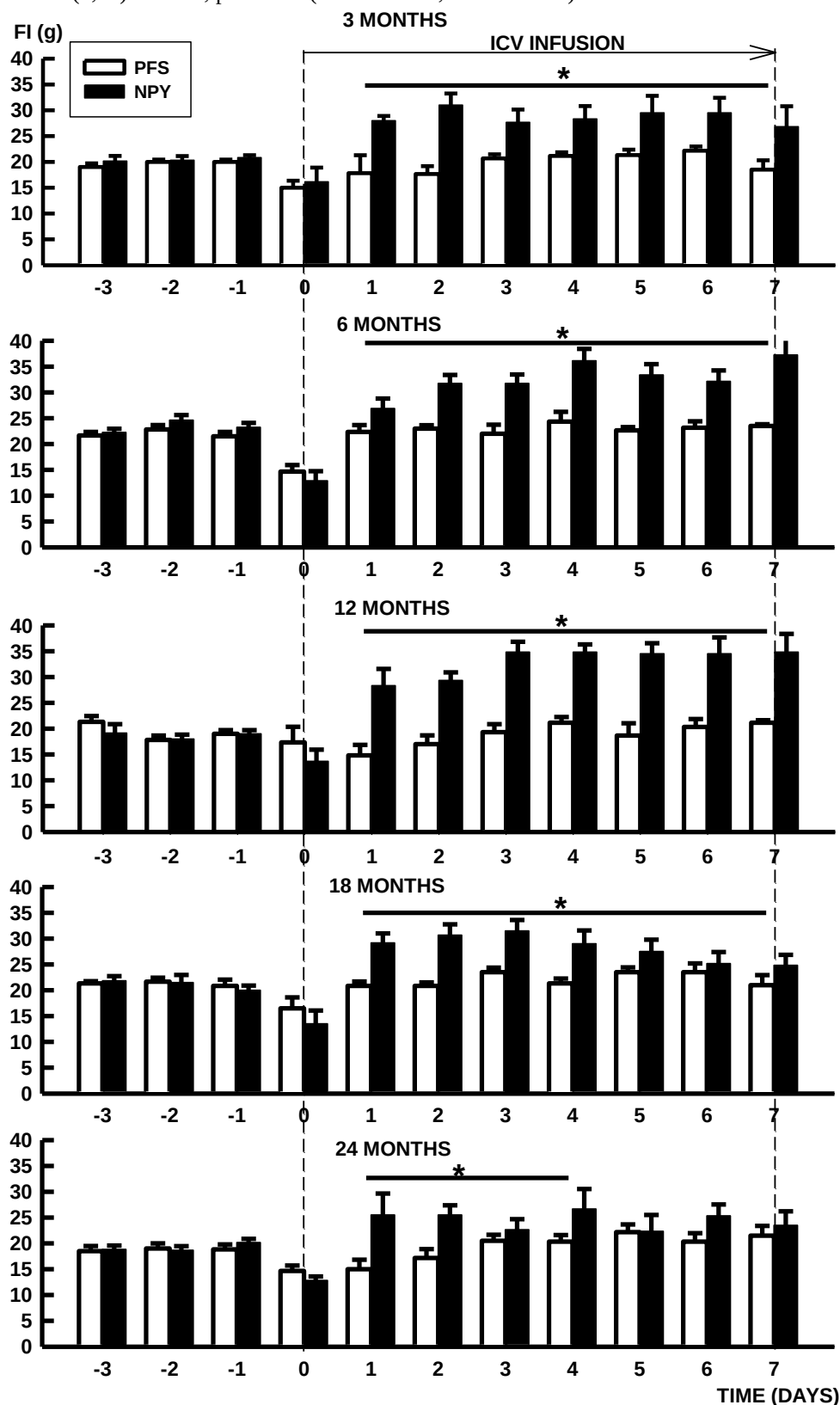
3-month-old animals: $F(1,10) = 12.562$; $p = 0.005$ (treated: $n = 6$, control $n = 6$)

