

Supplementary Table S1. The summary of AH donors

Control									
ID	Age	Sex	Eye	Diagnosis	Topical Treatment	General Personal History	General Treatment	Visual acuity	IOP preop
N1	50	Male	Right					0.05	13
N2	76	Female	Right					0.5	15
N3	70	Male	Right			ischemic stroke, AHT, ischemic heart disease, dyslipidemia, benign prostatic hyperplasia	omeprazol, salicylic acid, amlodipine, atorvastatin, bromazepam, tamsulosine	0.4	12
N5	65	Male	Right			COPD, duodenal ulcer	almagate	0.6	18
N6	73	Female	Left			dyslipidemia, depression	sertraline, atorvastatin, lorazepam	0.5	16
N7	64	Female	Right					0.6	16
N8	77	Female	Left			stroke, arrhythmia, diabetes mellitus, AHT	metformin, amlodipine, telmisartan, diazepam	0.5	16
N9	57	Male	Left				bromazepam	hand movement	15
N10	79	Male	Left			AHT, dyslipidemia, diabete mellitus	metformin, irbesartan, esomeprazol, atorvastatin	0.6	15
N11	64	Female	Right					0.5	15
N12	88	Female	Right			rheumatoid arthritis	metotrexate, prednisone, salazopyrin, folic acid	0.6	20
N13	77	Female	Left					0.5	16
N14	69	Female	Left			diabetes mellitus	metformin	0.4	16
N15	76	Male	Left			depression, dyslipidemia	lorazepam, paroxetine, atorvastatin,	0.5	16
N16	60	Female	Right					0.6	12
N17	77	Female	Left			depression, AHT, arthrosis, diabetes mellitus	amilodipine, repaglinide, salycilic acid, telmisartan, vildagliptin, metformin	0.1	21
N18	62	Male	Left			AHT, ankylosing spondylitis, gastroesophageal reflux disease	omeprazol, enalapril, hydrochlorothiazide, cintraprude, salazopyrin	0.5	10
N19	63	Male	Left			HIV, COPD	kivexa	0.2	12
N20	82	Female	Left			dyslipidemia	estatin	0.3	17
N21	85	Female	Left			alzheimer's, dyslipidemia, osteoporosis	quetiapine, paracetamol, omeptrazol, estatine	0.6	20
N22	80	Male	Right			kidney disease		0.6	16
N23	74	Male	Right			AHT, ischemic heart disease, dyslipidemia	salicylic acid, estatine, bisoprolol, enalapril	0.6	14
N24	61	Female	Left					0.6	11

POAG									
ID	Age	Sex	Eye	Diagnosis	Topical Treatment	General Personal History	General Treatment	Visual acuity	IOP preop
G1	78	Female	Left	POAG	monoprost	AHT, stroke	salicylic acid, Candesartan-Hydrochlorothiazide, rosuvastatin, lorazepam	0.6	15
G2	79	Male	Left	POAG	monoprost	AHT, dyslipidemia, diabetes mellitus	rabeprazol, metformin, folic acid, enalapril, simvastatin	0,4	14
G3	64	Male	Left	POAG	latanest	dyslipidemia	atorvastatin	0.4	13
G4	75	Male	Right	POAG	xalacom	diabetes mellitus, dyslipidemia, arterial hypertension	insulin, simvastatin, metformin, enalapril	0.4	17
G5	67	Male	Right	POAG	monoprost	AHT	enalapril	0.3	17
G6	80	Female	Right	POAG	latanest	dyslipidemia, AHT	valsartan, amlodipine	0.3	16
G7	74	Male	Left	POAG	cosopt	gastroesophageal reflux disease, hypothyroidism, arrhythmia	acenocoumarol, euthyrox bisoprolol, pacemaker	0.1	15
G8	74	Female	Right	POAG	azarga, xalatan			0.63	15
G9	81	Female	Right	POAG	Ganfort	AHT	Enalapril	0.5	18
G10	77	Male	Right	POAG	Monoprost	benign prostatic hyperplasia		0.4	16
G11	61	Male	Left	POAG	monoprost	sleep apnea syndrome, COPD, AHT, chronic lymphocytic leukemia	enalapril, amilodipine, fluticasone furoate/vilanterol	0.5	15
G12	81	Male	Left	POAG		auricular fibrillation	dabigatram	0.3	16
G13	74	Female	Right	POAG	monoprost			0.2	20
G14	67	Female	Left	POAG	simbrinza	asthma, AHT	ebastine, lisinopril, salbutamol	0.5	23
G15	77	Female	Right	POAG	combigan	rheumatoid arthritis	hydroxychloroquine, vitamin D, tramadol	0.2	15
G16	79	Male	Left	POAG	monoprost	AHT, kidney failure, dyslipidemia, hyperuricemia	simvastatin, olmerstan, duodart, amlodipine, allopurinol	0.5	15
G17	73	Male	Left	POAG	monoprost			0.3	16
G18	81	Male	Left	POAG	monoprost	COPD	salbutamol, fluticasone	0.4	18
N4	68	Female	Right	POAG	monoprost	hypothyroidism	euthyrox	0.3	13

