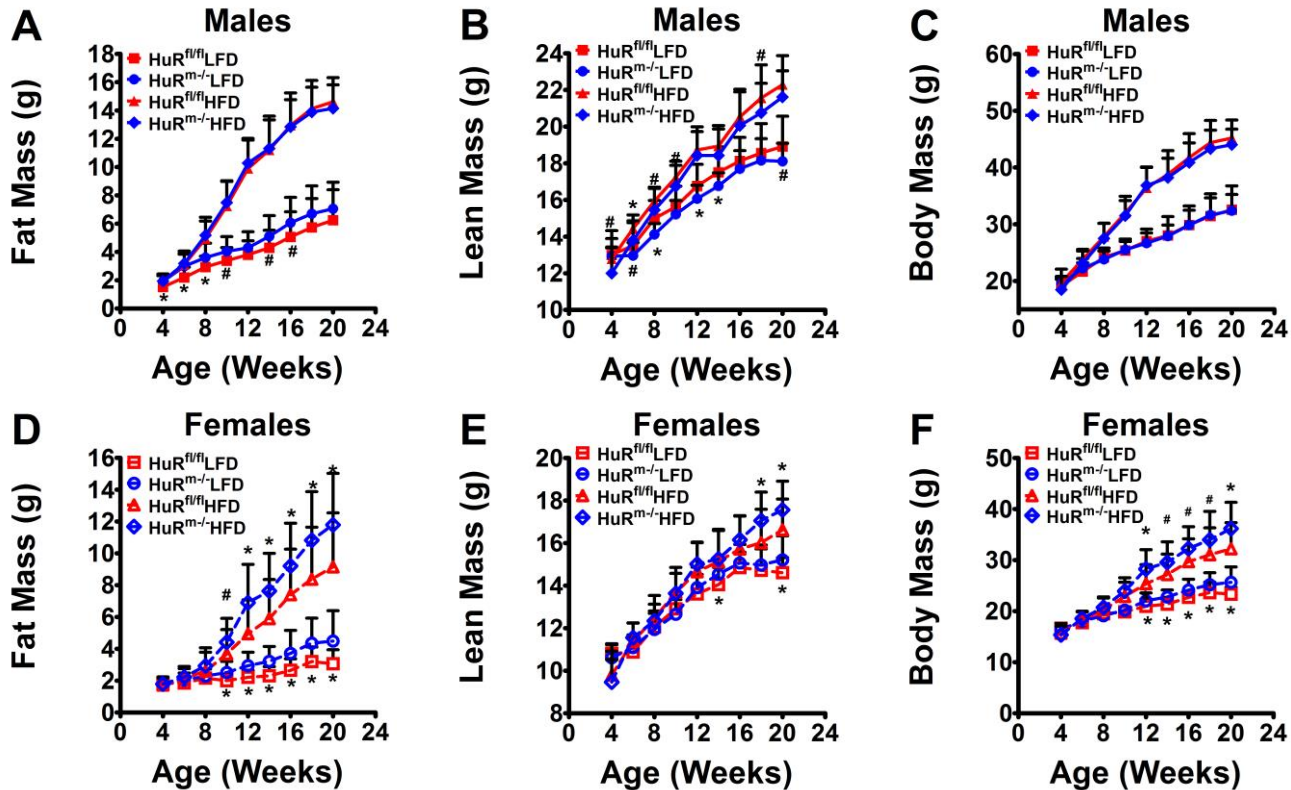


Supplementary Table S1: Primers used in this study

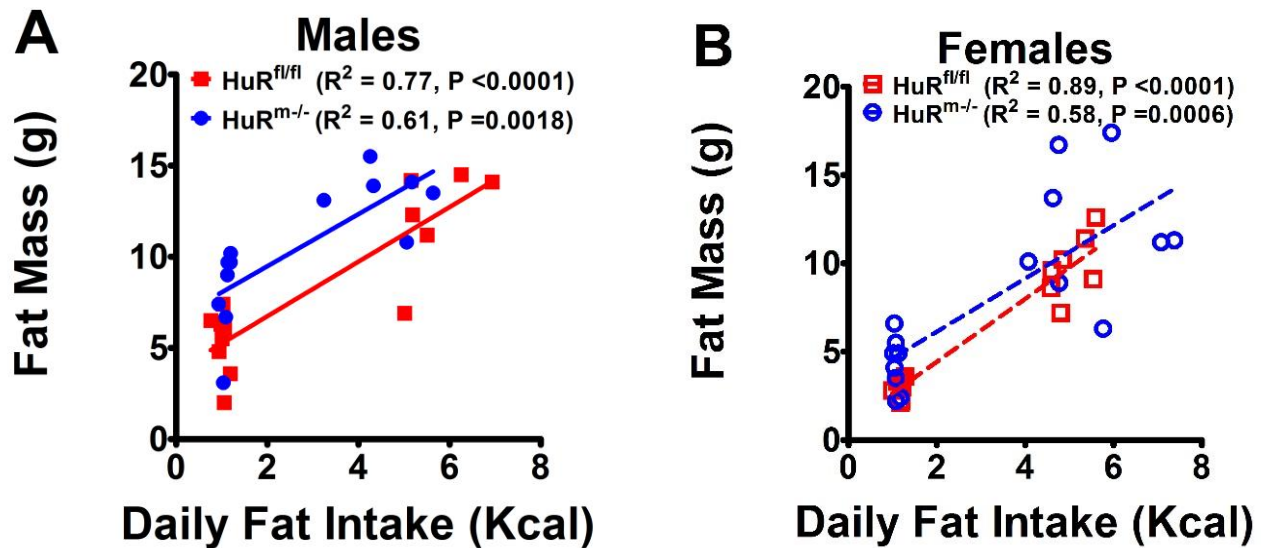
Gene Symbol	Ref. Seq. ID	Forward Primer	Reverse Primer
<i>mm Ech1</i>	NM_016772	TCGCTACTGCACTCAGGATG	AGCAGCCAAGCCCATATCTA
<i>mm Cpt2</i>	NM_009949	TGCCCAGGCTGCCTATCCCTAAACT	GCTCCTTCCCAATGCCGTTCTCAAAAT
<i>mm PPARα</i>	NM_011144	CCTCAGGGTACCACTACGGAGTT	TCGCCGAAAGAAGCCCTTA
<i>mm PGC1α</i>	NM_008904	AGCCTCTTTGCCCAGATCTTC	CCATCTGTCAGTGCATCAAATGA
<i>mm Cs</i>	NM_026444	CGGGAGGGCAGCAGTATCGG	ACCACCCTCATGGTCACTATGGATG
<i>mm Slc25a20</i>	NM_020520	CCAACGCTGCCTGTTTCCTTGG	GCCAAGCCTGGAGCTCTGATCAC
