

SUPPORTING INFORMATION

Lifelong exposure to PCBs in the remote Norwegian Arctic disrupts the plasma stress metabolome in Arctic charr

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METABOLITE LIBRARY

(2-aminoethyl)phosphonate, (2r,3r)-(-)-2,3-butanediol, (r)-malate, (r,r)-tartaric acid, (s)-1-phenylethanol, (s)-dihydroorotate, (s)-lactate, (s)-malate, (s)-nicotine, (s,s)-tartaric acid, 1-aminocyclopropane-1-carboxylate, 1-hydroxy-2-naphthoate, 1-methyl-6,7-dihydroxy-1,2,3,4-tetrahydroisoquinoline, 1-methyladenosine, 1-methylnicotinamide, 1-naphthylamine, 1-oleoyl-rac-glycerol, 1,2-didecanoyl-sn-glycero-3-phosphocholine, 1,2-dipalmitoyl-rac-glycero-3-phosphoethanolamine, 1,2-dipalmitoyl-sn-glycerol, 1,3-diaminopropane, 10-hydroxydecanoate, 2'-deoxyadenosine, 2'-deoxyadenosine 5'-diphosphate, 2'-deoxyadenosine 5'-triphosphate, 2'-deoxycytidine 5'-diphosphate, 2'-deoxycytidine 5'-monophosphate, 2'-deoxyguanosine, 2'-deoxyguanosine 5'-diphosphate, 2'-deoxyguanosine 5'-monophosphate, 2'-deoxyguanosine 5'-triphosphate, 2'-deoxyuridine 5'-mono-phosphate, 2'-deoxyuridine 5'-triphosphate, 2',4'-dihydroxyacetophenone, 2-acetamido-2-deoxy-beta-d-glucosylamine, 2-amino-2-methylpropanoate, 2-aminoethyl dihydrogen phosphate, 2-aminophenol, 2-deoxy-d-glucose, 2-hydroxy-4-(methylthio)butyric acid, 2-hydroxybutyric acid, 2-hydroxyphenylacetic acid, 2-hydroxypyridine, 2-methoxyethanol, 2-methylbutanal, 2-methylglutaric acid, 2-methylmaleate, 2-methylpropanal oxime, 2-methylpropanoate, 2-oxoadipate, 2-oxobutanoate, 2-quinolinecarboxylic acid, 2,3-dihydroxybenzoate, 2,3-diphospho-d-glyceric acid, 2,4-dihydroxypteridine, 2,4-dihydroxypyrimidine-5-carboxylic acid, 2,5-dihydroxybenzoate, 2,5-dimethylpyrazine, 2,6-dihydroxypyridine, 25-hydroxycholesterol, 3'-cmp, 3',5'-cyclic amp, 3-(2-hydroxyphenyl)propanoate, 3-(4-hydroxyphenyl)lactate, 3-(4-hydroxyphenyl)pyruvate, 3-alpha,11-beta,17-alpha,21-tetrahydroxy-5-alpha-pregnan-20-one, 3-amino-4-hydroxybenzoic acid, 3-amino-5-hydroxybenzoic acid, 3-aminoisobutanoate, 3-dehydroshikimate, 3-hydroxy-3-methylglutarate, 3-hydroxyanthranilate, 3-hydroxybenzaldehyde, 3-hydroxybenzoate, 3-hydroxybenzyl alcohol, 3-hydroxybutanoic acid, 3-hydroxykynurenine, 3-hydroxyphenylacetate, 3-methoxy-4-hydroxymandelate, 3-methoxy-l-tyrosine, 3-methoxytyramine, 3-methylglutaric acid, 3-methyl-2-oxindole, 3-methyl-2-oxovaleric acid, 3-methyladenine, 3-methylbutanal, 3-methylbutanol, 3-methylcrotonyl-coa, 3-methylhistamine, 3-nitro-l-tyrosine, 3-sulfinio-l-alanine, 3-ureidopropionate, 3,3',5'-triiodothyronine, 3,4-dihydroxy-l-phenylalanine, 3,4-dihydroxybenzoate, 3,4-dihydroxyphenyl glycol, 3,4-dihydroxyphenylacetate, 3,5-diiodo-l-thyronine, 3,5-diiodo-l-tyrosine, 3alpha-hydroxy-5beta-cholanate, 3alpha,12alpha-dihydroxy-5beta-cholanate, 4-acetamidobutanoate, 4-aminobenzoate, 4-aminobutanoate, 4-coumarate, 4-guanidinobutanoate, 4-hydroxy-2-quinolinecarboxylic acid, 4-hydroxy-3-methoxyphenylglycol, 4-hydroxy-l-phenylglycine, 4-hydroxy-l-proline, 4-hydroxybenzaldehyde, 4-hydroxybenzoate, 4-hydroxyphenylacetate, 4-imidazoleacetic acid, 4-methyl-2-oxo-pentanoic acid, 4-methyl-2-oxovaleric acid, 4-methylcatechol, 4-pyridoxate, 4-quinolinecarboxylic acid, 5'-deoxyadenosine, 5'-methylthioadenosine, 5-aminoimidazole-4-carboxamide-1-beta-d-ribofuranosyl 5'-monophosphate, 5-aminolevulinic acid, 5-aminopentanoate, 5-hydroxy-l-tryptophan, 5-hydroxyindoleacetate, 5-hydroxymethyluracil, 5-methylcytosine hydrochloride, 5-oxo-d-proline, 5-oxo-l-proline, 5-phospho-d-ribose 1-diphosphate, 5-valerolactone, 5,6-dihydrouracil, 6-carboxyhexanoate, 6-deoxy-l-galactose, 6-hydroxydopamine, 6-hydroxynicotinate, 6-phosphogluconic acid, acetaldehyde, acetoacetate, acetoin, acetyl phosphate, acetylcholine, adenine, adenosine, adenosine-5'-diphosphoglucose, adenosine 2',3'-cyclic monophosphate, adenosine 3',5'-cyclic monophosphate, adenosine 3',5'-diphosphate, adenosine 5'-diphosphate, adenosine 5'-diphosphoribose, adenosine 5'-monophosphate, adenosine 5'-triphosphate, adipic acid, agmatine sulfate, allantoin, allose, alpha-aminoacidipate, alpha-d-galactose 1-phosphate, alpha-d-glucose, alpha-d-glucose 1-phosphate, alpha-hydroxyisobutyric acid, alpha-ketoglutaric acid, alpha-tocopherol, amylose, aniline, aniline-2-sulfonic acid, anthranilate, arabinose, arachidic acid, ascorbate, azelaic acid, benzaldehyde, benzoate, benzyl alcohol, benzylamine, beta-alanine, beta-carotene, beta-nicotinamide