6-month-old animals: $F(1,12) = 24.415$; $p < 0.001$ (treated: $n = 8$, control $n = 6$)

12-month-old animals: $F(1,10) = 59.021$; $p < 0.001$ (treated: $n = 6$, control $n = 6$)

18-month-old animals: $F(1,10) = 16.422$; $p = 0.002$ (treated: $n = 6$, control $n = 6$)

24-month-old animals: $F(1,10) = 6.000$; $p = 0.034$ (treated: $n = 6$, control $n = 6$)



Supplementary Figure 2: Circadian changes in heart rate (HR) of different age groups (aged 3, 6, 12, 18 or 24 months) of male Wistar rats before and during the course of a 7-day intracerebroventricular (ICV) infusion of NPY.

Red symbols indicate NPY-treated groups, black symbols indicate HR (beats per minute, BPM) of age-matched PFS-treated (pyrogen-free saline) controls. 12-h averaging for the active (nighttime, closed symbols) and inactive (daytime, open symbols) periods was performed. The white-black bars underneath the abscissa refer to the day-night periods, respectively. All data are expressed as mean $\pm$ S.E.M. Asterisks indicate significant differences between the NPY-treated and control animals shown by repeated-measures ANOVA. The length of the line shows the duration of the difference. Asterisks with lines above the curves show differences for the nighttime HR values, those under the curves indicate differences for daytime mean HR values.

Results of the statistical analysis:

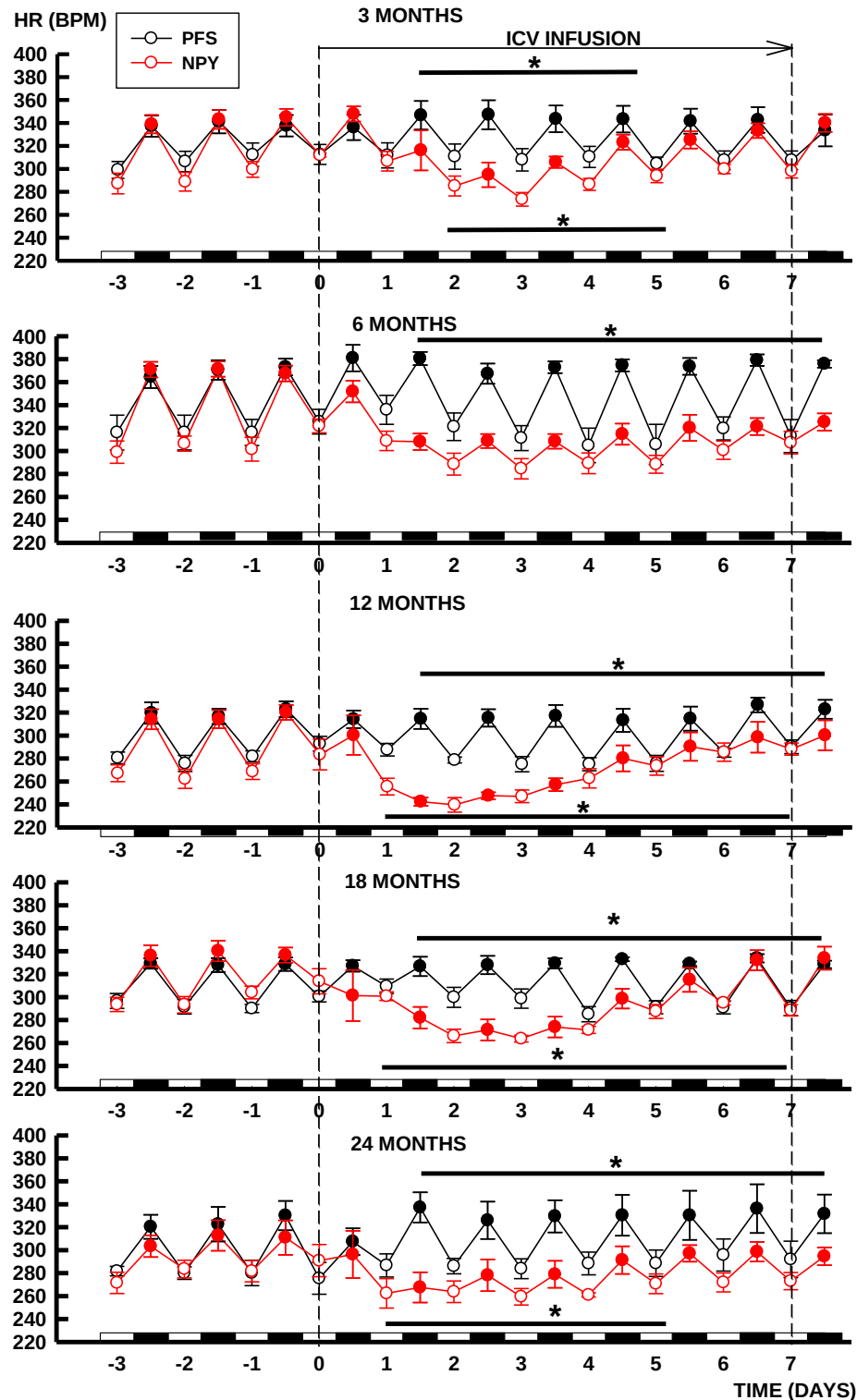
3-month-old: for nighttime HR: $F(1,12) = 5.149$; $p = 0.043$, for daytime HR: $F(1,12) = 4.968$; $p = 0.046$ (NPY: $n = 6$, PFS: $n = 8$)

