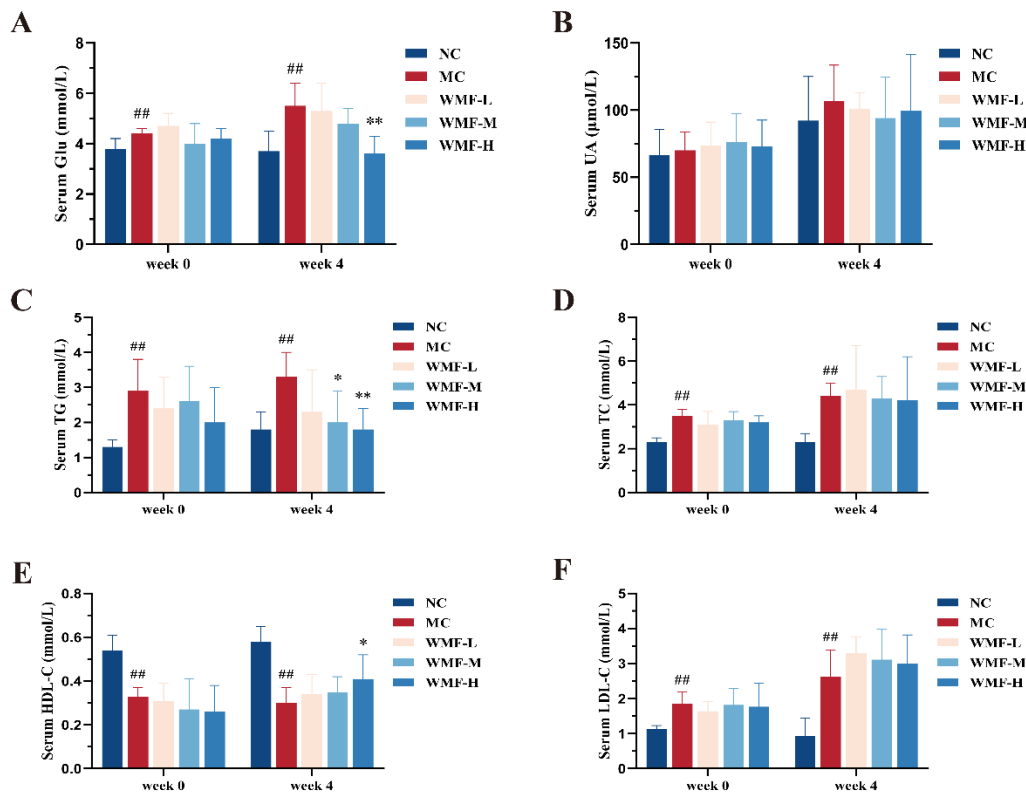


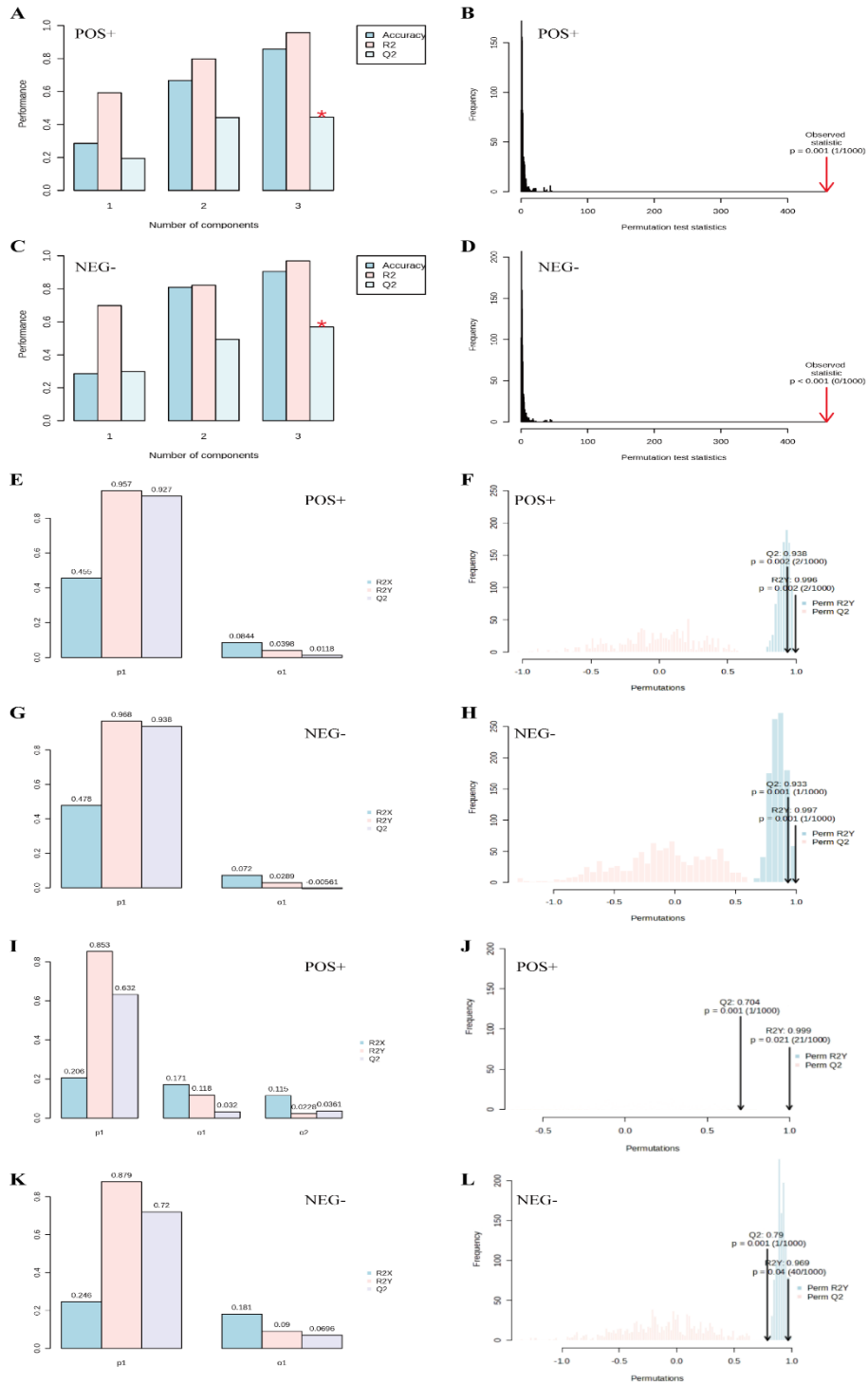
Supplementary Table.1 Body weight change of MAFLD rat (g)

Group	Week 0	Week 1	Week 2	Week 3	Week 4
NC	403.8±41.3	403.7±32.9	425.0±35.3	421.0±34.4	428.4±33.0
MC	552.7±34.1###	571.4±22.1###	566.6±49.1###	562.6±43.4###	586.0±36.9###
WMF-L	549.9±33.5	543.1±30.9	559.7±26	548.3±26.7	558.6±25.3
WMF-M	530.6±21.2	543.7±27.9	541.4±21.7	538.4±24.0	545.5±15.3*
WMF-H	529.9±32.4	522.2±38.3*	510.3±27.3*	513.3±23.6*	522.6±29.9**

WMF-L: Low dosage (0.36 g/mL); WMF-M: Mid dosage (0.71 g/mL); WMF-H: High dosage (1.43 g/mL). All the values were presented as the mean ± SD. #*P* < 0.05, ###*P* < 0.01 vs. NC group; **P* < 0.05, ***P* < 0.01 vs. MC group. (n=5)



Supplementary Fig.1 Serum biochemistry change of MAFLD rat. (A-F) The levels of Glu, UA, TG, TC, HDL-c and LDL-c in the serum, respectively. WMF-L: Low dosage (0.36 g/mL); WMF-M: Mid dosage (0.71 g/mL); WMF-H: High dosage (1.43 g/mL). All the values were presented as the mean ± SD. #*P* < 0.05, ###*P* < 0.01 vs. NC group; **P* < 0.05, ***P* < 0.01 vs. MC group. (n=5)



Supplementary Fig.2 Model tests of PLS-DA and OPLS-DA. (A, C) Cross-validation of PLS-DA score plot. (B, D) Permutation test of PLS-DA score plot. (E, G) Model overview of OPLS-DA score plot between MC group and NC group. (F, H) Permutation test of OPLS-DA score plot between MC group and NC group. (I, K) Model overview of OPLS-DA score plot between MC group and WMF group. (J, L) Permutation test of OPLS-DA score plot mode between MC group and WMF group.