<i>mm Cox2</i>	NC_005089	GCCGACTAAATCAAGCAACA	CAATGGGCATAAAGCTATGG
<i>mm Cytb</i>	NC_005089	CATTTATTATCGCGGCCCTA	TGTTGGGTTGTTTGATCCTG
<i>mm Gcg</i>	NM_008100	CAGGGCCATCTCAGAACC	GCTATTGGAAAGCCTCTTGC
<i>mm Hbb</i>	NM_001278161	GAAGCGATTCTAGGGAGCAG	GGAGCAGCGATTCTGAGTAGA
<i>mm Pdk4</i>	NM_013743	CCCTTTGGCTGGTTTGGT	TTGGCGTAGAGACGAGAAATTG
<i>mm Cd36</i>	NM_001159555	GCAAAGAACAGCAGCAAAATC	TCCTCGGGTCCTGAGTTAT
<i>mm Acads</i>	NM_007383	GCTGAGTGGTGCAGGCTTG	CCATTGGTGAAAGGGGTGATC
<i>mm Acadm</i>	NM_007382	TTGAGTTGACGGAACAGCAG	AGTTTGCACCCCTGTACACC
<i>mm Acadl</i>	NM_007381	TCACCACACAGAATGGGAGA	ACGCTTGCTCTTCCAAGTA
<i>mm Acadvl</i>	NM_017366	TATCTCTGCCCAGCGACTTT	TGGGTATGGGAACACCTGAT