6-month-old: for nighttime HR: $F(1,11) = 58.476$; $p < 0.001$ (NPY: $n = 8$, PFS: $n = 6$)

12-month-old: for nighttime: $F(1,11) = 14.588$; $p = 0.003$, for daytime HR: $F(1,11) = 5.103$; $p = 0.045$ (NPY: $n = 7$, PFS: $n = 6$)

18-month-old: for nighttime HR: $F(1,10) = 13.063$; $p = 0.005$, for daytime: $F(1,10) = 5.344$; $p = 0.043$ (NPY: $n = 6$, PFS: $n = 6$)

24-month-old: for nighttime HR: $F(1,10) = 5.423$; $p = 0.042$, for daytime: $F(1,10) = 5.273$; $p = 0.045$ (NPY: $n = 6$, PFS: $n = 6$)



Supplementary Figure 3: Circadian changes in core temperature (Tc) of different age groups (aged 3, 6, 12, 18 or 24 months) of male Wistar rats before and during the course of a 7-day intracerebroventricular (ICV) infusion of NPY. Red symbols indicate NPY-treated groups, black symbols indicate Tc of age-matched PFS-treated (pyrogen-free saline) controls. 12-h averaging for the active (nighttime, closed symbols) and inactive (daytime, open symbols) periods was performed. The white-black bars underneath the abscissa refer to the day-night periods, respectively. All data are expressed as mean $\pm$ S.E.M. Asterisks indicate significant differences between the NPY-treated and control animals shown by repeated-measures ANOVA. The length of the line shows the duration of the difference. Asterisks with lines above the curves show differences for the nighttime Tc values, those under the curves indicate differences for daytime mean Tc values.

