

Table S1. Distribution of CVH metrics among 461 Kardiovize participants

CVH metric	Poor	Intermediate	Ideal
Smoking status	18.0%	27.3%	54.7%
Healthy dietary score	3.3%	96.7%	-
Physical activity	15.1%	38.0%	46.9%
BMI	10.0%	41.2%	40.8%
Blood pressure	19.8%	43.8%	36.4%
Total cholesterol	14.9%	42.1%	43.0%
Fasting glucose	4.7%	16.6%	78.7%

The parameters for each CVH metric are described in Table S7.

Table S2. Important lipid features identified by ANOVA analysis and Fisher's least significant difference method across CVH categories of smoking status

Lipid species	F-statistic	P-value	FDR
LPE 22:6	6.4857	0.001669	0.049792
PC 14:1_14:1	6.4227	0.001774	0.049792
LPE 16:0	6.293	0.002013	0.049792
PE 18:2_16:1	6.2086	0.002186	0.049792
PE 18:0_18:0	6.0808	0.002475	0.049792
LPE 20:5	5.9263	0.002877	0.049792

Table S3. Important lipid features identified by ANOVA analysis and Fisher's least significant difference method across CVH categories of blood pressure

Lipid species	F-statistic	P-value	FDR
PE 18:0_20:5	11.694	1.11E-05	0.001038
PE 18:0_22:4	10.727	2.80E-05	0.001038
SM d18:1/18:1	10.655	3.00E-05	0.001038
PE 16:0_18:1	10.396	3.84E-05	0.001038
PE 16:0_16:1	10.116	5.02E-05	0.001085
PC 18:0_20:5	9.4165	9.82E-05	0.001768
PE 18:0_16:0	8.9346	0.000156	0.002408
PE 18:1_20:1	8.7966	0.000178	0.002408
PE 16:0_20:2	8.3629	0.000271	0.002926
PE 16:0_20:3	8.3627	0.000271	0.002926
PE 18:1_22:6	8.039	0.00037	0.003636
LPE 20:5	7.9369	0.000409	0.003679
LPC 20:5	7.7266	0.000501	0.004161
PE 16:0_18:2	7.5371	0.000602	0.004642
LPE 20:4	7.1707	0.000858	0.006179
SM d18:1/14:0	6.9202	0.001094	0.007305
PC 18:0_20:3	6.8691	0.00115	0.007305
PE 16:0_20:1	6.7923	0.001239	0.007434
LPE 20:3	6.7106	0.001341	0.007624
SM d18:1/20:1	6.5796	0.001523	0.008199
PC 16:0_20:5	6.5328	0.001594	0.008199
PE 18:0_18:0	6.2402	0.002119	0.010403

PC 18:0_20:0	5.9361	0.00285	0.013196
PE 18:1_22:4	5.9068	0.002933	0.013196
PE 18:2_20:5	5.7038	0.003575	0.01506
PC 18:0_20:2	5.6279	0.003849	0.01506
PE 18:2_16:1	5.6185	0.003885	0.01506
PC 18:1_20:5	5.608	0.003925	0.01506
PC 16:0_18:0	5.5774	0.004044	0.01506
SM d18:1/16:0	5.5117	0.004312	0.015523
SM d18:1/18:0	5.4601	0.004535	0.015798
PC 16:0_16:1	5.2998	0.005304	0.0179
PC 18:0_18:0	5.1826	0.005947	0.01894
Cer d18:1/14:0	5.1543	0.006114	0.01894
SM d18:1/20:0	5.1238	0.006299	0.01894
PC 18:0_22:4	5.1215	0.006314	0.01894
PE 18:2_20:1	5.0932	0.006491	0.018947
PC 16:0_20:2	4.8536	0.008206	0.023323
SM d18:1/22:1	4.8123	0.008545	0.023662
LPE 20:2	4.7077	0.009467	0.025561
LPE 18:3	4.5268	0.011304	0.029776
LPE 16:1	4.4466	0.012229	0.030746
PC 16:0_18:1	4.435	0.012368	0.030746
LPC 22:6	4.4221	0.012526	0.030746
PE 18:2_20:4	4.277	0.014443	0.034664
SM d18:1/24:1	4.2298	0.015127	0.035517
PE 16:0_16:0	4.0991	0.0172	0.039523
LPE 22:5	4.0018	0.018926	0.042584
SM d18:1/26:1	3.9074	0.020767	0.045652
PC 18:1_22:5	3.8704	0.021535	0.045652
PC 14:1_14:1	3.8693	0.021558	0.045652
LPE 18:0	3.8001	0.023076	0.047927
SM d18:1/24:0	3.7769	0.02361	0.048111

