

Extended Data

Extended Data Table 1. Human MetS NMR metabolomics, sex-specific changes.

Metabolite name	p-value M	beta M	beta F	p-value F
Very-large HDL cholesterol esters (%)	0,0900908	-0,1364	-0,4619	2,04E-14
Small VLDL cholesterol esters (%)	0,8713823	-0,01	0,3389	2,52E-06
Very-large HDL triglycerides	0,2765577	0,0683	-0,2974	4,29E-06
Medium VLDL cholesterol esters	0,2068834	0,0836	0,2885	0,0000119
LDL-cholesterol	0,1194023	0,1017	0,2582	0,0001106
Omega 3 fatty acids (%)	0,2440756	-0,0732	-0,2558	0,0002222
Large LDL cholesterol esters	0,3383242	0,0626	0,2419	0,0002969
Very small VLDL cholesterol	0,5718874	0,0367	0,2231	0,0005256
Large LDL total concentration	0,4721398	0,0473	0,2205	0,0008946
Large VLDL triglycerides (%)	0,4605852	0,0455	-0,2274	0,0020646
Small LDL cholesterol (%)	0	-0,8108	-0,1059	0,09477
Large LDL cholesterol (%)	1,88E-08	-0,3624	-0,0312	0,638437
IDL cholesterol	2,23E-07	-0,3363	-0,1177	0,0740391
IDL cholesterol esters	5,99E-07	-0,3245	-0,1089	0,0993768
Total phosphoglycerides	9,52E-07	0,3185	0,0403	0,5132957
22:6, Docosahexaenoic acid	9,44E-06	0,2859	0,0655	0,3219862
Large LDL free cholesterol	9,68E-06	-0,2903	-0,0649	0,3304098
IDL phospholipids	0,0000244	-0,2776	0,01	0,8766697
Small VLDL cholesterol (%)	0,0000342	-0,2552	-0,0311	0,6667319
Phosphatidylcholine	0,0000748	0,2571	0,0143	0,8177308

Significant Male or Female, up or down

Extended Data Table 2. Human MetS lipidomics, sex-specific changes.

Chemical name	p-value M	beta M	beta F	p-value F
N6-carbamoylthreonyladenosine	0,1804565	0,0826	0,3885	1,80E-08
3-(3-amino-3-carboxypropyl)uridine	0,1097458	0,0975	0,3865	2,72E-08
C-glycosyltryptophan	0,2455059	0,0688	0,3566	6,48E-08
cystine	0,7597132	0,0194	0,3673	6,52E-08
andro steroid monosulfate C19H28O6S (1)	0,5984022	0,0316	0,3069	5,53E-06
dihomo-linolenoylcarnitine (C20:3n3 or 6)	0,7019808	0,0251	0,3041	7,16E-06
1-(1-enyl-stearoyl)-2-arachidonoyl-GPE (P-18:0/20:4)	0,234889	-0,0791	-0,3148	0,000012
leucylglycine	0,621969	-0,0277	-0,2785	0,000036
5,6-dihydrouridine	0,9728218	0,0021	0,2853	0,000058
4-oxo-retinoic acid	0,36691	-0,0595	-0,2774	0,000071
2-hydroxy-3-methylvalerate	1,03E-07	0,2986	0,1111	0,103186
1,5-anhydroglucitol (1,5-AG)	1,82E-07	-0,3606	0,0877	0,164965
etiocholanolone glucuronide	2,83E-07	-0,3266	-0,0681	0,322826
N-acetyltryptophan	3,07E-07	0,3193	0,1083	0,140281
glutamine_degradant	7,96E-07	-0,2598	0,0291	0,607082
4-methyl-2-oxopentanoate	1,17E-06	0,265	0,0797	0,191626
deoxycholic acid glucuronide	1,55E-06	0,3129	0,0599	0,390031
octadecenedioylcarnitine (C18:1-DC)	3,82E-06	-0,3043	-0,0392	0,570474
pregnenediol sulfate (C21H34O5S)	3,91E-06	-0,2553	-0,019	0,766883
kynurenate	0,0000102	0,2823	0,1235	0,081586

