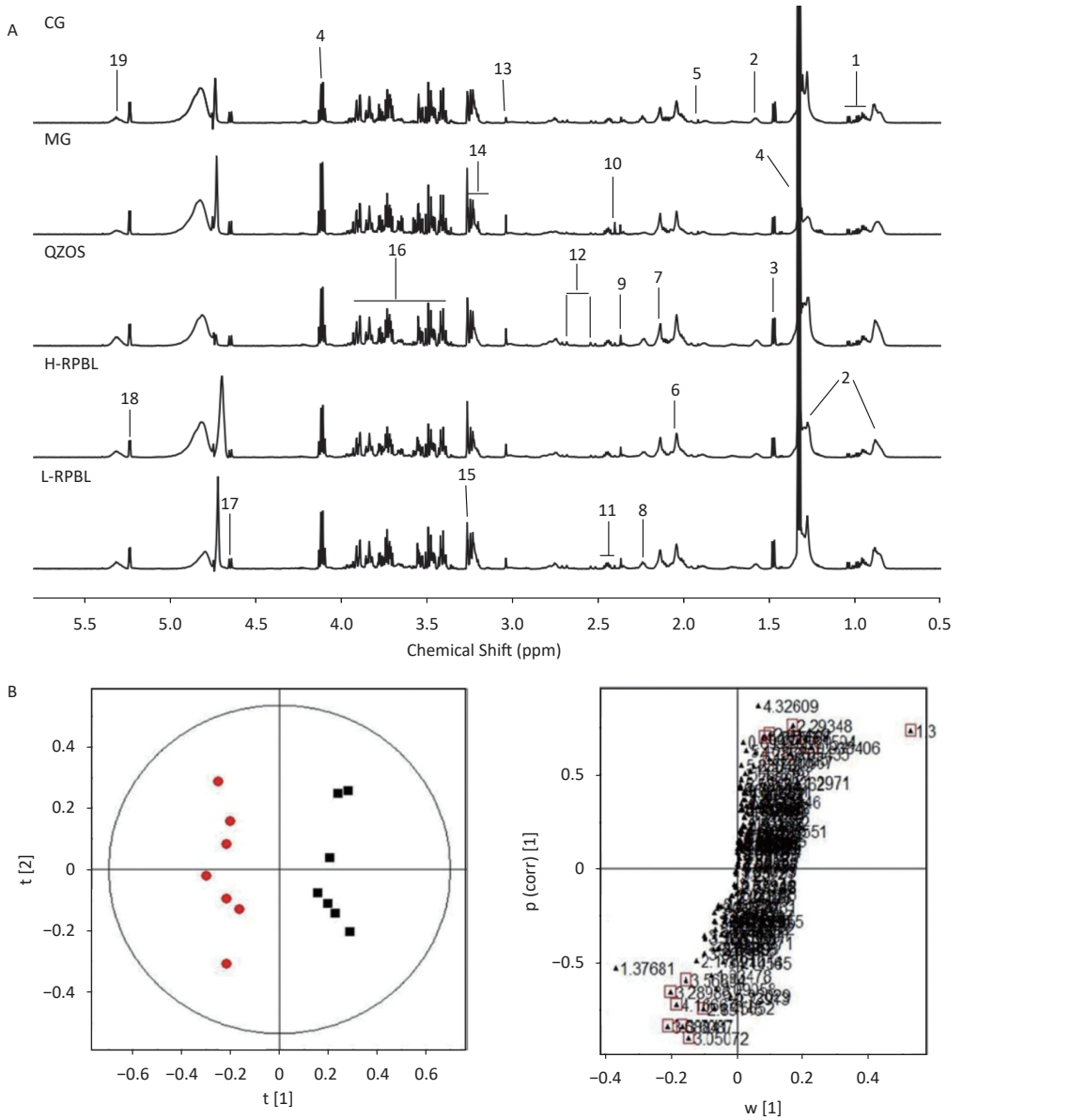
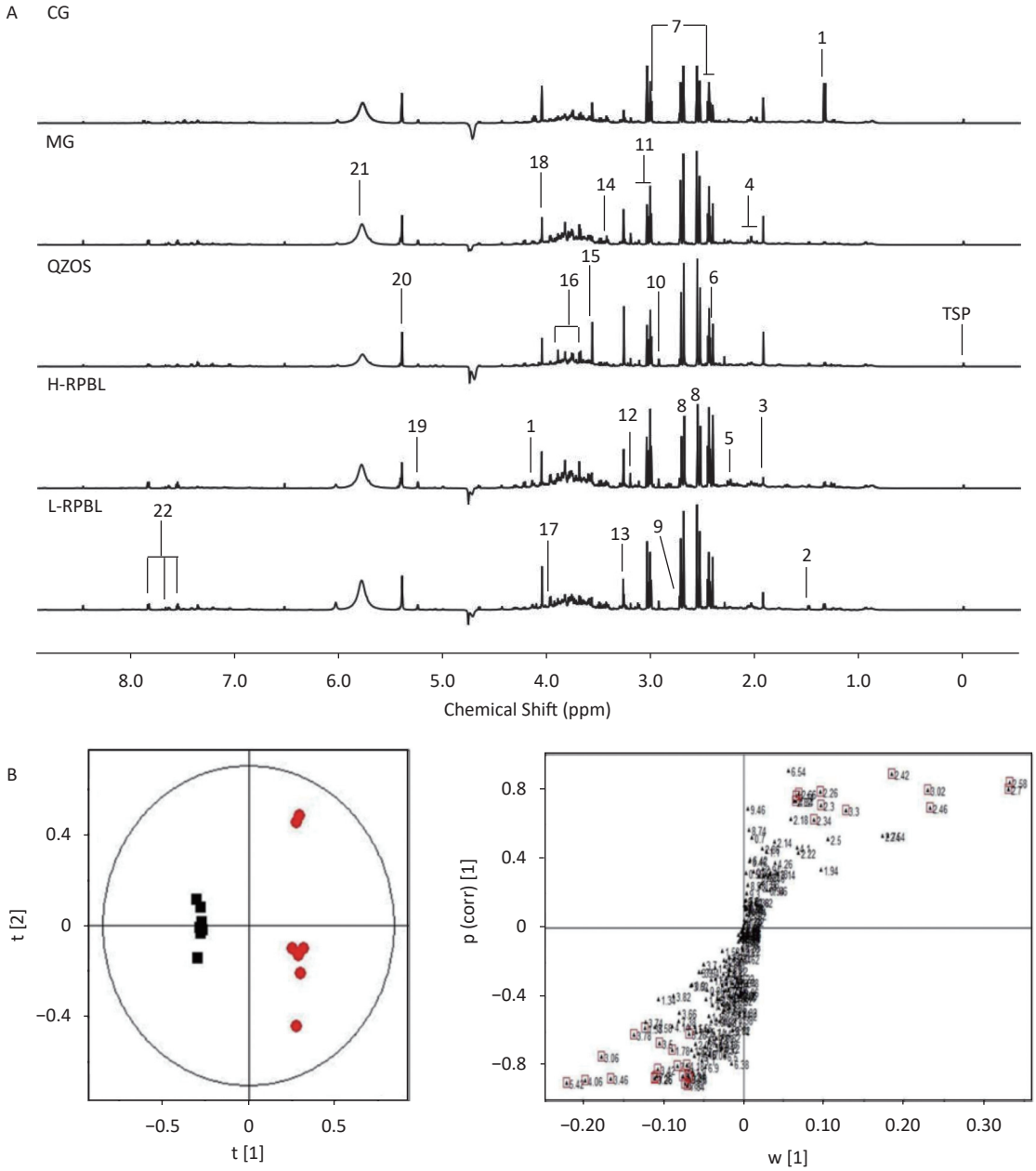


