

Supplementary Figure

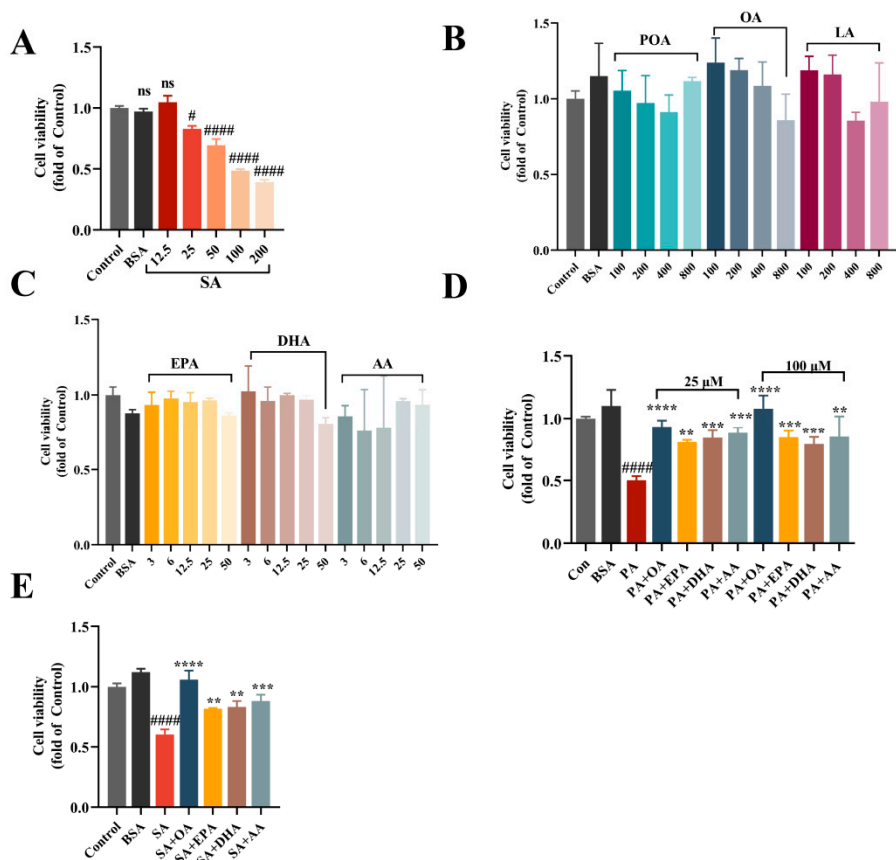


Figure S1. UFAs improve cell viability damage.

(A) Effects of different SA concentrations (12.5 μ M~200 μ M) incubated for 24 h on the viability of L-02 cells (BSA: 54 μ M). (B) Effect of different concentrations of POA (100 μ M~800 μ M), OA (100 μ M~800 μ M), LA (100 μ M~800 μ M), and incubation for 24 h on the viability of L-02 cells (BSA: 216 μ M). (C) The effect of different concentrations of EPA (3 μ M~50 μ M), DHA (3 μ M~50 μ M), and AA (3 μ M~50 μ M) on the viability of L-02 cells incubated for 24 h (BSA: 13.5 μ M). (D) L-02 cells treated with 25 or 100 μ M OA, EPA, DHA, and AA in combination with 100 μ M PA (BSA: 27 μ M). (E) L-02 cells treated with 100 μ M OA and 25 μ M EPA, DHA, and AA in combination with 100 μ M SA (BSA: 27 μ M). ns vs. Control group. # P <0.01, ## P <0.01, #### P <0.0001 vs. BSA group. ** P <0.01, *** P <0.001, **** P <0.0001 vs. PA group. Data are expressed as the mean \pm SD, ($n \geq 3$). BSA as solvent control.