Supplementary Figure S1: Fat and Lean mass gain in control and $HuR^{m-/-}$ mice. **A)** Fat mass is plotted from 4-20 weeks of age for control (red) and $HuR^{m-/-}$ (blue) male mice fed LFD (squares and circles) or HFD (triangles and diamonds). **B)** Lean mass is plotted from 4-20 weeks of age for control (red) and $HuR^{m-/-}$ (blue) male mice fed LFD (squares and circles) or HFD (triangles and diamonds). **C)** Body Mass is plotted from 4-20 weeks of age for control (red) and $HuR^{m-/-}$ (blue) male mice fed LFD (squares and circles) or HFD (triangles and diamonds). **D)** Fat mass is plotted from 4-20 weeks of age for control (red) and $HuR^{m-/-}$ (blue) female mice fed LFD (squares and circles) or HFD (triangles and diamonds). **E)** Lean mass is plotted from 4-20 weeks of age for control (red) and $HuR^{m-/-}$ (blue) female mice fed LFD (squares and circles) or HFD (triangles and diamonds). **F)** Body Mass is plotted from 4-20 weeks of age for control (red) and $HuR^{m-/-}$ (blue) female mice fed LFD (squares and circles) or HFD (triangles and diamonds). N=14-19 for male animals. **D)** Fat mass is plotted from 4-20 weeks of age for control (red) and $HuR^{m-/-}$ (blue) female mice fed LFD (squares and circles) or HFD (triangles and diamonds). **E)** Lean mass is plotted from 4-20 weeks of age for control (red) and $HuR^{m-/-}$ (blue) female mice fed LFD (squares and circles) or HFD (triangles and diamonds). **F)** Body Mass is plotted from 4-20 weeks of age for control (red) and $HuR^{m-/-}$ (blue) female mice fed LFD (squares and circles) or HFD (triangles and diamonds). N=16-19 for female animals. Bottom asterisks and hashtags represent significance between genotypes fed LFD. Top asterisks and hashtags represent significance between genotypes fed HFD. * - $P \leq 0.05$; # - $P \leq 0.1$

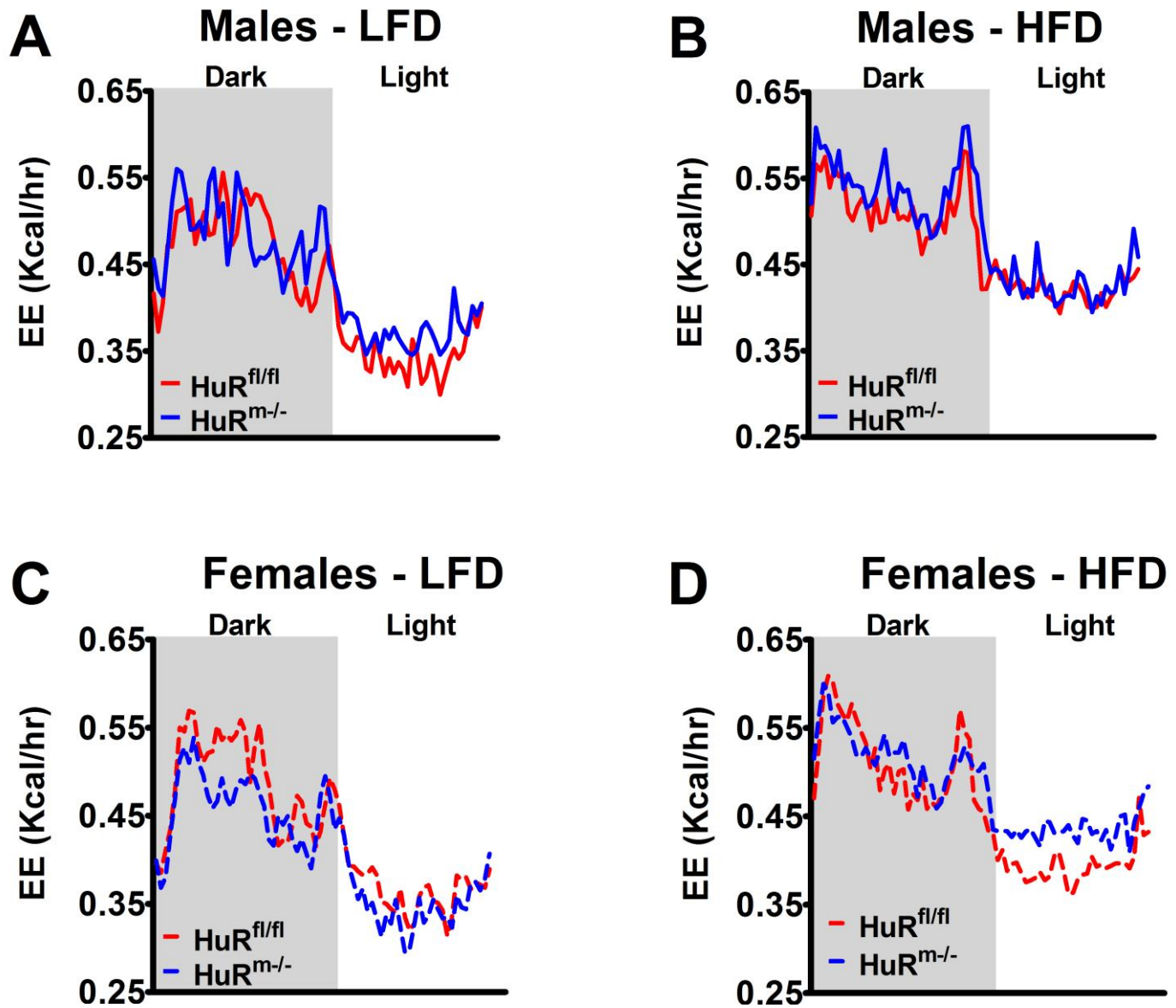


Supplementary Figure S2: Increased dietary fat intake increases fat mass in control and HuR^{m/-} mice.

