

## Supporting Information

### Profiling of polar metabolites in mouse feces using four analytical platforms to study the effects of cathelicidin-related antimicrobial peptide in alcoholic liver disease

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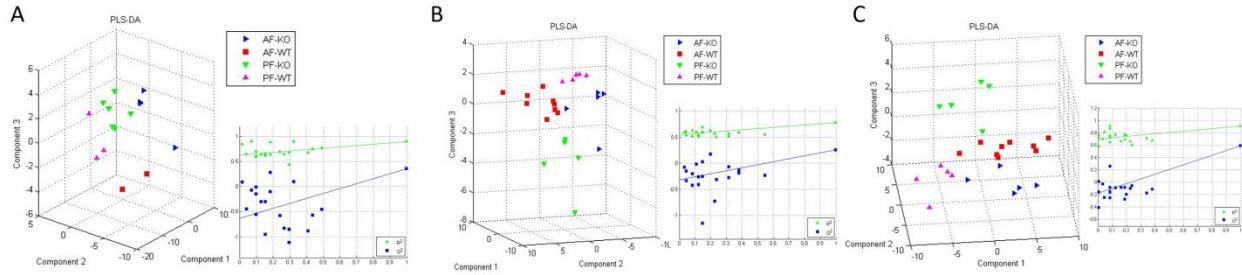
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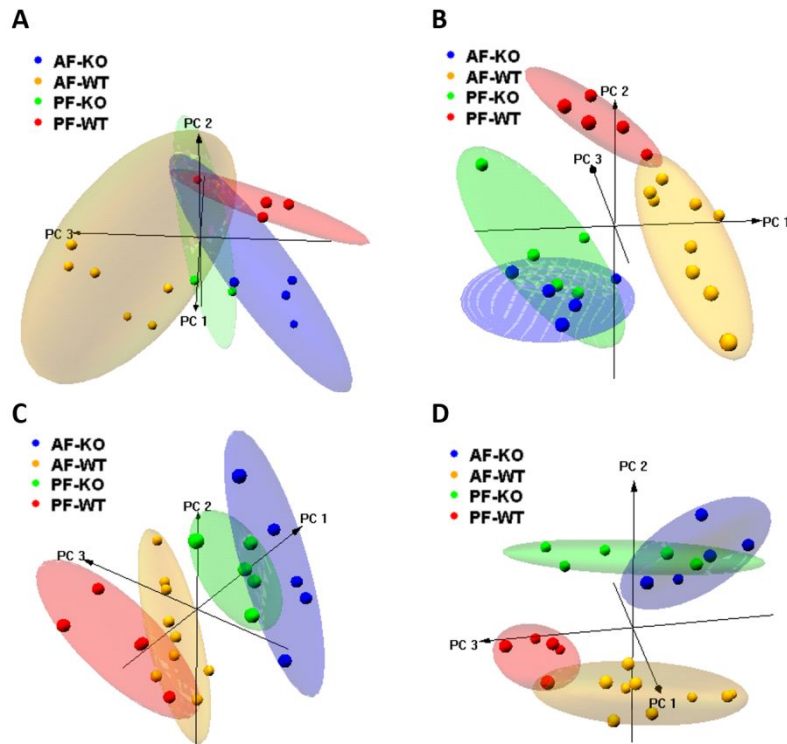
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**Figure S-1.** The results of PLS-DA. (A) is the result of PLS-DA using GC×GC-MS data ( $R^2=0.89$ ,  $Q^2=0.35$ ). (B) is the result of PLS-DA using 2DLC-MS/MS(-) data ( $R^2=0.78$ ,  $Q^2=0.26$ ). (C) is the result of PLS-DA using 2DLC-MS/MS(+) data ( $R^2=0.91$ ,  $Q^2=0.59$ ).



**Figure S-2.** Principal component analysis of metabolic profiling using the data acquired by (A) GC×GC-MS, (B) 2DLC-MS/MS(-), (C) 2DLC-MS/MS(+), and (D) merging all data acquired on the three platforms. AF, alcohol-fed; PF, pair-fed; WT, wild type; KO, CRAMP knockout. Principal component 1 (PC 1) explains 53%, 17%, 23%, and 21% variances, PC 2 explains 16%, 14%, 17%, and 15% variances, and PC 3 explains 6%, 10%, 11%, and 13% variances for (A) GC×GC-MS, (B) 2DLC-MS/MS(-), (C) 2DLC-MS/MS(+), and (D) merged data, respectively.