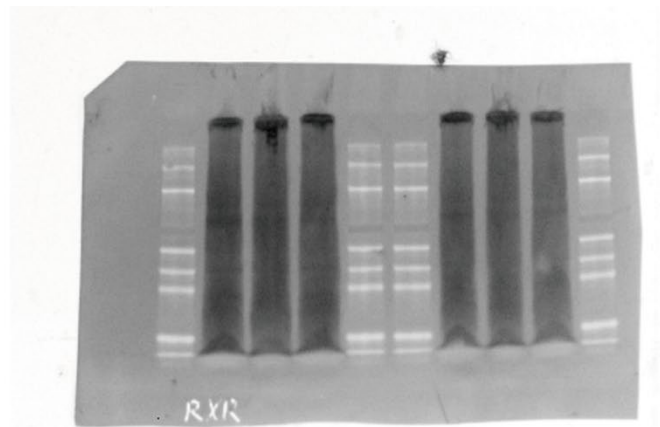
Supplementary Table 2 The information of annotated metabolites in liver

No.	RT ¹	Metabolite	<i>m/z</i>	Adducts	Mode	HMDB ID	Change Trend	
							M ² /N ³	W ⁴ /M
1	0.790	5-Hydroxylysine	204.1340	M+ACN+H	pos	HMDB0245508	↓##	↑*
2	0.971	Glycerol 3-Phosphate	171.0057	M-H ₂ O-H, M-H	neg	HMDB0252849	↑##	↓*
3	0.995	(S)C(S)S-S-Methylecysteine sulfoxide	132.0117	M-H ₂ O-H	neg	HMDB0029432	↓#	↑*
4	1.040	Glycylproline	173.0919	M+H	pos	HMDB0000721	↓##	↑**
5	1.917	3-Hydroxybutanoic Acid	103.0391	M-H	neg	HMDB0000011	↑##	↓*
6	2.486	Hydroxypropyl-Valine	213.1230	M+H-H ₂ O	pos	HMDB0028876	↓##	↑*
7	2.698	5-(delta-Carboxybutyl)homocysteine	222.0792	M+H	pos	HMDB0246764	↑##	↓**
8	2.746	Oxyphencyclimine	367.1968	M+Na	pos	HMDB0014527	↓##	↑*
9	2.794	Ecgonine Methyl Ester	217.1543	M+NH ₄	pos	HMDB0006406	↓##	↑*
10	2.802	N-(3-Methylbut-2-EN-1-YL)-9H-purin-6-amine	267.1334	M+ACN+Na	pos	HMDB0245646	↓##	↑*
11	2.802	Prolyl-Valine	215.1387	M+H	pos	HMDB0029030	↓##	↑*
12	2.817	7-Hydroxyoct-3-enedioylcarnitine	332.1694	M+H	pos	HMDB0241714	↑##	↓*
13	2.824	6-(2-Hydroxyethoxy)-6-oxohexanoylcarnitine	334.1852	M+H	pos	HMDB0241809	↑##	↓*
14	2.886	L-Threo-3-Phenylserine	223.1074	M+ACN+H	pos	HMDB0002184	↓##	↑**
15	2.982	L-Proline, 1-(1-L-leucyl-L-prolyl)-	326.2067	M+H	pos	HMDB0253022	↓##	↑**
16	2.990	Etiracetam	203.1388	M+CH ₃ OH+H	pos	HMDB0015333	↓##	↑**
17	3.013	Glycylleucine	189.1231	M+H, M+Na	pos	HMDB0028929	↓##	↑*
18	3.101	Val-Gly-Val-Ala-Pro-Gly	521.2707	M+Na	pos	HMDB0253033	↓##	↑*
19	3.125	Leucylproline	229.1543	M+H, M+Na	pos	HMDB0011175	↓##	↑**
20	3.141	Methyldopa	253.1179	M+ACN+H	pos	HMDB0011754	↓##	↑**
21	3.149	Isoleucyl-Tyrosine	295.1647	M+H	pos	HMDB0028919	↓##	↑*
22	3.204	Saccharopine	318.1654	M+ACN+H	pos	HMDB0000279	↓##	↑**
23	3.305	Undeca-5,7,9-trienedioylcarnitine	374.1567	M+Na-2H	neg	HMDB0241204	↓##	↑**
24	3.305	Phenylalanylaspartic acid	279.0985	M-H	neg	HMDB0028991	↓##	↑*
25	3.321	Valylproline	213.1240	M-H	neg	HMDB0029135	↓##	↑*
26	3.360	Dodeca-4,6,8-trienedioylcarnitine	388.1724	M+Na-2H	neg	HMDB0241284	↓##	↑**

