

Supplementary material for:

Suramin induces mitochondrial activation in bloodstage African trypanosomes

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Supplementary figure legends

Figure S1: Summary of metabolite changes of cells grown in the presence ¹³C-labeled glucose one day after suramin exposure.

Figure S2: Amino acid level changes upon suramin treatment. -log₁₀ fold changes of amino acids detected in the metabolomics are plotted versus the 3 time points analyzed.

Figure S3: Suramin induced proteome changes have an onset later than 24 hours. Correlation of proteome changes upon suramin treatment after 24 hours and 48 hours. The correlation plot uses the respective normalised SILAC ratio, averaged from triplicate experiments.

Figure S4: GO term analysis. Volcano plots of normalised SILAC ratio after 48 hours suramin (35 nM) exposure. -log₂ transformed average ratios from triplicate experiments, are plotted against the respective -log₁₀ transformed p-values. Data points are colored for indicated GO terms. Selected data points are annotated.

Figure S5: Correlation of proteome changes upon suramin treatment with proteome differences between BSF and PCF. -log₂ transformed abundance shifts after 48 hours suramin (35 nM) exposure, were plotted against corresponding -log₂ transformed abundance differences between BSF and PCF (50). Selected GO terms are color indicated. Infinite changes were omitted for clarity. (DH = dehydrogenase, PPDK = pyruvate phosphate dikinase).

Figure S6: Suramin binding to serum proteins. Gel filtration chromatogram of 0.5 ml foetal bovine serum pre-incubated with ^3H -suramin on a 24 ml Superdex 200 column. The black line indicates the relative absorbance at $\lambda=280$ nm and the red line the scintillation count (counts per minute (CPM)) of respective fractions.

Figure S7: Pyruvate transporter overexpression has no effect on suramin sensitivity. Pt1-myc overexpression was detected by western blotting using the myc epitope (A), but did not change potency (EC_{50}) of suramin (B).

Movie S1: 3D segmentation of whole *T. brucei* cell. Plasma membrane and flagellum (purple), glycosomes (orange).

Table S1: High confidence metabolite changes of cells grown in the presence ^{13}C -labeled glucose one day after suramin exposure List of 84 quantified metabolites with the respective \log_2 fold change and corresponding p -value

Table S2: Metabolomics analysis at different time points of suramin exposure.

Table S3: High confidence metabolite changes at different time points of suramin exposure List of 65 quantified metabolites.

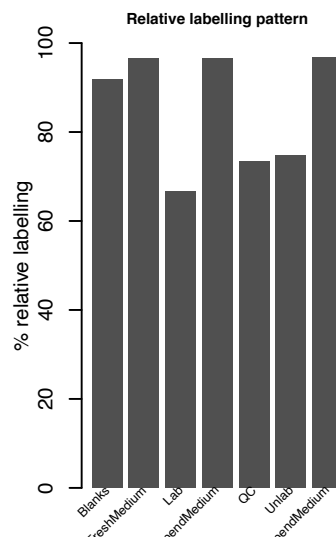
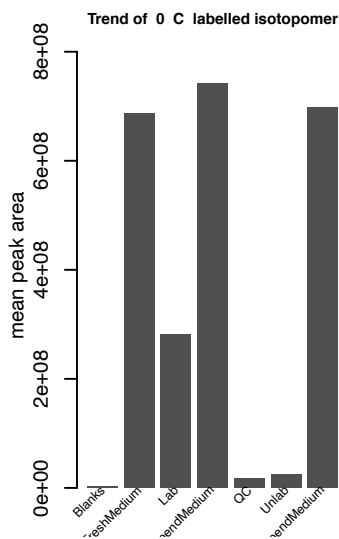
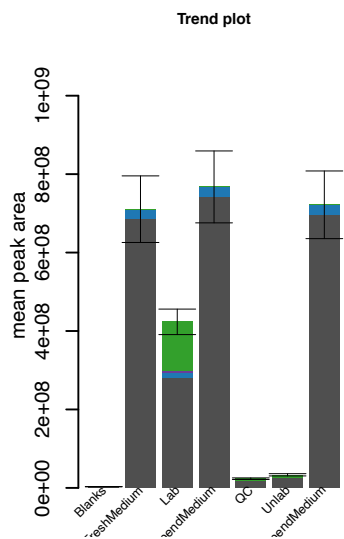
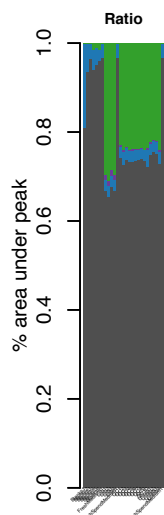
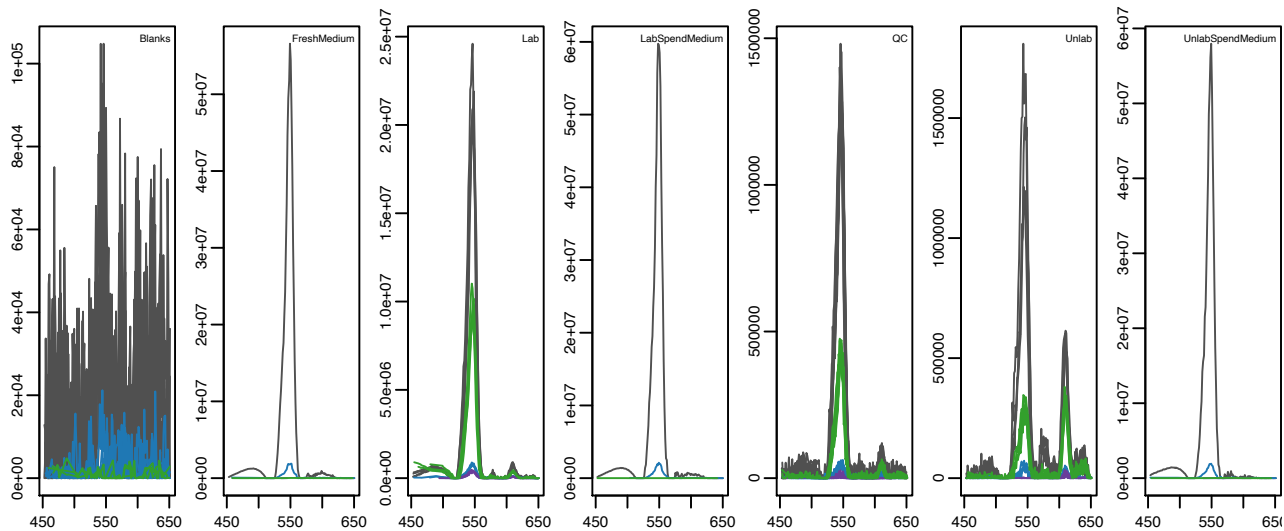
Table S4: SILAC proteomics analysis after 24 hours and 48 hours suramin exposure.

(R)-Lactate

Formula: C₃H₆O₃ Mass: 90.032 Std.RT: 552.6 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3

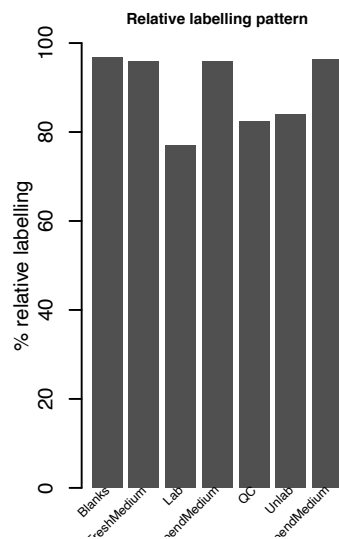
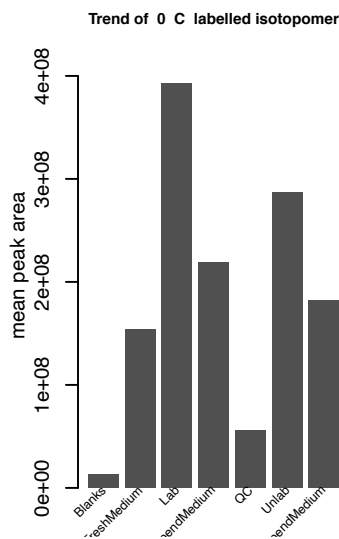
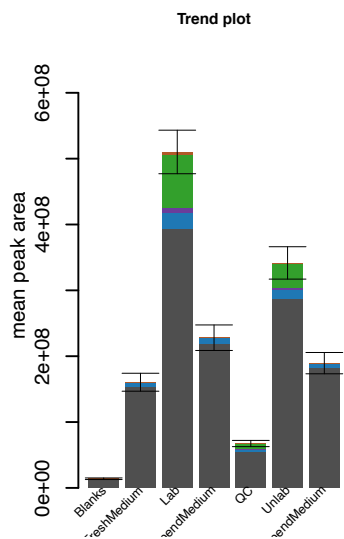
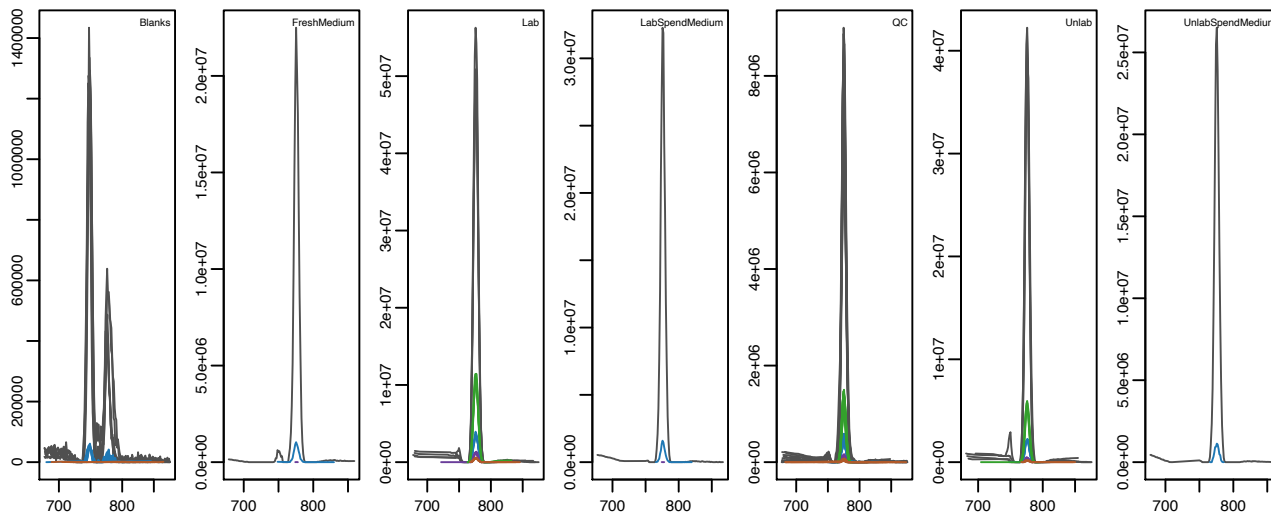


(S)-Malate

Formula: C₄H₆O₅ Mass: 134.022 Std.RT: 777 Ion: NEG

G1

■UL ■+1 ■+2 ■+3 ■+4

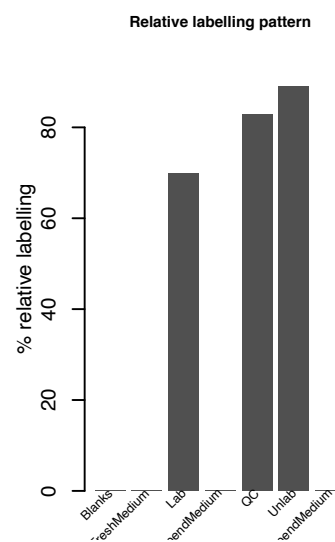
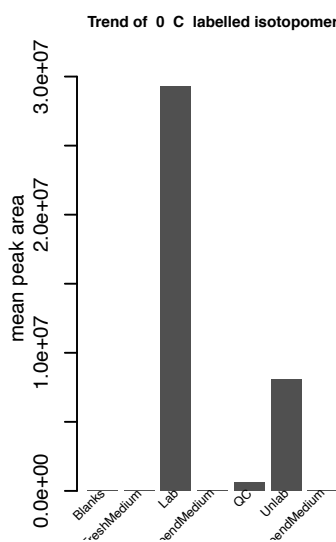
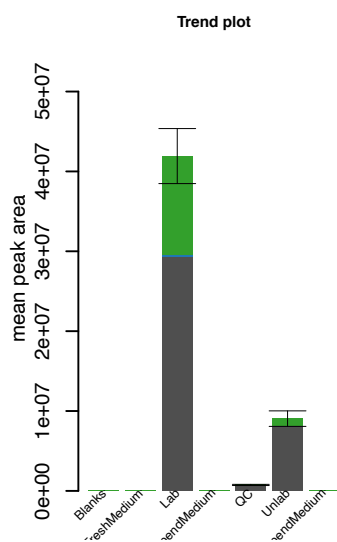
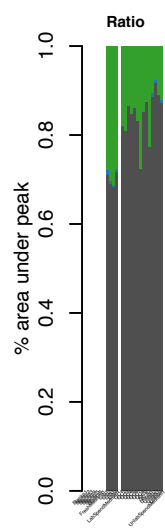
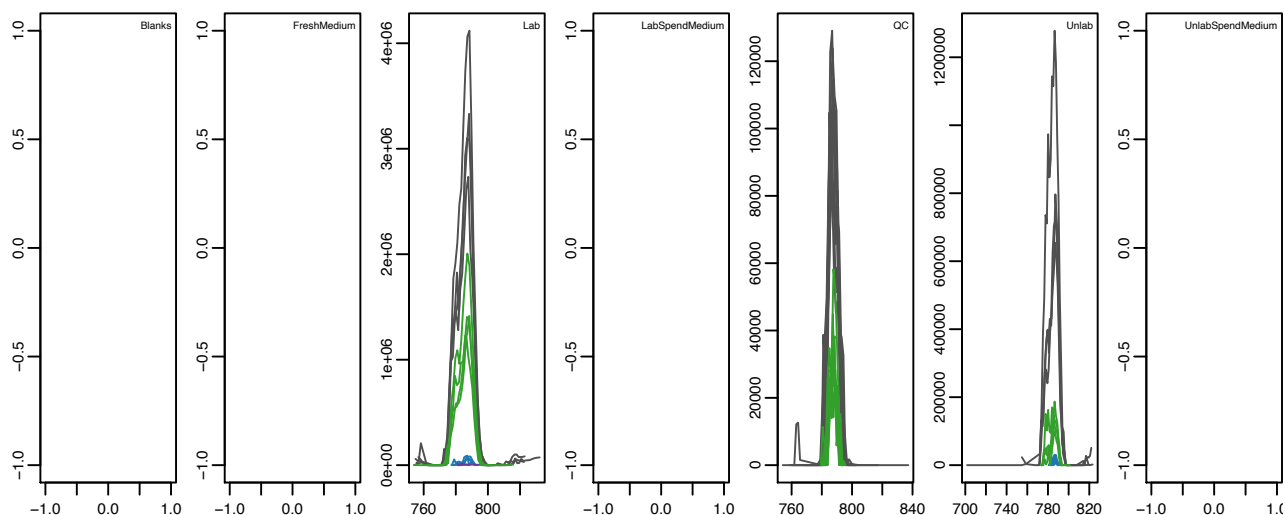


2-phospho-D-glycerate

Formula: C3H7O7P Mass: 185.993 Std.RT: 783 Ion: NEG

G1

■UL ■+1 ■+2 ■+3

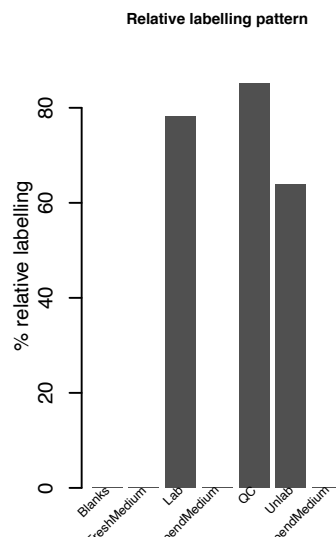
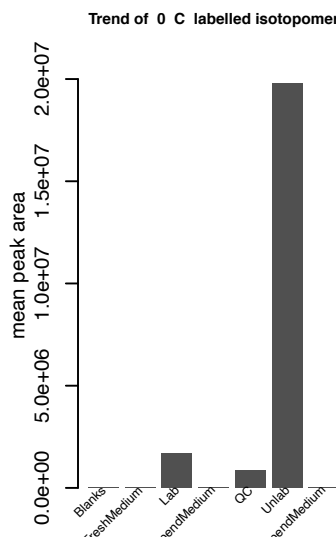
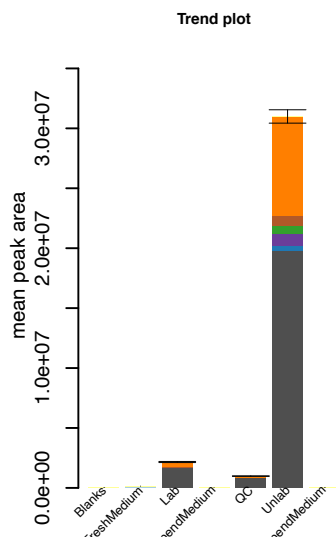
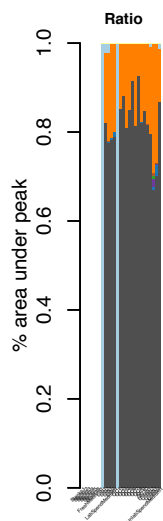
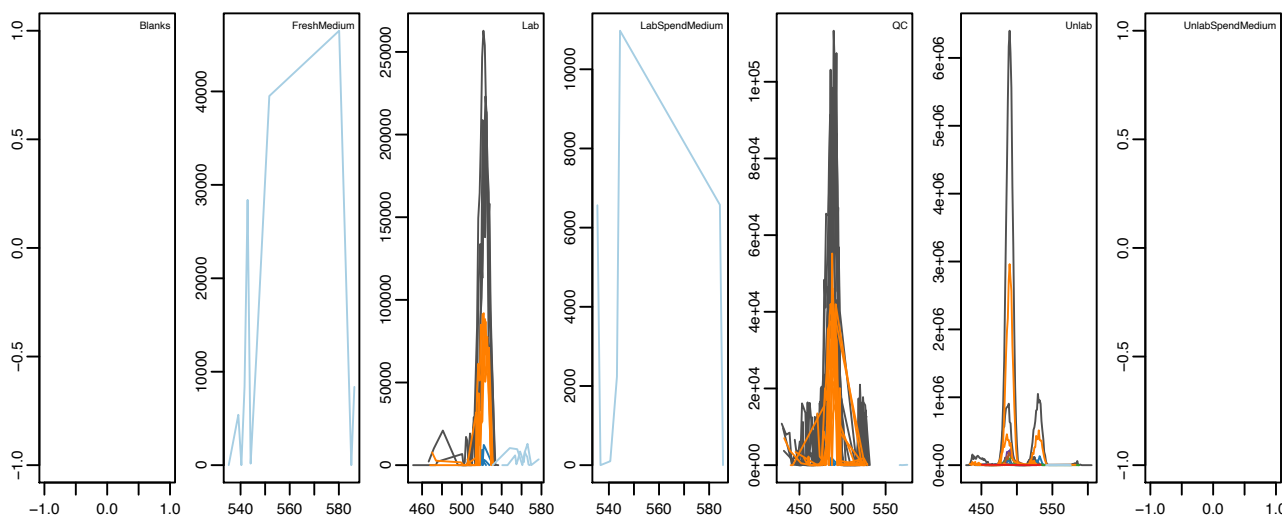


3'_5'-Cyclic AMP

Formula: C₁₀H₁₂N₅O₆P Mass: 329.053 Std.RT: 526.8 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6 ■ +7 ■ +8 ■ +9 ■ +10

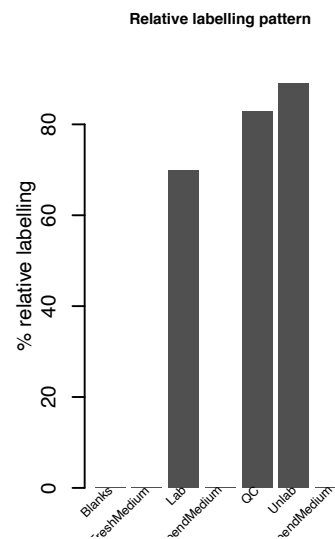
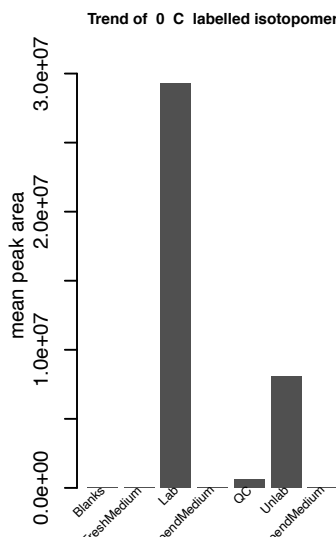
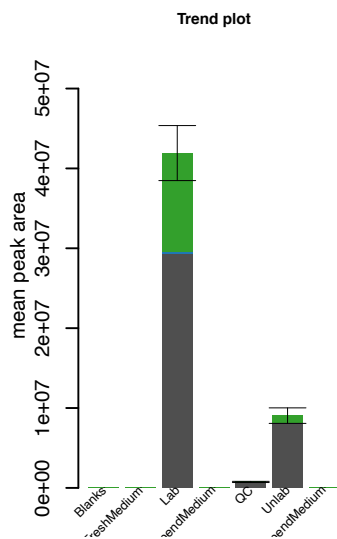
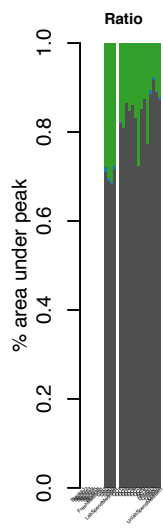
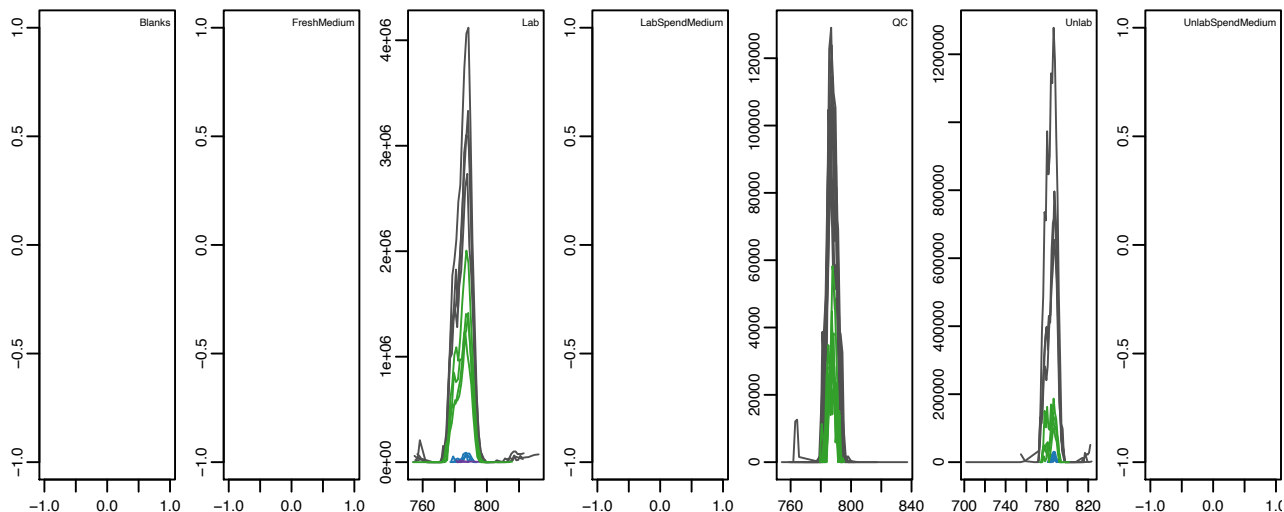


3-Phospho-D-glycerate

Formula: C3H7O7P Mass: 185.993 Std.RT: 788.4 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3

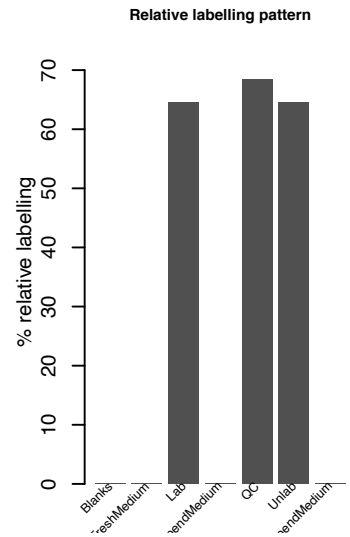
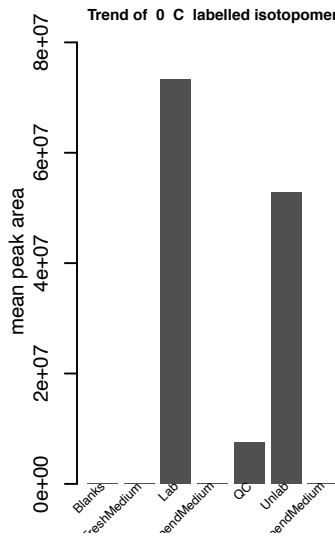
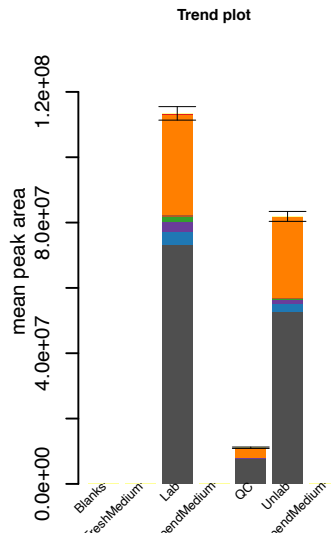
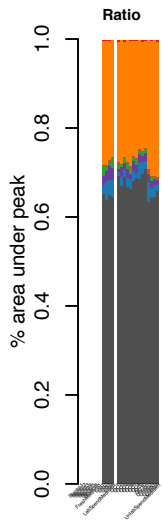
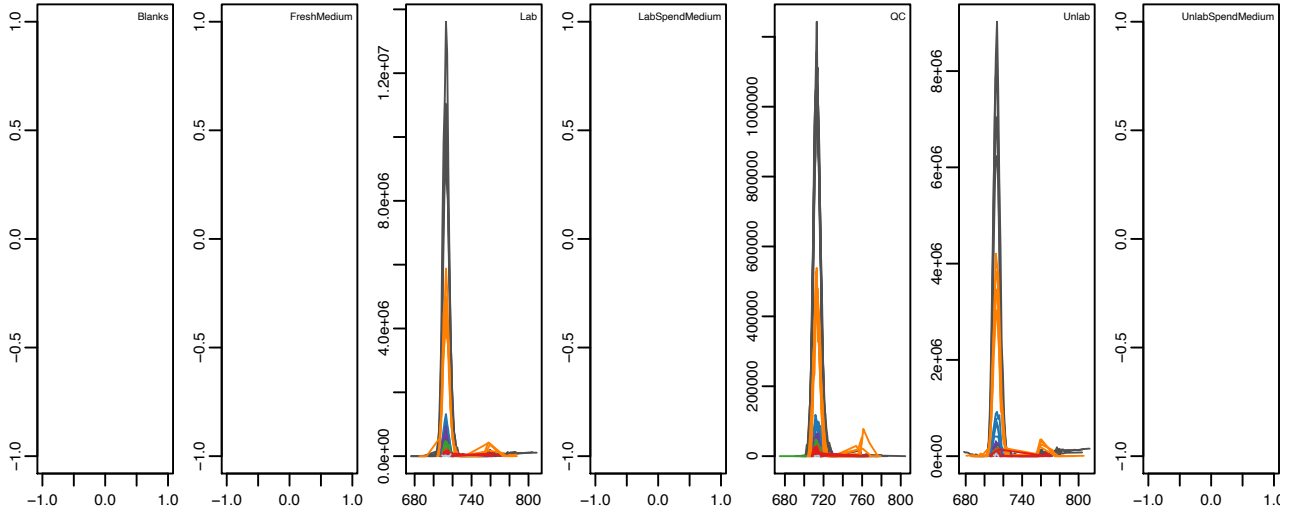


ADP

Formula: C₁₀H₁₅N₅O₁₀P₂ Mass: 427.029 Std.RT: 714 Ion: NEG

G1

■UL ■+1 ■+2 ■+3 ■+4 ■+5 ■+6 ■+7 ■+8 ■+9 ■+10

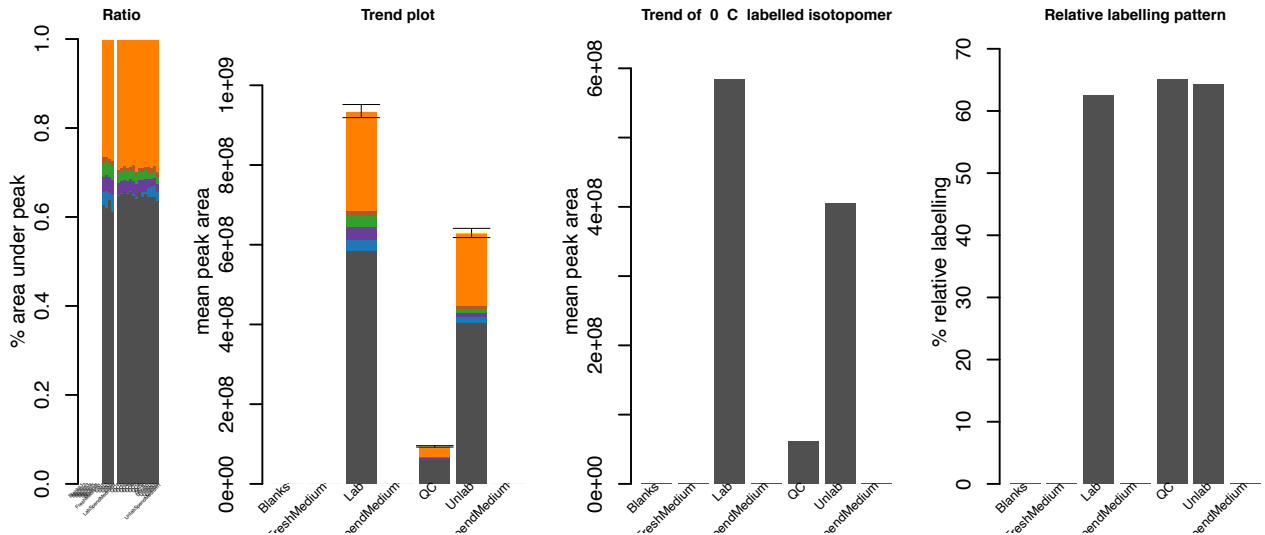
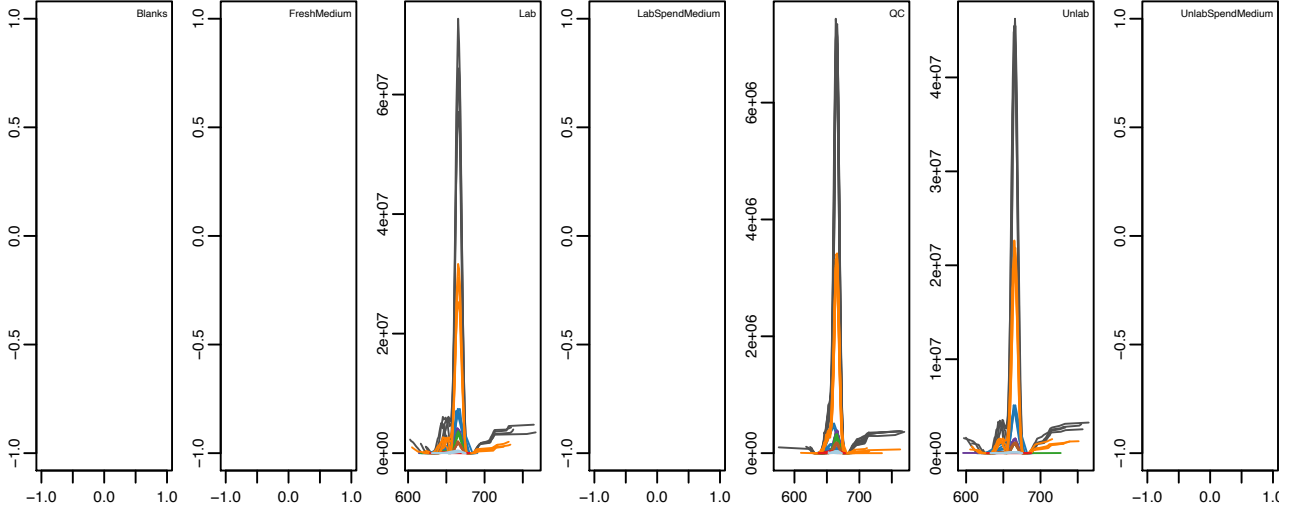


AMP

Formula: C₁₀H₁₄N₅O₇P Mass: 347.063 Std.RT: 670.8 Ion: NEG

G1

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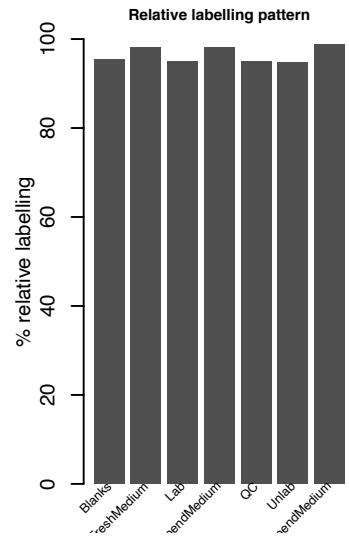
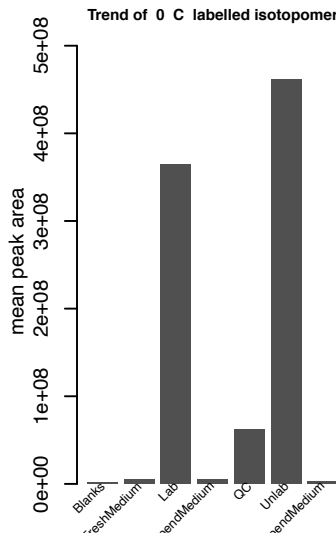
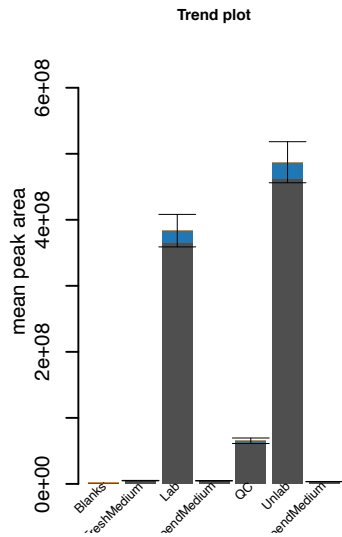
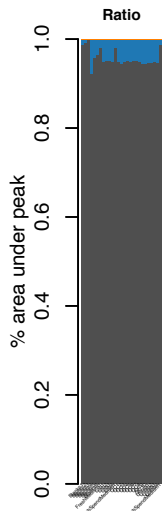
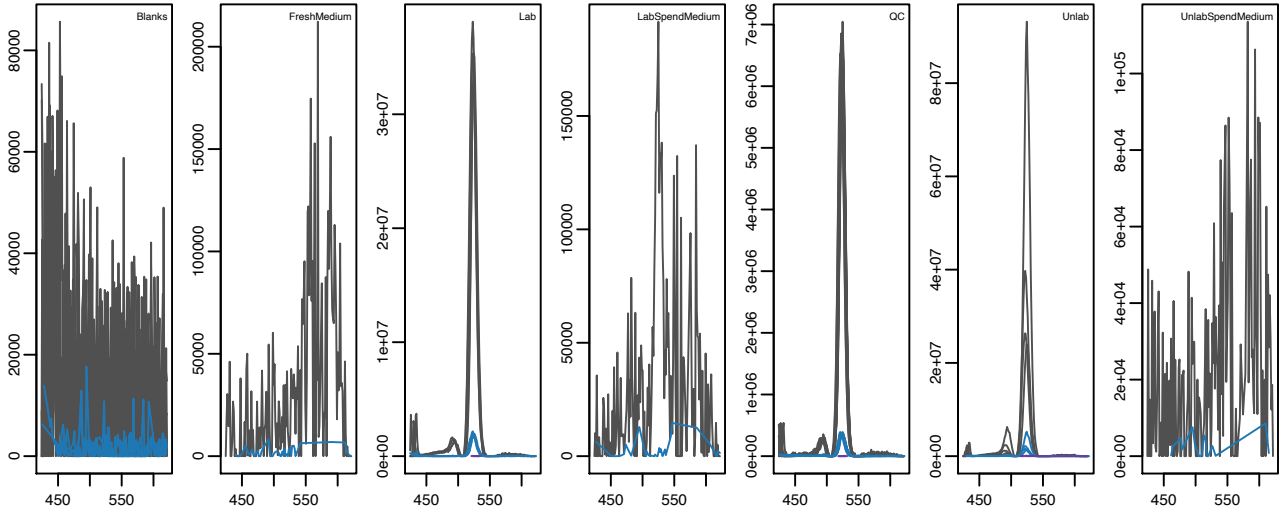


Adenine

Formula: C₅H₅N₅ Mass: 135.054 Std.RT: 523.8 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5

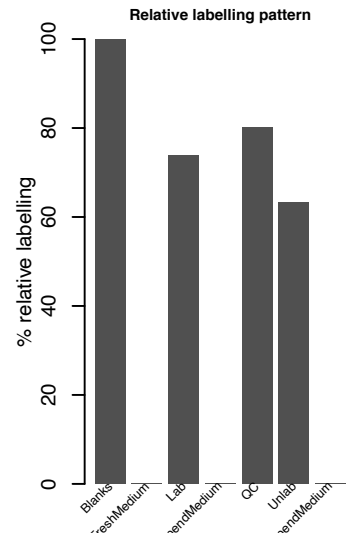
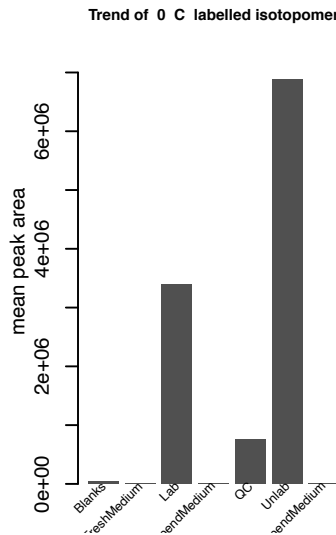
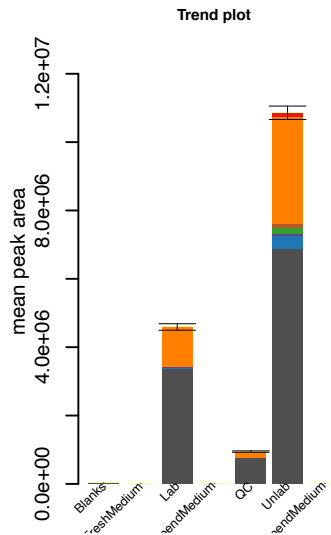
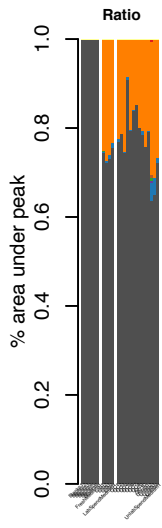
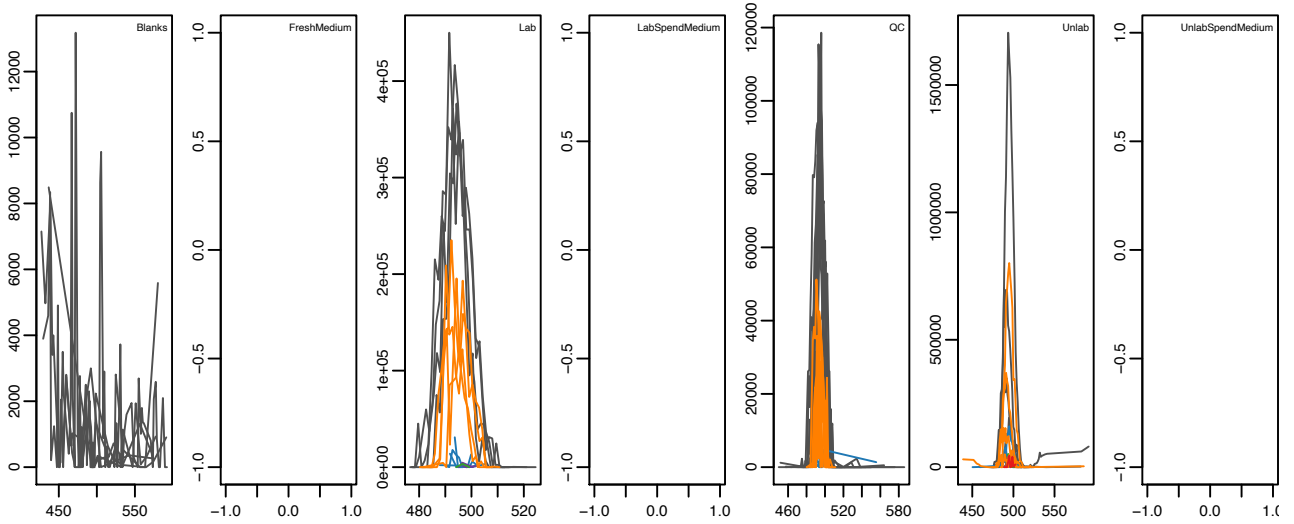


Adenosine

Formula: C₁₀H₁₃N₅O₄ Mass: 267.097 Std.RT: 494.4 Ion: NEG

G1

■UL ■+1 ■+2 ■+3 ■+4 ■+5 ■+6 ■+7 ■+8 ■+9 ■+10

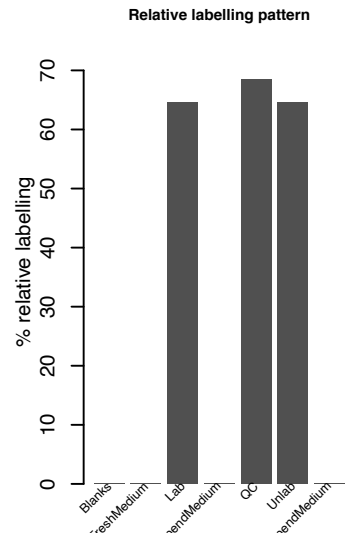
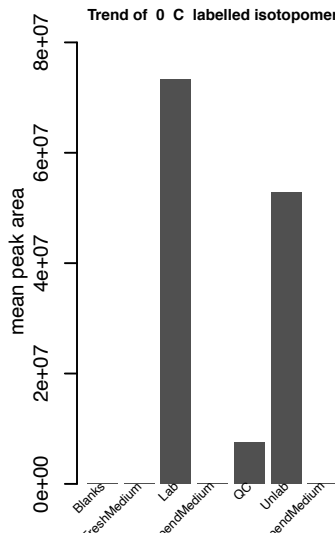
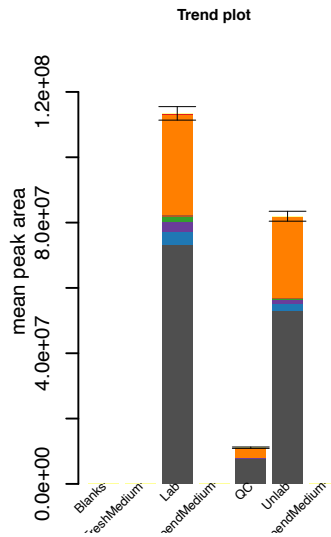
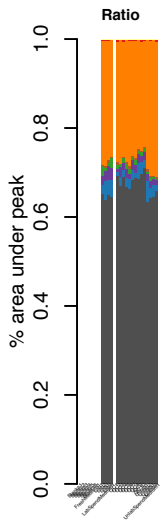
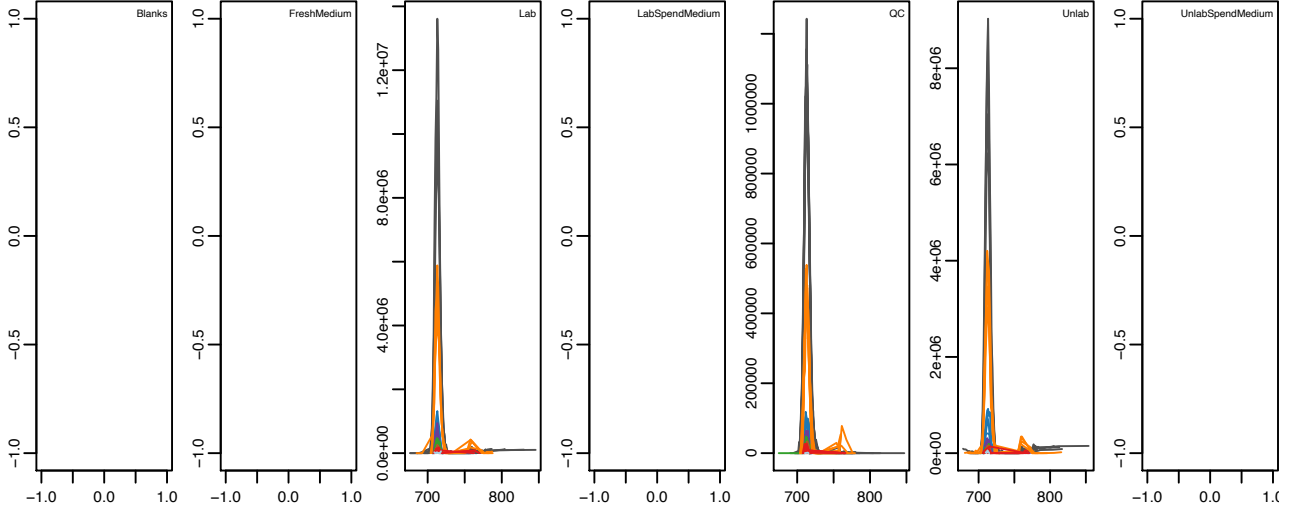


Adenosine 2'_5'-bisphosphate

Formula: C₁₀H₁₅N₅O₁₀P₂ Mass: 427.029 Std.RT: 761.4 Ion: NEG

G1

■UL ■+1 ■+2 ■+3 ■+4 ■+5 ■+6 ■+7 ■+8 ■+9 ■+10

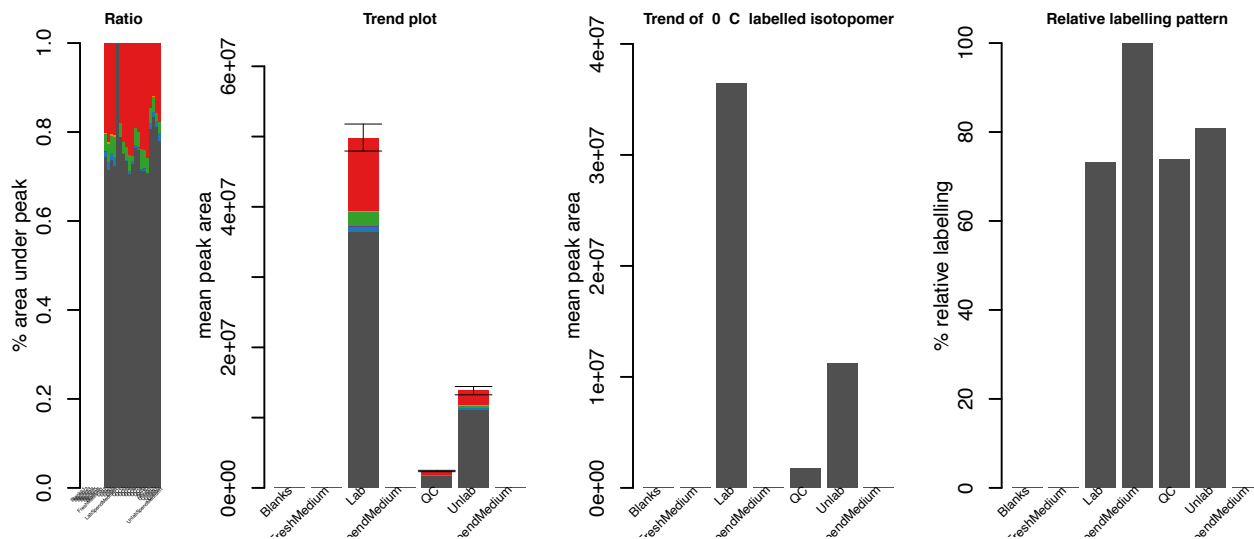
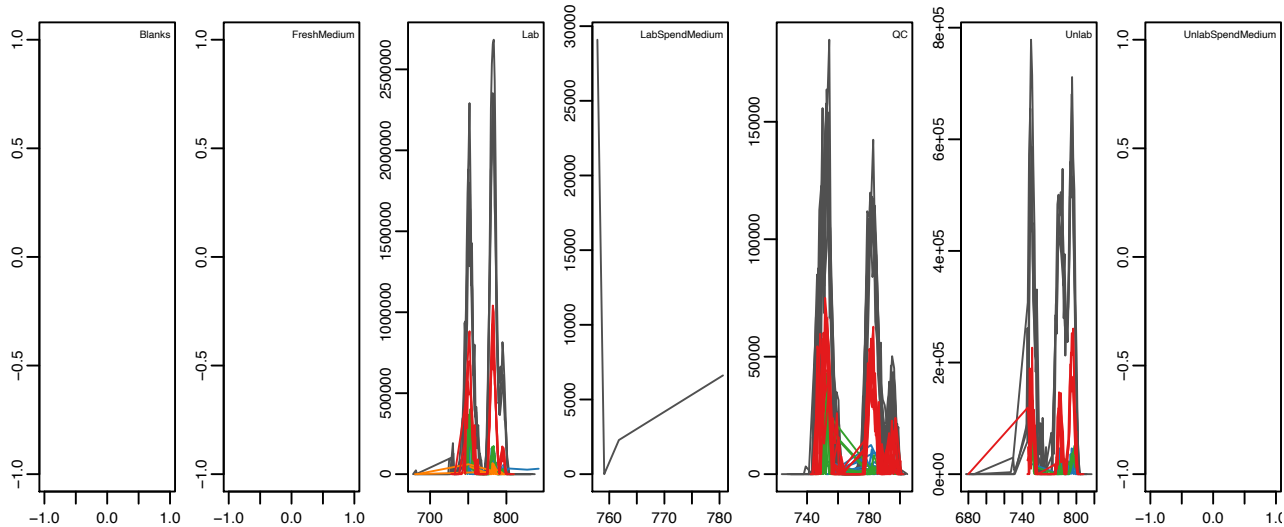


D-Fructose 6-phosphate

Formula: C₆H₁₃O₉P Mass: 260.03 Std.RT: 754.8 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6

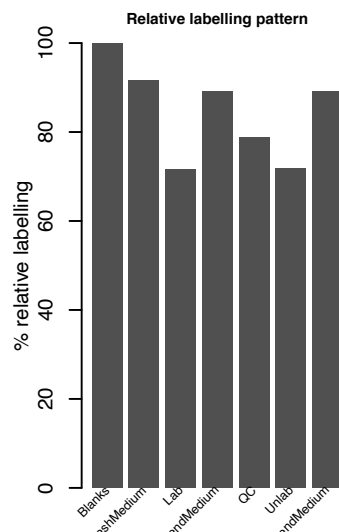
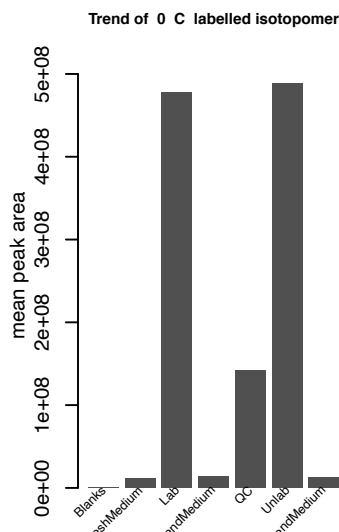
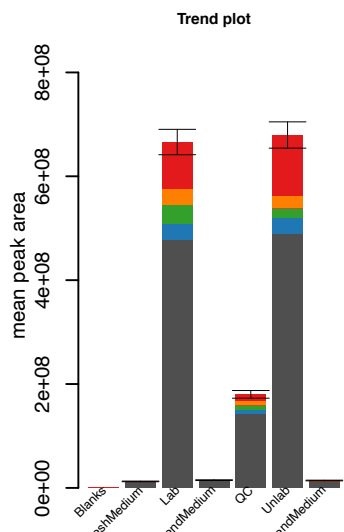
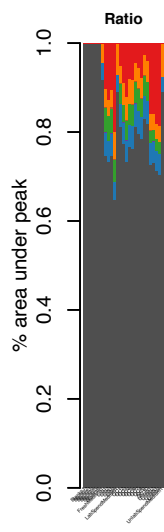
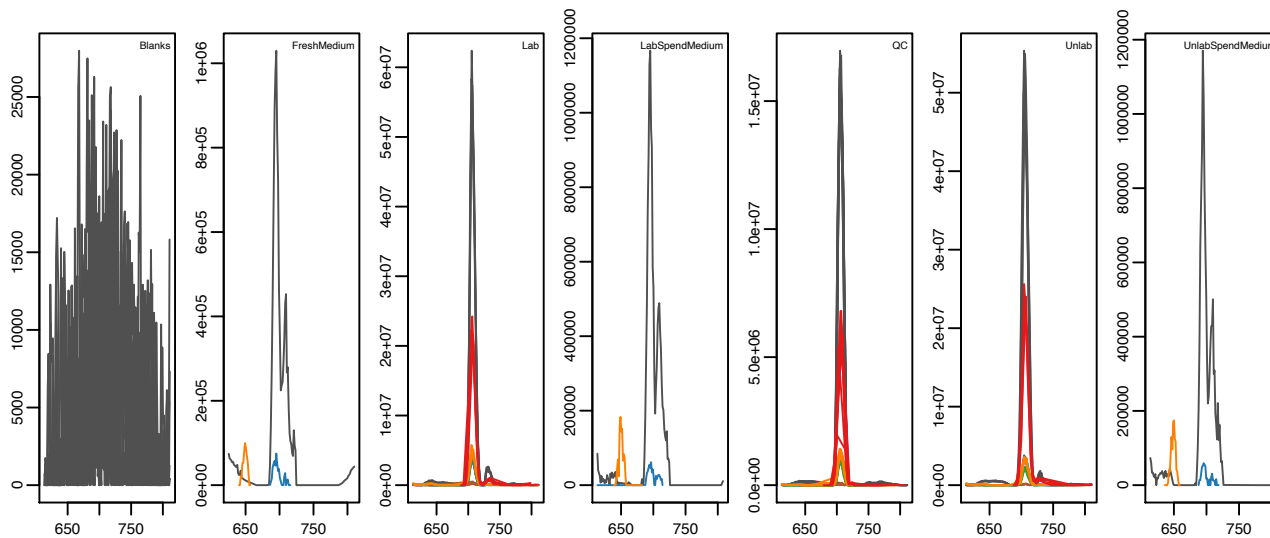


D-Gluconic acid

Formula: C₆H₁₂O₇ Mass: 196.058 Std.RT: 712.8 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6

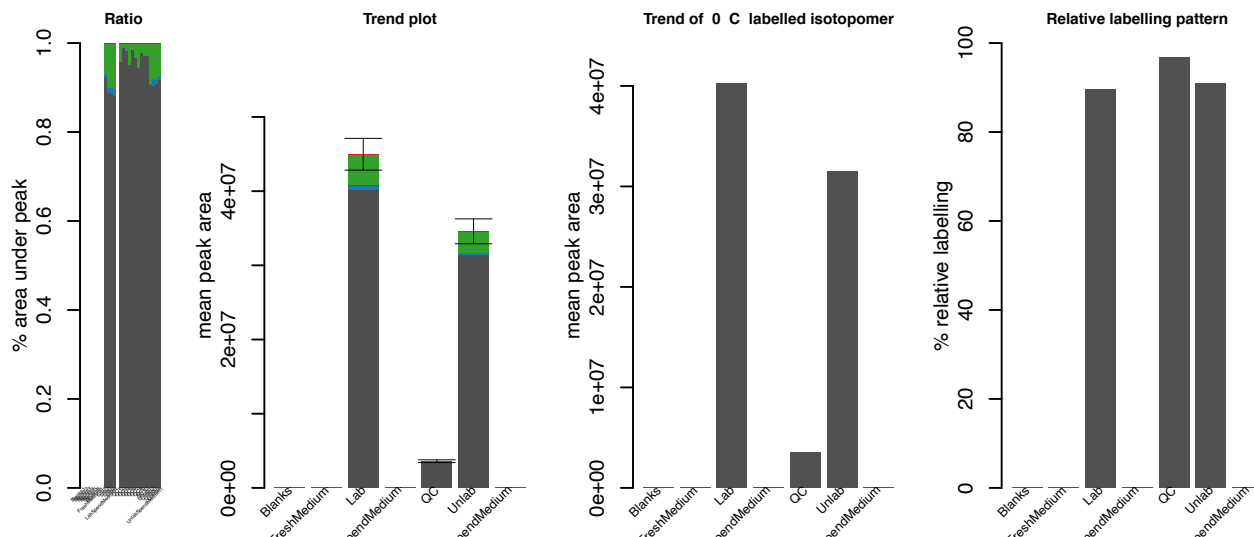
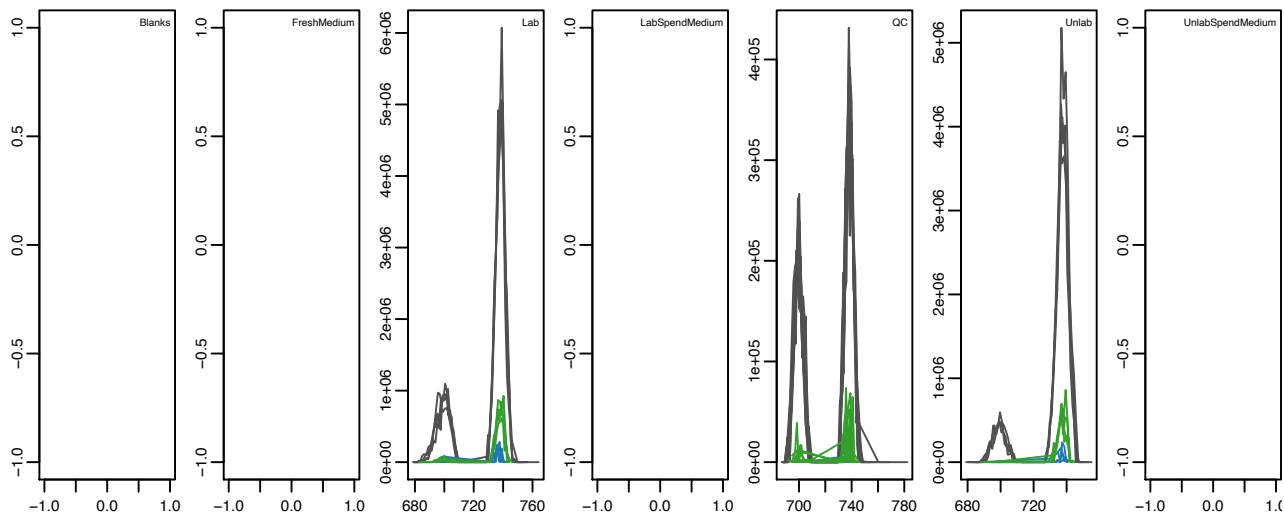


