<u>**Supplementary information inventory**</u>

1. **Figure S1: Comparison of gene expression in *kdm5* mutant larvae and adults, related to Figure 1.** Differences in KDM5 targets are shown, in addition to quality control data for RNA-seq analyses.

2. **Figure S2**: **Analyses of gene expression levels and KDM5 binding in normal and oxidative stress conditions, related to Figure 1.** Scatter plots related to RNA-seq data of paraquat treated flies are shown, in addition to quality control data regarding these transcriptome data.

3. **Figure S3: Quality control analyses for ChIP-seq data, related to Figure 1.** Data showing quantitation of KDM5 ChIP-seq binding data with respect to genomic features are shown. In addition, data comparing ChIP-seq data from normal and paraquat treated animals is shown.

4. **Figure S4: KDM5 binding is strongly correlated with H3K9 acetylation (H3K9ac) and weakly with H3K27 acetylation (H3K27ac) and H3K4 monomethylation (H3K4me1). Related to Figure 1.** Figure contains heat maps showing distribution of KDM5, H3K9ac, H3K4me1 and H3K27ac relative to TSS.

5. **FigureS5: Preventing KDM5-mediated binding to H3K4me0 does not affect promoter recruitment, related to Figure 6.** Figure shows the generation and characterization of a fly strain harboring a mutation in PHD1 that abrogates its ability to bind to H3K4me0.

6. **Figure S6: KDM5 binding regions of mitochondrial function genes show motif enrichment, related to Figure 6.** Figure shows MEME-ChIP analyses of KDM5-regulated genes.

7. **Supplementary Figure legends:** Describes supplementary figures.

8. **Table S1: Summary of RNA-seq mapping data, related to Figure 1.** Quantitation of the number of RNA-seq reads that were generated and mapped is shown.

9. **Table S2: Gene expression levels of TCA cycle enzymes, related to Figure 3.** Table shows expression of genes involved in the TCA cycle in addition to whether they were identified as direct targets in ChIP-seq analyses.

10. **Table S3: Metabolic analyses in kdm5 mutant flies, related to Figure 3.** Table has extensive analyses of the metabolites (amino acids, fatty acids, antioxidants) in *kdm5* mutant flies.

11. **Table S4: Primers used for RT-PCR and ChIP analyses, related to Figures 2, 4, 5, 6.** Lists all primer sets used for real-time PCR and ChIP-PCR analyses.

12. **Supplementary methods:** This section contains extensive additional information, particularly regarding the analyses of RNA-seq and ChIP-seq experiments carried out.

13. **Supplementary references:** Bibliography of references cited in supplementary section.