adenine dinucleotide 2'-phosphate reduced, beta-nicotinamide adenine dinucleotide phosphate, betaine, bilirubin, biliverdin, biotin, bis(2-ethylhexyl)phthalate, bis(3-aminopropyl)amine, butanal, butanoate, cadaverine, caffeine, caprylic acid, carbamoyl phosphate, carbamoylphosphate, carnosine, catechol, chenodeoxycholate, cholate, cholesta-5,7-dien-3beta-ol, cholesteryl acetate, cholesteryl oleate, cholesteryl palmitate, choline, cis-4-hydroxy-d-proline, citramalate, citrate, citrulline, cmp, coenzyme a, corticosterone, cortisol, cortisol 21-acetate, cortisone, creatine, creatine phosphate, creatinine, cyclopentanone, cyst-gly, cysteamine, cytidine, cytidine 2',3'-cyclic mono-phosphate, cytidine 5'-diphosphate, cytidine 5'-diphosphocholine, cytidine 5'-triphosphate, cytochrome c, cytosine, d-(-)-3-phosphoglyceric acid, d-(-)-arabinose, d-(+)-cellobiose, d-(+)-galactosamine, d-(+)-galacturonic acid, d-(+)-glucosamine, d-(+)-raffinose, d-(+)-trehalose, d-alanine, d-aspartate, d-fructose, d-fructose 6-phosphate, d-galactose, d-gluconate, d-glucono-1,5-lactone, d-glucosamine 6-phosphate, d-glucosamine 6-sulfate, d-glucose-6-phosphate, d-glucose 6-phosphate, d-glucuronic acid, d-glucuronolactone, d-glyceric acid, d-gulonic acid gamma-lactone, d-lactose, d-lyxose, d-mannosamine, d-mannose 6-phosphate, d-orithine, d-pantothenic acid, d-psicose, d-ribose, d-ribose 5-phosphate, d-ribulose 1,5-bisphosphate, d-saccharic acid, d-sorbitol, d-tagatose, d-tryptophan, d-xylose, damp, decanoate, dehydro-l-(+)-ascorbic acid dimer, dehydroascorbate, deoxycarnitine, deoxycholate, deoxycorticosterone acetate, deoxycytidine, deoxyribose, deoxyuridine, desmosterol, dethiobiotin, diacetyl, diethanolamine, diethyl 2-methyl-3-oxosuccinate, dihydrofolate, dihydroxyacetone phosphate, dihydroxyfumaric acid, dihydroxymandelic acid, dimethyl sulfide, dimethylbenzimidazole, dl-5-hydroxylysine, dl-normetanephine, docosahexaenoic acid, dopamine, elaidic acid, epinephrine, erucic acid, erythritol, estradiol-17alpha, ethanolamine, ethanolamine phosphate, ethyl 3-indoleacetate, ethyl 3-ureidopropionate, ethylmalonic acid, farnesyl diphosphate, ferulate, flavin adenine dinucleotide, folic acid, formamide, formate, formyl-l-methionyl peptide, fructose 1,6-biphosphate, fumarate, galactarate, galactitol, gamma-linolenic acid, gamma,gamma-dimethylallyl pyrophosphate, geranyl pyrophosphate, geranyl pyrophosphate, geranylgeranyl pyrophosphate, gluconic acid, glucosaminide, glutarate, glutaric acid, glutathione, glyceraldehyde, glyceraldehyde 3-phosphate diethyl acetal, glycerate, glycerol, glycerol 2-phosphate, glyceryl trimyristate, glyceryl tripalmitate, glycine, glycocholate, glycolaldehyde dimer, glycolate, glyoxylic acid, guaiacol, guanidinoacetate, guanine, guanosine, guanosine 3',5'-cyclic monophosphate, guanosine 5'-diphosphate, guanosine 5'-diphospho-d-mannose, guanosine 5'-diphosphoglucose, guanosine 5'-monophosphate, guanosine 5'-triphosphate, heptadecanoate, heptanoic acid, hexadecanol, hexanoate, hippurate, histamine, homocysteine, homocystine, homogentisate, homoserine, homovanillate, hydroquinone, hydroxypyruvate, hypotaurine, hypoxanthine, indole, indole-3-acetaldehyde, indole-3-acetic acid, indole-3-acetate, indole-3-ethanol, indole-3-pyruvic acid, indoxyl sulfate, inosine, inosine 5'-diphosphate, inosine 5'-monophosphate, inosine 5'-phosphate, inosine 5'-triphosphate, isocitric acid, isopentenyl pyrophosphate, itaconate, kynurenine, l-2-phosphoglyceric acid, l-2,3-diaminopropionic acid, l-alanine, l-allothreonine, l-anserine, l-arabitol, l-arginine, l-asparagine, l-aspartate, l-carnitine, l-cystathionine, l-cysteic acid, l-cysteine, l-cystine, l-glutamic acid, l-glutamine, l-histidine, l-histidinol, l-homocysteine thiolactone, l-isoleucine, l-kynurenine, l-lysine, l-methionine, l-methionine sulfoximine, l-norvaline, l-ornithine, l-phenylalanine, l-pipecolic acid, l-proline, l-rhamnose, l-serine, l-sorbose, l-threonine, l-tryptophan, l-tryptophanamide, l-tyrosine, l-valine, lanosterol, lauric acid, lauroylcarnitine, leucine, leukotriene b4, linoleate, lipamide, ll-2,6-diaminoheptanedioate, lumichrome, maleamate, maleic acid, maleimide, malonate, maltose, mandelic acid, mannitol, mannose, melanin, melatonin, melibiose, menaquinone, mercaptopyruvate, meso-tartaric acid, mesoxalate, methyl acetoacetate, methyl beta-d-galactoside, methyl indole-3-acetate, methyl jasmonate,