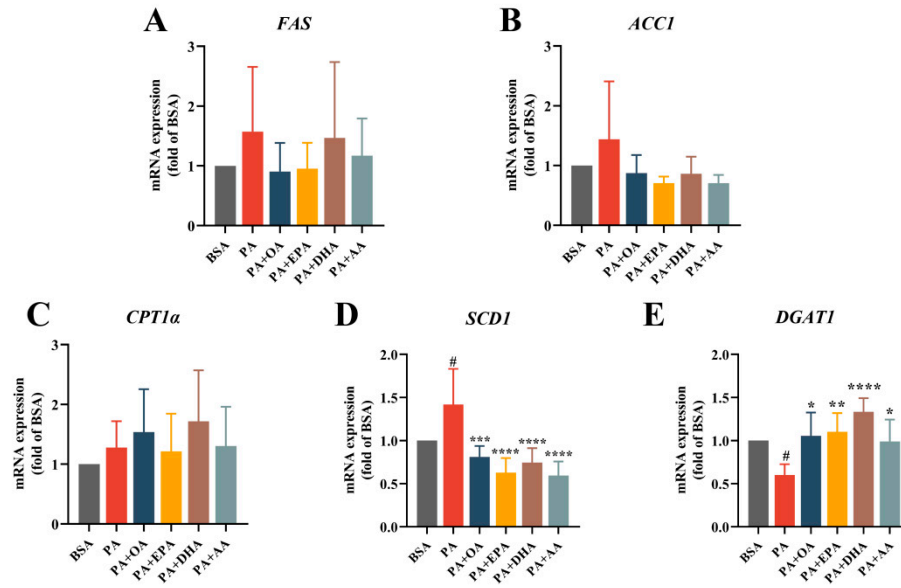


Figure S2. Effects of the combined use of UFAs and PA on lipid metabolism genes. (A) FAS. (B) ACC1. (C) CPT1 α . (D) SCD1. (E) DGAT1. (BSA: 27 μ M; PA: 100 μ M; EPA, DHA and AA: 25 μ M; OA: 100 μ M). * P <0.05, ** P <0.01, *** P <0.001, **** P <0.0001 vs. PA group. # P <0.05 vs. BSA group. Data are expressed as the mean \pm SD, ($n \geq 3$). BSA as solvent control.