Significant Male or Female, up or down

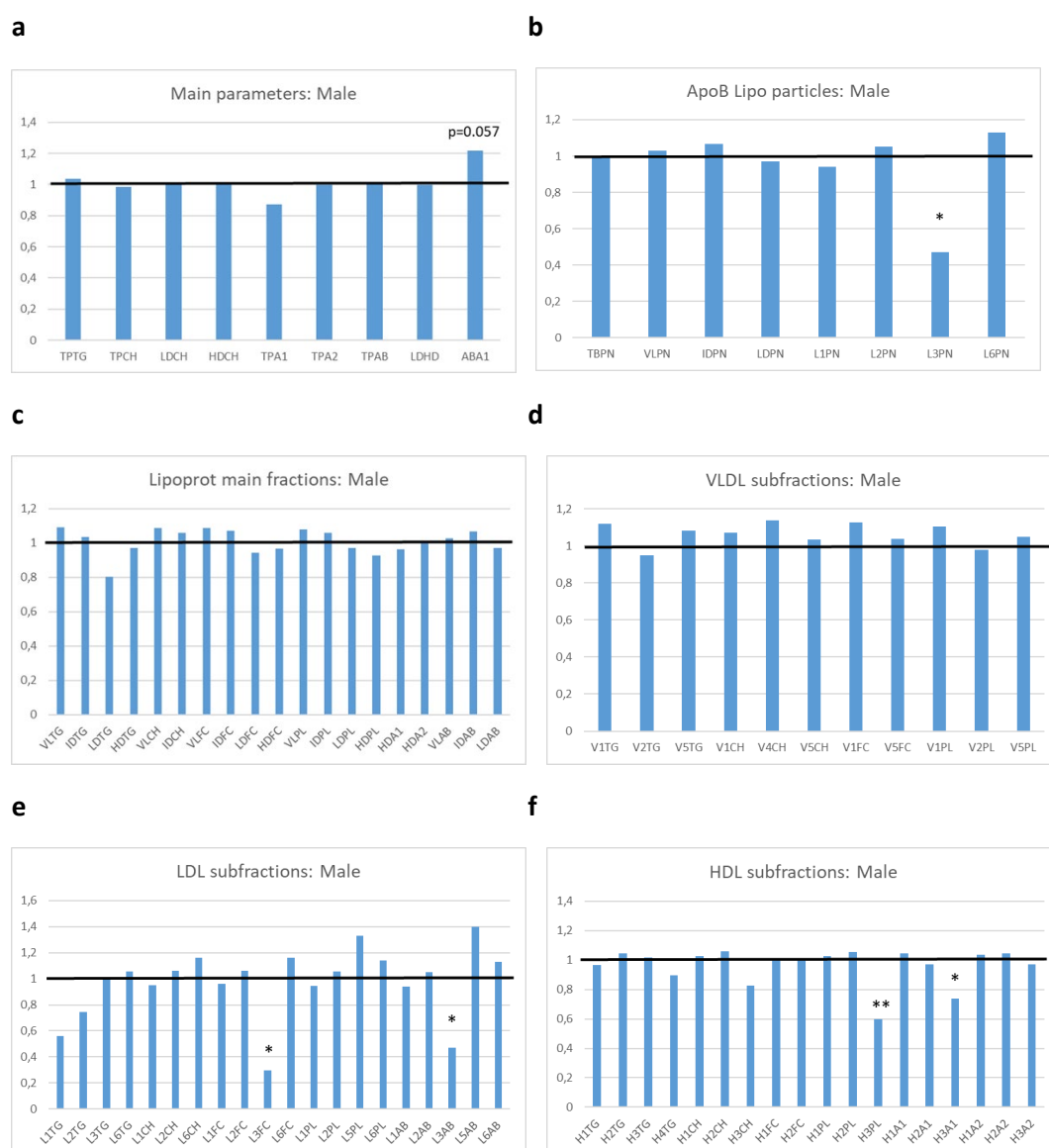
Extended Data Fig. 1.