PEX									
ID	Age	Sex	Eye	Diagnosis	Topical Treatment	General Personal History	General Treatment	Visual acuity	IOP preop
BB03	69	Female	Left	PEX		AHT	perindopril, manidipine	0.4	19
BB04	77	Female	Left	PEX		hypothyroidism, depression	euthyrox	0.4	18
PX1	83	Male	Right	PEX		AHT, COPD, benign prostatic hyperplasia, ischemic heart disease	enalapril, simvastatin, omeprazol, salicylic acid, salbutamol	0.4	21
PX3	72	Male	Left	PEX		crohn disease, benign prostatic hyperplasia	duodart, salazopyrin, azathioprine	0.6	18
PX5	80	Male	Right	PEX		dyslipidemia, AHT, ischemic heart disease, benign prostatic hyperplasia	atorvastatin, enalapril, salicylic acid, atenolol, doxazosine, omeprazol	0.3	20

PX10	78	Female	Left	PEX		epilepsy	lancosamide	0.4	18
PX12	87	Female	Right	PEX		hyperthyroidism	tirodril	0.4	18
PX13	80	Female	Left	PEX		depression	antidepressive treatment	0.3	18
PX18	79	Male	Right	PEX		AHT, ischemic heart disease, dyslipidemia, benign prostatic hyperplasia, arrhythmia	furosemide, eplerenone, clopidogrel, atorvastatin, tamsulosin, ranolazine	0.3	10

PEXG

ID	Age	Sex	Eye	Diagnosis	Topical Treatment	General Personal History	General Treatment	Visual acuity	IOP preop
BB02	70	Male	Left	PEXG	monoprost	COPD, dyslipidemia	simvastatin	0.6	16
PX2	80	Male	Left	PEXG	cosduo	AHT, dyslipidemia, hypothyroidism, auricular fibrillation, hyperuricemia	acenocoumarol, euthyrox, valsartan, bisoprolol, estatin, allopurinol, hidroclorotiazide	0.5	18
PX4	75	Female	Right	PEXG	azarga, brimonidine, monoprost	AHT	diltiazem	0.2	26
PX6	76	Female	Right	PEXG	monoprost	dyslipidemia, AHT	enalapril, atorvastatin, furosemide	0.6	15
PX7	86	Male	Right	PEXG	combigan, monoprost	COPD, AHT	furosemide, enalapril, tiotropium bromide	0.6	28
PX8	65	Male	Right	PEXG	xalatan, cosduo	AHT, diabetes mellitus, benign prostatic hyperplasia	enalapril, insulin, silodosin	1	18
PX9	75	Female	Left	PEXG	lumigan			0.5	19
PX11	84	Female	Left	PEXG	ganfort	ischemic stroke, AHT	acenocoumarol, hidroclorotiazide, lorazepam	0.6	16
PX14	70	Male	Left	PEXG	travatan	AHT, dyslipidemia, hyperuricemia	allopurinol, atorvastatin, enalapril, metamizole, pregabalin	0.6	18
PX15	73	Female	Right	PEXG	xalacom	dyslipidemia	atorvastatin	0.2	20
PX16	75	Female	Left	PEXG	lumigan	essential tremor	salicylic acid	0.5	19
PX17	78	Female	Right	PEXG	timoftol 0.5	dyslipidemia	simvastatin	0.5	24
PX19	73	Female	Left	PEXG	taptiqom	AHT	telmisartan	0.5	17
PX20	81	Male	Right	PEXG	azarga	AHT, dyslipidemia	atenolol, estatin, salicylic acid	0.5	14

