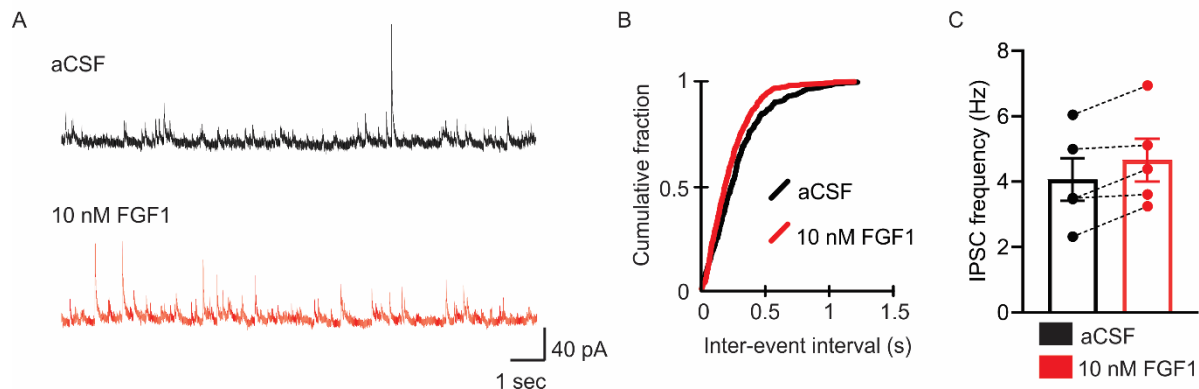
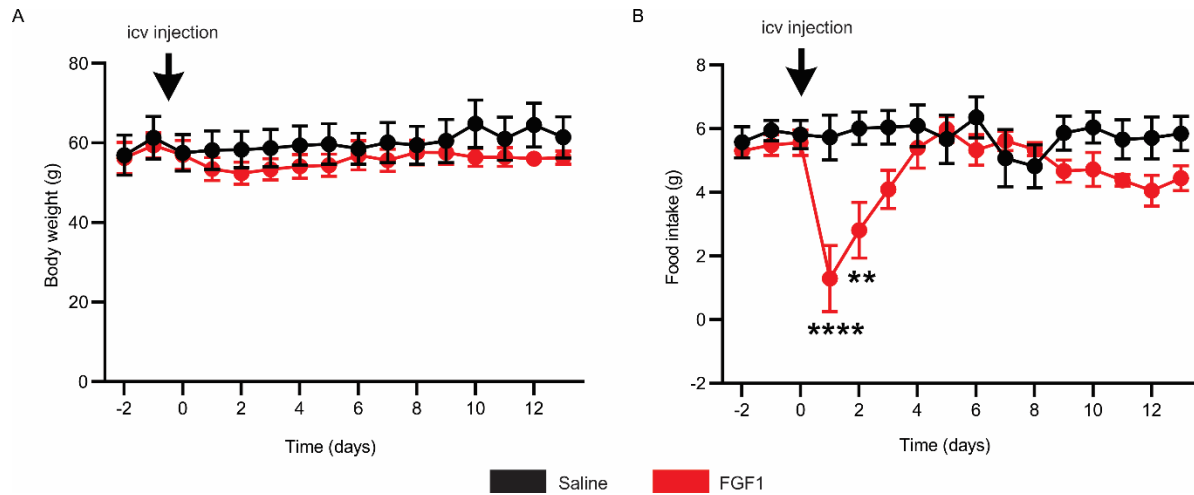


**Supplementary figure 1 (related to Figure 2). FGF-1 reduced AP frequency of NPY/AgRP neurons in a concentration-dependent manner.** Current clamp trace showing FGF-1 effects at 1, 10, and 30 nM in NPY/AgRP neurons (5 mice were used to generate data).

