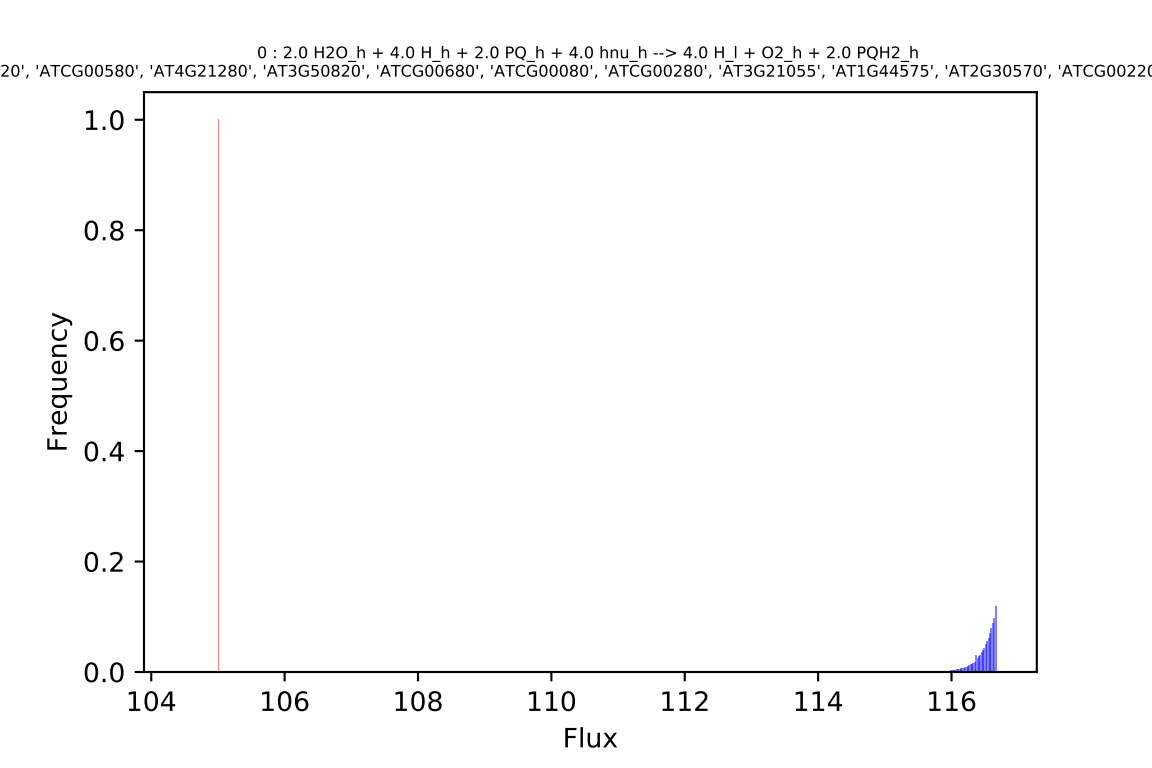
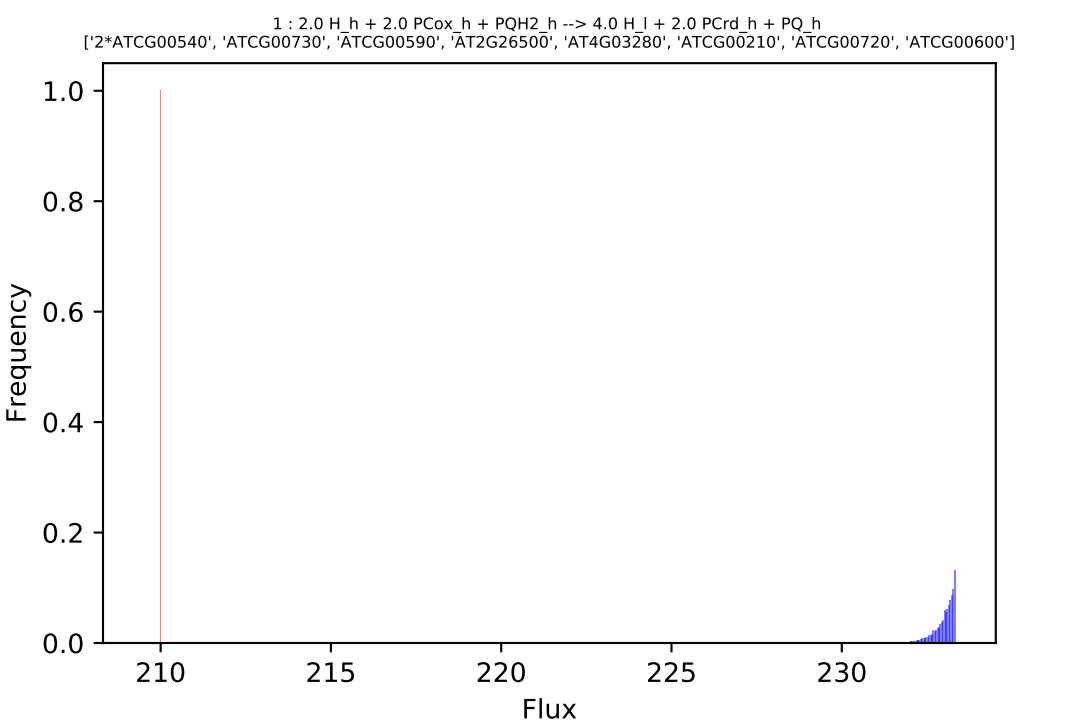
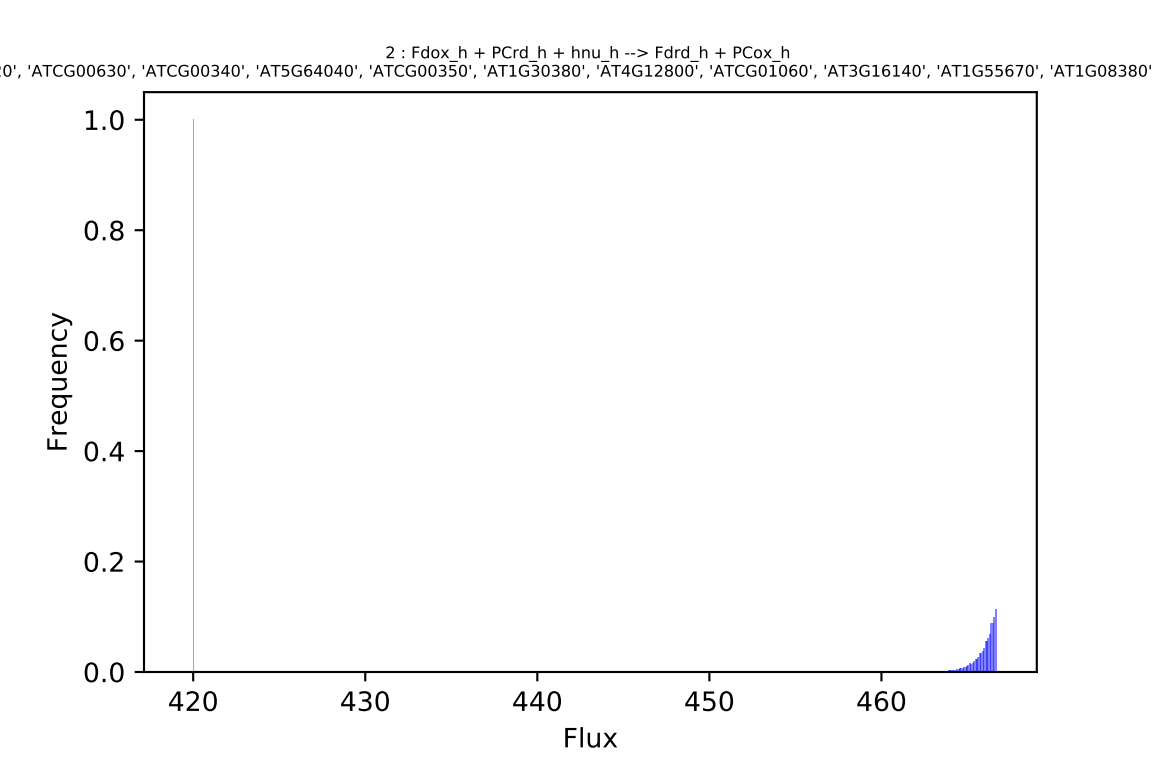
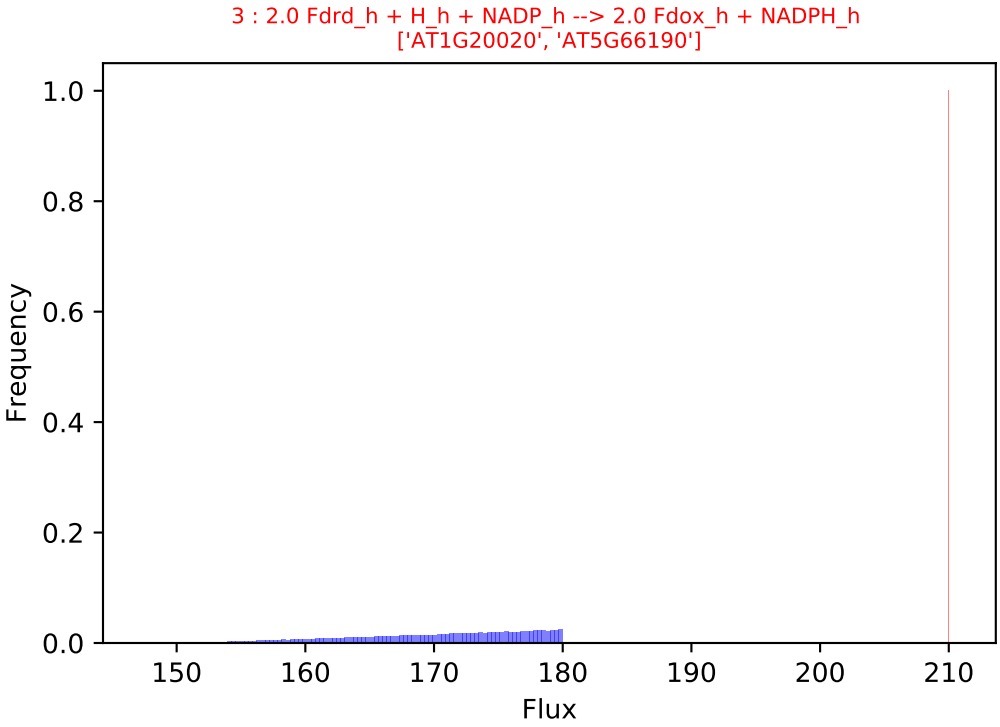
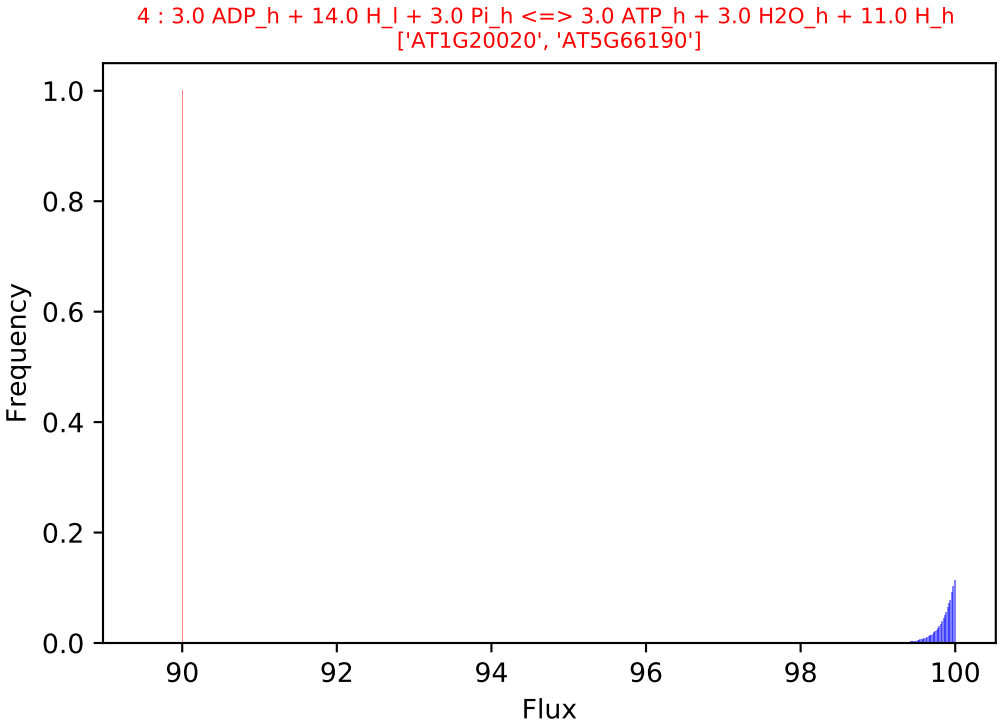