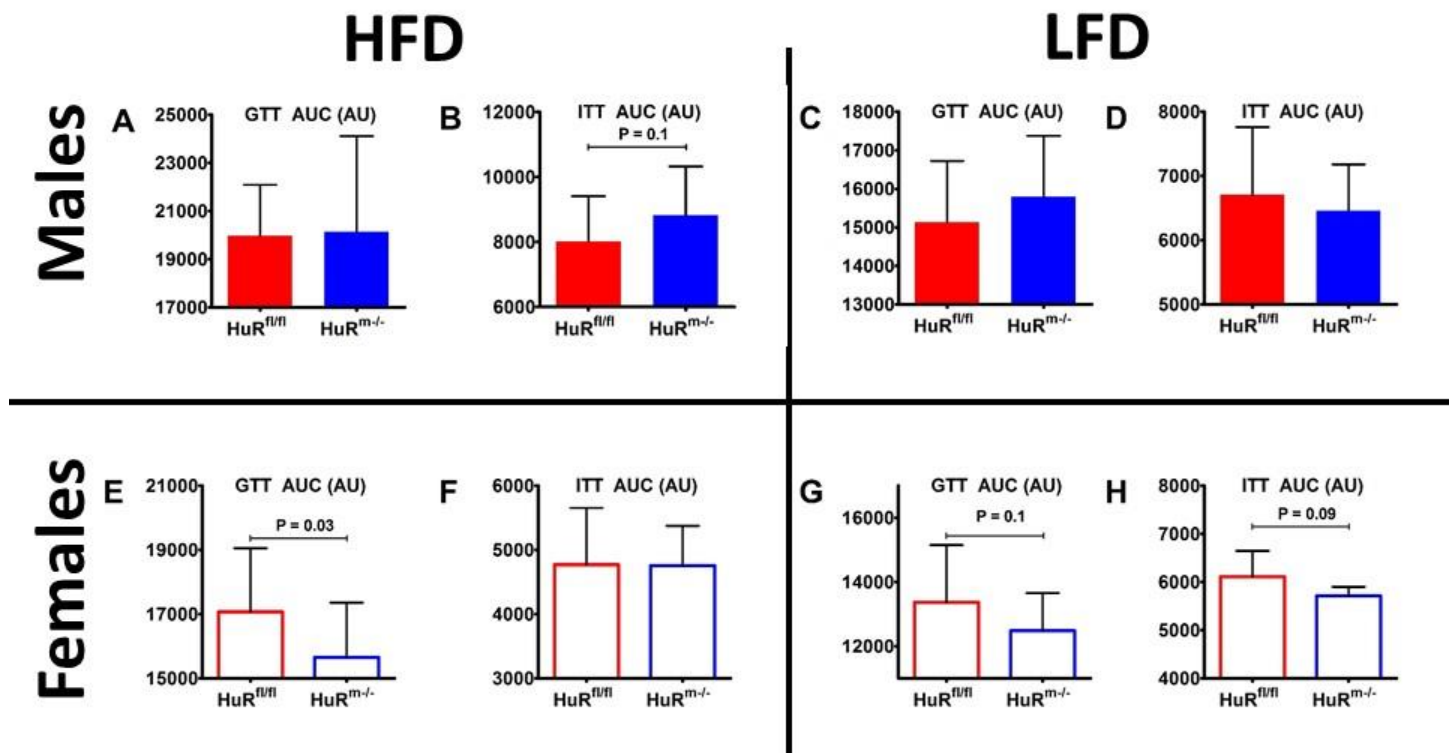
A) Fat mass at 20 Weeks of age as a function of dietary fat intake for control (red) and HuR^{m/-} (blue) male mice. **H)** Fat mass at 20 Weeks of age as a function of dietary fat intake for control (red) and HuR^{m/-} (blue) female mice.



