

Table S1 Primer sequences for β -actin, KDM4D and β -Catenin.

Gene	Length (bp)	Primer sequence (5'-3')
β -Actin-Forward	22	GTGACGTTGACATCCGTAAAGA
β -Actin-Reverse	19	GCCGGACTCATCGTACTCC
KDM4D-Forward	23	CCAACAGCAAAAAGTACCAGACC
KDM4D-Reverse	22	GACTCATACAGGCGATTCTTCC
β -catenin-Forward	20	ATGGAGCCGGACAGAAAAGC
β -catenin-Reverse	19	CTTGCCACTCAGGGAAGGA

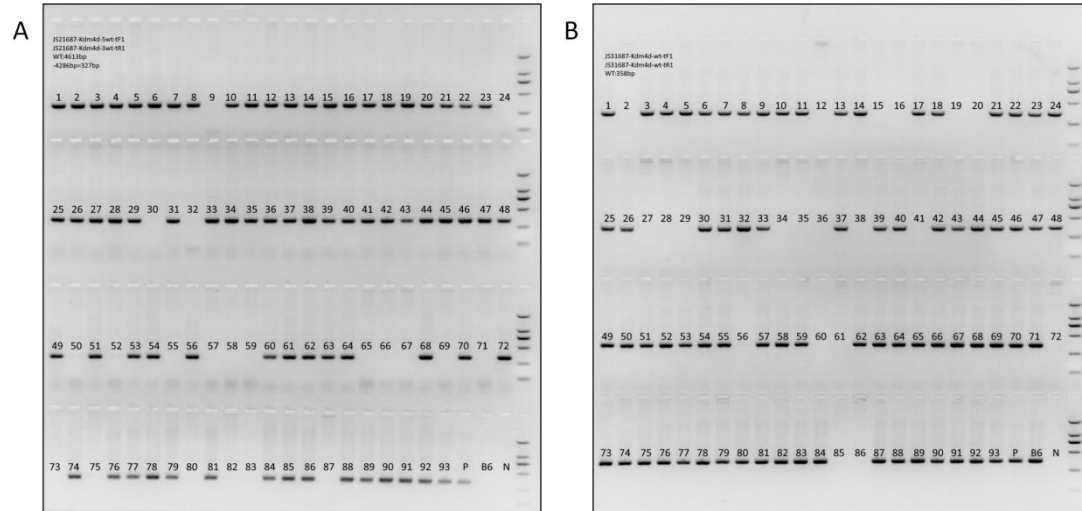


Figure S1 Identification of *kdm4d* gene knockout. Mice showing a band only in panel A and no band in panel B are classified as *kdm4d*^{-/-}. Those exhibiting a band only in panel B and no band in panel A are designated wt/wt. Mice presenting bands in both panels A and B are identified as heterozygous.

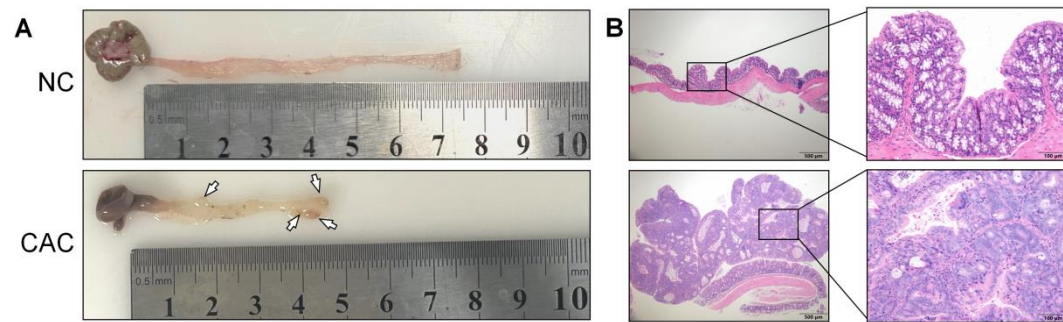


Figure S2 AOM combined with DSS resulted in CAC tumorigenesis. **A** Macroscopic observation of the colons of NC and CAC mice; the formation of colonic tumors is indicated by white arrows. **B** HE staining of the colons of NC and CAC mice (scale bars, 500 μm).