D-Glucosamine-6-phosphate

Formula: C₆H₁₄NO₈P Mass: 259.046 Std.RT: 759 Ion: NEG

G1

■UL ■+1 ■+2 ■+3 ■+4 ■+5 ■+6

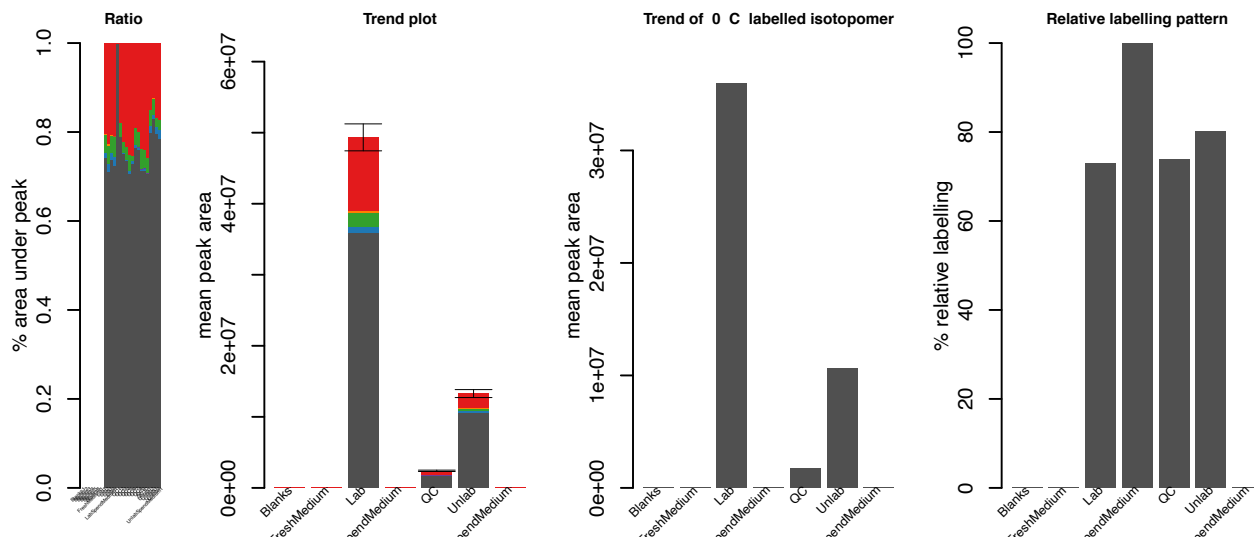
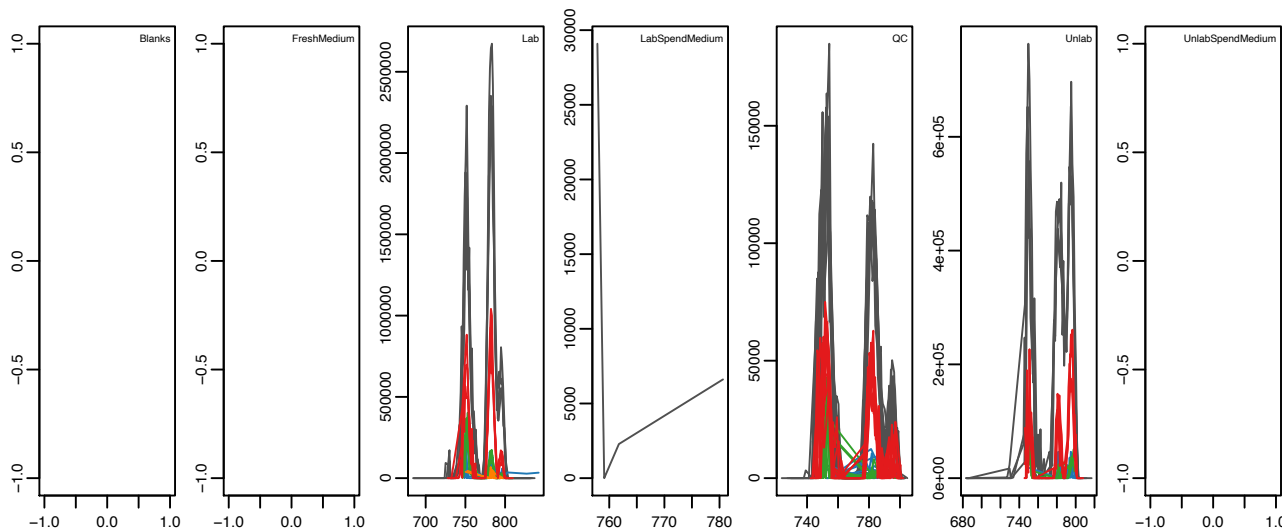


D-glucose 6-phosphate

Formula: C₆H₁₃O₉P Mass: 260.03 Std.RT: 783 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6

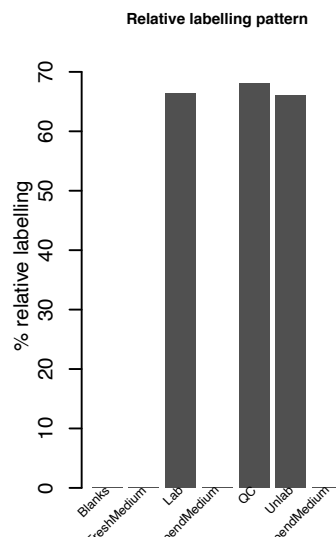
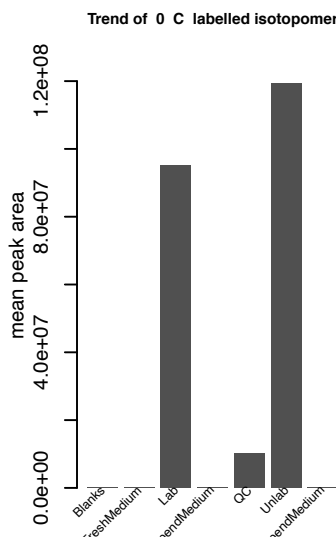
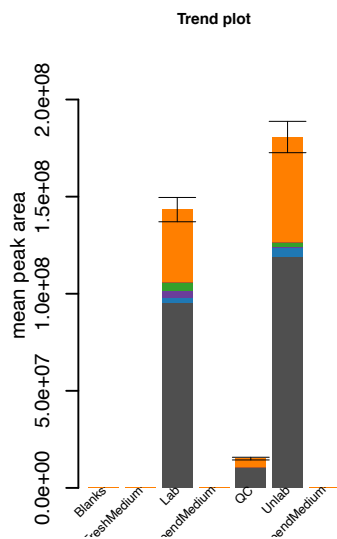
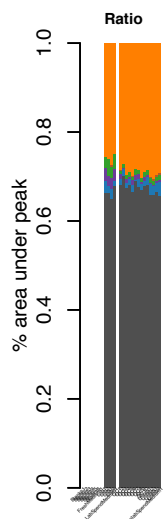
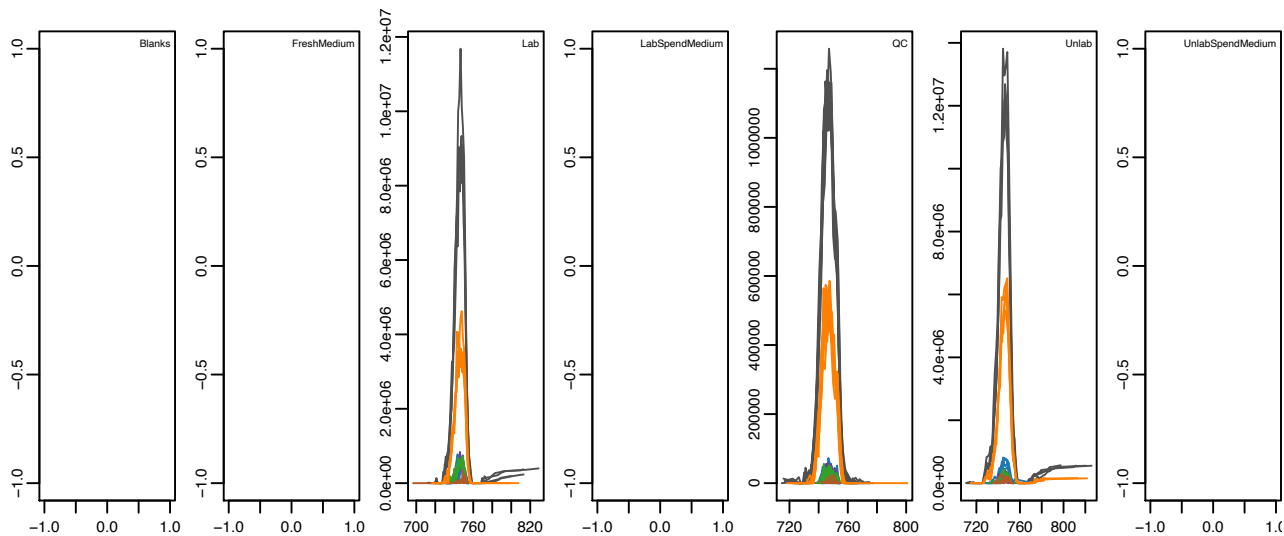


D-ribose 5-phosphate

Formula: C₅H₁₁O₈P Mass: 230.019 Std.RT: 750 Ion: NEG

G1

■UL ■+1 ■+2 ■+3 ■+4 ■+5

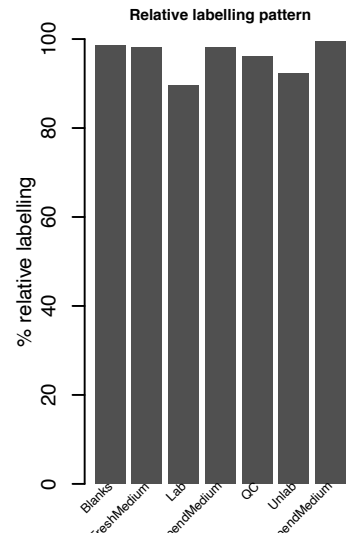
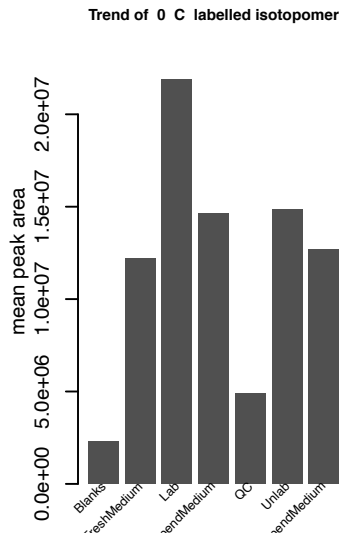
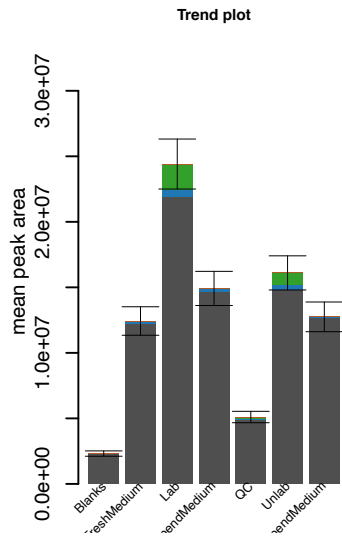
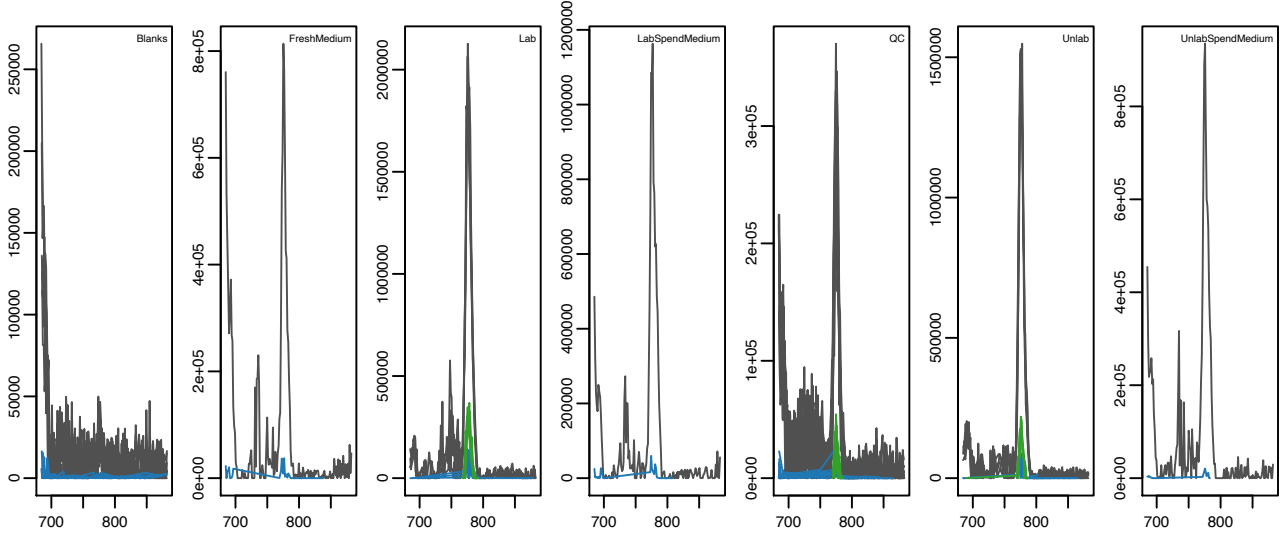


Fumarate

Formula: C₄H₄O₄ Mass: 116.011 Std.RT: 784.2 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4

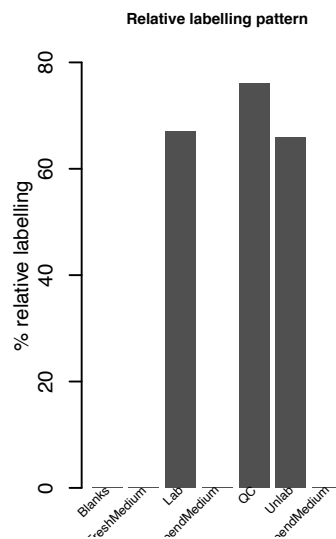
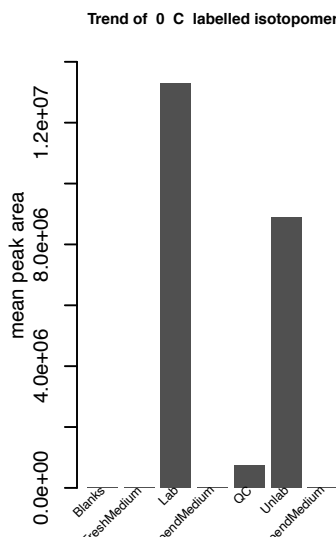
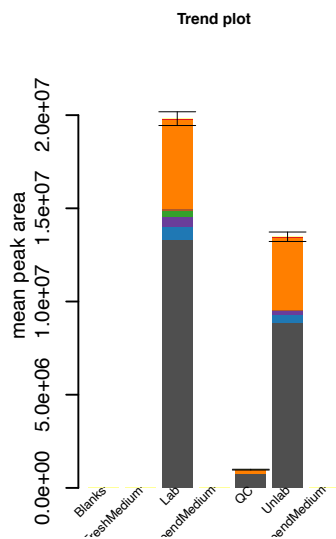
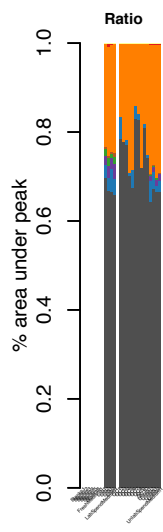
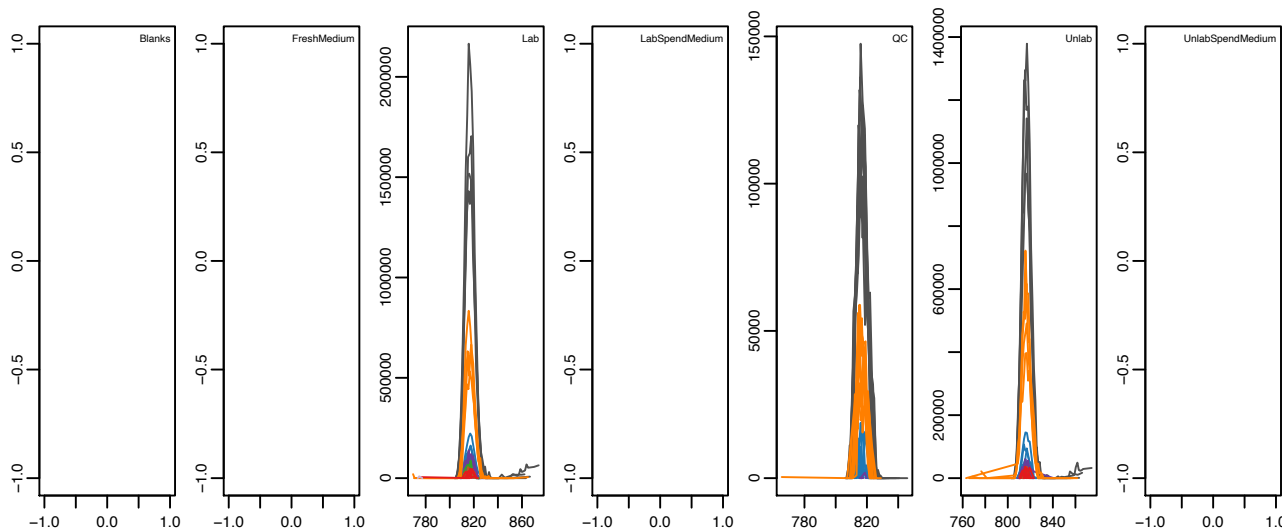


GDP

Formula: C₁₀H₁₅N₅O₁₁P₂ Mass: 443.024 Std.RT: 816 Ion: NEG

G1

■UL ■+1 ■+2 ■+3 ■+4 ■+5 ■+6 ■+7 ■+8 ■+9 ■+10

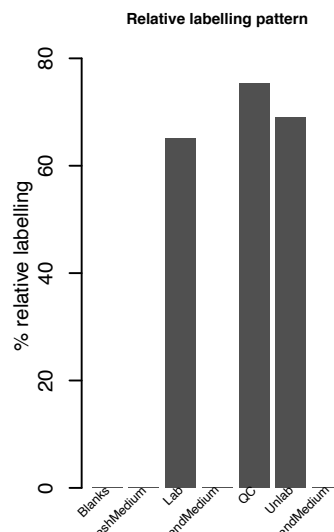
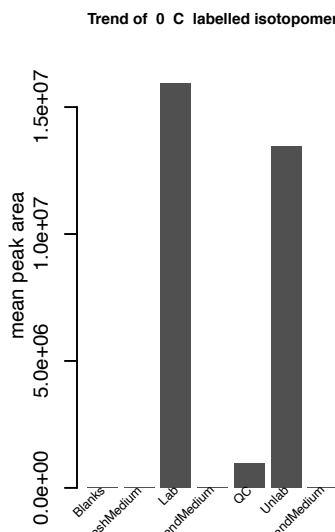
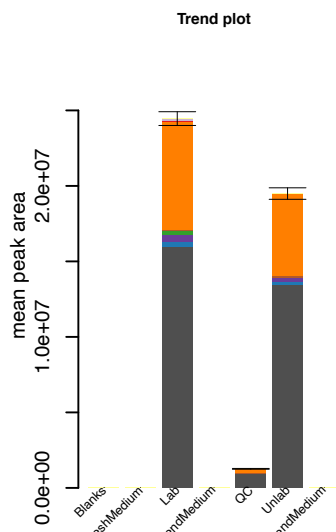
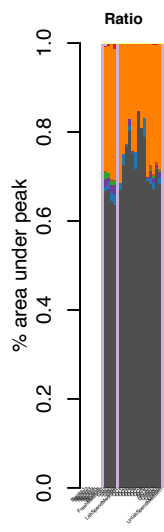
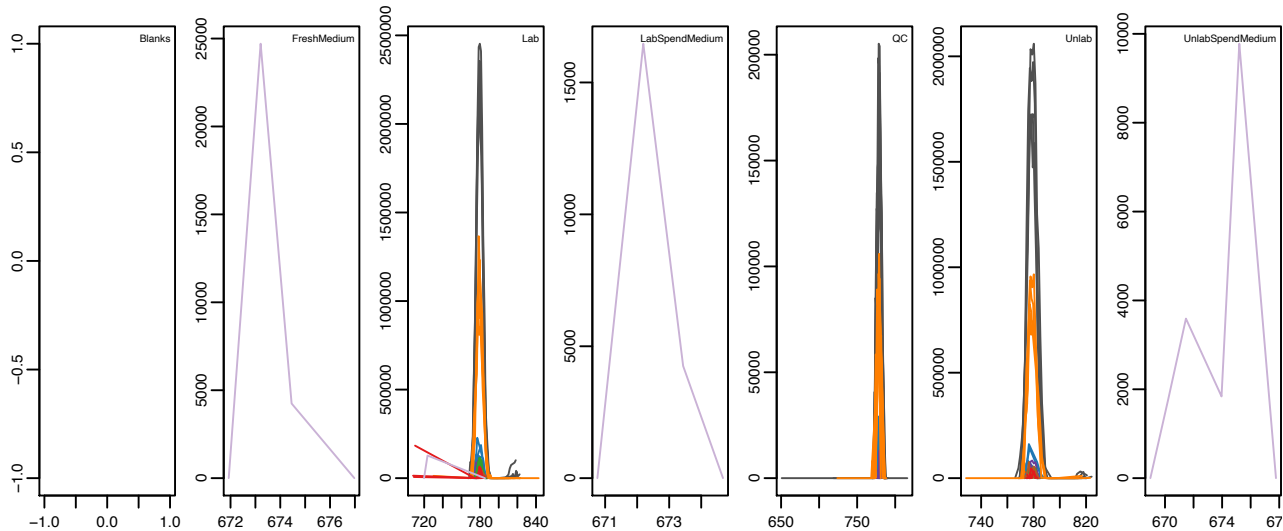


GMP

Formula: C₁₀H₁₄N₅O₈P Mass: 363.058 Std.RT: 747 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6 ■ +7 ■ +8 ■ +9 ■ +10

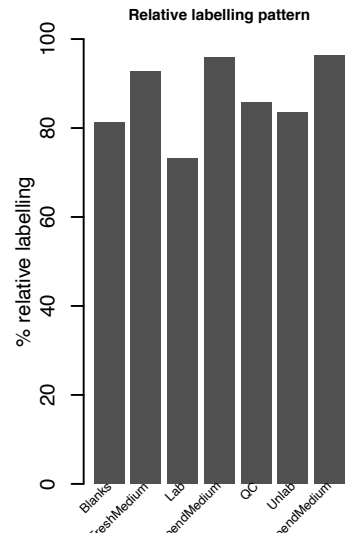
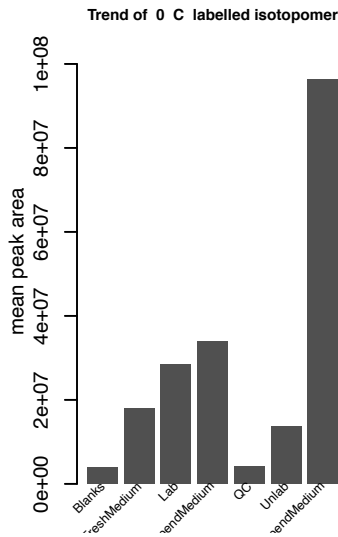
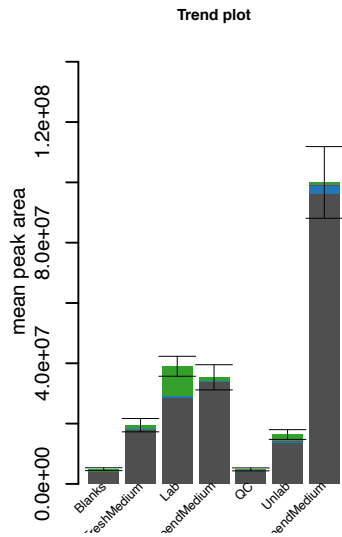
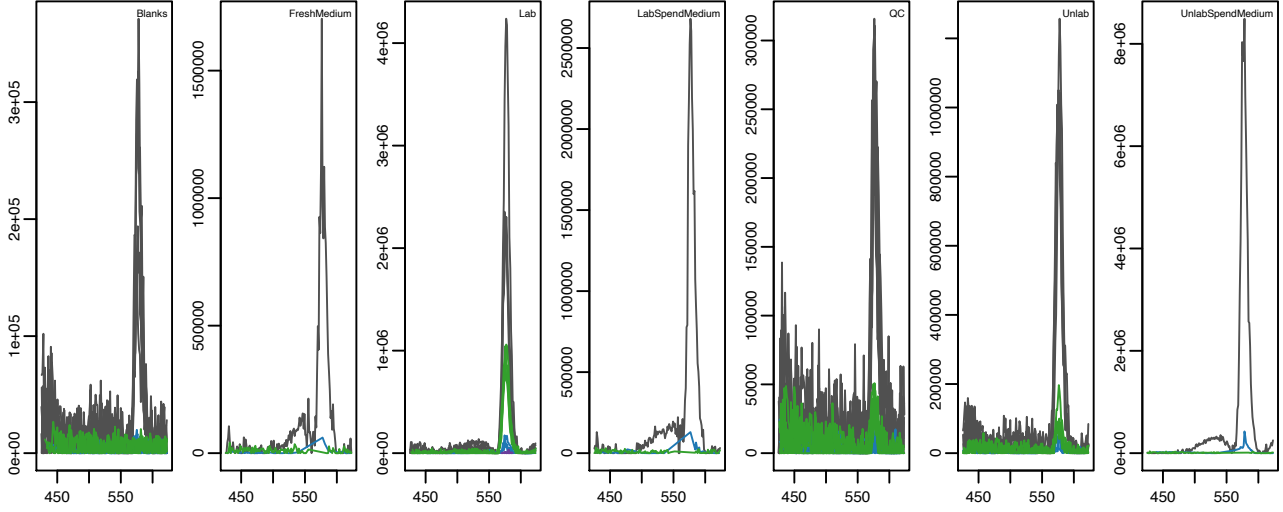


Glycerol

Formula: C₃H₈O₃ Mass: 92.047 Std.RT: 525 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3

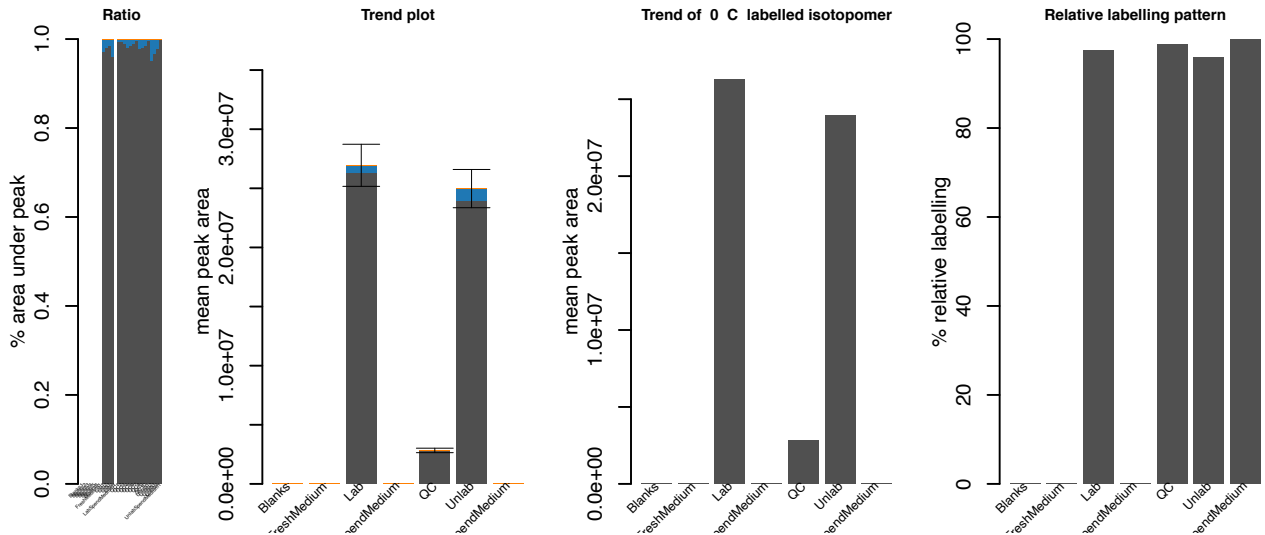
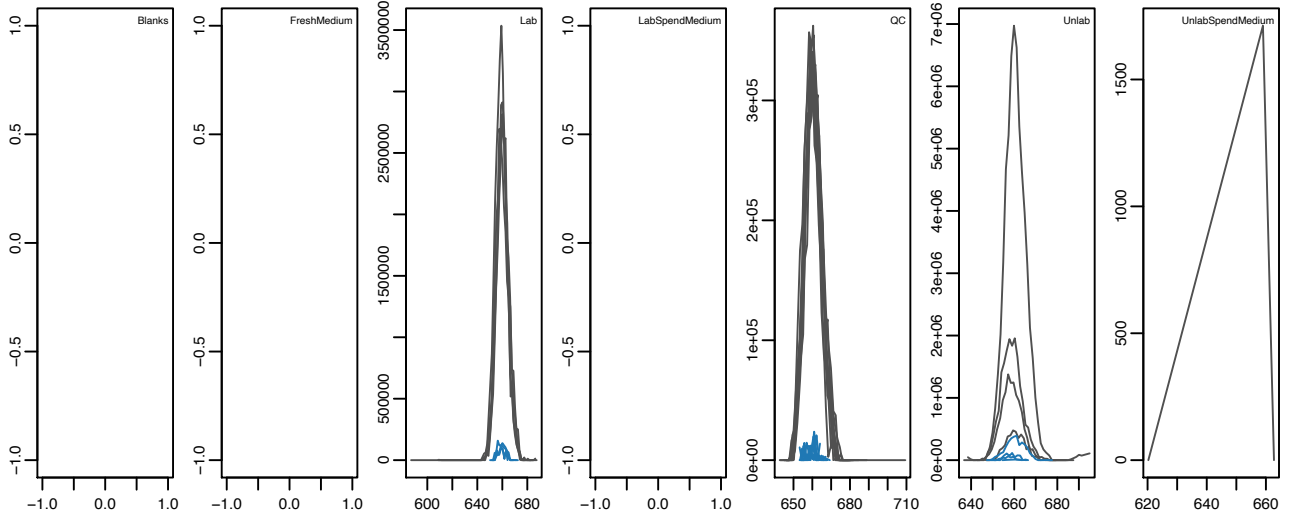


Guanine

Formula: C₅H₅N₅O Mass: 151.049 Std.RT: 664.2 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5

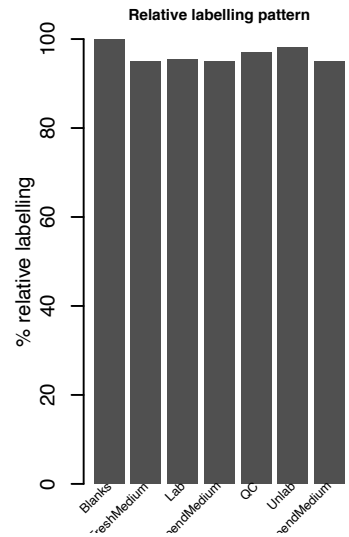
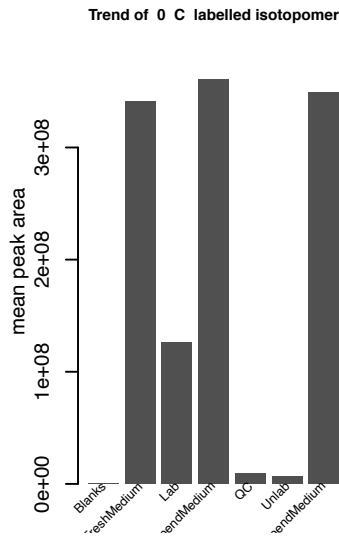
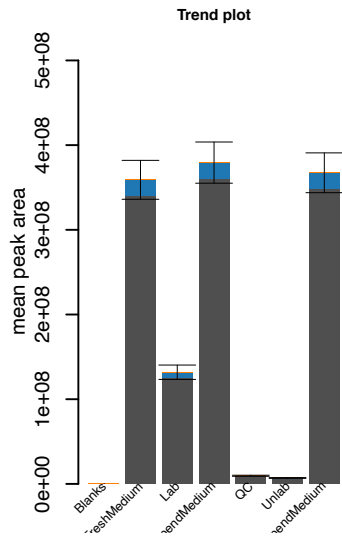
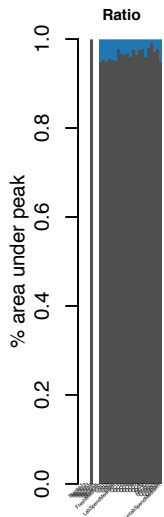
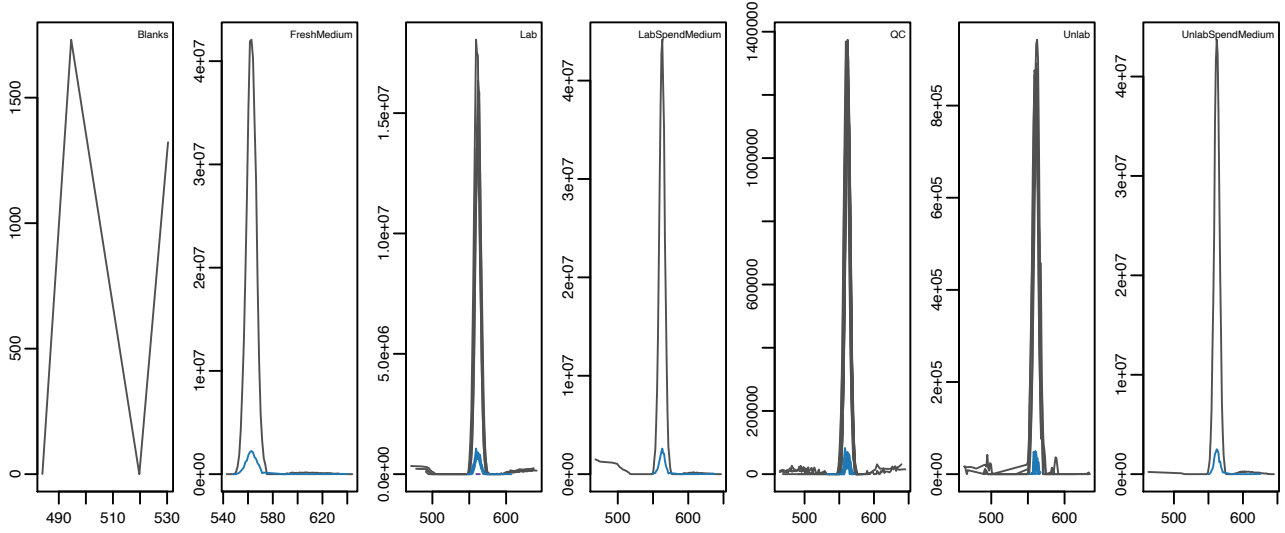


Hypoxanthine

Formula: C₅H₄N₄O Mass: 136.039 Std.RT: 562.2 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5

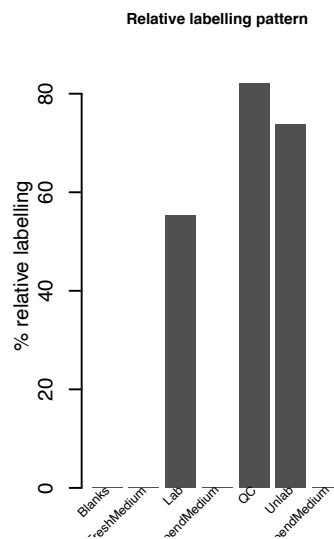
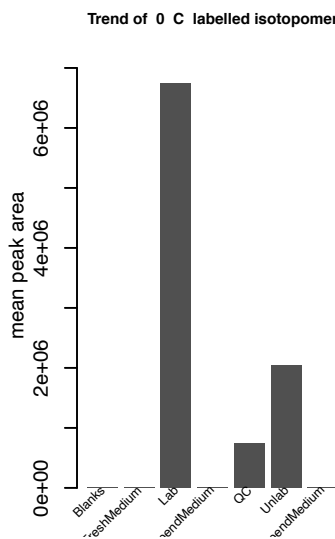
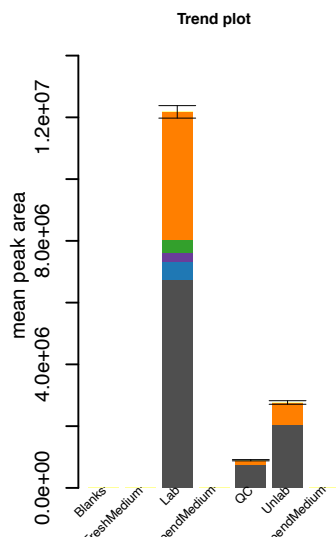
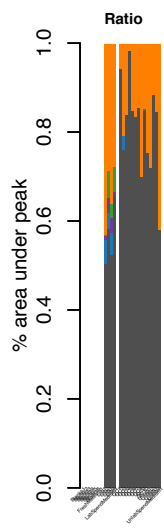
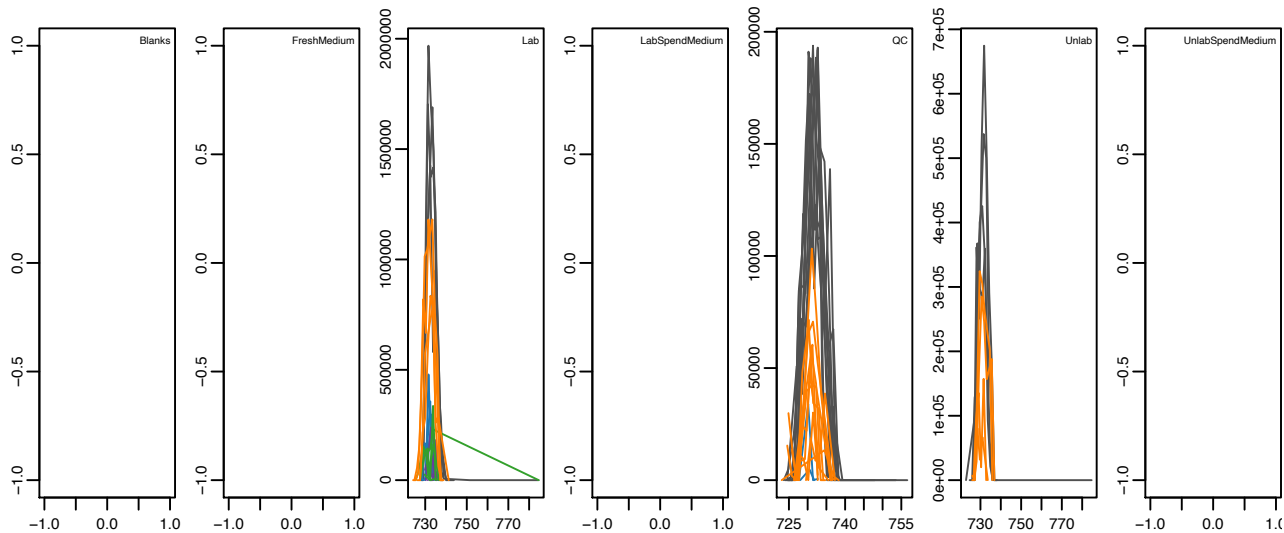


IMP

Formula: C₁₀H₁₃N₄O₈P Mass: 348.047 Std.RT: 732.6 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6 ■ +7 ■ +8 ■ +9 ■ +10

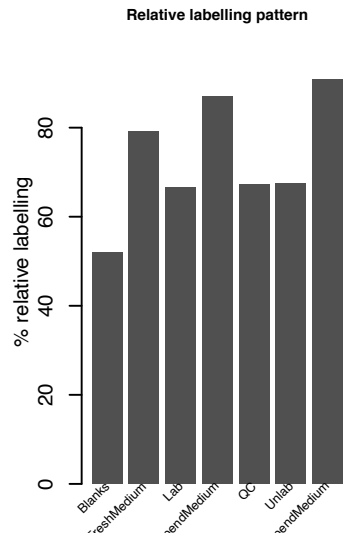
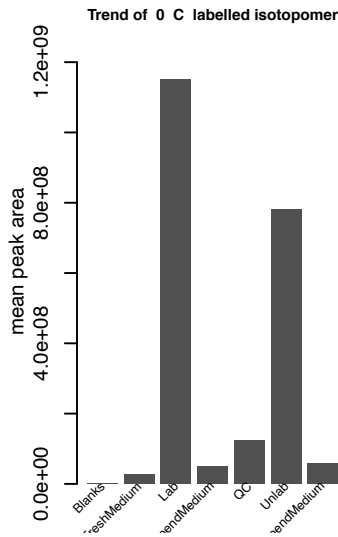
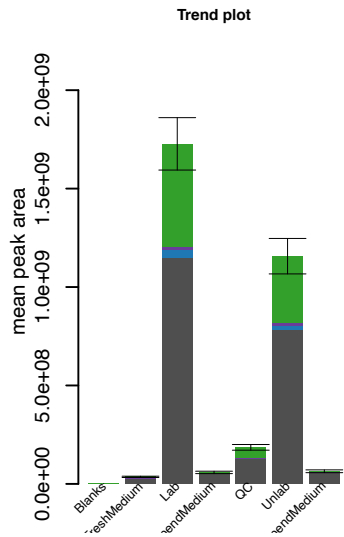
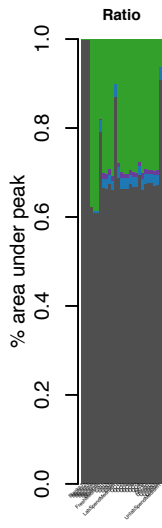
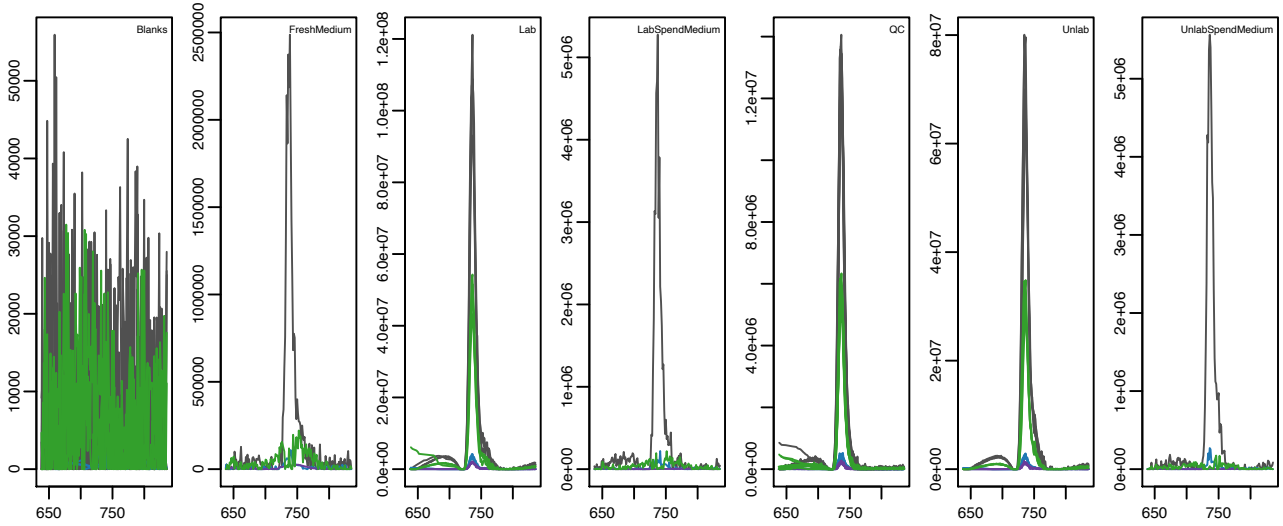


L-Alanine

Formula: C₃H₇NO₂ Mass: 89.048 Std.RT: 737.4 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3

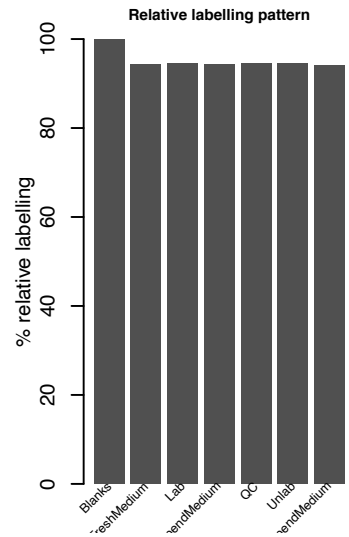
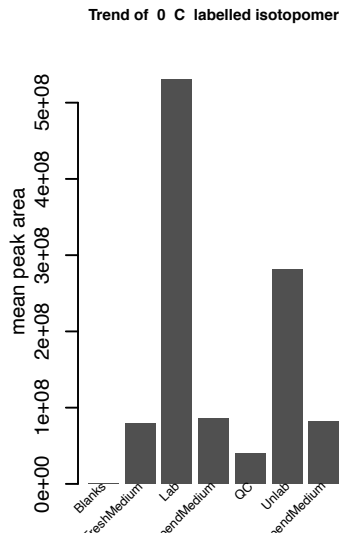
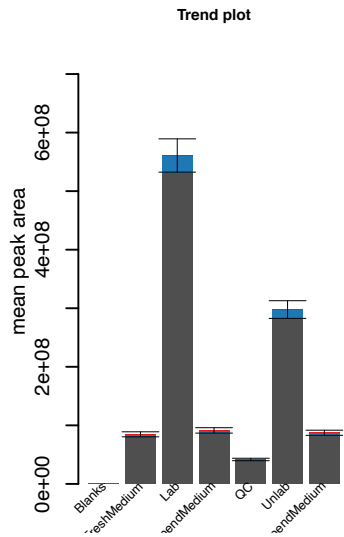
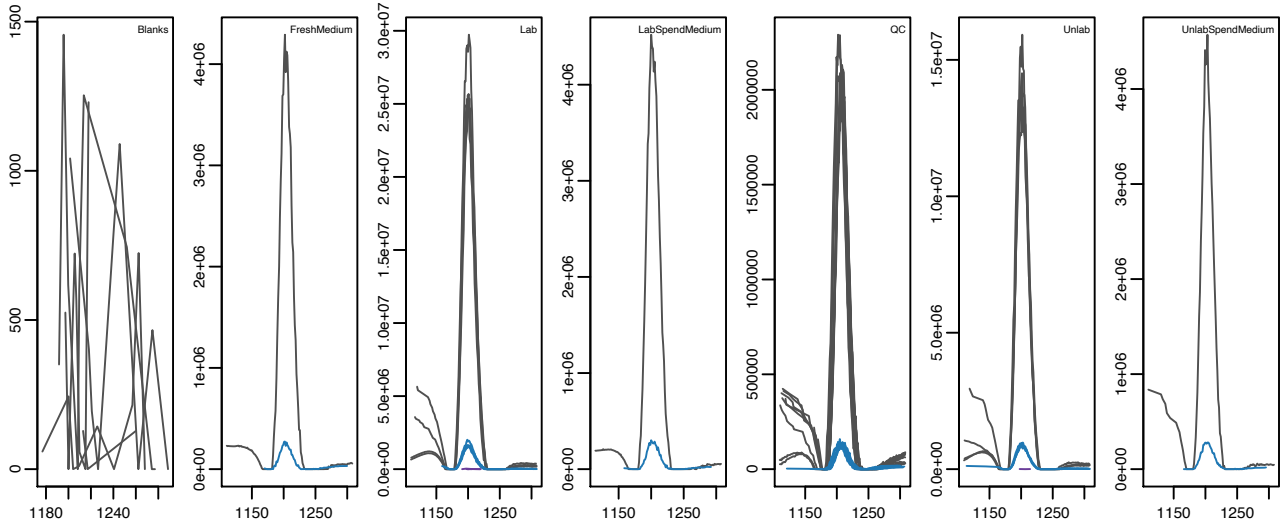


L-Arginine

Formula: C₆H₁₄N₄O₂ Mass: 174.112 Std.RT: 1209.6 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6

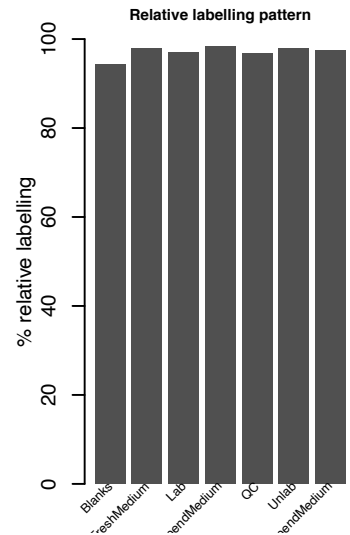
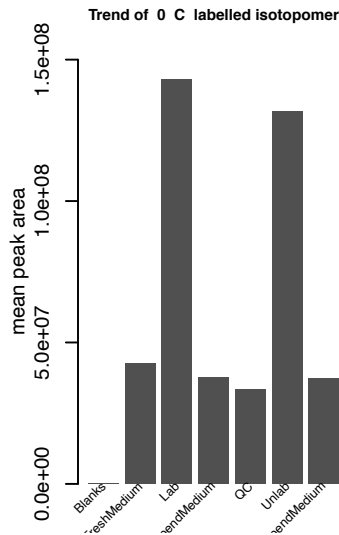
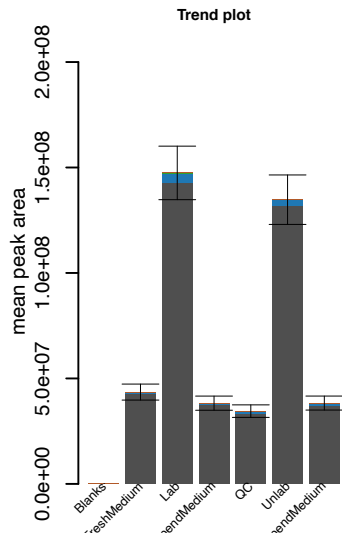
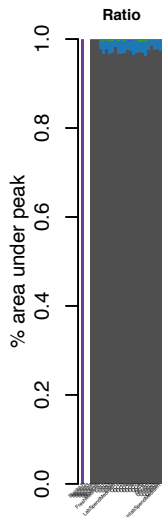
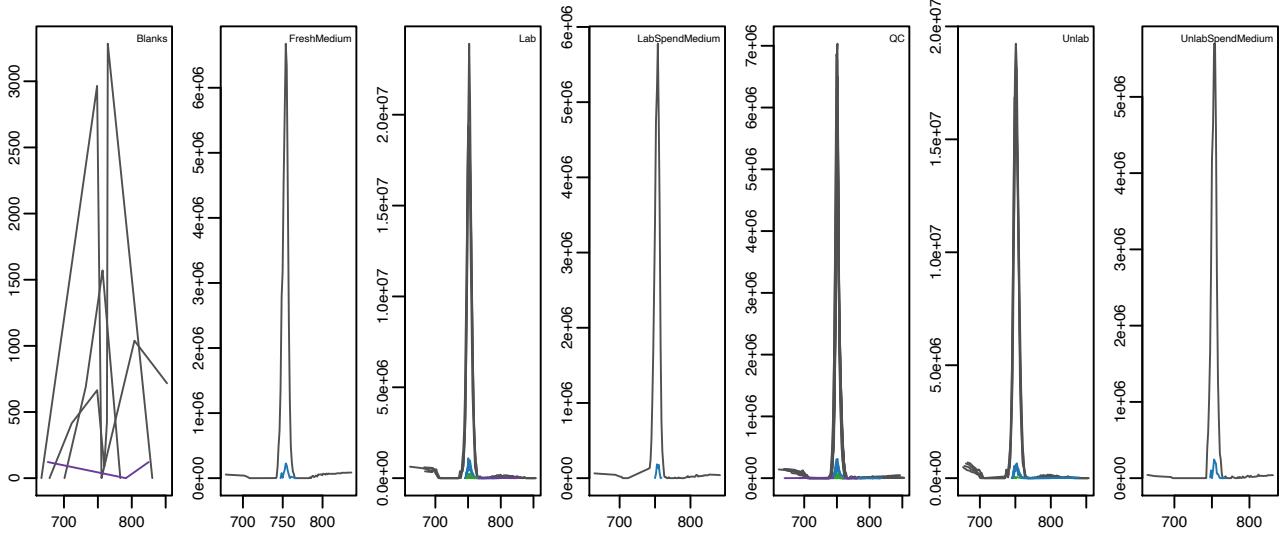


L-Asparagine

Formula: C₄H₈N₂O₃ Mass: 132.053 Std.RT: 754.8 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4

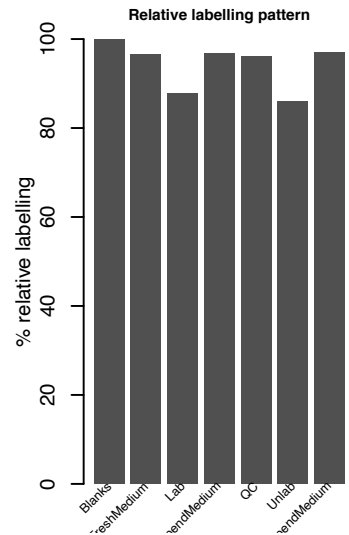
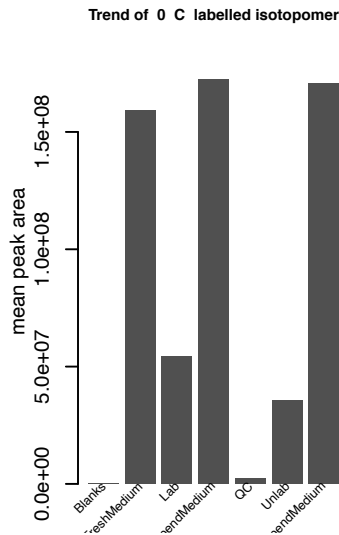
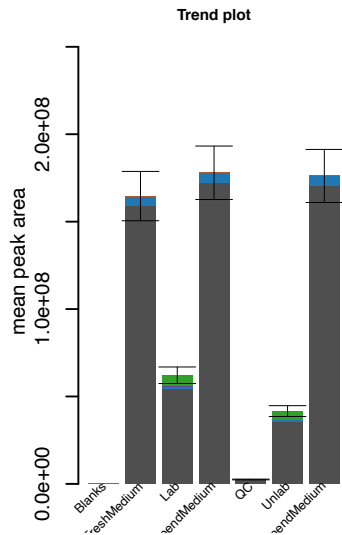
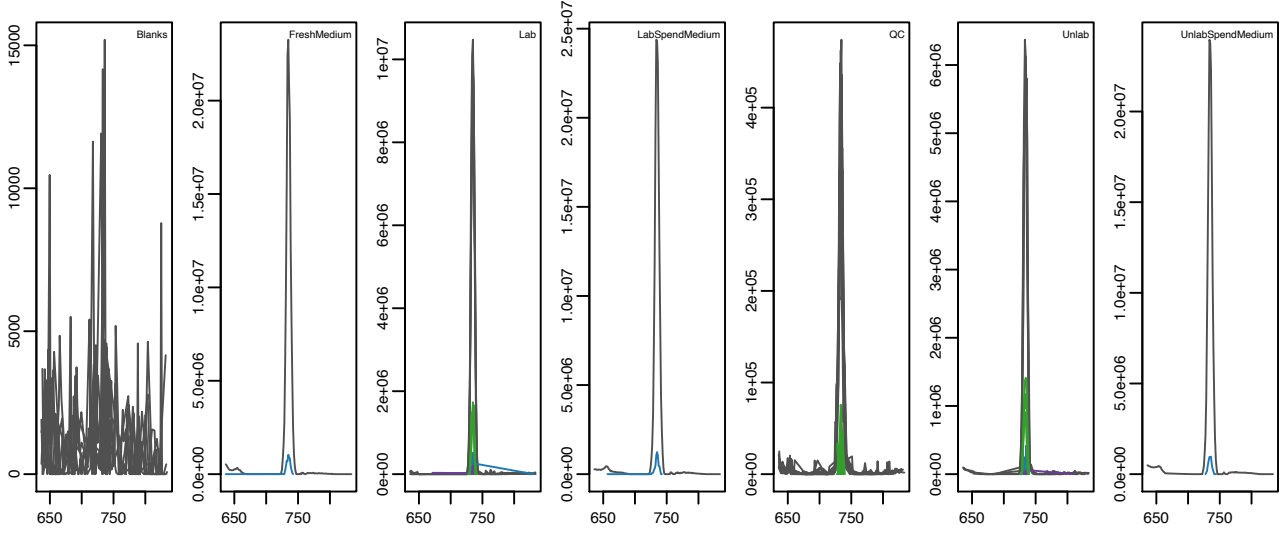


L-Aspartate

Formula: C₄H₇NO₄ Mass: 133.038 Std.RT: 735.6 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4

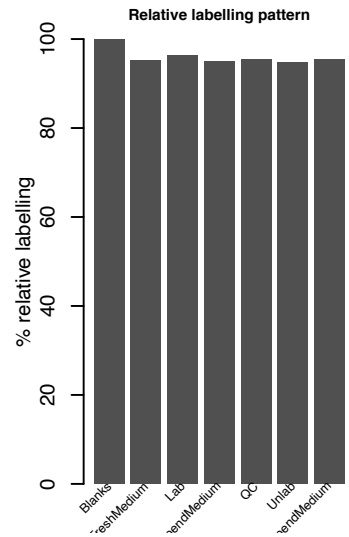
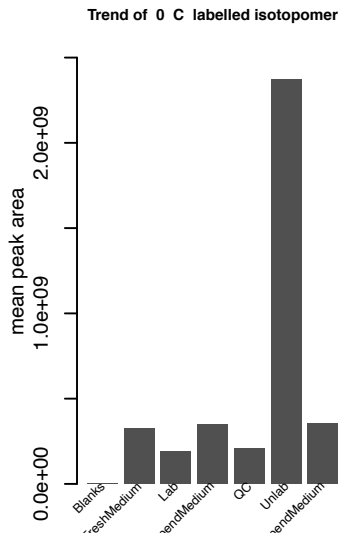
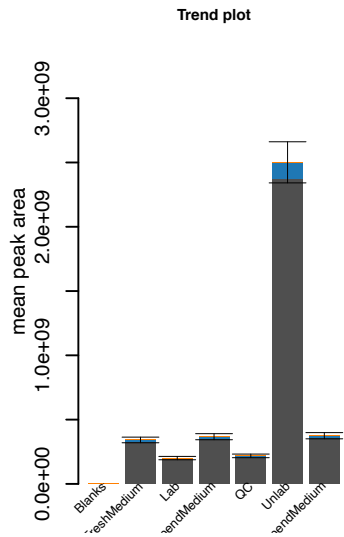
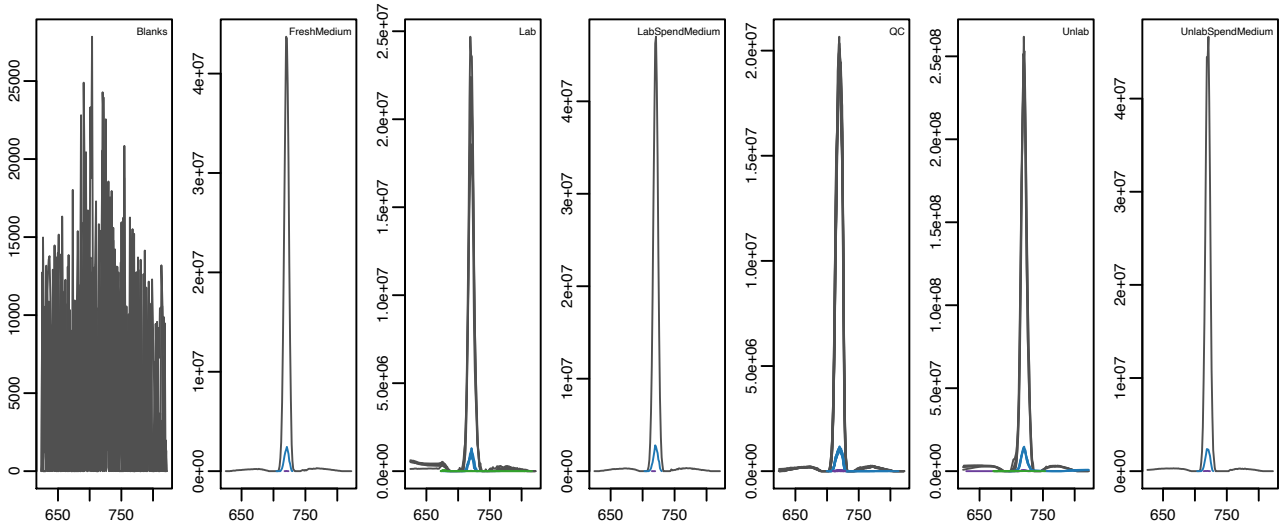


L-Glutamate

Formula: C₅H₉NO₄ Mass: 147.053 Std.RT: 723.6 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5

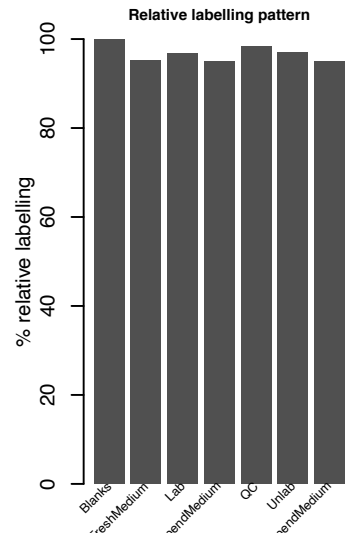
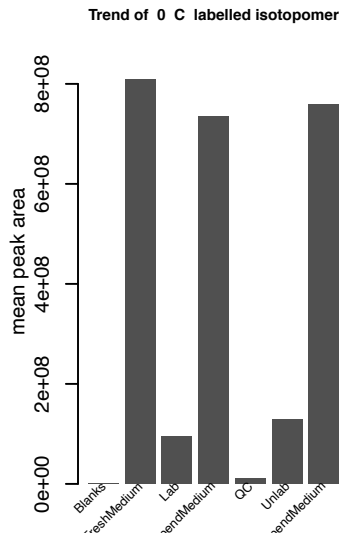
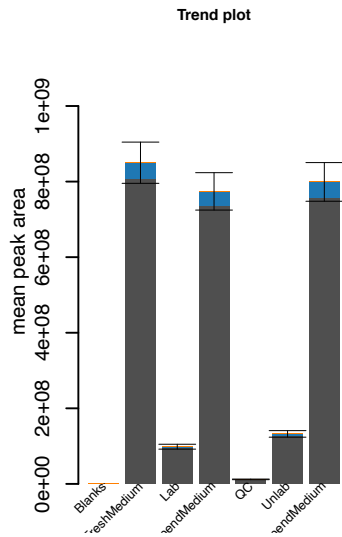
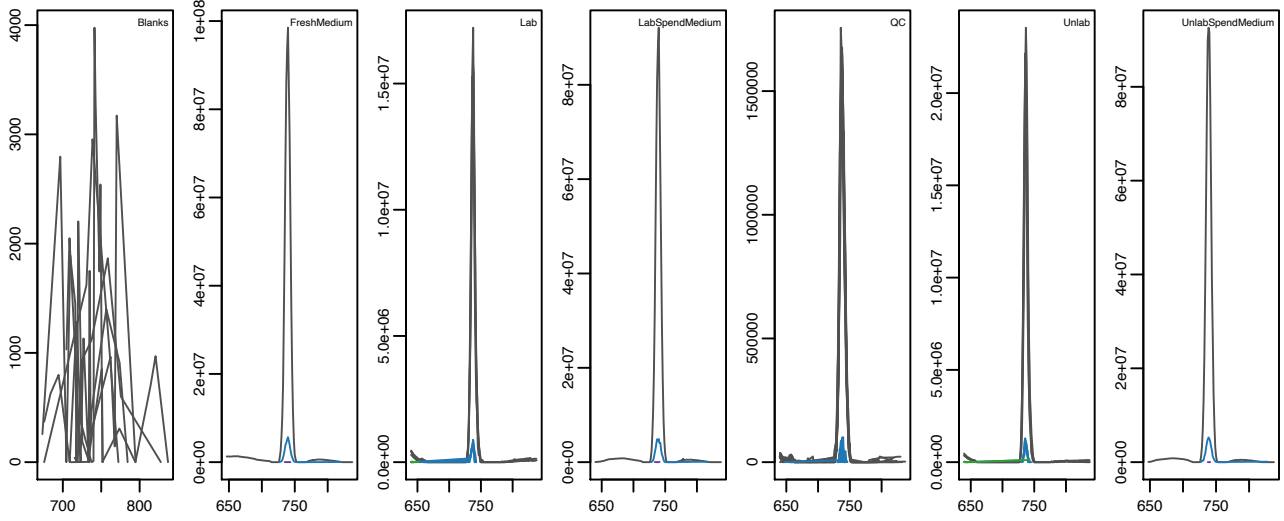