**Table S-1.** Metabolites changed in feces by alcohol detected by three platforms (i.e., AF-WT vs. PF-WT)

2DLC-MS (+)			2DLC-MS (-)			GC×GC-MS		
Compound Name	Fold Change	<i>p</i> Value	Compound Name	Fold Change	<i>p</i> Value	Compound Name	Fold Change	<i>p</i> Value
<b>Metabolites with significant abundance changes</b>								
2-Amino adipic acid	1.7E-01	5.4E-06	(R)-2-Hydroxybutyric acid	5.0E-01	3.9E-02	(Aminoxy)acetic acid	2.0E+00	3.2E-03
4-Indolecarbaldehyde	1.5E-01	8.6E-05	(S)-(+)-1,2-Isopropylidenglycerol	2.3E-01	5.7E-05	1,2-Pyrrolidinedicarboxylic acid	3.7E-01	4.6E-02
7-Methylguanine	3.4E-01	4.6E-04	2'-Deoxyinosine	5.3E-01	1.4E-02	1-Butanol	1.4E+00	7.2E-04
Acetophenone	1.6E+00	2.5E-03	2-Hydroxyvaleric acid	5.6E-02	1.6E-05	2-Hydroxy-3-methylbutyric acid	1.3E-01	1.3E-03
Acetylcarnitine	4.4E-01	2.9E-02	2-Ketobutyric acid	2.5E-01	1.5E-02	2-Thiobarbituric acid	5.0E-01	3.0E-02
Adenine	2.6E+00	2.1E-04	4-Nitrophenol	1.5E+00	4.3E-02	4-Coumaric acid	1.9E+00	3.0E-03
Adenosine	2.9E-01	1.3E-03	6-Hydroxycaproic acid	9.3E-02	1.0E-03	Alpha-Aminoisobutyric acid	3.3E-01	9.0E-03
Alanine	7.9E-01	6.2E-03	Adenine	3.8E+00	2.4E-04	Butyric acid	1.0E-01	1.1E-02
Alpha-Aminoisobutyric acid	6.2E-01	2.6E-02	Adipic acid	6.1E-01	9.6E-03	Ethanolamine	4.0E-01	3.9E-03
Arginine	1.6E-01	4.8E-04	Alanine	6.0E-01	1.3E-02	Ethyl diethanolamine	4.8E-01	2.2E-02
Cannabigerolic acid	5.7E+00	8.2E-04	Alpha-Aminoisobutyric acid	4.3E-01	4.2E-02	Fumaric acid	2.7E-01	1.9E-02
Cholest-4-en-3-one	1.5E+01	1.4E-02	alpha-Ketoglutaric acid	3.7E-01	4.2E-02	Glyceric acid	3.2E-01	8.8E-03
Coenzyme Q1	1.5E+00	1.1E-02	Arachidonic acid	3.2E+00	3.3E-02	Glycerol-3-phosphate	3.8E-01	2.0E-03
Cytidine	5.5E-01	2.2E-03	Arginine	1.4E-01	3.1E-04	Glycine	4.4E-01	3.4E-02
Cytosine	6.5E-01	3.3E-02	Azelaic acid	1.4E+00	2.0E-02	Hydroxylamine	7.5E-01	1.9E-02
Ethyl oleate	2.2E+00	2.7E-05	Benzoic acid	1.4E+00	4.8E-02	Malic acid	1.3E-01	2.5E-03
gamma-Aminobutyric acid	2.7E-01	3.8E-02	Cholic acid	3.9E-01	1.6E-02	N-Acetylaspartic acid	2.4E-01	5.9E-03
Lysine	5.4E-01	8.6E-03	Deoxycholic acid	4.2E+00	4.6E-02	Nicotinic acid	5.5E-01	3.2E-02
Methionine sulfoxide	5.6E-01	2.3E-02	Docosaehaenoic acid	5.0E+00	3.9E-03	Valeric acid	2.1E-01	1.5E-02

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Methylimidazoleacetic acid	4.0E-01	1.6E-03	Ethyl- $\beta$ -D-glucuronide	5.7E+00	3.8E-03	Propylene glycol	3.2E+00	1.3E-02
N <sup>3</sup> ,N <sup>4</sup> -Dimethylarginine	4.3E-01	1.6E-04	Fumaric acid	3.6E-01	4.5E-02	Serine	6.8E-01	3.4E-03
N-Acetylneuraminic acid	1.3E-01	4.9E-02	Glutamic acid	4.2E-01	3.3E-02	Succinic acid	6.4E-02	1.6E-03
N-Acetylorithine	2.5E-01	1.1E-02	Glutaric acid	2.2E-01	1.6E-04	Taurine	1.5E-01	2.7E-02
Nicotinamide	6.1E-01	1.6E-02	Guanosine	1.9E-01	2.7E-04			
Nicotinic acid	6.4E-01	7.5E-03	Histidine	3.7E-01	4.2E-03			
Ornithine	1.4E+00	2.8E-02	Inosine	5.2E-02	6.2E-05			
Phenylalanine	6.3E-01	2.0E-02	Isobutyric acid	1.9E-01	3.6E-05			
Pipecolic acid	6.6E-01	4.5E-02	Lactic acid	2.8E-01	2.1E-03			
Sarcosine	8.0E-01	1.8E-02	Levulinic acid	5.5E-01	1.3E-02			
Serine	6.0E-01	4.5E-02	L-Pyroglutamic acid	6.4E-01	3.5E-03			
Taurine	5.6E-01	1.5E-02	Maleic acid	7.9E-01	4.6E-02			
Taurocholic acid	1.5E-05	0.0E+00	Malic acid	1.2E-01	2.5E-04			
Tetrahydrocannabinol	3.2E+00	1.7E-03	Malonic acid	2.6E-01	1.3E-04			
Tyrosine	6.2E-01	6.3E-04	N-Ethylglycine	4.3E-01	4.2E-02			
Urocanic acid	1.4E+00	2.5E-02	Nicotinic acid	5.6E-01	2.0E-02			
Xanthurenic acid	1.7E-01	4.3E-05	Oleic acid	4.1E+00	1.6E-02			
			Oxalic acid	4.5E+00	8.5E-04			
			Palmitic acid	3.0E+00	2.5E-03			
			Propionic acid	9.3E-02	1.5E-03			
			Serine	5.6E-01	2.8E-02			
			Succinic acid	7.9E-02	5.2E-05			
			Sucrose	1.2E-01	1.4E-04			
			Taurine	6.8E-01	2.5E-02			
			Uridine	3.4E-01	1.3E-03			
			Urocanic acid	2.1E+00	2.9E-03			
<b>Metabolites without statistical significant abundance changes</b>								
1-Methylhistidine	6.5E-01	6.6E-02	(+/-)12-HpETE	5.0E-01	5.6E-02	1-Hexanol	9.1E-01	6.5E-01
2-Aminonicotinic acid	7.2E-01	8.0E-02	HODE	1.7E+00	2.6E-01	2-Buten-1-ol	1.1E+00	5.7E-01
3,4-Dimethylbenzoic acid	1.7E+00	1.7E-01	2-Hydroxycaproic acid	1.3E+00	6.8E-01	Alpha-Hydroxybutyric acid	7.3E-01	1.7E-01