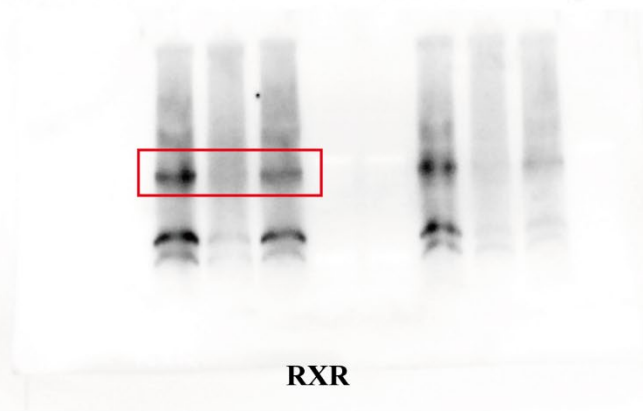
No.	RT ¹	Metabolite	<i>m/z</i>	Adducts	Mode	HMDB ID	Change Trend	
							M ² /N ³	W ⁴ /M
27	3.391	Ala-Leu	201.1239	M-H	neg	HMDB0028691	↓##	↑*
28	3.393	L-phenylalanyl-L-proline	263.1385	M+H	pos	HMDB0011177	↓##	↑**
29	3.407	Aspartame	293.1142	M-H	neg	HMDB0001894	↓##	↑*
30	3.456	Tramadol	286.1755	M+Na	pos	HMDB0259401	↓##	↑**
31	3.501	Glutaminylleucine	258.1458	M-H	neg	HMDB0028801	↓##	↑**
32	3.595	Leucyl-Valine	229.1554	M-H	neg	HMDB0028942	↓##	↑*
33	3.607	Capsicoside A1	617.3647	M+Na	pos	HMDB0303762	↓##	↑*
34	3.615	Salidroside	333.1550	M+CH ₃ OH+H	pos	HMDB0257463	↓##	↑*
35	3.655	Phenylalanyl-Gamma-glutamate	276.1338	M+H-H ₂ O	pos	HMDB0029009	↓##	↑*
36	3.678	N(2)-phenylacetyl-L-glutamate	306.1443	M+ACN+H	pos	HMDB0062645	↓##	↑*
37	3.690	Delta-Hydroxylysylnorleucine	272.1615	M-H ₂ O-H	neg	HMDB0253190	↓##	↑**
38	3.690	Benfluorex	332.1253	M-H ₂ O-H	neg	HMDB0248949	↓##	↑**
39	3.713	Isoleucylproline	227.1397	M-H	neg	HMDB0011174	↓##	↑*
40	3.729	Hydroxyzine	373.1726	M-H	neg	HMDB0014697	↓#	↑**
41	3.742	N-Valylphenylalanine	265.1541	M+H	pos	HMDB0255244	↓##	↑**
42	3.745	Deca-4,6,8-trienedioylcarnitine	360.1410	M+Na-2H	neg	HMDB0241130	↓#	↑*
43	3.768	Adipic Acid	145.0498	M-H	neg	HMDB0000448	↑##	↓**
44	3.781	Dithizone	274.1102	M+NH ₄	pos	HMDB0251496	↑##	↓**
45	3.807	Ala-phe	235.1085	M-H	neg	HMDB0028694	↓##	↑*
46	3.845	Heliotridine	328.2223	2M+NH ₄	pos	HMDB0253071	↓##	↑**
47	3.862	6-(2-Hydroxyethoxy)-6-oxohexanoic acid	189.0762	M-H	neg	HMDB0061681	↑##	↓**
48	3.862	N-(N-(3-Amino-3-carboxypropyl)-3-amino-3-carboxypropyl)azetidine-2-carboxylic acid	284.1250	M-H ₂ O-H	neg	HMDB0255025	↓#	↑**
49	3.917	Metoprolol	288.1564	M+Na-2H	neg	HMDB0001932	↓##	↑**
50	4.060	N-Jasmonoylisoleucine	346.1965	M+Na	pos	HMDB0029391	↓##	↑*
51	4.389	DL-Allylglycine	344.1824	3M-H	neg	HMDB0251510	↓##	↑**
52	4.393	Pumiliotoxin A	330.2380	M+Na	pos	HMDB0256924	↓##	↑*
53	4.640	Hordatine A	587.2682	M+Na-2H	neg	HMDB0030461	↓#	↑*

