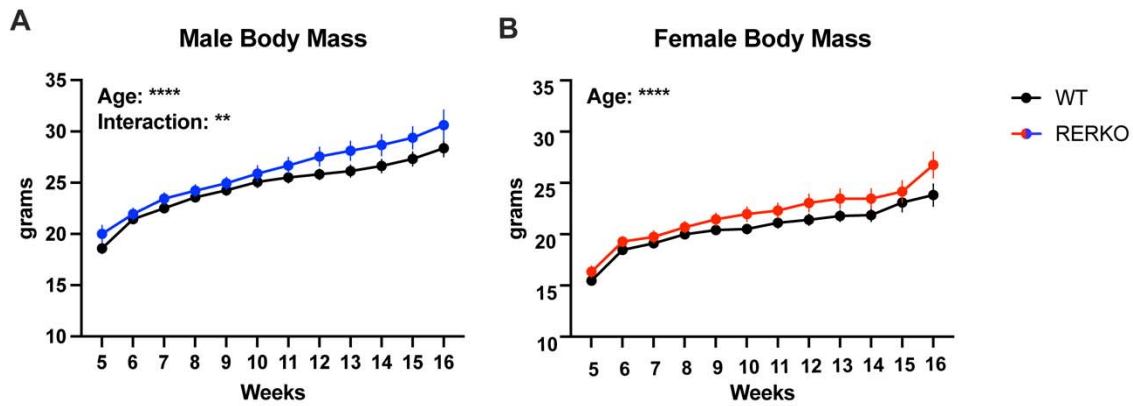
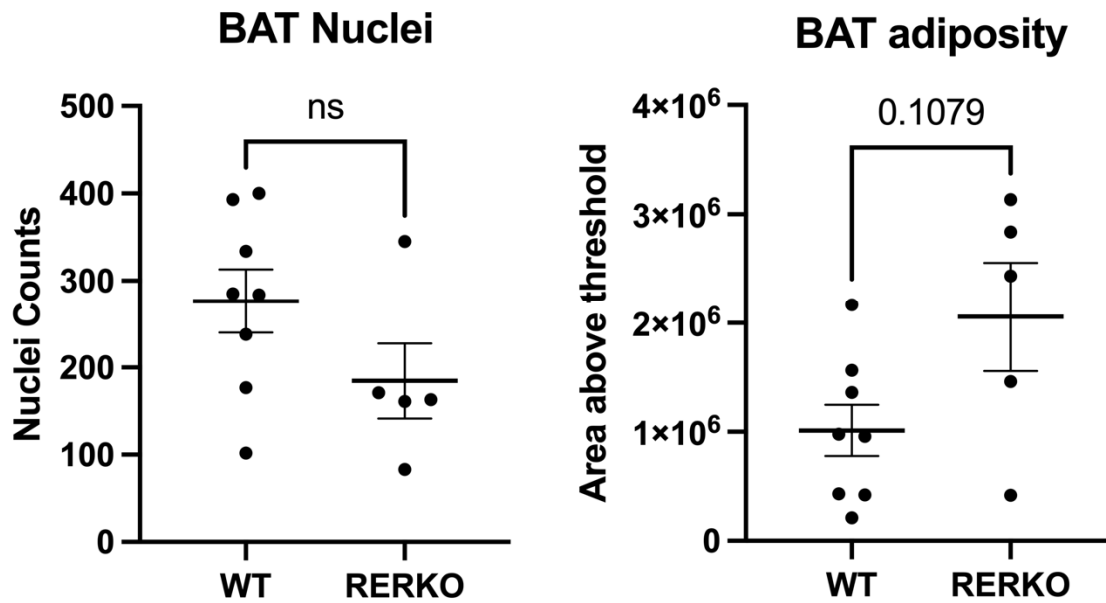