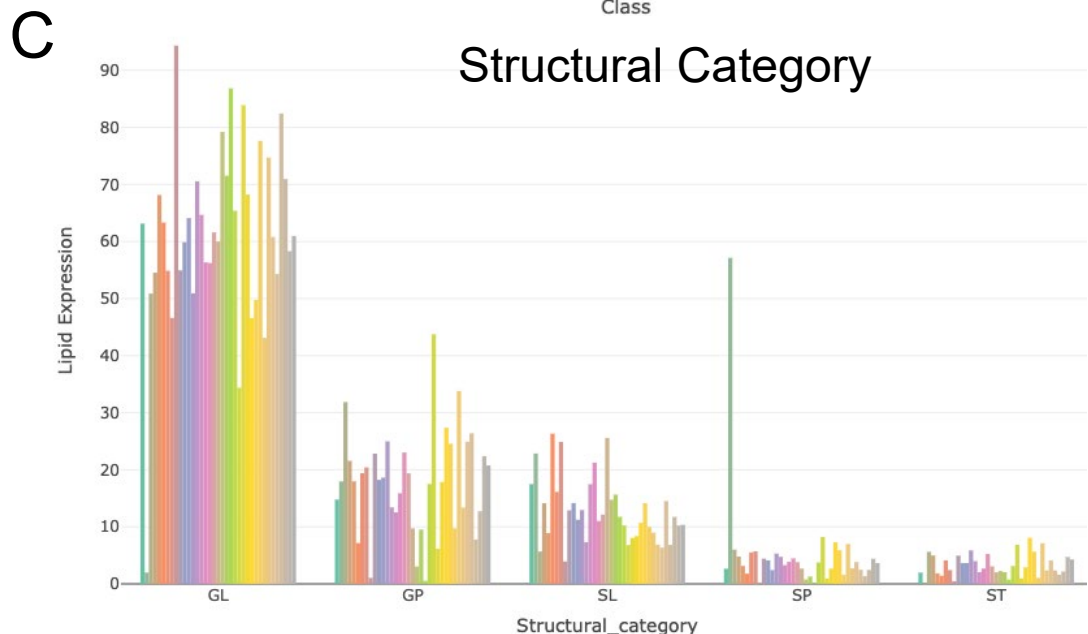
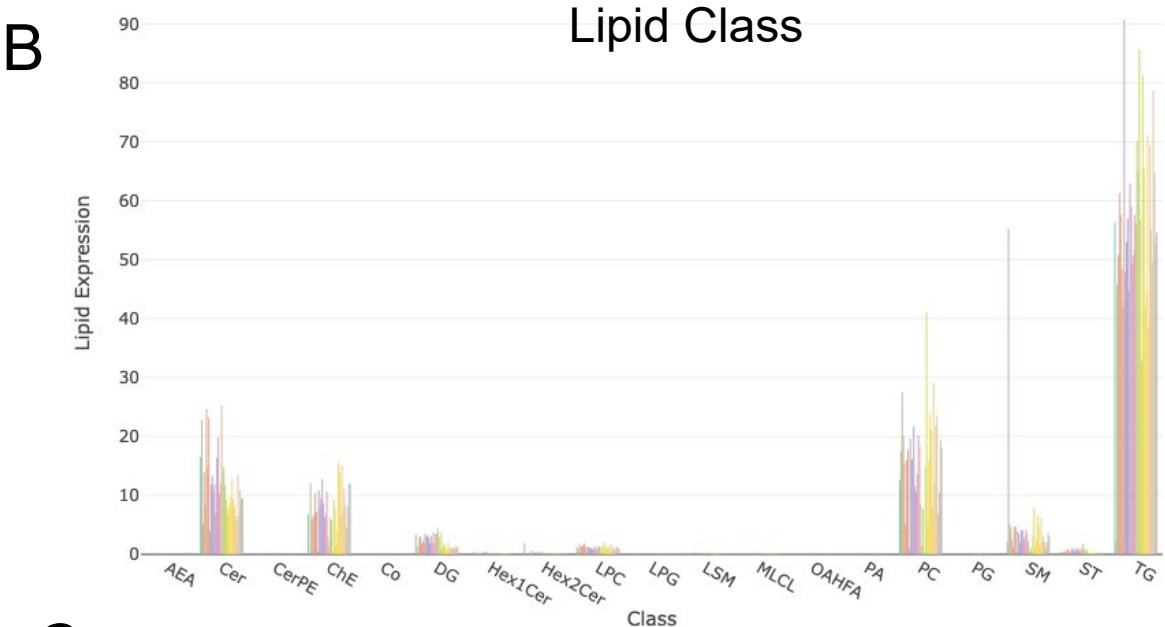
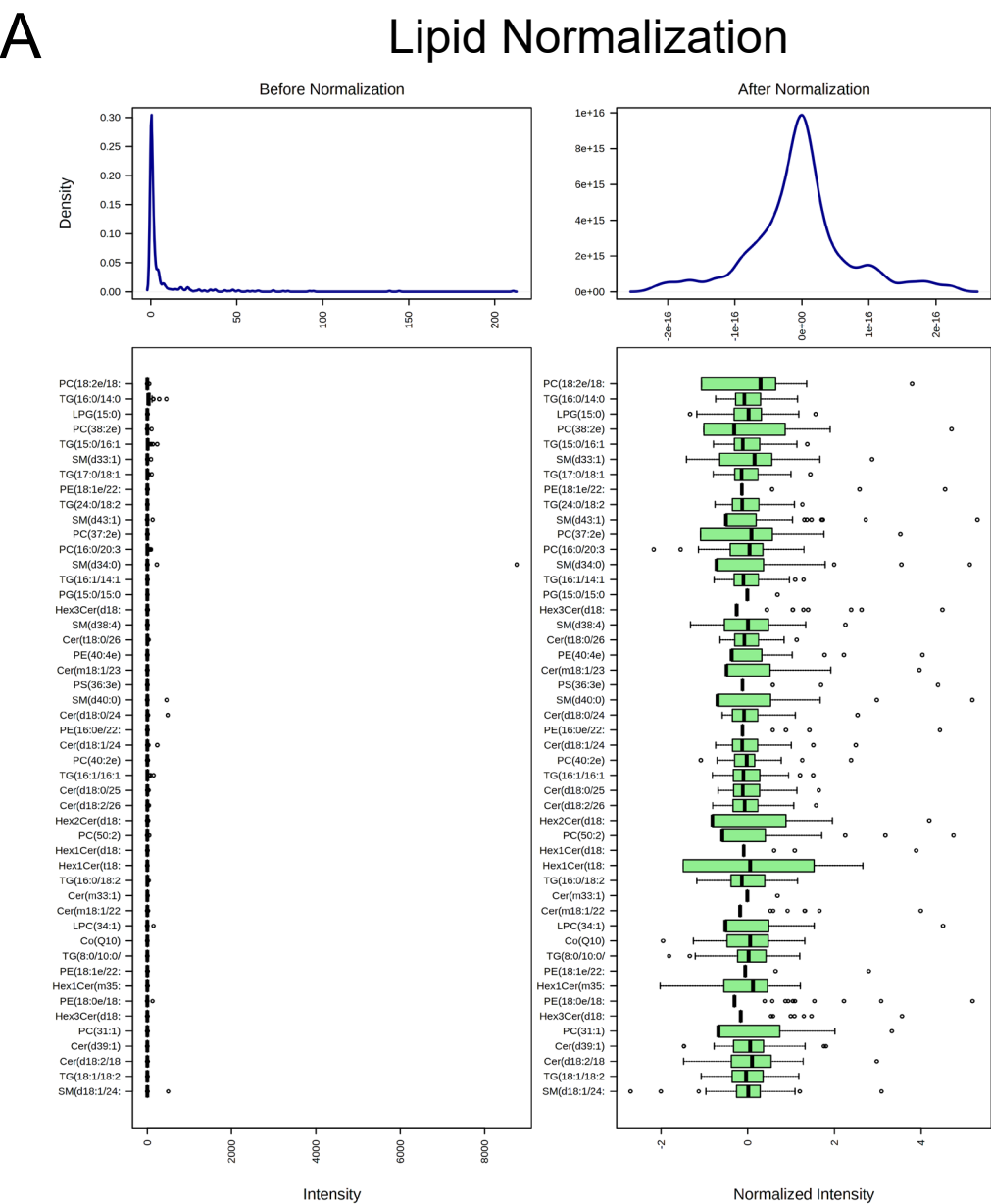