L-Glutamine

Formula: C₅H₁₀N₂O₃ Mass: 146.069 Std.RT: 739.2 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5

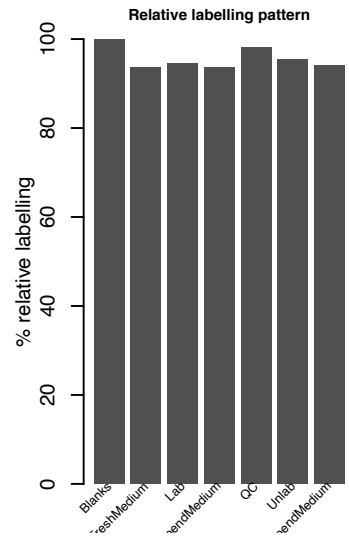
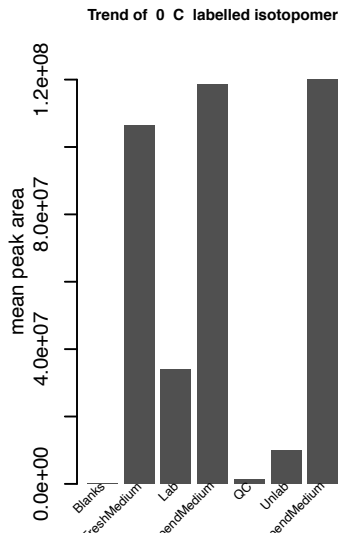
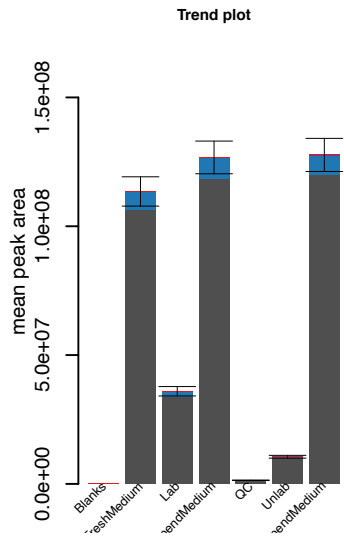
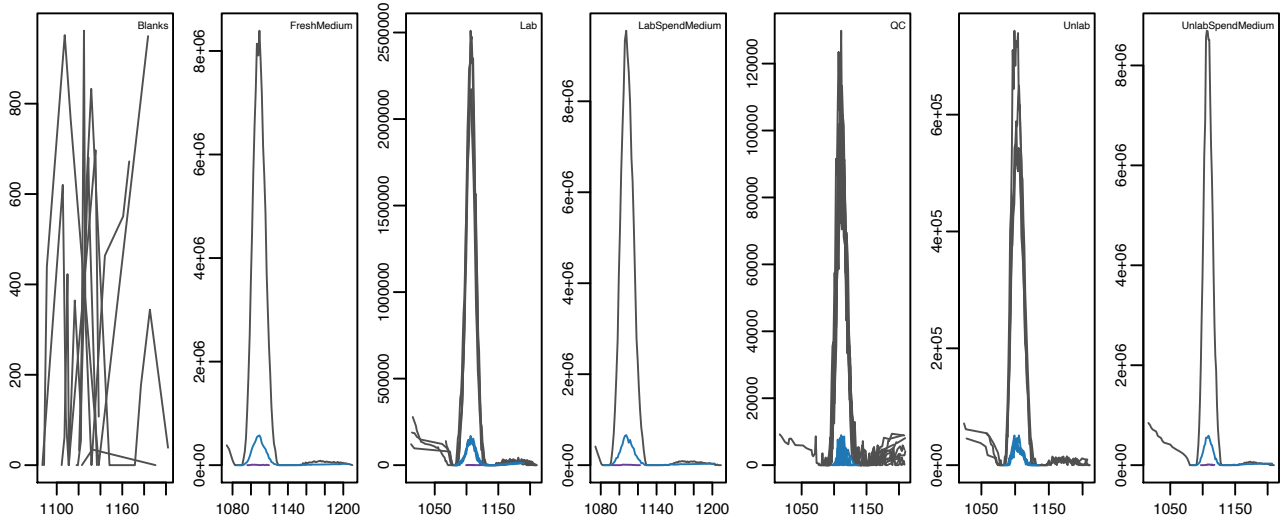


L-Lysine

Formula: C₆H₁₄N₂O₂ Mass: 146.106 Std.RT: 1111.8 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6

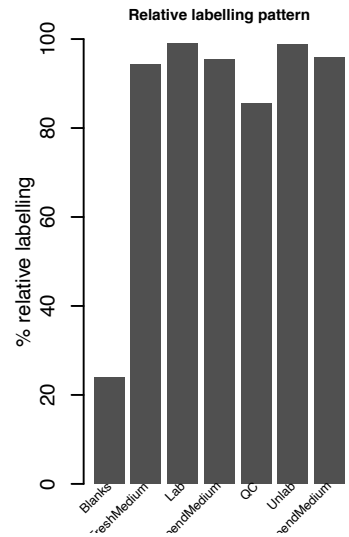
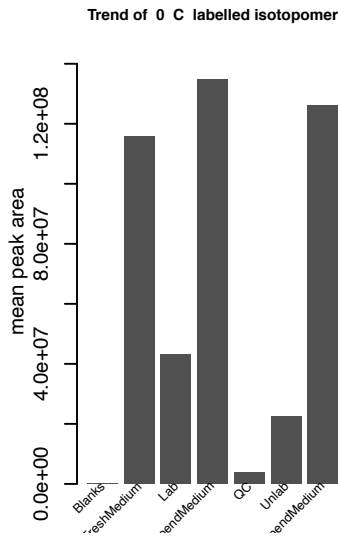
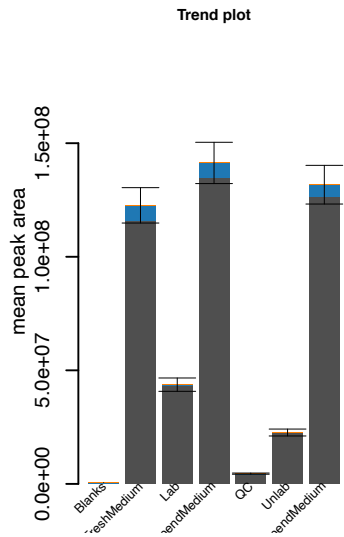
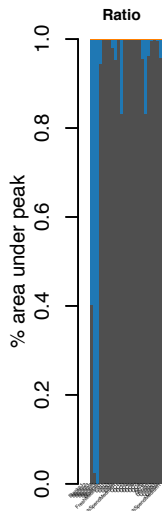
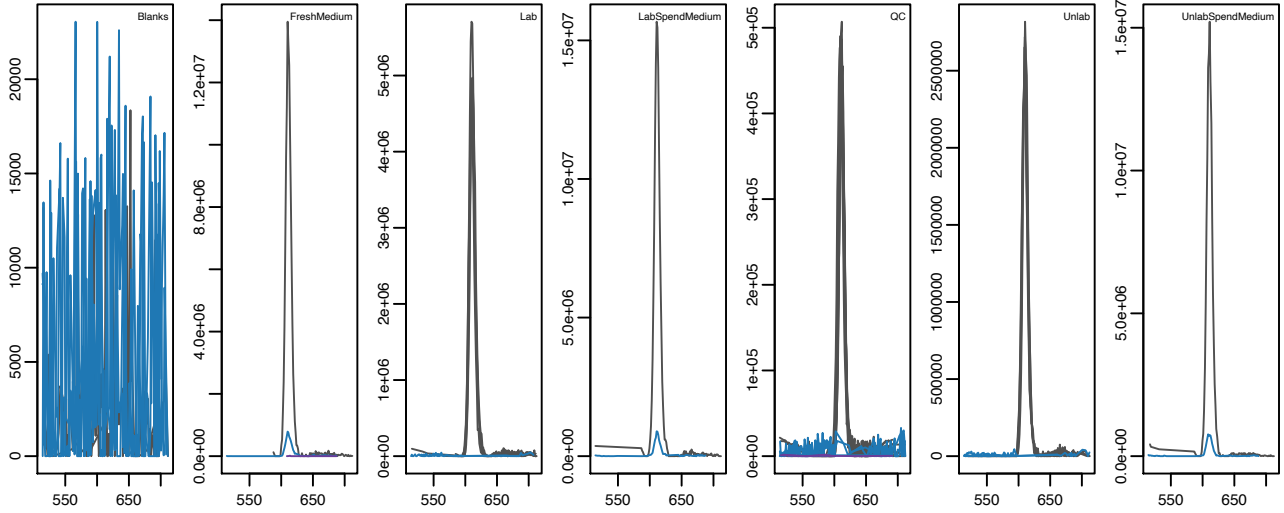


L-Methionine

Formula: C₅H₁₁NO₂S Mass: 149.051 Std.RT: 613.8 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5

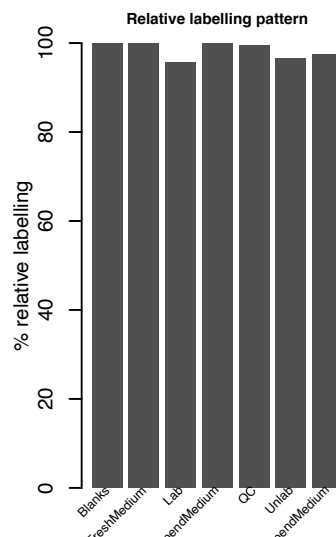
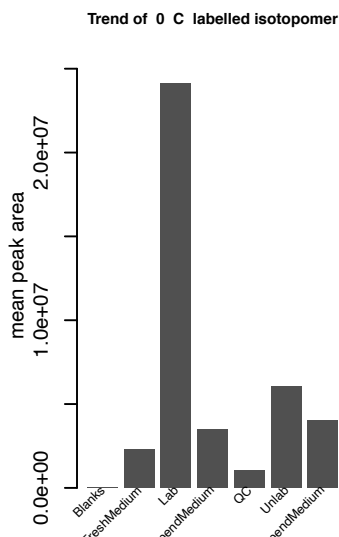
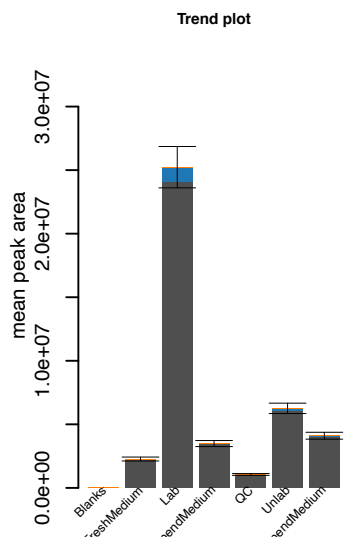
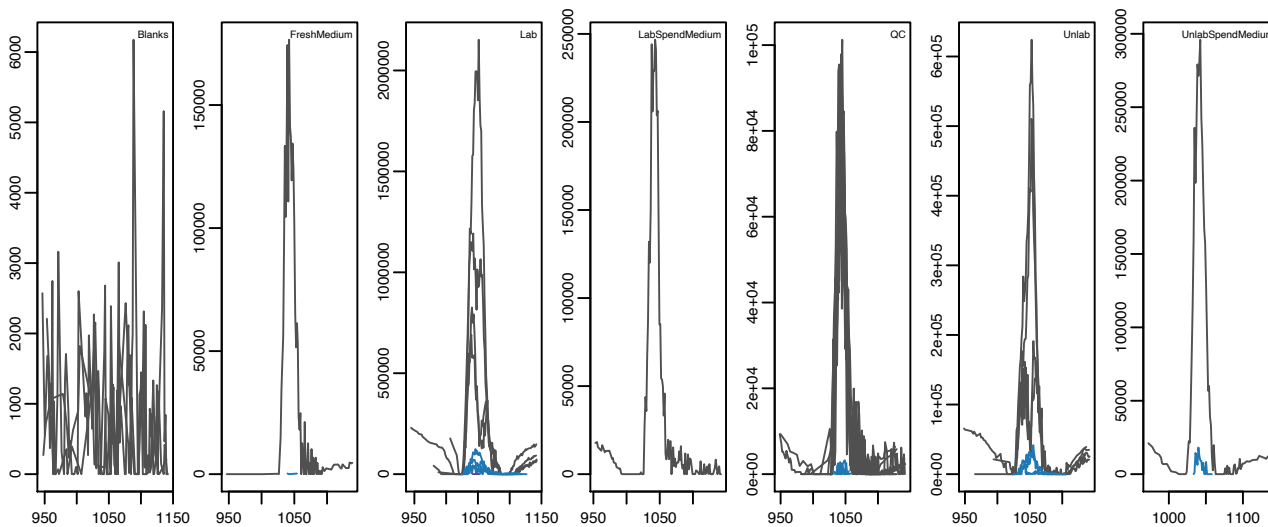


L-Ornithine

Formula: C₅H₁₂N₂O₂ Mass: 132.09 Std.RT: 1044 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5

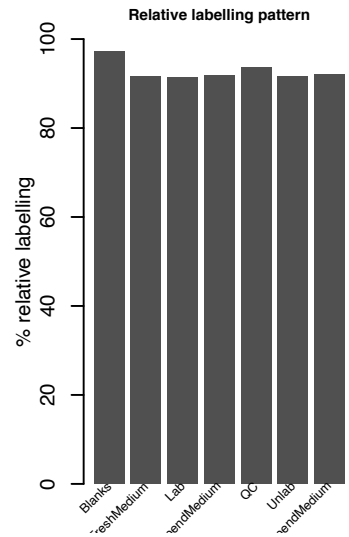
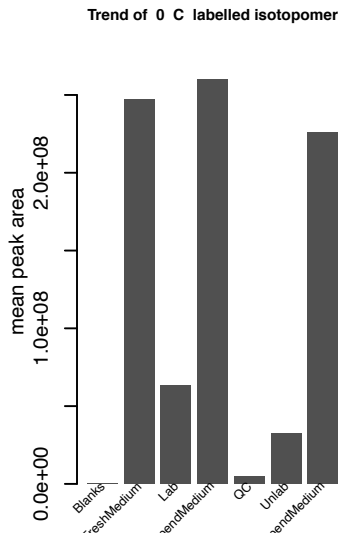
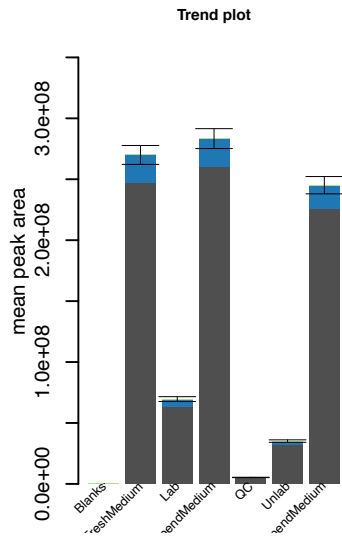
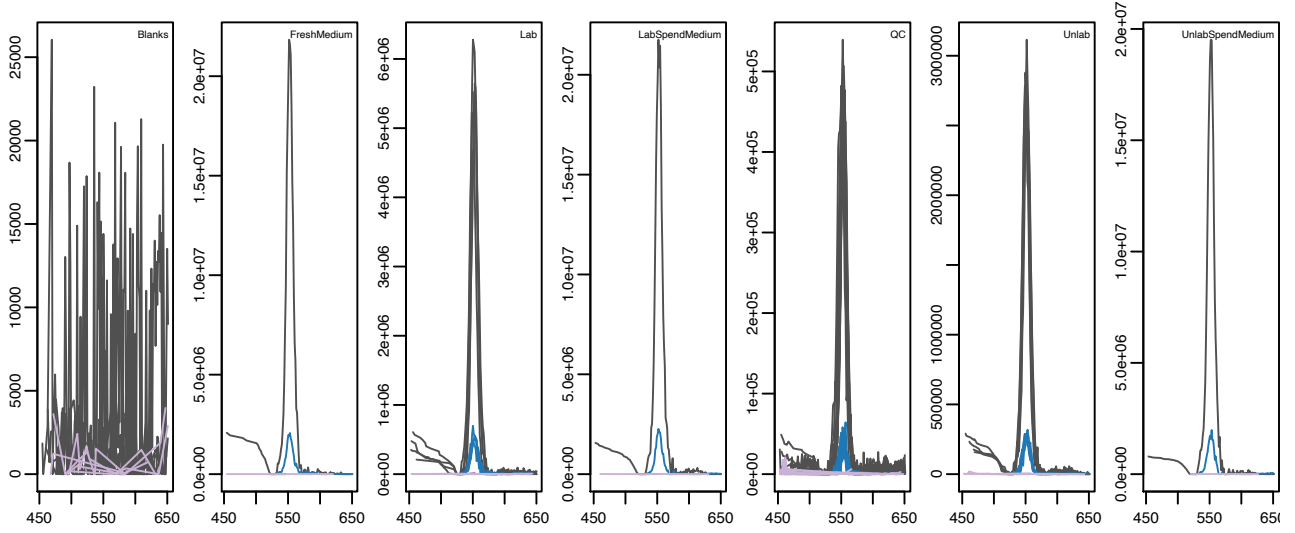


L-Phenylalanine

Formula: C₉H₁₁NO₂ Mass: 165.079 Std.RT: 552.6 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6 ■ +7 ■ +8 ■ +9

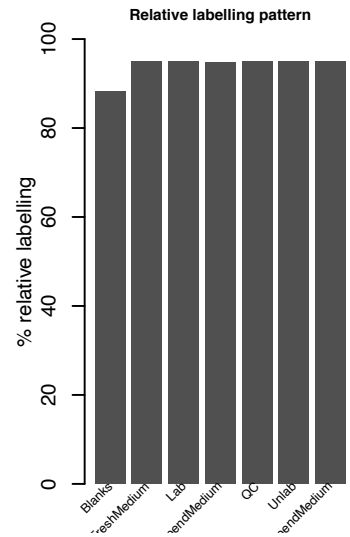
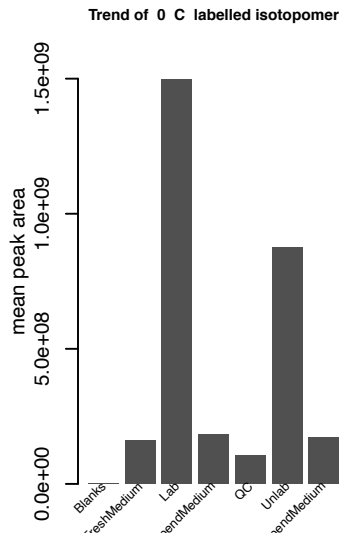
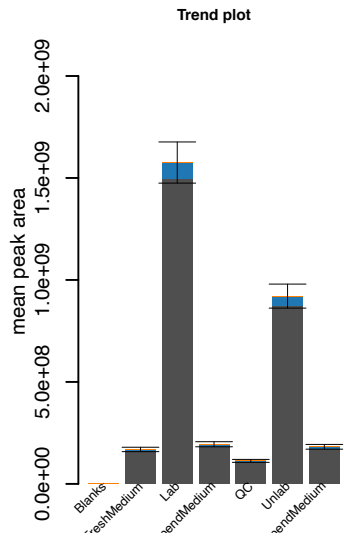
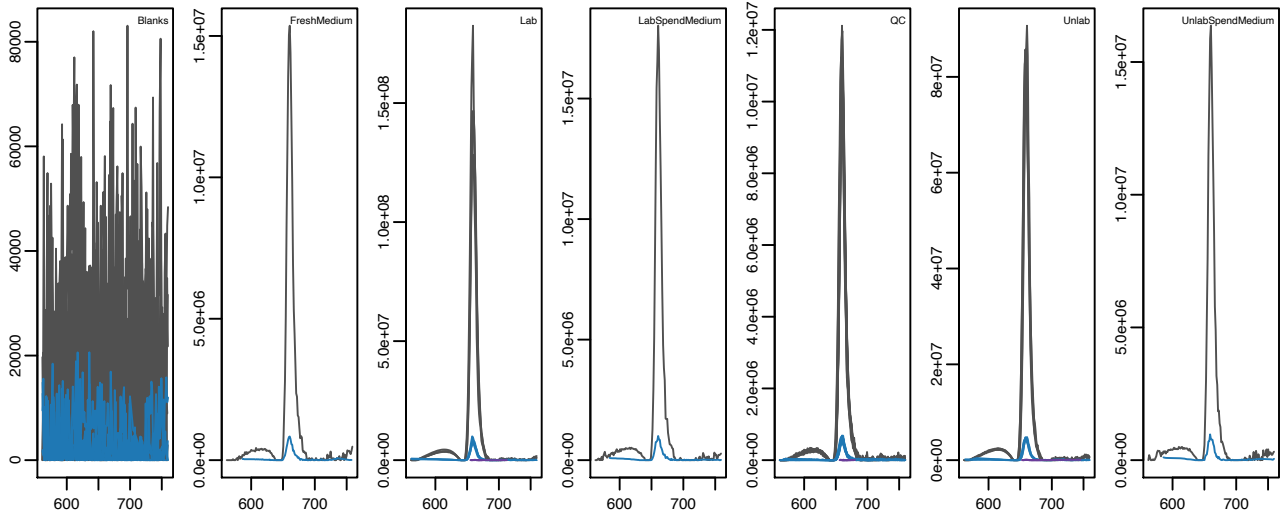


L-Proline

Formula: C₅H₉NO₂ Mass: 115.063 Std.RT: 661.2 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5

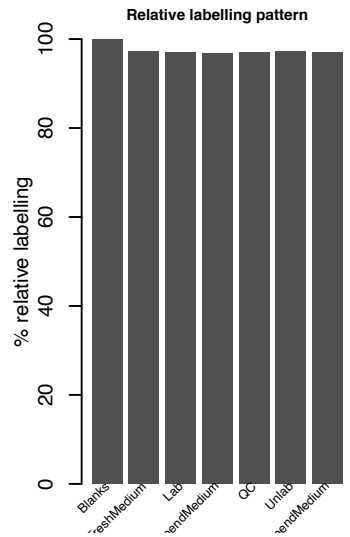
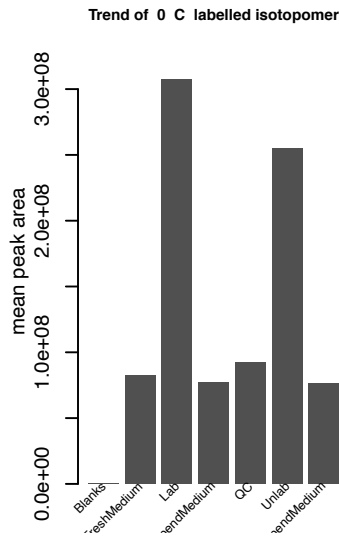
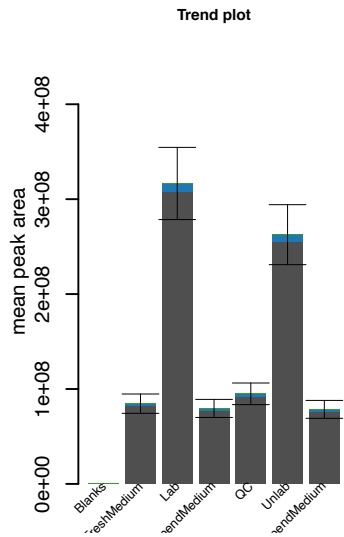
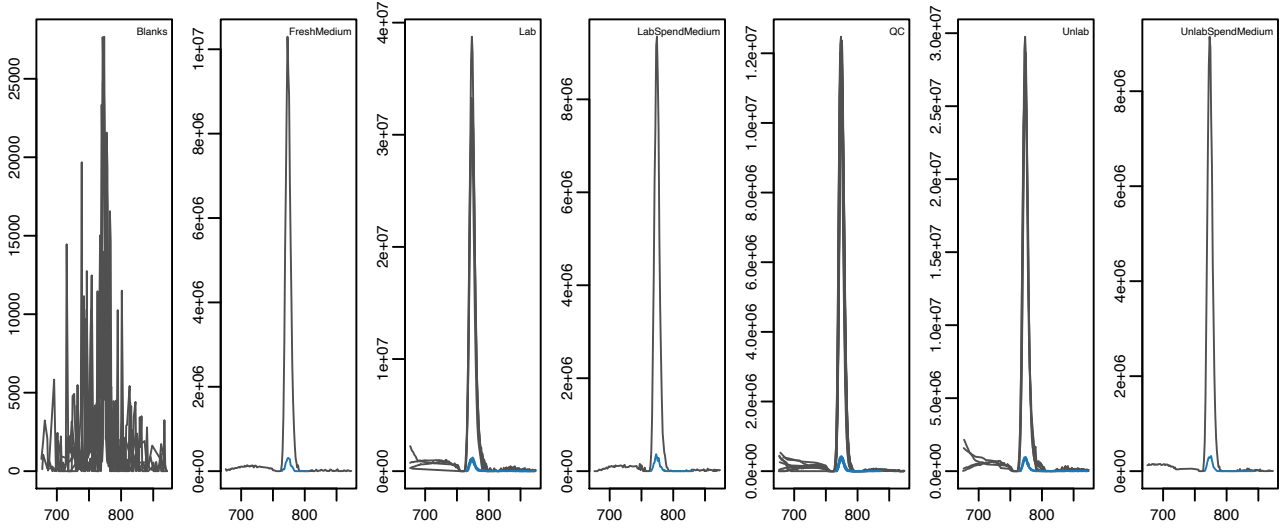


L-Serine

Formula: C₃H₇NO₃ Mass: 105.043 Std.RT: 775.2 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3

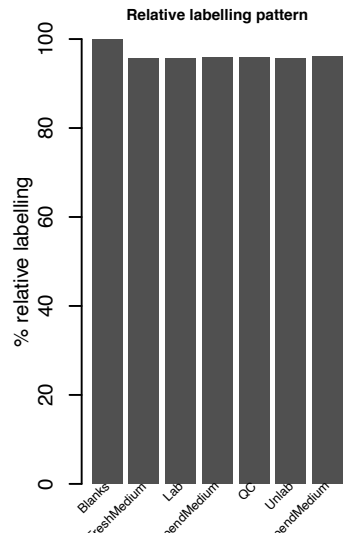
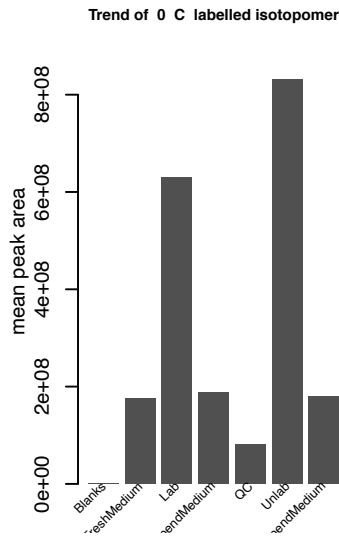
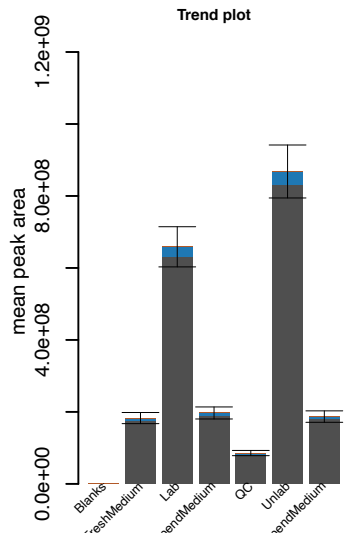
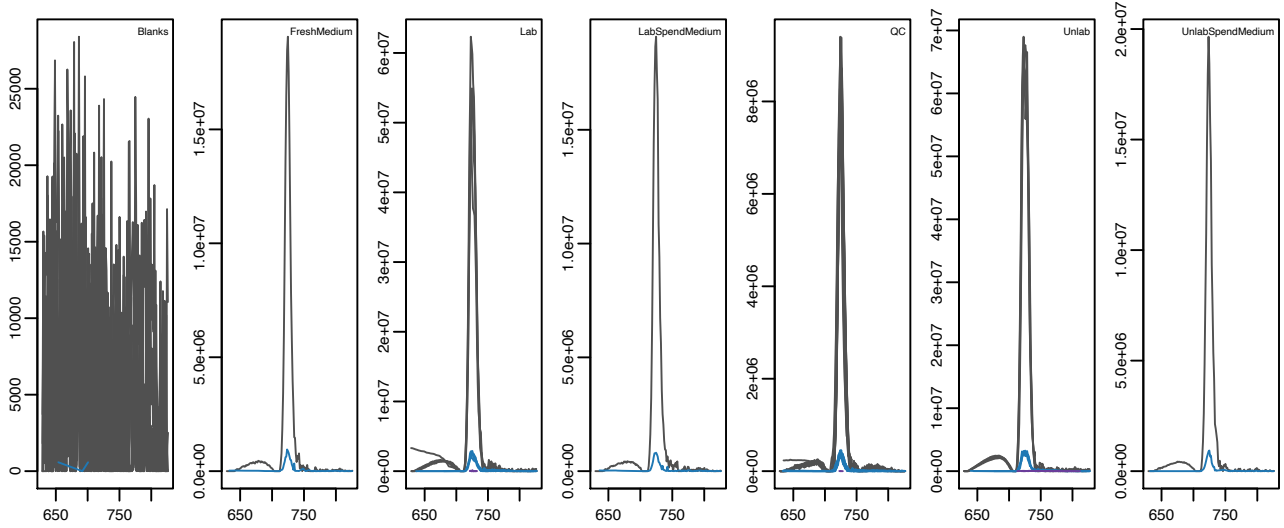


L-Threonine

Formula: C₄H₉NO₃ Mass: 119.058 Std.RT: 728.4 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4

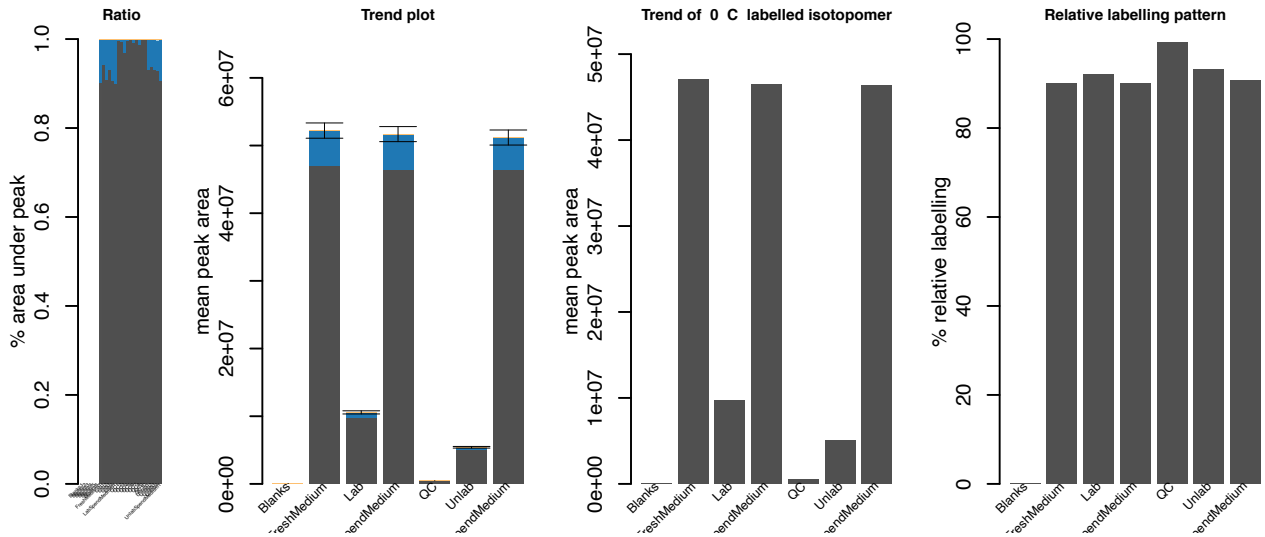
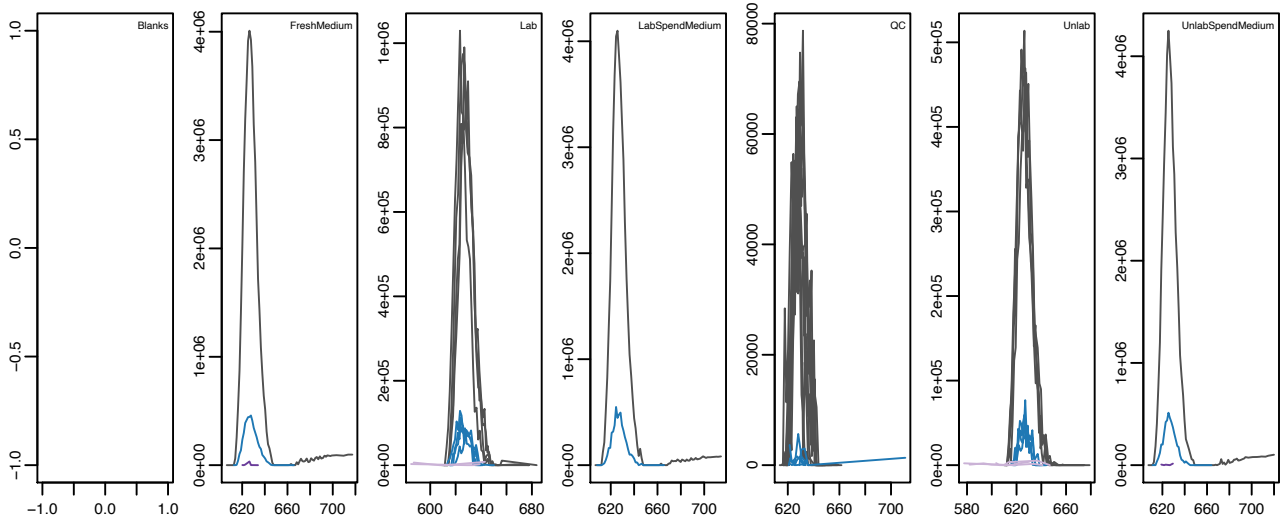


L-Tryptophan

Formula: C₁₁H₁₂N₂O₂ Mass: 204.09 Std.RT: 630 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6 ■ +7 ■ +8 ■ +9 ■ +10 ■ +11

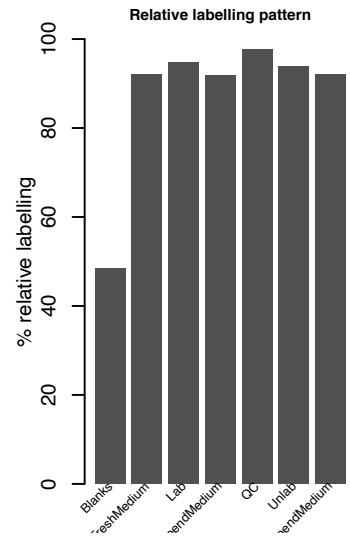
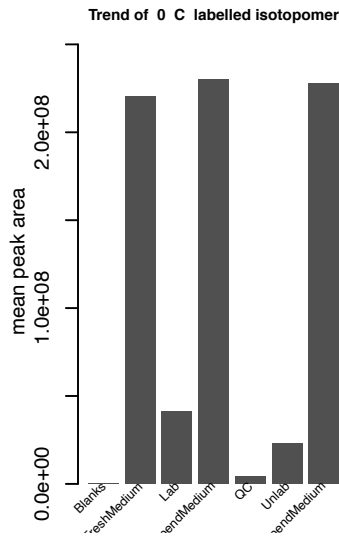
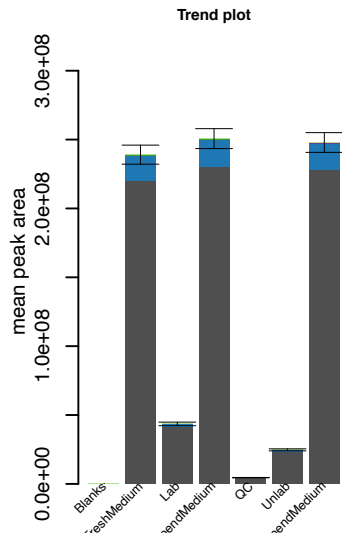
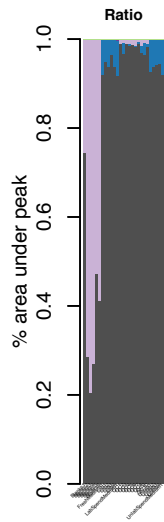
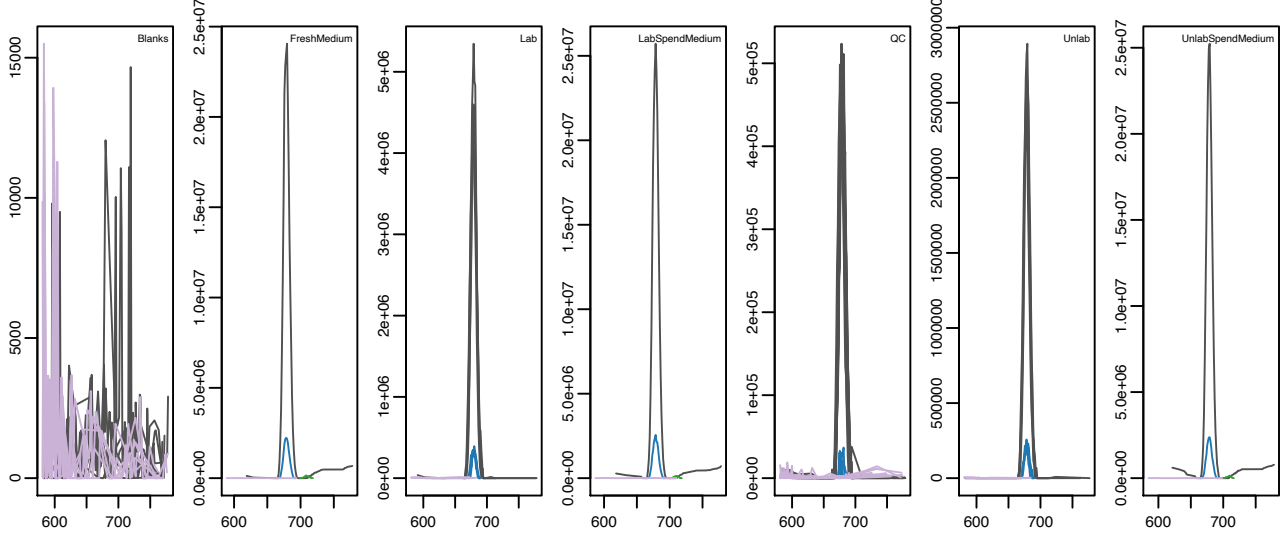


L-Tyrosine

Formula: C₉H₁₁NO₃ Mass: 181.074 Std.RT: 680.4 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6 ■ +7 ■ +8 ■ +9

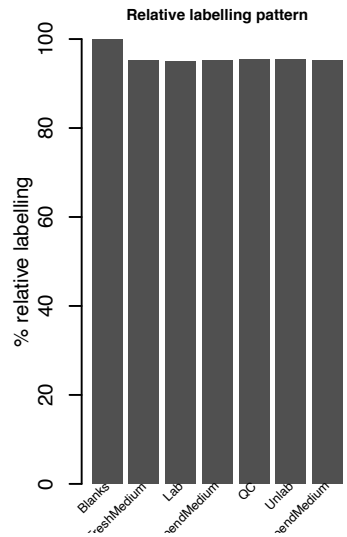
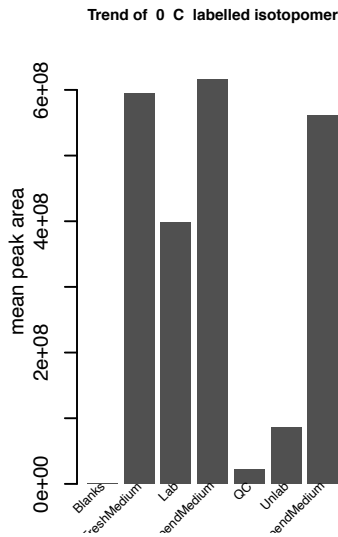
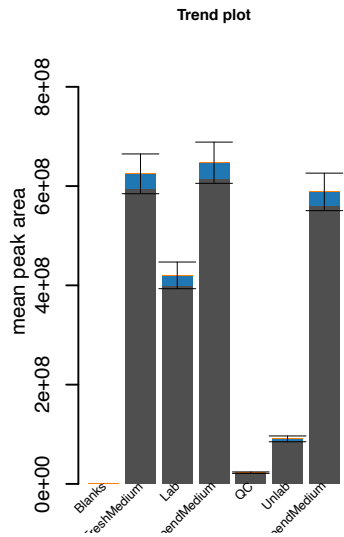
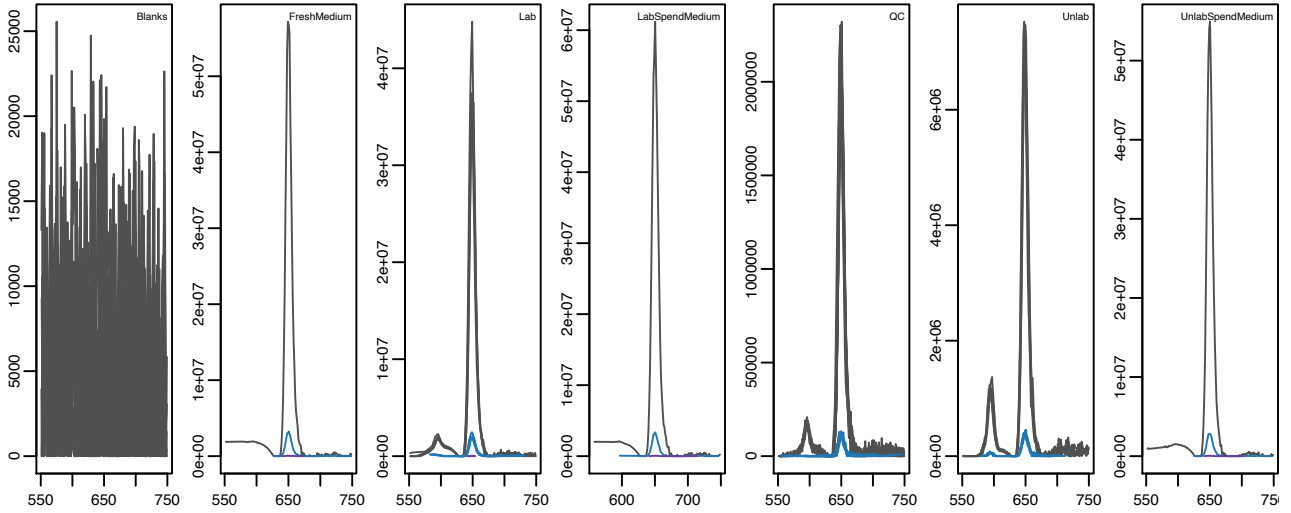


L-Valine

Formula: C₅H₁₁NO₂ Mass: 117.079 Std.RT: 651 Ion: NEG

G1

■UL ■+1 ■+2 ■+3 ■+4 ■+5

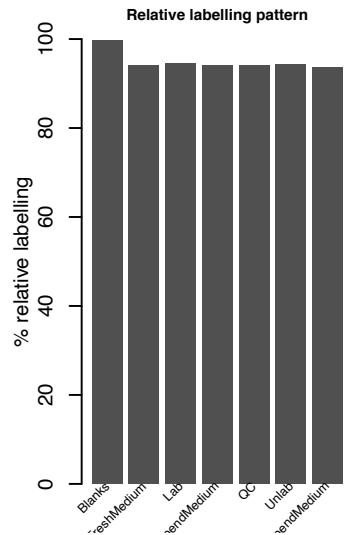
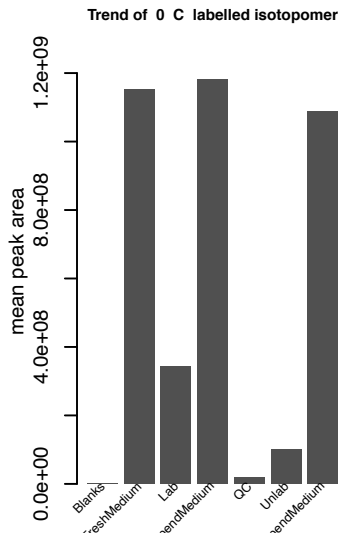
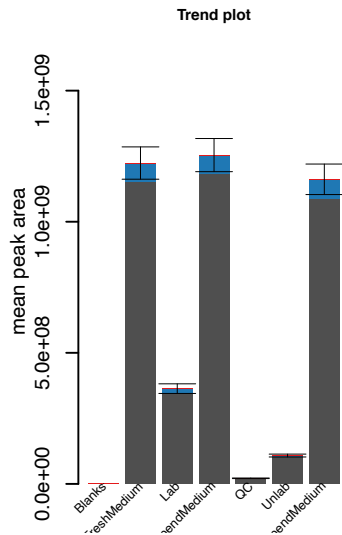
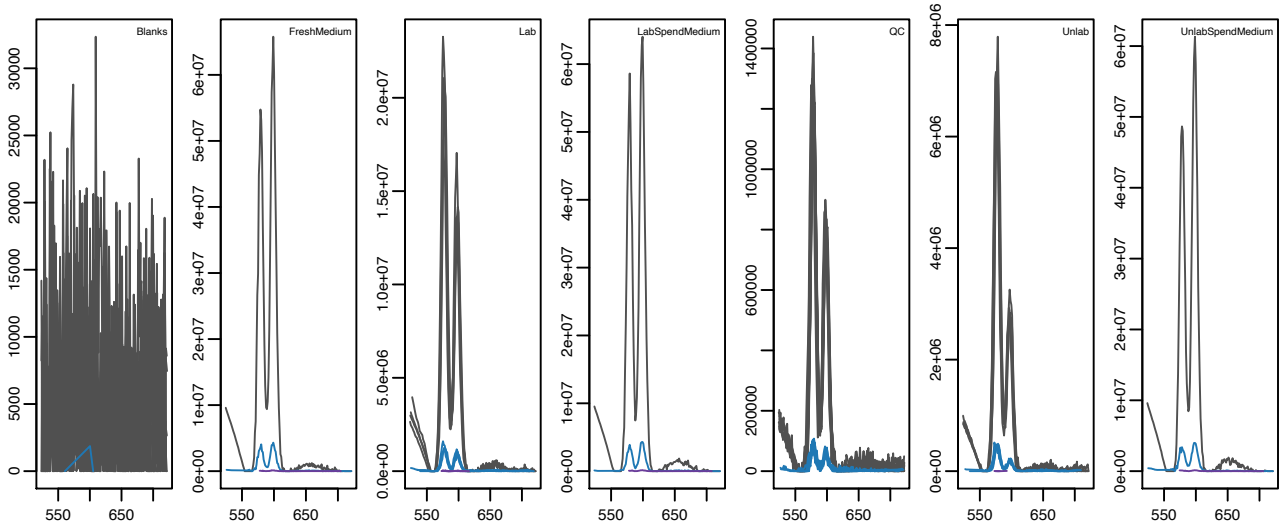


L-isoIeucine

Formula: C₆H₁₃NO₂ Mass: 131.095 Std.RT: 623.4 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6

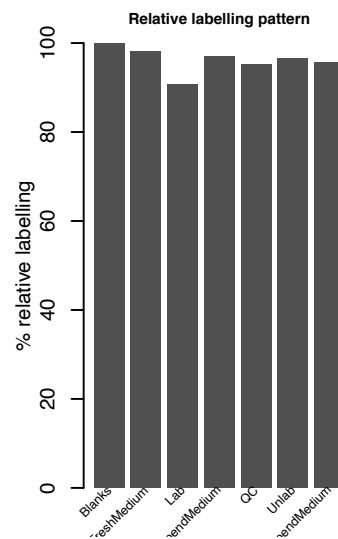
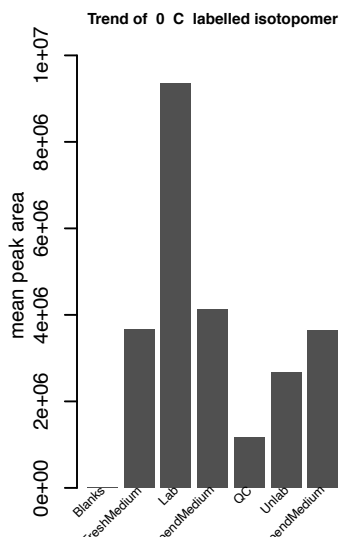
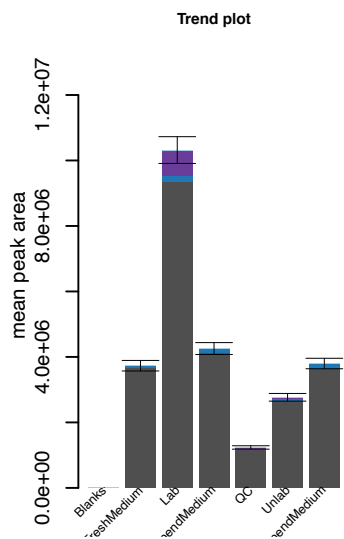
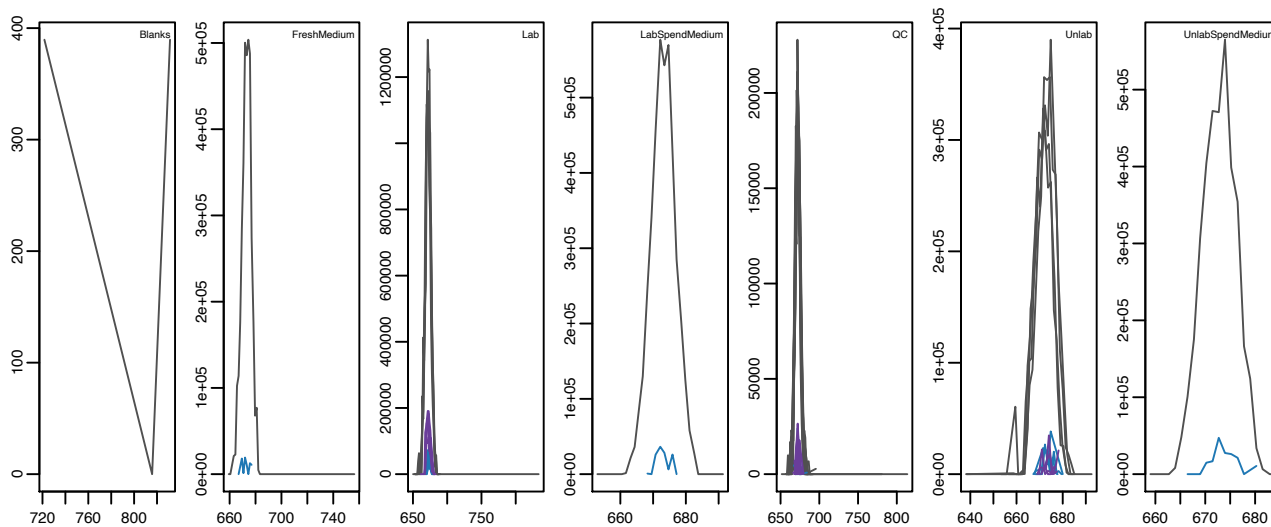


N-Acetylornithine

Formula: C₇H₁₄N₂O₃ Mass: 174.1 Std.RT: 735 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6 ■ +7

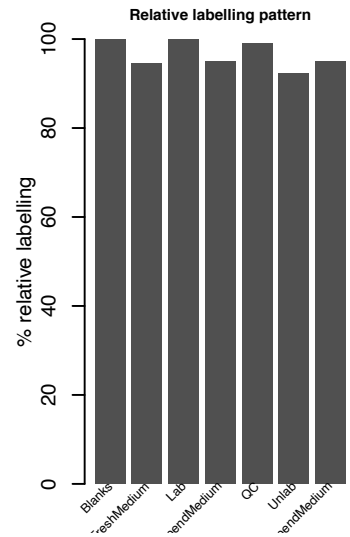
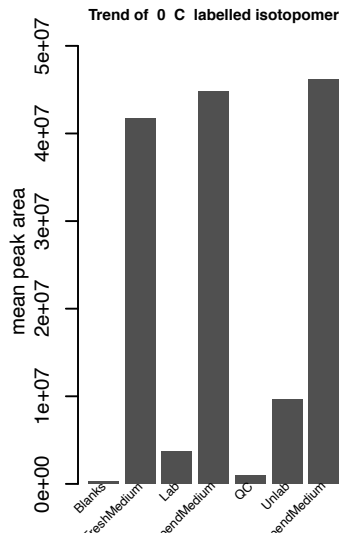
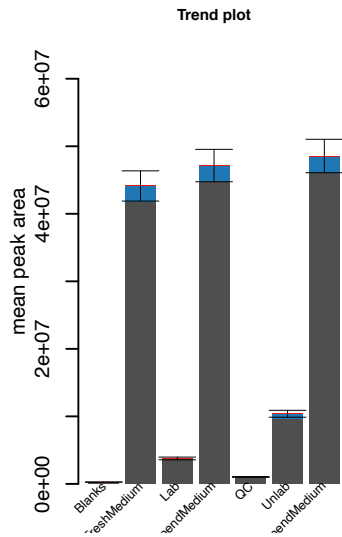
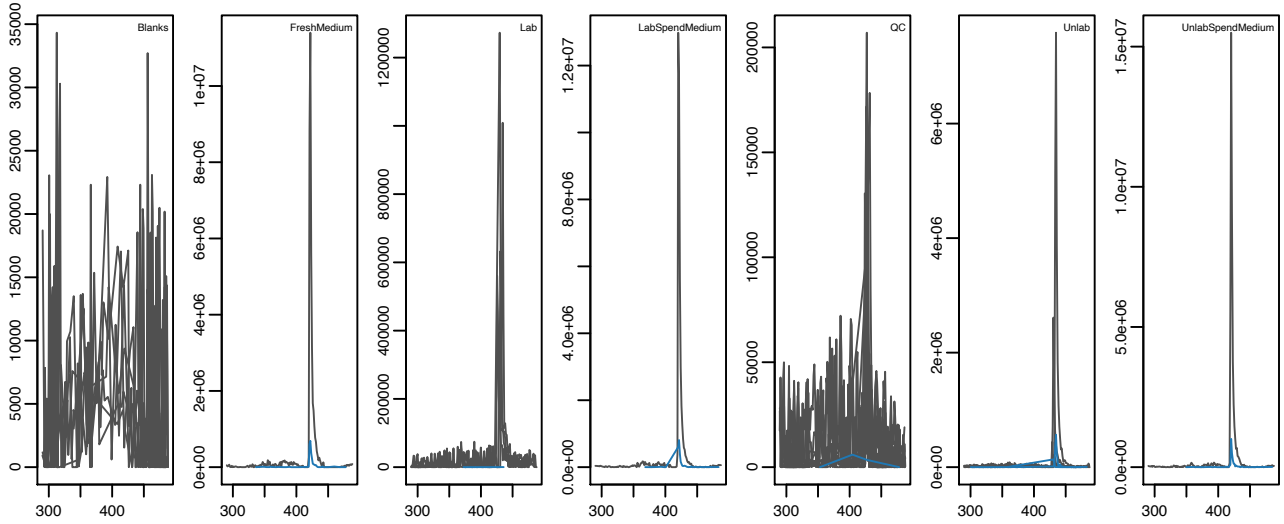


Nicotinamide

Formula: C₆H₆N₂O Mass: 122.048 Std.RT: 389.4 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6

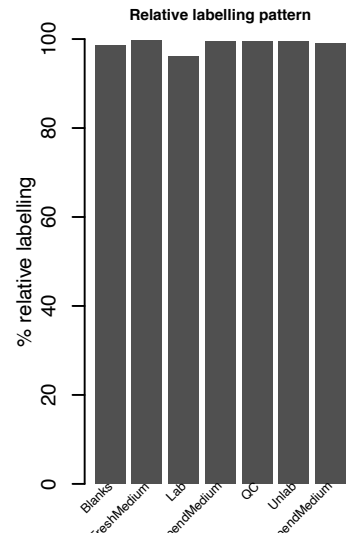
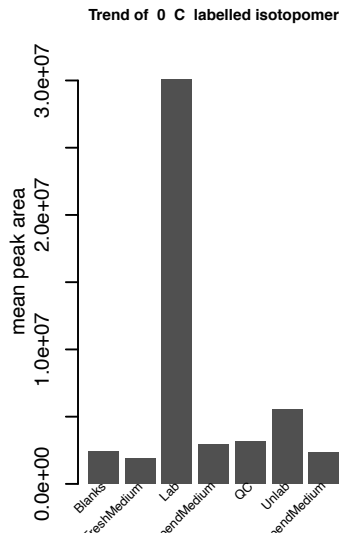
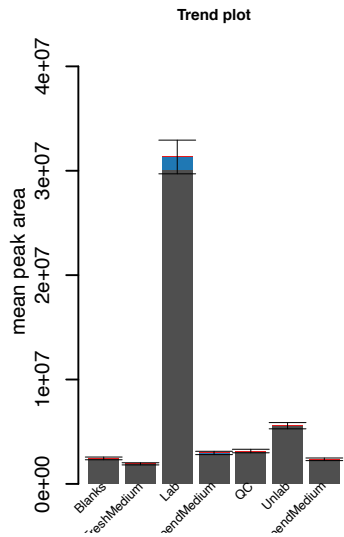
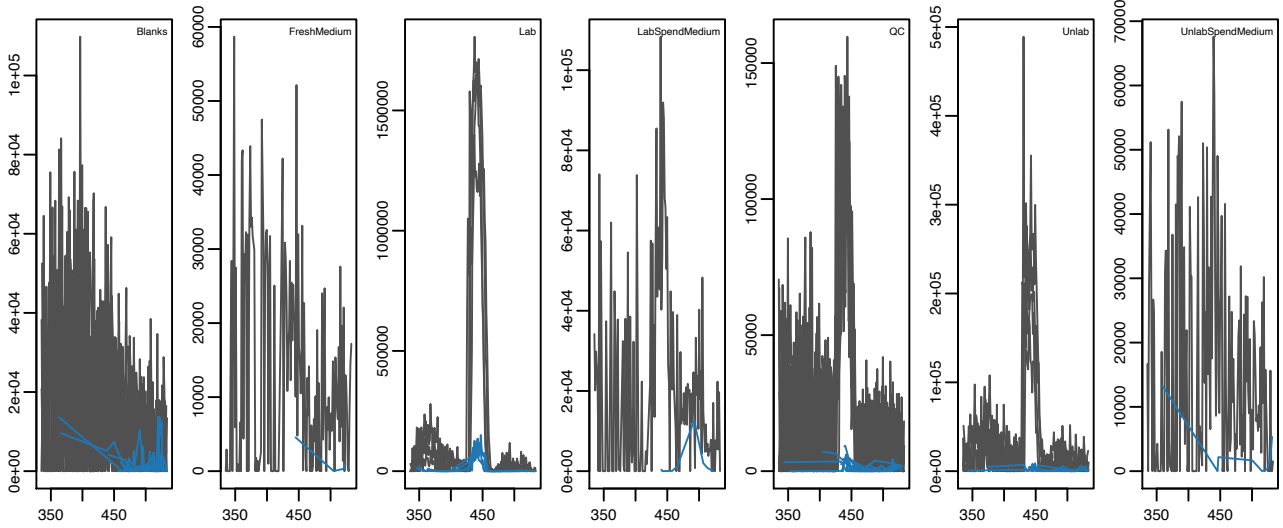


Nicotinate

Formula: C₆H₅NO₂ Mass: 123.032 Std.RT: 435 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6