Table S4. Important lipid features identified by ANOVA analysis and Fisher's least significant difference method across CVH categories of total cholesterol

Lipid species	F-statistic	P-value	FDR
PC 18:0_20:5	11.295	1.63E-05	0.000905
PE 18:0_20:5	11.265	1.68E-05	0.000905
Cer d18:1/14:0	9.987	5.69E-05	0.002047
PC 16:0_20:5	7.1388	0.000885	0.023903
PE 18:1_22:6	6.6916	0.001367	0.029516

Table S5. Important lipid features identified by ANOVA analysis and Fisher's least significant difference method across CVH categories of blood fasting glucose

Lipid species	F-statistic	P-value	FDR
PE 18:1_22:6	7.5593	0.000589	0.026949
PE 18:0_20:5	7.1709	0.000858	0.026949
PE 18:0_22:4	6.9553	0.001058	0.026949
LPE 20:3	6.7171	0.001333	0.026949
LPE 20:4	6.5234	0.001609	0.026949
PC 16:0_20:5	6.4964	0.001652	0.026949
PC 18:0_20:5	6.4391	0.001747	0.026949
PC 18:1_20:5	6.2336	0.002133	0.028798
LPE 20:2	5.9228	0.002888	0.033241
PE 18:1_20:1	5.8573	0.003078	0.033241
PE 16:0_18:1	5.5919	0.003988	0.033887
PE 18:1_22:4	5.4416	0.004618	0.033887
PE 18:2_20:1	5.4217	0.004709	0.033887
PE 16:0_16:1	5.3999	0.00481	0.033887
PE 16:0_20:3	5.321	0.005195	0.033887
PE 18:0_18:0	5.2357	0.005647	0.033887
Cer d18:1/14:0	5.2053	0.005817	0.033887
PC 18:0_18:0	5.2002	0.005846	0.033887
PE 16:0_20:2	5.1803	0.005962	0.033887

Table S6. Important lipid features identified by ANOVA analysis and Fisher's least significant difference method across categories of CVH

Lipid species	F-statistic	P-value	FDR
PE 18:0_20:5	14.581	7.27E-07	5.05E-05
PE 18:0_22:4	14.154	1.09E-06	5.05E-05
PE 16:0_16:1	13.882	1.40E-06	5.05E-05
PC 18:0_20:5	11.423	1.44E-05	0.000389
PE 16:0_20:3	10.468	3.59E-05	0.000703
PE 16:0_18:1	10.379	3.91E-05	0.000703
PC 16:0_20:5	9.7656	7.03E-05	0.001085
PC 16:0_16:1	9.4294	9.71E-05	0.001311
LPE 20:3	8.6153	0.000212	0.002383
SM d18:1/18:1	8.5758	0.000221	0.002383
PE 18:1_22:6	8.3384	0.000277	0.002686
PE 18:1_22:4	8.1654	0.000328	0.002686
PC 18:0_20:3	8.1489	0.000333	0.002686
PE 16:0_18:2	8.103	0.000348	0.002686
PC 18:1_20:5	7.4499	0.000655	0.004715
LPC 20:5	7.3316	0.000734	0.004778
PE 18:0_16:0	7.3071	0.000752	0.004778
PC 18:0_22:4	7.209	0.000827	0.004962
PE 18:0_18:0	7.1407	0.000884	0.005023
SM d18:1/14:0	7.0697	0.000947	0.005112