No.	RT ¹	Metabolite	m/z	Adducts	Mode	HMDB ID	Change Trend	
							M ² /N ³	W ⁴ /M
54	4.718	5-Acetamidovalerate	360.2120	2M+ACN+H	pos	HMDB0012175	↓##	↑*
55	4.844	Leucylphenylalanine	277.1555	M-H	neg	HMDB0302841	↓##	↑**
56	4.955	Valerylglycine	360.2121	M+ACN+H, 2M+ACN+H	pos	HMDB0000927	↓##	↑**
57	5.066	Val-pro-pro	640.4015	2M+NH ₄	pos	HMDB0253034	↓##	↑**
58	5.559	Acetophenazine	392.1826	M-H ₂ O-H	neg	HMDB0015196	↓#	↑**
59	5.613	Isopetasoside	379.2106	M+H-H ₂ O	pos	HMDB0029622	↑##	↓**
60	5.879	3-ethylphenyl Sulfate	201.0221	M-H	neg	HMDB0062721	↓#	↑**
61	6.049	Curdione	219.1741	M+H-H ₂ O	pos	HMDB0034714	↓##	↑*
62	6.248	24-Epibrassinolide	501.3223	M+Na-2H	neg	HMDB0034081	↓##	↑*
63	6.295	Hernandulcin	281.1757	M+FA-H	neg	HMDB0037906	↑##	↓*
64	6.311	19(S)-HETE	303.2312	M+H-H ₂ O	pos	HMDB0011136	↓##	↑*
65	6.334	9,10-DiHOME	313.2383	M-H, M+Cl	neg	HMDB0004704	↑##	↓**
66	6.334	Alpha-Bisabolol oxide B	283.1913	M+FA-H	neg	HMDB0038197	↑##	↓*
67	6.375	N-Linoleoyl Leucine	426.3568	M+NH ₄ , M+CH ₃ OH+H	pos	HMDB0241979	↑##	↓**
68	6.396	3a,7b,12a-Trihydroxy-5a-Cholanoic acid	389.2696	M-H ₂ O-H	neg	HMDB0000432	↑##	↓*
69	6.671	9-Hydroxy-10,12-Octadecadienoic Acid	277.2171	M-H ₂ O-H	neg	HMDB0062652	↑##	↓**
70	6.710	Immepip	375.2520	2M+FA-H	neg	HMDB0253436	↓##	↑**
71	6.820	N-Oleoyl Leucine	394.3324	M-H	neg	HMDB0241962	↑##	↓**
72	6.913	Retinol	269.2258	M+H-H ₂ O, M+H	pos	HMDB0006221	↓##	↑*
73	6.945	Linoleylanilide	400.2854	M+FA-H	neg	HMDB0254103	↑#	↓**
74	6.993	LysoPC(P-18:1(9Z)/0:0)	538.3858	M+CH ₃ OH+H	pos	HMDB0010408	↑##	↓**
75	7.008	Primaquine	560.3677	2M+ACN+H	pos	HMDB0015219	↑##	↓**
76	7.016	3-Icosa-5,8,11-trienoylcarnitine	430.3308	M+H-2H ₂ O	pos	HMDB0241586	↑##	↓*
77	7.048	Polypropylene	396.3466	M+ACN+H	pos	HMDB0255988	↑##	↓**
78	7.119	LysoPA(20:4(8Z,11Z,14Z,17Z)/0:0)	459.2470	M+H, M+NH ₄	pos	HMDB0114742	↑##	↓**

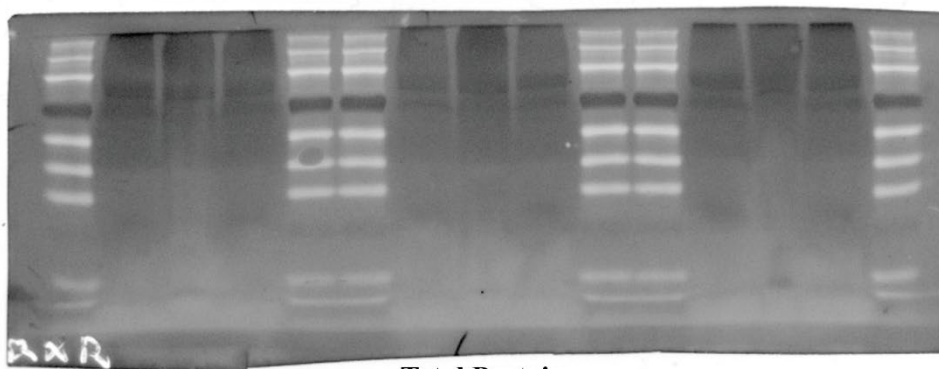
Note: ¹Retention time. ²MC group. ³NC group. ⁴WMF group. ↑Upregulate significantly. ↓Downregulate significantly. #*P* < 0.05, ##*P* < 0.01 vs. NC group; **P* < 0.05, ***P* < 0.01 vs. MC group.