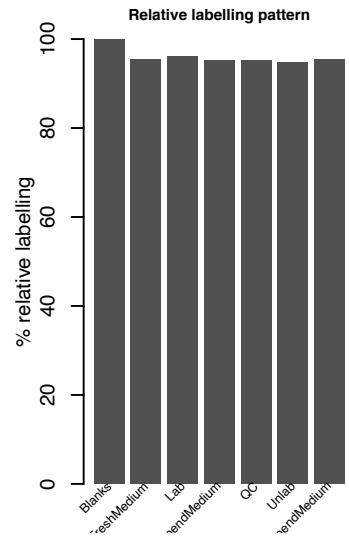
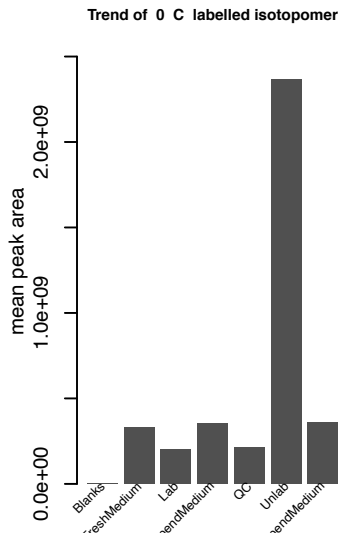
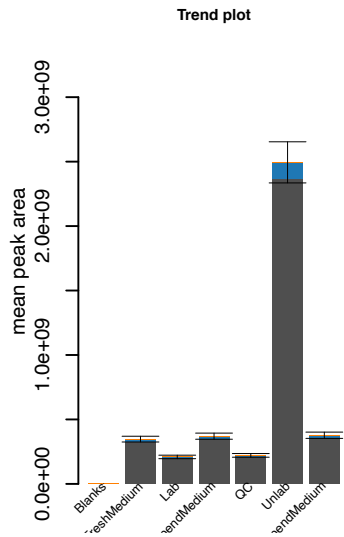
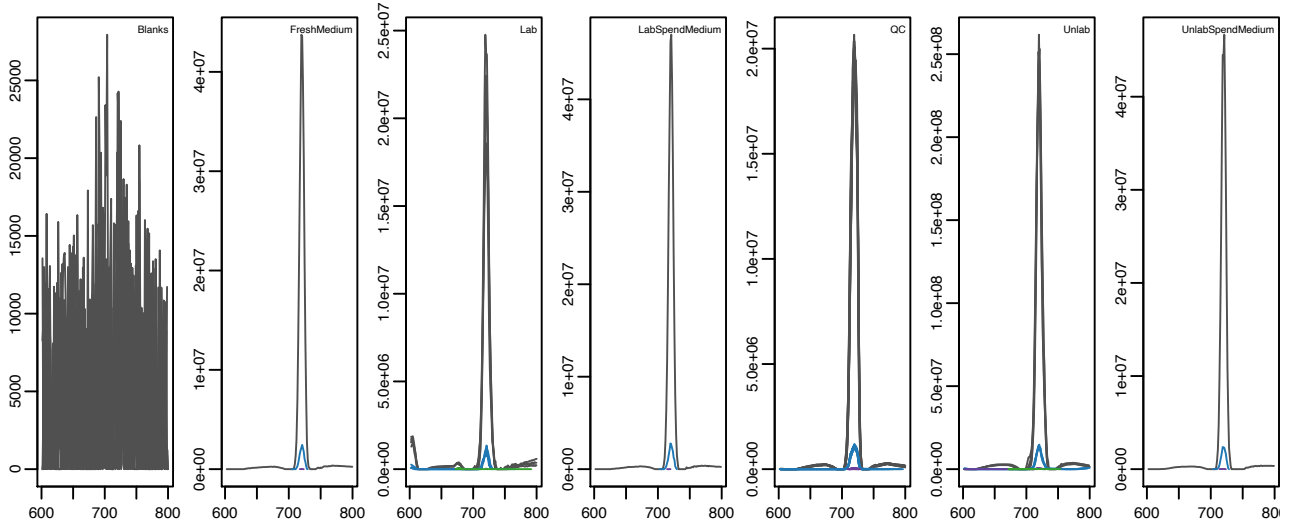


O-Acetyl-L-serine

Formula: C₅H₉NO₄ Mass: 147.053 Std.RT: 701.4 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5

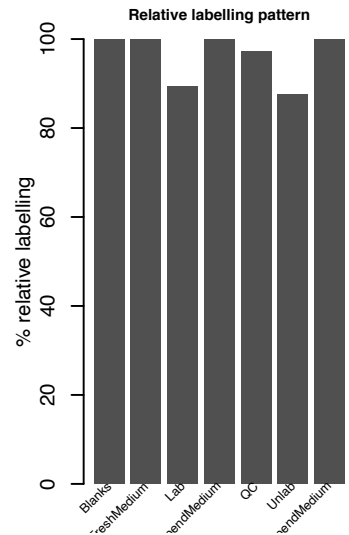
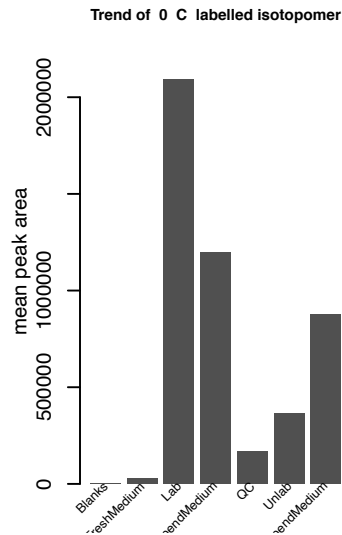
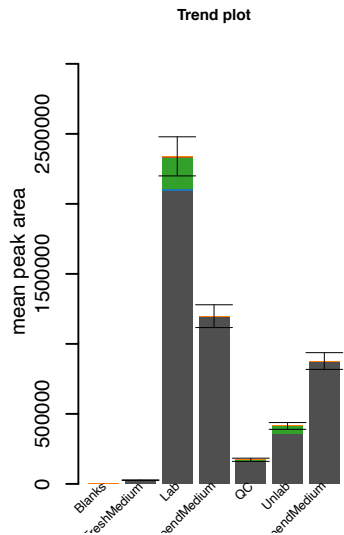
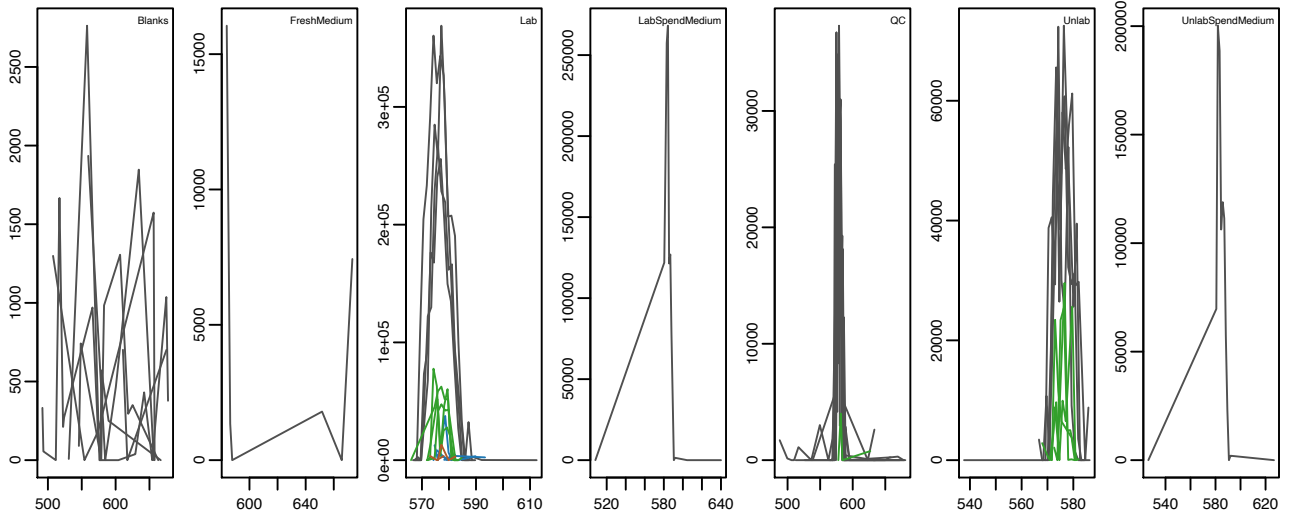


Orotate

Formula: C₅H₄N₂O₄ Mass: 156.017 Std.RT: 586.8 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5

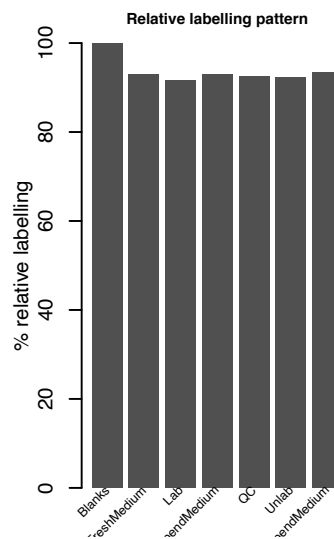
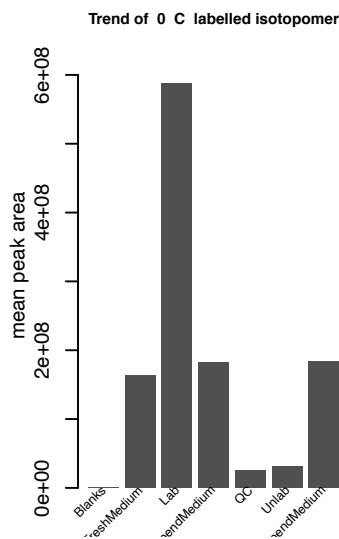
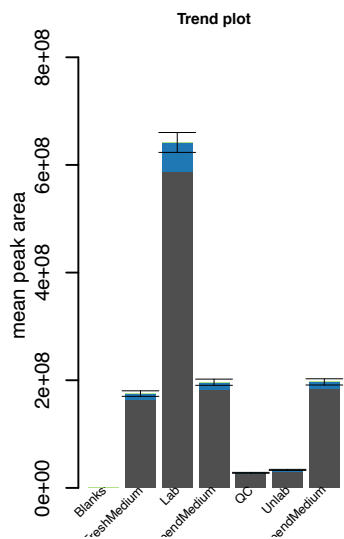
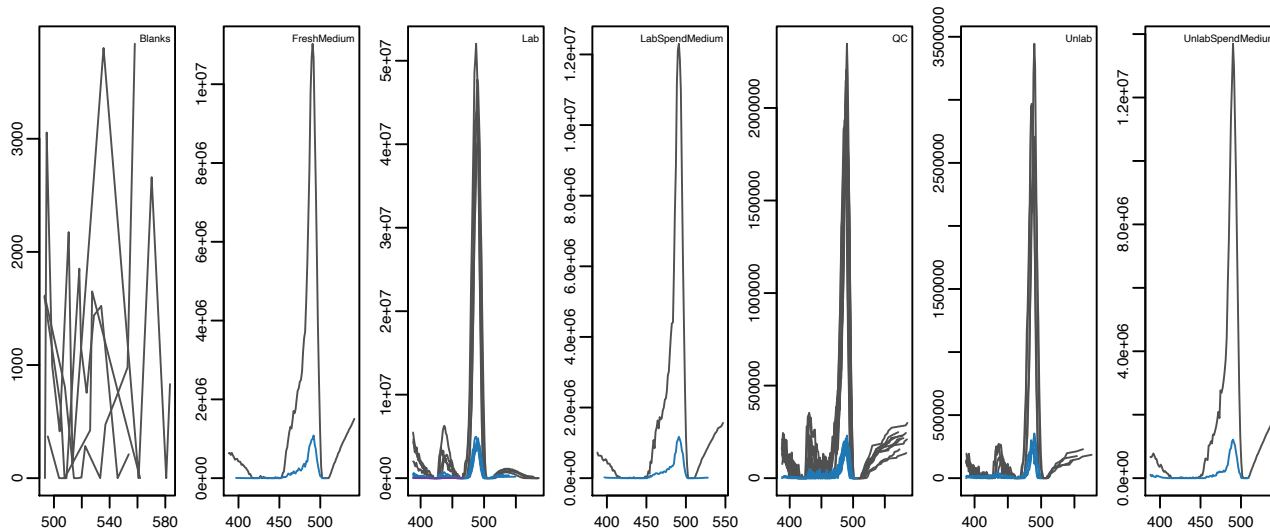


Pantothenate

Formula: C₉H₁₇NO₅ Mass: 219.111 Std.RT: 487.2 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6 ■ +7 ■ +8 ■ +9

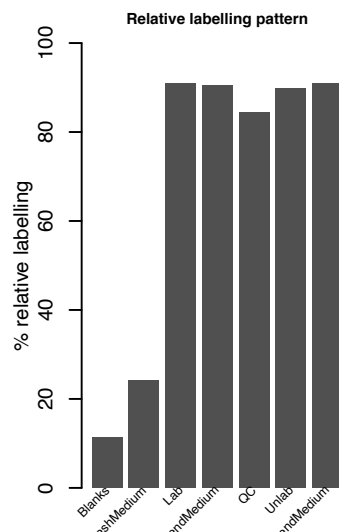
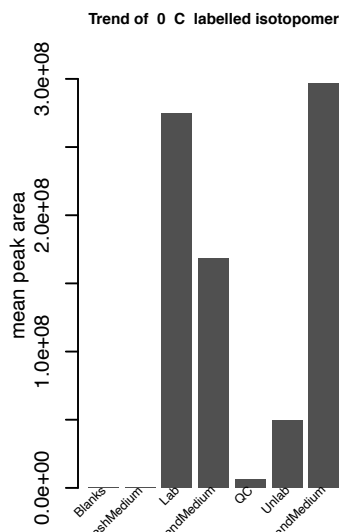
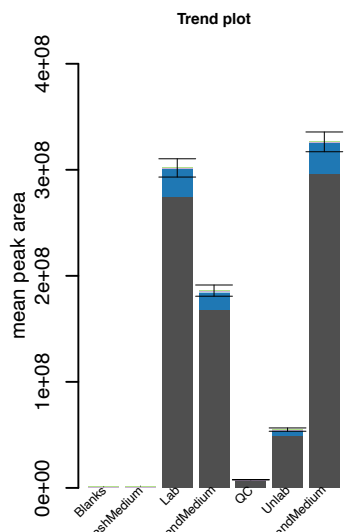
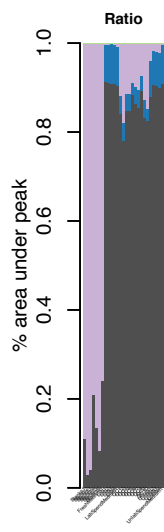
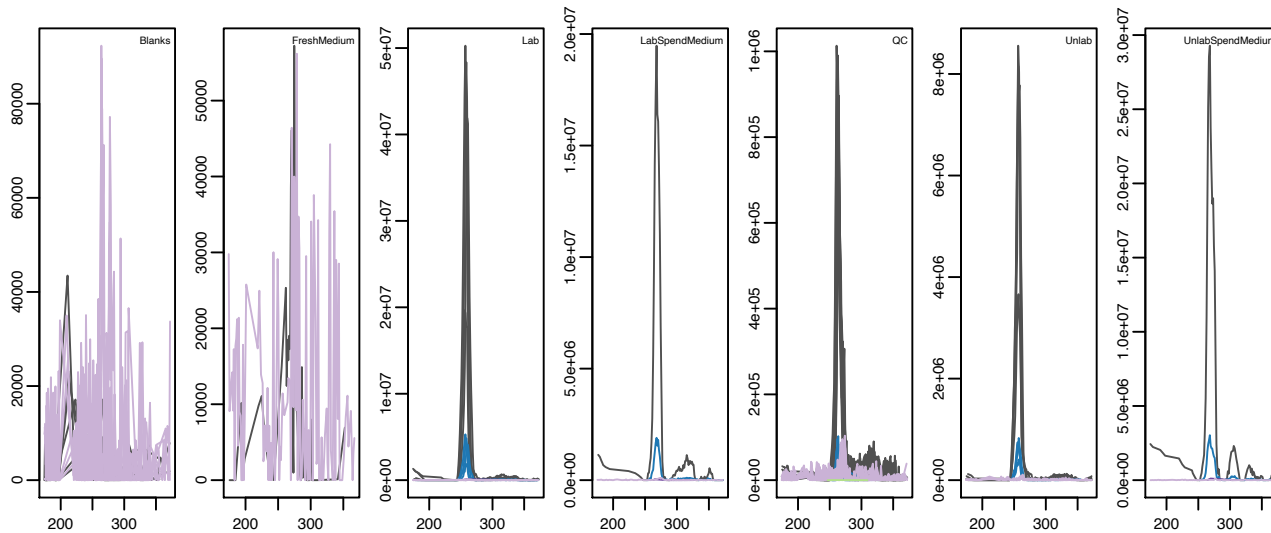


Phenylpyruvate

Formula: C₉H₈O₃ Mass: 164.047 Std.RT: 274.2 Ion: NEG

G1

■ UL ■+1 ■+2 ■+3 ■+4 ■+5 ■+6 ■+7 ■+8 ■+9

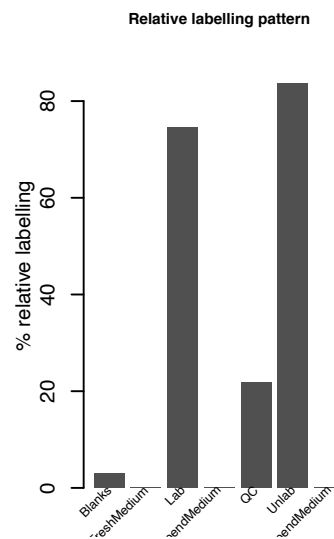
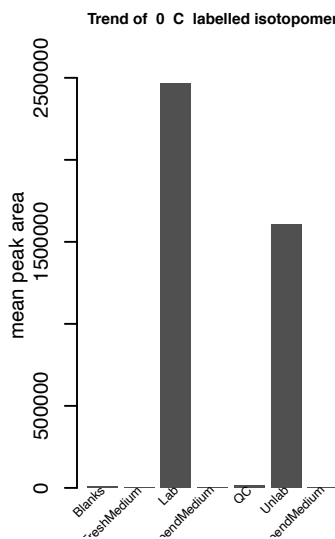
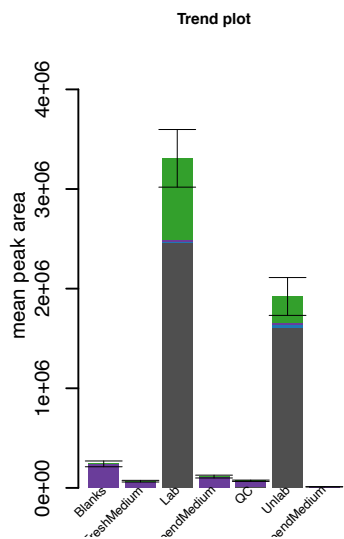
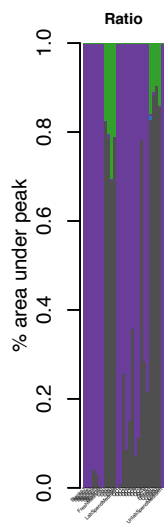
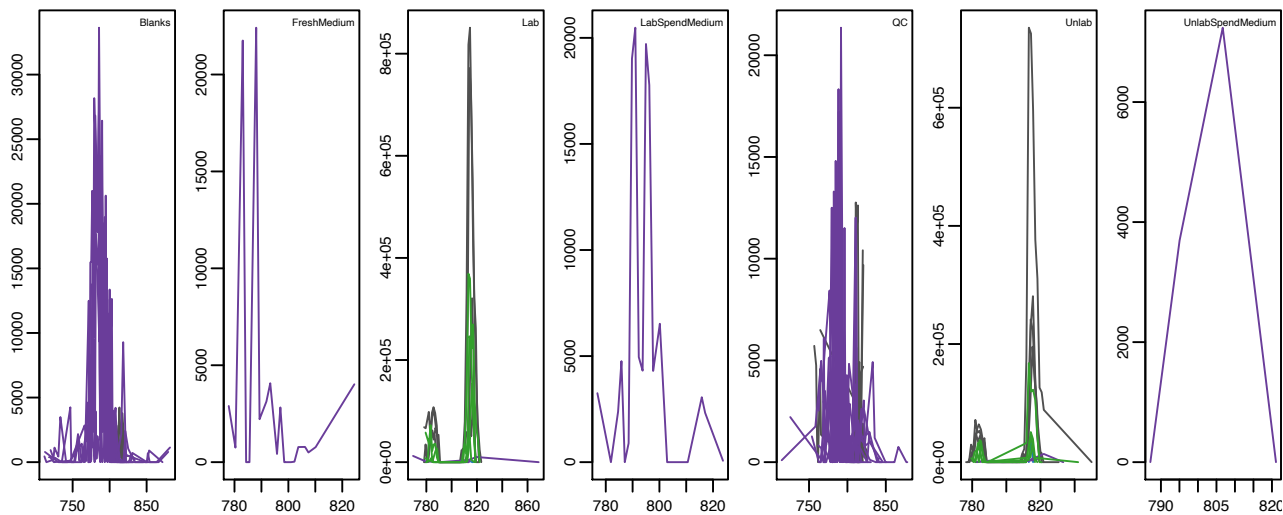


Phosphoenolpyruvate

Formula: C₃H₅O₆P Mass: 167.982 Std.RT: 811.8 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3

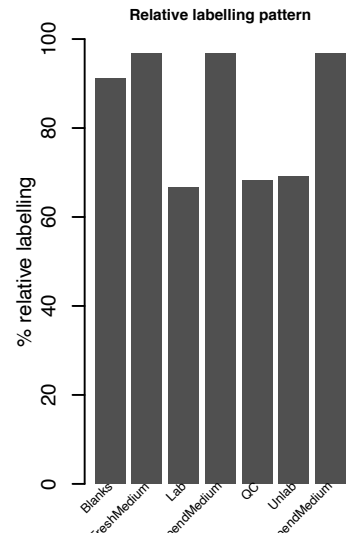
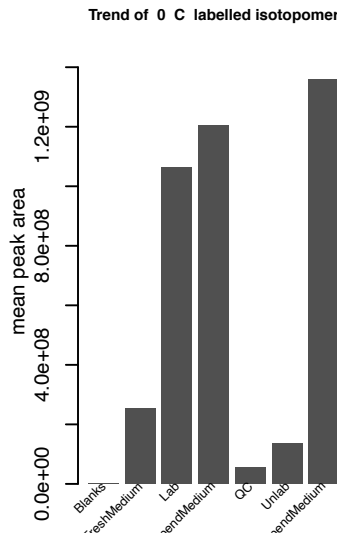
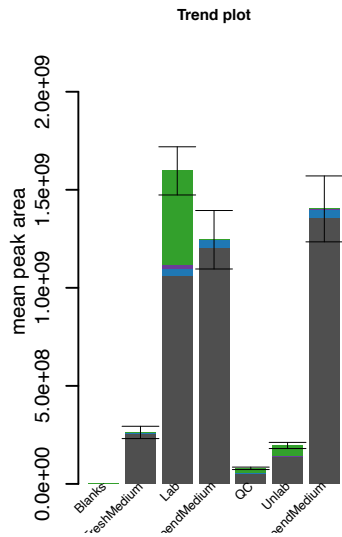
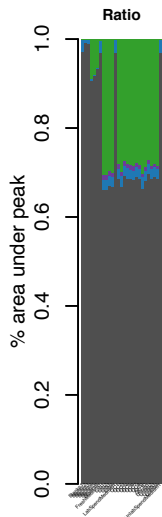
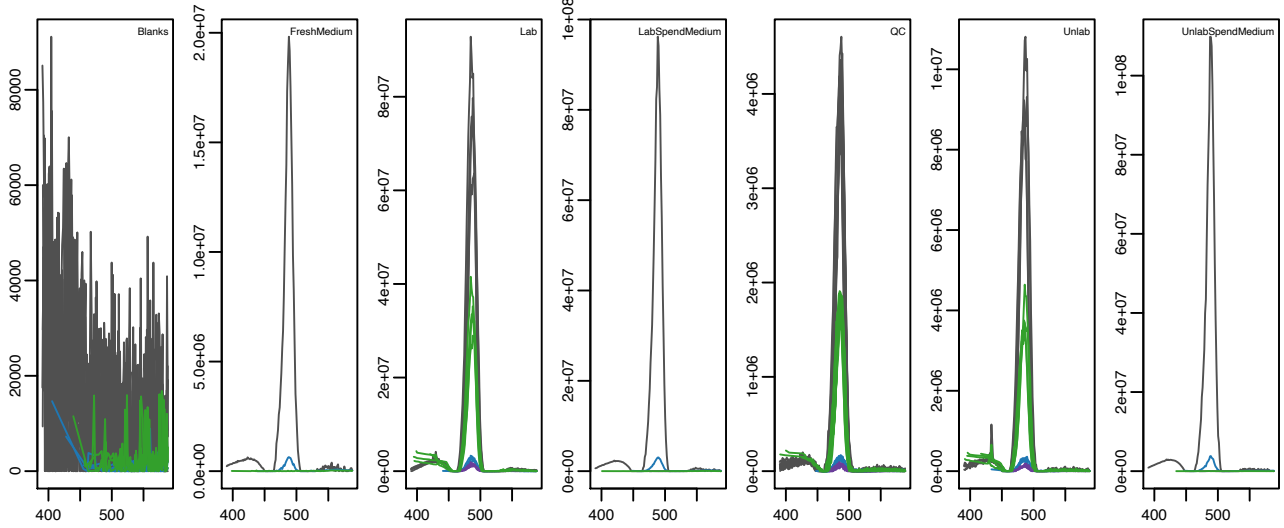


Pyruvate

Formula: C3H4O3 Mass: 88.016 Std.RT: 490.2 Ion: NEG

G1

■UL ■+1 ■+2 ■+3

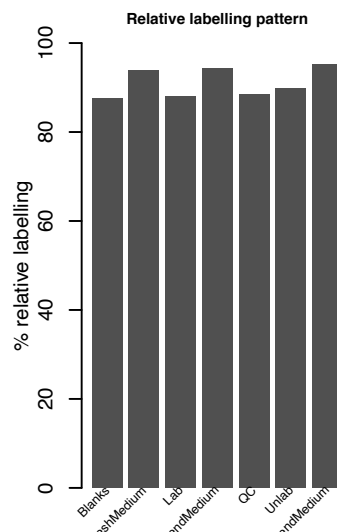
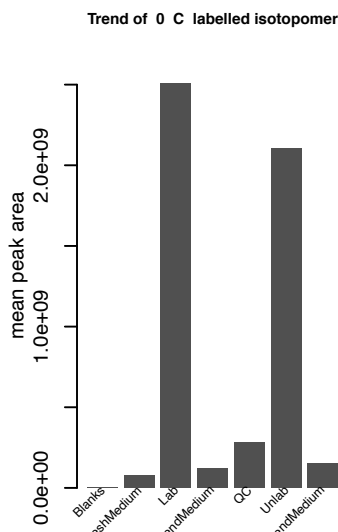
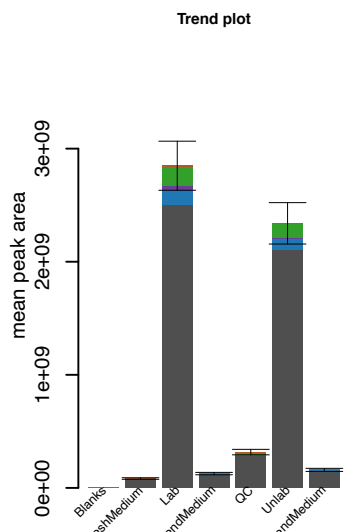
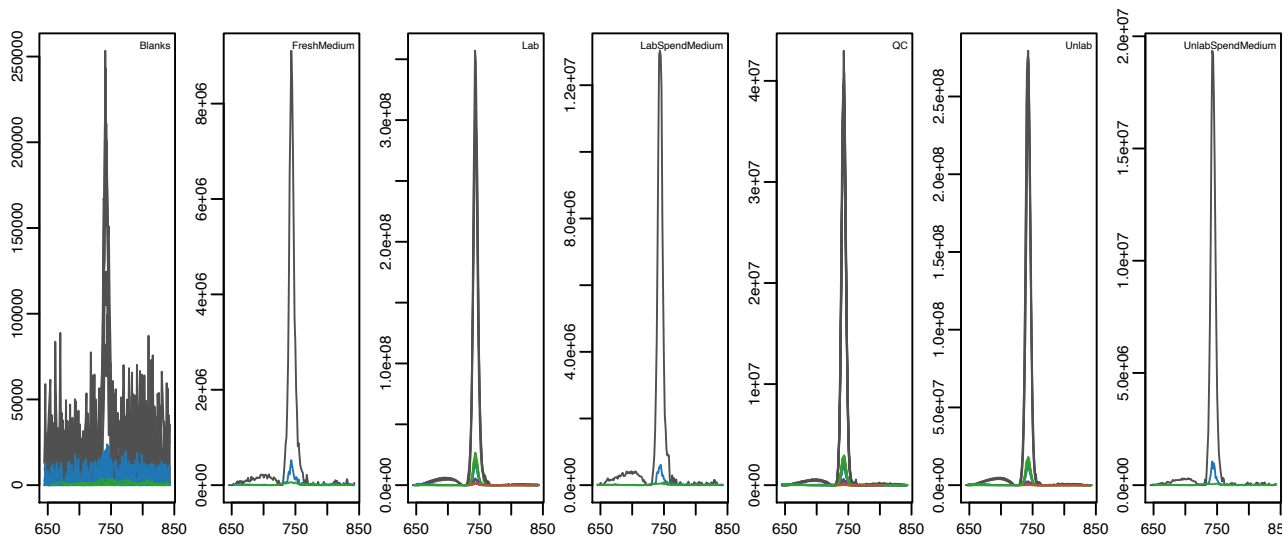


Succinate

Formula: C₄H₆O₄ Mass: 118.027 Std.RT: 744.6 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4

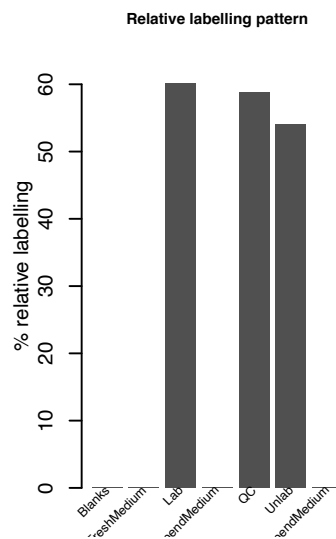
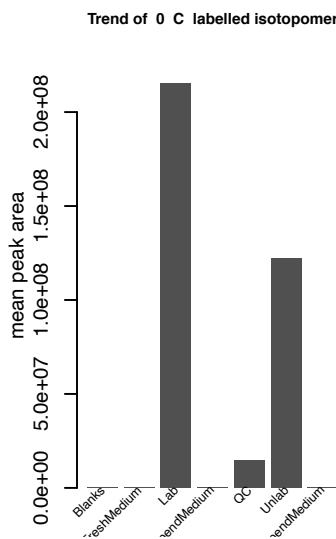
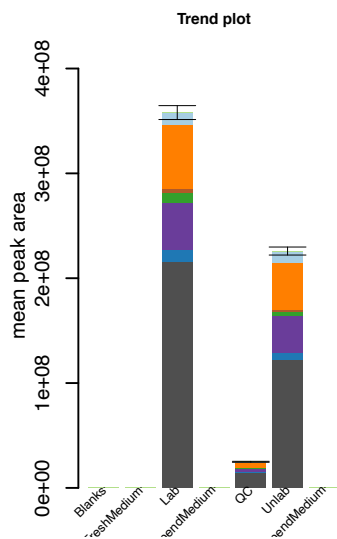
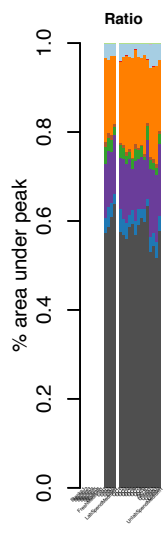
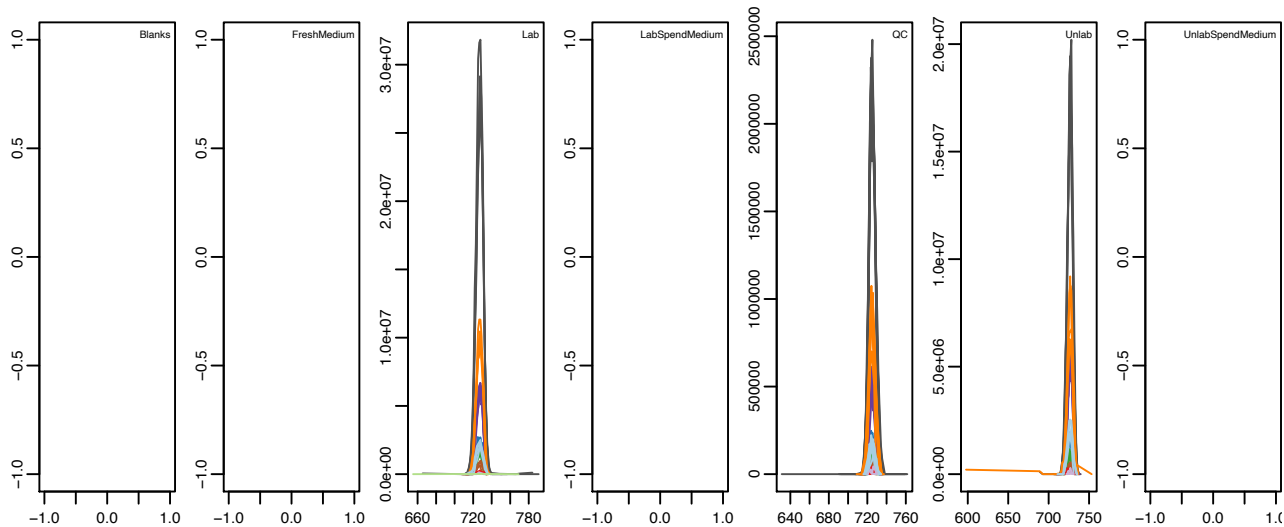


UMP

Formula: C₉H₁₃N₂O₉P Mass: 324.036 Std.RT: 694.8 Ion: NEG

G1

■UL ■+1 ■+2 ■+3 ■+4 ■+5 ■+6 ■+7 ■+8 ■+9

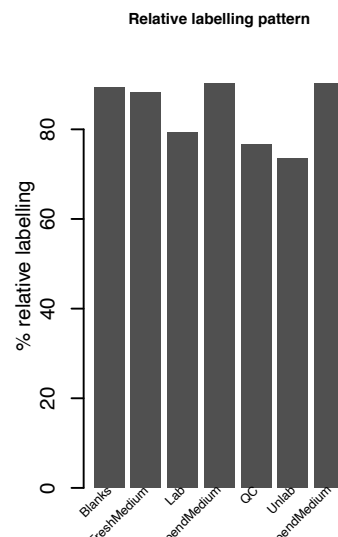
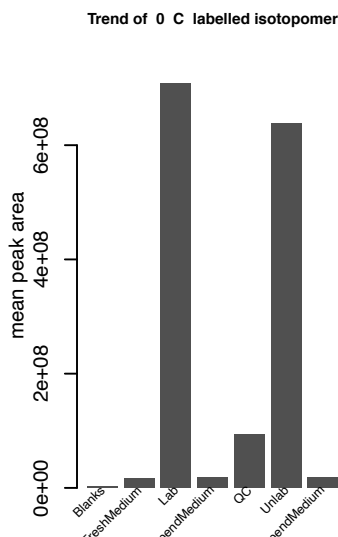
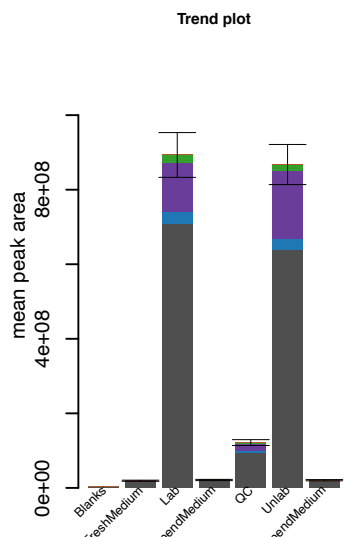
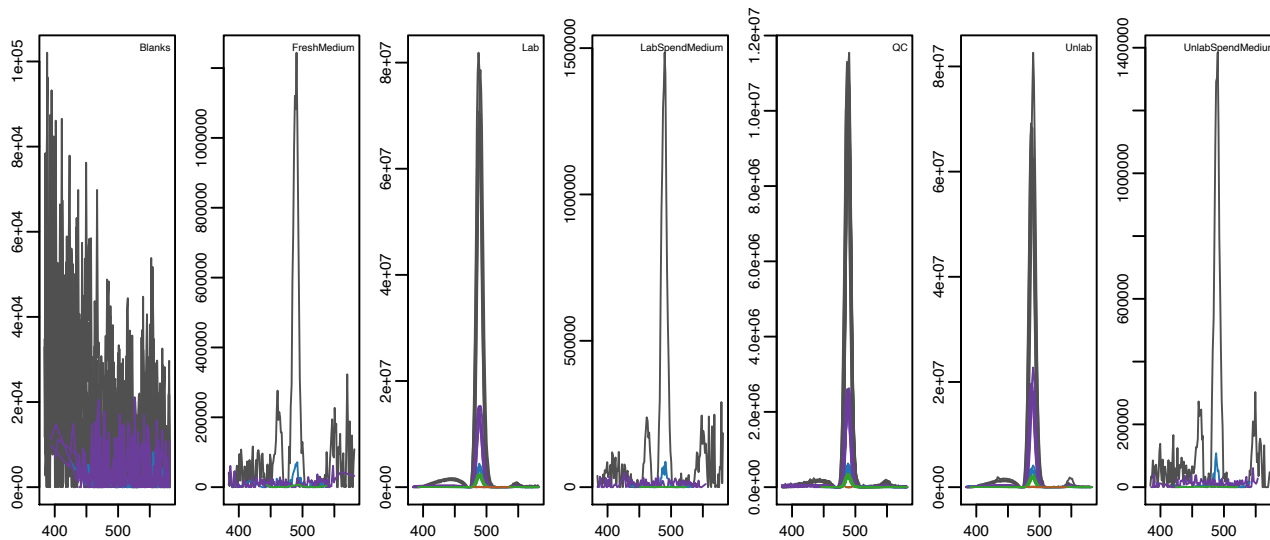


Uracil

Formula: C₄H₄N₂O₂ Mass: 112.027 Std.RT: 483.6 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4

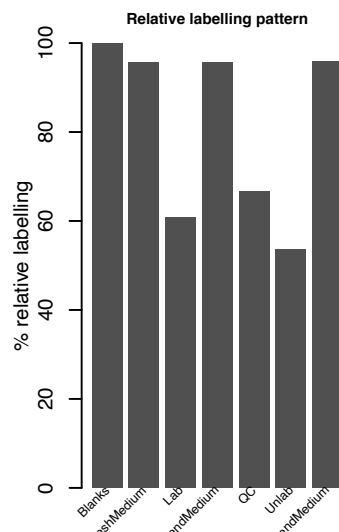
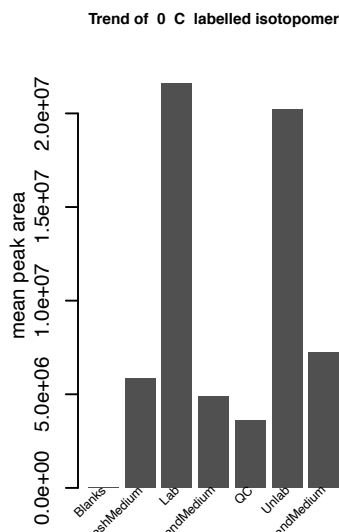
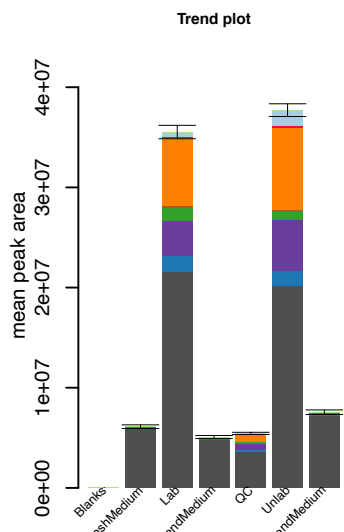
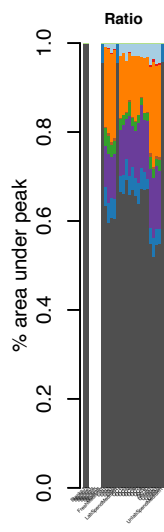
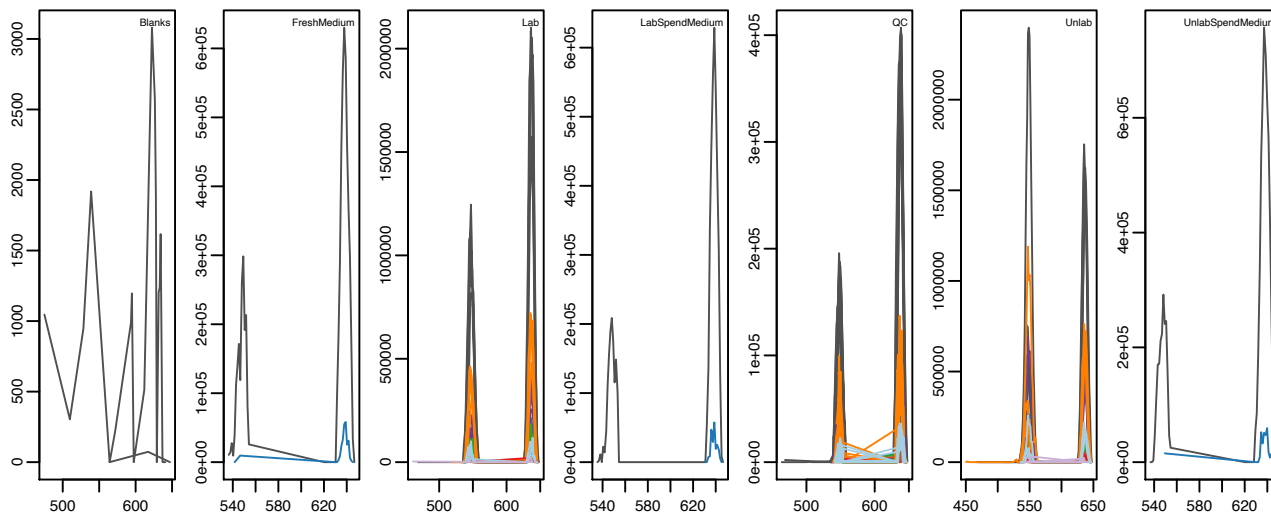


Uridine

Formula: C₉H₁₂N₂O₆ Mass: 244.07 Std.RT: 549 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6 ■ +7 ■ +8 ■ +9

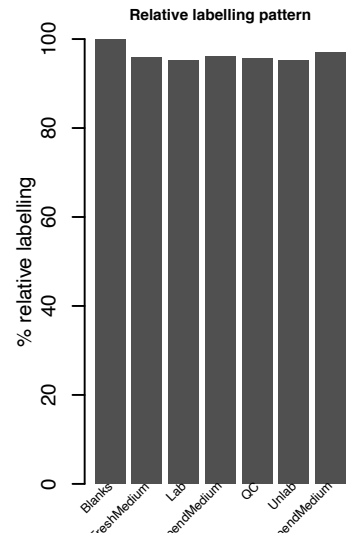
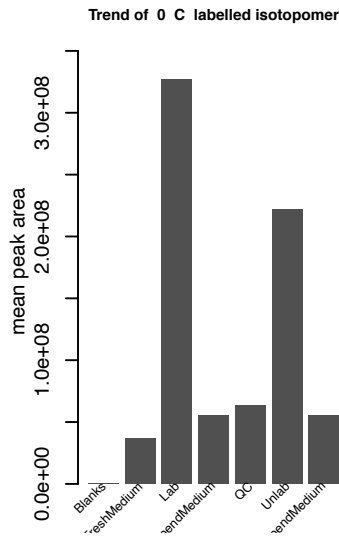
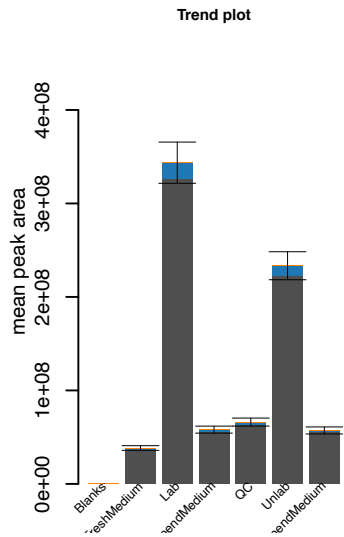
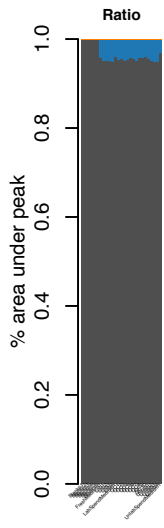
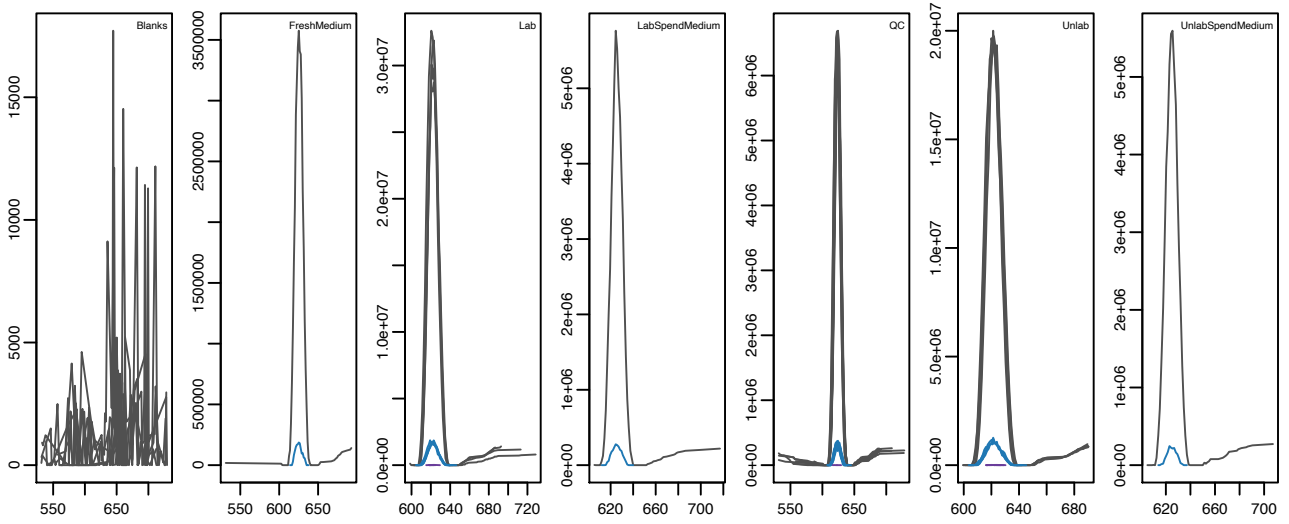


Xanthine

Formula: C₅H₄N₄O₂ Mass: 152.033 Std.RT: 630.6 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5

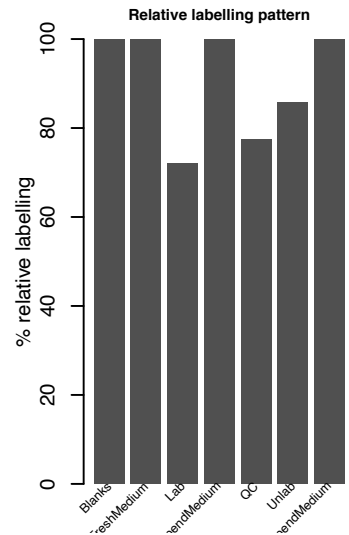
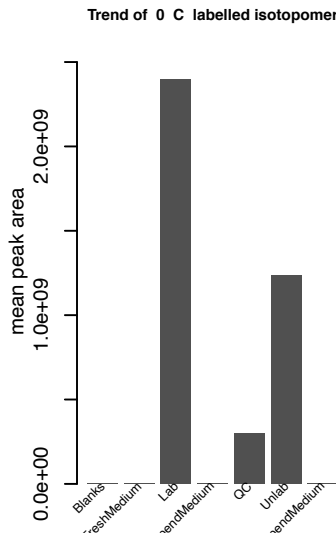
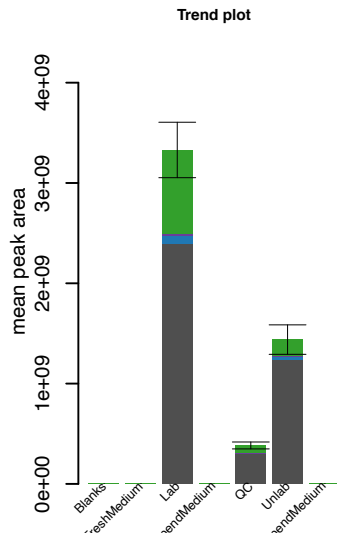
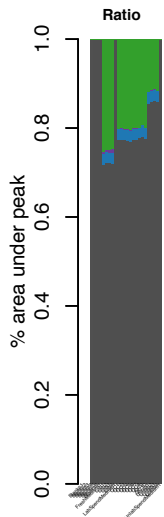
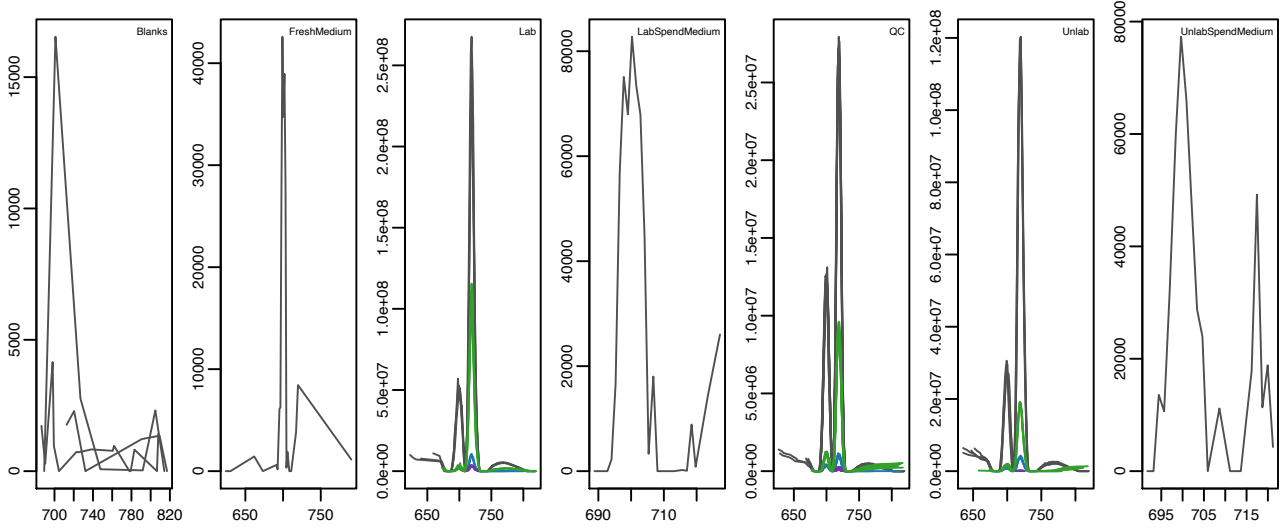


sn-Glycerol 3-phosphate

Formula: C3H9O6P Mass: 172.014 Std.RT: 720.6 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3

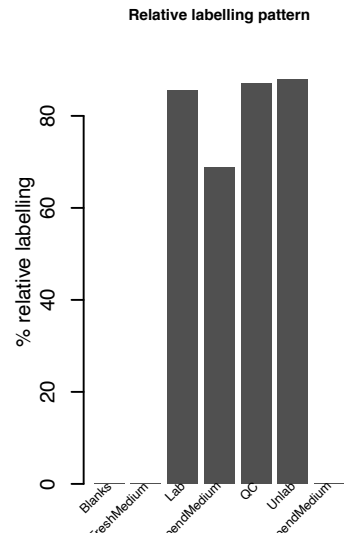
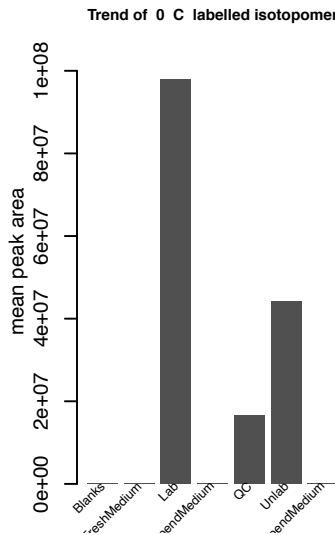
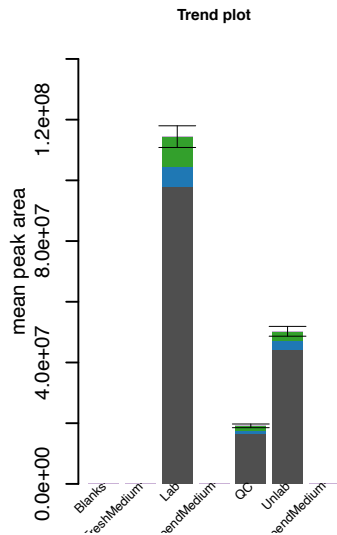
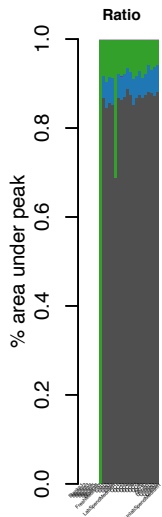
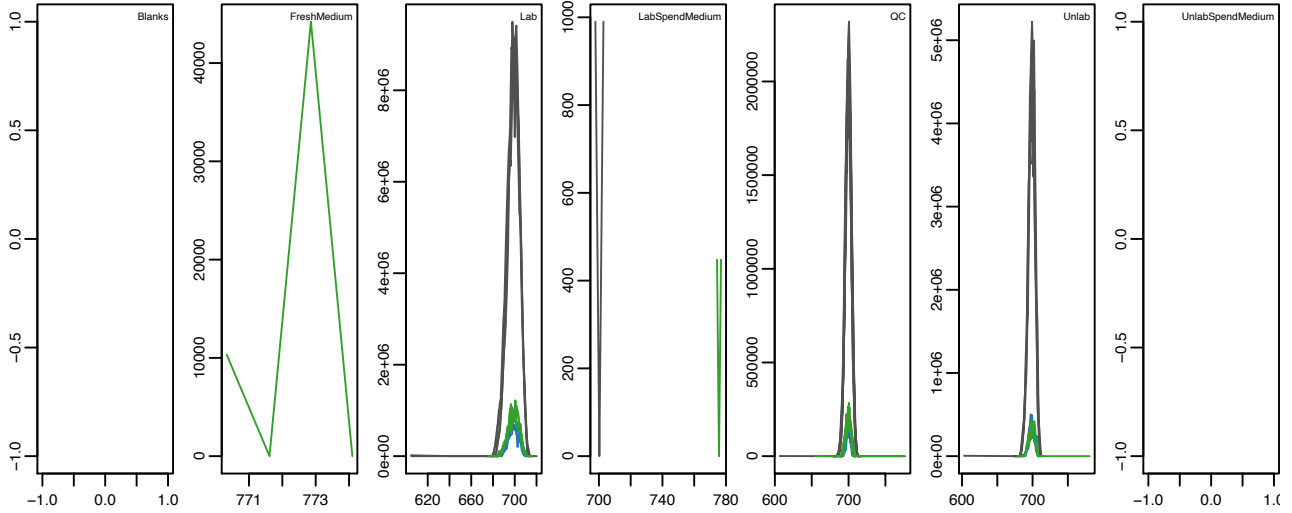


sn-glycero-3-Phosphocholine

Formula: C₈H₂₀NO₆P Mass: 257.103 Std.RT: 700.8 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6 ■ +7 ■ +8

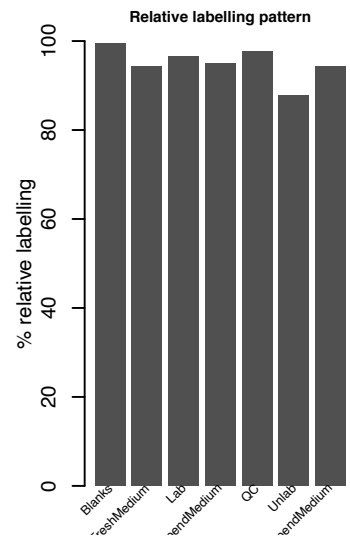
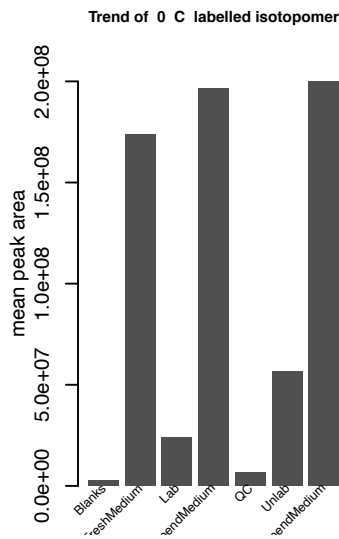
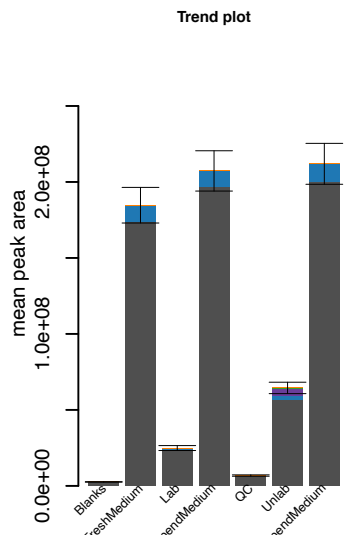
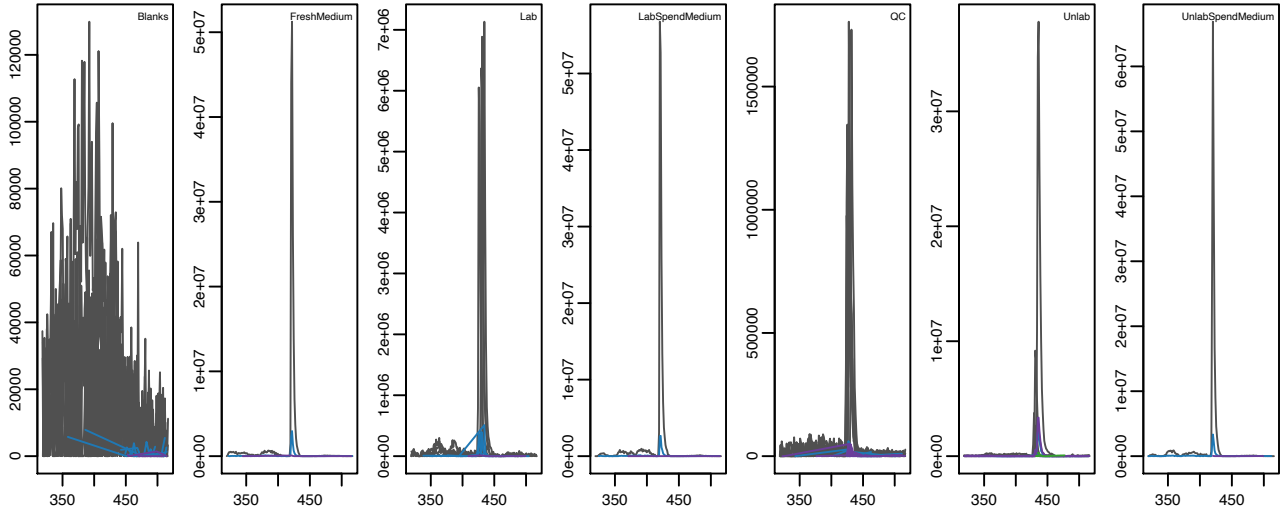


thymine

Formula: C₅H₆N₂O₂ Mass: 126.043 Std.RT: 418.2 Ion: NEG

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5

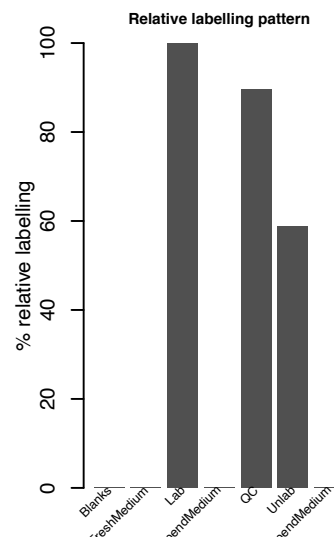
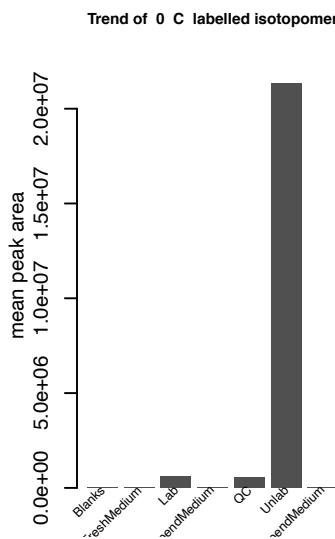
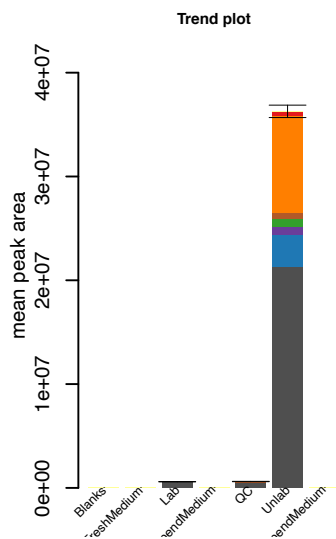
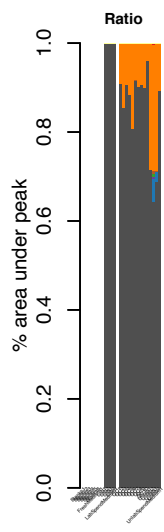
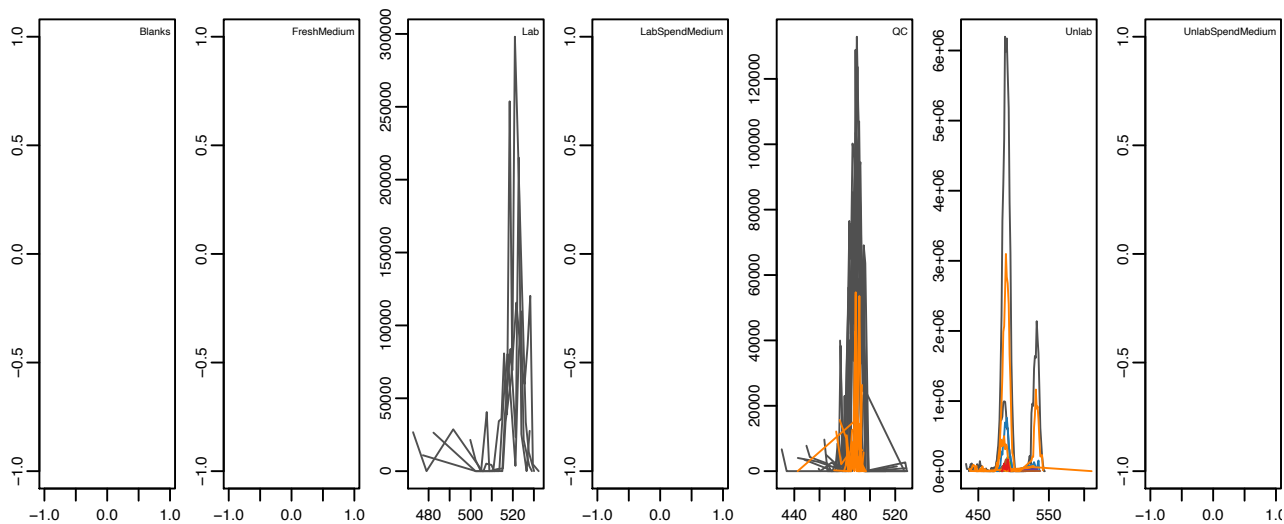