PE 16:0_20:2	7.0128	0.001001	0.005145
LPE 20:4	6.5918	0.001506	0.007391
PE 18:1_20:1	6.3393	0.001925	0.009038
LPE 18:3	6.2436	0.002113	0.009507
PC 18:0_20:2	6.0582	0.002531	0.010932
PE 16:0_16:0	5.918	0.002901	0.011818
LPE 16:1	5.8982	0.002958	0.011818
PE 18:2_20:5	5.862	0.003064	0.011818
LPE 18:1	5.6719	0.003688	0.013735
PC 18:0_20:0	5.5107	0.004317	0.015228
PE 18:2_16:1	5.4706	0.004489	0.015228
LPE 20:2	5.4654	0.004512	0.015228
PC 16:0_22:4	5.4051	0.004785	0.015661
PC 18:1_22:4	5.1196	0.006326	0.019653
PC 16:0_20:2	5.1127	0.006369	0.019653
PE 18:2_20:4	5.0349	0.006872	0.020312
PE 18:2_20:1	5.0221	0.006959	0.020312
PC 16:0_18:0	4.9842	0.007222	0.020526
PC 18:1_22:5	4.7424	0.009152	0.025343
PC 16:1_18:2	4.6256	0.010261	0.027706
PC 18:0_18:0	4.5757	0.010775	0.028374
PC 16:0_18:1	4.5515	0.011034	0.028374
PC 18:1_18:3	4.4249	0.012492	0.031376
PE 18:2_22:6	4.3549	0.01338	0.032843
SM d18:1/24:1	4.3245	0.013787	0.033088
LPC 22:4	4.2517	0.014807	0.034764
PE 16:0_20:1	4.2147	0.015355	0.035182
PC 18:2_20:5	4.1962	0.015636	0.035182
LPC 20:4	4.171	0.016029	0.035329
LPE 18:2	4.1044	0.017112	0.036962
SM d18:1/16:0	3.9572	0.019775	0.041876
LPC 22:5	3.8649	0.021654	0.044174
SM d18:1/18:0	3.8553	0.021858	0.044174
LPC 20:3	3.8448	0.022087	0.044174
LPC 16:1	3.785	0.023424	0.045997
PE 18:2_18:2	3.6614	0.026454	0.049626
LPC 20:2	3.6559	0.026596	0.049626
LPE 20:5	3.6538	0.026651	0.049626
LPC 22:6	3.6347	0.027159	0.049714

Table S7. Definition of cardiovascular health metrics.

Health Metric		Definition
Smoking	Ideal Intermediate Poor	Never or quit > 12 months Former ≤ 12 months Current
Body mass index	Ideal Intermediate Poor	< 25kg/m ² 25-29.9 kg/m ² ≥ 30 kg/m ²
Physical Activity	Ideal Intermediate Poor	≥ 150 min/week moderate, ≥ 75 min/week vigorous or ≥ 150 min/week moderate + vigorous 1–149 min/ week moderate or 1–74 min/week vigorous or 1–149 min/week moderate + vigorous None
Fasting serum glucose	Ideal Intermediate Poor	< 5.55 mmol/l, without treatment 5.55-6.94 mmol/l or treated to 5.5 mmol/l ≥ 6.95 mmol/l
Total cholesterol	Ideal Intermediate Poor	< 5.17 mmol/l without medication 5.17-6.18 mmol/l, or treated to < 5.17 mmol/l ≥ 6.19 mmol/l
Blood Pressure	Ideal Intermediate Poor	SBP < 120 and DBP < 80 mmHg, without medication SBP 120-139 or DBP 80-89 mmHg, or treated to hypertension SBP ≥ 140 or DBP ≥ 90 mmHg
Healthy diet score	Ideal Intermediate Poor	4-5 components 2-3 components 0-1 component
	COMPONENTS:	A) ≥ 4,5 cups/day of fruits and vegetables
		B) ≥ 2 servings/week of fish
		C) ≥ 3 servings/day of whole grains
		D) < 1500 mg/day of sodium
		E) 450 kcal (or 1 litre)/week of sweet/sugar sweetened beverages

Medina-Inojosa JR, Vinciguerra M, Maugeri A, Kunzova S, Sochor O, Movsisyan N, Geda YE, Stokin GB, Lopez-Jimenez F. Prevalence of ideal cardiovascular health in a Central European community: results from the Kardiovize Brno 2030 Project. Eur J Prev Cardiol. 2020; 27(4):441-443.

Figure S1. ANOVA analysis of lipid species across CVH categories of smoking status. Lipid species with adjusted *P*-value (FDR) <0.05 are indicated in red.