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3-Hydroxypyridine	7.7E-01	2.9E-01	3-Hydroxybutyric acid	3.3E+00	7.9E-02	3,3-Dimethyl-2-butanol	1.1E+00	6.1E-01
4-Methyl-5-thiazoleethanol	1.4E+00	3.2E-01	4-Methyl-2-oxovaleric acid	2.0E-01	8.9E-02	3-Hydroxy-3-phenylpropionic acid	1.3E+00	1.5E-01
Acetylcholine	9.9E-01	9.2E-01	8(S)-Hydroxy-(5Z,9E,11Z,14Z)-eicosatetraenoic acid	1.1E+00	1.0E+00	3-Hydroxybutyric acid	1.2E+00	8.1E-01
Alanylproline	5.7E-01	1.3E-01	Adrenic acid	8.1E-01	5.4E-01	3-Methylbutanoic acid	6.7E-01	7.1E-01
Alpha-Amino adipic acid	8.8E-01	5.6E-01	Asparagine	1.4E+00	4.8E-01	4-Hydroxybenzeneacetic acid	5.0E-01	1.5E-01
Anserine	9.8E-01	7.4E-01	Aspartic acid	4.6E-01	1.4E-01	5-Aminovaleric acid	2.3E-01	4.6E-01
Aspartic acid	5.3E-01	4.5E-01	Citrulline	1.3E+00	4.1E-01	6-Methyl-2-(methylthio)-4-pyrimidinol	8.2E-01	4.9E-01
Betaine	1.1E+00	3.8E-01	Creatinine	8.8E-01	8.4E-01	9-Hexadecenoic acid	1.4E+00	4.4E-01
Carnitine	1.2E+00	1.8E-01	Cystine	1.0E+00	4.7E-01	Acetimidamide	1.3E+00	7.2E-02
Carnosine	5.5E-01	1.5E-01	Dihomo-gamma-Linolenic acid	2.2E+00	3.1E-01	Alanine	7.8E-01	1.3E-01
Choline	1.4E+00	1.0E-01	Glyceraldehyde 3-phosphate	1.2E+00	7.1E-01	Asparagine	1.8E+00	1.2E-01
Citrulline	1.1E+00	9.3E-01	$\beta$ -Leucine	1.1E+00	8.9E-01	Aspartic acid	4.6E-01	1.4E-01
Creatine	1.4E+00	1.6E-01	Glutamine	9.4E-01	5.3E-01	Benzeneacetic acid	9.7E-01	7.4E-01
Creatinine	8.5E-01	7.5E-01	Glycine	8.6E-01	3.1E-01	Benzoic acid	1.3E+00	1.9E-01
Cystine	1.4E+00	5.6E-01	Glycyl-L-leucine	9.4E-01	7.3E-01	Decanoic acid	4.2E-01	1.4E-01
Ethanolamine	7.2E-01	2.9E-01	Hexanoic acid	2.7E+00	1.2E-01	Diacetic acid	6.7E-01	3.0E-01
Ethyl palmitoleate	1.4E+00	2.1E-01	Hypoxanthine	6.0E-01	1.4E-01	Ethyl hydroxycarbamate	1.3E+00	3.7E-01
Glutamic acid	4.9E-01	7.9E-02	Isocitric acid	1.4E+00	8.2E-01	Ethylene glycol	1.3E+00	2.3E-01
Glutamine	7.7E-01	2.8E-01	Itaconic acid	6.9E-01	1.5E-01	Glutamic acid	9.4E-01	6.5E-01
Glycylproline	7.1E-01	1.5E-01	Alpha-Amino adipic acid	1.0E+00	7.1E-01	Glyceraldehyde	8.9E-01	7.3E-01
Guanine	6.6E-01	2.4E-01	Cysteine-S-sulfate	8.1E-01	4.9E-01	Glycerol	1.2E+00	9.4E-01
Histidine	5.8E-01	5.3E-02	Leukotriene B4	8.6E-01	9.6E-01	Glycolic acid	7.1E-01	2.7E-01
Hypoxanthine	6.3E-01	1.2E-01	Lipoxin A4	8.0E-01	4.1E-01	Hydracrylic acid	1.1E+00	9.9E-01

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Isoleucine	8.0E-01	2.7E-01	Rhamnose	8.6E-01	4.3E-01	Isobutyric acid	7.1E-01	3.5E-01
Leucine	7.0E-01	9.5E-02	Methionine	7.2E-01	9.6E-02	Isoleucine	8.6E-01	2.2E-01
Leucylproline	8.3E-01	5.0E-01	Methyl Salicylate	5.5E-01	1.1E-01	Lactic acid	6.4E-01	4.0E-01
L-Pyroglutamic acid	6.7E-01	1.1E-01	N-Acetyl-D-Glucosamine	7.4E-01	1.8E-01	Leucine	9.2E-01	4.8E-01
Methionine	8.7E-01	3.2E-01	N-Acetyl-L-glutamic acid	7.8E-01	2.3E-01	Linoelaidic acid	1.5E+00	4.8E-01
N6,N6,N6-Trimethyllysine	7.0E-01	2.4E-01	N-Acetylneuraminic acid	7.5E-01	2.0E-01	L-Pyroglutamic acid	5.7E-01	1.8E-01
N6-Acetyllysine	1.2E+00	2.8E-01	N-Acetylornithine	7.0E-01	1.3E-01	Lysine	4.4E-01	1.3E-01
N-Acetyl-galactosamine	9.9E-01	7.4E-01	Ornithine	1.4E+00	4.2E-01	Methionine	8.8E-01	1.5E-01
N-Acetyl-Glucosamine	8.1E-01	3.8E-01	Pantothenic acid	1.2E+00	2.0E-01	Methylthiouracil	5.6E-01	1.2E-01
N-Methyl-2-pyrrolidone	4.0E-01	5.6E-02	Phenylalanine	8.8E-01	3.3E-01	Myristic acid	1.0E+00	8.9E-01
Octadecanamine	1.5E+00	1.4E-01	Phenylpyruvic acid	3.0E+00	2.0E-01	Nonanoic acid	1.4E+00	1.8E-01
Proline	8.2E-01	2.0E-01	Prostaglandin G2	9.8E-01	7.3E-01	Oleic acid	2.1E+00	2.0E-01
Threonine	7.2E-01	7.5E-02	Pyruvic acid	6.3E-01	5.7E-01	Oxalic acid	1.0E+00	9.7E-01
Trans-4-Hydroxyproline	8.0E-01	9.5E-01	Salicylic acid	2.9E+00	5.4E-02	Palmitic acid	2.5E+00	1.3E-01
Tryptophan	9.2E-01	4.2E-01	Thiamine	1.1E+00	9.5E-01	Pentadecanoic acid	1.2E+00	5.8E-01
Valine	9.6E-01	7.6E-01	Threonine	8.8E-01	2.6E-01	Perfluoropropionic acid	1.5E+00	2.4E-01
Valylproline	5.5E-01	2.3E-01	Trans-4-Hydroxy-L-proline	5.0E-01	4.2E-01	Phenylalanine	9.0E-01	5.1E-01
			Trans-Ferulic acid	1.0E+00	6.4E-01	Proline	9.4E-01	8.8E-01
			Tryptophan	7.7E-01	2.3E-01	Propionic acid	5.3E-01	1.4E-01
			Tyrosine	8.5E-01	5.2E-01	Stearic acid	2.2E+00	1.1E-01
			Uracil	5.5E-01	5.7E-02	Threonine	7.2E-01	1.5E-01
			Xanthine	6.6E-01	5.0E-02	Thymol	1.3E+00	9.7E-02
						Tyrosine	7.6E-01	2.3E-01
						Uracil	7.2E-01	2.7E-01
						Valine	9.3E-01	4.6E-01