3'_5'-Cyclic AMP

Formula: C₁₀H₁₂N₅O₆P Mass: 329.053 Std.RT: 526.8 Ion: POS

G1

■UL ■+1 ■+2 ■+3 ■+4 ■+5 ■+6 ■+7 ■+8 ■+9 ■+10

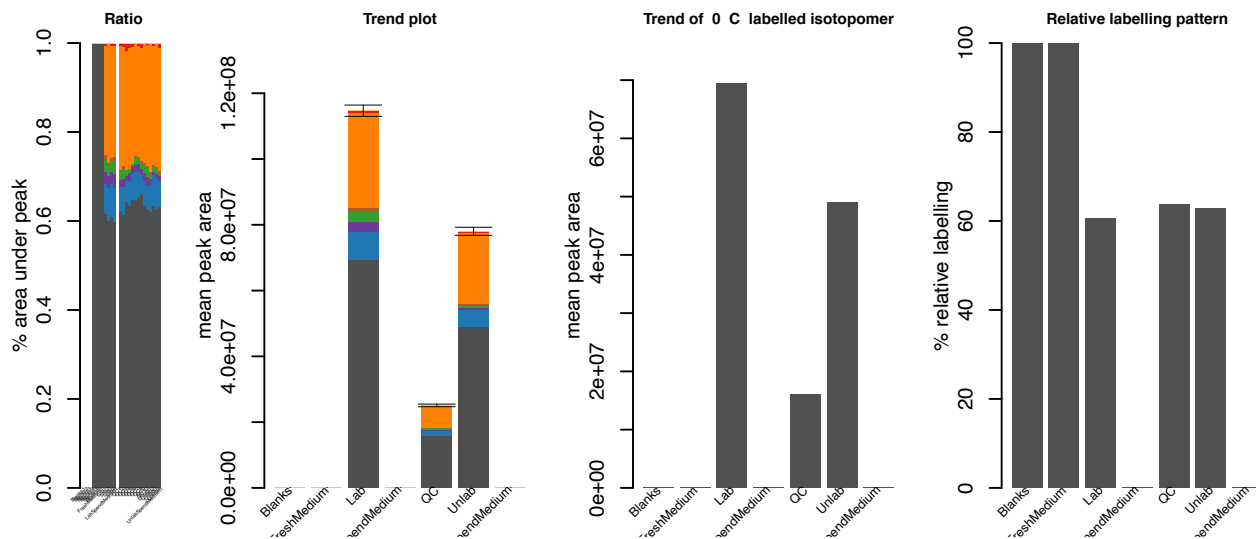
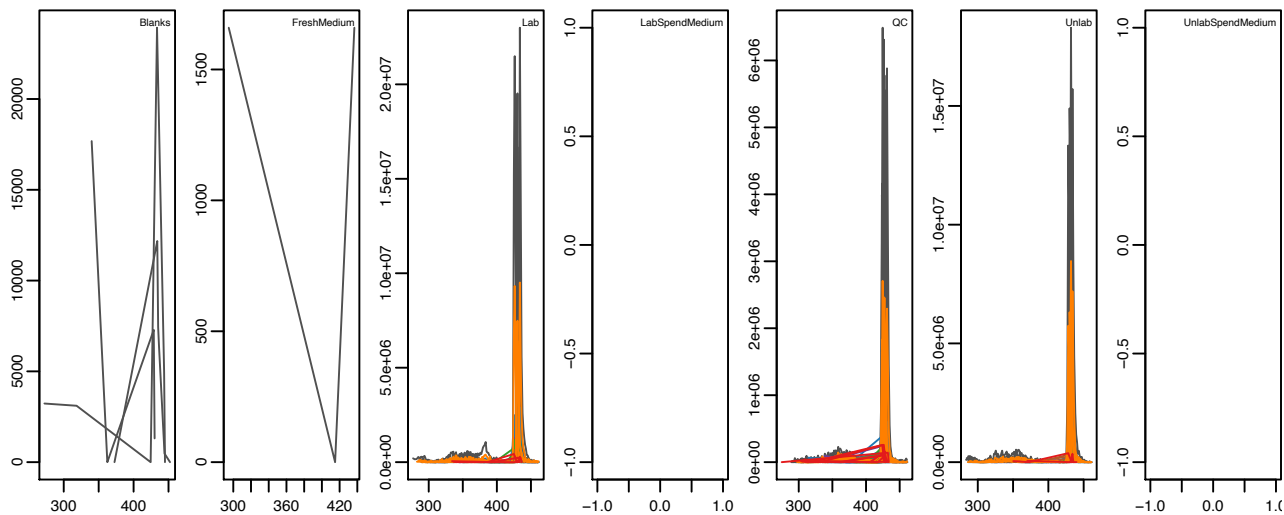


5'-Methylthioadenosine

Formula: C₁₁H₁₅N₅O₃S Mass: 297.09 Std.RT: 363 Ion: POS

G1

■UL ■+1 ■+2 ■+3 ■+4 ■+5 ■+6 ■+7 ■+8 ■+9 ■+10 ■+11

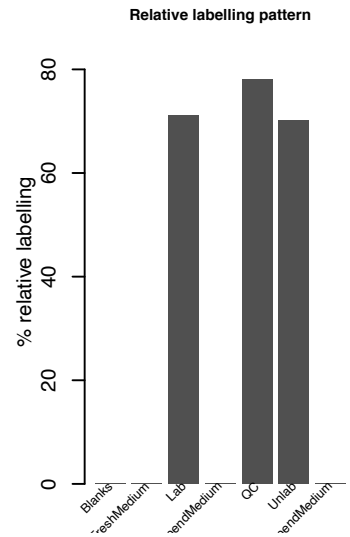
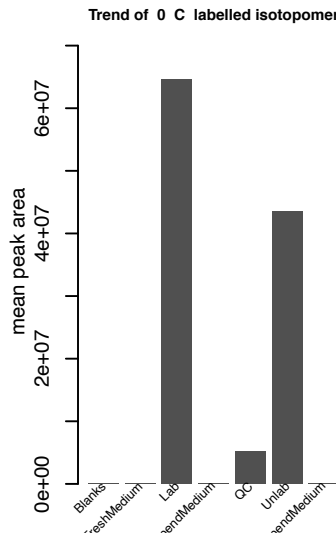
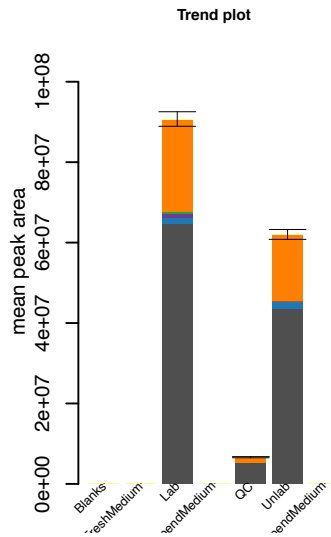
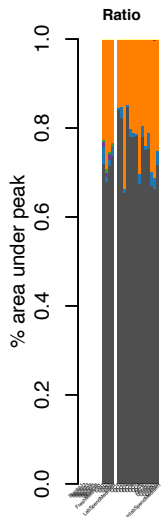
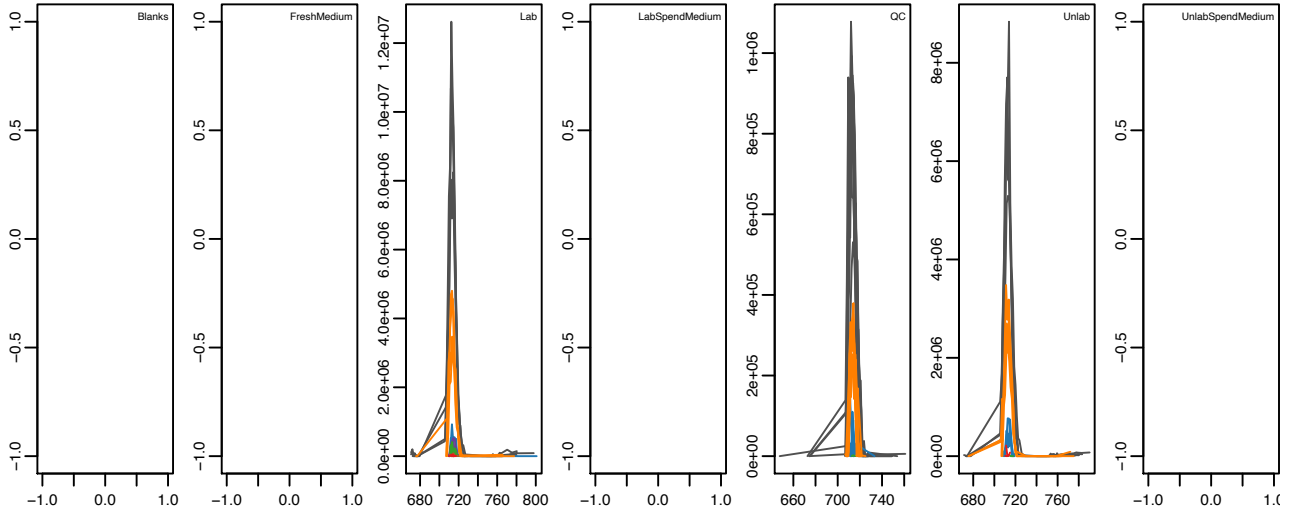


ADP

Formula: C₁₀H₁₅N₅O₁₀P₂ Mass: 427.029 Std.RT: 714 Ion: POS

G1

■UL ■+1 ■+2 ■+3 ■+4 ■+5 ■+6 ■+7 ■+8 ■+9 ■+10

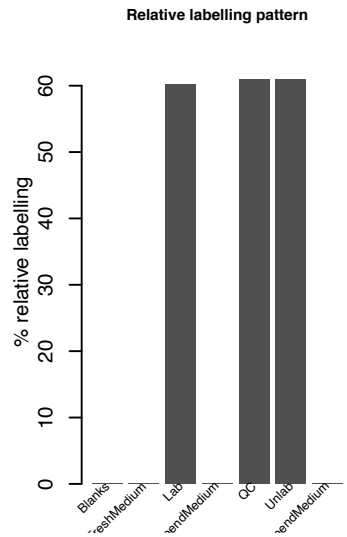
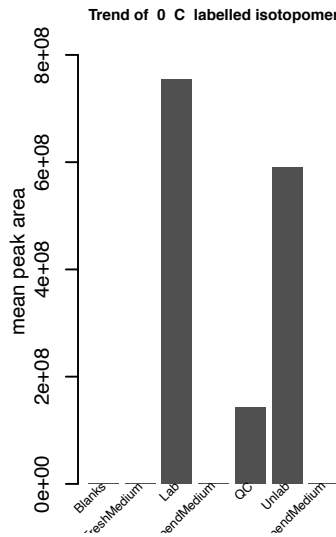
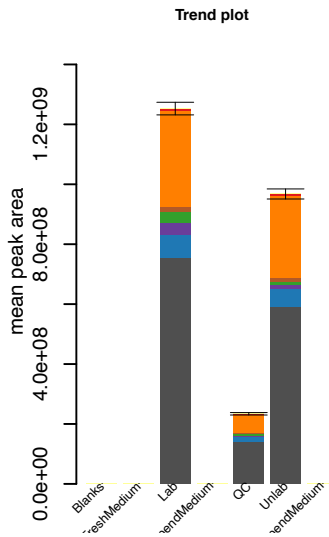
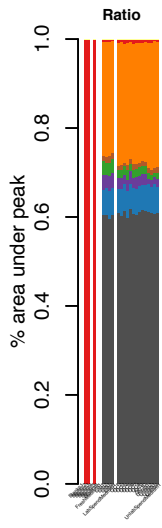
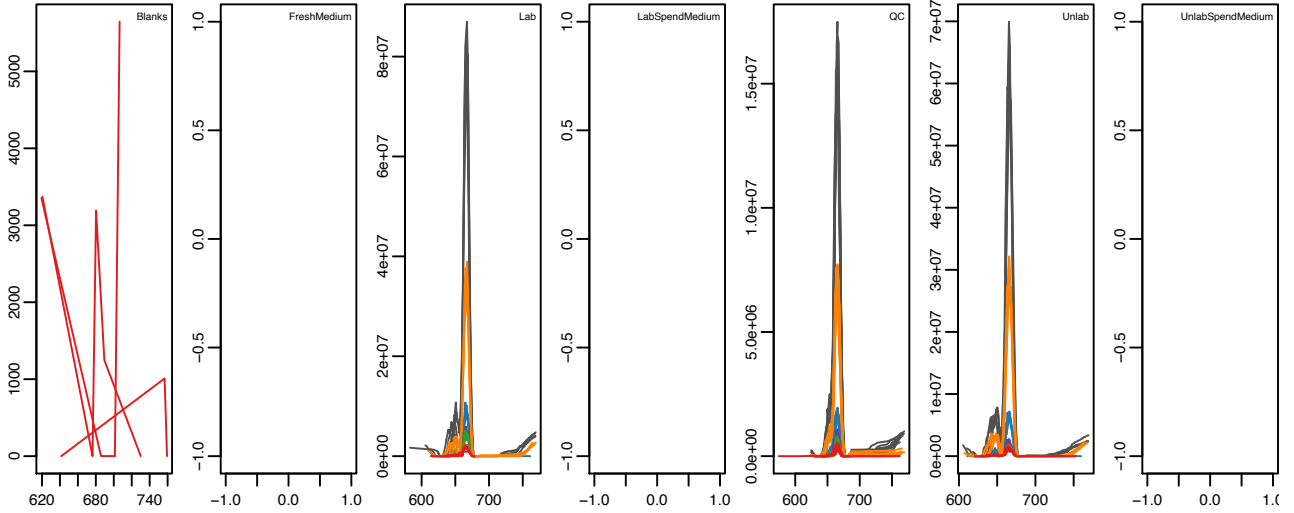


AMP

Formula: C₁₀H₁₄N₅O₇P Mass: 347.063 Std.RT: 670.8 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6 ■ +7 ■ +8 ■ +9 ■ +10

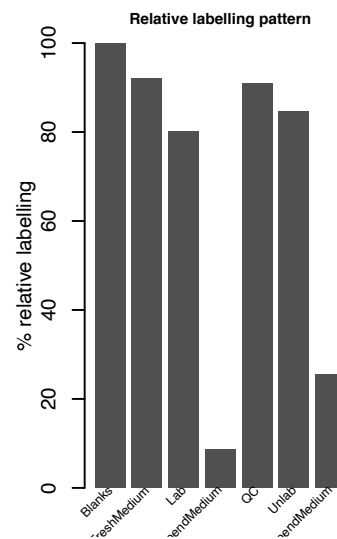
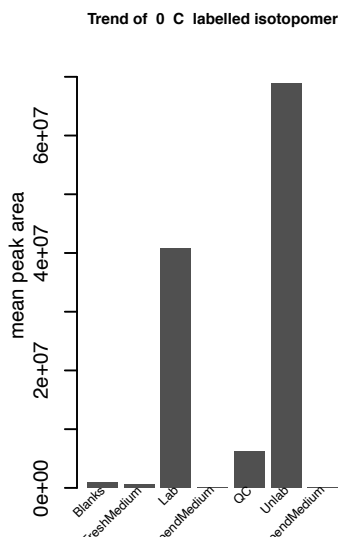
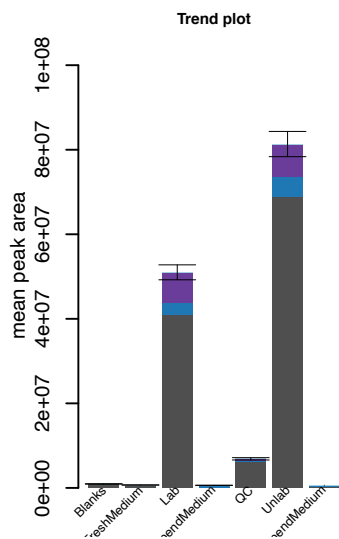
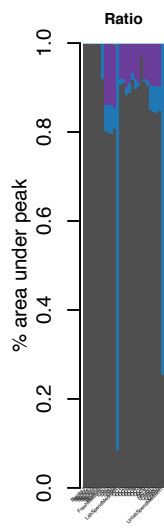
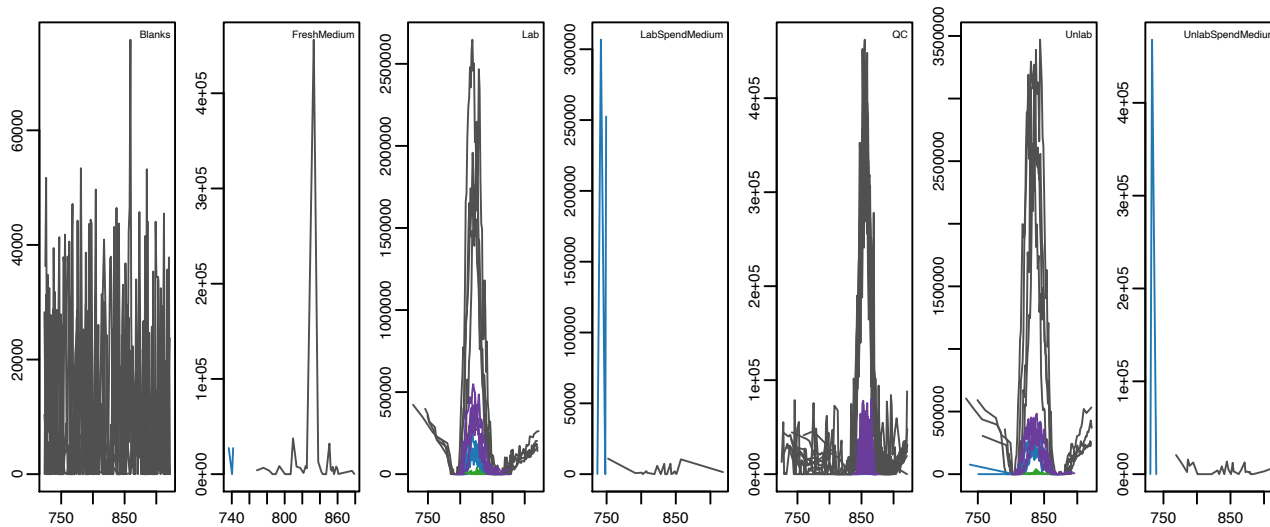


Acetylcholine

Formula: C₇H₁₅NO₂ Mass: 145.11 Std.RT: 823.2 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6 ■ +7

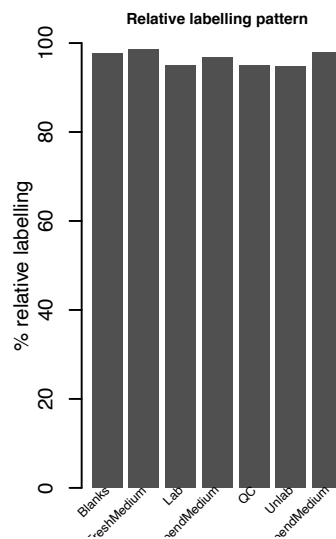
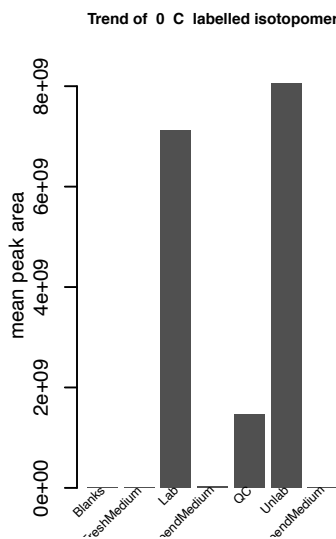
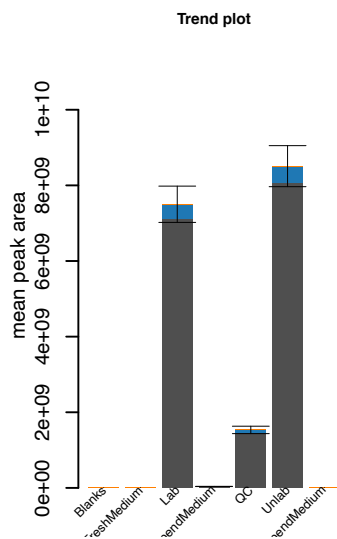
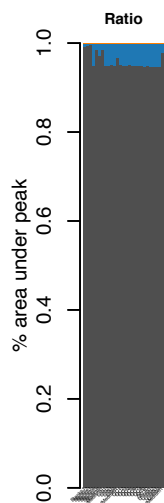
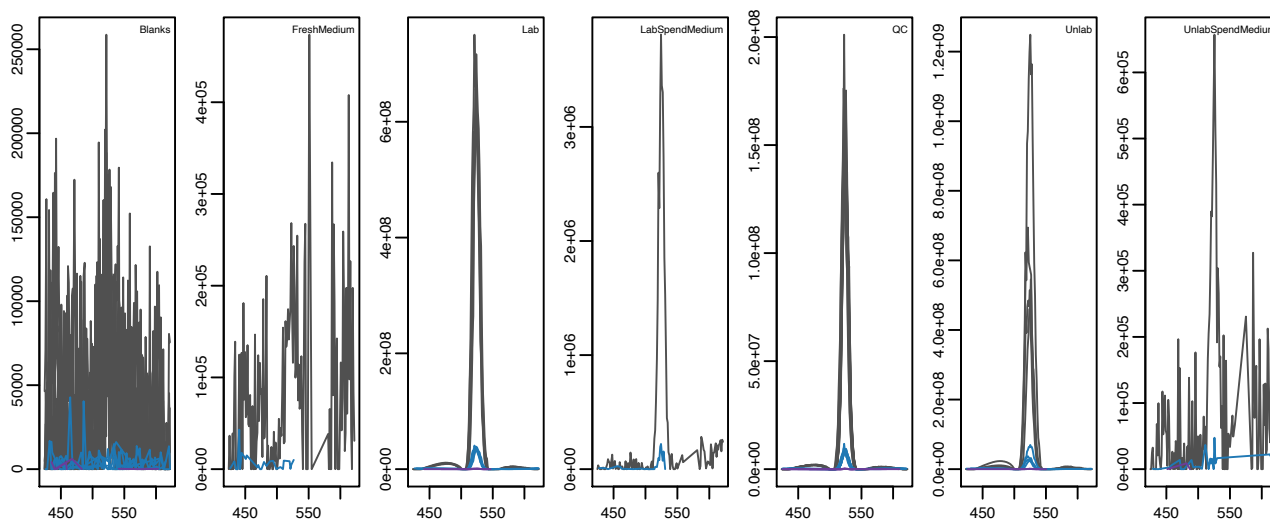


Adenine

Formula: C₅H₅N₅ Mass: 135.054 Std.RT: 523.8 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5

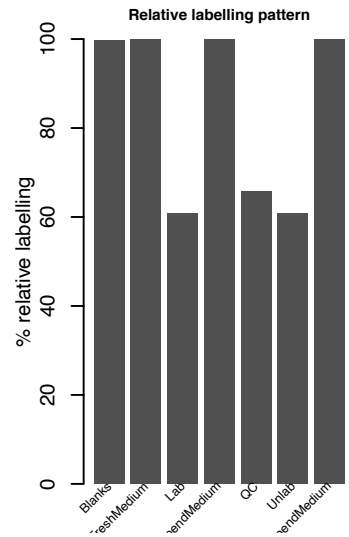
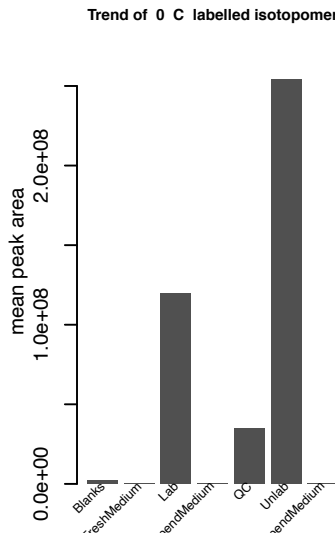
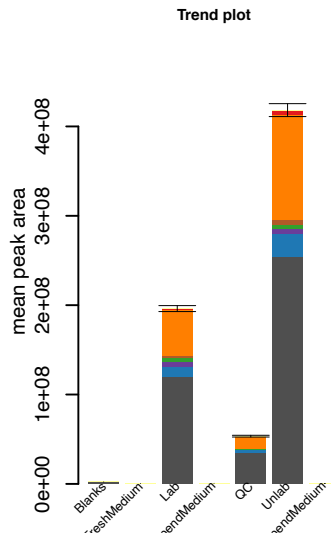
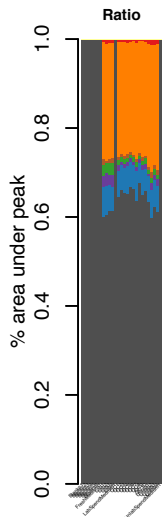
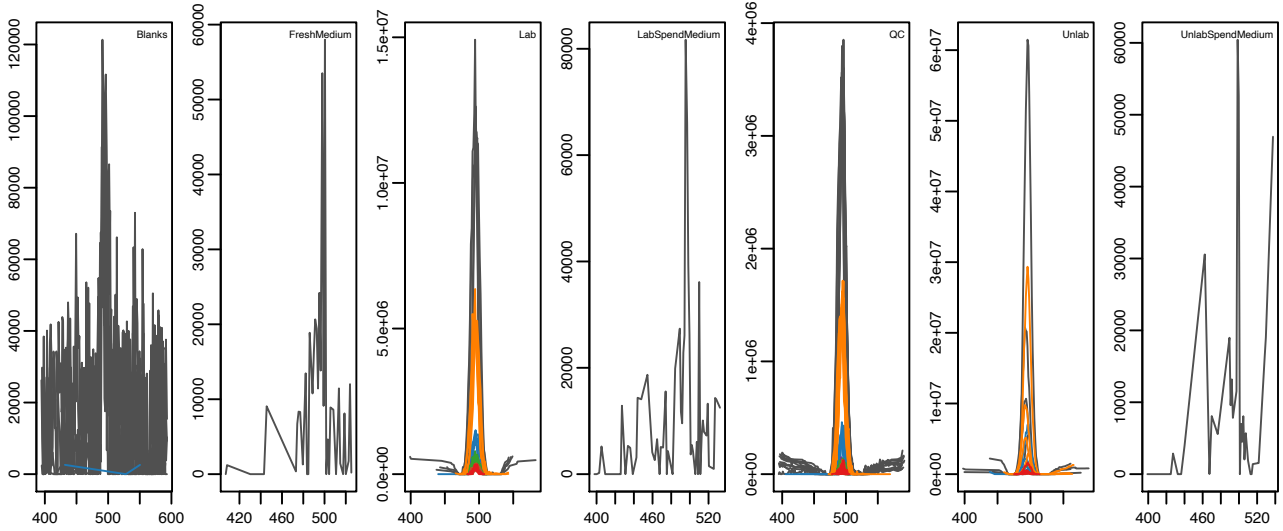


Adenosine

Formula: C₁₀H₁₃N₅O₄ Mass: 267.097 Std.RT: 494.4 Ion: POS

G1

■UL ■+1 ■+2 ■+3 ■+4 ■+5 ■+6 ■+7 ■+8 ■+9 ■+10

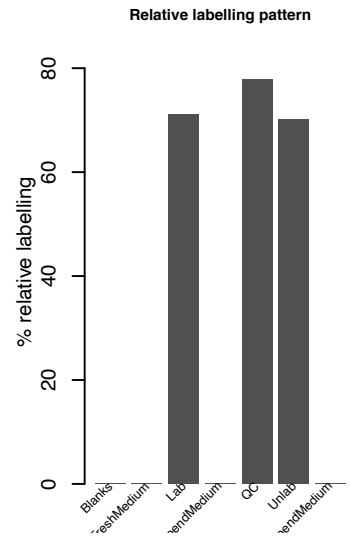
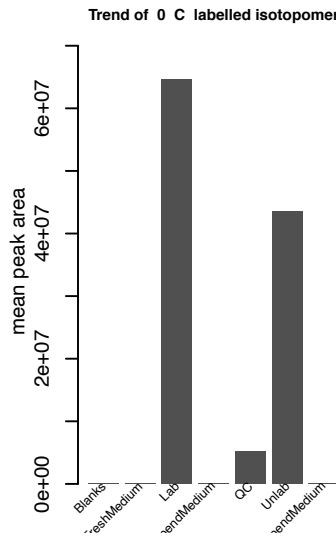
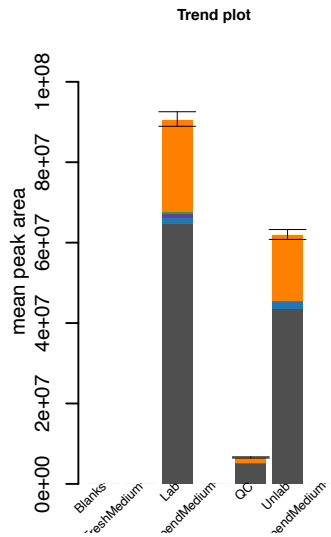
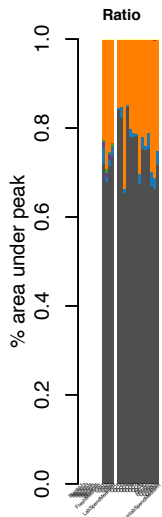
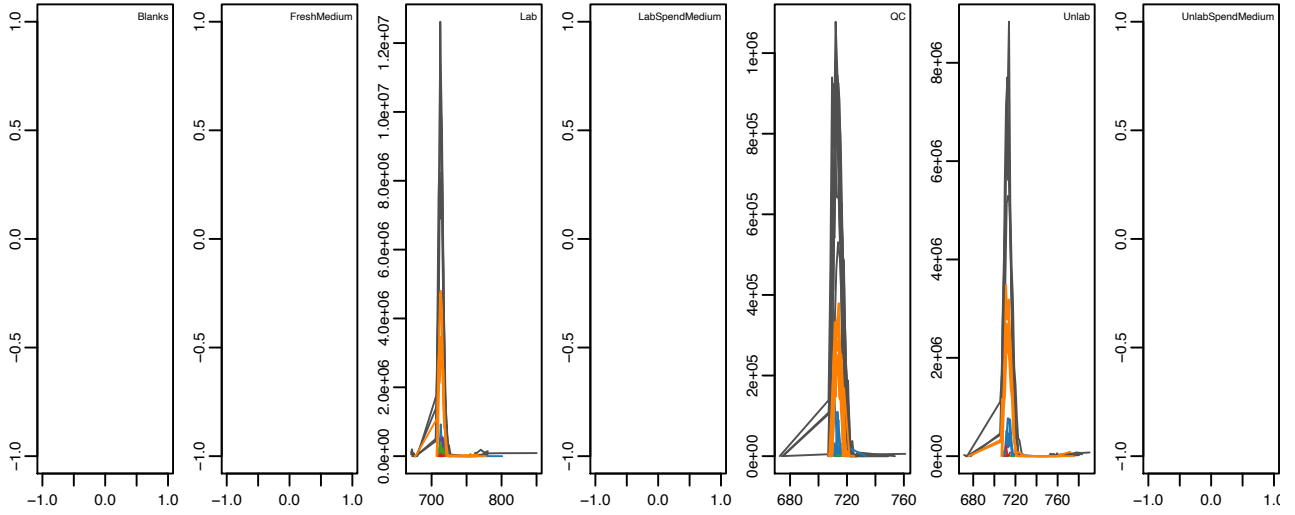


Adenosine 2'_5'-bisphosphate

Formula: C₁₀H₁₅N₅O₁₀P₂ Mass: 427.029 Std.RT: 761.4 Ion: POS

G1

■UL ■+1 ■+2 ■+3 ■+4 ■+5 ■+6 ■+7 ■+8 ■+9 ■+10

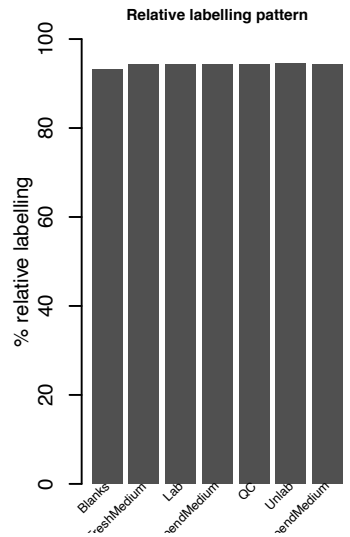
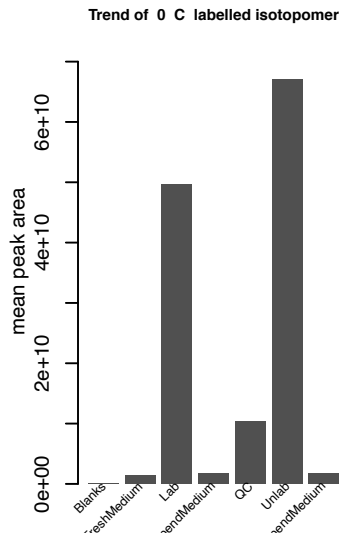
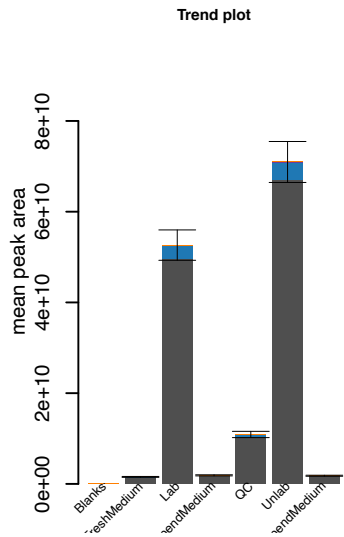
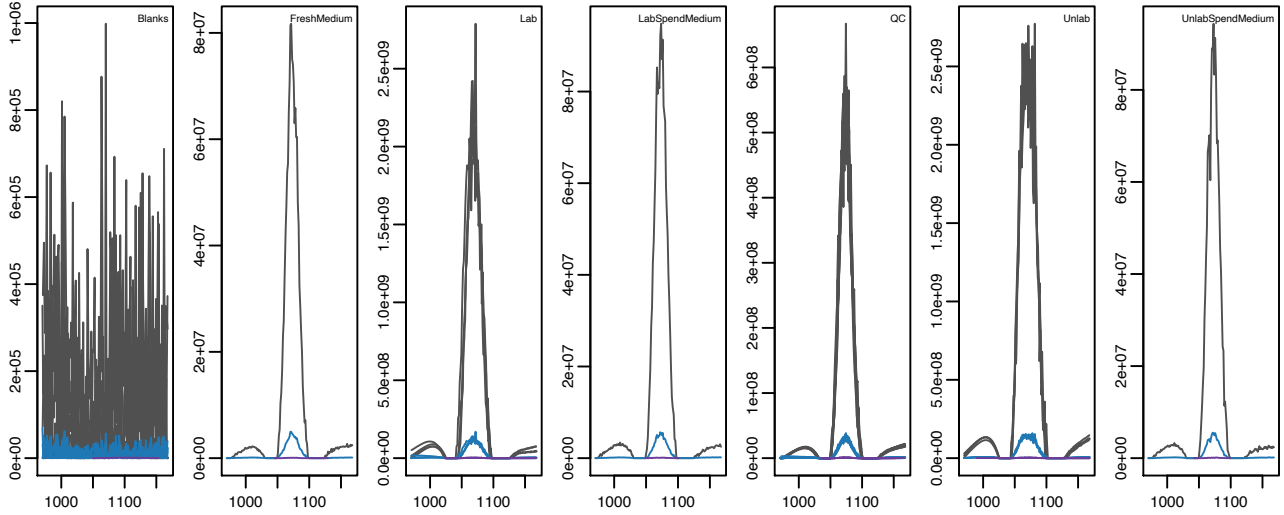


Choline

Formula: C₅H₁₃NO Mass: 103.1 Std.RT: 1069.8 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5

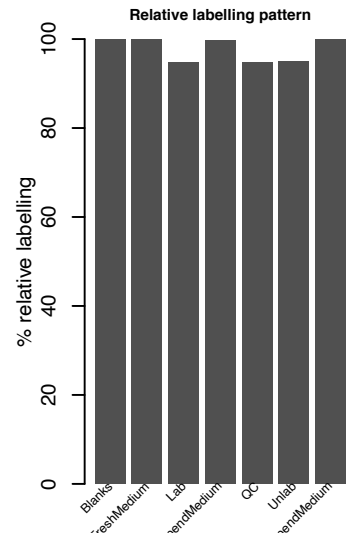
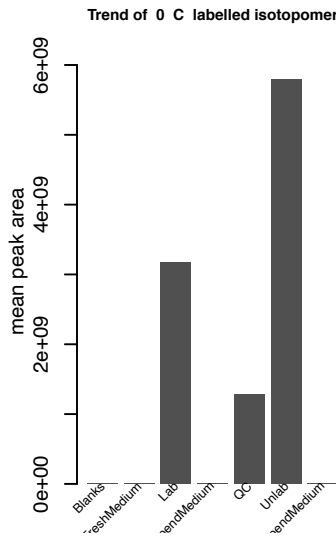
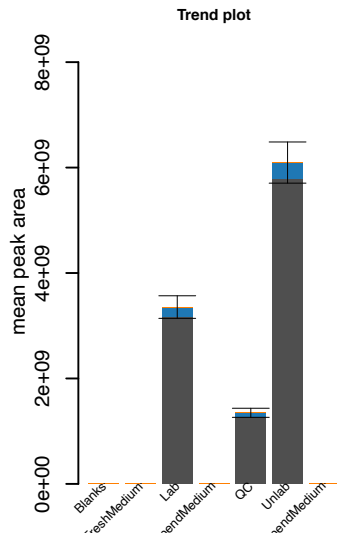
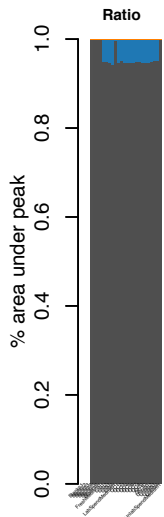
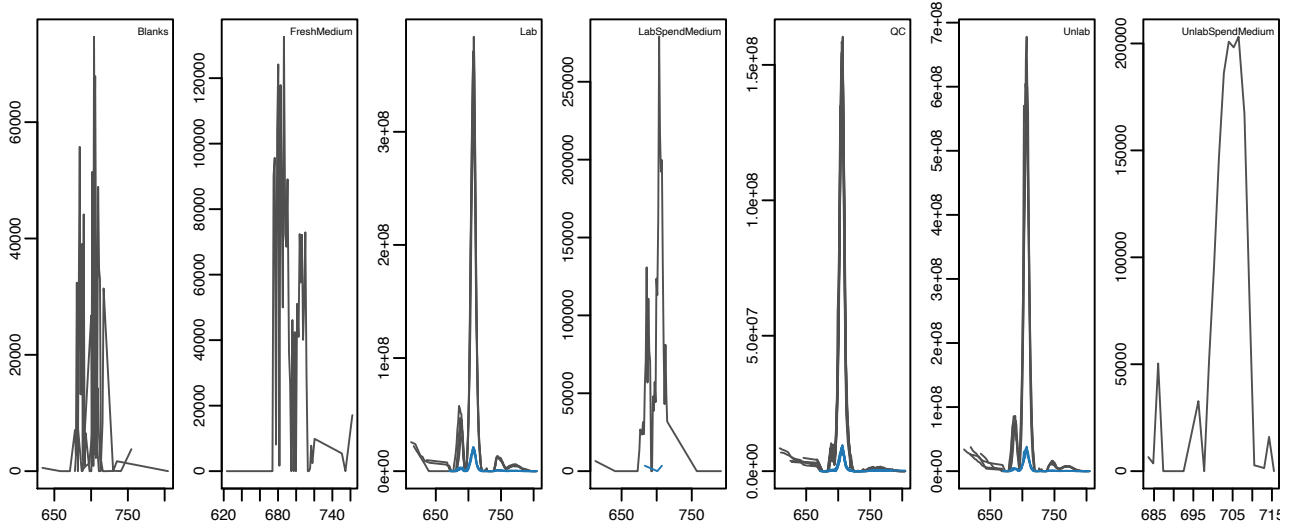


Choline phosphate

Formula: C₅H₁₄NO₄P Mass: 183.066 Std.RT: 706.2 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5

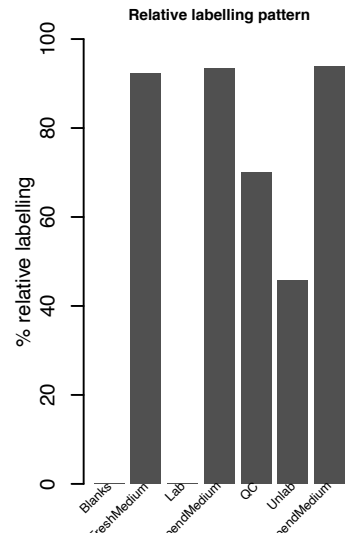
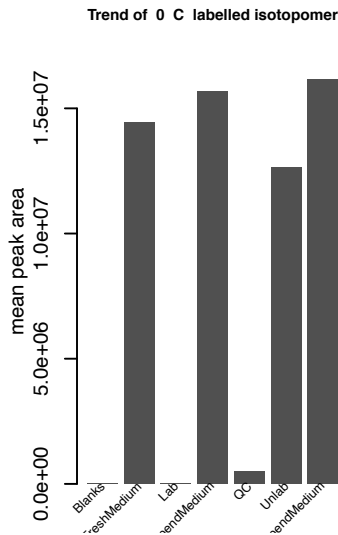
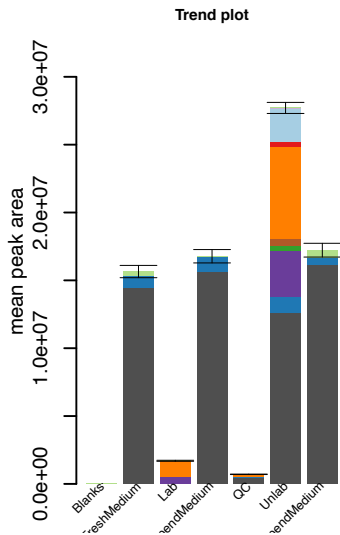
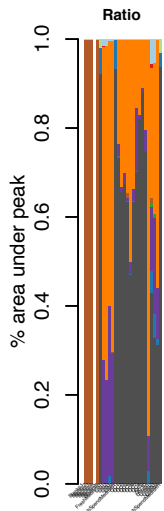
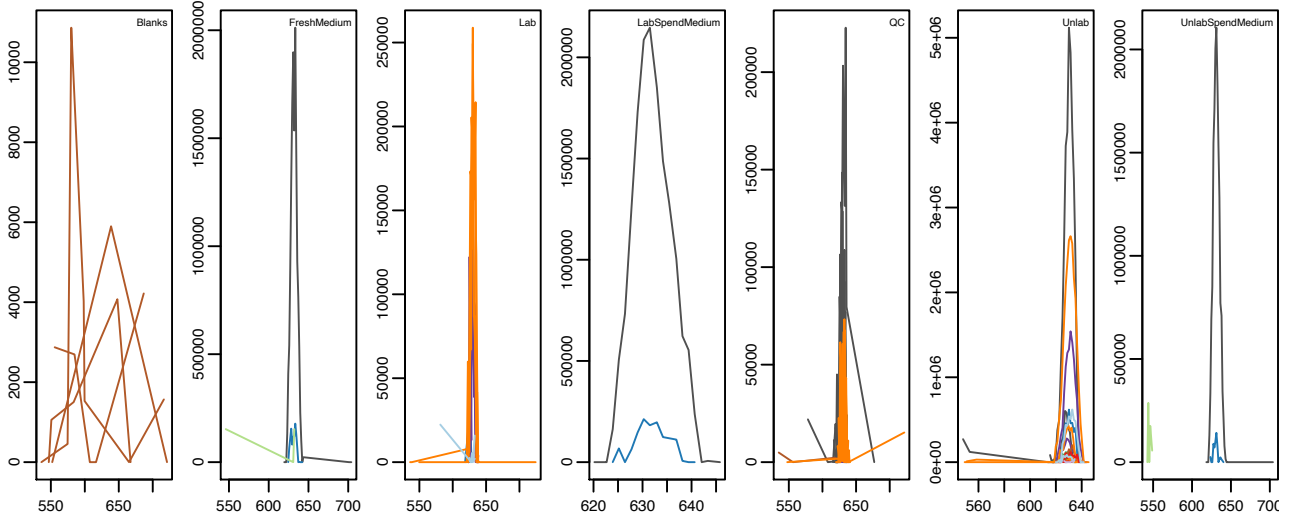


Cytidine

Formula: C₉H₁₃N₃O₅ Mass: 243.086 Std.RT: 633.6 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6 ■ +7 ■ +8 ■ +9

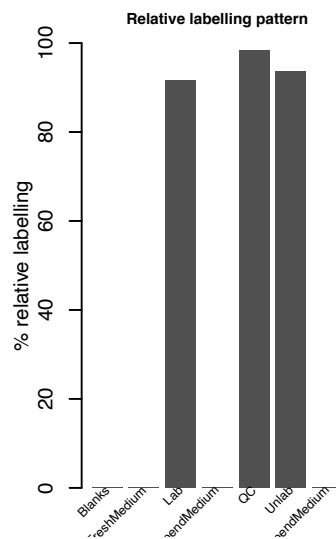
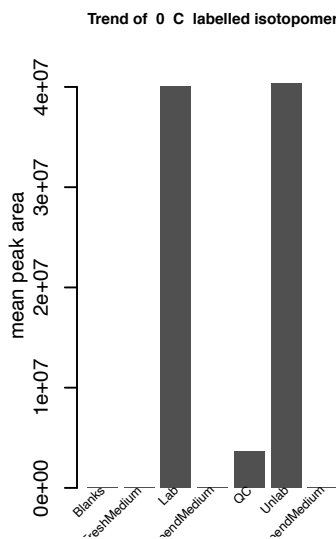
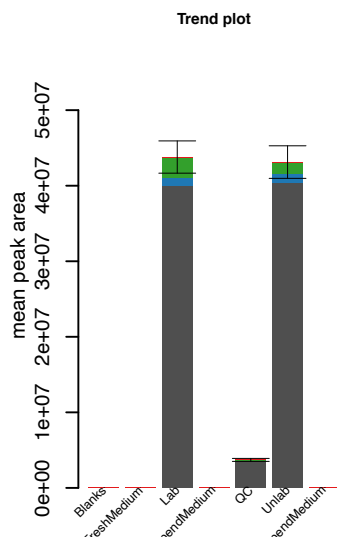
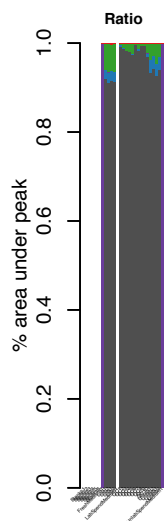
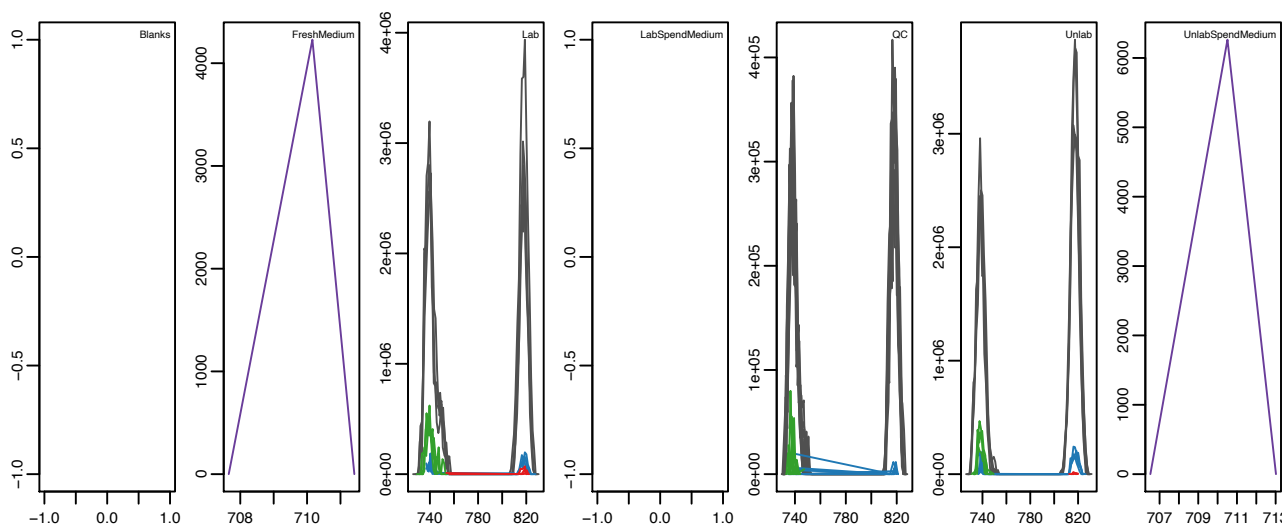


D-Glucosamine-6-phosphate

Formula: C₆H₁₄NO₈P Mass: 259.046 Std.RT: 759 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6

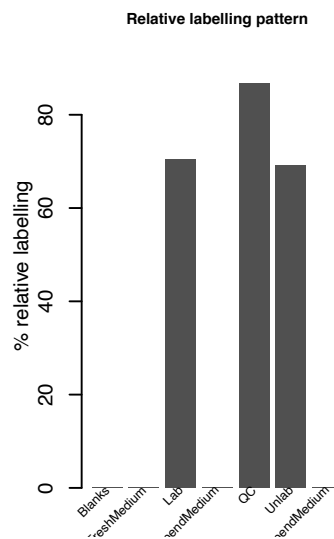
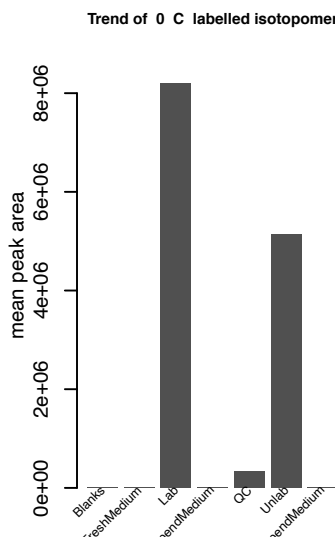
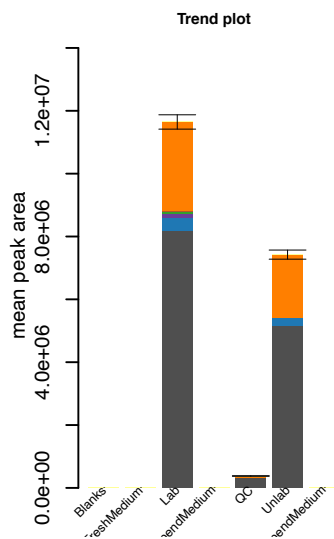
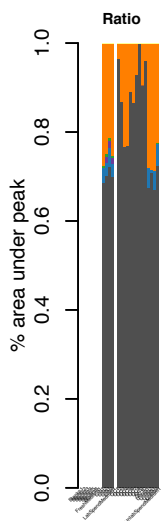
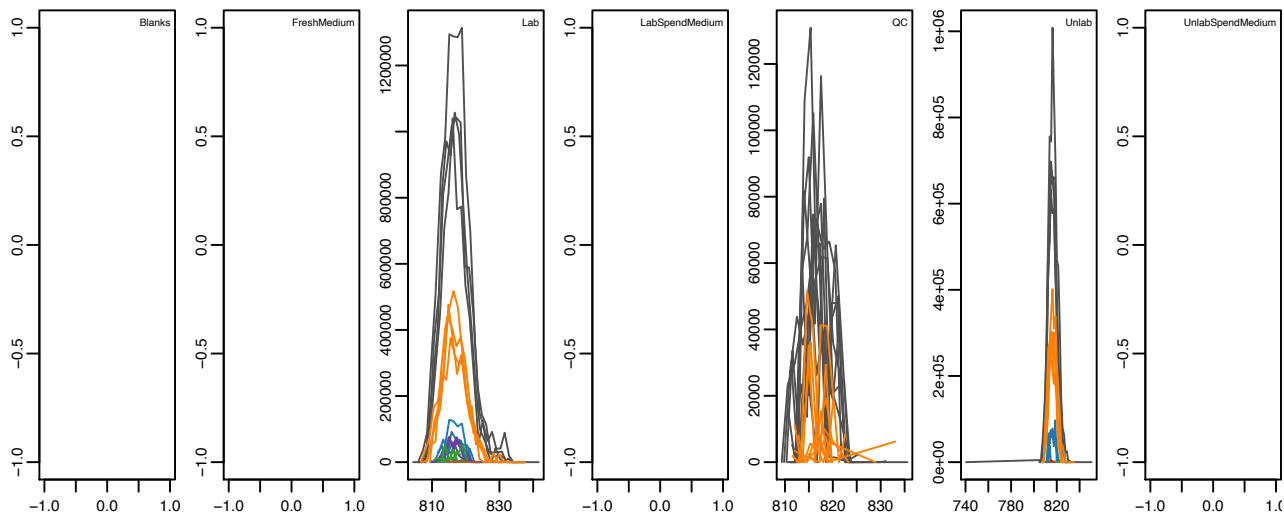


GDP

Formula: C₁₀H₁₅N₅O₁₁P₂ Mass: 443.024 Std.RT: 816 Ion: POS

G1

■UL ■+1 ■+2 ■+3 ■+4 ■+5 ■+6 ■+7 ■+8 ■+9 ■+10

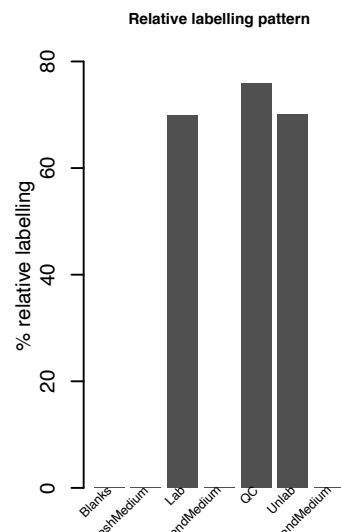
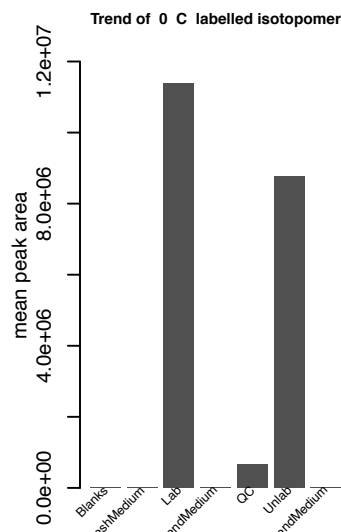
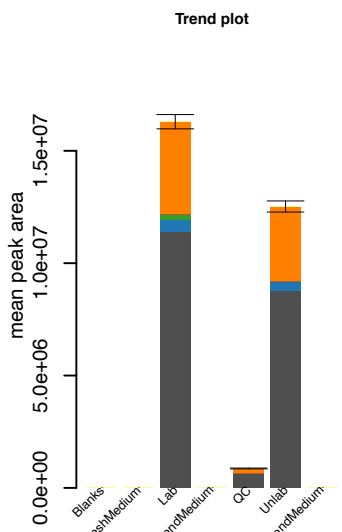
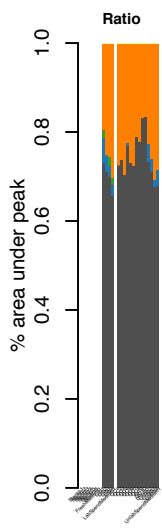
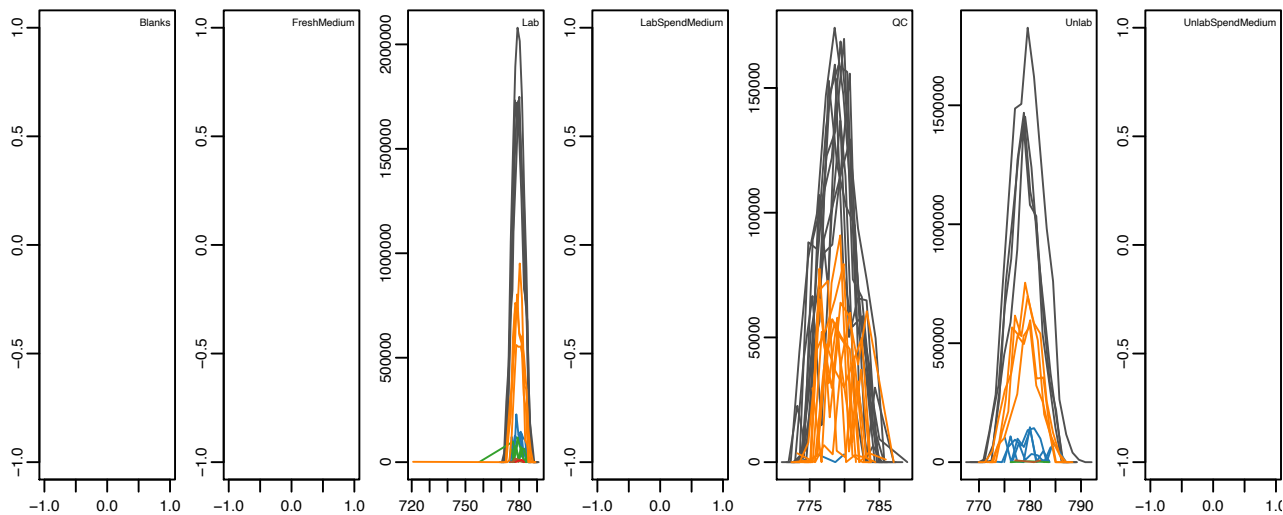


GMP

Formula: C₁₀H₁₄N₅O₈P Mass: 363.058 Std.RT: 747 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6 ■ +7 ■ +8 ■ +9 ■ +10

