

Description of Additional Supplementary Files:

Supplementary Data 1: List of the top differentially expressed genes between young and aged MuSCs, FAPs and macrophages ($s\text{-value} < 0.05$, $\text{LFC} > 1$).

Supplementary Data 2: List of reversible and irreversible genes that are affected by aging (moderated $\text{LFC} > 1$, $s\text{-value} < 0.05$).

Supplementary Data 3: List of reversible and irreversible genes that are affected by aging ($\text{LFC} > 1$, $s\text{-value} < 0.15$, $\text{LFC batch} < 0.5$).

Supplementary Data 4: List of differentially methylated regions (DMRs) in young compared to aged MuSCs.

Supplementary Data 5: Differentially accessible ATAC-seq peaks between young and aged MuSCs ($\text{LFC} > 1$, adjusted $p < 0.05$).