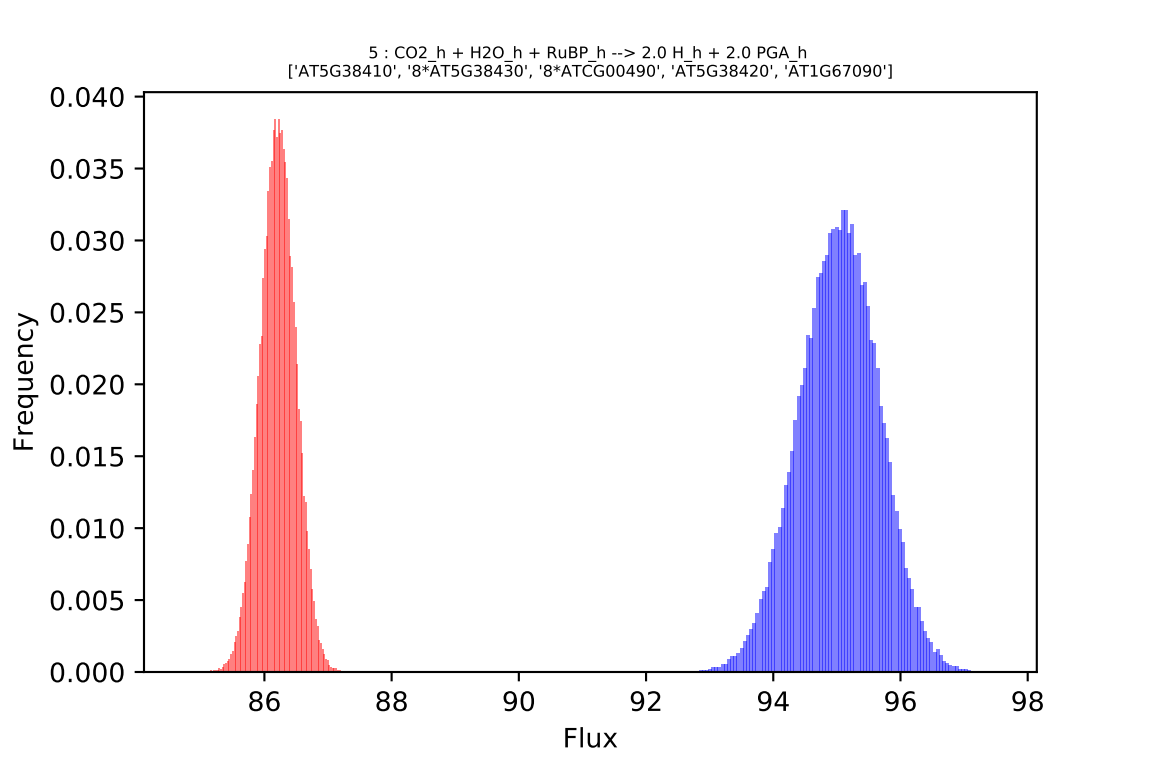

0 : 2.0 H2O_h + 4.0 H_h + 2.0 PQ_h + 4.0 hnu_h --> 4.0 H_l + O2_h + 2.0 PQH2_h
20', 'ATCG00580', 'AT4G21280', 'AT3G50820', 'ATCG00680', 'ATCG00080', 'ATCG00280', 'AT3G21055', 'AT1G44575', 'AT2G30570', 'ATCG00220