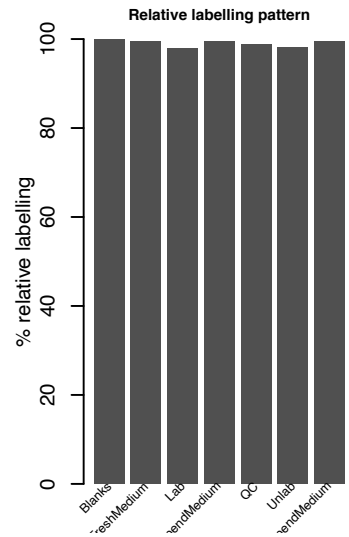
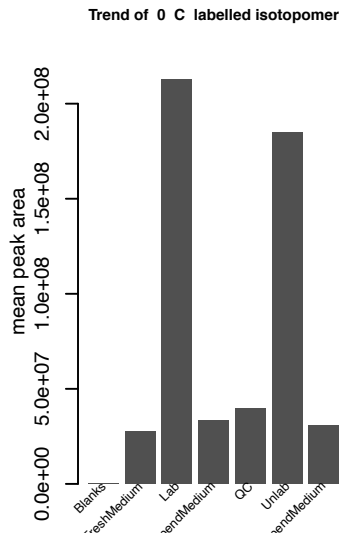
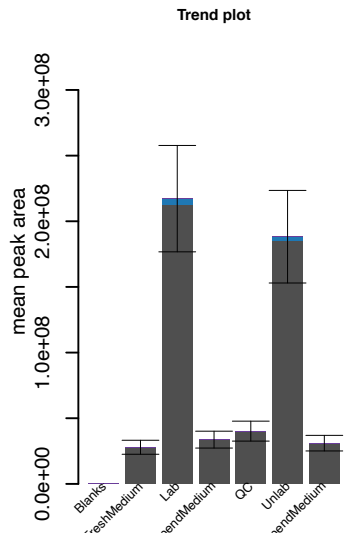
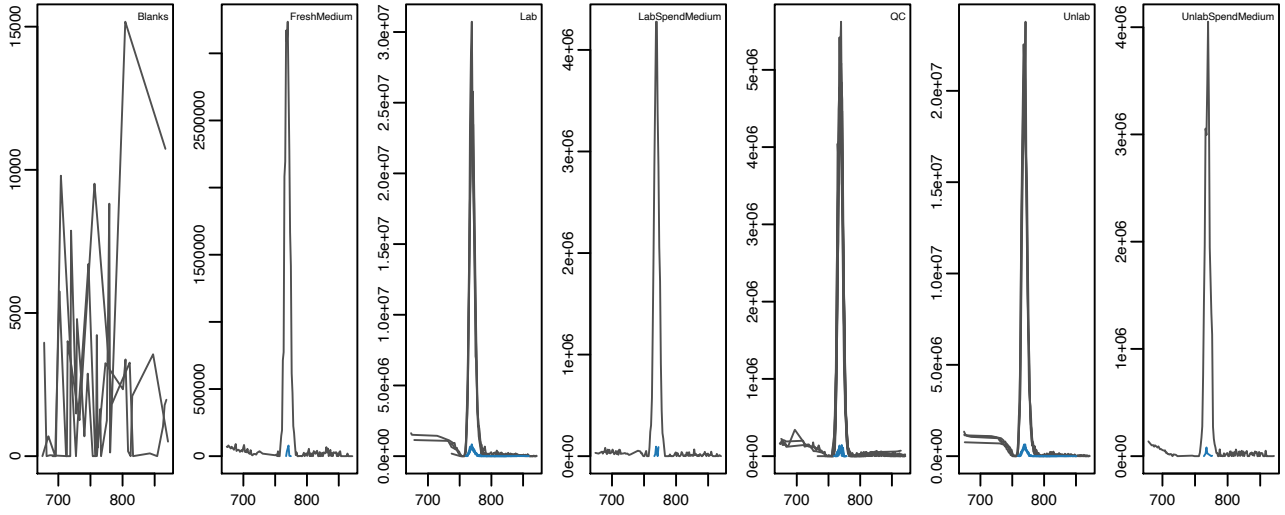


Glycine

Formula: C₂H₅NO₂ Mass: 75.032 Std.RT: 772.8 Ion: POS

G1

■ UL ■ +1 ■ +2

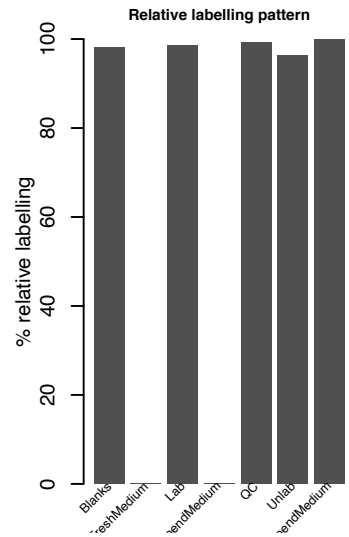
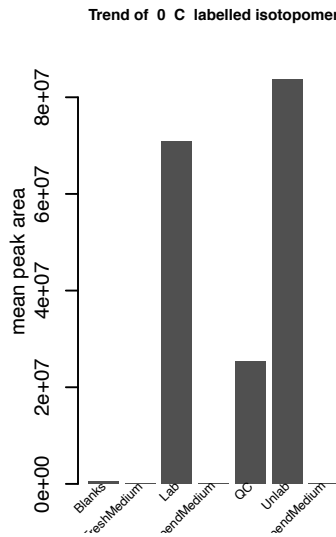
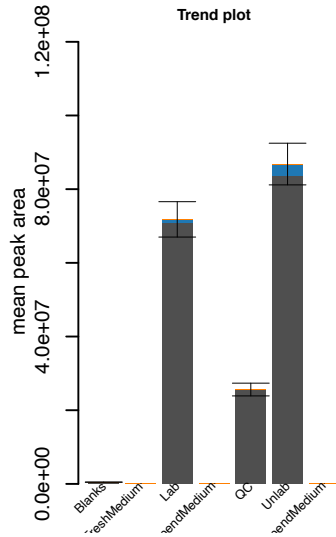
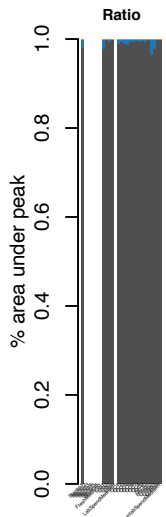
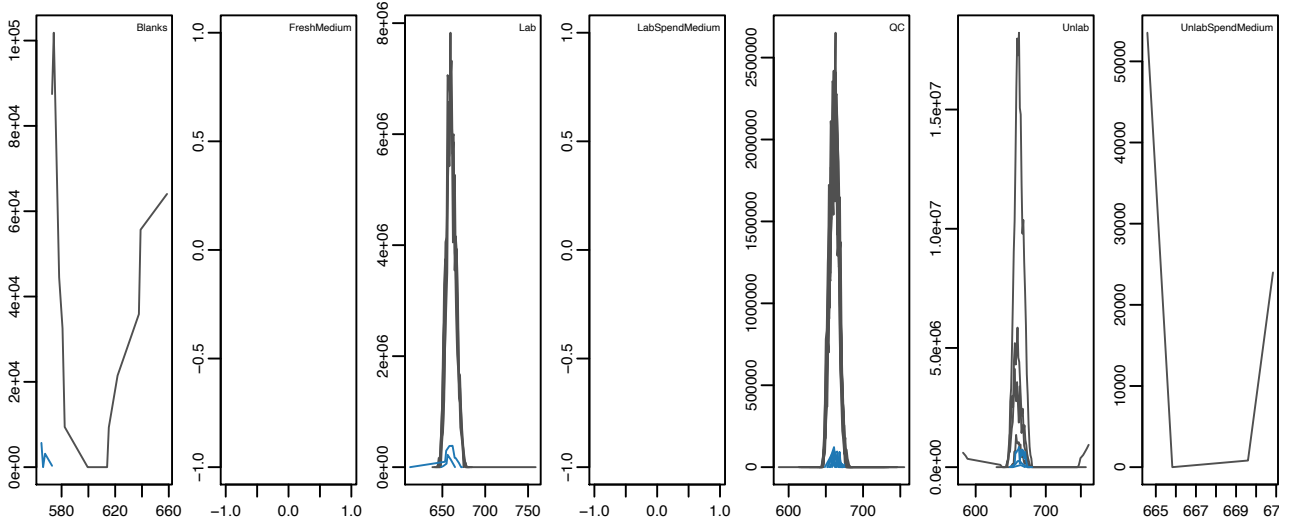


Guanine

Formula: C₅H₅N₅O Mass: 151.049 Std.RT: 664.2 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5

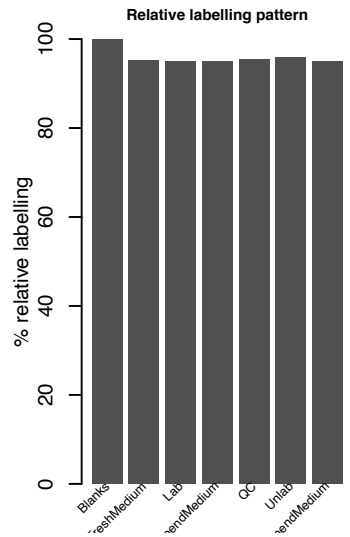
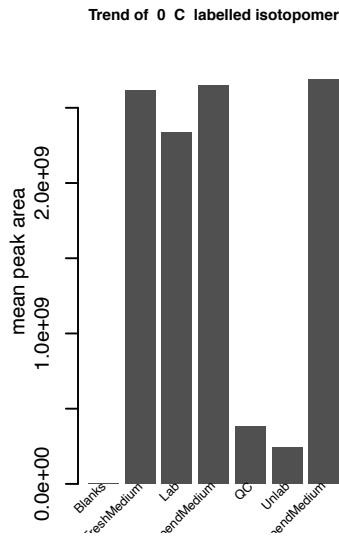
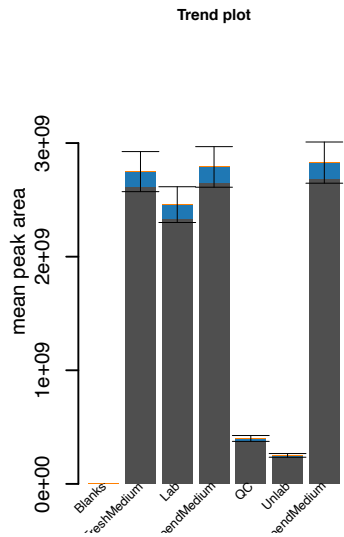
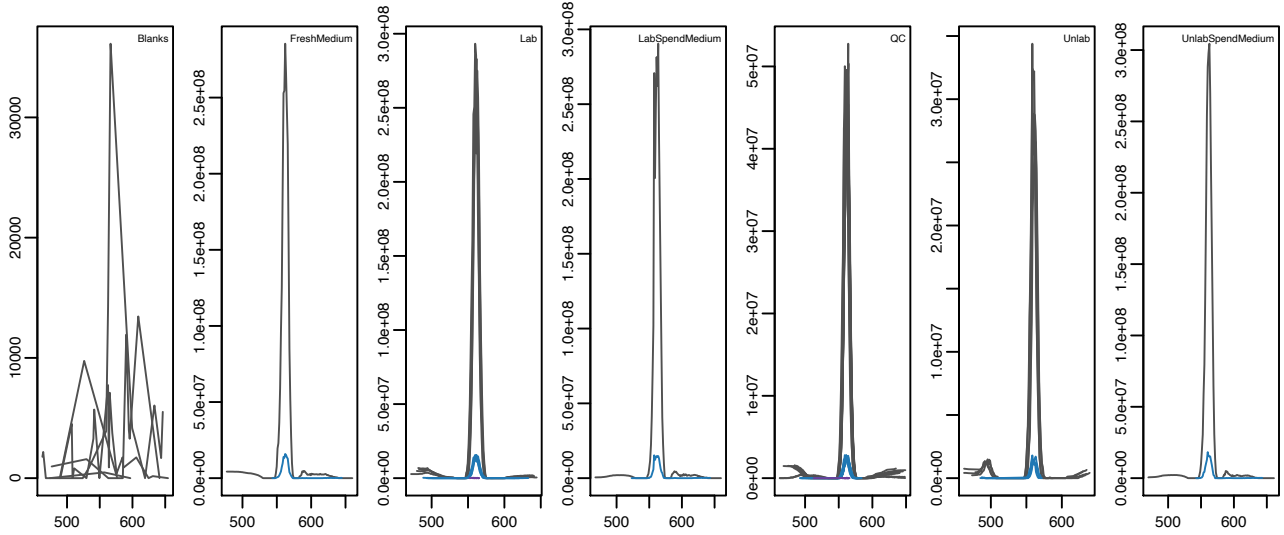


Hypoxanthine

Formula: C₅H₄N₄O Mass: 136.039 Std.RT: 562.2 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5

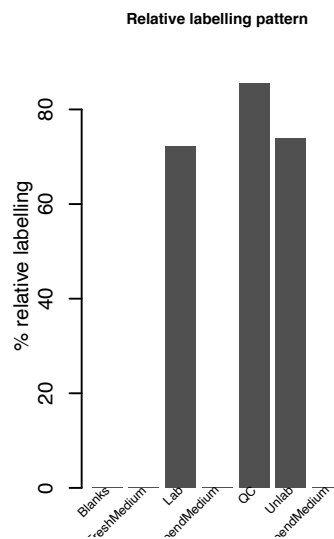
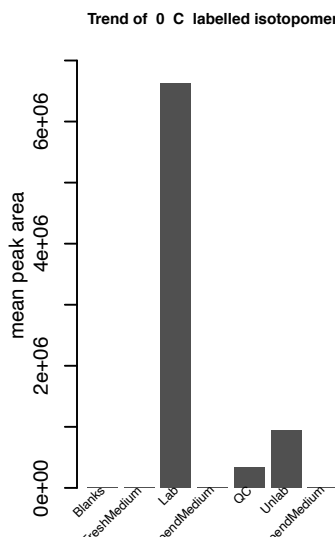
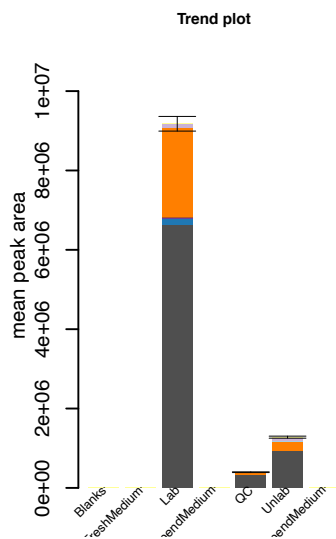
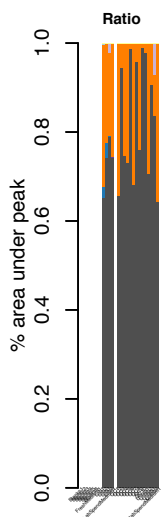
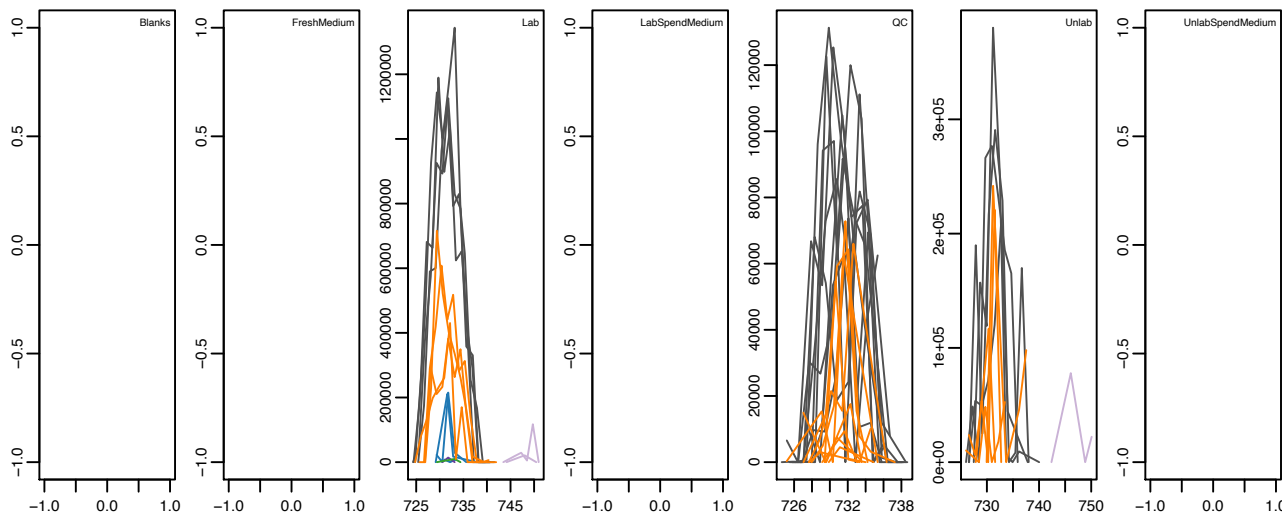


IMP

Formula: C₁₀H₁₃N₄O₈P Mass: 348.047 Std.RT: 732.6 Ion: POS

G1

■UL ■+1 ■+2 ■+3 ■+4 ■+5 ■+6 ■+7 ■+8 ■+9 ■+10

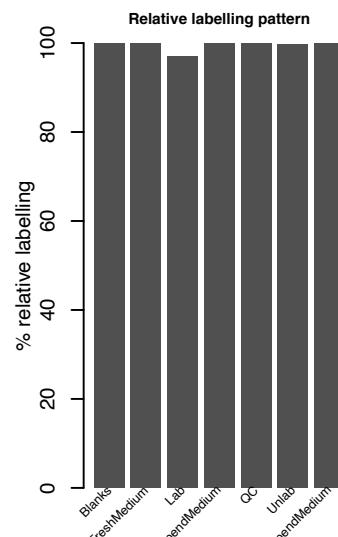
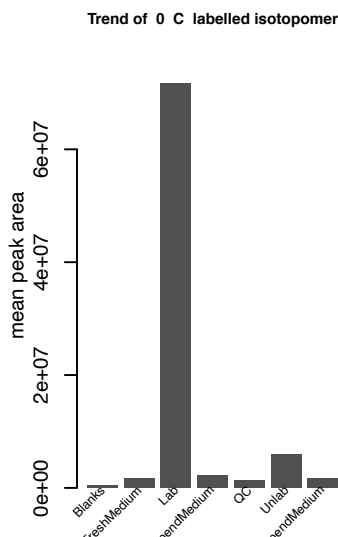
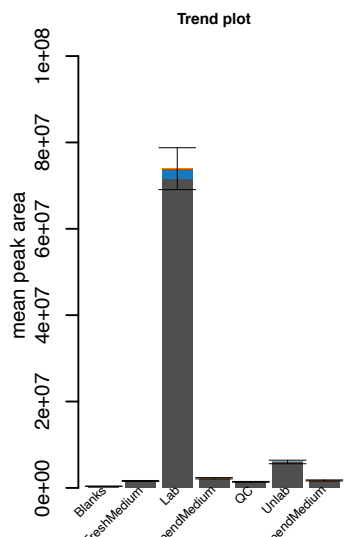
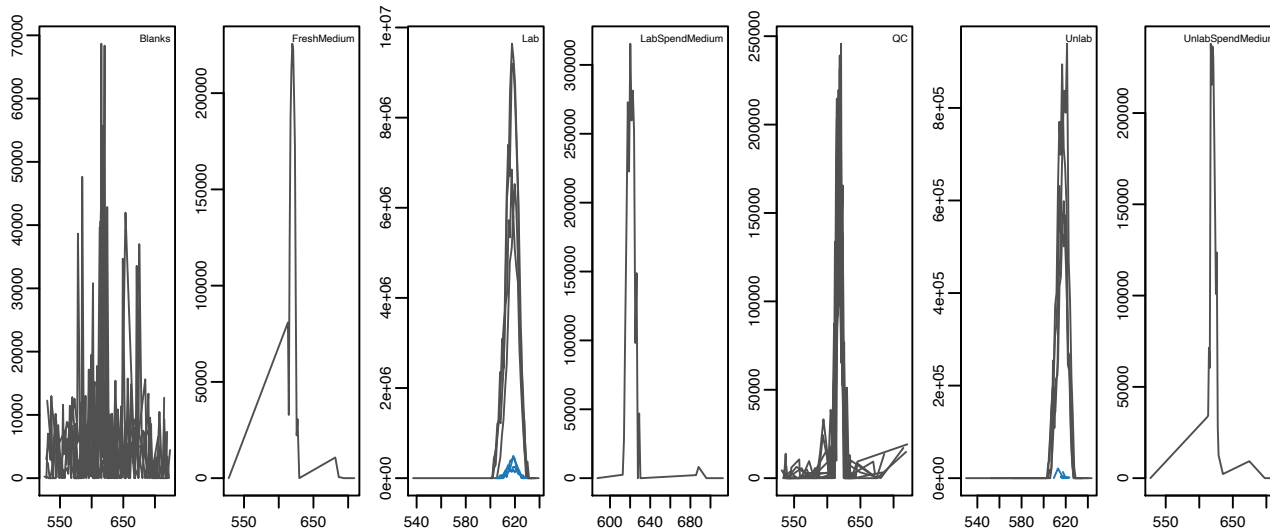


Imidazole-4-acetate

Formula: C₅H₆N₂O₂ Mass: 126.043 Std.RT: 625.2 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5

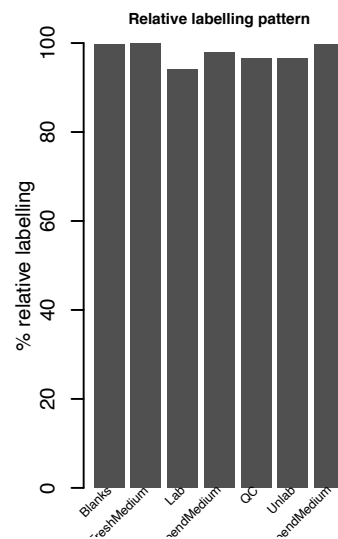
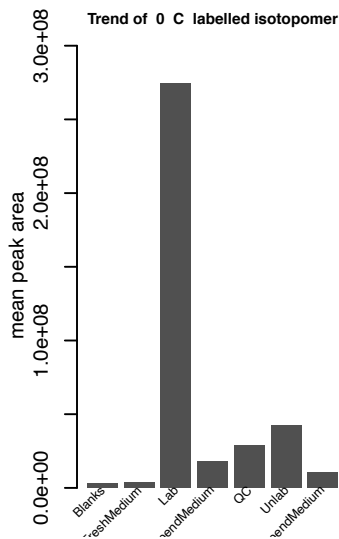
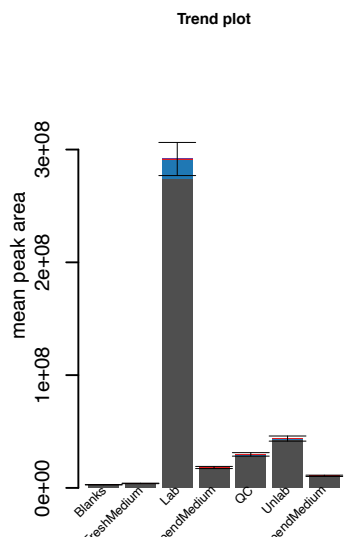
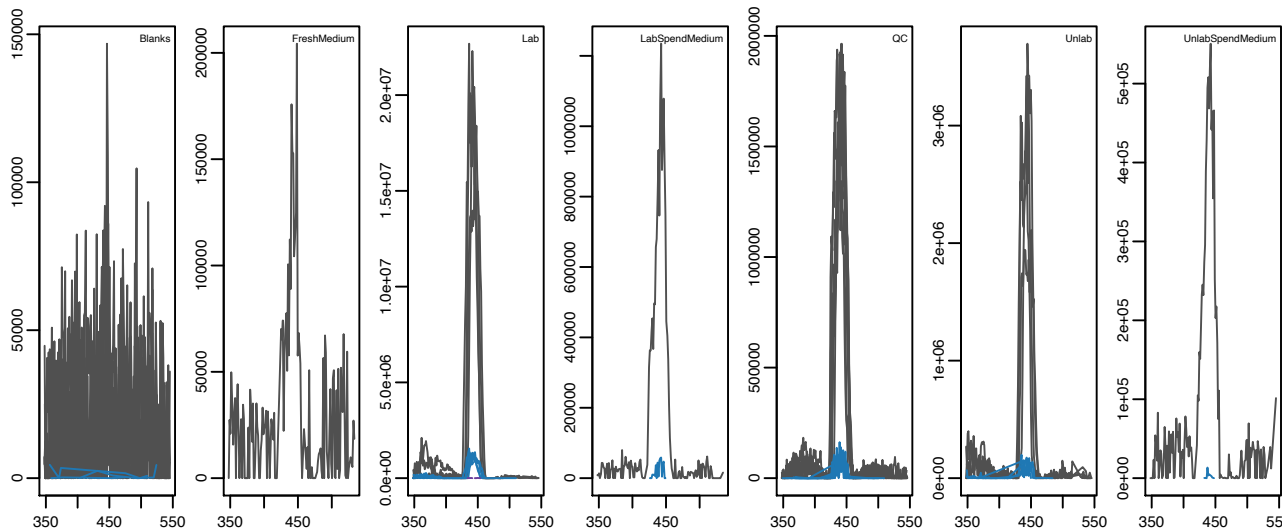


Isonicotinic acid

Formula: C₆H₅NO₂ Mass: 123.032 Std.RT: 447.6 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6

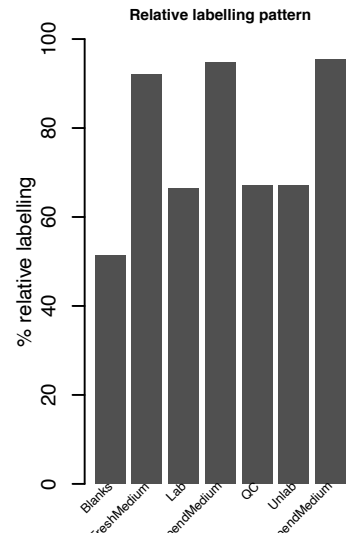
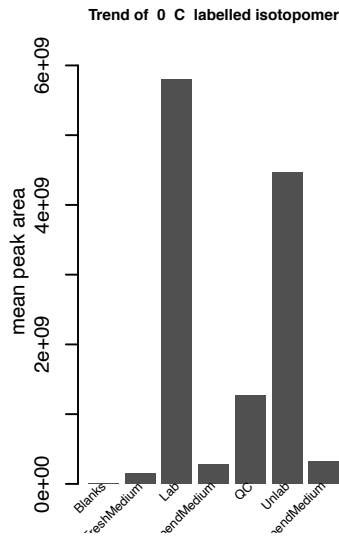
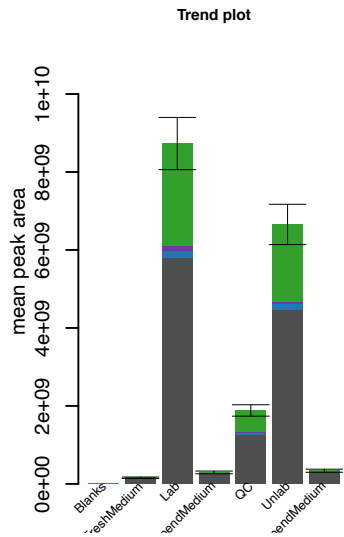
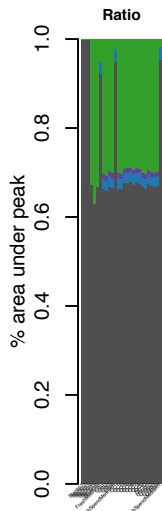
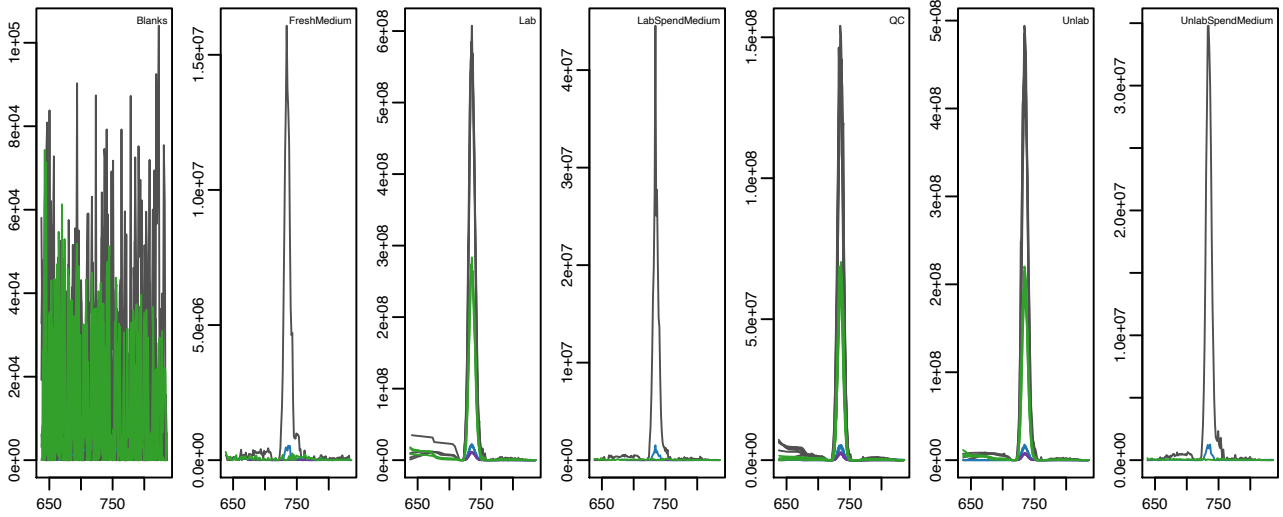


L-Alanine

Formula: C₃H₇NO₂ Mass: 89.048 Std.RT: 737.4 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3

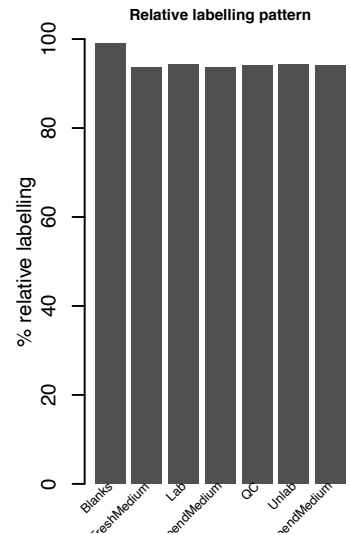
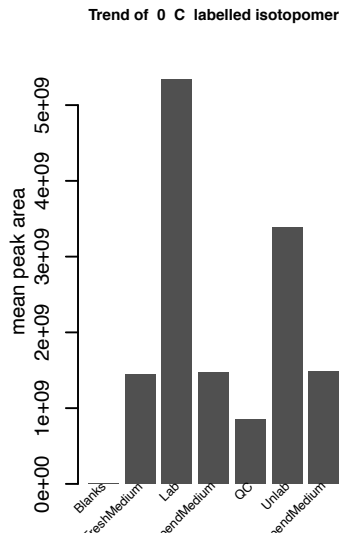
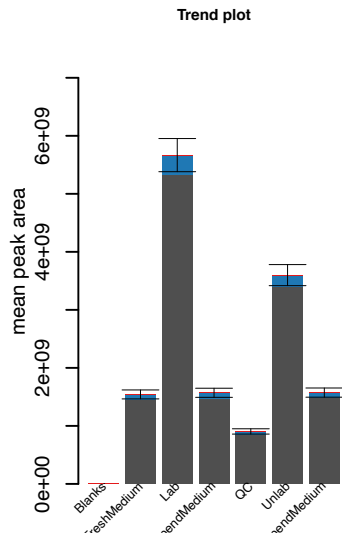
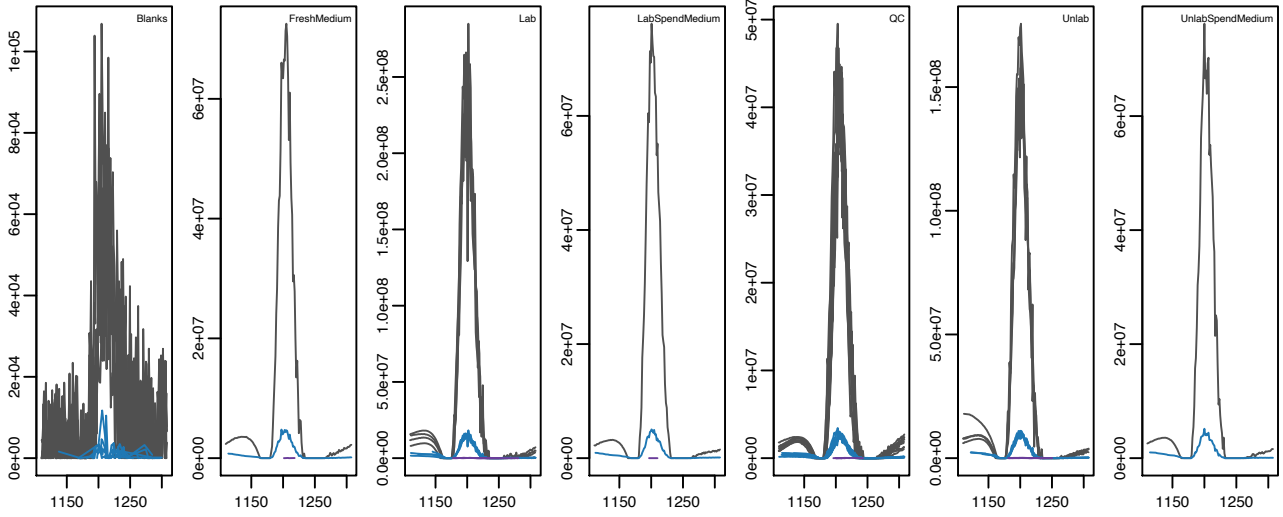


L-Arginine

Formula: C₆H₁₄N₄O₂ Mass: 174.112 Std.RT: 1209.6 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6

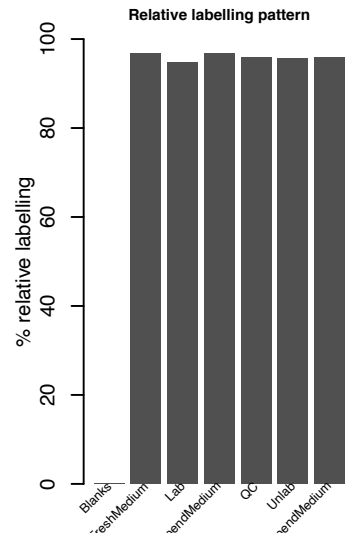
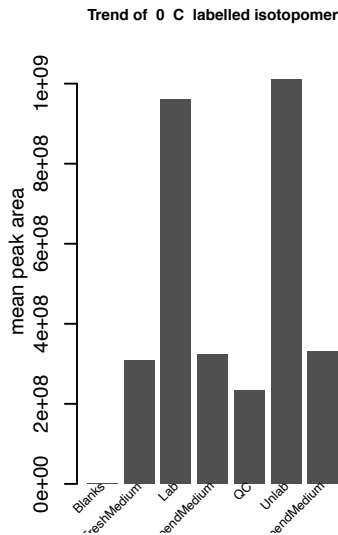
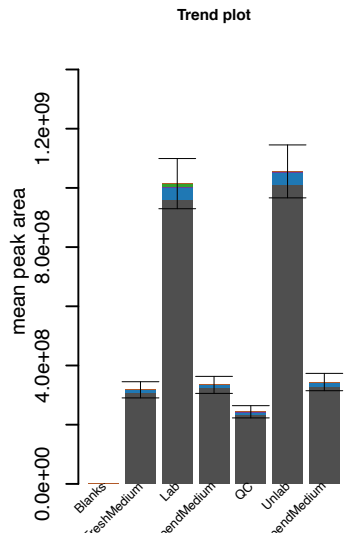
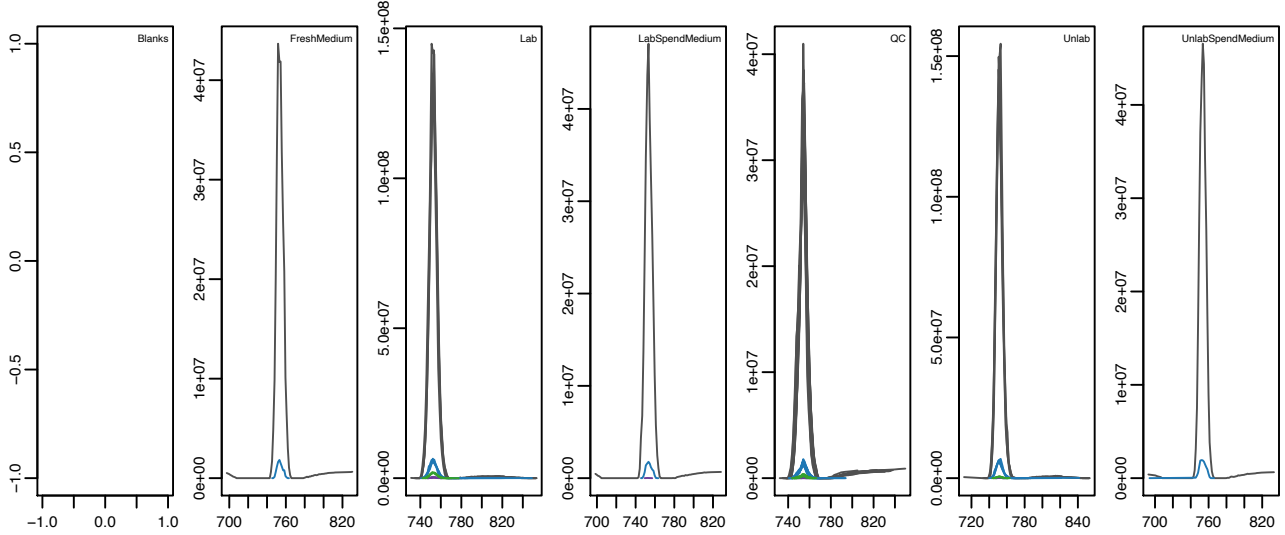


L-Asparagine

Formula: C₄H₈N₂O₃ Mass: 132.053 Std.RT: 754.8 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4

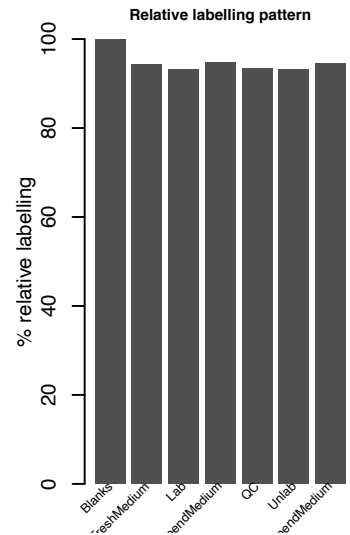
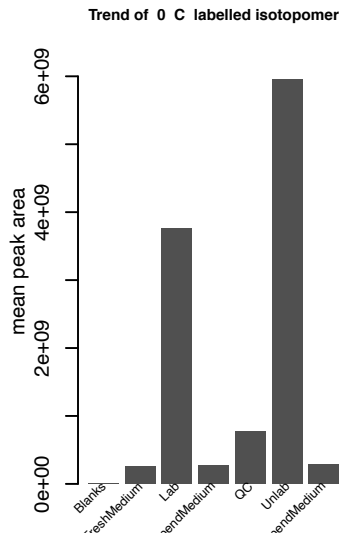
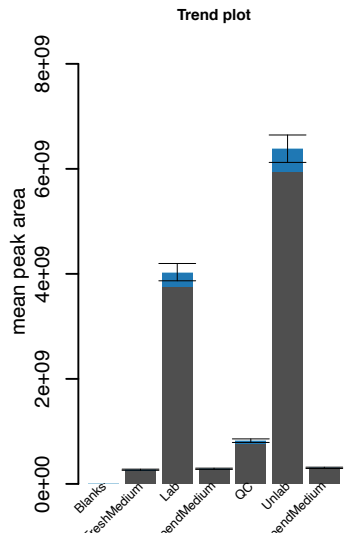
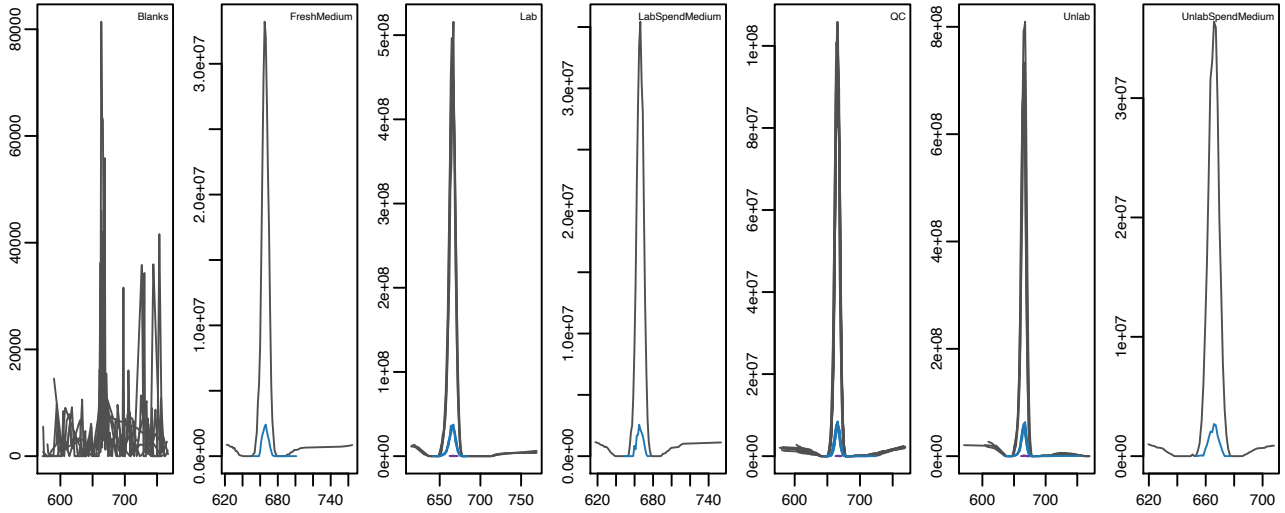


L-Carnitine

Formula: C₇H₁₅NO₃ Mass: 161.105 Std.RT: 670.8 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6 ■ +7

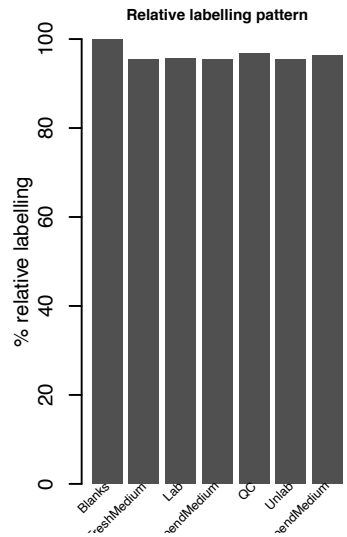
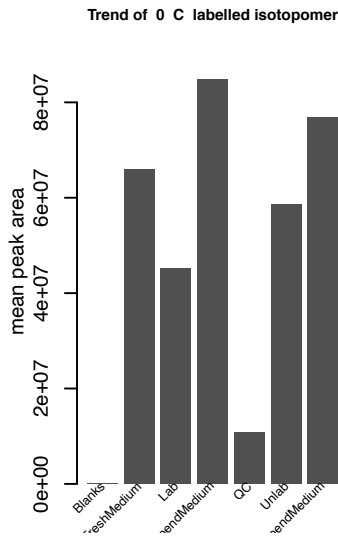
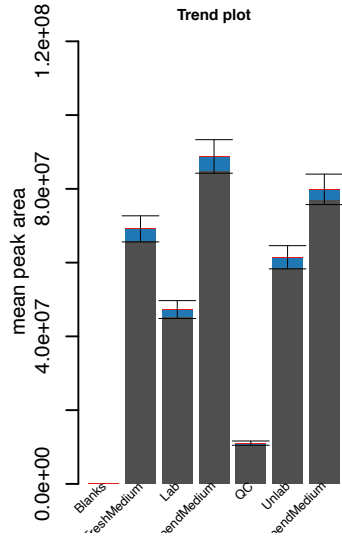
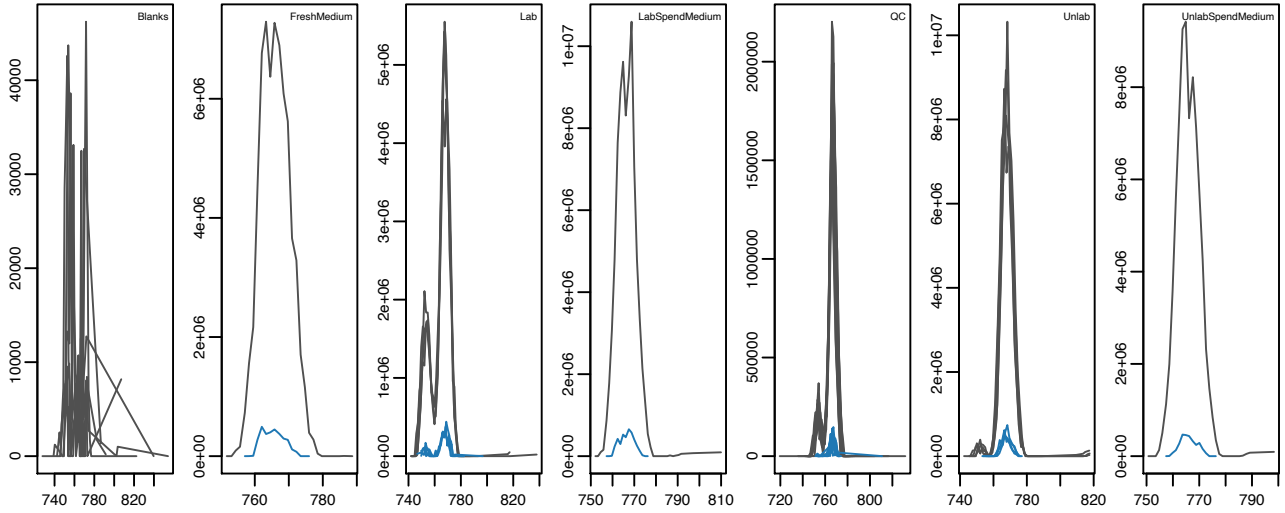


L-Citrulline

Formula: C₆H₁₃N₃O₃ Mass: 175.096 Std.RT: 767.4 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6

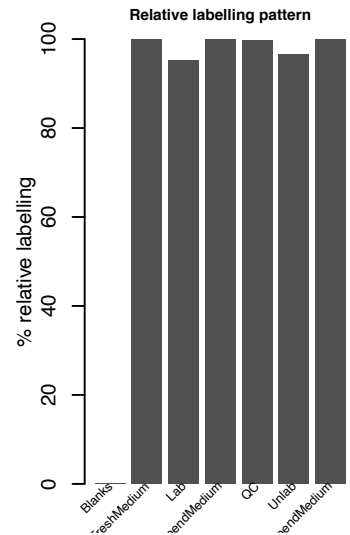
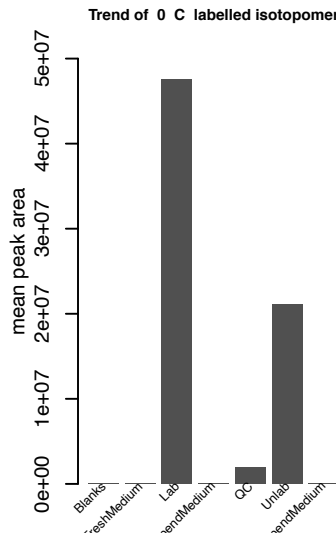
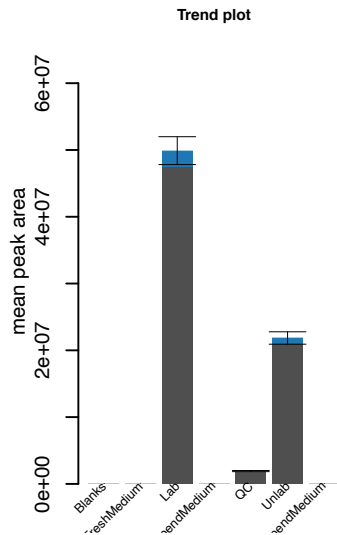
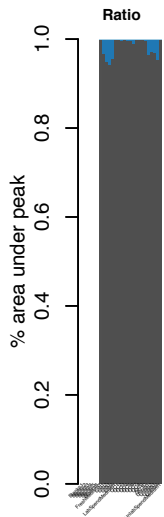
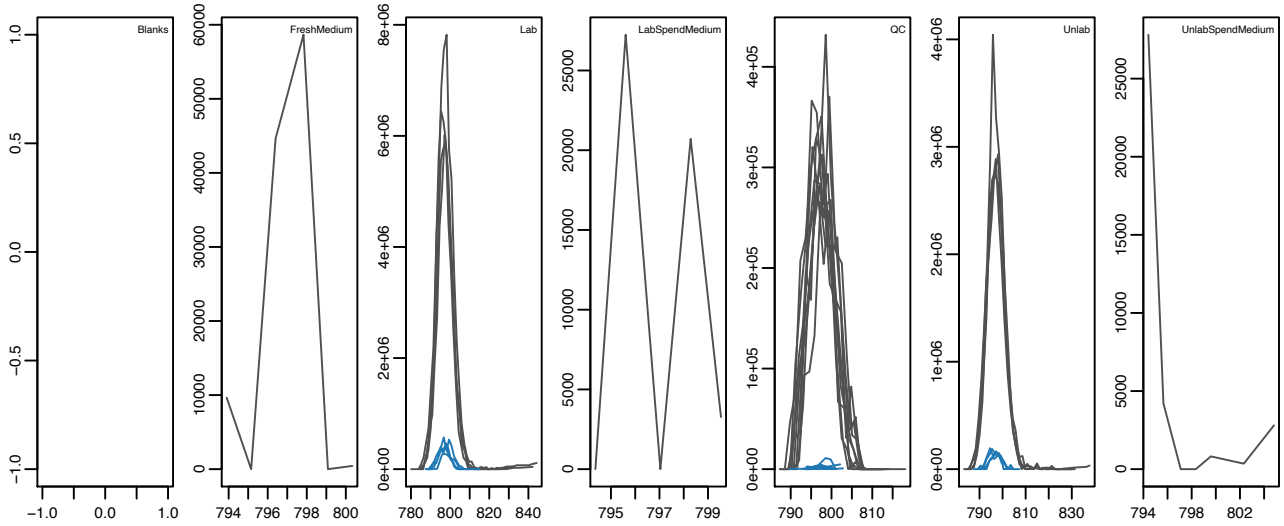


L-Cystathionine

Formula: C7H14N2O4S Mass: 222.067 Std.RT: 798.6 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6 ■ +7

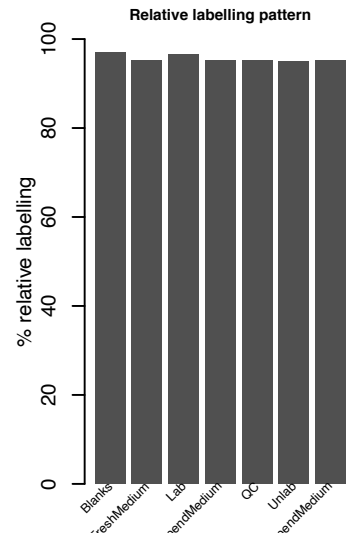
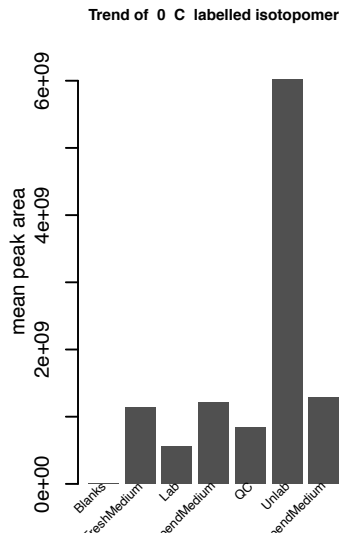
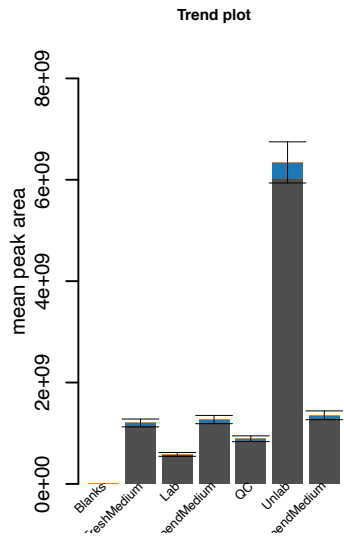
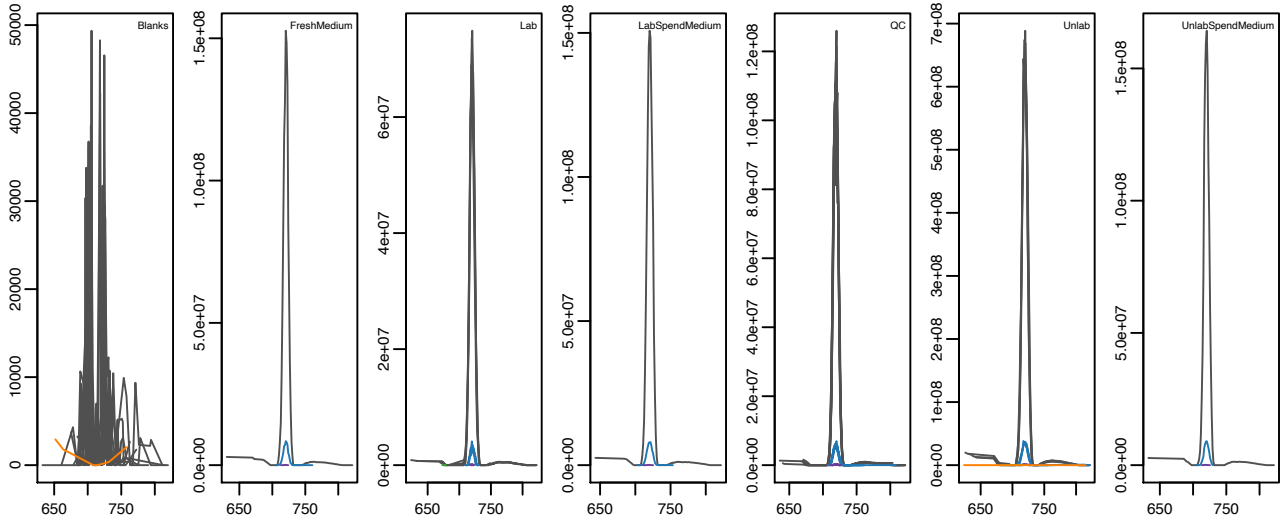


L-Glutamate

Formula: C₅H₉NO₄ Mass: 147.053 Std.RT: 723.6 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5

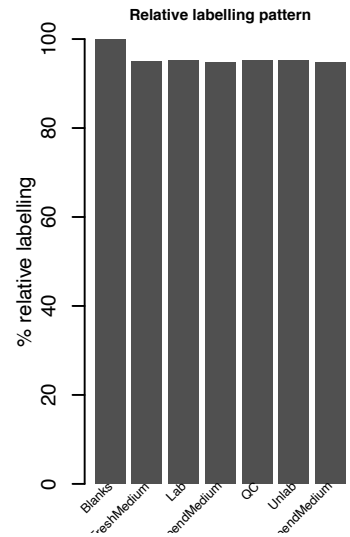
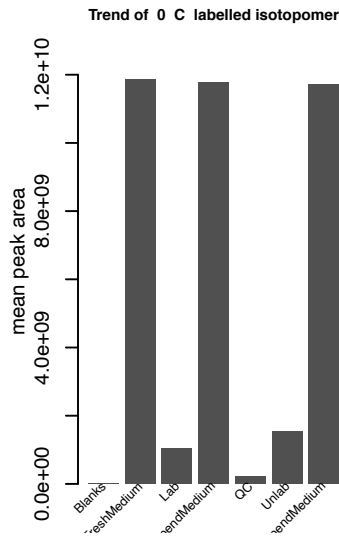
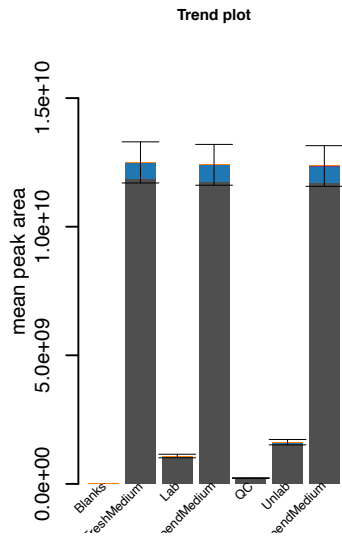
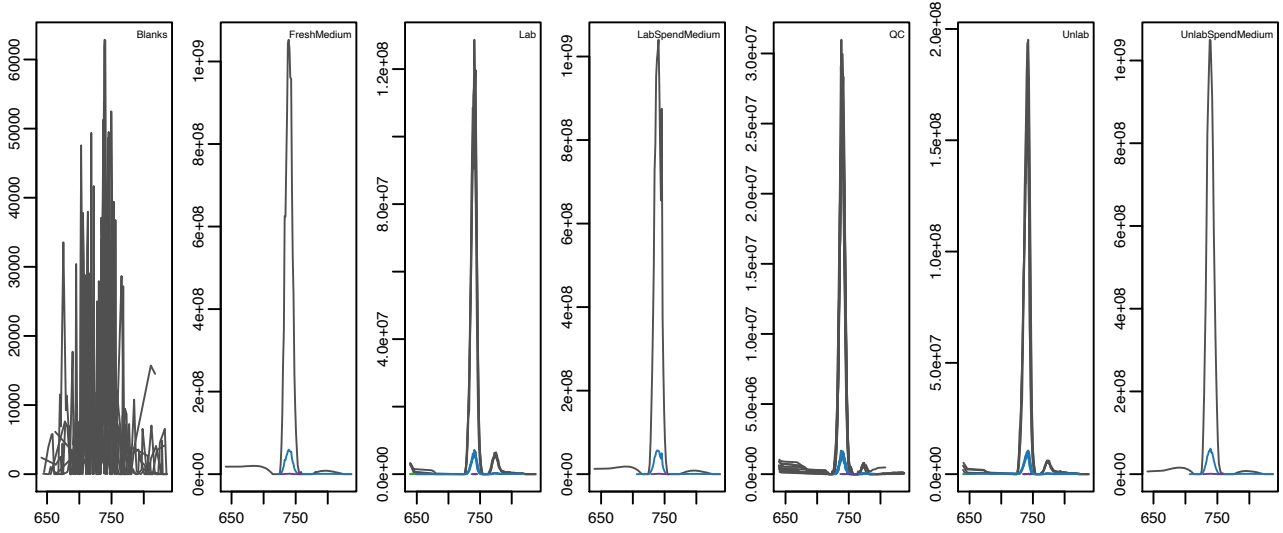


L-Glutamine

Formula: C₅H₁₀N₂O₃ Mass: 146.069 Std.RT: 739.2 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5

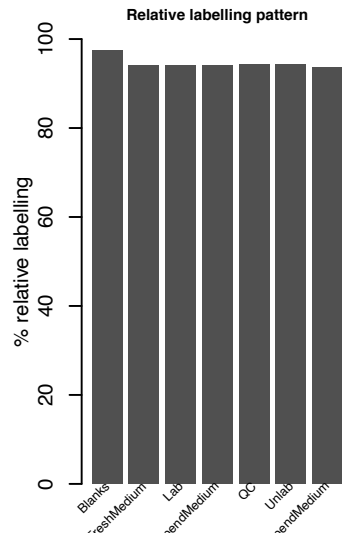
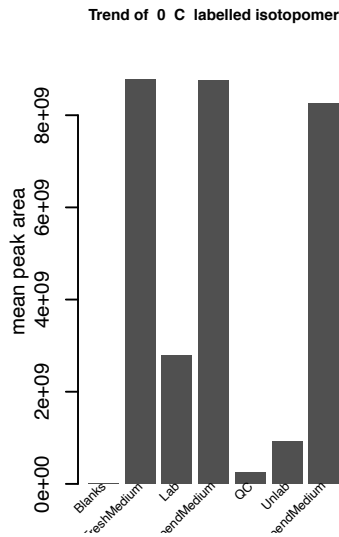
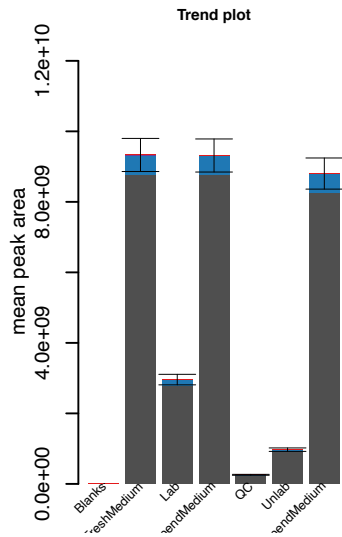
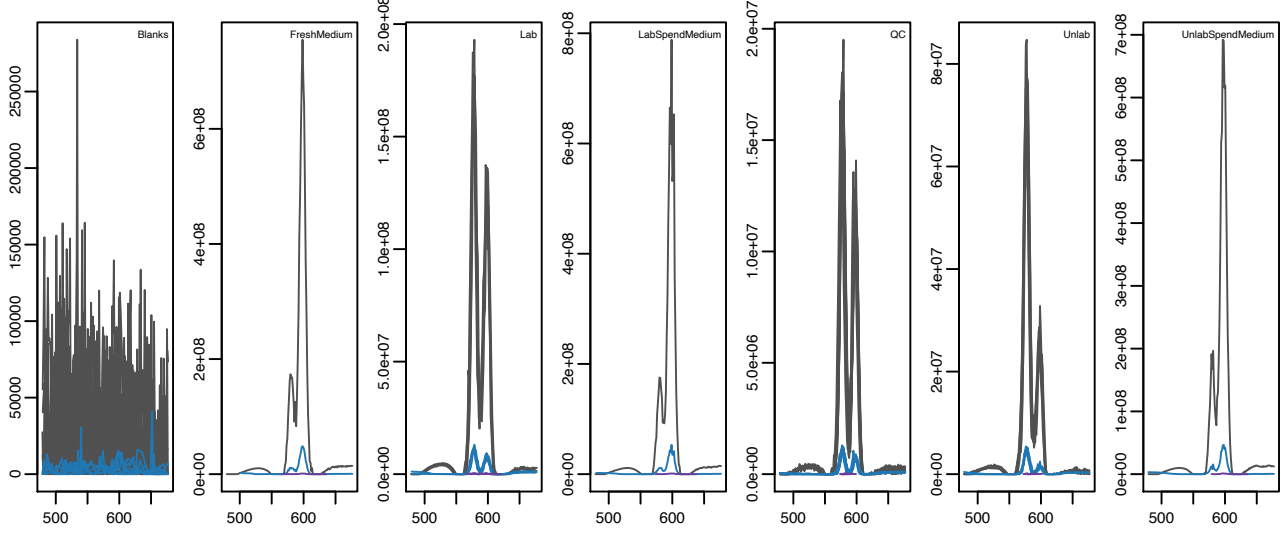