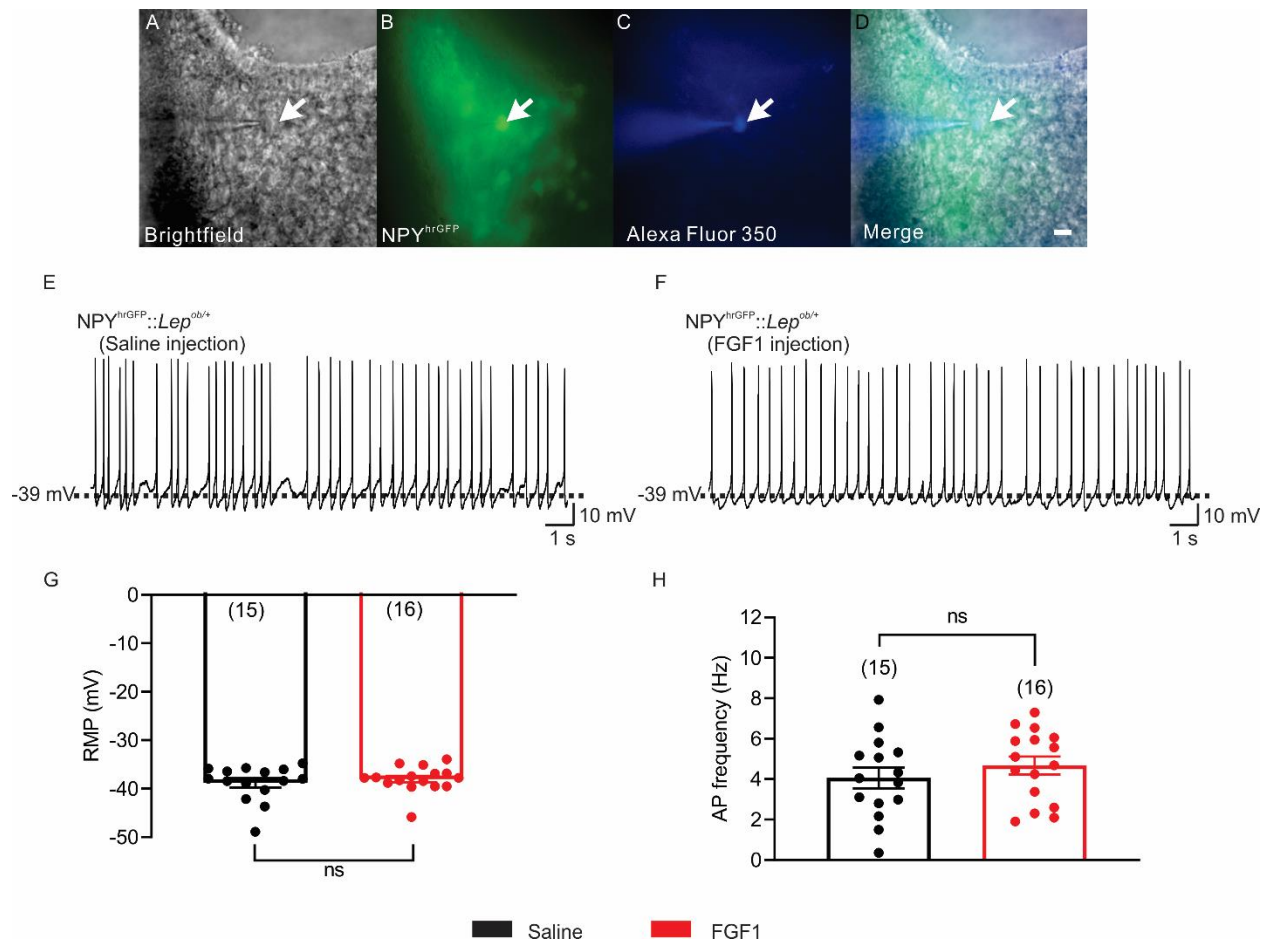


**Supplementary figure 2 (related to Figure 2). Bath application of FGF1 enhances**

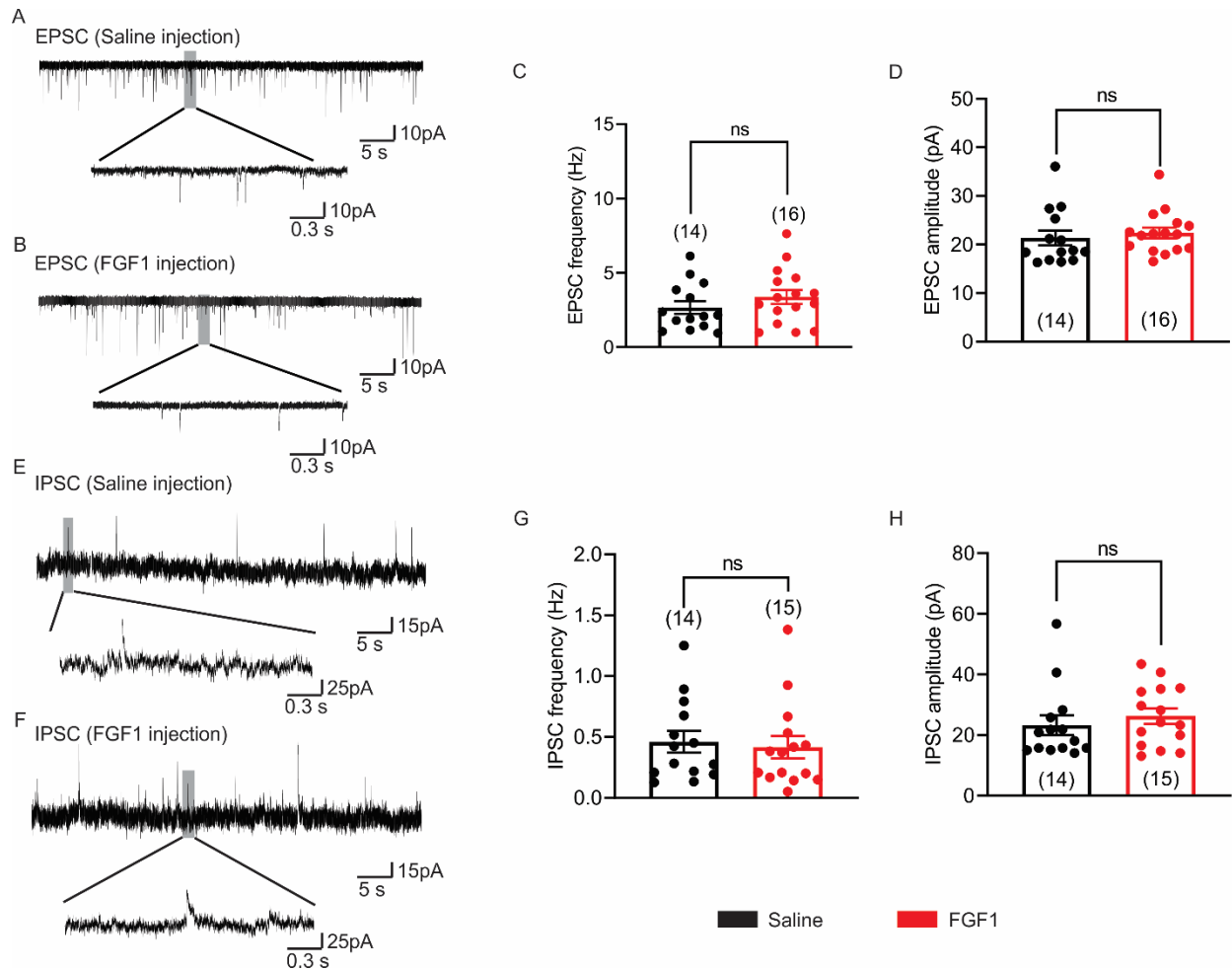
**GABAergic tone onto NPY neurons in an ex vivo slice preparation.** (A) Representative trace showing the spontaneous IPSC frequency of an NPY neuron before (black) and during (red) bath application of 10 nM FGF1. (B) Cumulative fraction plot shows a significant increase in sIPSC frequency in response to FGF1 (KS test;  $P < 0.05$ ). (C) Histogram indicating FGF1-induced changes in sIPSC frequency observed in 5 neurons (from 4 slices in 1 mouse).



**Supplementary figure 3 (related to Figures 3 and 4). A single injection of FGF1 (icv) transiently reduces food intake in *Lep<sup>ob/ob</sup>* mice.** (A) Body weight curve and (B) food intake of male *Lep<sup>ob/ob</sup>* mice that received a single injection of FGF1 (red) or Saline (black) into the lateral ventricle. Data are from male *Lep<sup>ob/ob</sup>* mice (n=3-4) and are expressed as mean  $\pm$  SEM. \*\*  $p < 0.01$  and \*\*\*\*  $p < 0.0001$ , multiple unpaired t-test compared to Saline group.