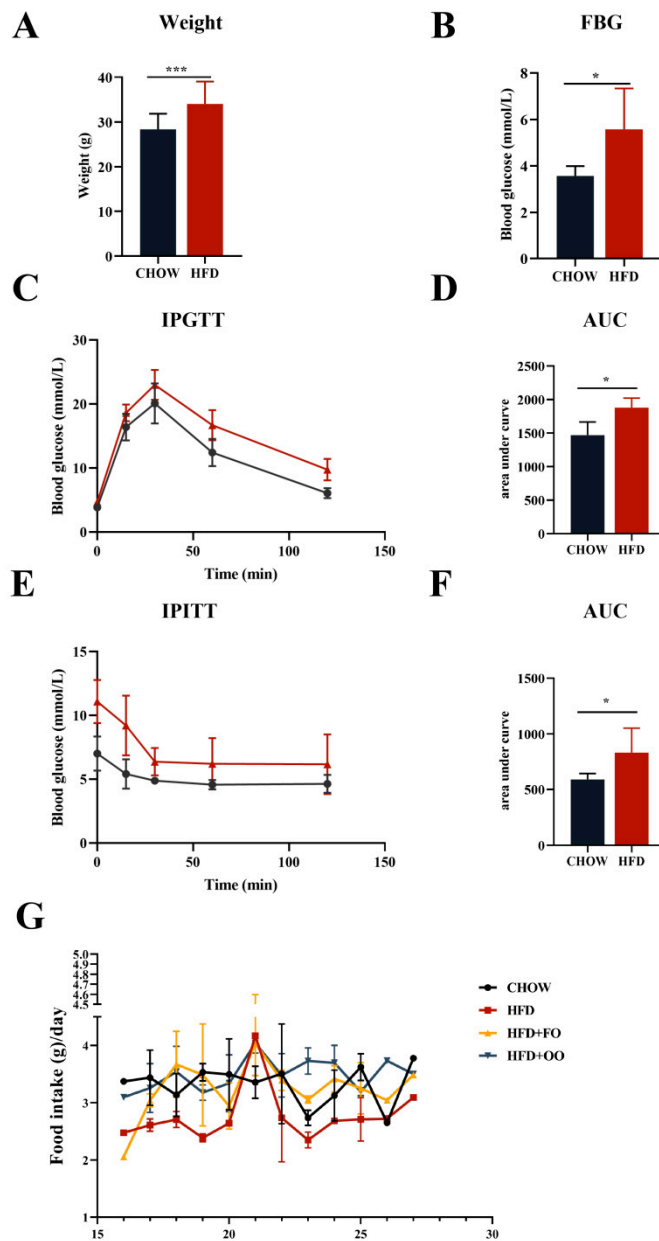


Figure S3. HFD feeding for 16 w induces obesity and insulin resistance in mice.

(A) Weight of mice. (B) FBG. (C) IPGTT. (D) The area under the curve (AUC) of IPGTT. (E) IPITT. (F) AUC of IPITT. (G) Time-related changes in food intake. * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$, Data are expressed as the mean \pm SD, ($n \geq 5$).