Extended Data Fig. 1. Rat plasma NMR lipoprotein profiling of female and male controls. (a) Main parameters: triglycerides (TPTG), cholesterol (TPCH), LDL-cholesterol (LDCH), HDL-cholesterol (HDCH), Apo-A1 (TPA1), Apo-A2 (TPA2), Apo-B1 (TPAB), LDCH/HDL (LDHD) and TPAB/TPA1 (ABA1). (b) Apo-B particles: Total concentration of Apo-B particles (TBPN), VLDL particle number (VLPN), IDL particle number (IDPN), LDL-1 (1.019-1.030 kg/L) particle number (L1PN), LDL-2 (1.031-1.033 kg/L) particle number (L2PN), LDL-3 (1.034-1.037 kg/L) particle number (L3PN), LDL-6 (1.044-1.063 kg/L) particle number (L6PN). LDL particle densities between 1.037-1.043 (L4PN and L5PN) gave too low signal. (c) Lipoprotein main fractions: triglycerides in VLDL (VLTG), triglycerides in IDL (IDTG), triglycerides in LDL (LDTG), triglycerides in HDL (HDTG), cholesterol in VLDL (VLCH), cholesterol in IDL (IDCH), free cholesterol in VLDL (VLFC), free cholesterol in IDL (IDFC), free cholesterol in LDL (LDFC), free cholesterol in HDL (HDFC), phospholipids in VLDL (VLPL), phospholipids in IDL (IDPL), phospholipids in LDL (LDPL), phospholipids in HDL (HDPL), Apo-A1 in HDL (HDA1), Apo-A2 in HDL (HDA2), Apo-B in VLDL (VLAB), Apo-B in IDL (IDAB), Apo-B in LDL (LDAB). Cholesterol in LDL and HDL gave too low signal. (d) VLDL 1-5 subfractions (increasing density): triglycerides

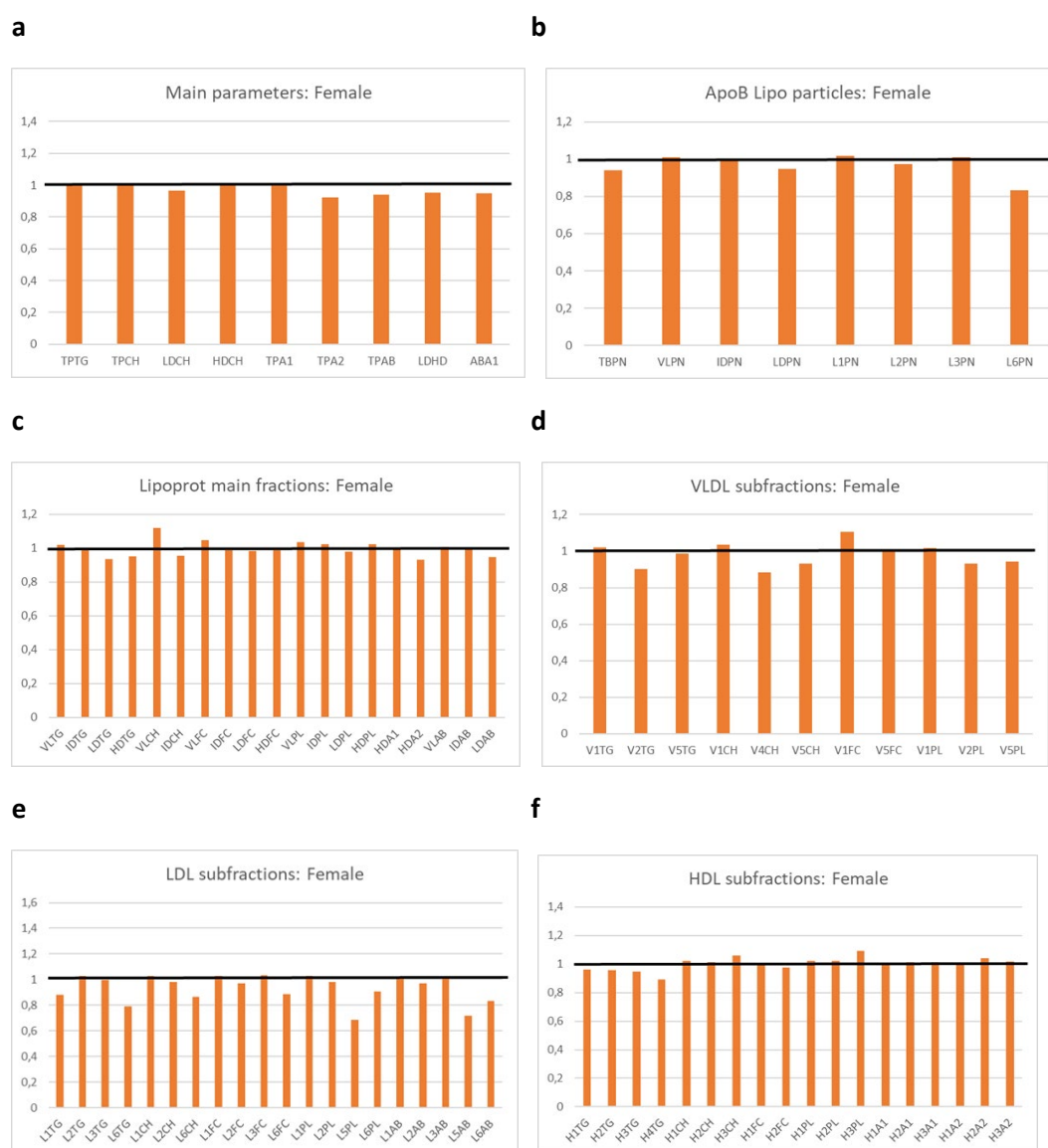
in VLDL-1 (V1TG), triglycerides in VLDL-2 (V2TG), triglycerides in VLDL-5 (V5TG), cholesterol in VLDL-1 (V1CH), cholesterol in VLDL-4 (V4CH), cholesterol in VLDL-5 (V5CH), free cholesterol in VLDL-1 (V1FC), free cholesterol in VLDL-5 (V5FC), phospholipids in VLDL-1 (V1PL), phospholipids in VLDL-2 (V2PL), phospholipids in VLDL-5 (V5PL). V3TG, V4TG, V2CH, V3CH, V2FC, V3FC, V4FC, V3PL and V4PL gave too low signal. (e) LDL subfractions: triglycerides in LDL-1 (L1TG), triglycerides in LDL-2 (L2TG), triglycerides in LDL-3 (L3TG), triglycerides in LDL-6 (L6TG), cholesterol in LDL-1 (L1CH), cholesterol in LDL-2 (L2CH), cholesterol in LDL-6 (L6CH), free cholesterol in LDL-1 (L1FC), free cholesterol in LDL-2 (L2FC), free cholesterol in LDL-3 (L3FC), free cholesterol in LDL-6 (L6FC), phospholipids