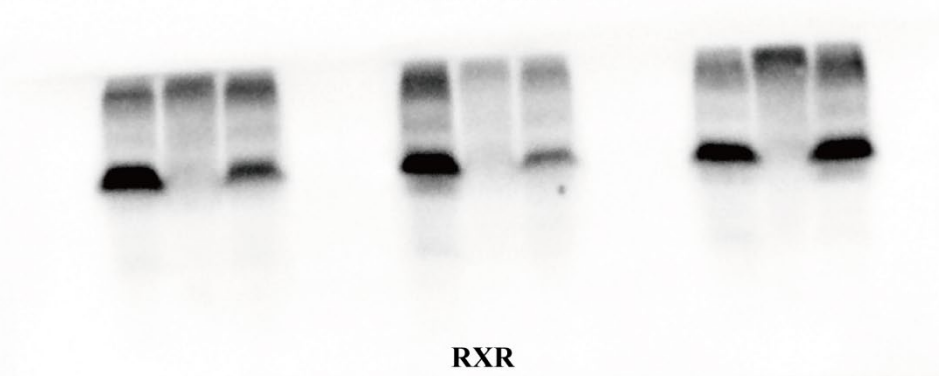
Total Protein



RXR

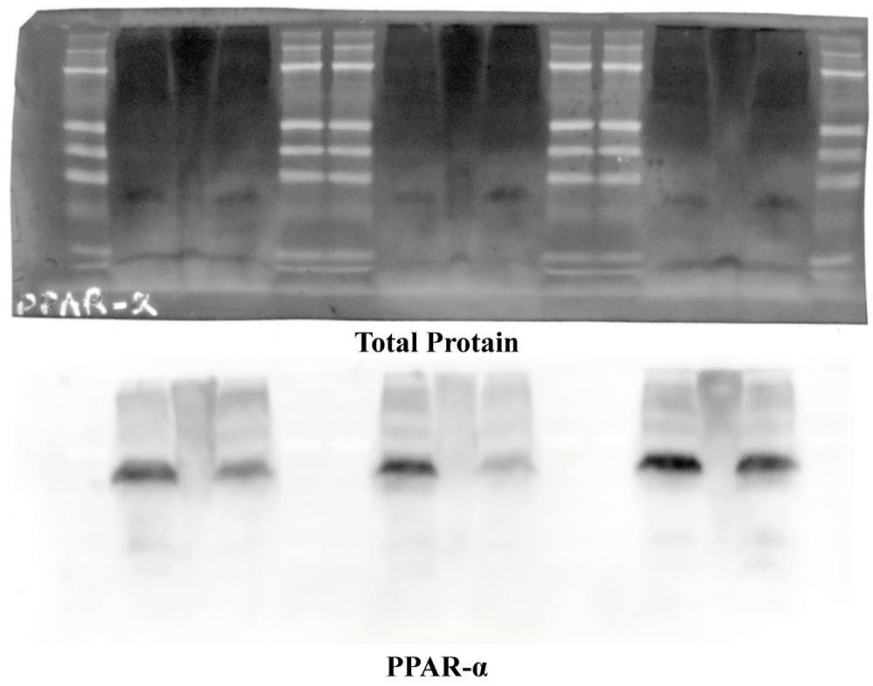
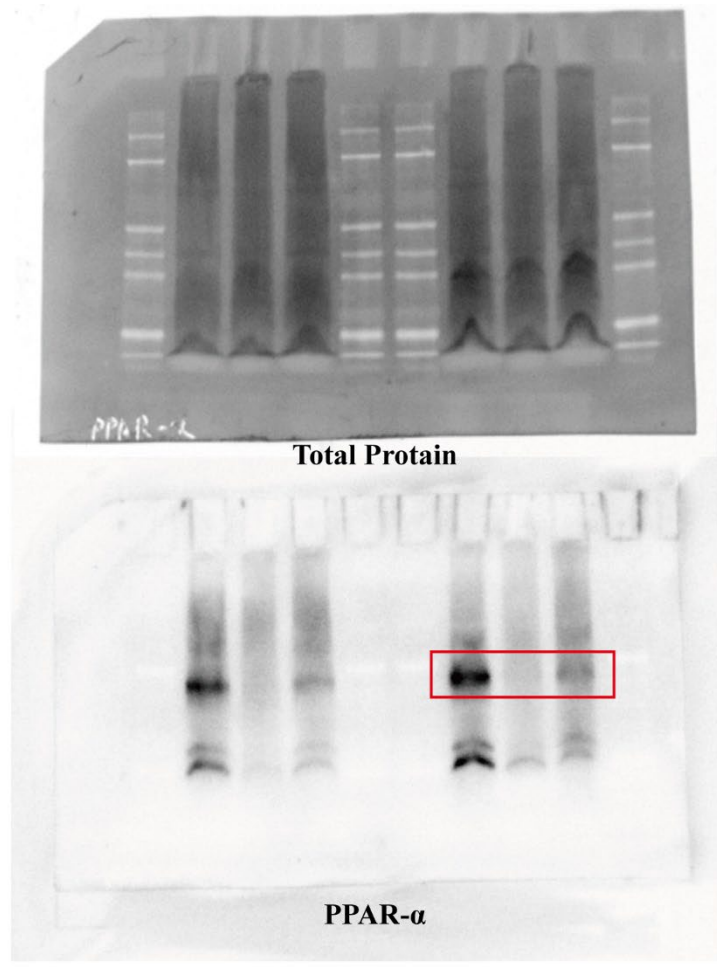