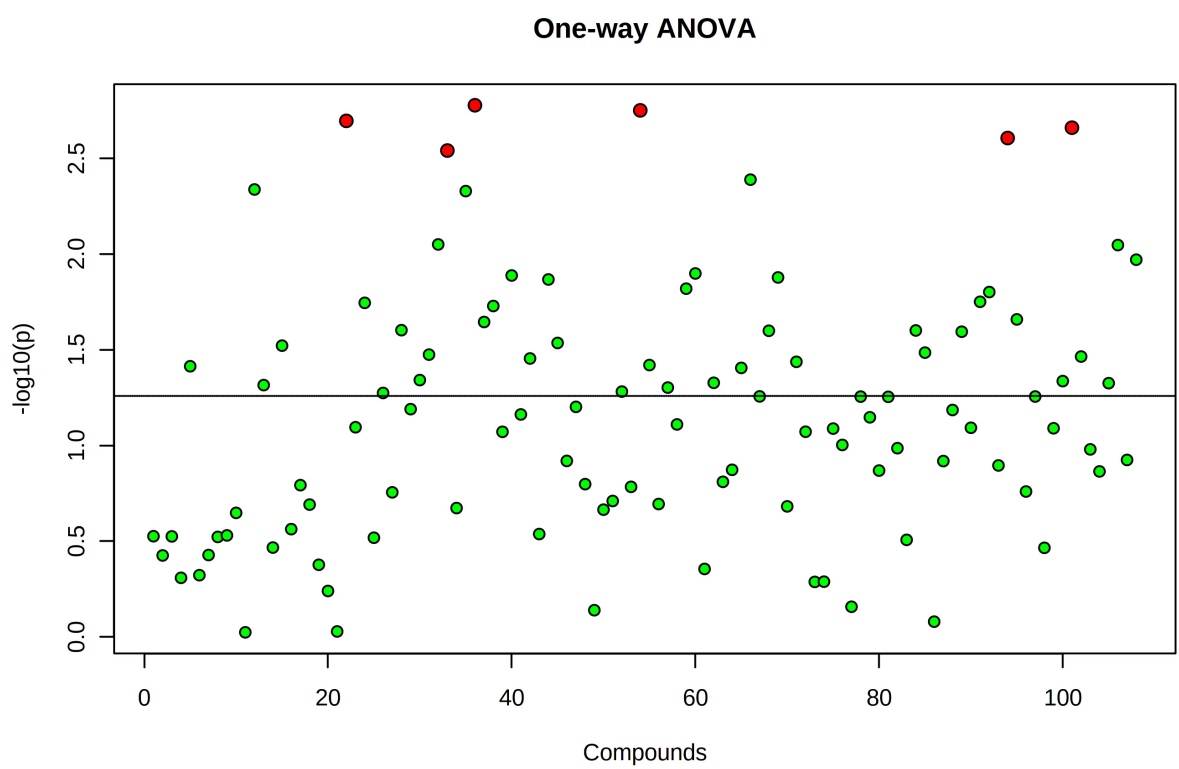


Figure S2. ANOVA analysis of lipid species across CVH categories of physical activity.