methyl vanillate, methylguanidine, methylmalonate, mevalolactone, mono-ethyl malonate, mono-methyl glutarate, myo-inositol, myristic acid, n-?-methyltryptamine, n-acetyl-d-galactosamine, n-acetyl-d-glucosamine, n-acetyl-d-mannosamine, n-acetyl-d-tryptophan, n-acetyl-dl-glutamic acid, n-acetyl-dl-methionine, n-acetyl-dl-serine, n-acetyl-l-alanine, n-acetyl-l-aspartic acid, n-acetyl-l-cysteine, n-acetyl-l-leucine, n-acetyl-l-phenylalanine, n-acetyl-glycine, n-acetylneuraminate, n-acetylputrescine, n-acetylserotonin, n-alpha-acetyl-l-asparagine, n-amidino-l-aspartate, n-formylglycine, n-methyl-d-aspartic acid, n-methyl-l-glutamate, n(pai)-methyl-l-histidine, n,n-dimethyl-1,4-phenylenediamine, n1-acetylspermine, n6-(delta2-isopentenyl)-adenine, nad, nalpha-acetyl-l-lysine, nepsilon,nepsilon,nepsilon-trimethyllysine, nervonic acid, nicotinamide, nicotinamide hypoxanthine dinucleotide, nicotinamide mononucleotide, nicotinate, nicotinic acid adenine dinucleotide phosphate, nonanoate, noradrenaline, norleucine, o-acetyl-l-carnitine, o-acetyl-l-serine, o-phospho-dl-serine, o-phospho-l-serine, o-succinyl-l-homoserine, octopamine, oleate, omega-hydroxydodecanoic acid, ophthalmic acid, orotate, orotic acid, oxalic acid, oxaloacetate, oxalomalic acid, palatinose, palmitate, palmitoleic acid, pantolactone, paraxanthine, pentanoate, petroselinic acid, phenethylamine, phenol, phenyl acetate, phenylacetaldehyde, phenylacetic acid, phenylethanalamine, phenylpyruvate, phospho(enol)pyruvic acid, phosphocholine, phosphocreatine, phosphonoacetate, phyloquinone, phytic acid, picolinic acid, pipelolate, prenol, propanal, propanoate, propenoate, propionate, propynoate, protoporphyrin, pterin, purine, putrescine, pyrazole, pyridine-2,3-dicarboxylate, pyridoxal, pyridoxal 5'-phosphate, pyridoxamine, pyridoxine, pyrimidine, pyrrole-2-carboxylate, pyruvate, pyruvic aldehyde, quinate, quinoline, rac-glycerol 1-myristate, reichstein's substance s, resorcinol monoacetate, retinoate, retinol, retinyl palmitate, ribitol, riboflavin, rosmarinic acid, s-(5'-adenosyl)-l-homocysteine, s-(5'-adenosyl)-l-methionine, s-carboxymethyl-l-cysteine, s-hexyl-glutathione, salicylamide, salicylate, sarcosine, selenocystamine, selenomethionine, serotonin, serotonin creatinine sulfate complex, shikimate, sn-glycero-3-phosphocholine, sn-glycerol 3-phosphate, sorbate, spermidine, spermine, sphinganine, sphingomyelin, squalene, stachyose, stearate, suberic acid, succinate, succinate semialdehyde, sucrose, taurine, tauro lithocholate, tetrahydrofolate, theobromine, theophylline, thiamine, thiamine monophosphate, thiamine pyrophosphate, thioacetate, thiopurine s-methylether, thiourea, thymidine, thymidine-5'-diphospho-alpha-d-glucose, thymidine 5'-monophosphate, thymine, thyrotropin releasing hormone, thyroxine, trans-4-hydroxyproline, trans-aconitate, trans-cinnamaldehyde, trans-cinnamate, trans-cyclohexane-1,2-diol, tricosanoic acid, trigonelline, trimethylamine, tryptamine, tyramine, uracil, urate, uridine, uridine-5-monophosphate, uridine 5'-diphosphate, uridine 5'-diphospho-n-acetylglucosamine, uridine 5'-diphospho-n-acetylglucosamine, uridine 5'-diphosphogalactose, uridine 5'-diphosphoglucose, uridine 5'-diphosphoglucuronic acid, uridine 5'-triphosphate, urocanate, vitamin b12, vitamin d2, xanthine, xanthosine, xanthosine 5'-monophosphate, xanthurenic acid, xylitol