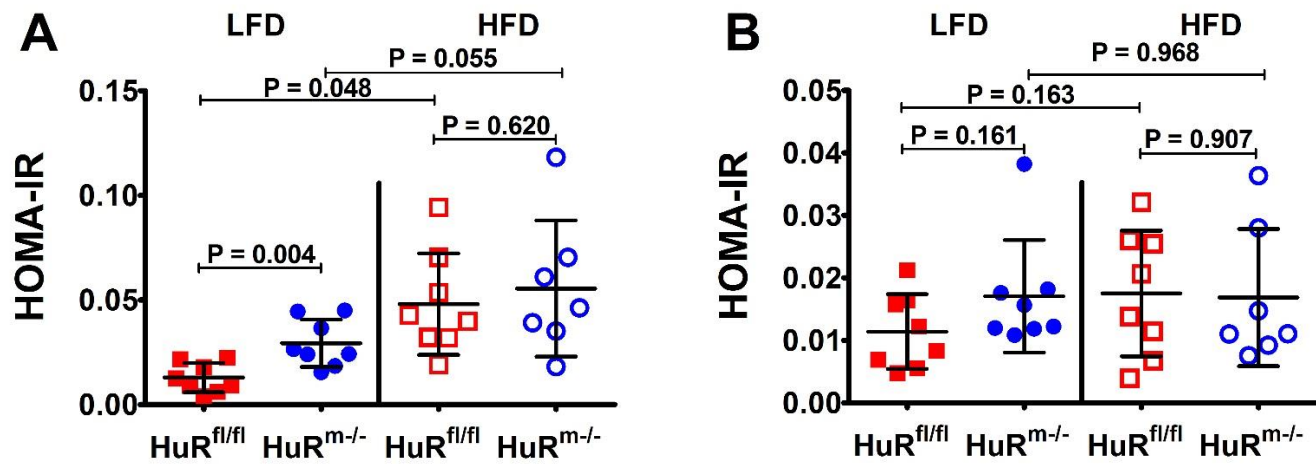
Supplementary Figure S3: Energy Expenditure graphs for mice in this study. A) Energy Expenditure at 20-22 weeks of age for male control (red) or $HuR^{m/-}$ (blue) mice fed LFD (N=8). **B)** Energy Expenditure at 20-22 weeks of age for male control (red) or $HuR^{m/-}$ (blue) mice fed HFD (N=6-8). **C)** Energy Expenditure at 20-22 weeks of age for female control (red) or $HuR^{m/-}$ (blue) mice fed LFD (N=7-8). **D)** Energy Expenditure at 20 weeks of age for female control (red) or $HuR^{m/-}$ (blue) mice fed HFD (N=8).



Supplementary Figure S4: Area under the curve for GTT and ITT in this study. A) GTT at 20 weeks of age for male control (red) or $HuR^{m/-}$ (blue) mice fed HFD (N=18). **B)** ITT at 20 weeks of age for male control (red) or $HuR^{m/-}$ (blue) mice fed HFD (N=18). **C)** GTT at 20 weeks of age for male control (red) or $HuR^{m/-}$ (blue) mice fed LFD (N=14-16). **D)** ITT at 20 weeks of age for male control (red) or $HuR^{m/-}$ (blue) mice fed LFD (N=10-16). **E)** GTT at 20 weeks of age for female control (red) or $HuR^{m/-}$ (blue) mice fed HFD (N=19). **F)** ITT at 20 weeks of age for female control (red) or $HuR^{m/-}$ (blue) mice fed HFD (N=19). **G)** GTT at 20 weeks of age for male control (red) or $HuR^{m/-}$ (blue) mice fed LFD (N=12-16). **H)** ITT at 20 weeks of age for male control (red) or $HuR^{m/-}$ (blue) mice fed LFD (N=14-16).



Supplementary Figure S5: HOMA-IR calculated from 4-hour fasted glucose and insulin from animals in this study. A) HOMA-IR shown at 20 weeks of age for male control (red) or $HuR^{m-/-}$ (blue) mice (N=7-8). B) HOMA-IR shown at 20 weeks of age for female control (red) or $HuR^{m-/-}$ (blue) mice (N=7-8).



Supplementary Figure S6: Fat pad weights and body temperature for $HuR^{m/-}$ and control mice **A-B)** combined fat pad weights are shown for control and $HuR^{m/-}$ males (A) and females (B). Fat pad weights are the summation of inguinal (i-pink), gonadal (g-teal), and retroperitoneal (rp-lilac) depots (N=6-10). **C-D)** Brown adipose tissue weights are shown for control and $HuR^{m/-}$ males (C) and females (D) (N=6-10). **E)** Body temperatures are shown for control (red) and $HuR^{m/-}$ (blue) males (closed) and females (open) fed low fat diet.