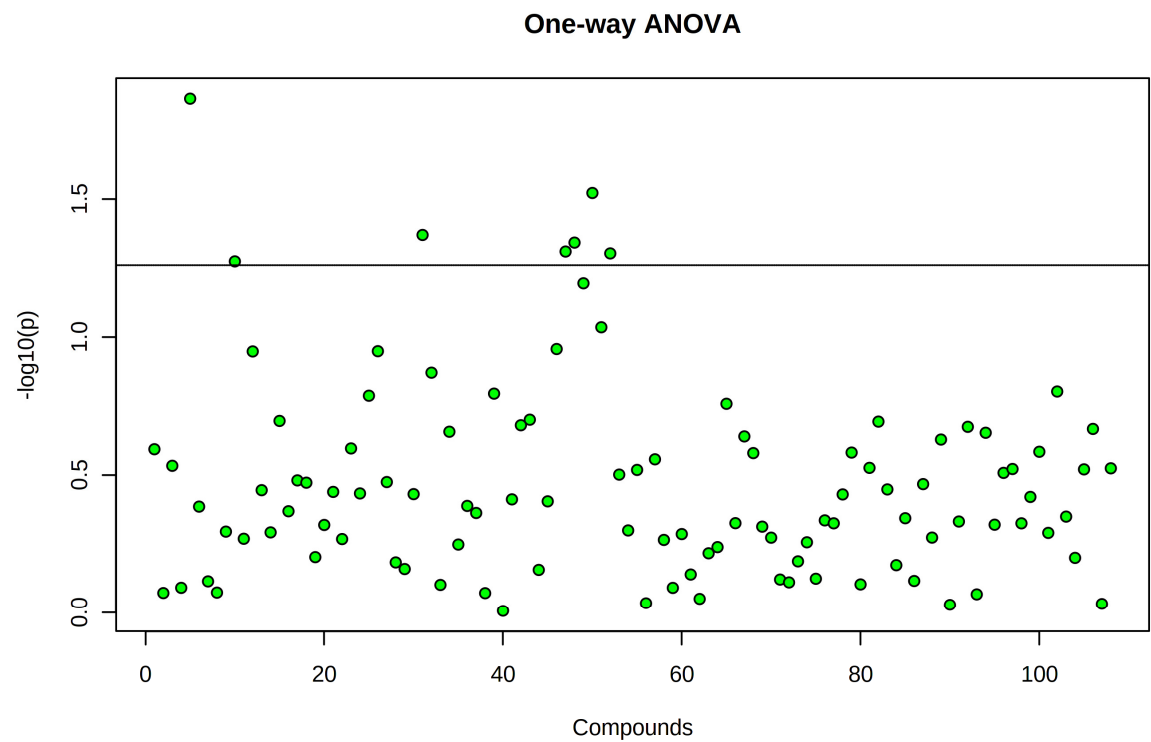


Figure S3. ANOVA analysis of lipid species across CVH categories of BMI.