Table S1. Log₂ fold-changes in plasma metabolites in Lake Ellasjøen in reference to Lake Laksvatn

KEGGid	compound	log ₂ (fold change)
C00026	2-Oxoglutarate	-5.3317
C00366	Urate	-3.1849
C06429	Docosahexaenoic acid	-2.9747
C02774	10-Hydroxydecanoic acid	-1.4265
C01042	N-Acetyl-L-aspartate	-1.4006
C00072	Ascorbate	-1.382
C08261	Azelaic acid	-1.2536
C01152	N(pi)-Methyl-L-histidine	-1.1943
C01012	(R)-Pantolactone	-1.1305
C00233	4-Methyl-2-oxopentanoate	-1.0945
C00519	Hypotaurine	-1.038
C00164	Acetoacetate	-0.97911
C00245	Taurine	-0.97267
C00022	Pyruvate	-0.95826
C00232	Succinate semialdehyde	-0.95325
C00109	2-Oxobutanoate	-0.95325
C00489	Glutarate	-0.91123
C00741	Diacetyl	-0.89002
C00099	beta-Alanine	-0.8879
C00041	L-Alanine	-0.8879
C00133	D-Alanine	-0.8879
C00186	(S)-Lactate	-0.87499
C00259	L-Arabinose	-0.874
C00247	L-Sorbose	-0.86161
C01487	D-Allose	-0.86161
C00267	alpha-D-Glucose	-0.86161
C00137	myo-Inositol	-0.86161
C00159	D-Mannose	-0.86161
C07480	Theobromine	-0.86161
C00476	D-Lyxose	-0.85521
C00216	D-Arabinose	-0.85521
C00121	D-Ribose	-0.85521
C00181	D-Xylose	-0.85521
C00212	Adenosine	-0.84968
C00330	Deoxyguanosine	-0.84968
C02154	Glyceraldehyde	-0.84933
C06468	D-Psicose	-0.84538

C00795	D-Tagatose	-0.84538
C00124	D-Galactose	-0.84538
C00095	D-Fructose	-0.84538
C13747	1,7-Dimethylxanthine	-0.84538
C00300	Creatine	-0.84042
C00785	Urocanate	-0.83151
C03465	3-Methyl-2-oxopentanoate	-0.82258
C07130	Theophylline	-0.8218
C00526	Deoxyuridine	-0.77502
C00295	Orotate	-0.75146
C08278	Suberic acid	-0.74225
C04083	N6-(Delta2-Isopentenyl)-adenine	-0.70695
C02571	O-Acetylcarnitine	-0.70695
C06104	Adipate	-0.6072
C01879	Pidolic acid	-0.5673
C00047	L-Lysine	-0.55996
C00064	L-Glutamine	-0.55508
C00385	Xanthine	-0.47161
C00213	Sarcosine	-0.41929
C00407	L-Isoleucine	-0.40708
C01933	L-Norleucine	-0.40708
C00123	L-Leucine	-0.40708
C00073	L-Methionine	-0.38451
C00979	O-Acetyl-L-serine	-0.3684
C00025	L-Glutamate	-0.3684
C12269	N-Methyl-D-aspartic acid	-0.3684
C00262	Hypoxanthine	-0.34773
C01040	L-Gulono-1,4-lactone	-0.34075
C00257	D-Gluconic acid	-0.34075
C05422	Dehydroascorbate	-0.31004
C02226	2-Methylmaleate	-0.30031
C00525	D-Tryptophan	-0.29502
C00078	L-Tryptophan	-0.29502
C00387	Guanosine	-0.25434
C00515	D-Ornithine	-0.24806
C00077	L-Ornithine	-0.24806
C06422	beta-Cellobiose	-0.20664
C00089	Sucrose	-0.20664
C01971	beta-Maltose	-0.20664
C01970	beta-Lactose	-0.20664
C01083	alpha,alpha-Trehalose	-0.20664
C01826	L-Norvaline	-0.19674
C00183	L-Valine	-0.19674
C00719	Betaine	-0.19674
C00431	5-Aminopentanoate	-0.19674
C00633	4-Hydroxybenzaldehyde	-0.17549
C03067	3-Hydroxybenzaldehyde	-0.17549
C01551	Allantoin	-0.17484
C00062	L-Arginine	-0.16721
C00079	L-Phenylalanine	-0.15496
C00546	Methylglyoxal	-0.10711
C02656	Pimelate	-0.092299
C00049	L-Aspartate	-0.03592
C00490	Itaconate	-0.01413
C00188	L-Threonine	0.058962
C00263	L-Homoserine	0.058962
C05519	L-Allothreonine	0.058962
C00065	L-Serine	0.1087
C00106	Uracil	0.12945
C00037	Glycine	0.13961
C02642	3-Ureidopropionate	0.16245
C02710	N-Acetyl-L-leucine	0.19182
C05984	2-Hydroxybutanoic acid	0.30174
C01089	(R)-3-Hydroxybutanoate	0.30174
C00242	Guanine	0.32015
C02946	4-Acetamidobutanoate	0.32184
C01586	Hippurate	0.3432
C00156	4-Hydroxybenzoate	0.35363
C01384	Maleic acid	0.36391
C00122	Fumarate	0.36391