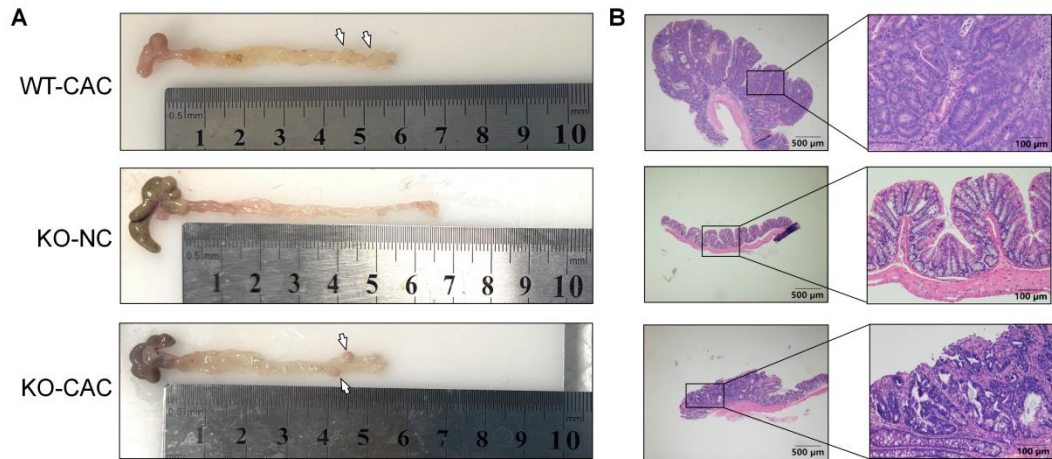


Figure S3 AOM combined with DSS induced CAC tumorigenesis in *kdm4d* knockout mice. **A** Macroscopic observation of the colons of NC and CAC mice; the formation of colonic tumors is indicated by white arrows. **B** Histopathological examination of mouse colon tissues (left scale bars, 500 μm ; right scale bars, 100 μm).

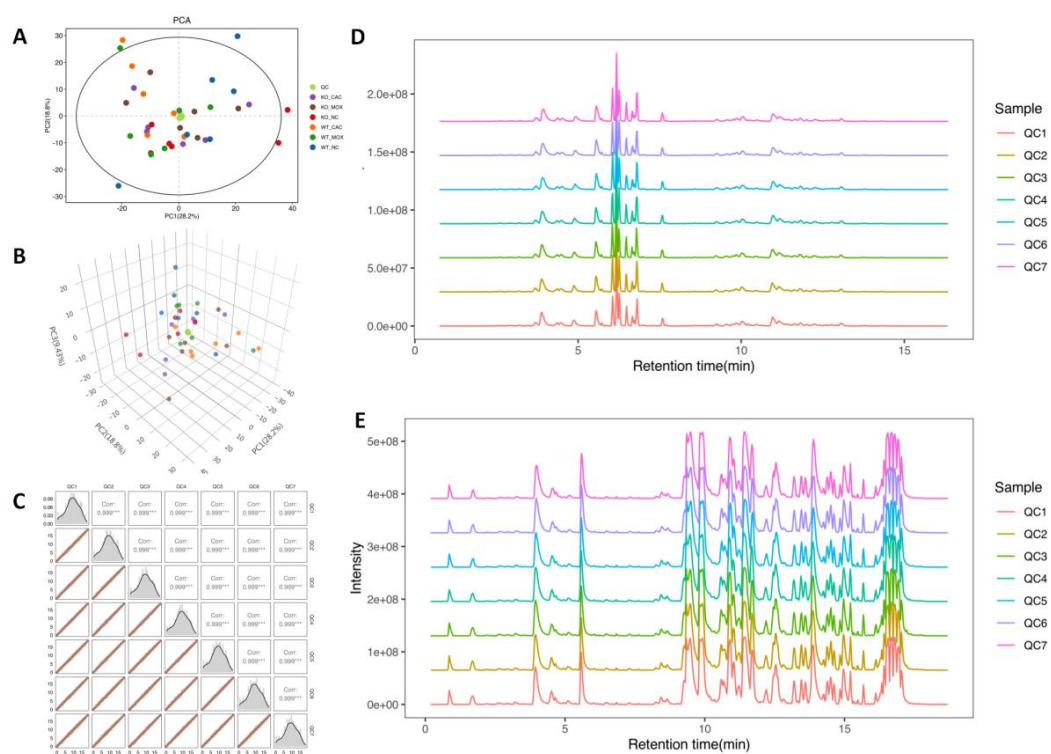


Figure S4 Quality assessment of the lipid pseudotargeted lipid metabolomics data. **A** 2D-PCA diagram. **B** 3D-PCA diagram. **C** QC-corplot plot. **D** NEG chromatograms of OC samples. **E** POS chromatograms of the QC samples.