Supplementary Figure S1. (A) Typical ^{1}H-NMR CPMG spectra of plasma from five groups, CG; MG; QZOS; H-RPBL and L-RPBL. Main metabolites,1. Isoleucine/Leucine/Valine; 2. LDL/VLDL; 3. Alanine; 4. Lactate; 5. Acetate; 6. *N*-Acetyl-glycoprotein; 7. *O*-acetyl-glycoprotein; 8. Acetoacetate; 9. Pyruvate; 10. Succinate; 11. Glutamine/glutamate; 12. Citrate; 13. Creatine; 14. Choline; 15. Trimethylamine-N-oxide; 16. Glucose and amino acid; 17. β-Glucose; 18. α-Glucose; and 19. Unsaturated lipids. (B) OPLS-DA score plots in the left and corresponding loading plots in the right generated from the OPLS-DA of the NMR data derived from the plasma samples of rats. $R^2X = 0.87$, $R^2Y = 0.969$, $Q^2 = 0.792$. CG (■) and MG (●). Combining the results of the OPLS-DA analysis with S-plots value plots and the *P*-values from the t-test ($P < 0.05$), six metabolites were identified as hypothetical biomarkers for distinguishing between the MG and CG[7], among which LDL/VLDL, lactate, *N*-Acetyl-glycoprotein (NAC) and acetoacetate were decreased, by contrary, creatine and trimethylamine-N-oxide (TMAO) were increased in the MG group than in the CG (Supplementary Table S1) to the independent-sample t-tests, we found that the peak areas of metabolites could be reversed after taking the RPBL (Figure 1A). It shows that after taking RPBL, the concentrations of the four metabolites (LDL/VLDL, lactate, NAC, acetoacetate) had up-regulated ($P < 0.05$, 0.01), while the two metabolites (creatine and TMAO) showed to down-regulated ($P < 0.05$, 0.01), which come back from the MG to the CG.