**Table S-2.** Metabolites changed in feces by CRAMP knockout detected by three platforms

2DLC-MS (+)			2DLC-MS (-)			GC×GC-MS		
Compound Name	Fold Change	<i>p</i> Value	Compound Name	Fold Change	<i>p</i> Value	Compound Name	Fold Change	<i>p</i> Value
<b>Metabolites with significant abundance changes</b>								
1-Methyl-L-histidine	4.3E-01	1.0E-02	4-Nitrophenol	5.6E+00	4.0E-02	(Aminooxy)acetic acid	2.4E+00	7.4E-03
Acetylcholine	1.0E+02	1.3E-04	Alpha-Aminoisobutyric acid	5.1E-01	1.5E-02	1,2-Pyrrolidinedicarboxylic acid	3.1E-01	3.7E-02
Adenine	2.3E-01	1.2E-02	Cholic acid	3.4E-01	1.2E-02	1-Butanol	1.8E+00	2.6E-02
Adenosine	4.9E-01	3.8E-02	β-Leucine	1.7E+00	2.3E-02	1-Hexadecanol	1.6E+00	4.0E-02
Alanine	7.2E-01	2.4E-03	Glutamic acid	5.5E-01	2.3E-02	2-Hydroxy-3-methylbutyric acid	8.7E-02	9.8E-03
Anserine	1.8E+00	5.1E-03	Glutaric acid	3.3E-01	2.0E-02	Alpha-Aminoisobutyric acid	3.4E-01	3.8E-02
Creatinine	5.8E+00	3.3E-02	Glycine	7.2E-01	1.0E-03	4-Coumaric acid	3.1E+00	6.1E-03
Cystine	1.5E+00	1.3E-02	Lactic acid	5.1E-01	6.1E-03	9-Hexadecenoic acid	3.1E+00	3.3E-02
Cytidine	4.7E-01	9.5E-04	L-Pyroglutamic acid	5.5E-01	3.9E-03	Glycine	3.5E-01	2.1E-02
Glutamic acid	6.2E-01	3.9E-03	Malonic acid	2.7E-01	2.8E-04	Linoelaidic acid	1.8E+00	4.9E-02
Methionine	8.0E-01	3.6E-02	Phenylpyruvic acid	7.4E+00	7.9E-03	Methionine	5.9E-01	1.7E-02
N <sub>3</sub> ,N <sub>4</sub> -Dimethyl-L-arginine	6.3E-01	3.6E-02	Propionic acid	1.9E-01	2.1E-02	Lysine	2.0E-01	3.4E-02
Nicotinamide	3.3E-01	3.5E-03	Salicylic acid	5.3E+00	3.3E-03	N-Acetylaspartic acid	1.4E-01	2.0E-02
N-Methyl-2-pyrrolidone	2.1E+01	3.9E-04	Thiamine	2.9E-01	2.1E-02	Octanoic acid	1.2E+00	3.2E-02
Sarcosine	3.2E+00	8.8E-03	Trans-Ferulic acid	3.1E+00	1.7E-02	Palmitic acid	8.2E+00	8.6E-03
Taurine	5.0E-01	4.1E-02	Uracil	3.0E+00	2.6E-03	Serine	6.1E-01	4.8E-02
Threonine	7.7E-01	7.2E-03				Stearic acid	7.0E+00	2.5E-03
Tyrosine	6.2E-01	2.1E-03				Succinic acid	9.5E-02	3.1E-02
Xanthurenic acid	3.8E-01	8.4E-03						
<b>Metabolites without statistical significant abundance changes</b>								
2-Amino adipic acid	7.7E-01	2.0E-01	(R)-2-Hydroxybutyric acid	3.7E-01	5.1E-02	1,6-Anhydro-2,3-O-isopropylidene-α-D-mannopyranose	5.4E-01	3.3E-01