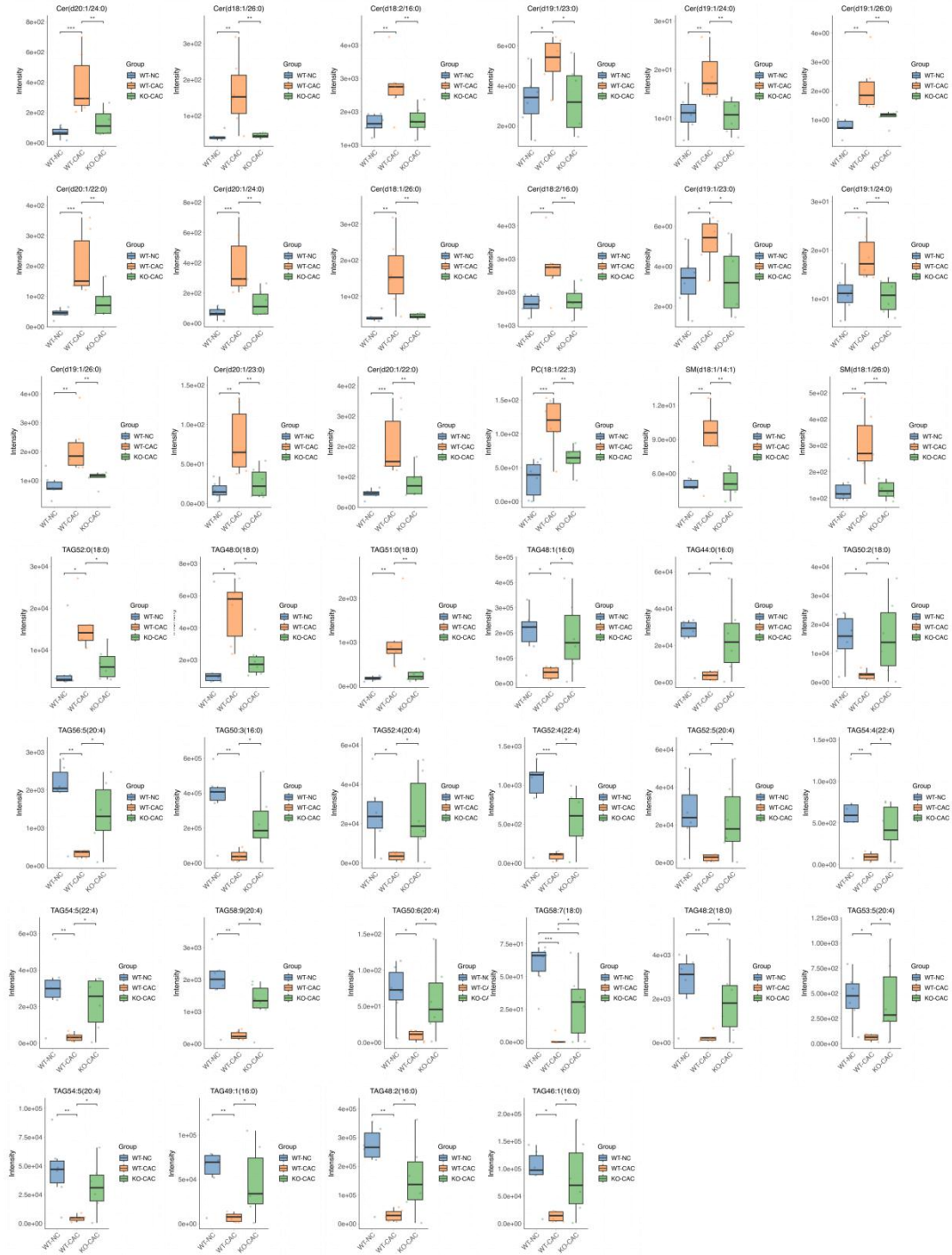


Figure S5 Box plots of differential lipids in the WT-NC/WT-CAC and KO-CAC groups. * $P<0.05$,

** $P<0.01$, *** $P<0.001$.