Figure S1 related to Fig.1. Lipid Normalization and Class/Category Profiling (A) Box plots and kernel density plots before and after normalization. The boxplots show at most 50 features. The density plots are based on all samples. Selected methods : Data transformation: Log10 Normalization; Data scaling: Mean Centering. (B) Distribution plot showing the lipid class expression across samples. Each color represents a different sample (n = 65). (C) Distribution plot showing the lipid structural category across samples. Each color represents a different sample (n = 65).

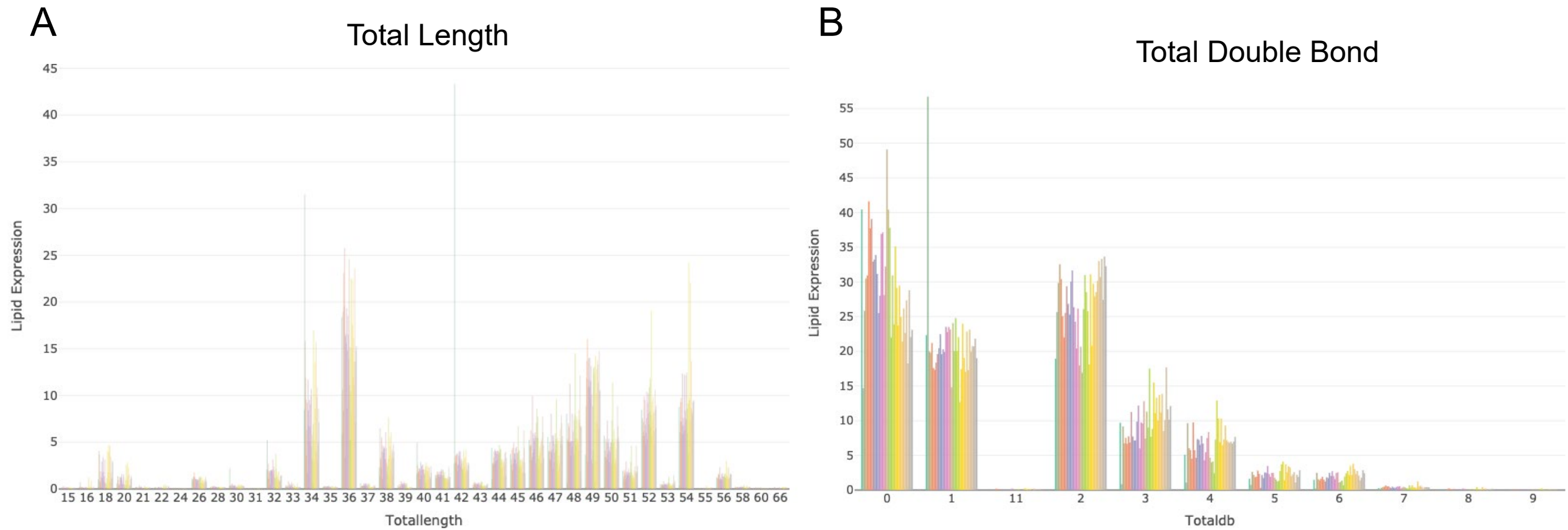


Figure S2. related to Fig. 1. Lipid Normalization and Class/Category Profiling (A) Distribution plot showing the total chain length expression across samples. Each color represents a different sample ($n = 65$). (B) Distribution plot showing the total double bond expression across samples. Each color represents a different sample ($n = 65$).