## Supporting Information

3,4-Dimethylbenzoic acid	8.5E-01	8.2E-01	(S)-(+)-1,2-Isopropylidene-glycerol	5.9E-01	1.8E-01	1-Hexanol	9.3E-01	8.1E-01
3-Hydroxypyridine	1.0E+00	8.6E-01	HODE	7.2E-01	3.0E-01	2-Butanol	1.5E+00	1.5E-01
4-Indolecarbaldehyde	4.4E-01	1.2E-01	2'-Deoxyinosine	6.6E-01	8.0E-02	2-Buten-1-ol	1.2E+00	4.4E-01
4-Methyl-5-thiazoleethanol	8.1E-01	3.8E-01	2-Hydroxycaproic acid	1.1E+00	9.1E-01	Alpha-Hydroxybutyric acid	4.0E-01	1.0E-01
7-Methylguanine	6.6E-01	9.7E-02	2-Ketobutyric acid	5.2E-01	1.1E-01	2-Methylpropionic acid	8.0E-01	7.2E-01
Acetyl-L-carnitine	5.6E-01	8.5E-01	3-Hydroxybutyric acid	2.2E+00	8.2E-02	2-Phenylbutyric acid	3.6E+00	6.0E-02
Alanyl-L-proline	6.7E-01	5.6E-01	4-Methyl-2-oxovaleric acid	1.7E+00	1.9E-01	2-Thiobarbituric acid	3.6E-01	6.9E-02
Alpha-Aminoadipic acid	3.1E+00	2.4E-01	Adenine	2.1E+00	2.0E-01	3,3-Dimethyl-2-butanol	8.5E-01	1.4E-01
Alpha-Aminoisobutyric acid	1.1E+00	5.2E-01	Adipic acid	6.3E-01	1.2E-01	3-Hydroxy-3-phenylpropionic acid	1.0E+00	9.3E-01
Arginine	6.7E-01	2.7E-01	Adrenic acid	5.8E-01	3.3E-01	3-Hydroxybutyric acid	2.0E+00	4.8E-01
Aspartic acid	6.0E-01	7.1E-01	Alanine	9.6E-01	8.8E-01	3-Methylbutanoic acid	6.5E-01	4.8E-01
Betaine	1.2E+00	4.9E-01	alpha-Ketoglutaric acid	6.7E-01	4.6E-01	4-Hydroxybenzeneacetic acid	6.6E-01	2.7E-01
Cannabigerolic acid	1.2E+00	5.4E-01	Arachidonic acid	2.5E+00	8.1E-02	5-Aminovaleric acid	8.8E-02	4.8E-01
Carnitine	1.3E+00	3.7E-01	Arginine	6.4E-01	3.0E-01	6-Methyl-2-(methylthio)-4-pyrimidinol	7.5E-01	5.0E-01
Carnosine	4.6E-01	1.2E-01	Asparagine	8.2E-01	6.4E-01	acetimidamide	1.1E+00	2.8E-01
Cholest-4-en-3-one	1.1E+00	4.8E-01	Aspartic acid	8.8E-01	6.7E-01	Alanine	8.3E-01	4.7E-01
Choline	1.2E+00	1.6E-01	Azelaic acid	1.3E+00	1.9E-01	Aspartic acid	5.8E-01	3.0E-01
Citrulline	7.3E-01	1.6E-01	Benzoic acid	1.8E+00	1.6E-01	Benzeneacetic acid	6.0E-01	5.7E-01
Coenzyme Q1	8.9E-01	4.4E-01	Citrulline	8.0E-01	2.3E-01	Benzoic acid	1.2E+00	4.6E-01
Creatine	1.1E+00	5.4E-01	Creatinine	9.5E-01	8.9E-01	Butyric acid	2.1E-01	5.8E-02
Cytosine	1.5E+00	2.6E-01	Cystine	1.2E+00	4.4E-01	Cysteine	6.2E-01	3.7E-01
Ethanolamine	8.2E-01	6.2E-01	Deoxycholic acid	2.1E+00	2.4E-01	Cytosine	1.3E+00	7.1E-02
Ethyl palmitoleate	1.1E+00	9.1E-01	Dihomo-gamma-Linolenic acid	4.7E-01	4.2E-01	Decanoic acid	2.0E+00	4.9E-01



## Supporting Information

Gamma-Aminobutyric acid	3.8E-01	3.3E-01	Glyceraldehyde 3-phosphate	9.0E-01	6.5E-01	Dodecanoic acid	6.2E-01	5.1E-01
Glutamine	1.0E+00	9.7E-01	Docosaehaenoic acid	2.9E+00	8.6E-02	L-Pyroglutamic acid	9.1E-01	8.9E-01
Guanine	1.7E+00	4.9E-01	Ethyl-β-D-glucuronide	2.4E-01	8.5E-02	Ethanolamine	2.4E+00	2.0E-01
Histidine	8.4E-01	4.4E-01	Fumaric acid	7.3E-01	5.6E-01	Ethyl hydroxycarbamate	3.0E-01	2.1E-01
Hypoxanthine	8.5E-01	7.1E-01	Glutamine	8.8E-01	7.9E-01	Ethyl-diethanolamine	4.3E-01	1.4E-01
Isoleucine	8.9E-01	6.5E-01	Glycyl-L-leucine	7.9E-01	4.8E-01	Ethylene glycol	1.9E+00	7.2E-02
Leucine	9.5E-01	8.5E-01	Hexanoic acid	3.9E-01	7.3E-01	Fumaric acid	3.2E-01	1.4E-01
Leucylproline	5.6E-01	1.2E-01	Histidine	6.4E-01	1.2E-01	Glutamic acid	8.3E-01	2.0E-01
L-Pyroglutamic acid	8.4E-01	3.1E-01	Hypoxanthine	9.5E-01	9.7E-01	Glyceraldehyde	1.4E+00	4.3E-01
Lysine	7.0E-01	9.7E-02	Inosine	6.1E-01	4.2E-01	Glyceric acid	5.6E-01	9.3E-02
Methionine sulfoxide	7.1E-01	2.6E-01	Isobutyric acid	1.8E-01	2.0E-01	Glycerol	1.3E+00	1.9E-01
Methylimidazoleacetic acid	1.3E+00	3.8E-01	Isocitric acid	9.7E-01	6.6E-01	Glycerol-3-phosphate	1.0E+00	8.1E-01
N6,N6,N6-Trimethyl-L-lysine	8.4E-01	7.0E-01	Itaconic acid	8.8E-01	7.2E-01	Glycolic acid	5.6E-01	1.8E-01
N6-Acetyl-L-lysine	1.0E+00	9.8E-01	alpha-Amino adipic acid	1.3E+00	3.7E-01	Hydroxylamine	1.0E+00	8.3E-01
N-Acetyl-D-Glucosamine	1.3E+00	3.8E-01	Cysteine-S-sulfate	1.1E+00	7.7E-01	Isoleucine	8.2E-01	3.1E-01
N-Acetylneuraminic acid	6.6E-01	5.7E-01	Leukotriene B4	8.1E-01	8.0E-01	Lactic acid	4.9E-01	3.9E-01
N-Acetylornithine	3.1E-01	1.1E-01	Levulinic acid	6.9E-01	1.4E-01	Leucine	8.6E-01	3.8E-01
Nicotinic acid	8.3E-01	3.6E-01	Lipoxin A4	1.3E+00	4.1E-01	Malic acid	2.4E-01	5.6E-02
Ornithine	6.5E-01	7.6E-02	Rhamnose	1.0E+00	7.1E-01	Methylthiouracil	5.9E-01	2.7E-01
Phenylalanine	7.9E-01	1.5E-01	Maleic acid	7.3E-01	1.1E-01	Myristic acid	1.9E+00	1.7E-01
Pipecolic acid	6.9E-01	5.4E-02	Malic acid	6.2E-01	2.2E-01	Nicotinic acid	6.7E-01	2.8E-01
Proline	8.4E-01	3.3E-01	Methionine	8.3E-01	1.9E-01	Nonanoic acid	1.2E+00	4.9E-01
Serine	8.2E-01	1.5E-01	Methyl Salicylate	1.0E+00	6.8E-01	Oleic acid	4.1E+00	5.9E-02
Tetrahydrocannabinol	9.4E-01	8.0E-02	N-Acetyl-D-Glucosamine	1.4E+00	4.9E-01	Ornithine	5.3E-01	2.1E-01
Trans-4-Hydroxy-L-proline	6.0E-01	6.6E-01	N-Acetyl-DL-glutamic acid	1.1E+00	6.1E-01	Oxalic acid	9.6E-01	6.8E-01