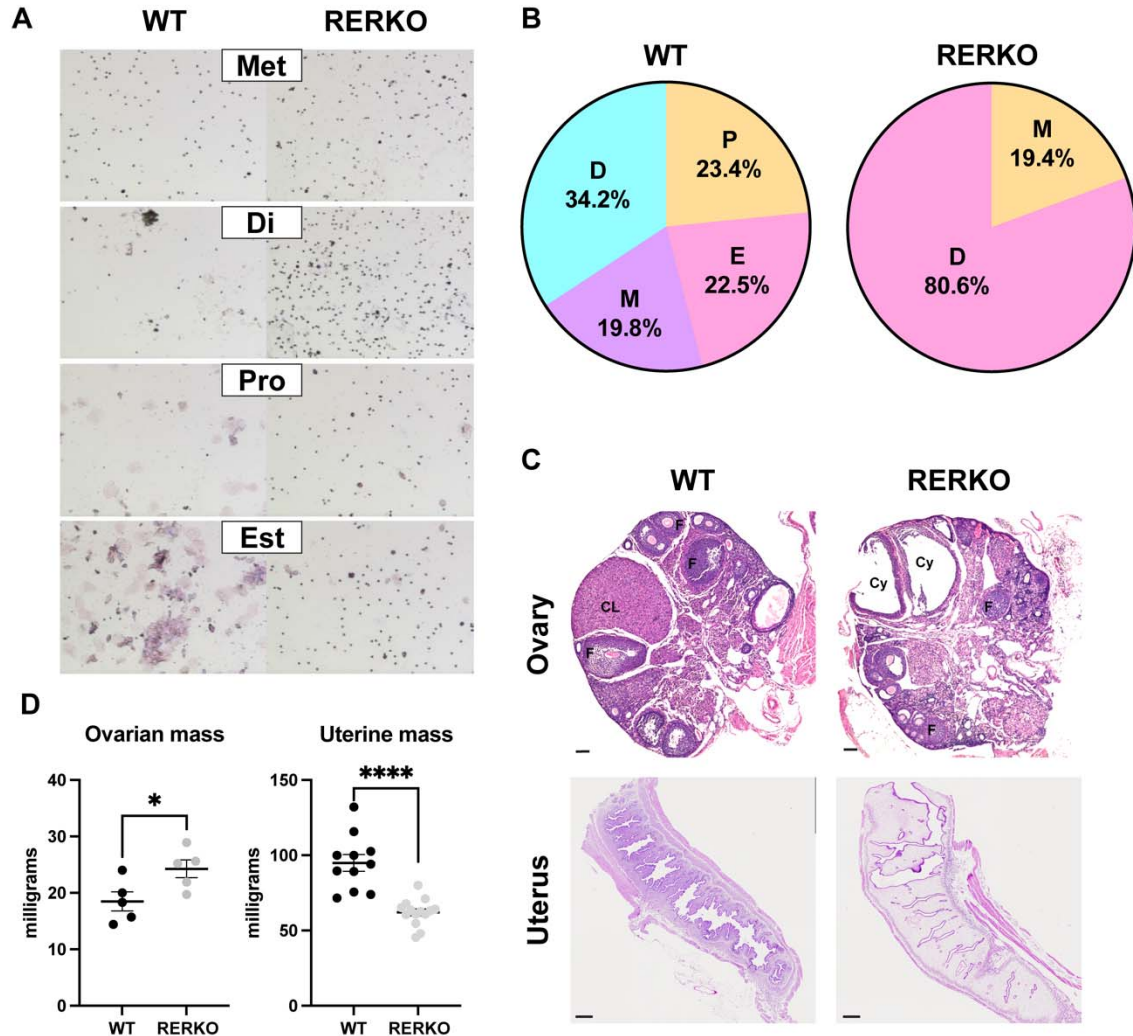
Supplementary Figure 1: Additional tissues displaying tdTomato expression in *Rprm*^{Cre}; Ai14^{fl/+} mice. Tissue harvesting and imaging reveal the expression of tdTomato in the pancreas and pituitary in female mice. Brightfield images displayed on top, fluorescent images below. Scale bars = 200 μ m.



