PM$_{2.5}$ and O$_3$ co-exposure affecting serum LDL-C: evidence from epidemiology and animal models

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Table S1 Primers for Genes Related to LDL-C Uptake and VLDL-C Secretion in Rat Liver.

Gene	Protein	Forward primers (5' to 3')	Reverse primers (5' to 3')
β-actin	actin, cytoplasmic 1	CCCGCGAGTACAACCTTCTT	AACACAGCCTGGATGGCTAC
LDLR	low density lipoprotein receptor	GACAGATTGGGGGACACCTG	CTCCGGGGACATGAGGTTTT

PCSK9	proprotein convertase subtilisin/kexin type 9	AGGGCCAGAGAAGCAATGTC	ACTGGGGCTAAGGGAGCATA
SREBP1c	sterol regulatory element-binding protein 1	ACGAGCTACCCTTCGGTGAG	AGCATGTCTTCGATGTCGGT
APOB	apolipoprotein B-100	GAGAAGCTACTCTCCGACGC	CAGTGTTGCCAACGGGAAAG
MTTP	microsomal triglyceride transfer protein	TCCTCTACTCTGGGTCTGGC	TCGGCTTTGTCCATCTGCAT
Cideb	Lipid transferase CIDEB	CTGCGGTGGAGACTGAAGAC	GGGCGATGTCCTTGCTATGT
SHP	nuclear receptor subfamily 0, group B, member 2	CTGGTACCCAGCTAGCCAAG	AACATCTCCGATGACAGGGC
PGC-1α	PPARG coactivator 1 alpha	CATGTGCAGCCAAGACTCTG	GTGAGGACCGCTAGCAAGTT
ADRP	perilipin-2	ATTCTGGACCGTGCCGATTT	TGCCATCTCACACACTGACC
GRP78	endoplasmic reticulum chaperone BiP precursor	GAAGGAGGATGTAGGCACGG	AAGGGTCATTCCAAGTGCGT
IRE1α	Inositol-requiring enzyme 1	GCGCAGGTGCAATGACATAC	AGGCTCTTCCACGTGTGTTG

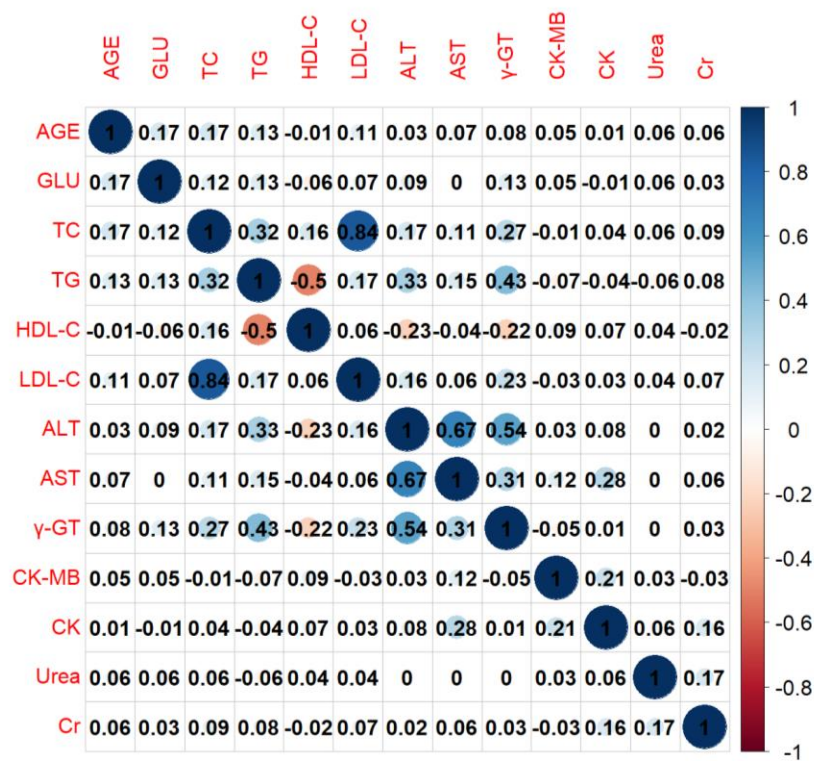|	AGE	GLU	TC	TG	HDL-C	LDL-C	ALT	AST	γ-GT	CK-MB	CK	Urea	Cr
AGE	1	0.17	0.17	0.13	-0.01	0.11	0.03	0.07	0.08	0.05	0.01	0.06	0.06
GLU	0.17	1	0.12	0.13	-0.06	0.07	0.09	0	0.13	0.05	-0.01	0.06	0.03
TC	0.17	0.12	1	0.32	0.16	0.84	0.17	0.11	0.27	-0.01	0.04	0.06	0.09
TG	0.13	0.13	0.32	1	-0.5	0.17	0.33	0.15	0.43	-0.07	-0.04	-0.06	0.08
HDL-C	-0.01	-0.06	0.16	-0.5	1	0.06	-0.23	-0.04	-0.22	0.09	0.07	0.04	-0.02
LDL-C	0.11	0.07	0.84	0.17	0.06	1	0.16	0.06	0.23	-0.03	0.03	0.04	0.07
ALT	0.03	0.09	0.17	0.33	-0.23	0.16	1	0.67	0.54	0.03	0.08	0	0.02
AST	0.07	0	0.11	0.15	-0.04	0.06	0.67	1	0.31	0.12	0.28	0	0.06
γ-GT	0.08	0.13	0.27	0.43	-0.22	0.23	0.54	0.31	1	-0.05	0.01	0	0.03
CK-MB	0.05	0.05	-0.01	-0.07	0.09	-0.03	0.03	0.12	-0.05	1	0.21	0.03	-0.03
CK	0.01	-0.01	0.04	-0.04	0.07	0.03	0.08	0.28	0.01	0.21	1	0.06	0.16
Urea	0.06	0.06	0.06	-0.06	0.04	0.04	0	0	0	0.03	0.06	1	0.17
Cr	0.06	0.03	0.09	0.08	-0.02	0.07	0.02	0.06	0.03	-0.03	0.16	0.17	1