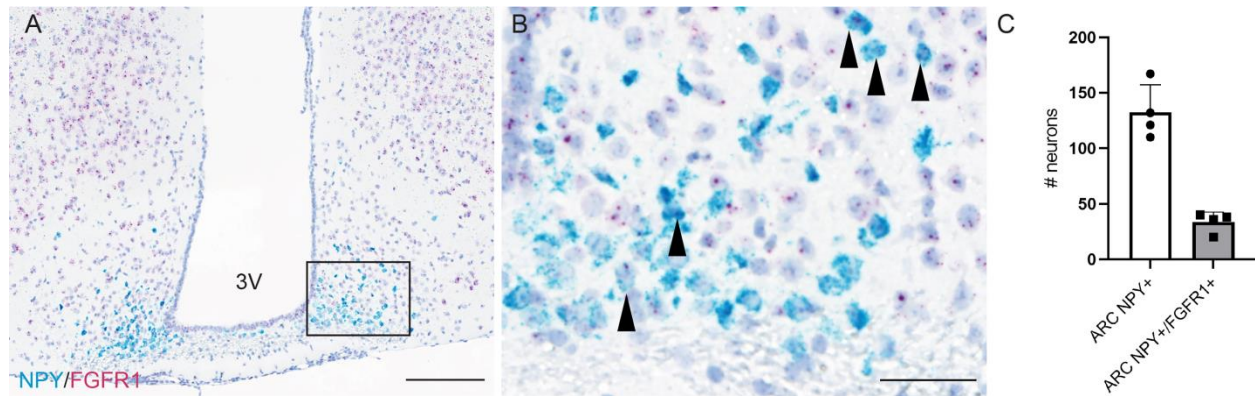


**Supplementary figure 4 (related to Figure 3). NPY/AgRP neuronal activity from *Lep<sup>ob/+</sup>* mice remains unchanged 2 wk after icv injection of FGF1.** Brightfield illumination (A) of NPY neurons from *Lep<sup>ob/+</sup>* mice. The same neuron under FITC (hrGFP; B) and Alexa Fluor 350 illumination (C). Merged image of targeted NPY neuron is shown in (D). Arrow indicates the targeted cell. Scale bar = 50  $\mu$ m. Current-clamp recording shows the resting membrane potential of an NPY neuron from a male *Lep<sup>ob/+</sup>* mouse that received saline (E) or FGF1 (F). Histograms demonstrate the average resting membrane potential (G) and action potential frequency (H) of NPY neurons from male *Lep<sup>ob/+</sup>* mice following injection of saline (black; n=15, from 2 mice) or FGF1 (red; n=16, from 2 mice). Data are taken from NPY neurons of male *NPY<sup>hrGFP::Lep<sup>ob/+</sup></sup>* mice and are expressed as mean  $\pm$  SEM. unpaired t-test compared to Saline group. The number of neurons studied for each group is in parentheses.



**Supplementary figure 5 (related to Figure 4). Synaptic activity of NPY/AgRP neurons from *Lep<sup>ob/+</sup>* mice remains unchanged 2 wk after icv injection of FGF1.** Voltage clamp recording of excitatory postsynaptic currents (EPSCs) observed in an NPY neuron from *Lep<sup>ob/+</sup>* mice 2 wk after i.c.v. saline (A) or FGF1 (B) injection. Histograms demonstrate the average EPSC frequency (C) and amplitude (D) of NPY neurons from male *Lep<sup>ob/+</sup>* mice injected with either saline (black; n=14, from 2 mice) or FGF1 (red; n=16, from 2 mice). Voltage clamp recording of inhibitory postsynaptic currents (IPSCs) observed in an NPY neuron from *Lep<sup>ob/+</sup>* mice 2 wk after i.c.v. injection of saline (E) or FGF1 (F). Histograms demonstrate the average IPSC frequency (G) and amplitude (H) of NPY neurons from male *Lep<sup>ob/+</sup>* mice injected with saline (black; n=14, from 2 mice) or FGF1 (red; n=15, from 2 mice). Data are taken from NPY neurons

of male NPY<sup>hrGFP</sup>::*Lep*<sup>ob/+</sup> mice and are expressed as mean  $\pm$  SEM. unpaired t-test compared to Saline group. The number of neurons studied for each group is in parentheses.



**Supplementary figure 6. Co-expression of *FGFR1* mRNA in NPY neurons. A:**

Representative duplex ISH to *NPY* (teal) and *FGFR1* (red), with inset expanded in panel B.

Arrows in panel B denote NPY neurons that contain *FGFR1* mRNA. C: <20% of NPY neurons (123/644, mean of 33.5 neurons per section) quantified in our analysis contain *FGFR1* mRNA whereas the majority of NPY neurons do not contain *FGFR1* mRNA (521/644 neurons, mean of 132.5 neurons per section). Data were analyzed from 2 hypothalamic sections from 2 separate mice. Scale bars in D = 200  $\mu$ m, E = 50  $\mu$ m.