Total Protein

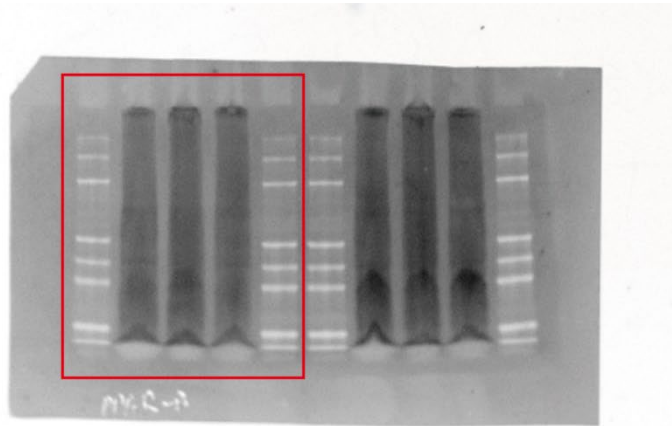


RXR

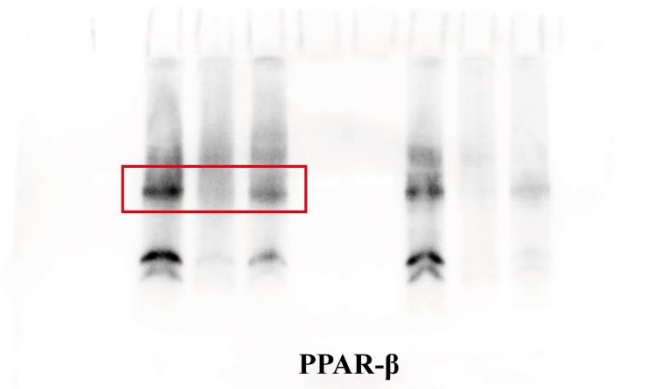
Supplementary Fig.3 Full, non-adjusted images of RXR western blot. Red rectangle = image displayed in manuscript file.



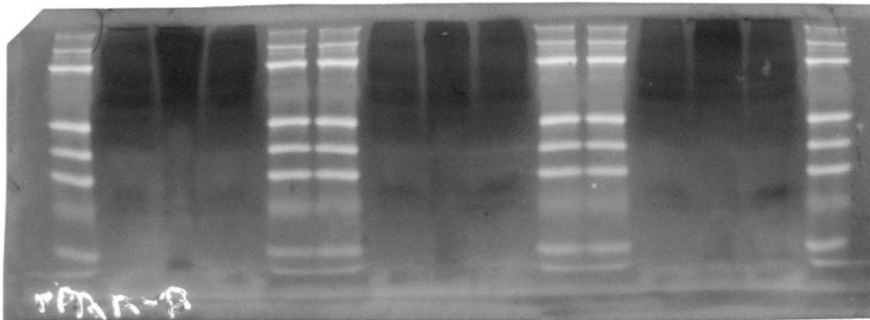
Supplementary Fig.4 Full, non-adjusted images of PPAR- α western blot. Red rectangle = image displayed in manuscript file.