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
104
106
108
110
112
114
116
Flux

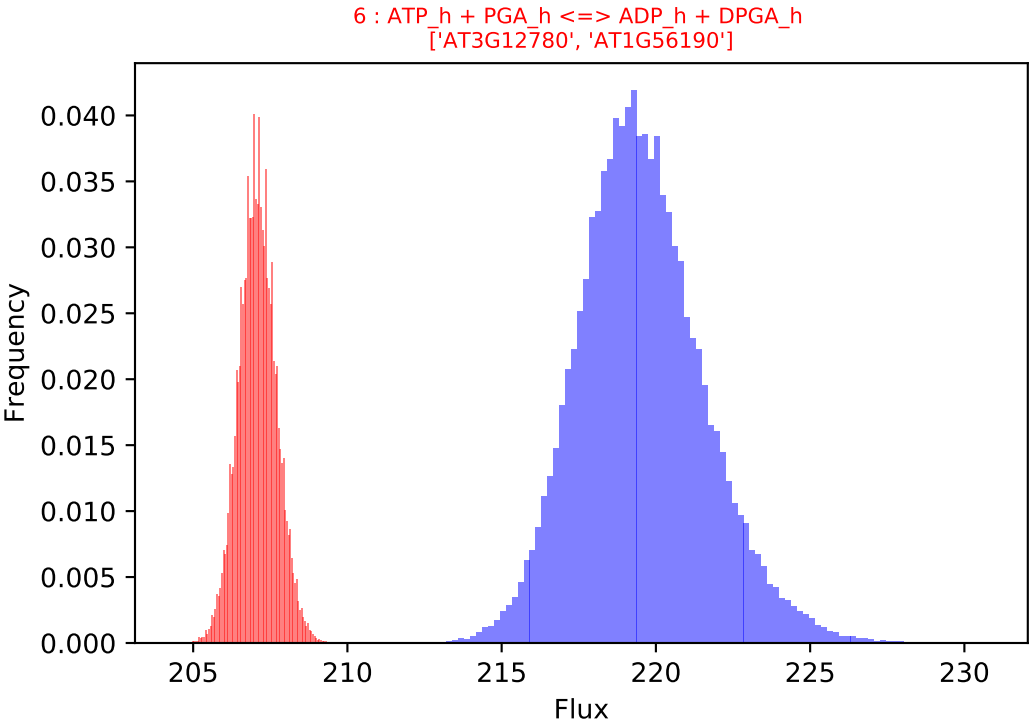

1 : 2.0 H_h + 2.0 PCox_h + PQH2_h --> 4.0 H_l + 2.0 PCrd_h + PQ_h