C02170	Methylmalonate	0.54063
C00042	Succinate	0.54063
C00163	Propanoate	0.56943
C00299	Uridine	0.60185
C00093	sn-Glycerol 3-phosphate	0.63278
C02979	Glycerol 2-phosphate	0.63278
C03137	N-Acetyl-D-tryptophan	0.65488
C00135	L-Histidine	0.66423
C00322	2-Oxoadipate	0.70846
C00493	Shikimate	0.73094
C00327	L-Citrulline	0.75665
C00864	Pantothenate	0.76025
C00294	Inosine	0.76355
C00557	Cyclopentanone	0.7776
C03690	Bis(2-ethylhexyl)phthalate	0.78585
C05582	Homovanillate	0.79054
C00152	L-Asparagine	0.79524
C01494	Ferulate	0.91295
C04067	Diethyl 2-methyl-3-oxosuccinate	1.0509
C00777	Retinoate	1.1178
C02240	5-Valerolactone	1.1831
C02165	Leukotriene B4	1.2531
C01157	Hydroxyproline	1.3746
C03440	cis-4-Hydroxy-D-proline	1.3746
C00430	5-Aminolevulinat	1.3746
C01585	Hexanoic acid	1.6379
C00146	Phenol	1.6388
C01198	3-(2-Hydroxyphenyl)propanoate	1.7894
C11512	Methyl jasmonate	1.8121
C12064	Resorcinol monoacetate	2.0382
C01983	(R)-Mandelate	2.0382
C05593	3-Hydroxyphenylacetate	2.0382
C05852	2-Hydroxyphenylacetate	2.0382
C00642	4-Hydroxyphenylacetate	2.0382
C07086	Phenylacetic acid	2.1526
C00548	Phenyl acetate	2.1526
C00544	Homogentisate	2.4634
C00811	4-Coumarate	2.4706
C00166	Phenylpyruvate	2.4706
C00253	Nicotinate	2.4989
C10164	Picolinic acid	2.4989
C00556	Benzyl alcohol	2.6974
C00090	Catechol	2.7892
C00530	Hydroquinone	2.7892
C03351	3-Hydroxybenzyl alcohol	3.0193
C01502	o-Methoxyphenol	3.0193
C06730	4-Methylcatechol	3.0193
C00511	Acrylic acid	3.2961
C00255	Riboflavin	3.3346
C05594	3-Methoxy-4-hydroxyphenylethyleneglycol	3.6777
C01762	Xanthosine	3.8002
C00019	S-Adenosyl-L-methionine	4.0707
C06325	2-Quinolincarboxylic acid	4.7859
C11348	(S)-1-Phenylethanol	5.1441
C02376	5-Methylcytosine	5.4239
D01225	Cocarboxylase (JAN/INN)	6.1595
C00055	CMP	6.328
C00954	Indole-3-acetate	6.669