Results of the statistical analysis:

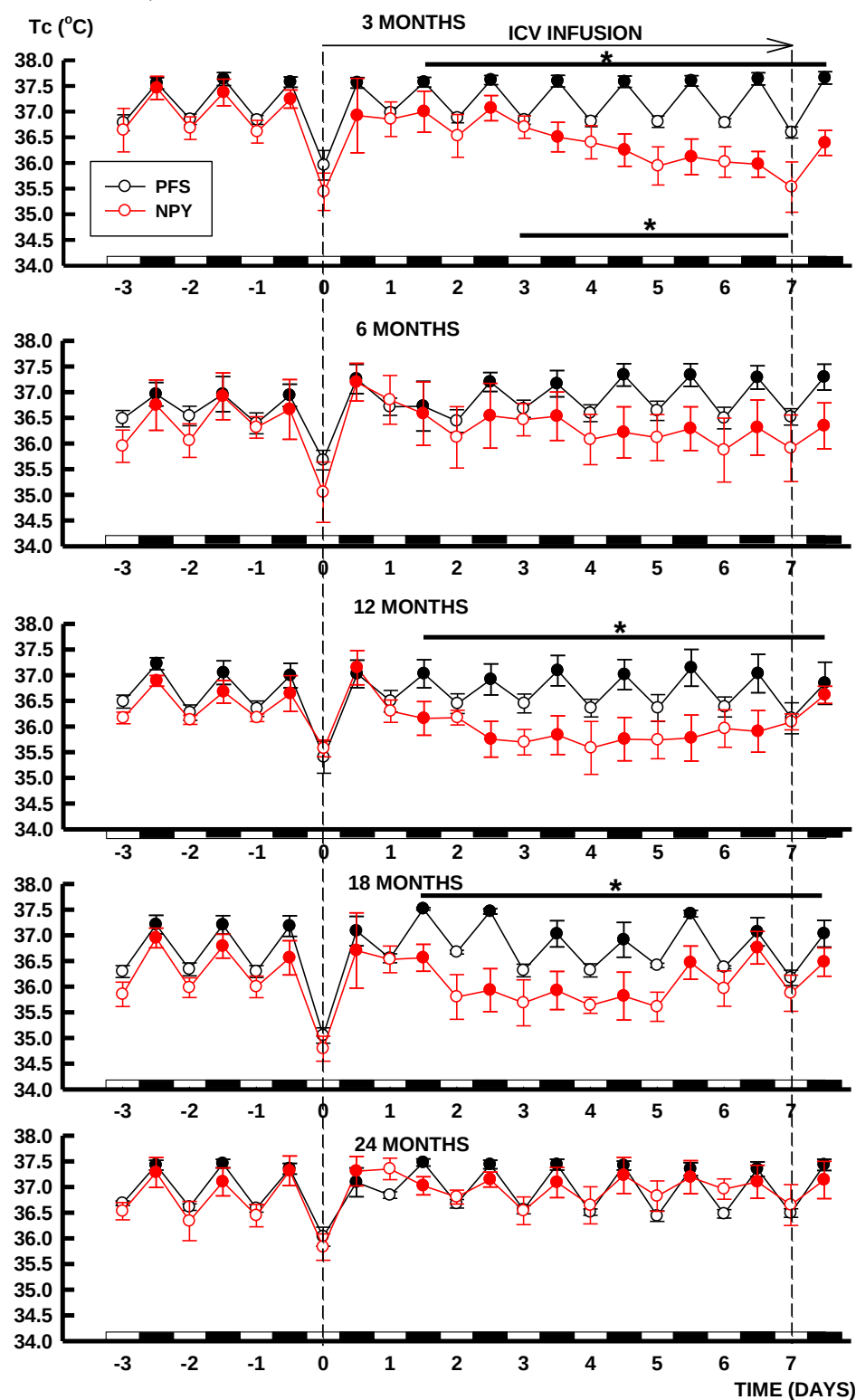
3-month-old: for nighttime Tc: $F(1,12) = 19.512$; $p = 0.001$, for daytime Tc: $F(1,12) = 4.799$; $p = 0.049$ (NPY: $n = 6$, PFS: $n = 8$)