Figure S1 Correlations among Participants' Blood Biochemical Indicators.

Note: The magnitude of the absolute values of the numbers and the darkness of the colors represent the strength of the Spearman correlation coefficients between variables. The numbers range from -1 to 1, with larger absolute values indicating stronger correlations. Darker colors indicate stronger correlations. Positive values and blue colors represent positive correlations, while negative values and red colors represent negative correlations.
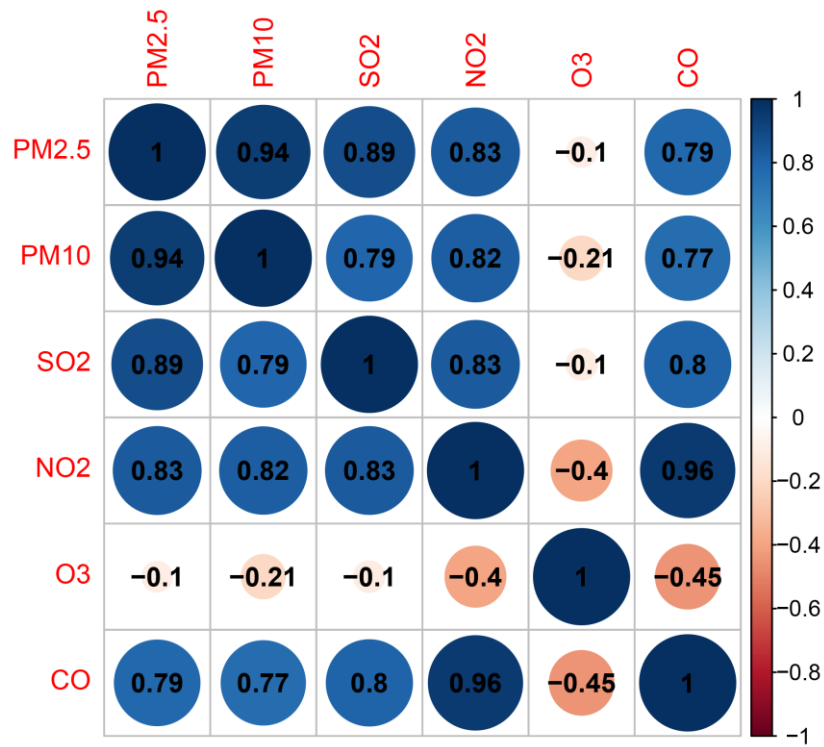
Figure S2 Correlations among Air Pollutant Concentrations.