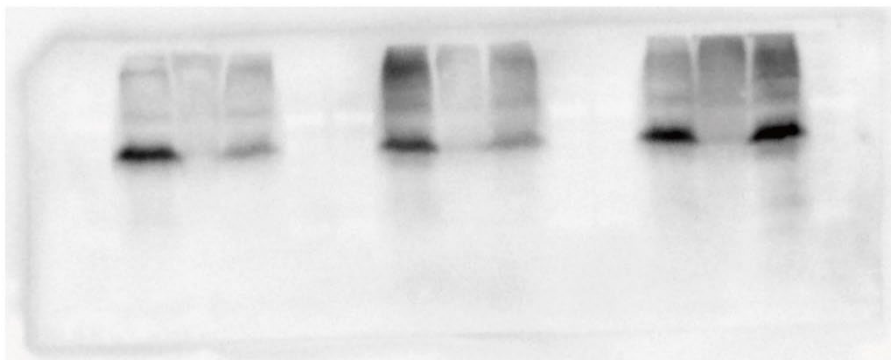
Total Protein



PPAR-β

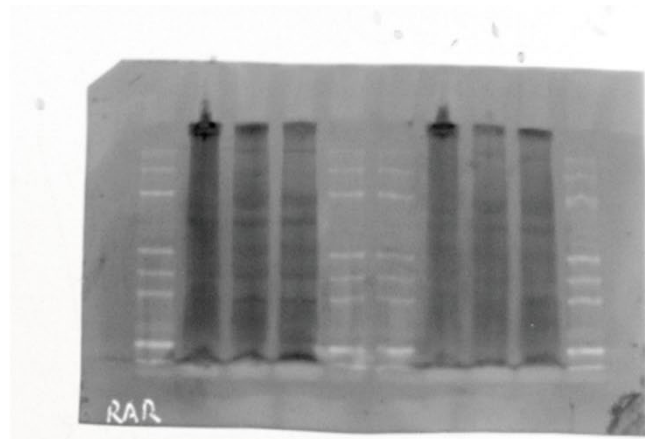


Total Protein

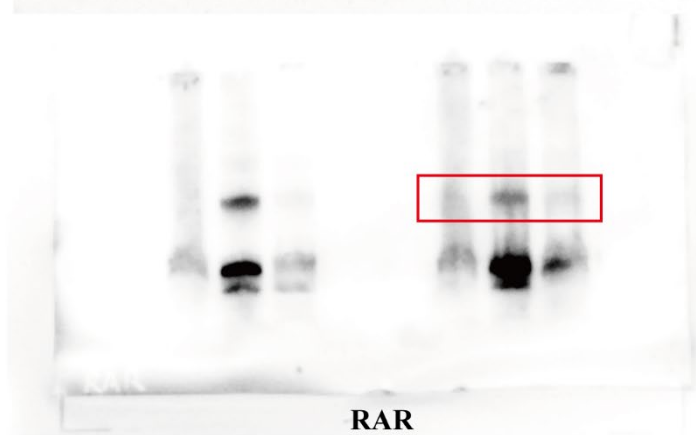


PPAR-β

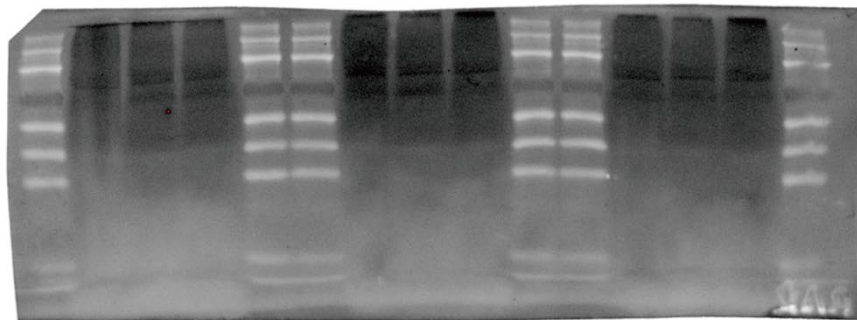
Supplementary Fig.5 Full, non-adjusted images of PPAR- β western blot. Red rectangle = image displayed in manuscript file.



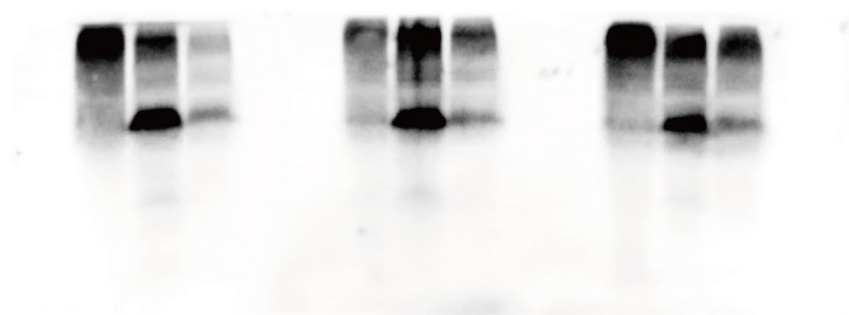
Total Protein



RAR



Total Protein



RAR

Supplementary Fig.6 Full, non-adjusted images of RAR western blot. Red rectangle = image displayed in manuscript file.