6-month-old: NPY: $n = 6$, PFS: $n = 6$

12-month-old: for nighttime Tc: $F(1,11) = 5.808$; $p = 0.035$ (NPY: $n = 6$, PFS: $n = 7$)

18-month-old: for nighttime Tc: $F(1,11) = 12.260$; $p = 0.005$ (NPY: $n = 6$, PFS: $n = 7$)

24-month-old animals: NPY: $n = 6$, PFS: $n = 8$



Supplementary Figure 4: Circadian changes in spontaneous horizontal locomotor activity (ACT) of different age groups (aged 3, 6, 12, 18 or 24 months) of male Wistar rats before and during the course of a 7-day intracerebroventricular (ICV) infusion of NPY. Red symbols indicate NPY-treated groups, black symbols indicate ACT (arbitrary units, counts) of age-matched PFS-treated (pyrogen-free saline) controls. 12-h averaging for the active (nighttime, closed symbols) and inactive (daytime, open symbols) periods was performed. The white-black bars underneath the abscissa refer to the day-night periods, respectively. All data are expressed as mean $\pm$ S.E.M. Asterisks indicate significant differences between the NPY-treated and control animals shown by repeated-measures ANOVA. The length of the line shows the duration of the difference. Asterisks with lines under the curves show differences for the daytime ACT values.

Results of the statistical analysis:

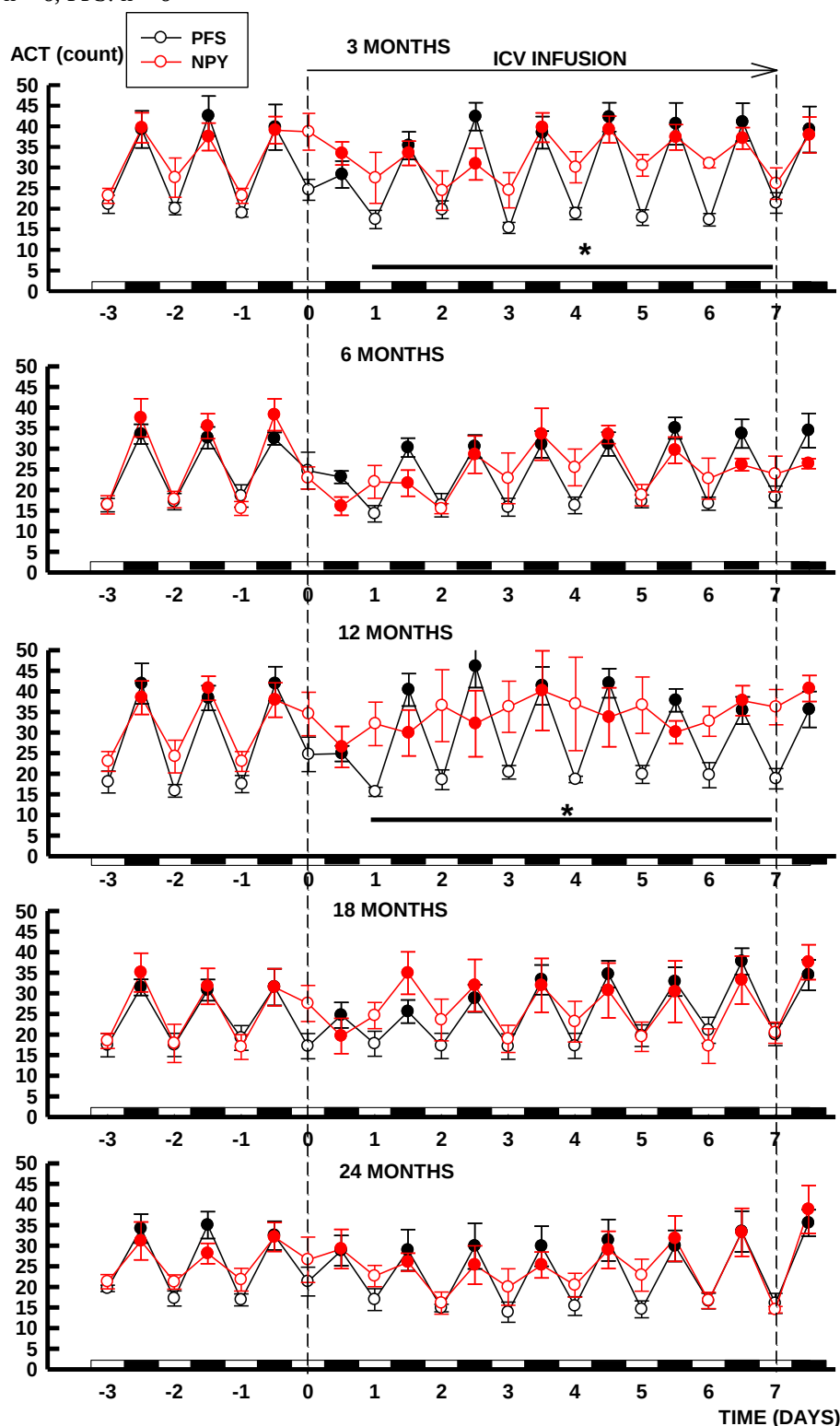
3-month-old: for daytime ACT: $F(1,12) = 11.454$; $p = 0.005$ (NPY: $n = 6$, PFS: $n = 8$)