Note: The concentrations of air pollutants represent the average levels over one year. The degree of correlation was calculated using the Spearman correlation coefficient, with blue and positive values indicating positive correlations, and red and negative values indicating negative correlations.
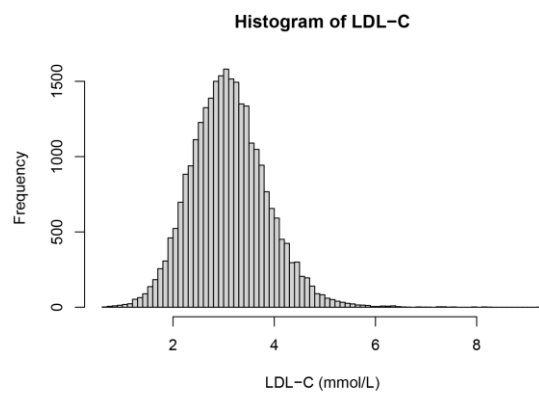
Figure S3 Frequency Distribution of Participant LDL-C Levels.

Note: The horizontal axis represents the LDL-C levels of the participants, and the vertical axis represents the number of participants at each LDL-C level.
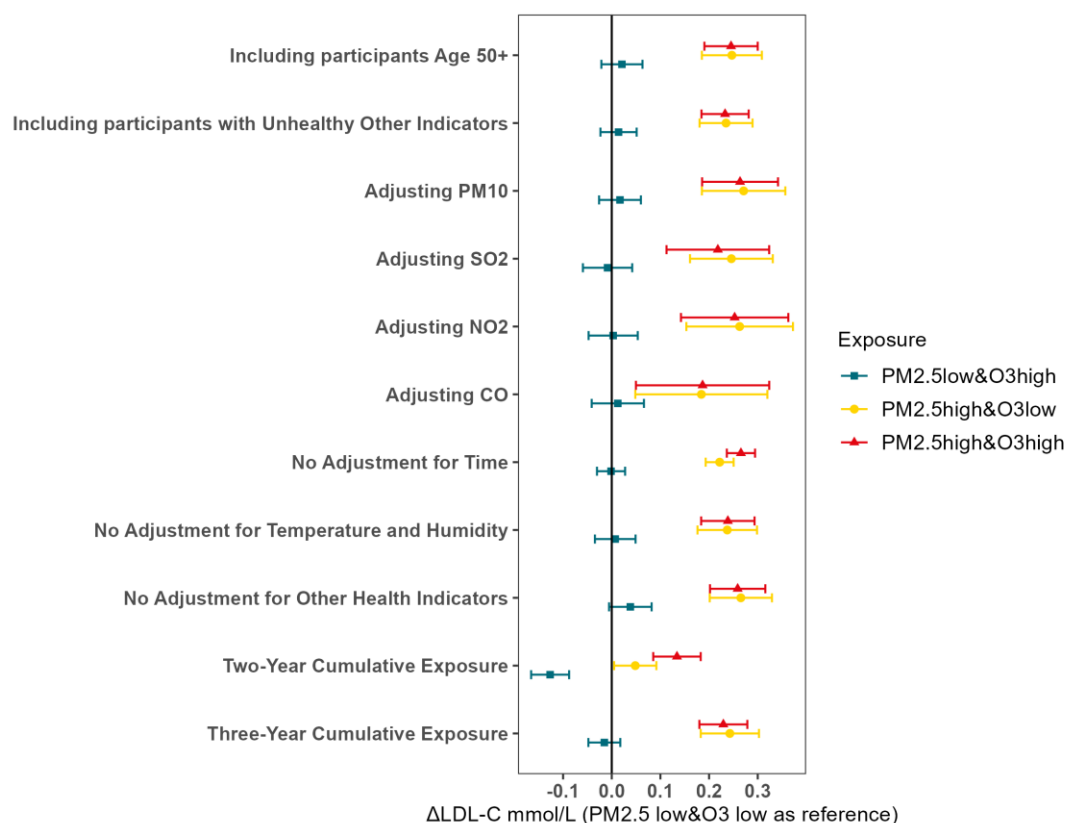
Figure S4 Sensitivity Analysis of the Association between Different Combinations of PM2.5 and O3 Exposure and LDL-C Levels.