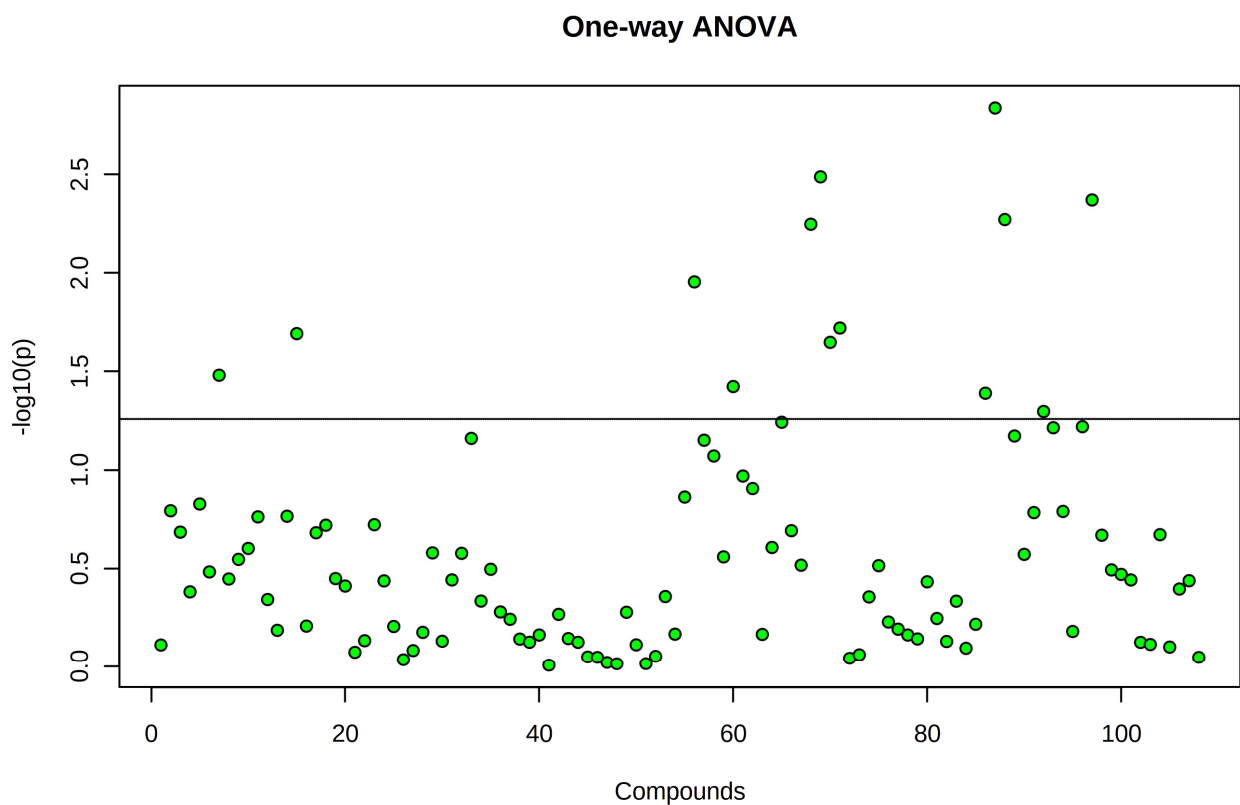


Figure S4. ANOVA analysis of lipid species across CVH categories of blood pressure. Lipid species with adjusted *P*-value (FDR) <0.05 are indicated in red.

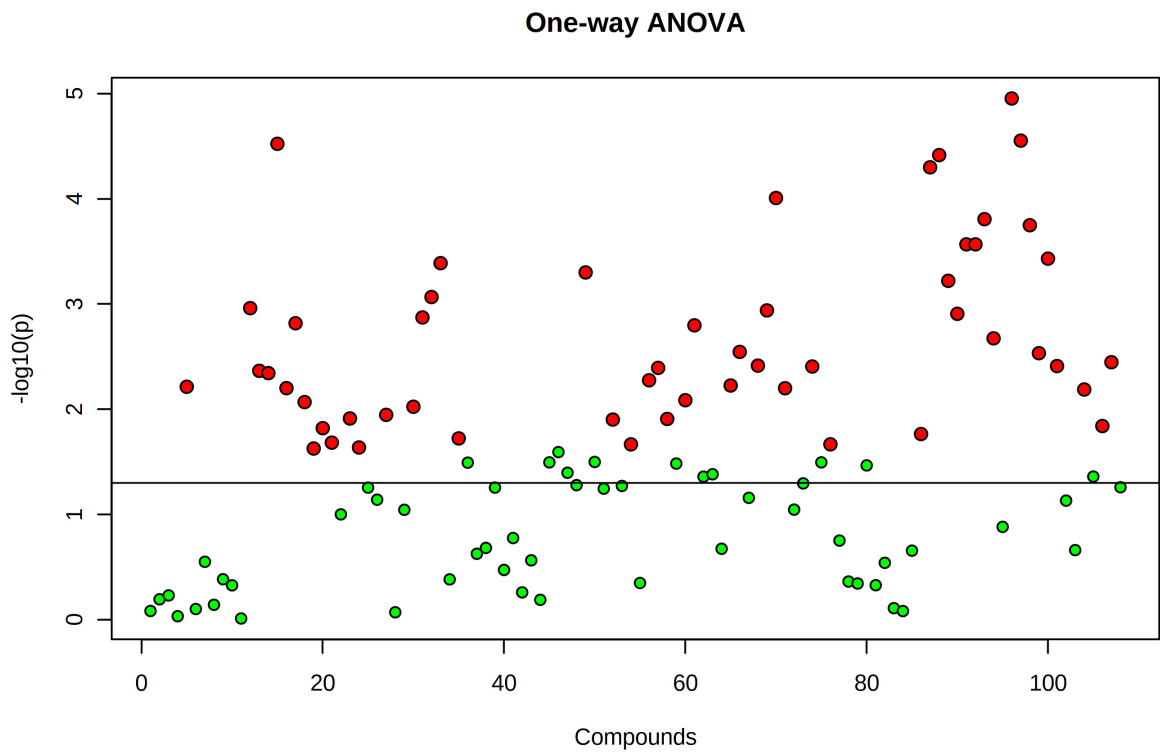


Figure S5. ANOVA analysis of lipid species across CVH categories of total cholesterol. Lipid species with adjusted *P*-value (FDR) <0.05 are indicated in red.