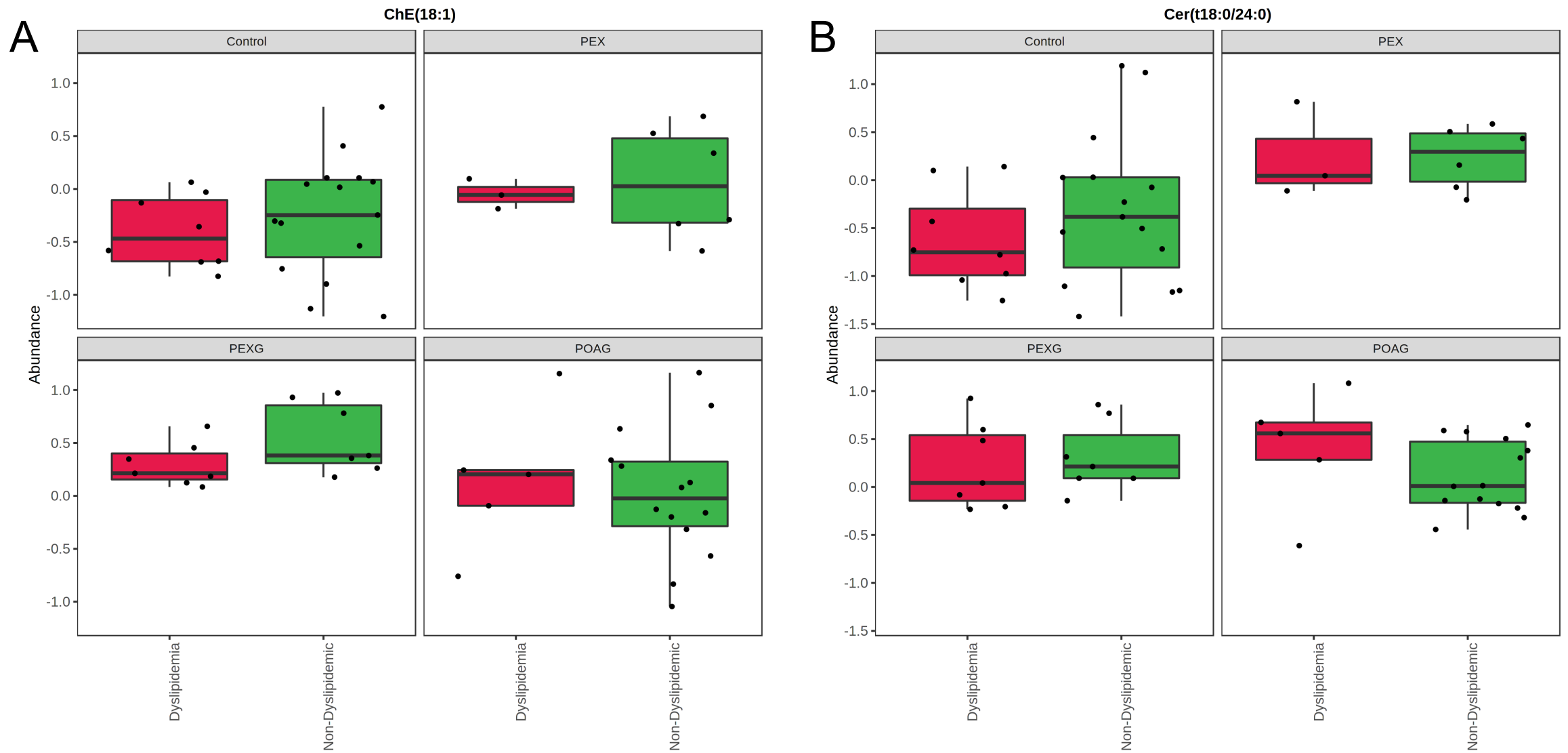


Figure S3. Cholesterol ester and ceramide lipid species difference between dyslipidemia and non-dyslipidemic patients (A) Composition of ChE(18:1) in the aqueous humor (AH) across disease groups between dyslipidemic and non-dyslipidemic patients. (B) Composition of Cer(t18:0/24:0) in the AH across disease groups between dyslipidemic and non-dyslipidemic patients.

