



**Fig. S1** Effects on gene expression of chronic intraperitoneal injections of vehicle solution (controls of Figure 5) compared to uninjected WT and *Crtc1*<sup>-/-</sup> mice (controls of Figure 2). **(A)** Effects of chronic injections on total *Bdnf* expression in the hippocampus (HIP) and prefrontal cortex (PFC). Chronic injections reduced *Bdnf* levels of WT in the HIP and PFC (\*\* $p < 0.01$ , \*\*\* $p < 0.001$ ) and of *Crtc1*<sup>-/-</sup> mice in the PFC (### $p < 0.001$ , vs. *Crtc1*<sup>-/-</sup> mice). **(B)** Effects of chronic injections on *BdnfIV* expression in the HIP and PFC. Chronic injections had no effect on *BdnfIV* levels in the HIP. Injections significantly downregulated *BdnfIV* in the PFC of *Crtc1*<sup>-/-</sup> mice (### $p < 0.01$ , vs. *Crtc1*<sup>-/-</sup> mice), and they also presented lower *BdnfIV* levels than injected WT mice in the same structure ( $^{\$}p < 0.05$ , vs. WT injected). **(C-F)** Effects of chronic injections on *Nr4a1-3* expression in the HIP and PFC. Chronic injections significantly decreased the expression of *Nr4a1-3* in the HIP and of *Nr4a2-3* in the PFC of WT mice (\* $p < 0.05$ , \*\*\* $p < 0.001$ , vs. WT mice). Non-injected *Crtc1*<sup>-/-</sup> mice presented lower *Nr4a1-3* levels in the HIP and PFC than non-injected WT mice ( $^+p < 0.05$ , vs. WT mice), except for *Nr4a3* in the HIP. Injected *Crtc1*<sup>-/-</sup> mice also displayed lower levels of *Nr4a1* and *Nr4a2* in the PFC ( $^{\$}p < 0.01$ , vs. WT injected). In *Crtc1*<sup>-/-</sup> mice, chronic injections only reduced the levels of *Nr4a3* in the HIP (### $p < 0.001$ ). \*: WT vs. WT injected, +: WT vs. *Crtc1*<sup>-/-</sup>, #: *Crtc1*<sup>-/-</sup> vs. *Crtc1*<sup>-/-</sup> injected,  $^{\$}$ : WT injected vs. *Crtc1*<sup>-/-</sup> injected.