Supplementary Figure S2. (A) Typical ^{1}H-NMR NOESY spectra of urine from five groups, CG; MG; QZOS; H-RPBL and L-RPBL. Main metabolites, 1. Lactate; 2. Alanine; 3. Acetate; 4. N-acetylglucosaminidase; 5. Acetone; 6. Succinate; 7. 2-oxoglutarate; 8. Citrate; 9. Dimethylamine; 10. Dimethylglycine; 11. Creatinine/creatine; 12. Choline; 13. Trimethylamine-N-oxide; 14. Proline; 15. Glycine; 16. Glucose and amino acid; 17. Tyrosine; 18. Creatinine; 19. α-Glucose; 20. Allantoin; 21. Urea and 22. Hippurate. (B) OPLS-DA score plot based on 1H NMR spectra of urine samples from the CG and MG. OPLS-DA loading plot to the right of Figure 1(B). Key, CG (■); MG (●). (R^2X= 0.833, R^2Y= 0.997, Q^2 = 0.946).

Supplementary Table S1. Identification and trends of potential biomarkers related with MG vs CG in rat plasma and urine based on OPLS-DA loading plots of the NMR spectral regions

	No.	Metabolites	Chemical shift ^{1}H (ppm)	Content variance
Plasma	1	LDL/VLDL	1.26(m),0.86(t)	↓*
	2	Lactate	1.33(d),4.12(q)	↓*
	3	*N*-Acetyl-glycoprotein	2.05(s)	↓*
	4	Acetoacetate	2.33(s)	↓*
	5	Creatine	3.05(s)	↑*
	6	Trimethylamine-N-oxide	3.28(s)	↑*
Urine	1	Lactate	1.34(d),4.13(q)	↓*
	2	Acetate	1.94(s)	↓*
	3	Acetone	2.26(m)	↑*
	4	Succinate	2.42(s)	↑*
	5	2-Oxoglutarate	2.46(t),3.02(t)	↑*
	6	Citrate	2.58(d), 2.66(d)	↑*
	7	Dimethylamine (DMA)	2.7(s)	↑*
	8	Creatinine/creatine	3.06(s),4.06(s)	↓*
	9	Choline	3.26(s)	↓*
	10	Trimethylamine-N-oxide	3.3(s)	↑*
	11	Proline	3.42(m)	↓*
	12	Glycine	3.54(s)	↓*
	13	α-Glucose	5.26(d)	↓*
	14	Allantoin	5.42(s)	↓*
	15	Hippurate	7.54(t),7.62(q),7.86(d)	↓*

Note. ↑, content increased; ↓, content decreased. $^{*}P < 0.01$.