Supporting Information

Tryptophan	7.8E-01	1.9E-01	N-Acetyl-L-glutamic acid	8.4E-01	9.7E-01	Pentadecanoic acid	3.3E+00	8.0E-02
Urocanic acid	1.2E+00	4.6E-01	N-Acetylneuraminic acid	7.3E+00	7.1E-02	Valeric acid	3.0E-01	1.9E-01
Valine	9.2E-01	3.9E-01	N-Acetylmethionine	1.1E+00	8.1E-01	Phenylalanine	8.5E-01	2.9E-01
Valylproline	9.7E-01	8.6E-01	Nicotinic acid	8.3E-01	3.5E-01	Phloretic acid	9.0E-01	7.3E-01
			Oleic acid	4.6E+00	1.3E-01	Proline	7.7E-01	5.4E-01
			Ornithine	8.3E-01	2.3E-01	Propionic acid	9.3E-01	9.5E-01
			Oxalic acid	2.9E+00	5.9E-02	Propylene glycol	1.8E+00	9.4E-01
			Palmitic acid	1.7E+00	3.7E-01	Taurine	1.6E-01	8.8E-02
			Pantothenic acid	7.5E-01	4.6E-01	Threonine	6.1E-01	1.6E-01
			Phenylalanine	7.7E-01	2.5E-01	Thymol	1.3E+00	3.7E-01
			Prostaglandin G2	1.5E+00	3.9E-01	Tyrosine	8.3E-01	2.0E-01
			Pyruvic acid	1.5E+00	2.4E-01	Uracil	8.5E-01	7.2E-01
			Serine	8.3E-01	2.6E-01	Urea	1.1E+00	5.8E-01
			Succinic acid	3.4E-01	5.2E-02	Valine	8.4E-01	2.7E-01
			Sucrose	5.4E-01	2.1E-01			
			Taurine	6.5E-01	1.6E-01			
			Threonine	9.3E-01	3.9E-01			
			trans-4-Hydroxy-L-proline	4.8E-01	6.0E-01			
			Tryptophan	8.5E-01	5.2E-01			
			Tyrosine	8.8E-01	4.6E-01			
			Uric acid	6.1E-01	6.0E-01			
			Uridine	1.5E+00	1.4E-01			
			Urocanic acid	6.9E-01	1.5E-01			
			Xanthine	7.0E-01	3.4E-01			
			β-D-Glucopyranuronic acid	1.9E+00	2.3E-01			

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**Table S-3.** Metabolites changed in feces by CRAMP knockout exposed to alcohol detected by three platforms (i.e., AF-WT vs. AF-KO)

2DLC-MS (+)			2DLC-MS (-)			GC×GC-MS		
Compound Name	Fold Change	<i>p</i> Value	Compound Name	Fold Change	<i>p</i> Value	Compound Name	Fold Change	<i>p</i> Value
<b>Metabolites with significant abundance changes</b>								
Acetylcholine	9.7E+01	1.4E-05	(S)-(+)-1,2-Isopropylidene-glycerol	3.3E+00	1.9E-02	Alpha-Aminoisobutyric acid	4.0E+00	2.3E-02
Alpha-Amino adipic acid	1.8E+00	2.8E-02	2-Ketobutyric acid	3.3E+00	5.1E-03	3,3-Dimethyl-2-butanol	5.9E-01	6.3E-03
Alpha-Aminoisobutyric acid	2.1E+00	1.7E-03	Alpha-Amino adipic acid	1.7E+00	1.6E-02	3-Hydroxy-3-phenylpropionic acid	7.2E-01	3.6E-02
Citrulline	4.1E-01	2.9E-02	Asparagine	1.3E-01	1.6E-02	Acetimidamide	6.3E-01	1.2E-02
Cytidine	5.8E-01	2.4E-02	Cholic acid	4.7E-01	3.6E-02	Glycerol-3-phosphate	1.6E+00	1.6E-02
Cytosine	6.4E-01	1.3E-02	Citrulline	4.2E-01	6.7E-03	Malic acid	3.1E+00	2.9E-02
Ethyl palmitoleate	3.0E+00	3.5E-02	Creatinine	5.5E-01	4.2E-02	Nicotinic acid	2.0E+00	1.2E-02
N <sub>3</sub> ,N <sub>4</sub> -Dimethyl-L-arginine	1.9E+00	4.2E-02	Cysteine-S-sulfate	3.9E-01	2.4E-02	Oleic acid	3.3E+00	4.1E-02
N-Acetylneuraminic acid	5.9E+00	3.2E-02	Glutaric acid	2.0E+00	1.6E-02	Valeric acid	7.3E-01	5.0E-03
N-Acetylornithine	2.3E+00	9.5E-05	Hexanoic acid	6.4E-01	4.1E-02	Propylene glycol	4.0E-01	2.4E-02
Nicotinic acid	1.6E+00	1.2E-02	Malic acid	3.8E+00	2.7E-03			
N-Methyl-2-pyrrolidone	1.1E+01	2.7E-05	N-Acetyl-L-glutamic acid	3.2E+00	2.5E-02			
Taurine	2.4E+00	4.1E-02	N-Acetylneuraminic acid	2.2E+00	3.2E-02			
Tyrosine	5.7E-01	4.8E-02	Nicotinic acid	1.7E+00	6.9E-03			
Valylproline	3.6E+00	2.8E-04	Ornithine	4.2E-01	7.2E-03			
			Phenylpyruvic acid	7.5E-02	2.0E-02			
			Prostaglandin G <sub>2</sub>	5.9E-01	4.1E-02			
			Rhamnose	2.1E+00	2.2E-05			
			Succinic acid	2.3E+00	1.5E-02			
			Sucrose	2.4E+00	3.8E-02			
			Trans-4-Hydroxy-L-proline	5.8E-01	2.2E-02			