['2*ATCG00540', 'ATCG00730', 'ATCG00590', 'AT2G26500', 'AT4G03280', 'ATCG00210', 'ATCG00720', 'ATCG00600']
Frequency
1.0
0.8
0.6
0.4
0.2
0.0
210
215
220
225
230
Flux

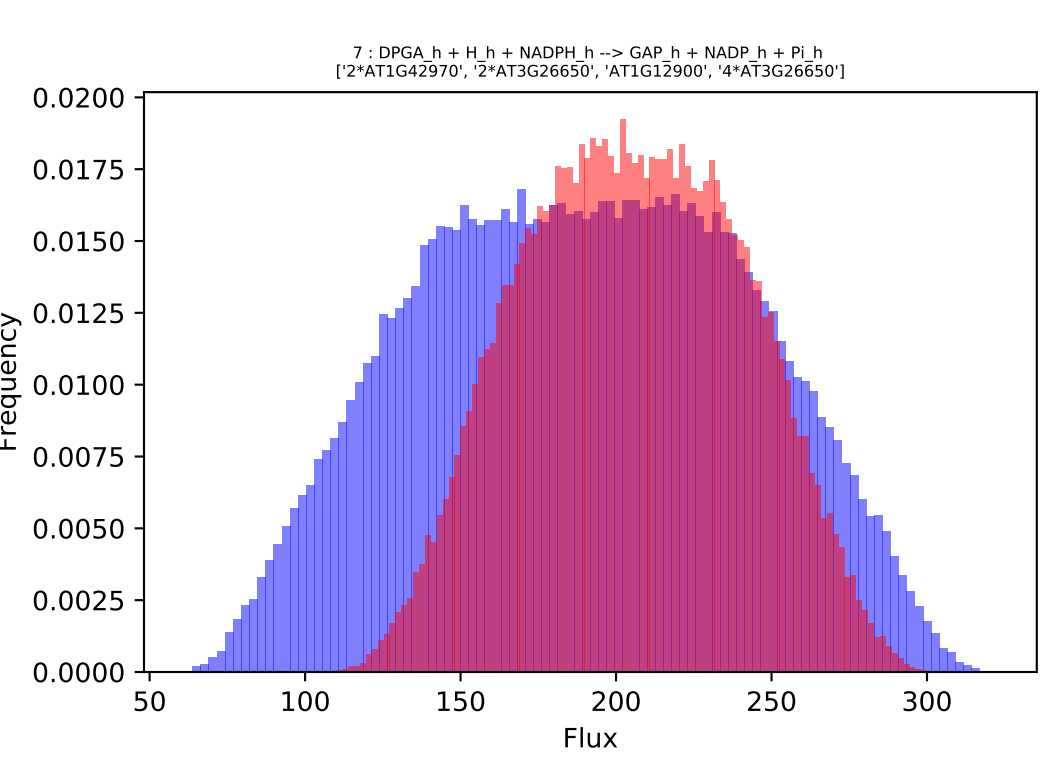