Table S2. Log₂ fold-changes in plasma metabolites post-stressor

KEGGid	compound	log ₂ (fold change)
C00019	S-Adenosyl-L-methionine	-1.4707
C00255	Riboflavin	-1.1377
C03351	3-Hydroxybenzyl alcohol	-1.1232
C01502	o-Methoxyphenol	-1.1232
C06730	4-Methylcatechol	-1.1232
C00387	Guanosine	-1.0448
C02165	Leukotriene B4	-1.0245
C00557	Cyclopentanone	-0.92961
C00954	Indole-3-acetate	-0.92188
C11348	(S)-1-Phenylethanol	-0.90026
C00047	L-Lysine	-0.89345
C00212	Adenosine	-0.87417
C00330	Deoxyguanosine	-0.87417
C00493	Shikimate	-0.84372
C00544	Homogentisate	-0.82129
C00146	Phenol	-0.8187
C00090	Catechol	-0.71321
C00530	Hydroquinone	-0.71321
C00811	4-Coumarate	-0.70993
C00166	Phenylpyruvate	-0.70993
C00777	Retinoate	-0.62362
C01198	3-(2-Hydroxyphenyl)propanoate	-0.60941
C06104	Adipate	-0.59578
C07086	Phenylacetic acid	-0.587
C00548	Phenyl acetate	-0.587
C03690	Bis(2-ethylhexyl)phthalate	-0.5562
C04067	Diethyl 2-methyl-3-oxosuccinate	-0.53857
C05594	3-Methoxy-4-hydroxyphenylethyleneglycol	-0.51732
C11512	Methyl jasmonate	-0.46885
C00062	L-Arginine	-0.42175
C00049	L-Aspartate	-0.41978
C12064	Resorcinol monoacetate	-0.41204
C01983	(R)-Mandelate	-0.41204
C05593	3-Hydroxyphenylacetate	-0.41204
C05852	2-Hydroxyphenylacetate	-0.41204
C00642	4-Hydroxyphenylacetate	-0.41204
C01042	N-Acetyl-L-aspartate	-0.39861
C02946	4-Acetamidobutanoate	-0.38606
C00633	4-Hydroxybenzaldehyde	-0.38526
C03067	3-Hydroxybenzaldehyde	-0.38526
C00073	L-Methionine	-0.38024
C02656	Pimelate	-0.37492
C00079	L-Phenylalanine	-0.36798
D01225	Cocarcboxylase (JAN/INN)	-0.36741
C00156	4-Hydroxybenzoate	-0.36499
C01879	Pidolic acid	-0.35997
C01826	L-Norvaline	-0.35718
C00183	L-Valine	-0.35718
C00719	Betaine	-0.35718
C00431	5-Aminopentanoate	-0.35718
C00242	Guanine	-0.34433
C05582	Homovanillate	-0.34294
C00295	Orotate	-0.33457
C00322	2-Oxoadipate	-0.32552
C00515	D-Ornithine	-0.31989
C00077	L-Ornithine	-0.31989
C00511	Acrylic acid	-0.31205
C00188	L-Threonine	-0.30465
C00263	L-Homoserine	-0.30465
C05519	L-Allothreonine	-0.30465
C00135	L-Histidine	-0.29602
C01157	Hydroxyproline	-0.28292
C03440	cis-4-Hydroxy-D-proline	-0.28292
C00430	5-Aminolevulinate	-0.28292
C00037	Glycine	-0.28051
C00407	L-Isoleucine	-0.26663

C01933	L-Norleucine	-0.26663
C00123	L-Leucine	-0.26663
C02240	5-Valerolactone	-0.26653
C00065	L-Serine	-0.26283
C00327	L-Citrulline	-0.25784
C00093	sn-Glycerol 3-phosphate	-0.24536
C02979	Glycerol 2-phosphate	-0.24536
C00490	Itaconate	-0.23146
C05422	Dehydroascorbate	-0.21722
C00064	L-Glutamine	-0.18855
C02226	2-Methylmaleate	-0.18256
C00152	L-Asparagine	-0.13667
C02376	5-Methylcytosine	-0.13607
C01494	Ferulate	-0.12979
C00245	Taurine	-0.1213
C05984	2-Hydroxybutanoic acid	-0.12062
C01089	(R)-3-Hydroxybutanoate	-0.12062
C00072	Ascorbate	-0.076744
C02642	3-Ureidopropionate	-0.07424
C08278	Suberic acid	-0.061963
C00556	Benzyl alcohol	-0.059092
C01551	Allantoin	-0.058347
C00055	CMP	-0.057372
C06429	Docosahexaenoic acid	-0.027361
C06325	2-Quinolincarboxylic acid	-0.026675
C00163	Propanoate	0.01426
C03465	3-Methyl-2-oxopentanoate	0.027611
C02710	N-Acetyl-L-leucine	0.027651
C02774	10-Hydroxydecanoic acid	0.065469
C00299	Uridine	0.070977
C00546	Methylglyoxal	0.071766
C01585	Hexanoic acid	0.11203
C00979	O-Acetyl-L-serine	0.11421
C00025	L-Glutamate	0.11421
C12269	N-Methyl-D-aspartic acid	0.11421
C00026	2-Oxoglutarate	0.11923
C01012	(R)-Pantolactone	0.19443
C00526	Deoxyuridine	0.19601
C08261	Azelaic acid	0.21073
C00525	D-Tryptophan	0.21285
C00078	L-Tryptophan	0.21285
C00233	4-Methyl-2-oxopentanoate	0.23829
C00253	Nicotinate	0.23971
C10164	Picolinic acid	0.23971
C00247	L-Sorbose	0.26083
C01487	D-Allose	0.26083
C00267	alpha-D-Glucose	0.26083
C00137	myo-Inositol	0.26083
C00159	D-Mannose	0.26083
C07480	Theobromine	0.26083
C06468	D-Psicose	0.26961
C00795	D-Tagatose	0.26961
C00124	D-Galactose	0.26961
C00095	D-Fructose	0.26961
C13747	1,7-Dimethylxanthine	0.26961
C07130	Theophylline	0.28157
C00164	Acetoacetate	0.30225
C00489	Glutarate	0.31948
C00022	Pyruvate	0.31995
C00259	L-Arabinose	0.32598
C00186	(S)-Lactate	0.32912
C00232	Succinate semialdehyde	0.33479
C00109	2-Oxobutanoate	0.33479
C00476	D-Lyxose	0.33493
C00216	D-Arabinose	0.33493
C00121	D-Ribose	0.33493
C00181	D-Xylose	0.33493
C00864	Pantothenate	0.33676
C00741	Diacetyl	0.35682
C02170	Methylmalonate	0.40671