L-Leucine

Formula: C₆H₁₃NO₂ Mass: 131.095 Std.RT: 578.4 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6

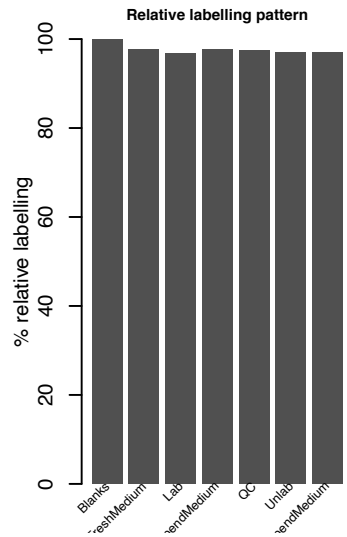
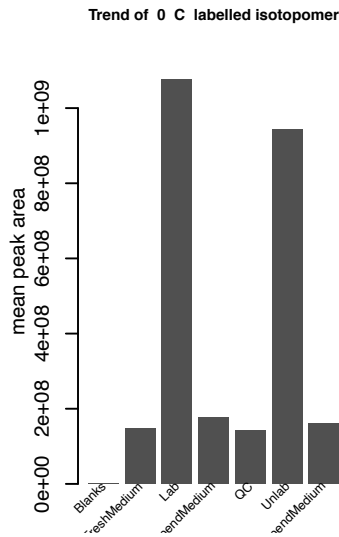
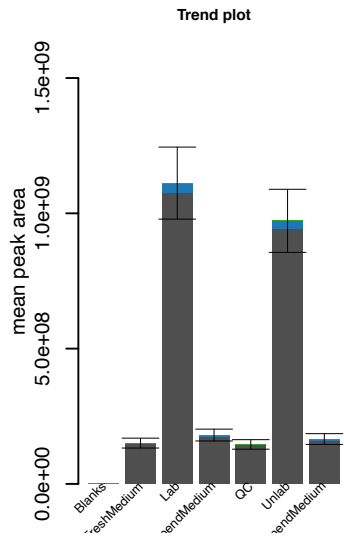
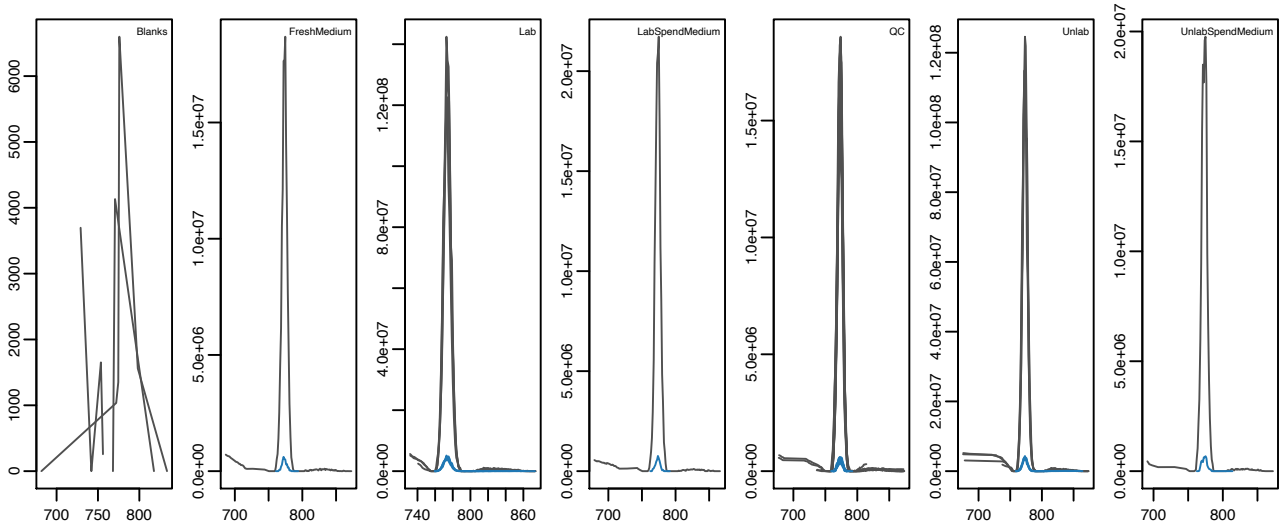


L-Serine

Formula: C₃H₇NO₃ Mass: 105.043 Std.RT: 775.2 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3

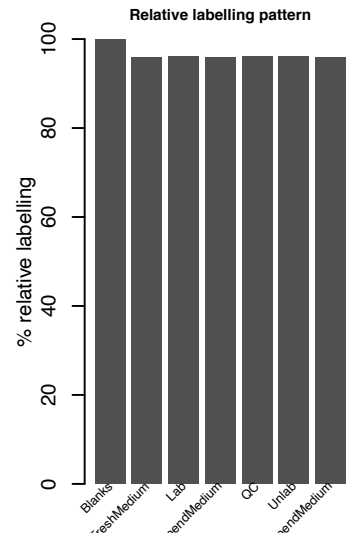
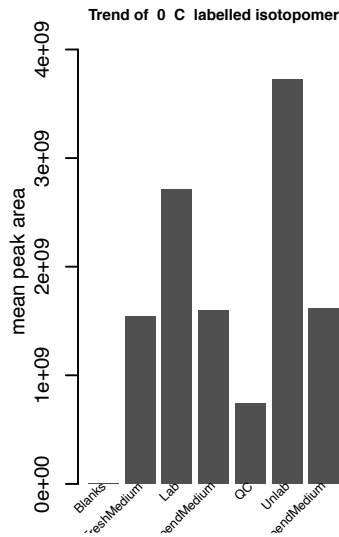
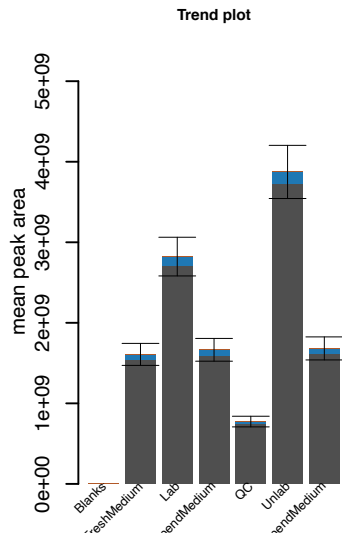
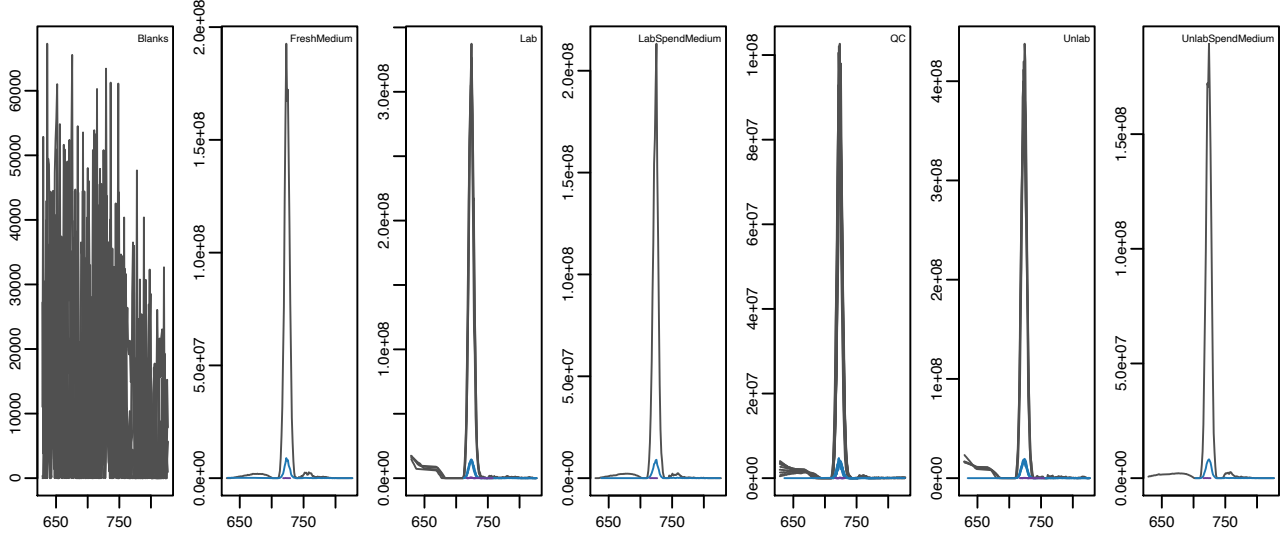


L-Threonine

Formula: C₄H₉NO₃ Mass: 119.058 Std.RT: 728.4 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4

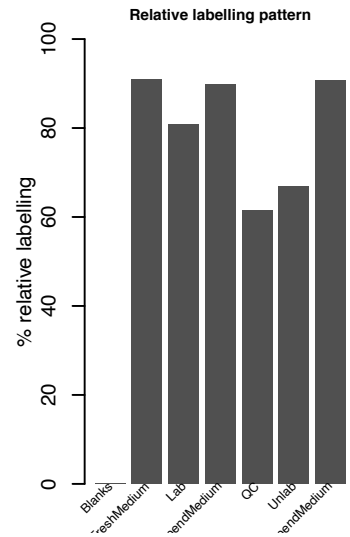
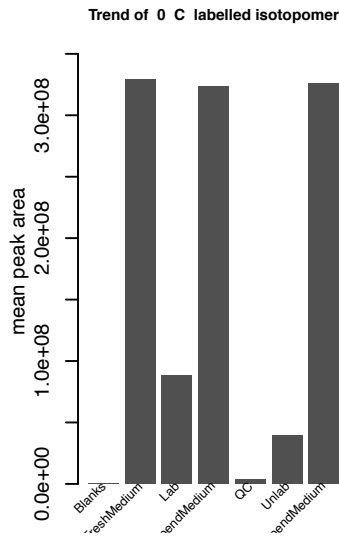
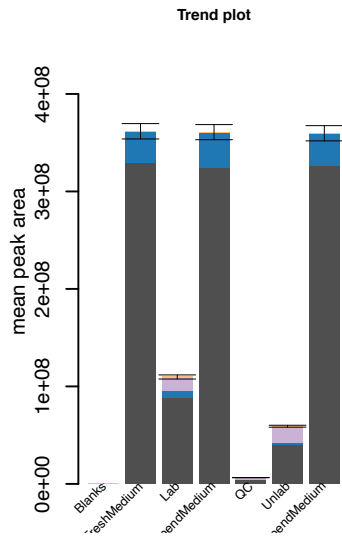
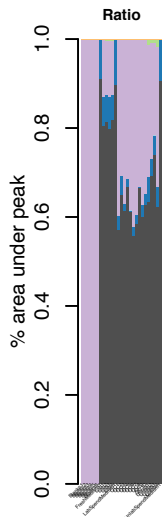
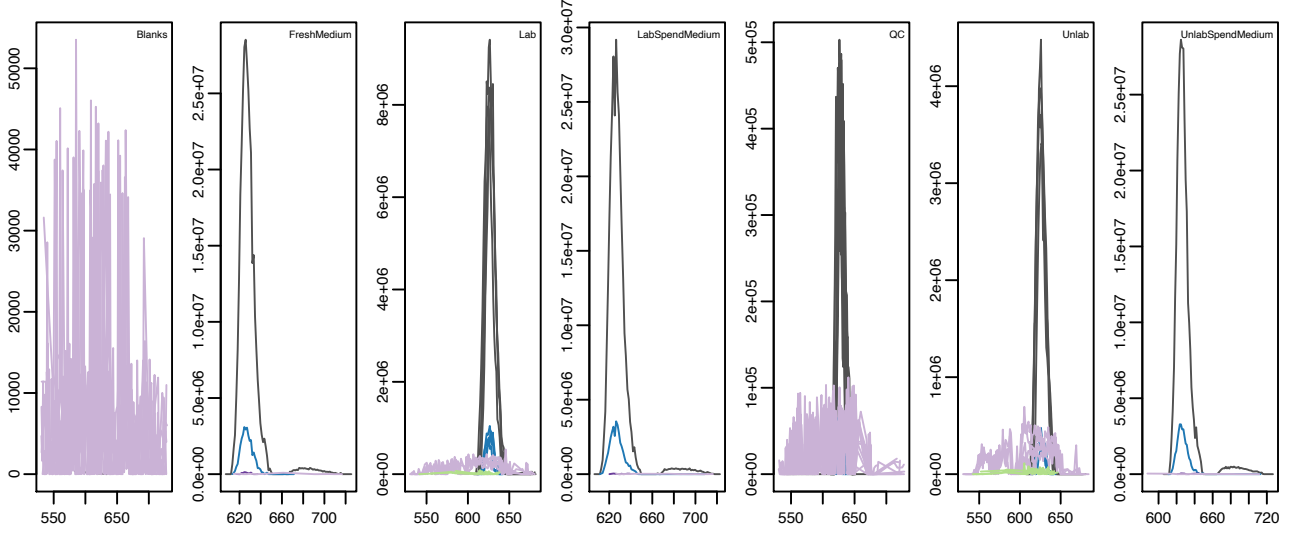


L-Tryptophan

Formula: C₁₁H₁₂N₂O₂ Mass: 204.09 Std.RT: 630 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6 ■ +7 ■ +8 ■ +9 ■ +10 ■ +11

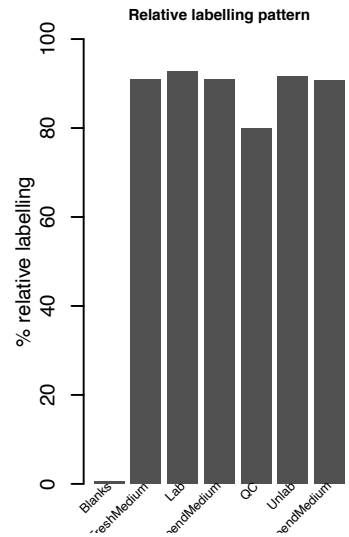
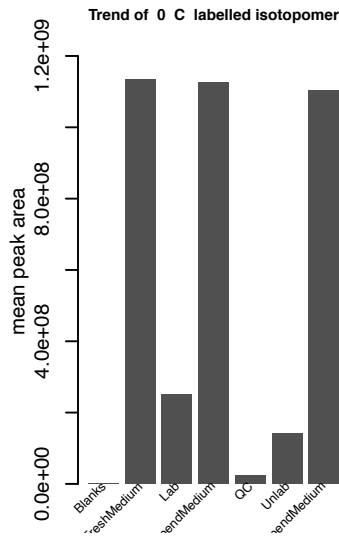
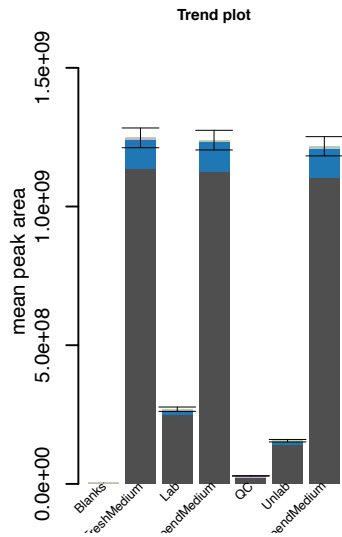
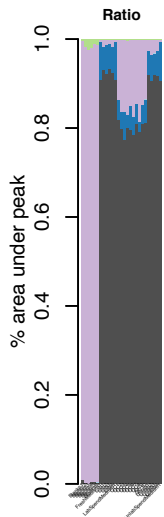
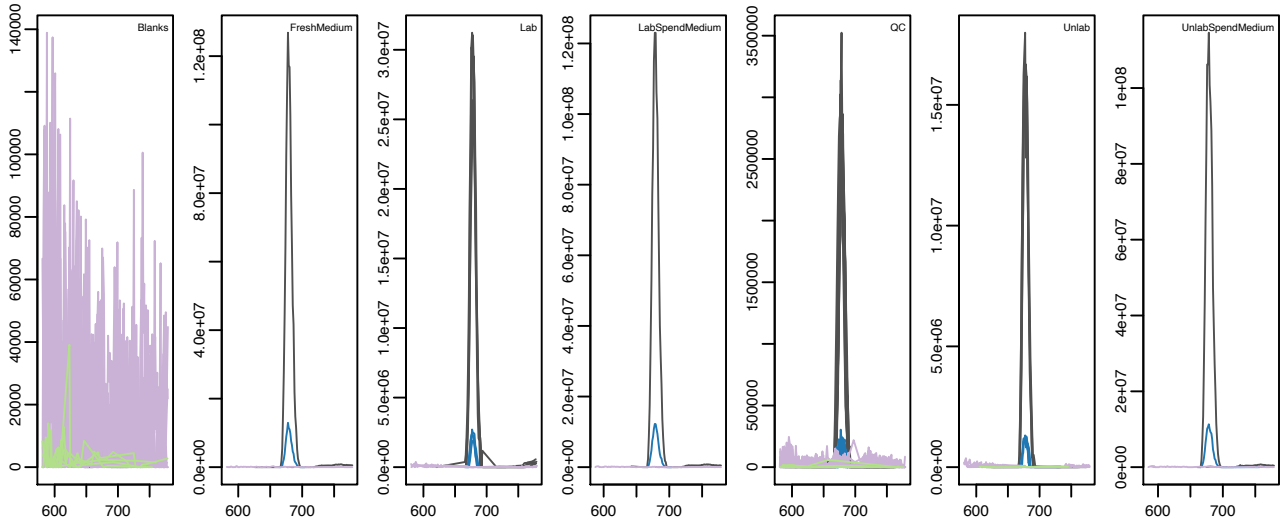


L-Tyrosine

Formula: C₉H₁₁NO₃ Mass: 181.074 Std.RT: 680.4 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6 ■ +7 ■ +8 ■ +9

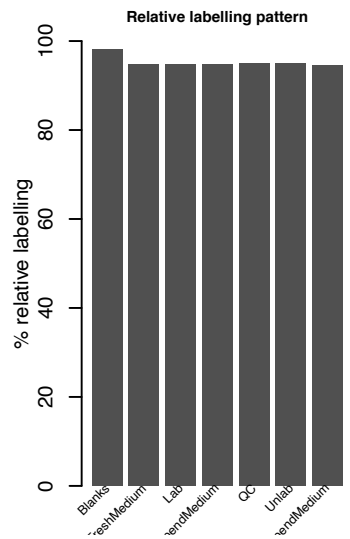
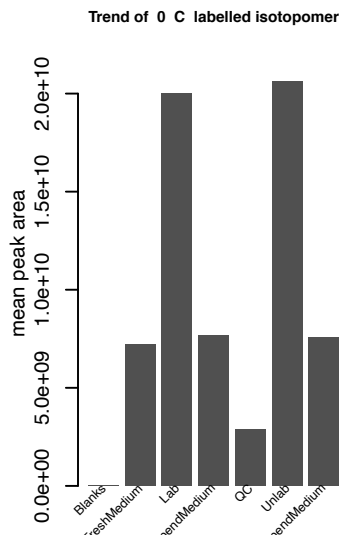
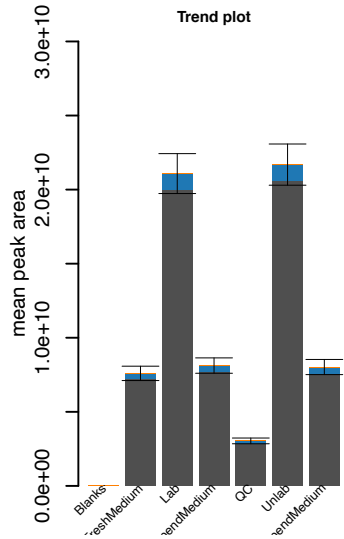
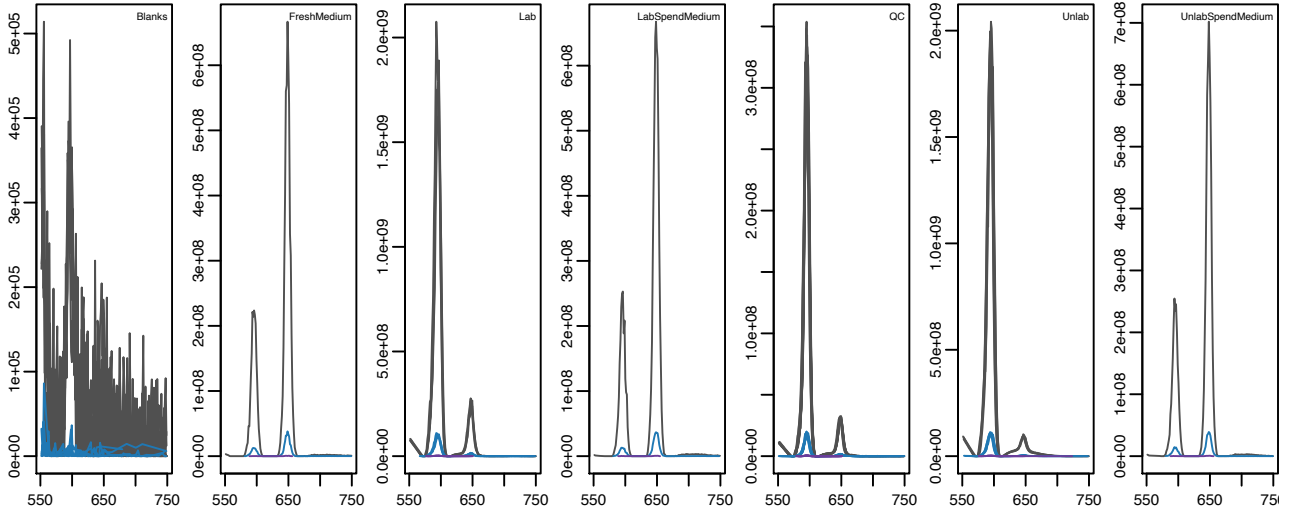


L-Valine

Formula: C₅H₁₁NO₂ Mass: 117.079 Std.RT: 651 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5

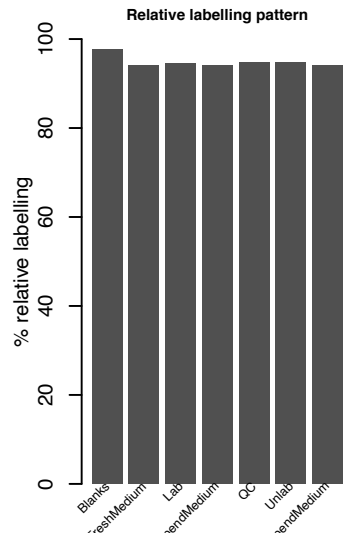
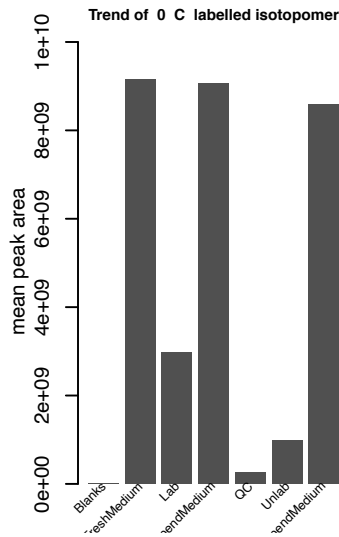
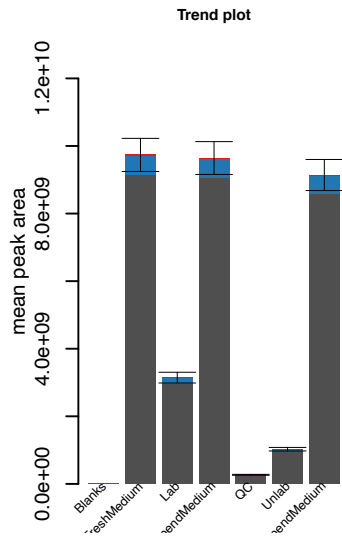
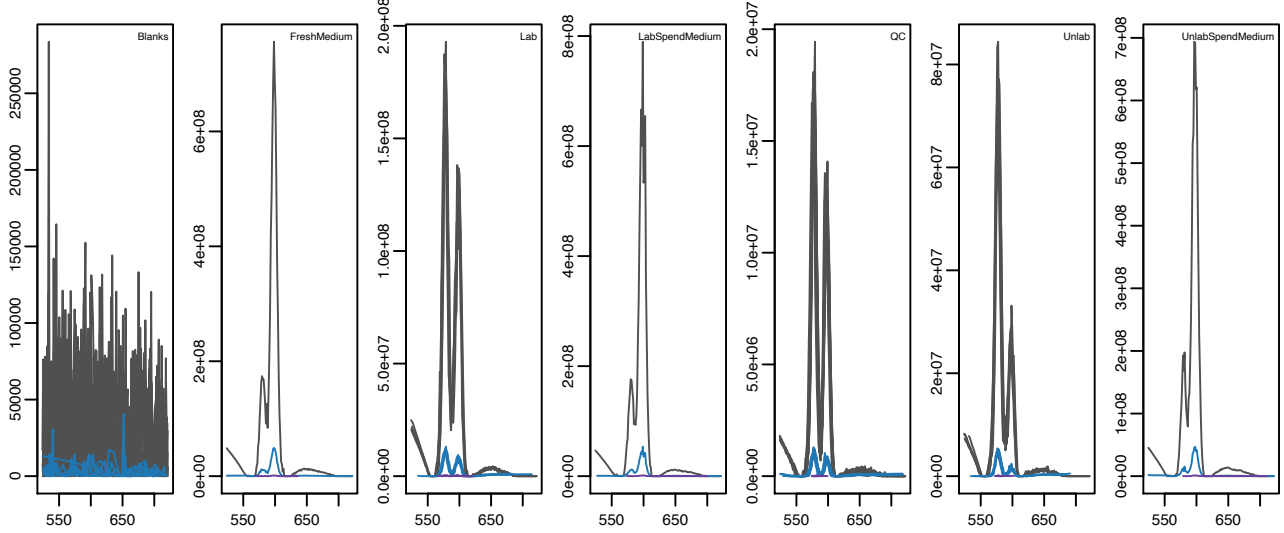


L-isoIeucine

Formula: C₆H₁₃NO₂ Mass: 131.095 Std.RT: 623.4 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6

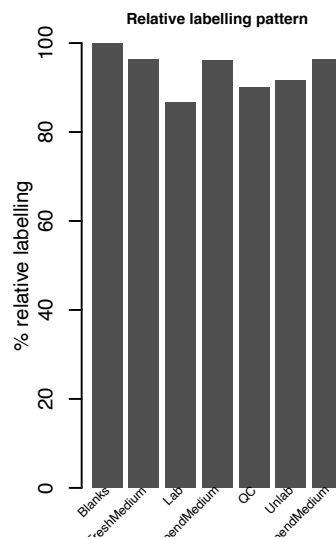
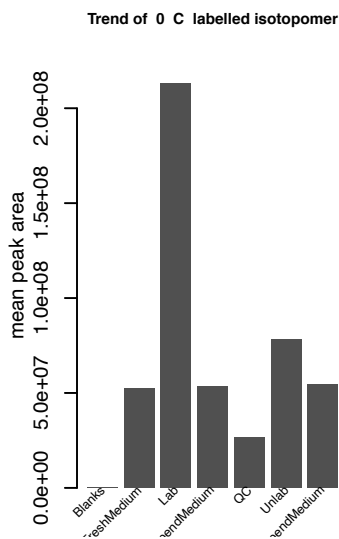
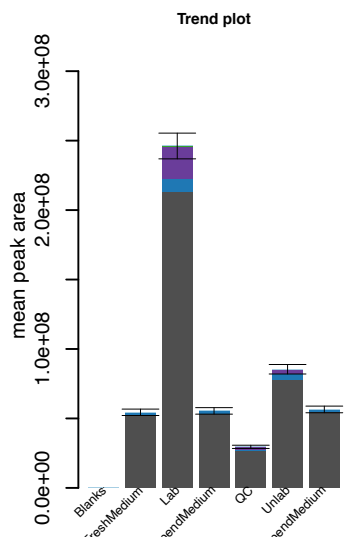
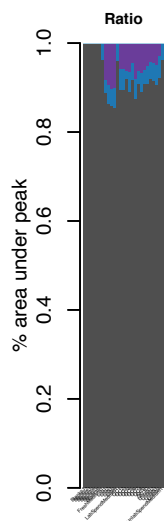
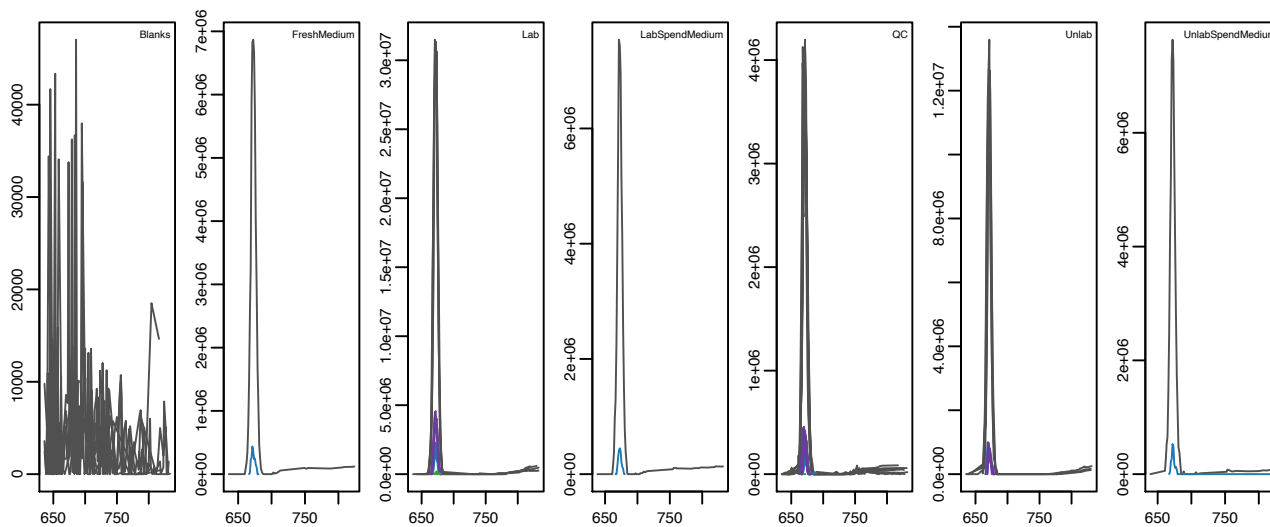


N-Acetylornithine

Formula: C₇H₁₄N₂O₃ Mass: 174.1 Std.RT: 735 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6 ■ +7

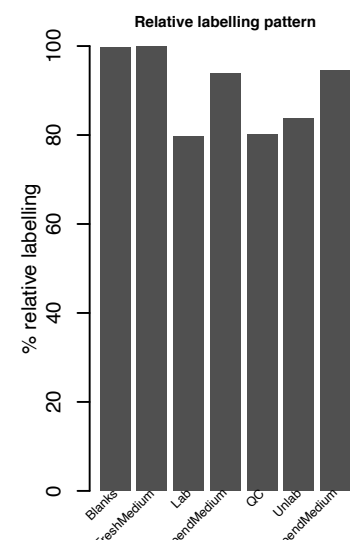
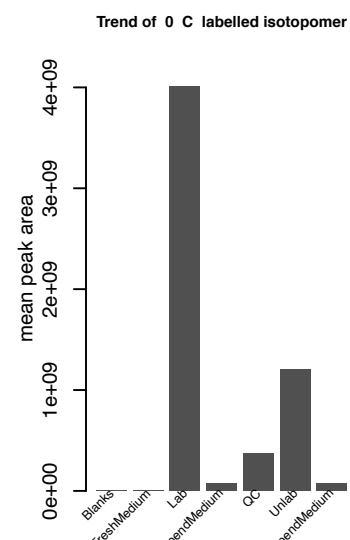
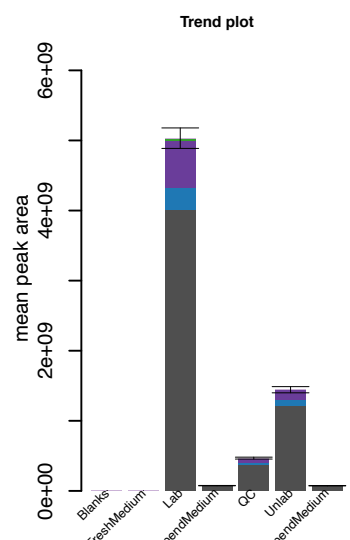
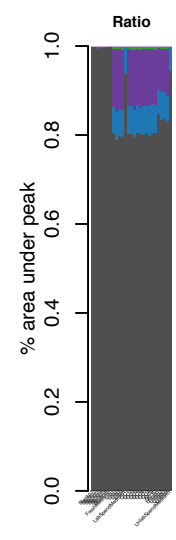
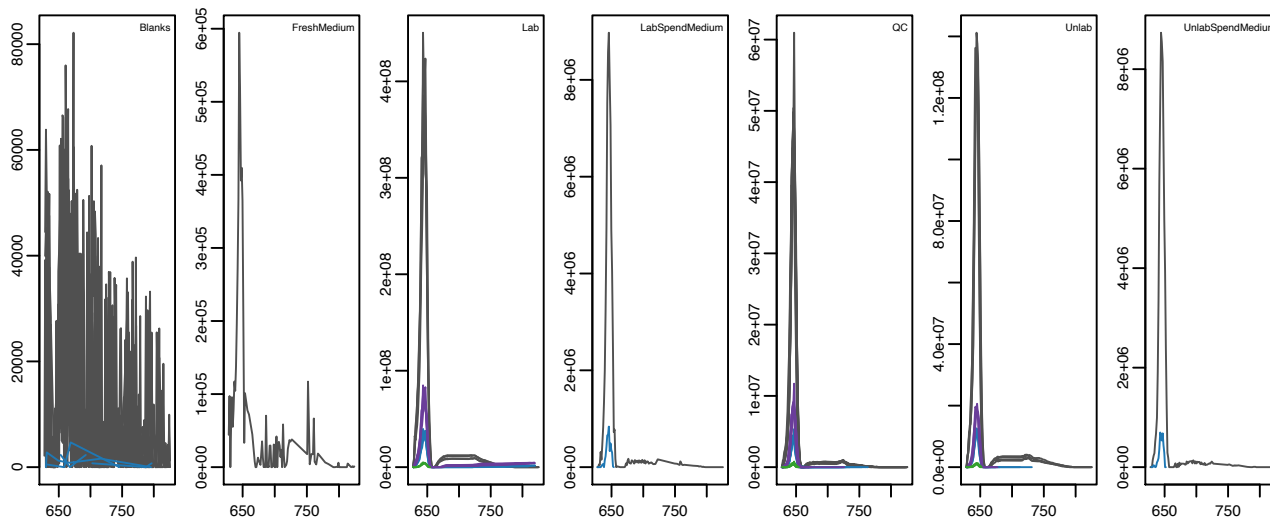


N2-Acetyl-L-lysine

Formula: C₈H₁₆N₂O₃ Mass: 188.116 Std.RT: 727.2 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6 ■ +7 ■ +8

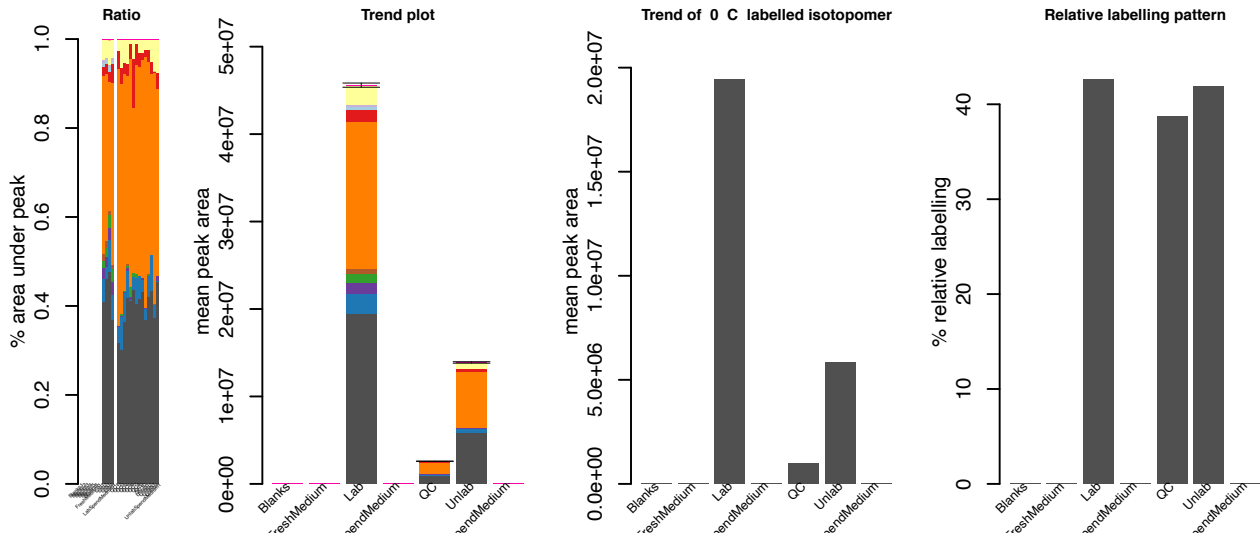
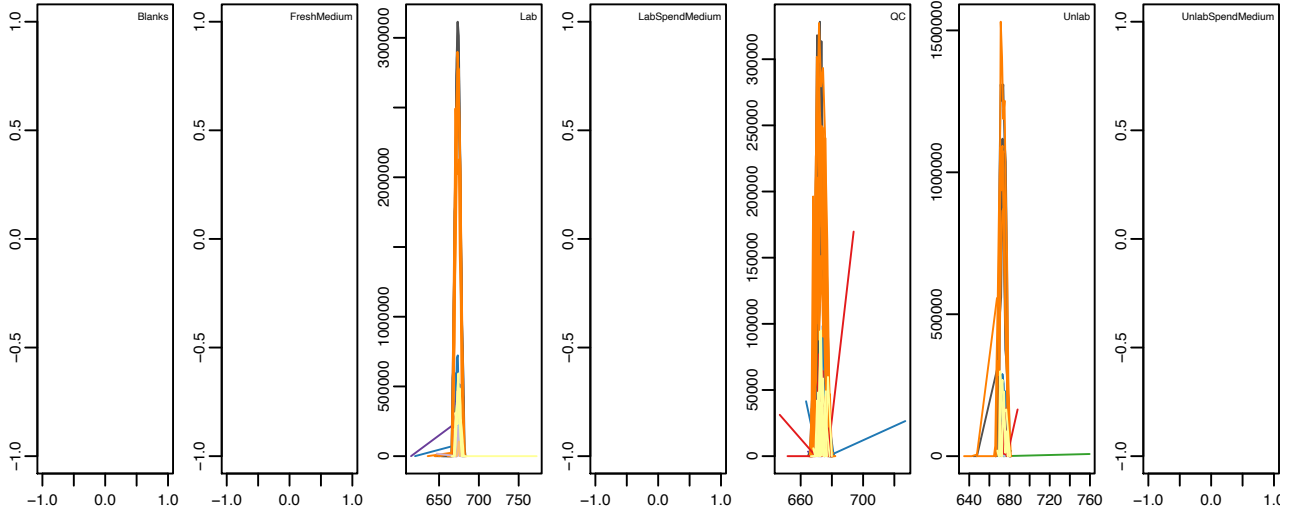


NAD+

Formula: C₂₁H₂₇N₇O₁₄P₂ Mass: 663.109 Std.RT: 678 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6 ■ +7 ■ +8 ■ +9 ■ +10 ■ +11 ■ +12 ■ +13 ■

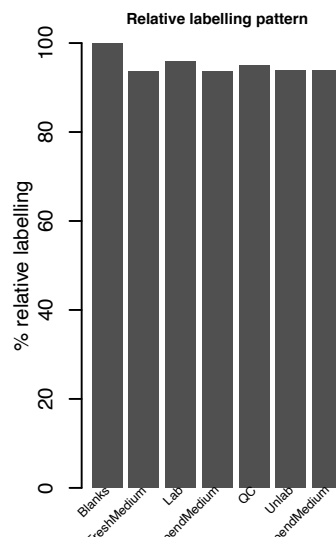
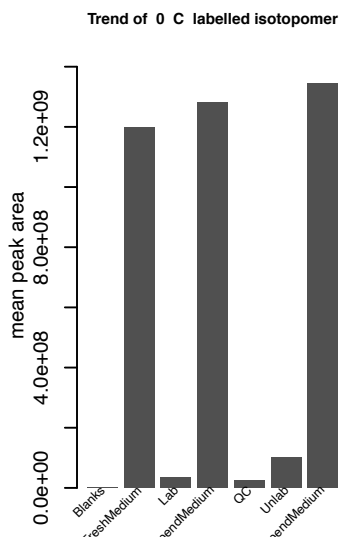
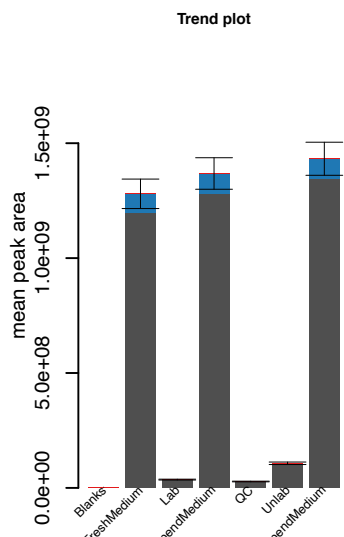
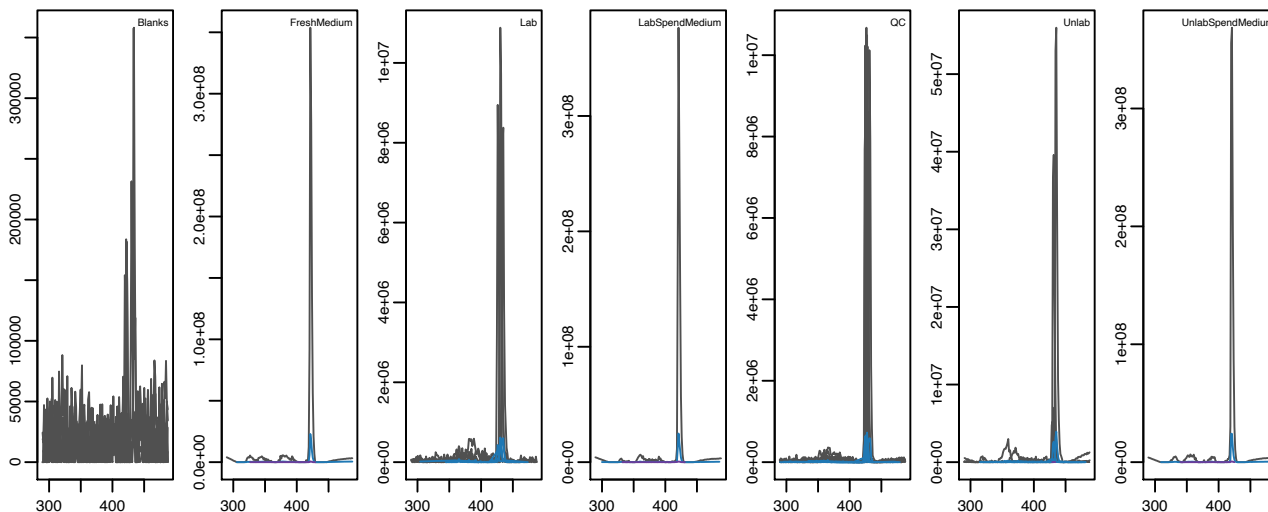


Nicotinamide

Formula: C₆H₆N₂O Mass: 122.048 Std.RT: 389.4 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6

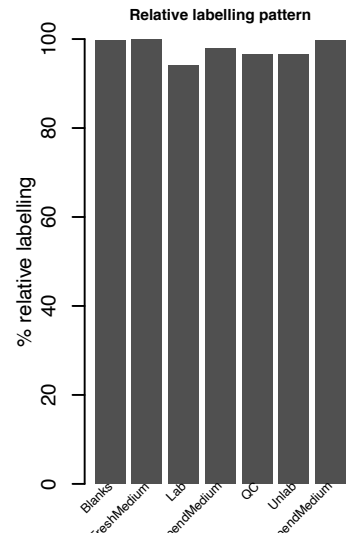
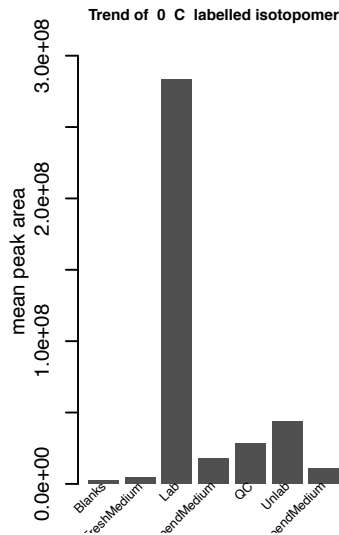
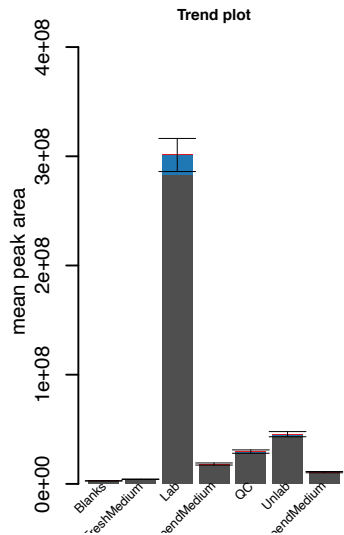
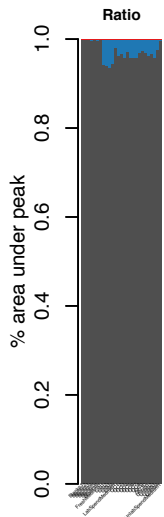
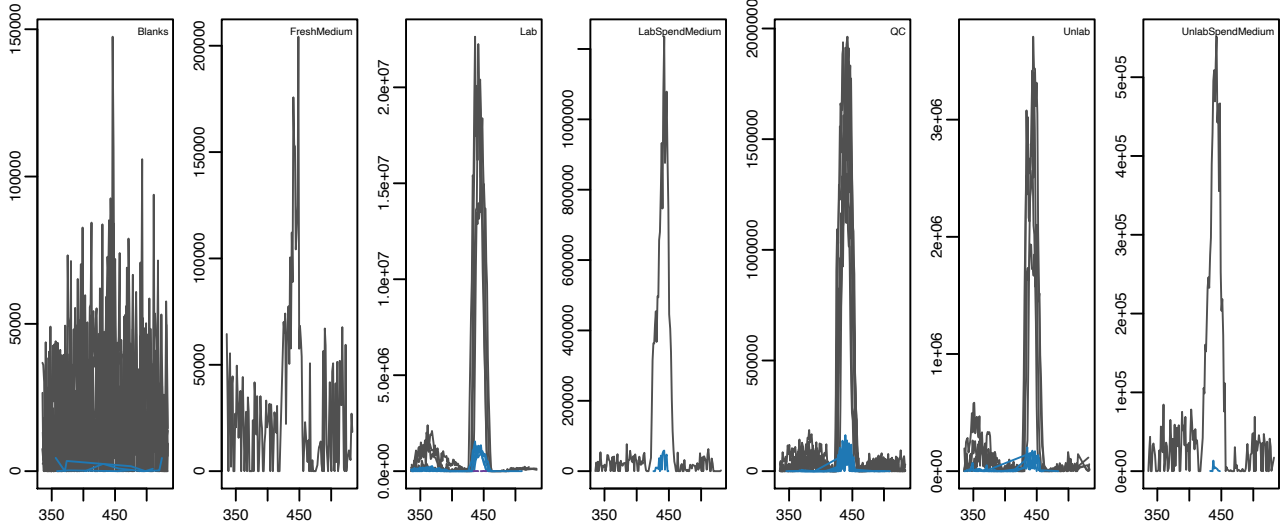


Nicotinate

Formula: C₆H₅NO₂ Mass: 123.032 Std.RT: 435 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6

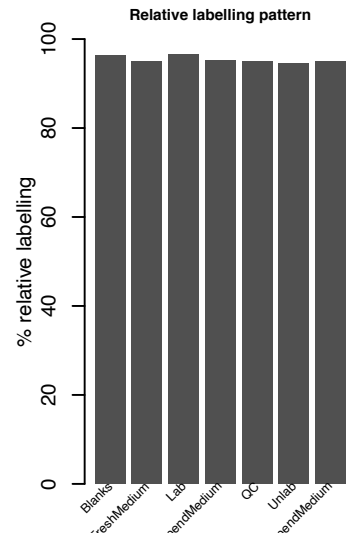
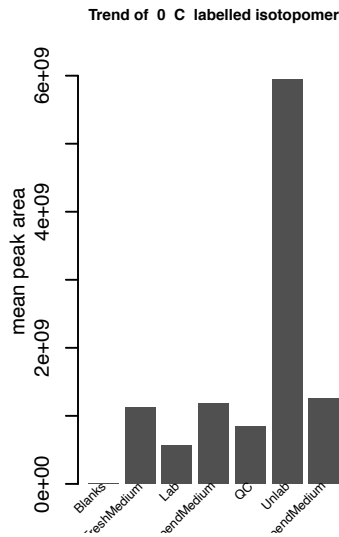
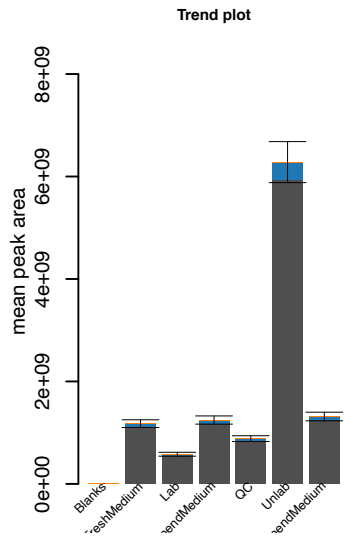
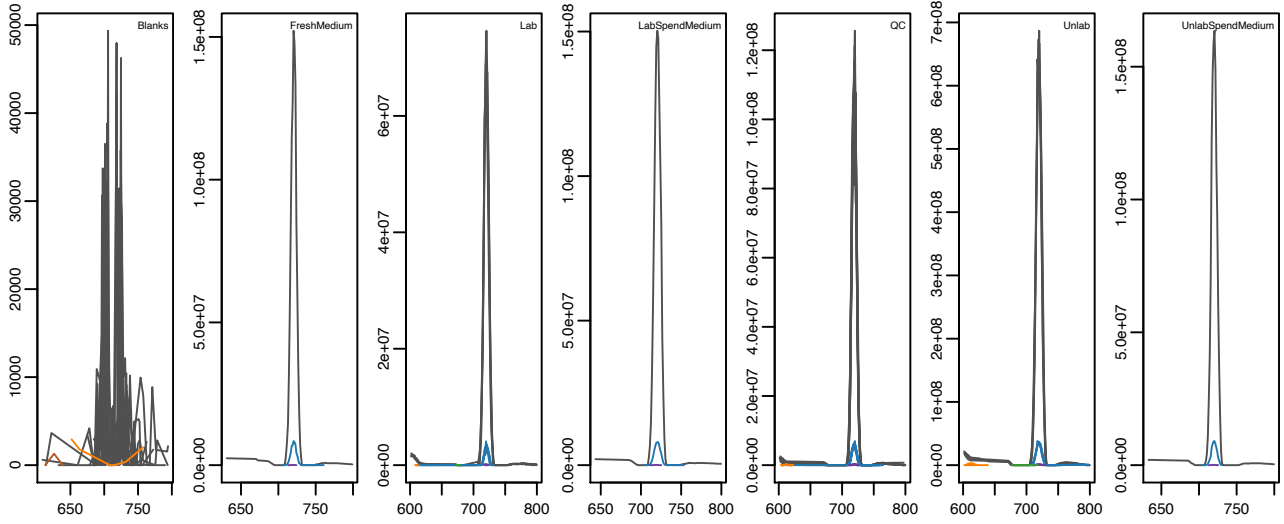


O-Acetyl-L-serine

Formula: C₅H₉NO₄ Mass: 147.053 Std.RT: 701.4 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5

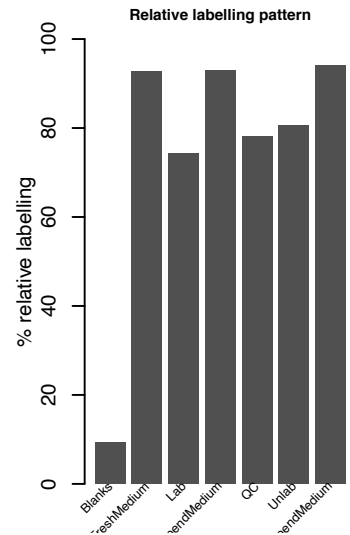
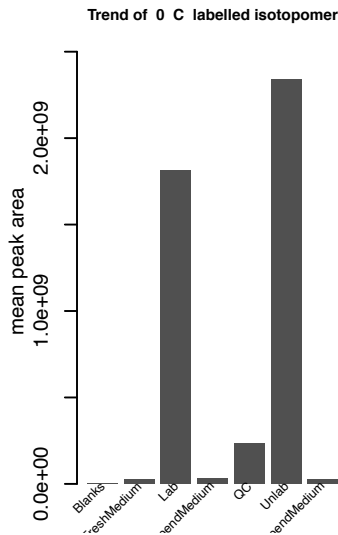
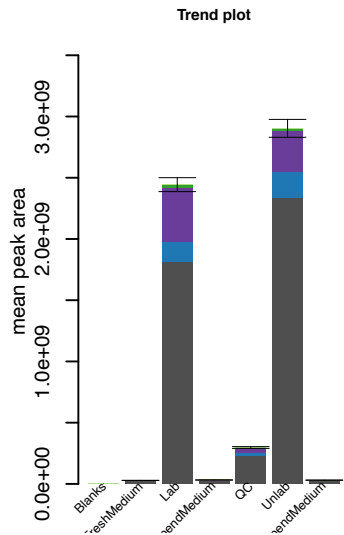
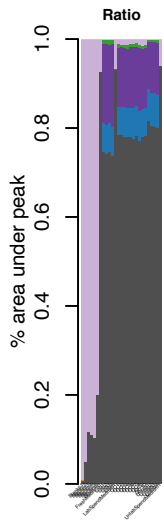
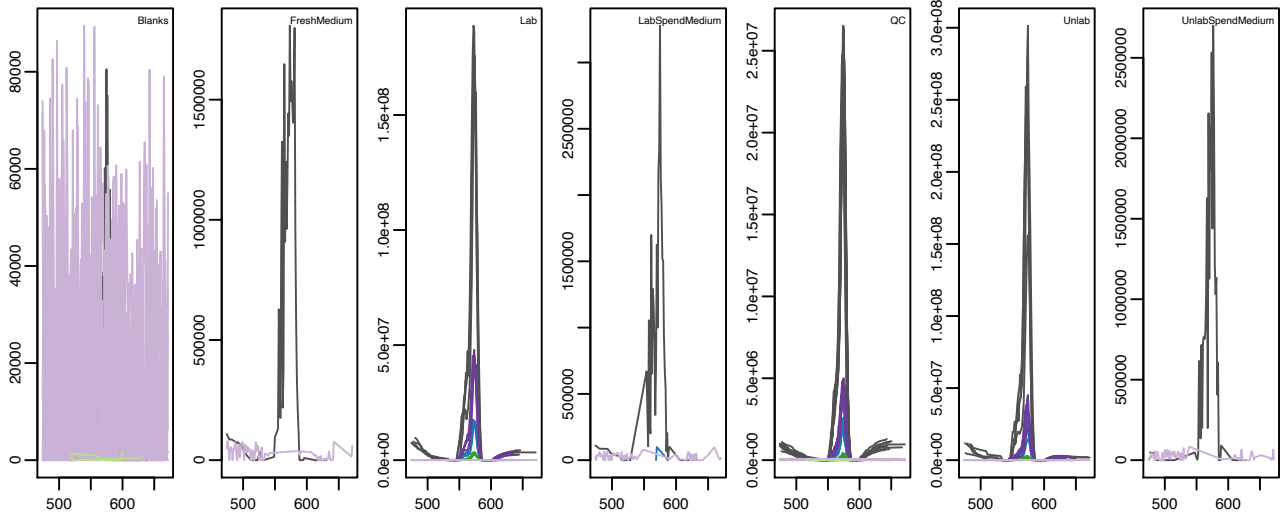


O-Acetylcarnitine

Formula: C₉H₁₇NO₄ Mass: 203.116 Std.RT: 573.6 Ion: POS

G1

■UL ■+1 ■+2 ■+3 ■+4 ■+5 ■+6 ■+7 ■+8 ■+9

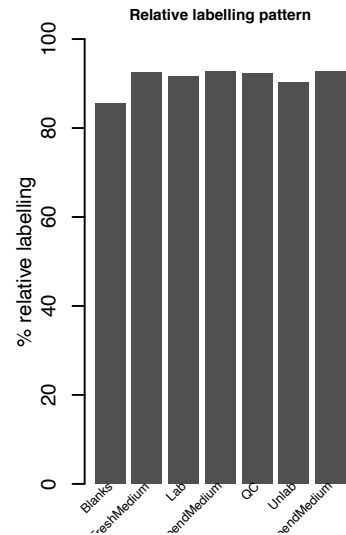
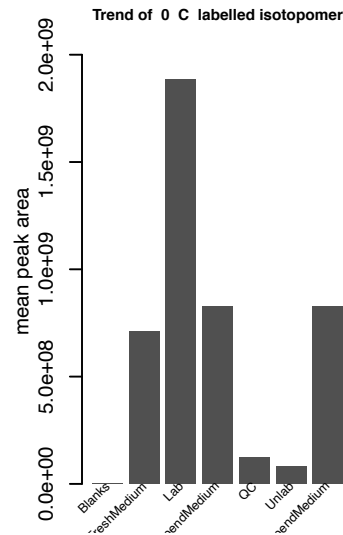
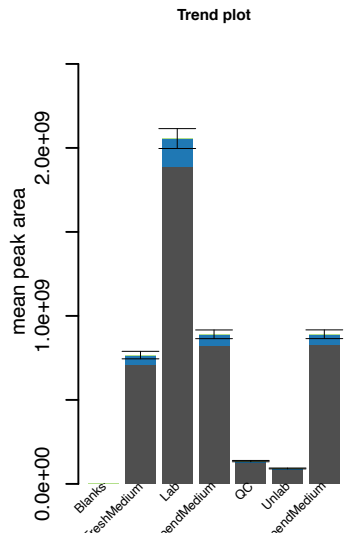
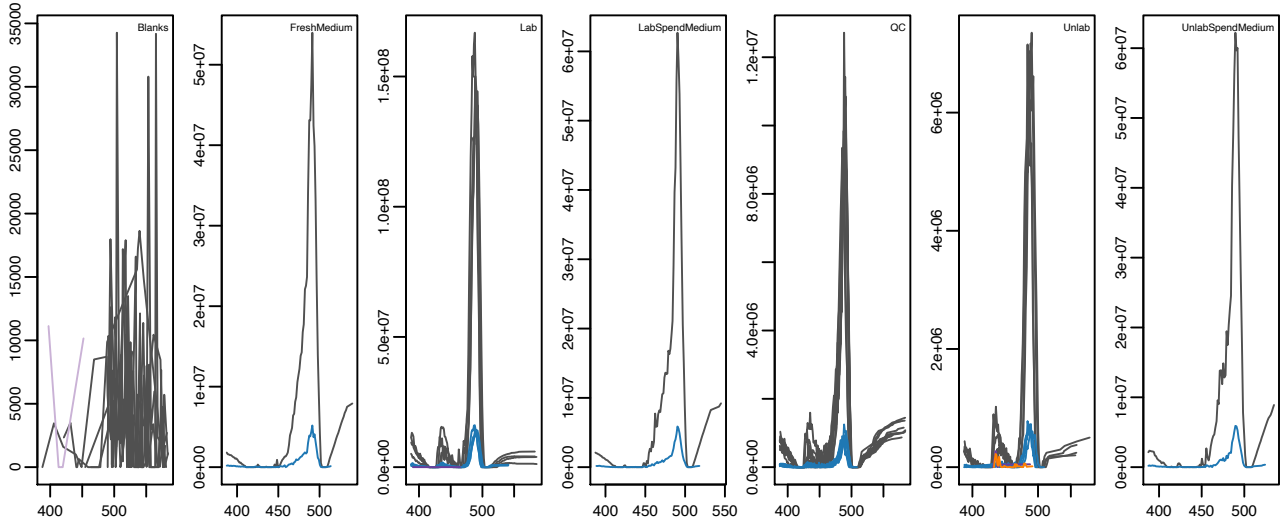