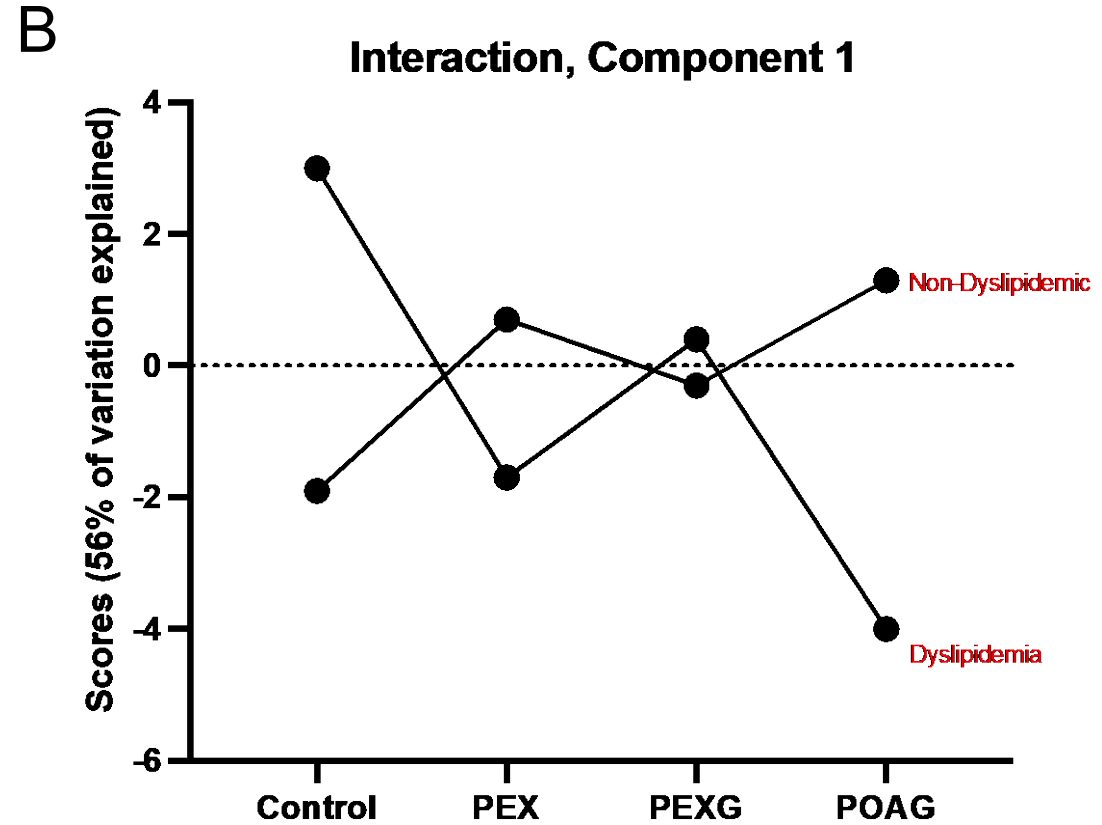
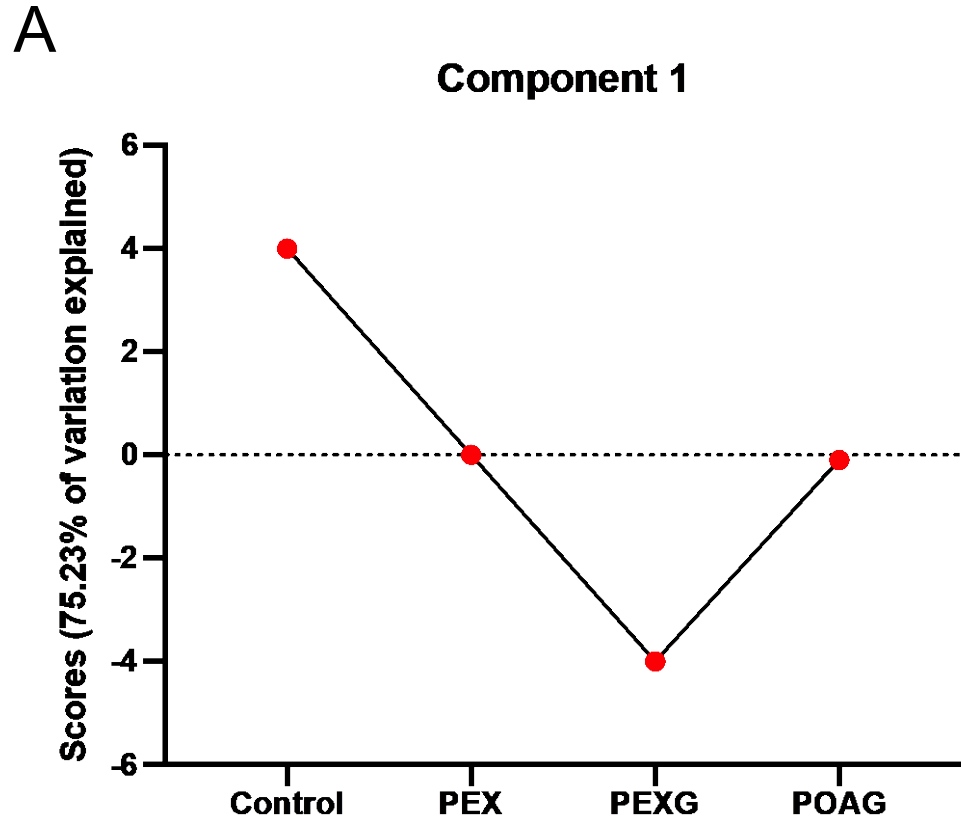
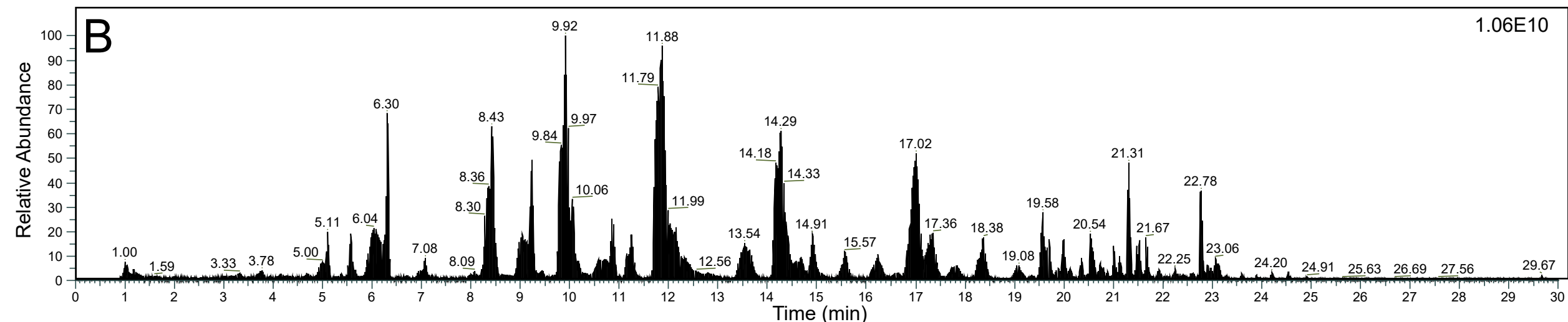