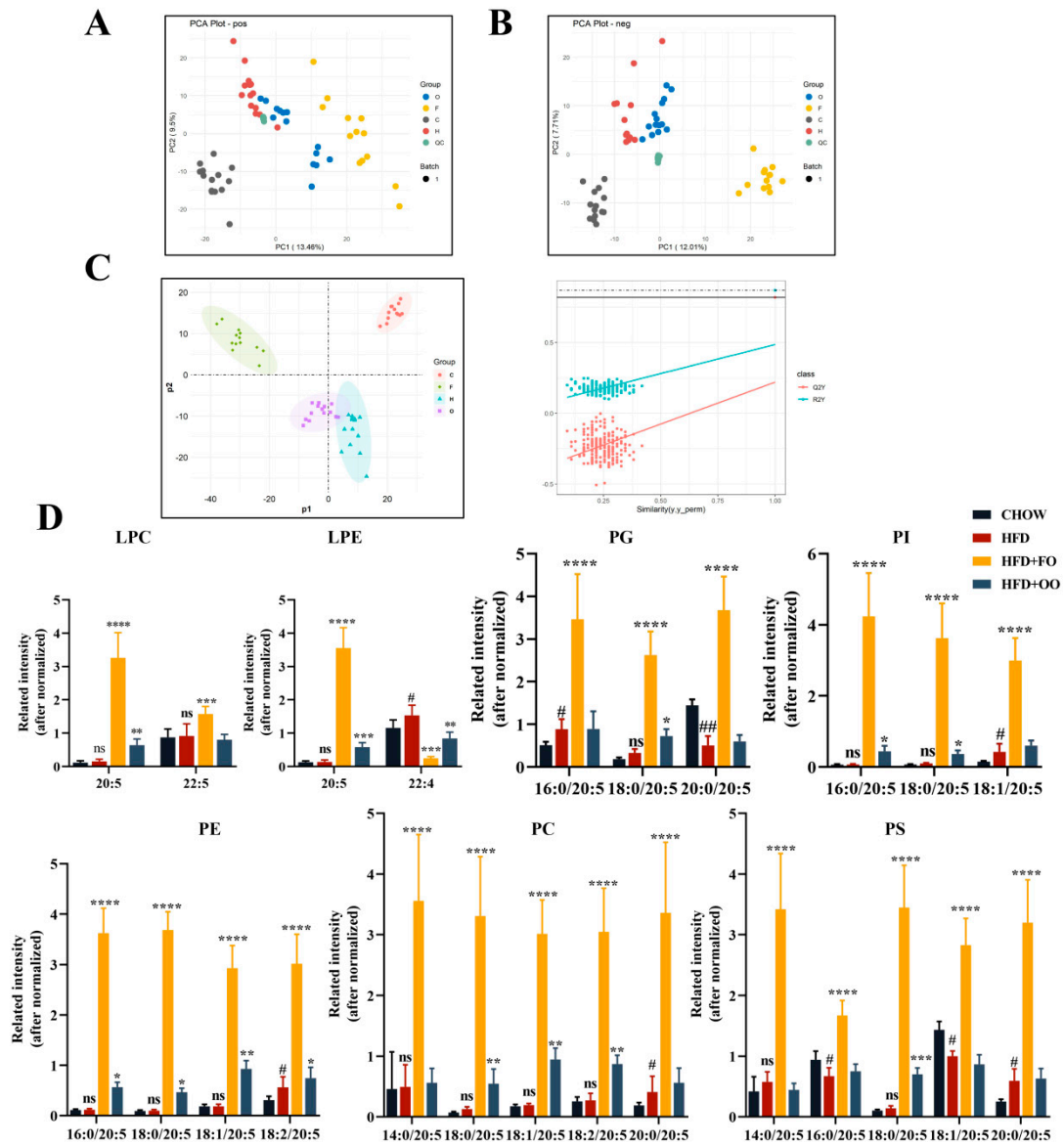


Figure S4. Multivariate statistical analysis.

(A) PCA diagram in positive ion mode. (B) PCA diagram in negative ion mode. (C) PLS-DA ($R^2X=0.643$, $R^2Y=0.869$, $Q^2=0.819$), PLS-DA model for ranking test plots. (D) Significant lipids of FA 20:5. * $P<0.05$, ** $P<0.01$, *** $P<0.001$, **** $P<0.0001$ vs. HFD group. # $P<0.05$, ## $P<0.01$ vs. CHOW group. Data are expressed as the mean \pm SD, ($n \geq 13$).

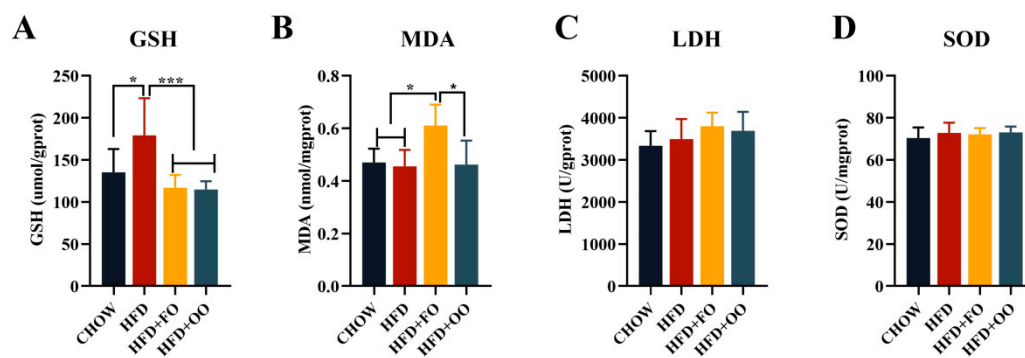


Figure S5. Expression of antioxidant enzymes in the liver tissue of mice fed UFA diet for 12 w.
 (A) GSH content in liver tissue. (B) MDA content in liver tissue. (C) LDH content in liver tissue.
 (D) SOD content in liver tissue. * $P < 0.05$, *** $P < 0.001$, Data are expressed as the mean \pm SD, ($n \geq 5$).