## Supporting Information

			Tryptophan	5.5E-01	2.6E-02			
			Tyrosine	4.5E-01	3.1E-02			
			Uracil	4.2E+00	3.4E-05			
			Uric acid	1.6E+00	3.6E-02			
			Urocanic acid	6.7E-01	3.2E-02			
<b>Metabolites without statistical significant abundance changes</b>								
1-Methyl-L-histidine	1.3E+00	4.9E-01	HODE	1.0E+00	6.6E-01	(Aminooxy)acetic acid	7.8E-01	1.0E-01
2-Amino adipic acid	2.1E+00	8.9E-02	(R)-2-Hydroxybutyric acid	1.8E+00	1.9E-01	1,2-Pyrrolidinedicarboxylic acid	8.7E-01	8.5E-01
3,4-Dimethylbenzoic acid	9.3E-01	1.0E+00	2'-Deoxyinosine	8.6E-01	8.2E-01	1-Butanol	8.8E-01	2.4E-01
3-Hydroxypyridine	1.1E+00	4.3E-01	2-Hydroxycaproic acid	1.1E+00	4.4E-01	1-Hexanol	1.1E+00	6.9E-01
4-Indolecarbaldehyde	8.7E-01	4.7E-01	3-Hydroxybutyric acid	2.9E+00	1.4E-01	1-Propanol, 3-(benzyloxy)-2-(dibenzylamino)-3-phenyl-	5.7E-01	2.0E-01
4-Methyl-5-thiazoleethanol	6.7E-01	2.7E-01	4-Methyl-2-oxovaleric acid	1.4E+00	2.4E-01	2-Buten-1-ol	1.0E+00	8.1E-01
7-Methylguanidine	1.6E+00	1.8E-01	4-Nitrophenol	8.4E-01	3.2E-01	2-Hydroxy-3-methylbutyric acid	1.4E+00	3.5E-01
Acetyl-L-carnitine	6.7E-01	2.4E-01	Adenine	7.8E-01	2.3E-01	alpha-Hydroxybutyric acid	2.4E+00	5.4E-02
Adenine	1.4E+00	3.1E-01	Adipic acid	5.9E-01	8.9E-02	2-Thiobarbituric acid	1.1E+00	9.0E-01
Adenosine	2.0E+00	7.1E-02	Adonitol	3.8E+00	2.7E-01	3-Hydroxybutyric acid	3.8E+00	1.1E-01
Alanine	1.1E+00	2.9E-01	Adrenic acid	8.9E-01	4.6E-01	3-Methylbutanoic acid	1.3E+00	7.7E-01
Alanyl-L-proline	7.5E-01	6.9E-01	Alanine	7.5E-01	8.5E-02	4-Hydroxybenzeneacetic acid	7.3E-01	4.3E-01
Anserine	1.5E+00	3.1E-01	Alpha-Aminoisobutyric acid	2.2E+00	6.6E-02	6-Methyl-2-(methylthio)-4-pyrimidinol	8.9E-01	6.1E-01
Arginine	5.0E-01	1.3E-01	Alpha-ketoglutaric acid	2.0E+00	6.3E-02	9-Hexadecenoic acid	1.7E+00	6.1E-01
Aspartic acid	1.0E+00	6.3E-01	Arachidonic acid	5.8E-01	3.4E-01	Acetoacetic acid	9.7E-01	9.5E-01