in LDL-1 (L1PL), phospholipids in LDL-2 (L2PL), phospholipids in LDL-5 (L5PL), phospholipids in LDL-6 (L6PL), Apo-B in LDL-1 (L1AB), Apo-B in LDL-2 (L2AB), Apo-B in LDL-3 (L3AB), Apo-B in LDL-5 (L5AB), Apo-B in LDL-6 (L6AB). L4TG, L5TG, L3CH, L4CH, L5CH, L4FC, L5FC, L3PL, L4PL and L5AB gave too low signal. (f) HDL subfractions: triglycerides in HDL-1 (H1TG) (1.063-1.099 kg/L), triglycerides in HDL-2 (H2TG) (1.100-1.111 kg/L), triglycerides in HDL-3 (H3TG) (1.112-1.124 kg/L), triglycerides in HDL-4 (H4TG) (1.125-1.210 kg/L), cholesterol in HDL-1 (H1CH), cholesterol in HDL-2 (H2CH), cholesterol in HDL-3 (H3CH), free cholesterol in HDL-1 (H1FC), free cholesterol in HDL-2 (H2FC), phospholipids in HDL-1 (H1PL), phospholipids in HDL-2 (H2PL), phospholipids in HDL-3 (H3PL), Apo-A1 in HDL-1 (H1A1), Apo-A1 in HDL-2 (H2A1), Apo-A1 in HDL-3 (H3A1), Apo-A2 in HDL-1 (H1A2), Apo-A2 in HDL-2 (H2A2), Apo-A2 in HDL-3 (H3A2). Results expressed as averages of male controls relative female controls. Black line represent value of no difference. Females n=11 and males n=12. *p<0.05, **p<0.01 and ***p<0.001 vs control, t-test.

Extended Data Fig. 2.



Extended Data Fig. 2. Rat plasma NMR lipoprotein profiling of male rats developmentally exposed to low-dose BPA. (a) Main parameters (for explanation se Supplemental Fig. S1). (b) Apo-B particles. (c) Lipoprotein main fractions. (d) VLDL 1-5 subfractions (increasing density). (e) LDL subfractions. (f) HDL subfractions. Results expressed as averages of exposed males relative male controls. Black line represent value of no difference. BPA exposed males n=16 and control males n=12. *p<0.05 and **p<0.01 vs control, t-test.

Extended Data Fig. 3.



Extended Data Fig. 3. Rat plasma NMR lipoprotein profiling of female rats developmentally exposed to low-dose BPA. (a) Main parameters (for explanation se Supplemental Fig. S1). (b) Apo-B particles. (c) Lipoprotein main fractions. (d) VLDL 1-5 subfractions (increasing density). (e) LDL subfractions. (f) HDL subfractions. Results expressed as averages of exposed females relative female controls. Black line represent no difference. BPA exposed females n=15 and control females n=12.