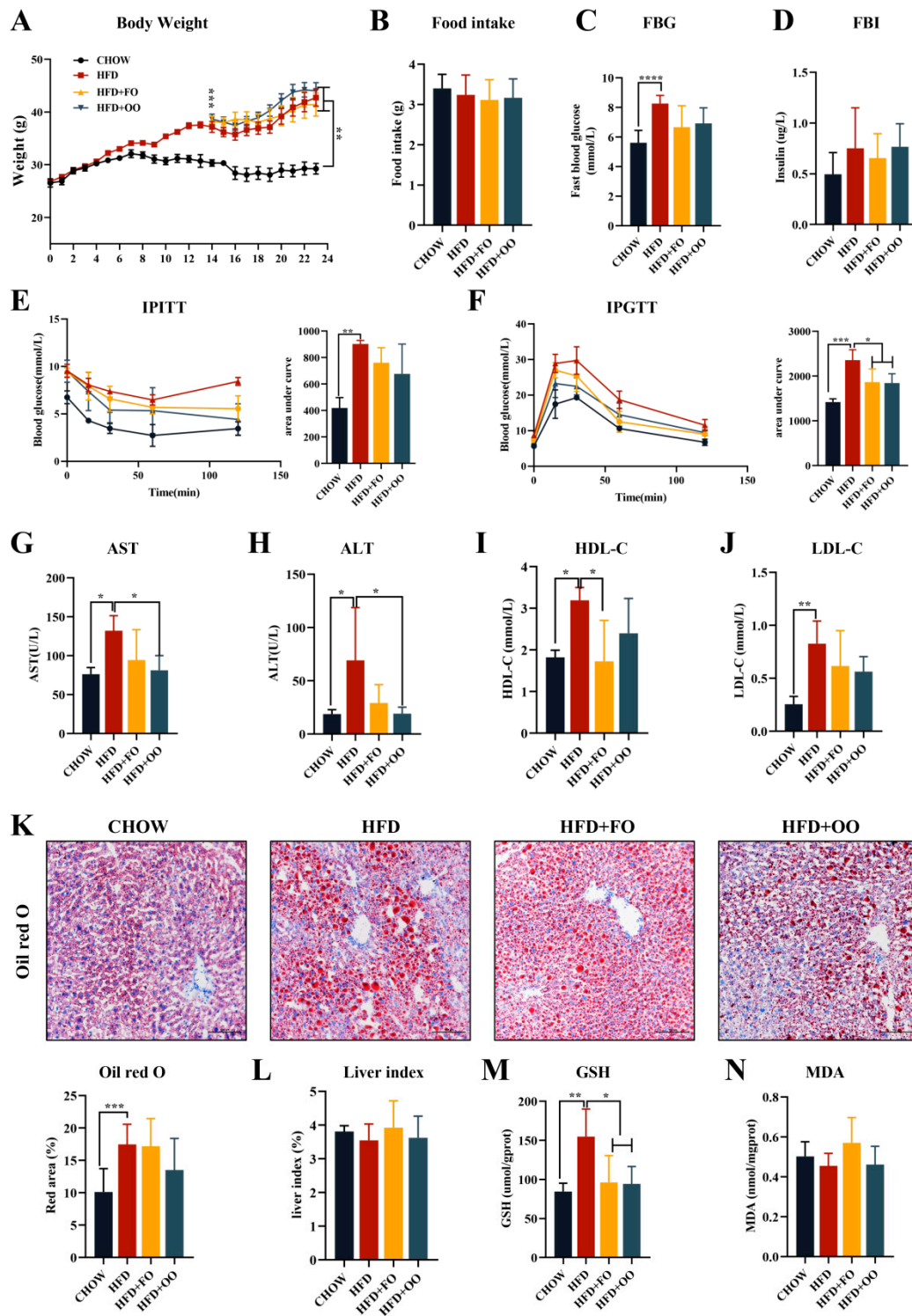


Figure S6. Results of mice fed with UFA diets (replacing 5% energy of SFAs). (A) Body weight. (B) Differences in food intake (g/mouse/day) between groups. (C) FBG. (D) FBI. (E) IPITT. (F) IPGTT. (G) AST. (H) ALT. (I) HDL-C. (J) LDL-C. (K) Oil Red O staining of liver (200X). (L) Liver index. (M) GSH content in liver tissue. (N) MDA content in liver tissue. * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$. Data are expressed as the mean \pm SD, ($n \geq 5$).