C00042	Succinate	0.40671
C01152	N(pi)-Methyl-L-histidine	0.40854
C00519	Hypotaurine	0.50906
C00106	Uracil	0.54132
C01384	Maleic acid	0.58078
C00122	Fumarate	0.58078
C00294	Inosine	0.58283
C00785	Urocanate	0.67141
C00213	Sarcosine	0.69126
C00300	Creatine	0.77725
C03137	N-Acetyl-D-tryptophan	0.78737
C00385	Xanthine	0.8575
C00099	beta-Alanine	0.86478
C00041	L-Alanine	0.86478
C00133	D-Alanine	0.86478
C04083	N6-(Delta2-Isopentenyl)-adenine	1.1952
C02571	O-Acetylcarnitine	1.1952
C02154	Glyceraldehyde	1.2017
C06422	beta-Cellobiose	1.2341
C00089	Sucrose	1.2341
C01971	beta-Maltose	1.2341
C01970	beta-Lactose	1.2341
C01083	alpha,alpha-Trehalose	1.2341
C01040	L-Gulono-1,4-lactone	1.3466
C00257	D-Gluconic acid	1.3466
C00262	Hypoxanthine	1.5607
C01762	Xanthosine	2.0049
C01586	Hippurate	2.5472
C00366	Urate	3.2099

Table S3. Log₂ fold-changes in plasma metabolites in Lake Ellasjøen post-stressor in reference to Lake Laksvatn post-stressor.

KEGGid	compound	log ₂ (foldchange)
C00026	2-Oxoglutarate	-5.9569
C00072	Ascorbate	-2.7902
C06429	Docosahexaenoic acid	-2.4515
C01042	N-Acetyl-L-aspartate	-1.3086
C00519	Hypotaurine	-1.226
C00212	Adenosine	-1.1121
C00330	Deoxyguanosine	-1.1121
C01012	(R)-Pantolactone	-1.1097
C02774	10-Hydroxydecanoic acid	-1.0579
C00233	4-Methyl-2-oxopentanoate	-1.0388
C01152	N(pi)-Methyl-L-histidine	-1.0192
C08261	Azelaic acid	-1.0025
C00245	Taurine	-0.94945
C00164	Acetoacetate	-0.88135
C00022	Pyruvate	-0.87062
C02642	3-Ureidopropionate	-0.85611
C00232	Succinate semialdehyde	-0.84184
C00109	2-Oxobutanoate	-0.84184
C02154	Glyceraldehyde	-0.82594
C00741	Diacetyl	-0.81755
C00489	Glutarate	-0.81569
C00247	L-Sorbose	-0.80864
C01487	D-Allose	-0.80864
C00267	alpha-D-Glucose	-0.80864
C00137	myo-Inositol	-0.80864
C00159	D-Mannose	-0.80864
C07480	Theobromine	-0.80864
C03465	3-Methyl-2-oxopentanoate	-0.80443
C00259	L-Arabinose	-0.79456
C06468	D-Psicose	-0.78587
C00795	D-Tagatose	-0.78587
C00124	D-Galactose	-0.78587
C00095	D-Fructose	-0.78587