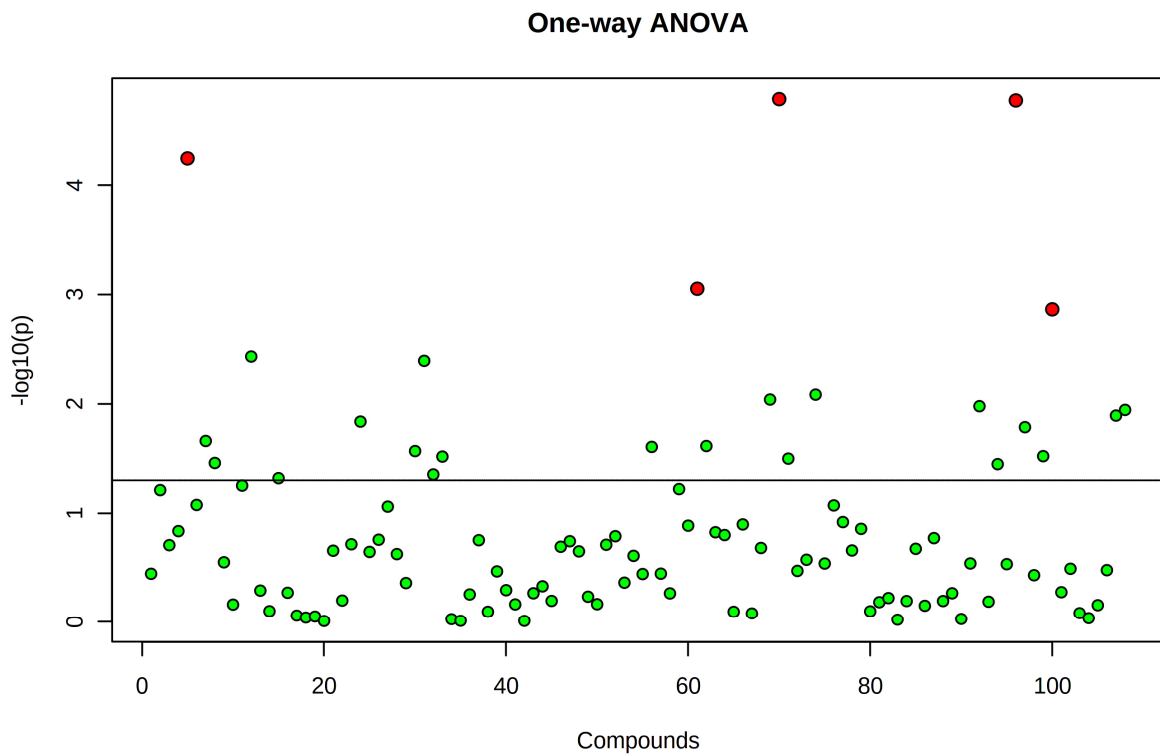


Figure S6. ANOVA analysis of lipid species across CVH categories of blood fasting glucose. Lipid species with adjusted *P*-value (FDR) <0.05 are indicated in red.