## Supporting Information

Betaine	8.8E-01	1.3E-01	Arginine	6.8E-01	4.2E-01	Alanine	1.2E+00	4.6E-01
Cannabigerolic acid	6.4E-01	1.6E-01	Aspartic acid	9.5E-01	6.4E-01	Aspartic acid	9.6E-01	8.7E-01
Carnitine	9.4E-01	8.0E-01	Azelaic acid	6.4E-01	1.6E-01	Benzeneacetic acid	8.5E-01	4.1E-01
Carnosine	4.3E-01	5.4E-02	Benzoic acid	1.4E+00	2.4E-01	Benzoic Acid	8.3E-01	2.3E-01
Choline	1.2E+00	7.8E-01	Cystine	2.5E+00	3.7E-01	Butyric Acid	5.8E-01	7.0E-01
Coenzyme Q1	9.1E-01	5.8E-01	Deoxycholic acid	5.0E-01	3.0E-01	Decanoic acid	2.8E+00	7.4E-02
Creatine	8.4E-01	6.3E-01	Dihomo-gamma-Linolenic acid	2.5E+00	1.3E-01	Ethanolamine	6.3E-01	9.5E-02
Creatinine	7.9E-01	1.9E-01	Docosahexaenoic acid	7.5E-01	7.0E-01	Ethyl-diethanolamine	9.5E-01	7.1E-01
Cystine	1.4E+00	6.4E-01	Ethyl-β-D-glucuronide	3.5E+00	6.6E-01	Ethylene glycol	9.4E-01	7.3E-01
Ethanolamine	7.9E-01	5.6E-01	Fructose	1.4E+00	3.4E-01	Fumaric acid	1.1E+00	7.4E-01
Gamma-Aminobutyric acid	1.3E+00	3.4E-01	Fumaric acid	1.8E+00	8.9E-02	Glutamic acid	1.2E+00	5.0E-01
Glutamic acid	1.9E+00	6.2E-02	Glutamic acid	2.2E+00	5.5E-02	Glyceraldehyde	1.3E+00	3.2E-01
Glutamine	6.1E-01	4.1E-01	Glutamine	6.9E-01	3.3E-01	Glyceric acid	1.6E+00	2.7E-01
Guanine	3.6E-01	1.4E-01	Glyceraldehyde 3-phosphate	9.0E-01	8.0E-01	Glycerol	1.0E+00	7.4E-01
Histidine	5.8E-01	1.6E-01	Glycine	7.5E-01	4.3E-01	Glycine	9.9E-01	7.5E-01
Hypoxanthine	1.3E+00	1.8E-01	Glycyl-L-leucine	7.3E-01	4.1E-01	Glycolic acid	9.2E-01	8.2E-01
Isoleucine	7.0E-01	1.2E-01	Histidine	6.6E-01	1.9E-01	Heptadecanoic acid	1.3E+00	4.1E-01
Leucine	7.2E-01	3.2E-01	Hypoxanthine	1.2E+00	3.5E-01	Hydracrylic acid	6.3E-01	3.9E-01
Leucylproline	6.5E-01	2.3E-01	Inosine	1.2E+00	4.0E-01	Hydroxylamine	1.1E+00	4.3E-01
L-Pyroglutamic acid	1.2E+00	5.3E-01	Isocitric acid	1.0E+00	6.6E-01	Isobutyric acid	8.2E-01	4.4E-01
Lysine	8.3E-01	4.9E-01	Itaconic acid	1.9E+00	6.0E-02	Isoleucine	9.0E-01	3.6E-01
Methionine	8.5E-01	4.9E-01	Lactic acid	1.2E+00	3.7E-01	Lactic acid	8.3E-01	6.4E-01
Methionine sulfoxide	1.1E+00	5.5E-01	Leukotriene B4	1.2E+00	9.8E-01	Leucine	8.5E-01	3.0E-01
Methylimidazoleacetic acid	7.2E-01	2.7E-01	Levulinic acid	9.9E-01	9.7E-01	Linoelaidic acid	1.7E+00	2.3E-01
N6,N6,N6-Trimethyl-L-lysine	1.2E+00	6.6E-01	Lipoxin A4	4.9E-01	1.5E-01	L-Pyroglutamic acid	1.0E+00	8.6E-01
N6-Acetyl-L-lysine	1.2E+00	3.7E-01	L-Pyroglutamic acid	8.8E-01	4.4E-01	Lysine	8.5E-01	8.3E-01
N-Acetyl-D-Glucosamine	1.2E+00	1.0E-01	Maleic acid	8.7E-01	1.9E-01	Methionine	6.2E-01	1.3E-01
Nicotinamide	1.9E+00	2.9E-01	Malonic acid	1.3E+00	3.7E-01	Methylthiouracil	3.5E+00	9.9E-02

## Supporting Information

Ornithine	1.5E+00	2.7E-01	Methionine	7.1E-01	4.8E-01	Myristic acid	1.6E+00	1.0E-01
Phenylalanine	7.2E-01	7.5E-02	Methyl Salicylate	4.5E-01	2.8E-01	N-Acetylaspartic acid	8.2E-01	4.5E-01
Pipecolic acid	1.5E+00	2.5E-01	Methylmalonic acid	1.1E+00	4.2E-01	Nonanoic acid	7.9E-01	3.7E-01
Proline	1.3E+00	2.1E-01	N-Acetyl-D-Glucosamine	1.3E+00	1.1E-01	Oxalic acid	8.8E-01	4.6E-01
Sarcosine	1.1E+00	8.1E-01	N-Acetylmethionine	1.3E+00	2.8E-01	Palmitic acid	3.0E+00	7.5E-02
Serine	9.9E-01	9.2E-01	Oleic acid	1.2E+00	6.3E-01	Pentadecanoic acid	2.7E+00	7.4E-02
Tetrahydrocannabinol	6.8E-01	4.3E-01	Oxalic acid	6.0E-01	5.7E-02	Perfluoropropionic acid	8.5E-01	5.8E-01
Threonine	1.0E+00	7.4E-01	Palmitic acid	1.4E+00	2.2E-01	Phenylalanine	7.8E-01	3.1E-01
Tiglic acid	2.4E-01	1.9E-01	Pantothenic acid	9.0E-01	3.9E-01	Proline	1.0E+00	8.2E-01
Trans-4-Hydroxy-L-proline	1.1E+00	6.9E-01	Phenylalanine	7.3E-01	1.4E-01	Propionic acid	1.2E+00	4.2E-01
Tryptophan	4.3E-01	8.4E-02	Propionic acid	1.8E+00	1.4E-01	Serine	8.6E-01	3.8E-01
Urocanic acid	7.6E-01	8.4E-02	Pyruvic acid	1.6E+00	5.0E-01	Stearic acid	1.4E+00	2.3E-01
Valine	8.3E-01	2.1E-01	Ribose	9.4E-01	8.7E-01	Succinic acid	1.4E+00	6.8E-01
Valylproline	2.0E+00	8.6E-02	Salicylic acid	6.6E-01	1.5E-01	Taurine	7.1E+00	1.3E-01
Xanthurenic acid	4.7E-01	1.1E-01	Serine	8.1E-01	5.8E-01	Threonine	9.6E-01	5.9E-01
			Taurine	1.6E+00	7.7E-02	Tyrosine	7.6E-01	3.5E-01
			Thiamine	3.6E-01	8.6E-02	Uracil	1.2E+00	5.0E-01
			Threonine	8.7E-01	4.4E-01	Valine	8.7E-01	3.0E-01
			Trans-Ferulic acid	1.8E+00	6.6E-01			
			Uridine	6.6E-01	2.3E-01			
			Xanthine	1.0E+00	6.8E-01			
			$\beta$ -Leucine	3.8E-01	6.0E-02			