6-month-old: NPY: $n = 6$, PFS: $n = 6$

12-month-old: for daytime ACT: $F(1,10) = 6.782$; $p = 0.026$ (NPY: $n = 6$, PFS: $n = 6$)

18-month-old: NPY: $n = 6$, PFS: $n = 8$

24-month-old: NPY: $n = 6$, PFS: $n = 6$



Supplementary Figure 5: Changes in body weight (BW compared with their initial BW on day 0) of different age groups (aged 3, 6, 12, 18 or 24 months) of male Wistar rats before and during the course of a 7-day intracerebroventricular (ICV) infusion of NPY. Dark symbols indicate NPY-treated groups, white symbols indicate changes in BW of age-matched PFS-treated (pyrogen-free saline) controls. All data are expressed as mean $\pm$ S.E.M. Asterisks indicate significant differences between the NPY-treated and control animals shown by repeated-measures ANOVA. The length of the line shows the duration of the difference. The initial BW values did not differ in NPY-treated and their age-matched controls (Supplementary Table).

Results of the statistical analysis:

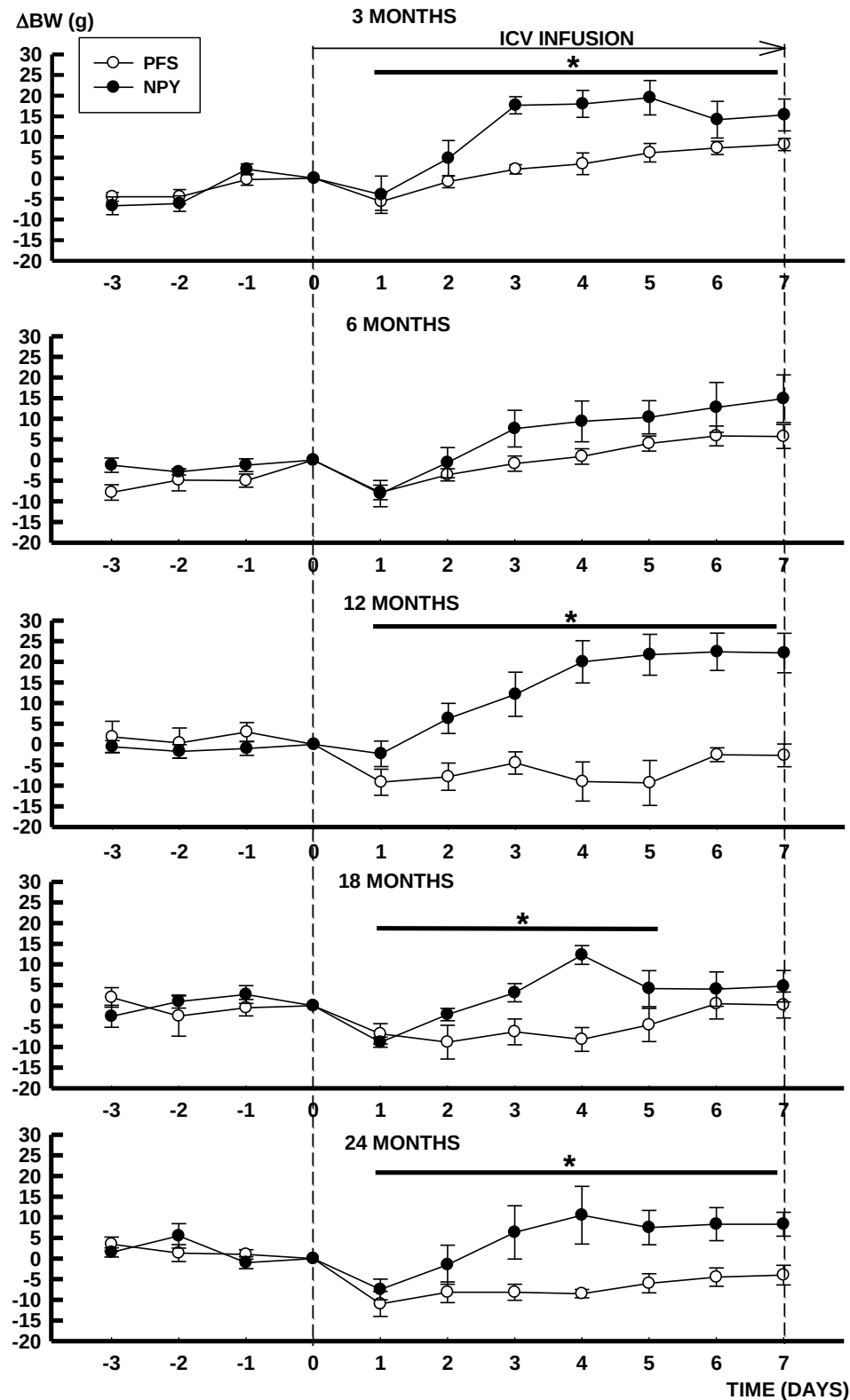
3-month-old: $F(1,10) = 18.876$; $p = 0.001$ (NPY: $n = 6$, PFS: $n = 6$)

6-month-old: NPY: $n = 8$, PFS: $n = 7$

12-month-old: $F(1,11) = 20.122$; $p = 0.001$ (NPY: $n = 7$, PFS: $n = 6$)

18-month-old animals: $F(1,11) = 6.672$; $p = 0.025$ (NPY: $n = 7$, PFS: $n = 6$)

24-month-old: $F(1,10) = 8.885$; $p = 0.014$ (NPY: $n = 6$, PFS: $n = 6$)



Supplementary Table:

Initial body weight values of NPY-treated and those of their age-matched controls treated with pyrogen-free saline.

Age (months)	Initial body weight before the NPY infusion (mean $\pm$ S.E.M.)	Initial body weight before the infusion of pyrogen-free saline (mean $\pm$ S.E.M.)
3	387.5 $\pm$ 12.5 g	389.3 $\pm$ 5.4 g
6	467.0 $\pm$ 12.6 g	470.4 $\pm$ 4.4 g
12	538.4 $\pm$ 13.7 g	536.2 $\pm$ 7.5 g
18	546.9 $\pm$ 18.2 g	562.3 $\pm$ 13.4 g
24	500.3 $\pm$ 10.7 g	499.3 $\pm$ 5.1 g