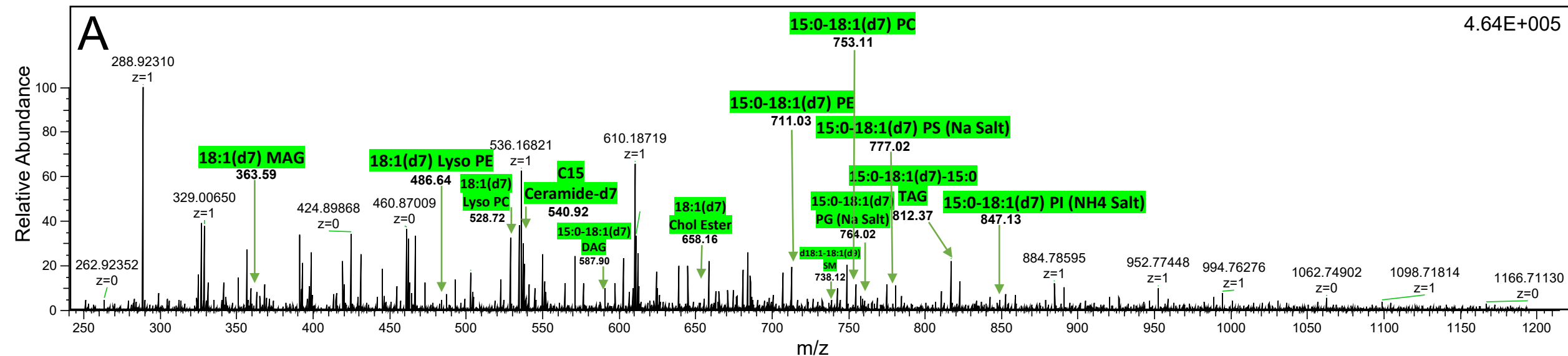
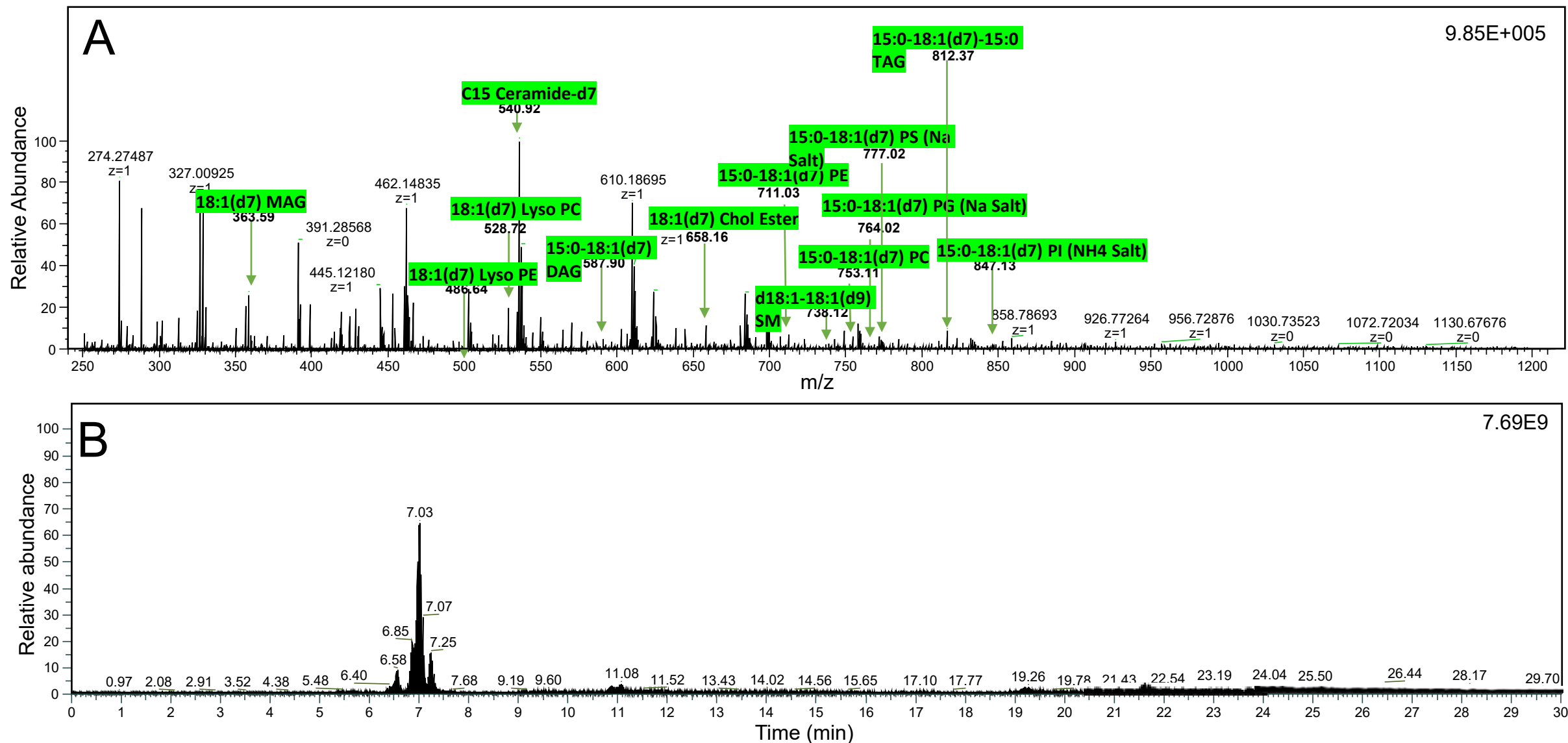