Note: The vertical axis represents the methods of sensitivity analysis. In each sensitivity method, the low PM2.5 & low O3 group is used as the reference group. Points of different colors (shapes) represent the change in LDL-C levels among other PM2.5 and O3 exposure groups compared to the reference group.
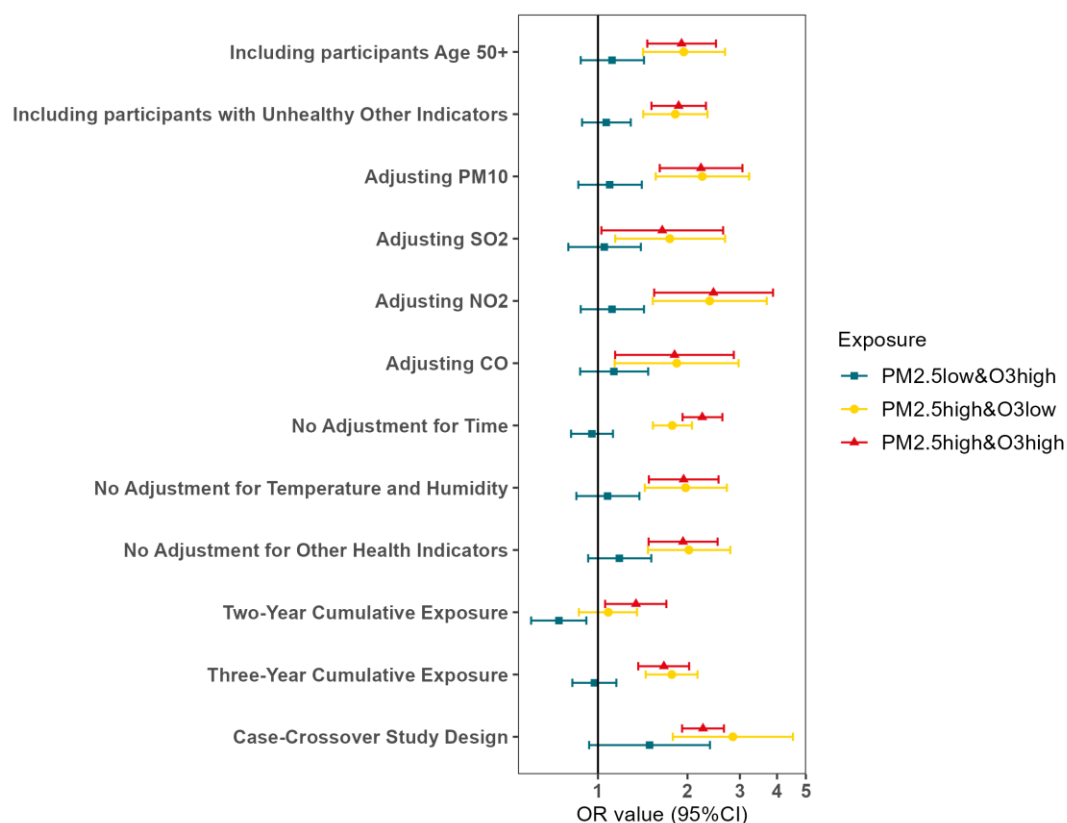
Figure S5 Sensitivity Analysis of the Association between Different Combinations of PM2.5 and O3 Exposure and the Risk of Abnormal LDL-C.

Note: The vertical axis represents the methods of sensitivity analysis. In each sensitivity method, the low PM2.5 & low O3 group is used as the control group. Points of different colors (shapes) represent the risk of abnormal LDL-C among other PM2.5 and O3 exposure groups compared to the control group.