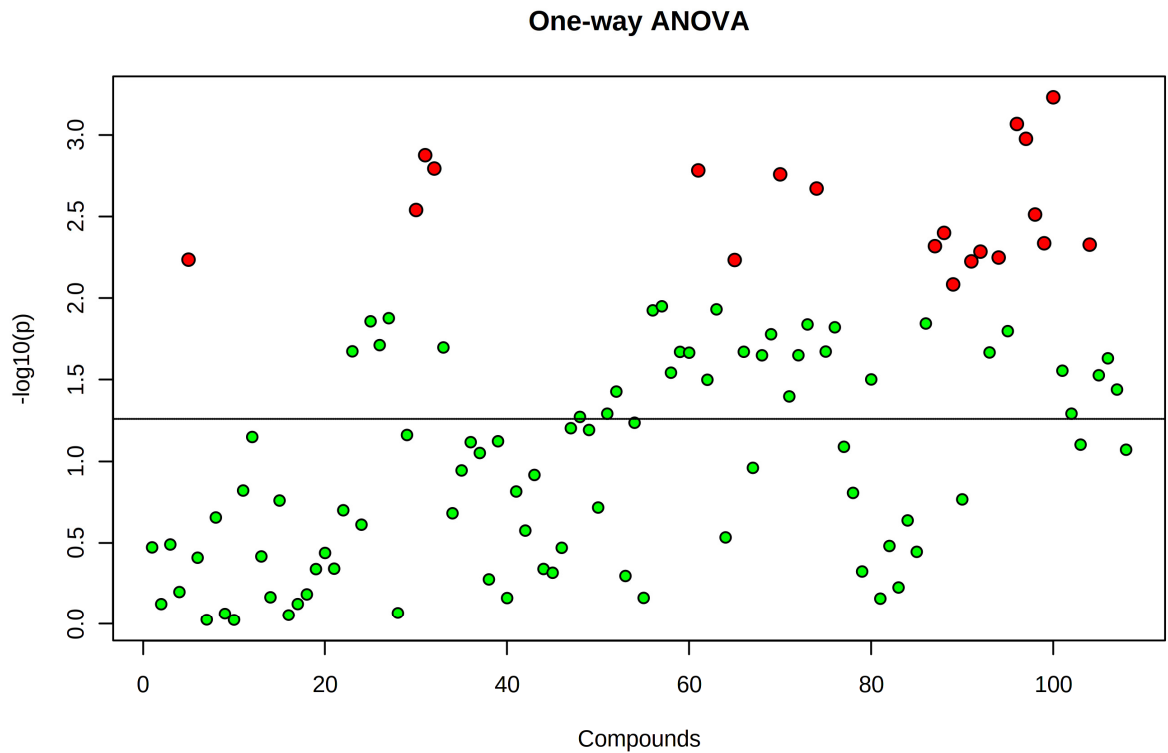


Figure S7. ANOVA analysis of lipid species across categories of CVH. Lipid species with adjusted *P*-value (FDR) <0.05 are indicated in red.

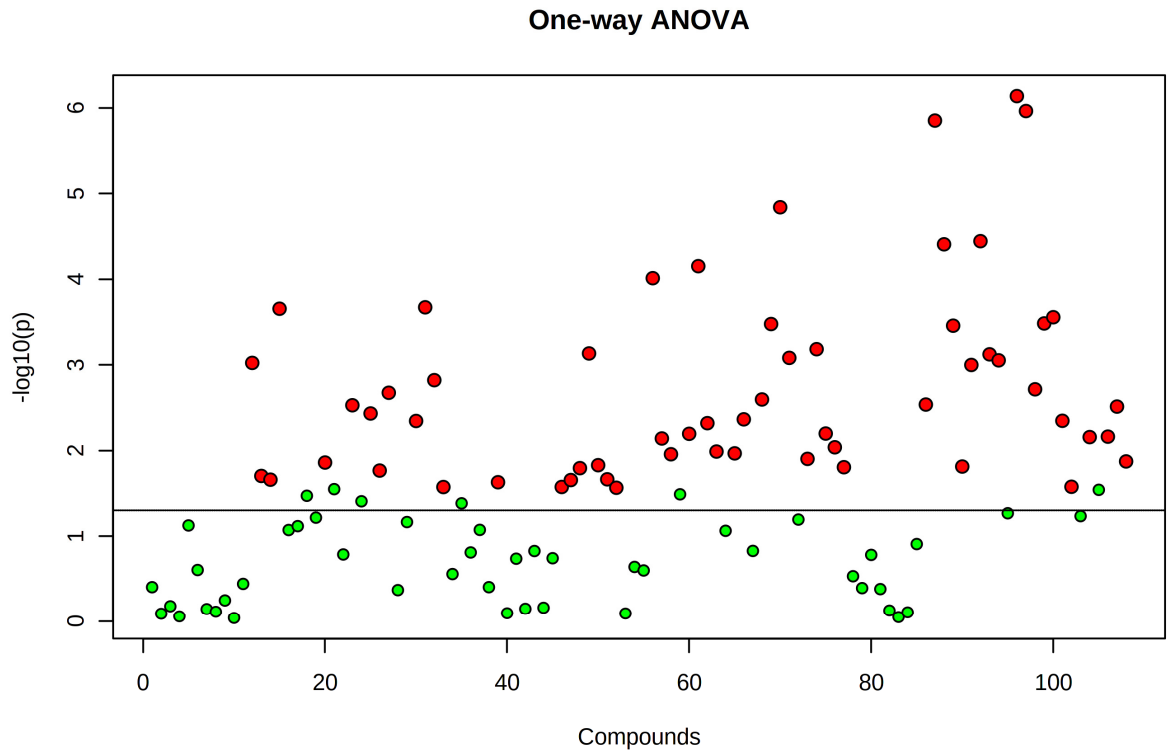


Figure S8. Classification performance and permutation test of the PLS-DA. (A) PLS-DA classification using different number of components. The red star indicates the best classifier. (B) PLS-DA model validation by permutation tests based on separation distance.