Figure S4. ANOVA-simultaneous component analysis (A) Major patterns associated with lipid composition across disease groups. (B) ANOVA-simultaneous component analysis resolving the interaction of disease groups and dyslipidemia on the aqueous humor lipidome.



Supplemental Figure S6. A. Representative mass spectrum of the human aqueous humor with EquiSPLASH™ LIPIDOMIX® Quantitative Mass Spec Internal Standard (330731) in the m/z range of 250-1200. The spectra was obtained with a spray voltage of 4.00 kV and a normalized collision energy (NCE) of 20, 30, and 40 on a Q-Exactive instrument (Thermo Fisher Scientific, Waltham, MA). The identified known lipid species in the standard are as indicated. The intensity of the spectra is as indicated on the right-hand corner. **B.** The chromatogram was run on a Vanquish Horizon UPLC using following gradient: The gradient was 0-10% solvent B for 0-2 minutes, 30% solvent B over 2-3.5 minutes, 50% solvent B over 3.5-7 minutes, 60% solvent B over 7-17 minutes, 70% solvent B over 17-18 minutes, 80% solvent B over 18-20 minutes, 95% solvent B over 20-22 minutes, 100% solvent B over 22-28.1 minutes, and 10% solvent B over 28.1-30 minutes.



Supplemental Figure S7. A. The mass spectrum of the EquiSPLASH™ LIPIDOMIX® Quantitative Mass Spec Internal Standard (330731) in the m/z range of 250-1200. The spectra was obtained with a spray voltage of 4.00 kV and a normalized collision energy (NCE) of 20, 30, and 40 on a Q-Exactive instrument (Thermo Fisher Scientific, Waltham, MA). The identified known lipid species in the standard are as indicated. The intensity of the spectra is as indicated on the right-hand corner. **B.** The chromatogram was run on a Vanquish Horizon UPLC using following gradient: The gradient was 0-10% solvent B for 0-2 minutes, 30% solvent B over 2-3.5 minutes, 50% solvent B over 3.5-7 minutes, 60% solvent B over 7-17 minutes, 70% solvent B over 17-18 minutes, 80% solvent B over 18-20 minutes, 95% solvent B over 20-22 minutes, 100% solvent B over 22-28.1 minutes, and 10% solvent B over 28.1-30 minutes.