Pantothenate

Formula: C₉H₁₇NO₅ Mass: 219.111 Std.RT: 487.2 Ion: POS

G1

■ UL ■+1 ■+2 ■+3 ■+4 ■+5 ■+6 ■+7 ■+8 ■+9

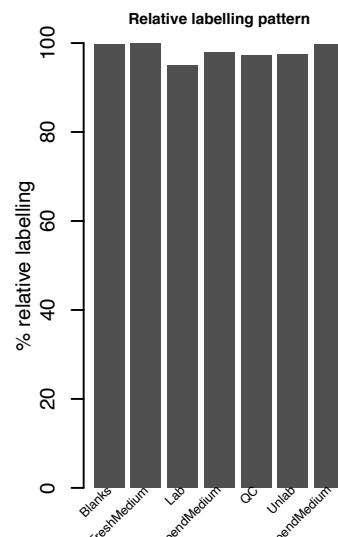
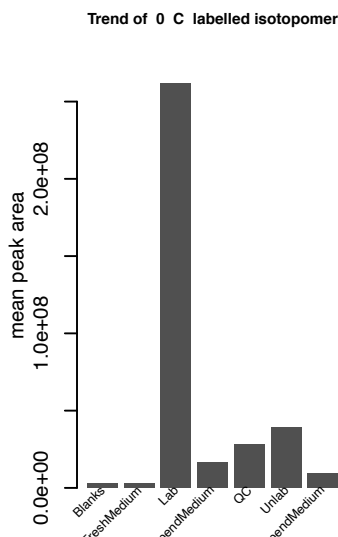
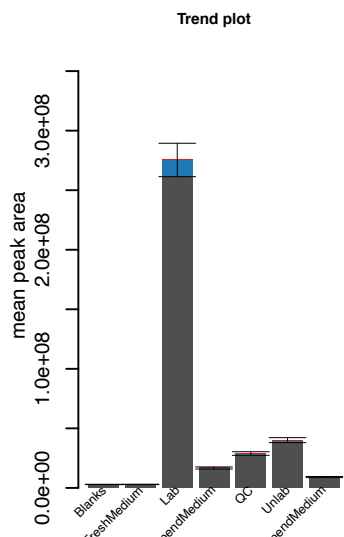
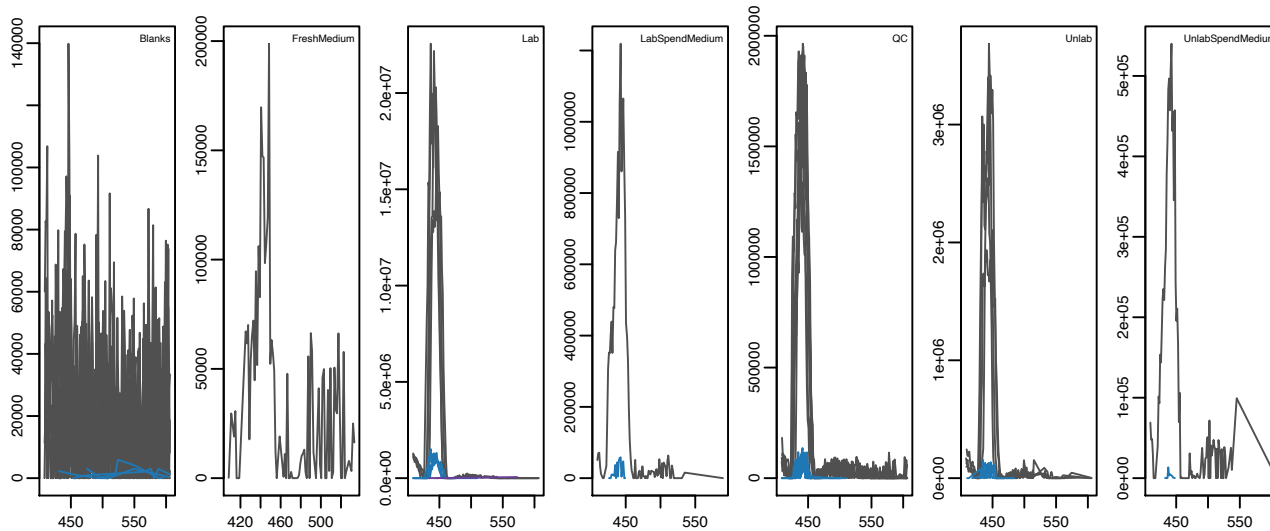


Picolinic acid

Formula: C₆H₅NO₂ Mass: 123.032 Std.RT: 508.2 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6

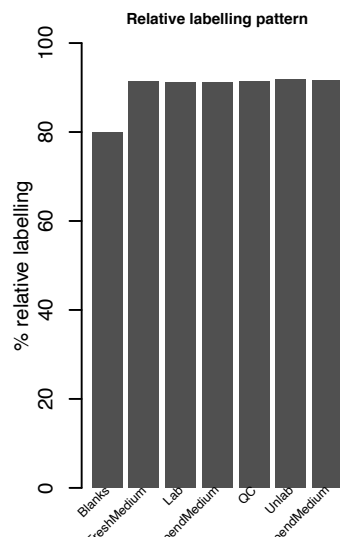
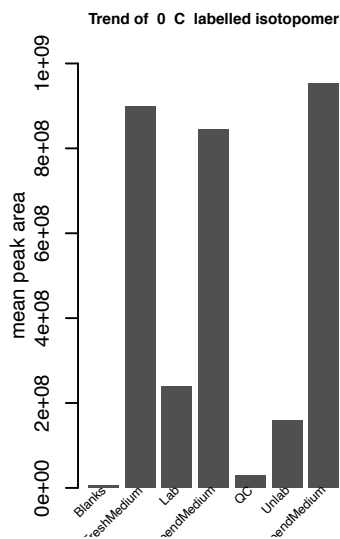
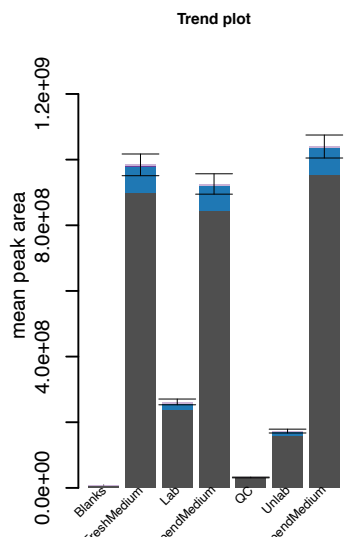
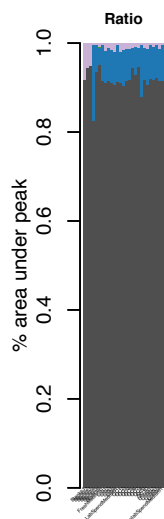
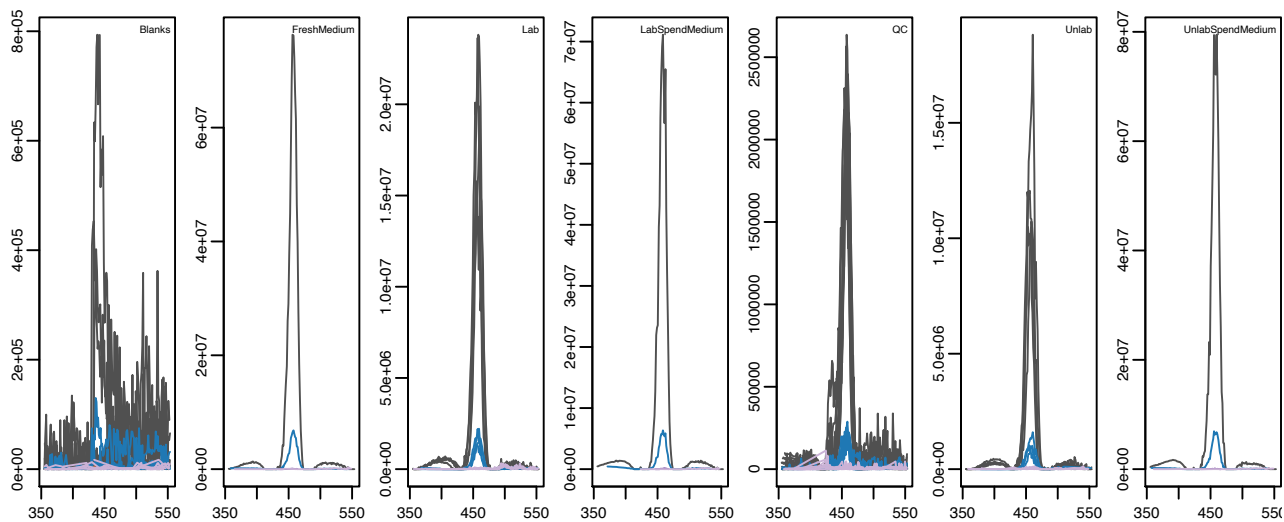


Pyridoxal

Formula: C₈H₉NO₃ Mass: 167.058 Std.RT: 454.8 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6 ■ +7 ■ +8

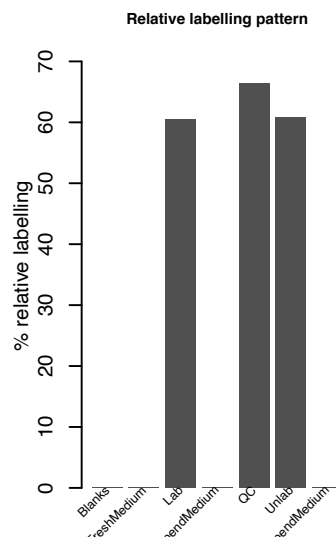
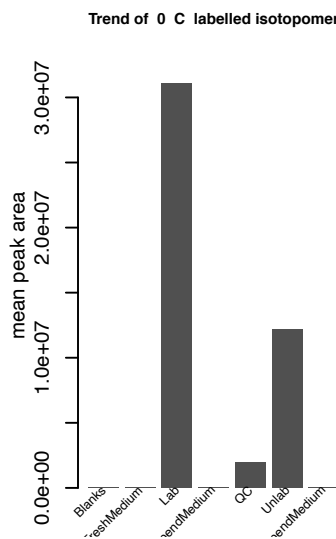
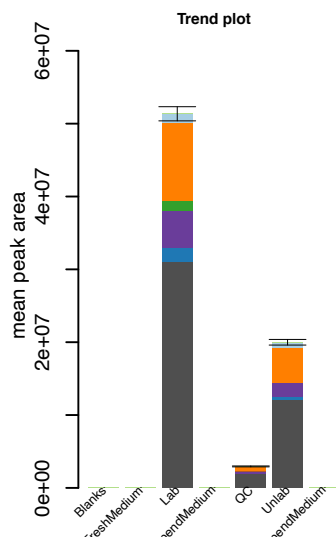
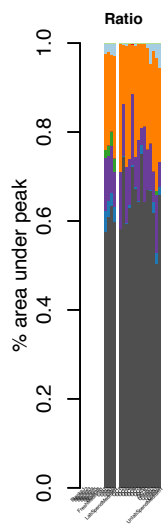
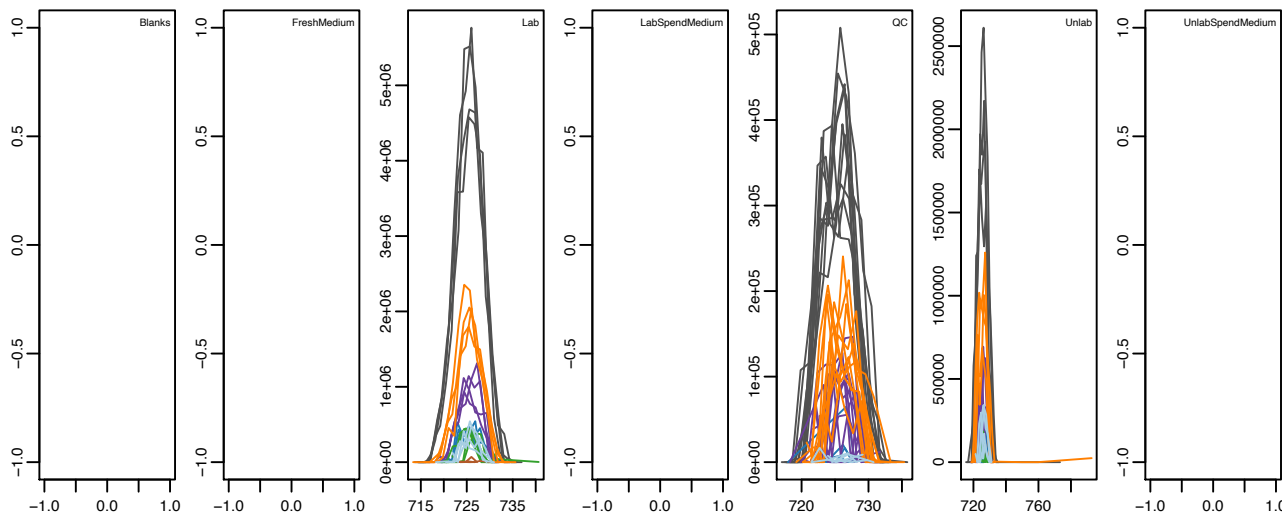


UMP

Formula: C₉H₁₃N₂O₉P Mass: 324.036 Std.RT: 694.8 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5 ■ +6 ■ +7 ■ +8 ■ +9

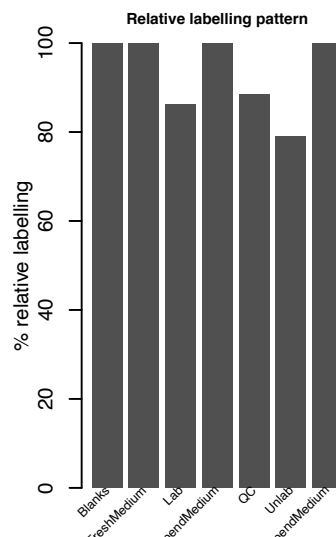
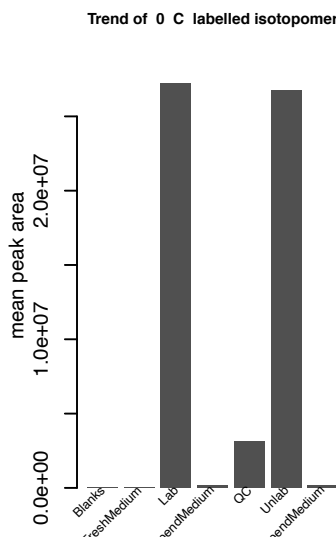
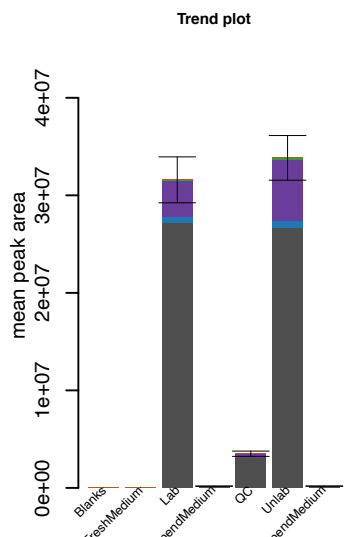
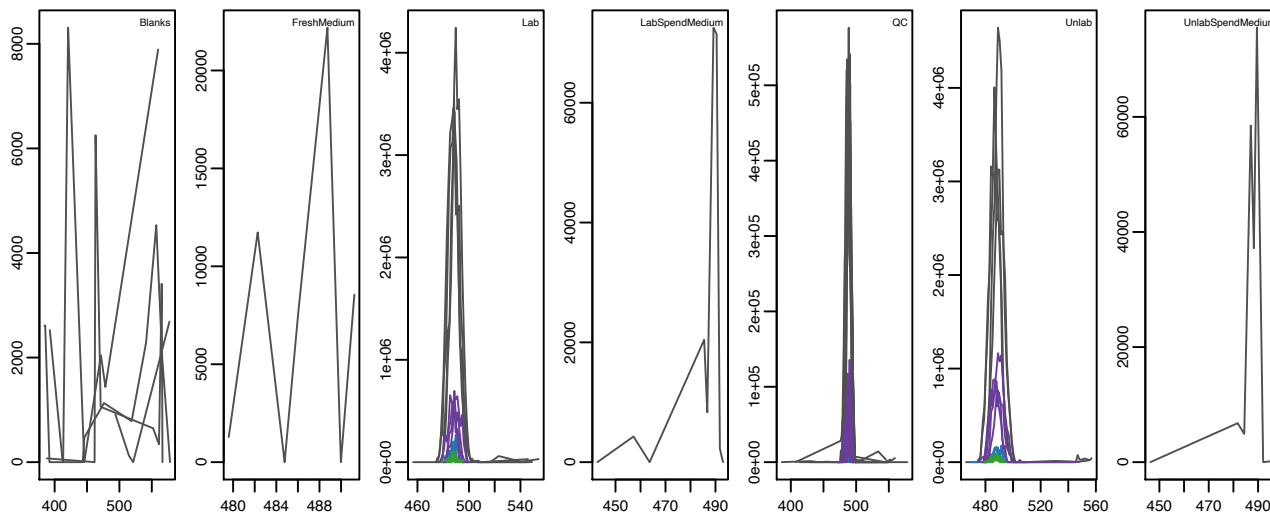


Uracil

Formula: C₄H₄N₂O₂ Mass: 112.027 Std.RT: 483.6 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4

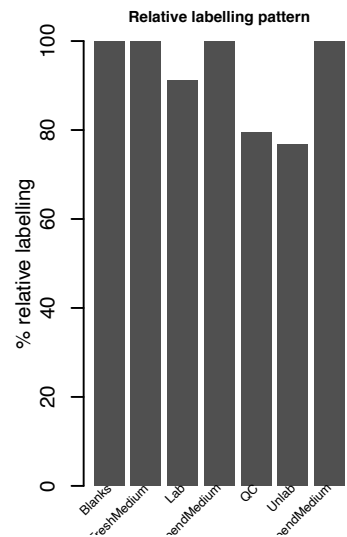
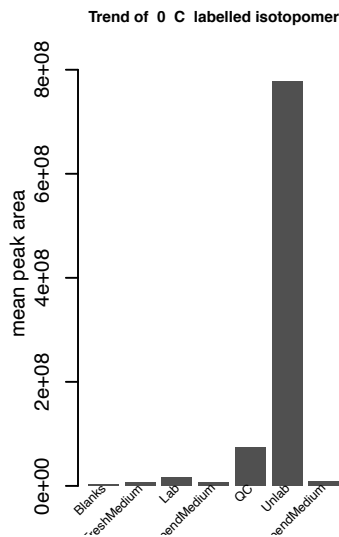
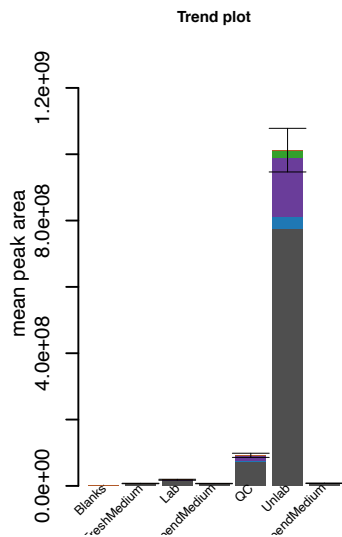
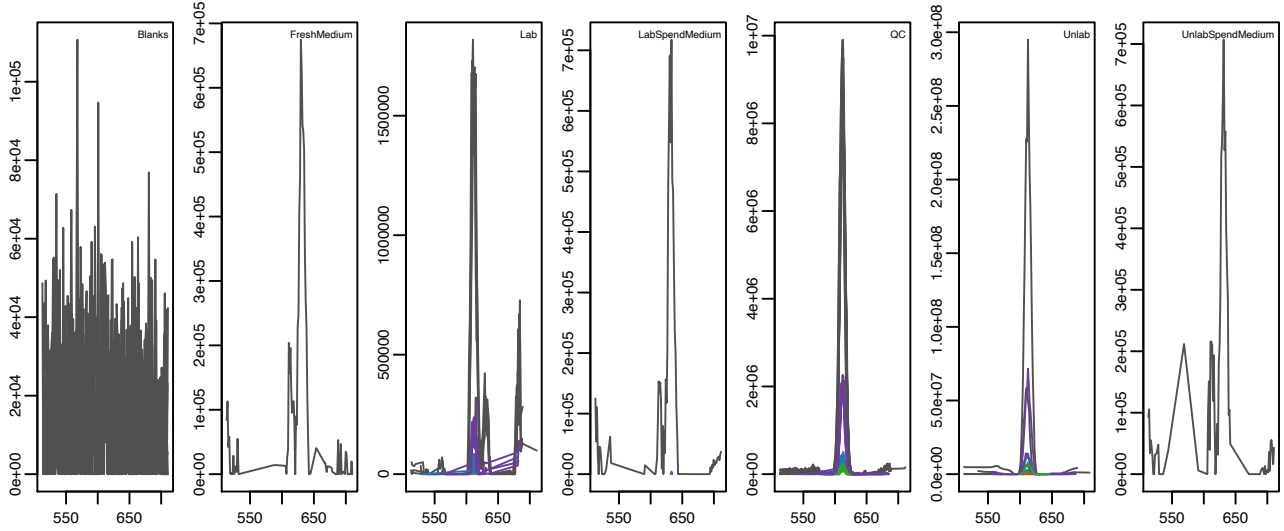


cytosine

Formula: C₄H₅N₃O Mass: 111.043 Std.RT: 612.6 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4

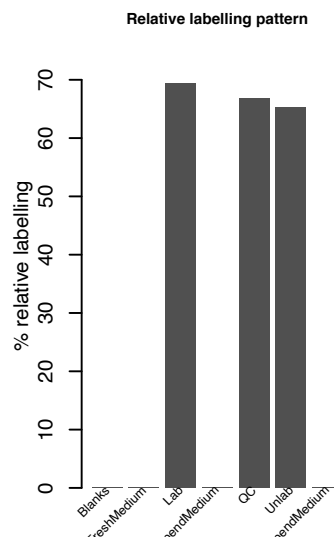
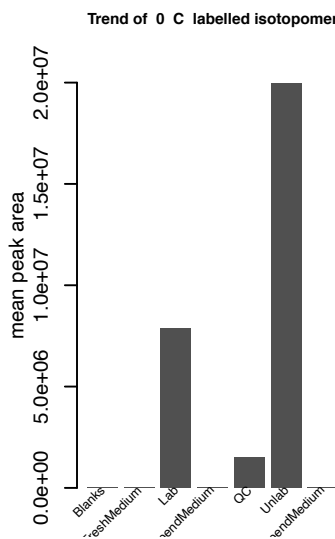
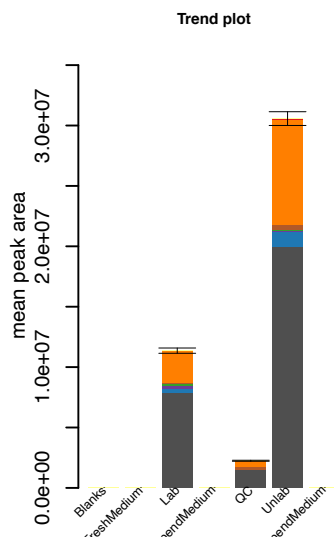
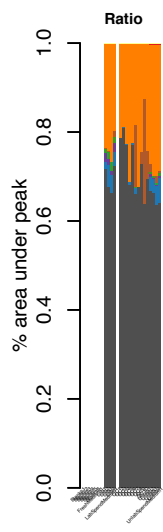
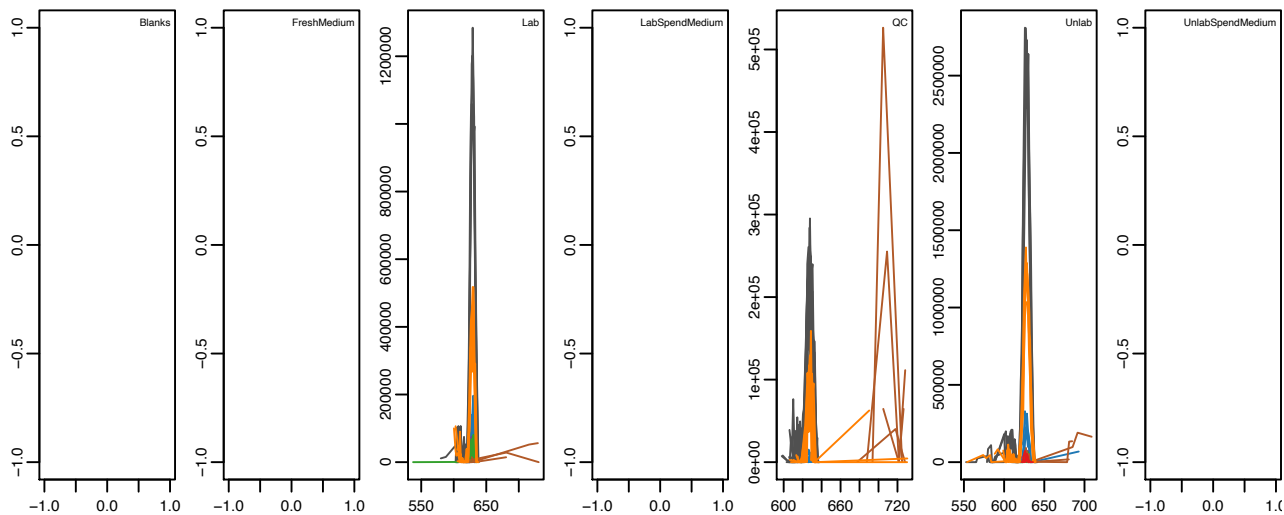


dAMP

Formula: C₁₀H₁₄N₅O₆P Mass: 331.068 Std.RT: 632.4 Ion: POS

G1

■UL ■+1 ■+2 ■+3 ■+4 ■+5 ■+6 ■+7 ■+8 ■+9 ■+10

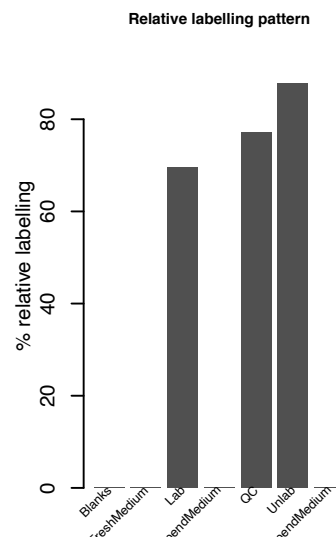
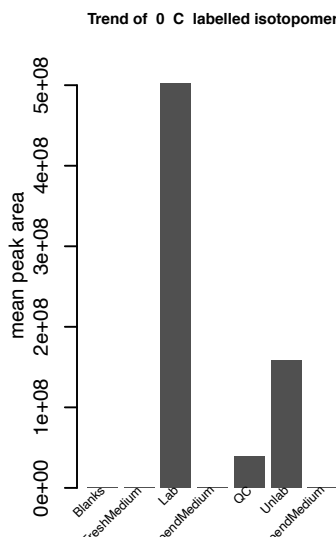
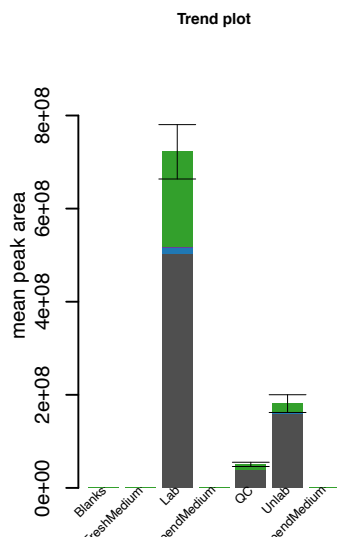
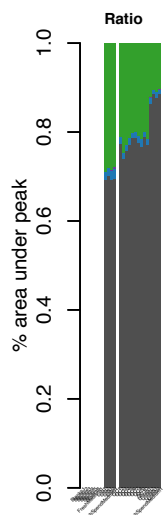
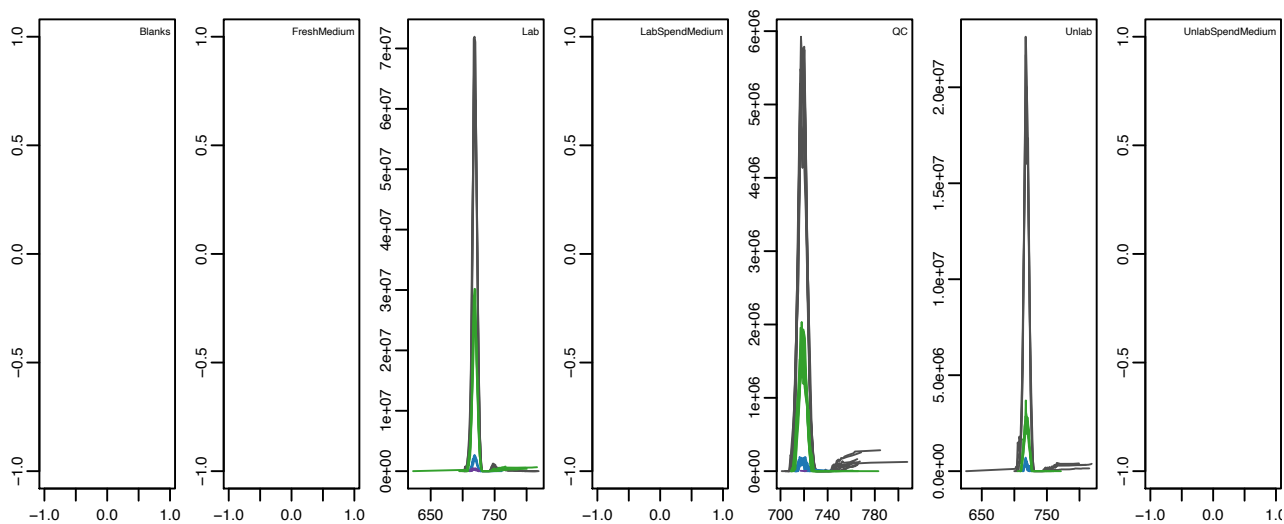


sn-Glycerol 3-phosphate

Formula: C3H9O6P Mass: 172.014 Std.RT: 720.6 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3

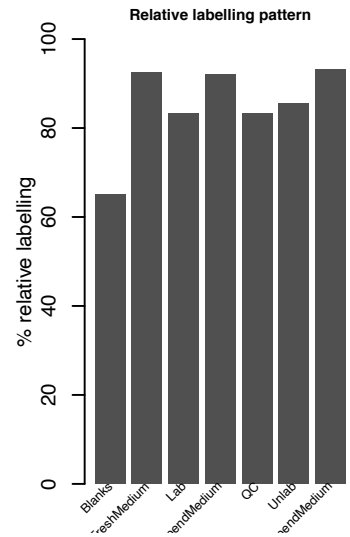
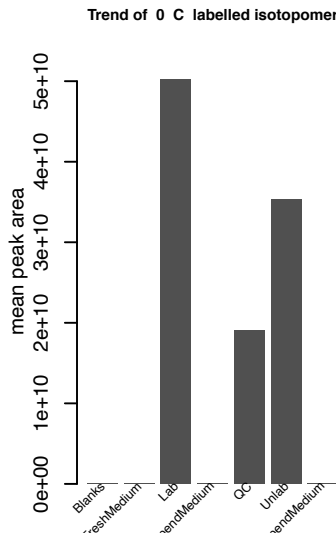
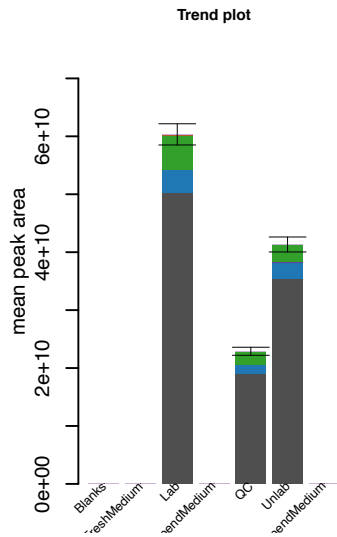
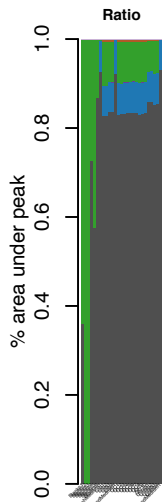
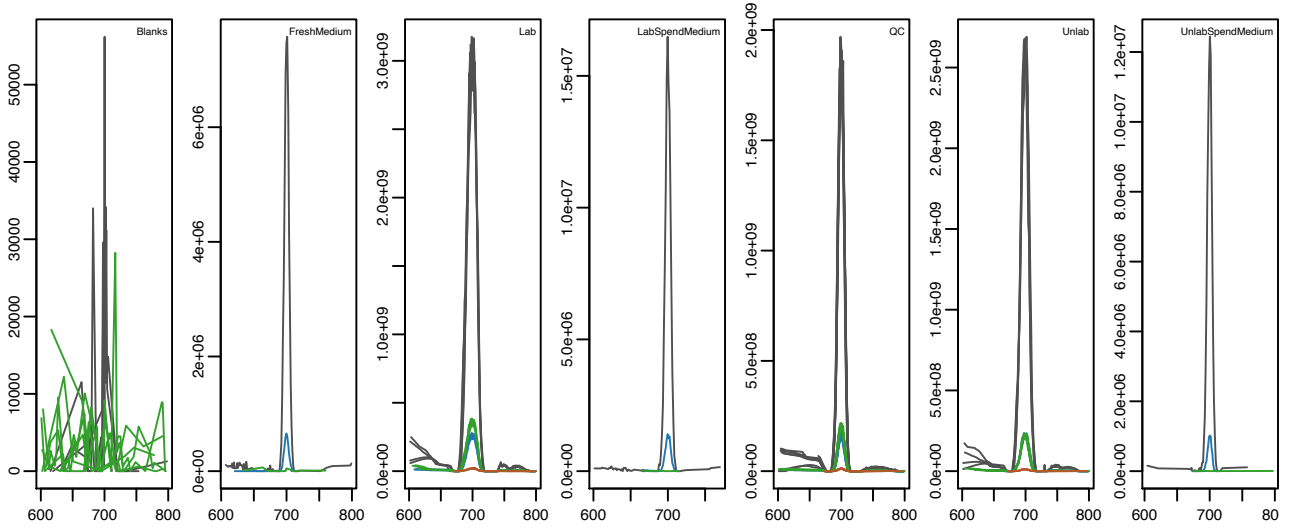


sn-glycero-3-Phosphocholine

Formula: C₈H₂₀NO₆P Mass: 257.103 Std.RT: 700.8 Ion: POS

G1

■ UL ■+1 ■+2 ■+3 ■+4 ■+5 ■+6 ■+7 ■+8

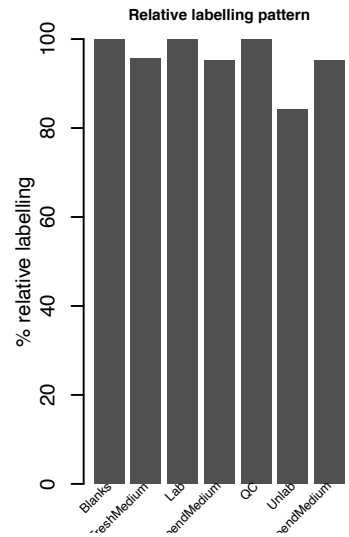
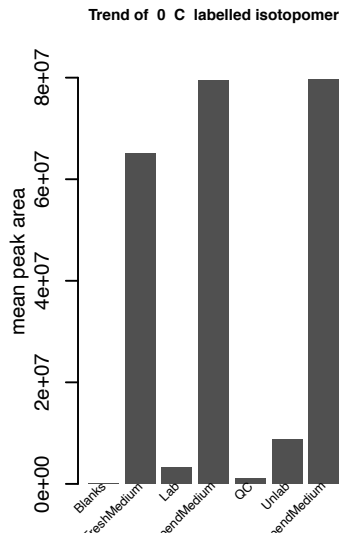
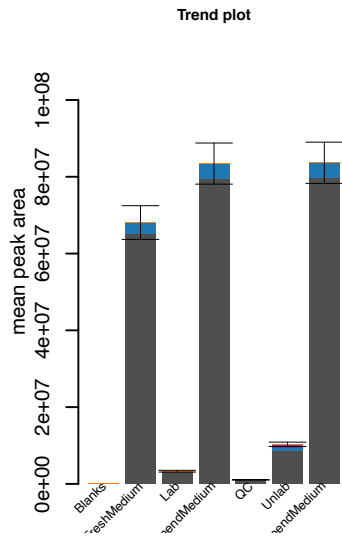
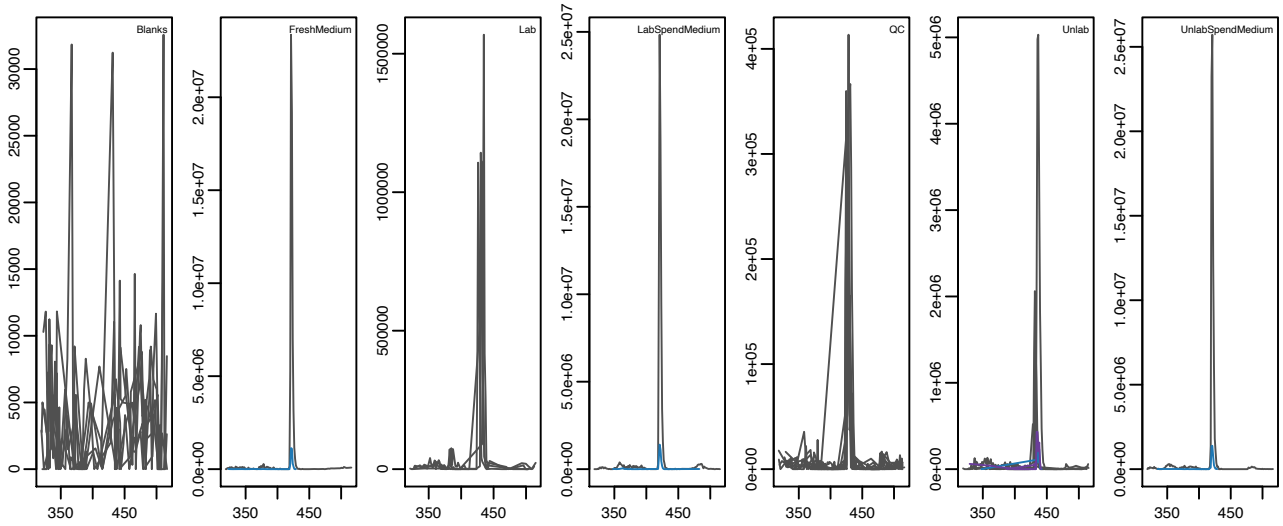


thymine

Formula: C₅H₆N₂O₂ Mass: 126.043 Std.RT: 418.2 Ion: POS

G1

■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5

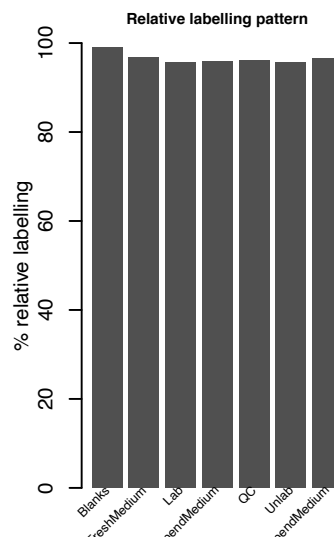
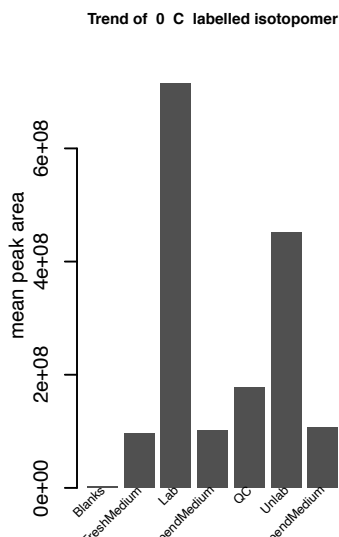
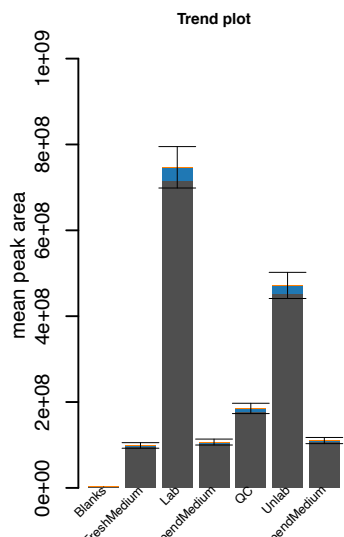
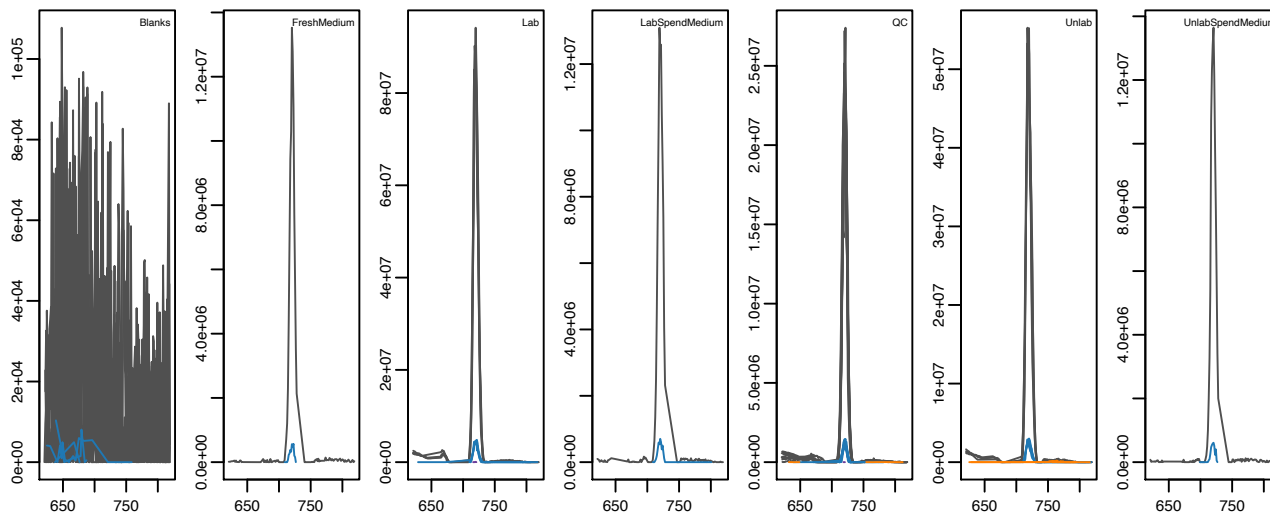


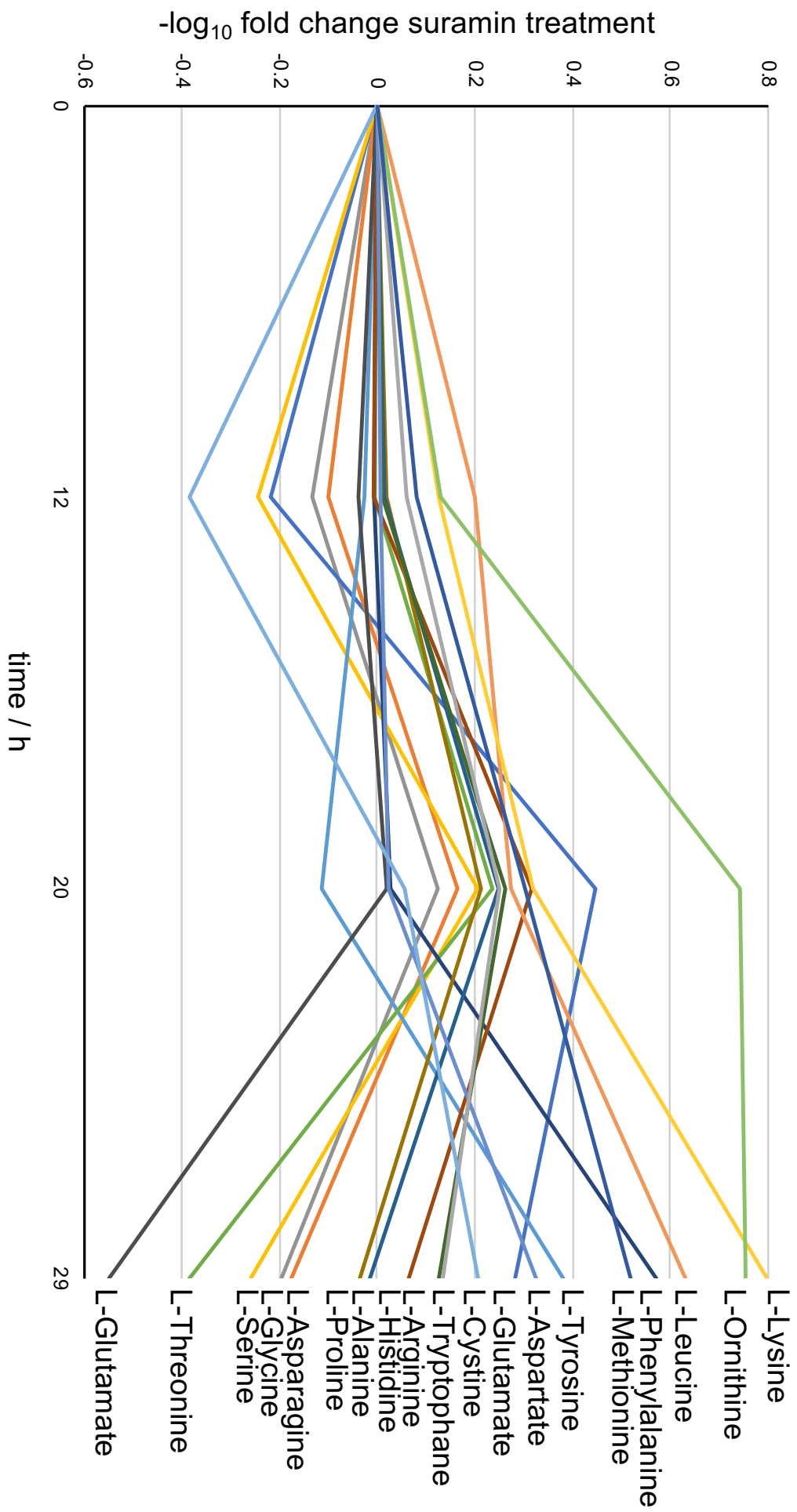
trans-4-Hydroxy-L-proline

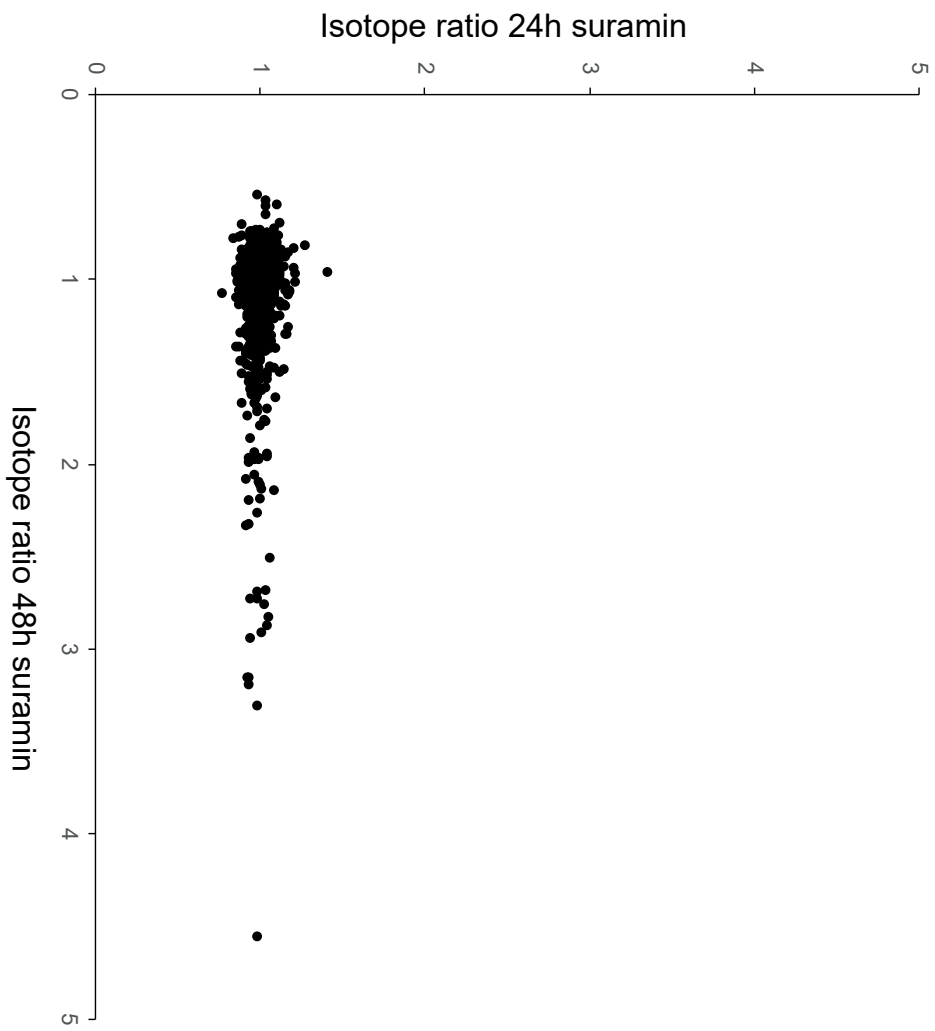
Formula: C₅H₉NO₃ Mass: 131.058 Std.RT: 720.6 Ion: POS

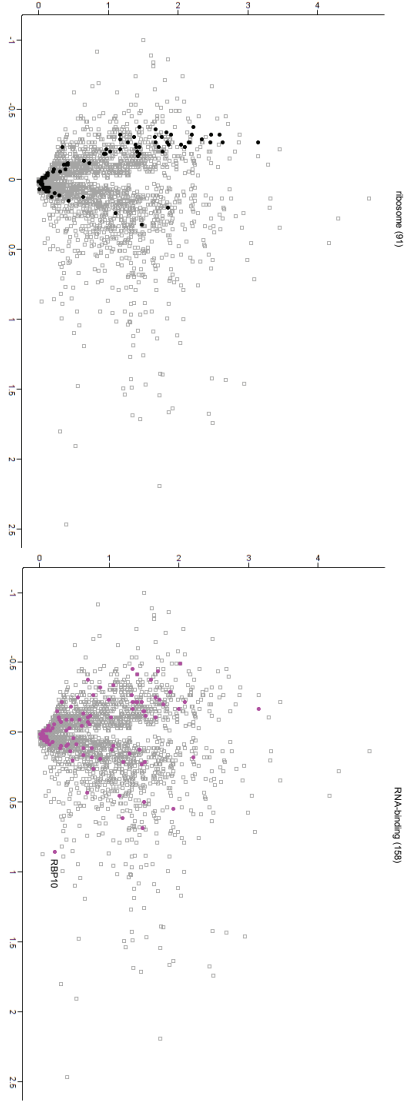
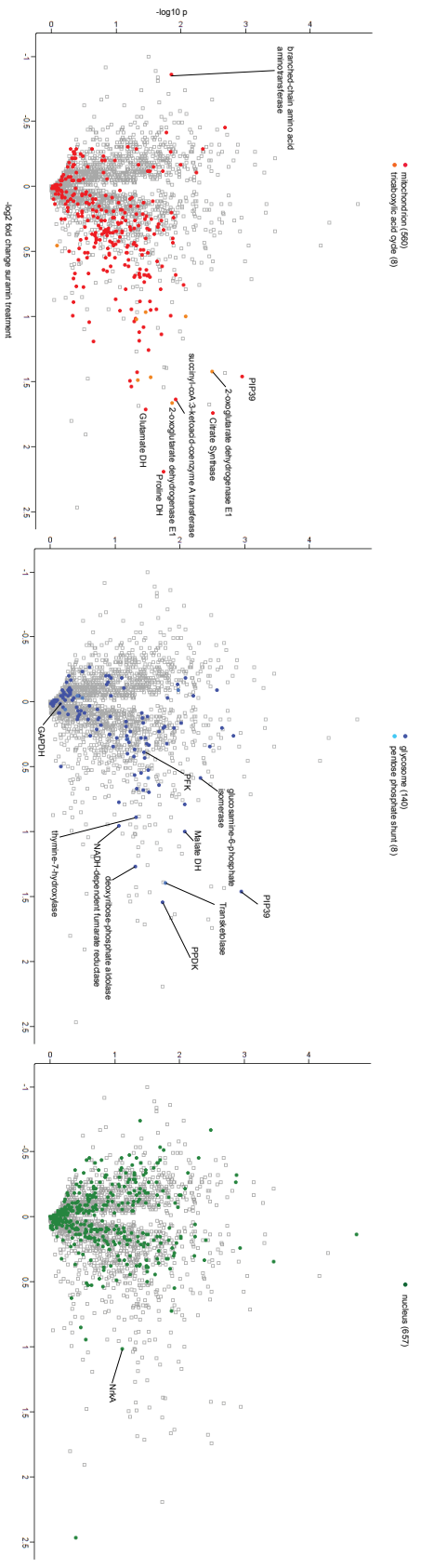
G1

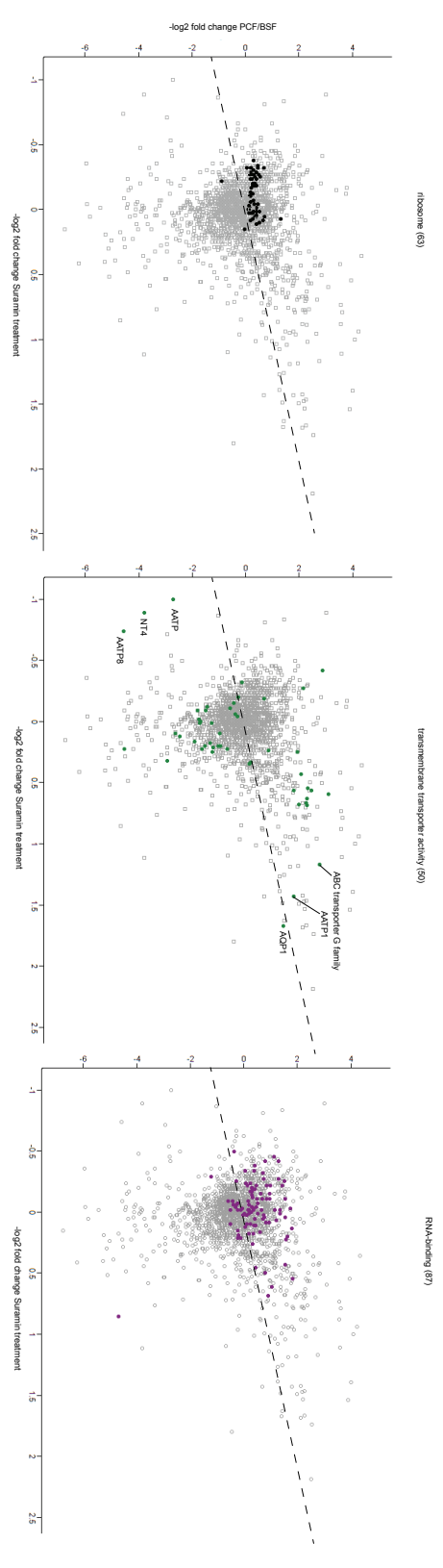
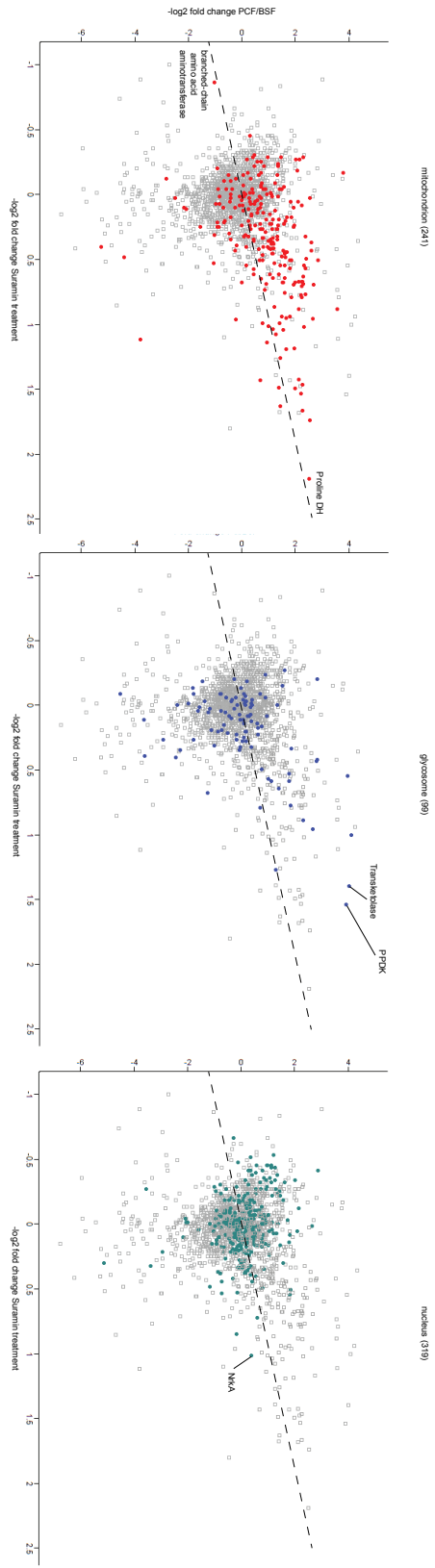
■ UL ■ +1 ■ +2 ■ +3 ■ +4 ■ +5











Relative absorbance A_{280}

100

200

0

0.2

0.4

0.6

0.8

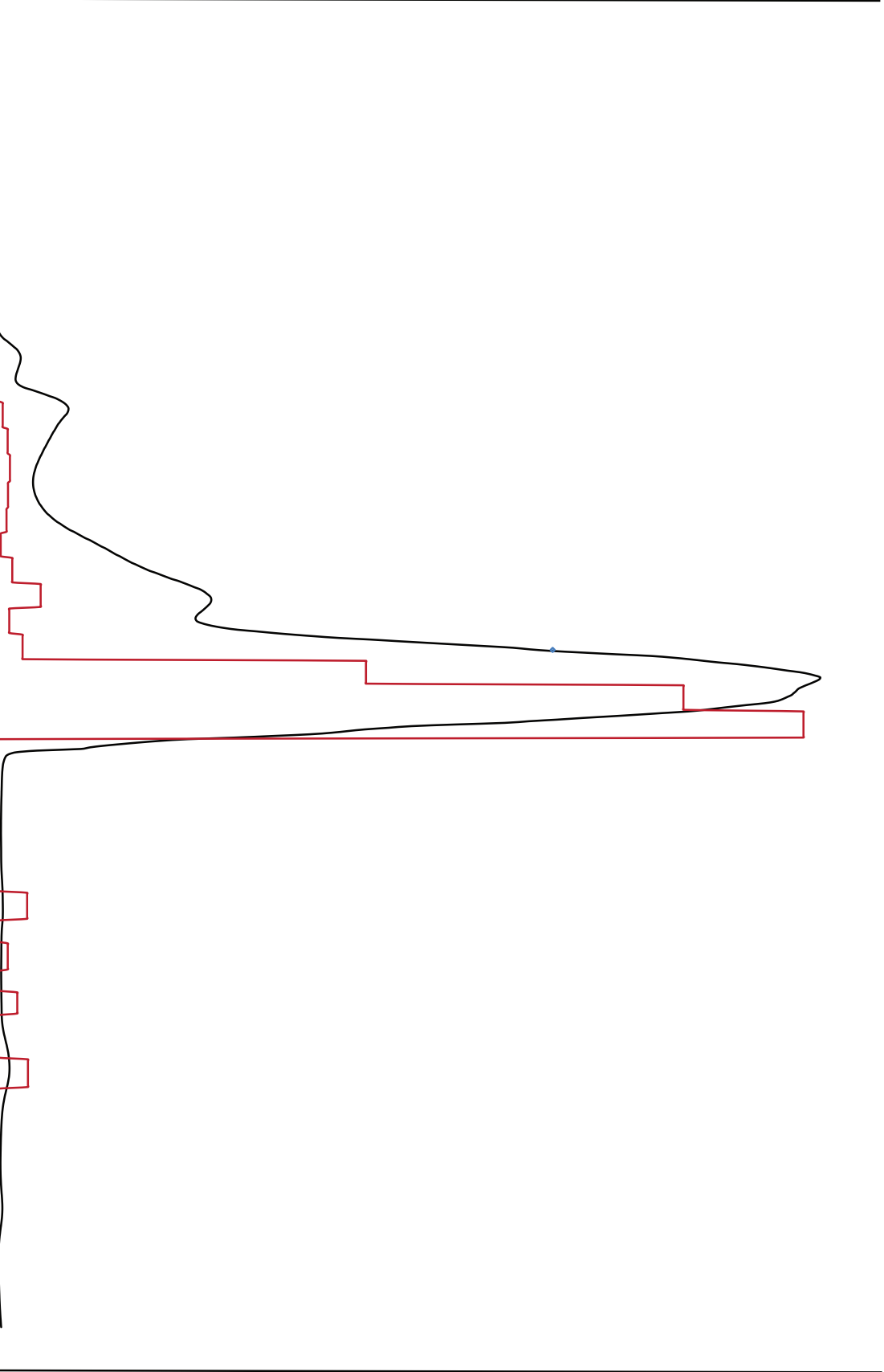
1.0

0

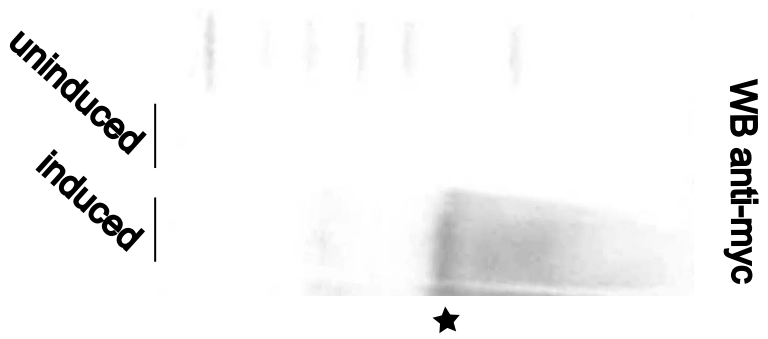
Column volume

Relative CPM

5000



A



B