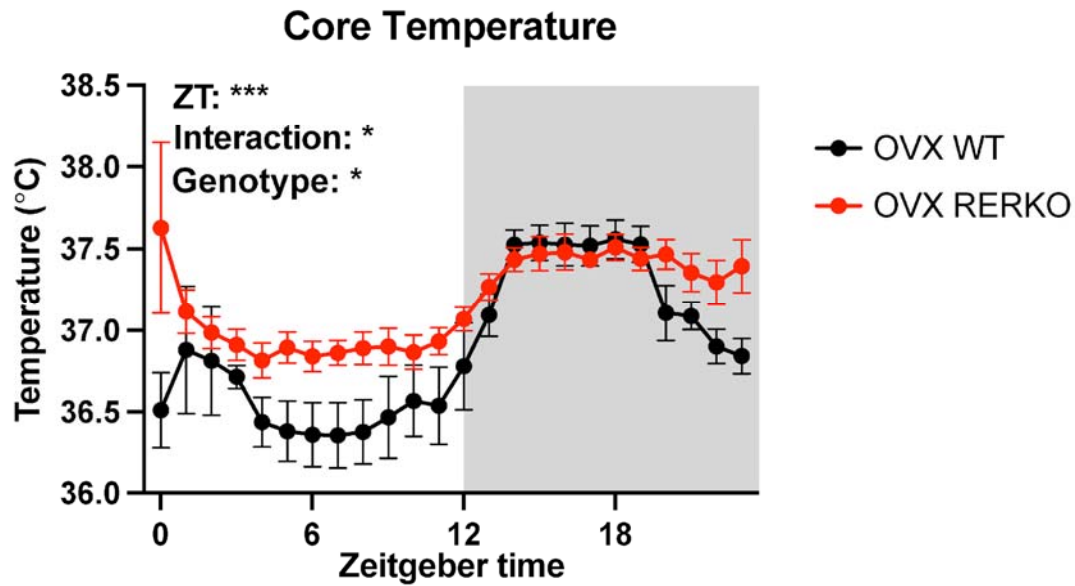
Supplementary Figure 2. Longitudinal body weight analysis of RERKO mice. (A) Body mass measurements of control (black) and RERKO (blue) male mice from 5 to 16 weeks of age ($n = 16$ WT, $n = 18$ RERKO). (B) Body mass measurements of control (black) and RERKO (red) female mice from 5 to 16 weeks of age ($n = 13$ WT, $n = 13$ RERKO). In females, we only detected an effect of age ($F_{11,238} = 61$, $p < 0.0001$). Mean and standard error of the mean plotted at each time point. A mixed-effects model using Restricted Maximum Likelihood (REML) estimation was used for statistical analysis due to missing values.



Supplementary Figure 3. BAT nuclei and BAT adipose quantification in control and RERKO mice. A) Nuclei within a fixed area of BAT tissue were counted in 40x images in control and RERKO adult female mice. B) To roughly compare the adiposity in BAT tissue, the total area of the white portion of BAT images (a proxy for fat droplets) was also estimated using thresholding analysis in ImageJ. Statistical analysis performed using t-test.



Supplementary Figure 4. RERKO female mice have disrupted reproduction. (A) Images depict vaginal lavages from WT (left) and RERKO (right) mice stained with Giemsa. While the WT mice display expected cellular morphological changes across the estrous cycle, swabs from RERKO mice mostly contain leukocytes. (B) The percent of days across 14 days spent in diestrus [D], proestrus [P], estrus [E], and metestrus [M] in WT (left) and RERKO (right) mice. (C) Ovarian histology visualized with hematoxylin & eosin stain. Follicular cysts are present and the corpus luteum is absent in the ovary from RERKO mice. CL = corpus luteum, F = ovarian follicles, Cy = cyst. Scales are 100 μ m (ovary) and 500 μ m (uterus). (D) Dissected ovarian and uterine mass from control (black) and RERKO (gray) mice. T-test used to compare between groups. The mean and standard error of the mean are depicted. Individual data points are shown in Figure D. * $p < 0.05$, **** $p < 0.0001$.



Supplementary Figure 5. Core temperature in RERKO mice lacking ovaries. Core temperature averaged hourly across 24 hours in ovariectomized (OVX) WT littermates (black) or RERKO (red) mice. Two-way mixed ANOVAs used for statistical analysis. The mean and standard error of the mean are depicted for each hour. * $p < 0.05$. ZT = Zeitgeber time. C = Celsius. Shaded box indicates the dark (active) phase of the day.