C13747	1,7-Dimethylxanthine	-0.78587
C00186	(S)-Lactate	-0.78564
C00476	D-Lyxose	-0.77513
C00216	D-Arabinose	-0.77513
C00121	D-Ribose	-0.77513
C00181	D-Xylose	-0.77513
C00526	Deoxyuridine	-0.77089
C00262	Hypoxanthine	-0.76637
C07130	Theophylline	-0.75432
C00785	Urocanate	-0.72416
C00099	beta-Alanine	-0.71369
C00041	L-Alanine	-0.71369
C00133	D-Alanine	-0.71369
C00300	Creatine	-0.71006
C04083	N6-(Delta2-Isopentenyl)-adenine	-0.70724
C02571	O-Acetylcarnitine	-0.70724
C06104	Adipate	-0.66595
C01040	L-Gulono-1,4-lactone	-0.6467
C00257	D-Gluconic acid	-0.6467
C00385	Xanthine	-0.62074
C01586	Hippurate	-0.60647
C00064	L-Glutamine	-0.54961
C00047	L-Lysine	-0.53752
C00295	Orotate	-0.53378
C01879	Pidolic acid	-0.51898
C00213	Sarcosine	-0.46116
C08278	Suberic acid	-0.44726
C00407	L-Isoleucine	-0.37365
C01933	L-Norleucine	-0.37365
C00123	L-Leucine	-0.37365
C00073	L-Methionine	-0.34055
C00979	O-Acetyl-L-serine	-0.32579
C00025	L-Glutamate	-0.32579
C12269	N-Methyl-D-aspartic acid	-0.32579
C00633	4-Hydroxybenzaldehyde	-0.28514
C03067	3-Hydroxybenzaldehyde	-0.28514
C00515	D-Ornithine	-0.28514
C00077	L-Ornithine	-0.28514
C00546	Methylglyoxal	-0.26172
C00062	L-Arginine	-0.24965
C01826	L-Norvaline	-0.19896
C00183	L-Valine	-0.19896
C00719	Betaine	-0.19896
C00431	5-Aminopentanoate	-0.19896
C05422	Dehydroascorbate	-0.17423
C01551	Allantoin	-0.16512
C00106	Uracil	-0.1597
C02226	2-Methylmaleate	-0.15406
C02656	Pimelate	-0.13842
C00049	L-Aspartate	-0.1254
C06422	beta-Cellobiose	-0.05489
C00089	Sucrose	-0.05489
C01971	beta-Maltose	-0.05489
C01970	beta-Lactose	-0.05489
C01083	alpha,alpha-Trehalose	-0.05489
C00079	L-Phenylalanine	-0.046989
C00525	D-Tryptophan	0.076015
C00078	L-Tryptophan	0.076015
C00366	Urate	0.077791
C00188	L-Threonine	0.091964
C00263	L-Homoserine	0.091964
C05519	L-Allothreonine	0.091964
C05582	Homovanillate	0.098456
C02170	Methylmalonate	0.10227
C00042	Succinate	0.10227
C00387	Guanosine	0.12603
C00065	L-Serine	0.15245
C00490	Itaconate	0.16062
C01384	Maleic acid	0.16358
C00122	Fumarate	0.16358

C01494	Ferulate	0.19473
C00493	Shikimate	0.21184
C02710	N-Acetyl-L-leucine	0.22784
C00156	4-Hydroxybenzoate	0.24757
C00093	sn-Glycerol 3-phosphate	0.29505
C02979	Glycerol 2-phosphate	0.29505
C00037	Glycine	0.31068
C00242	Guanine	0.36791
C00135	L-Histidine	0.41492
C05984	2-Hydroxybutanoic acid	0.45171
C01089	(R)-3-Hydroxybutanoate	0.45171
C00557	Cyclopentanone	0.5208
C03690	Bis(2-ethylhexyl)phthalate	0.54611
C02946	4-Acetamidobutanoate	0.55995
C02240	5-Valerolactone	0.63354
C00294	Inosine	0.63941
C00777	Retinoate	0.67153
C00163	Propanoate	0.71077
C00327	L-Citrulline	0.7183
C00299	Uridine	0.73545
C00322	2-Oxadipate	0.75805
C02165	Leukotriene B4	0.86129
C00864	Pantothenate	0.87834
C04067	Diethyl 2-methyl-3-oxosuccinate	0.92251
C00152	L-Asparagine	0.97114
C03137	N-Acetyl-D-tryptophan	1.0191
C00146	Phenol	1.2254
C01198	3-(2-Hydroxyphenyl)propanoate	1.4617
C01157	Hydroxyproline	1.5392
C03440	cis-4-Hydroxy-D-proline	1.5392
C00430	5-Aminolevulinate	1.5392
C01585	Hexanoic acid	1.7623
C07086	Phenylacetic acid	1.8559
C00548	Phenyl acetate	1.8559
C00253	Nicotinate	1.8689
C10164	Picolinic acid	1.8689
C12064	Resorcinol monoacetate	1.8742
C01983	(R)-Mandelate	1.8742
C05593	3-Hydroxyphenylacetate	1.8742
C05852	2-Hydroxyphenylacetate	1.8742
C00642	4-Hydroxyphenylacetate	1.8742
C11512	Methyl jasmonate	1.9145
C00544	Homogentisate	2.034
C00811	4-Coumarate	2.3197
C00166	Phenylpyruvate	2.3197
C00090	Catechol	2.4309
C00530	Hydroquinone	2.4309
C00556	Benzyl alcohol	2.497
C00511	Acrylic acid	2.7579
C03351	3-Hydroxybenzyl alcohol	2.9336
C01502	o-Methoxyphenol	2.9336
C06730	4-Methylcatechol	2.9336
C00255	Riboflavin	3.0524
C05594	3-Methoxy-4-hydroxyphenylethyleneglycol	3.3299
D01225	Coccarboxylase (JAN/INN)	4.2203
C01762	Xanthosine	4.3284
C06325	2-Quinolincarboxylic acid	4.8023
C11348	(S)-1-Phenylethanol	4.8562
C00019	S-Adenosyl-L-methionine	5.1336
C02376	5-Methylcytosine	5.4254
C00055	CMP	5.6661
C00954	Indole-3-acetate	7.4226