2 : Fdox_h + PCrd_h + hnu_h --> Fdrd_h + PCox_h
20', 'ATCG00630', 'ATCG00340', 'AT5G64040', 'ATCG00350', 'AT1G30380', 'AT4G12800', 'ATCG01060', 'AT3G16140', 'AT1G55670', 'AT1G08380'
Frequency
1.0
0.8
0.6
0.4
0.2
0.0
420
430
440
450
460
Flux

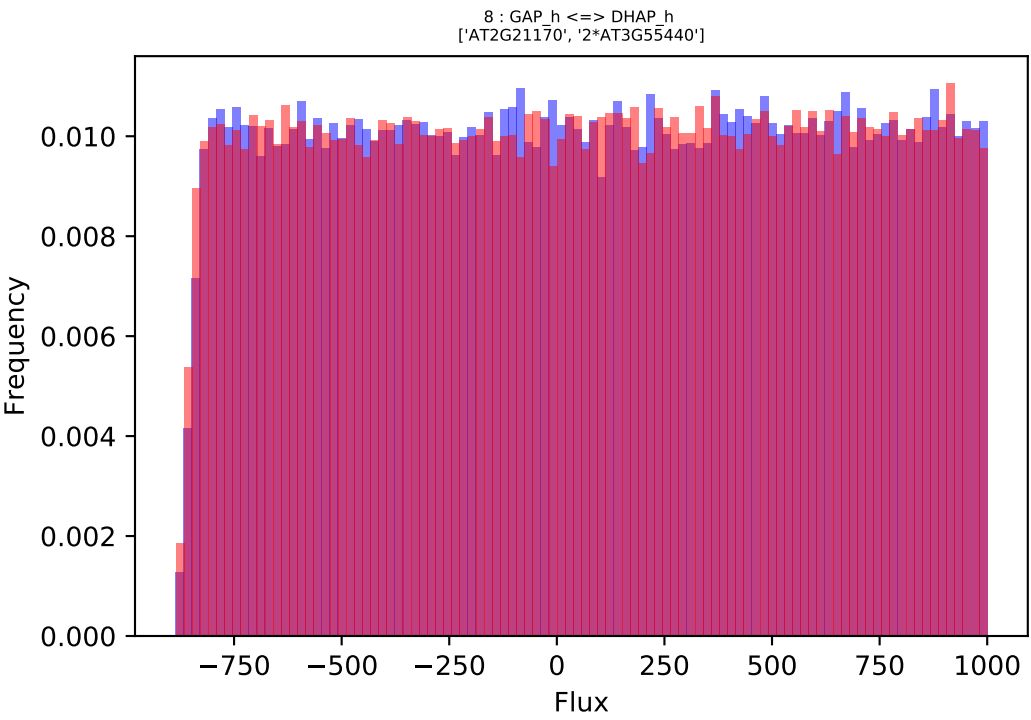

3 : 2.0 Fdrd_h + H_h + NADP_h --> 2.0 Fdox_h + NADPH_h
['AT1G20020', 'AT5G66190']
Frequency
1.0
0.8
0.6
0.4
0.2
0.0
150
160
170
180
190
200
210
Flux

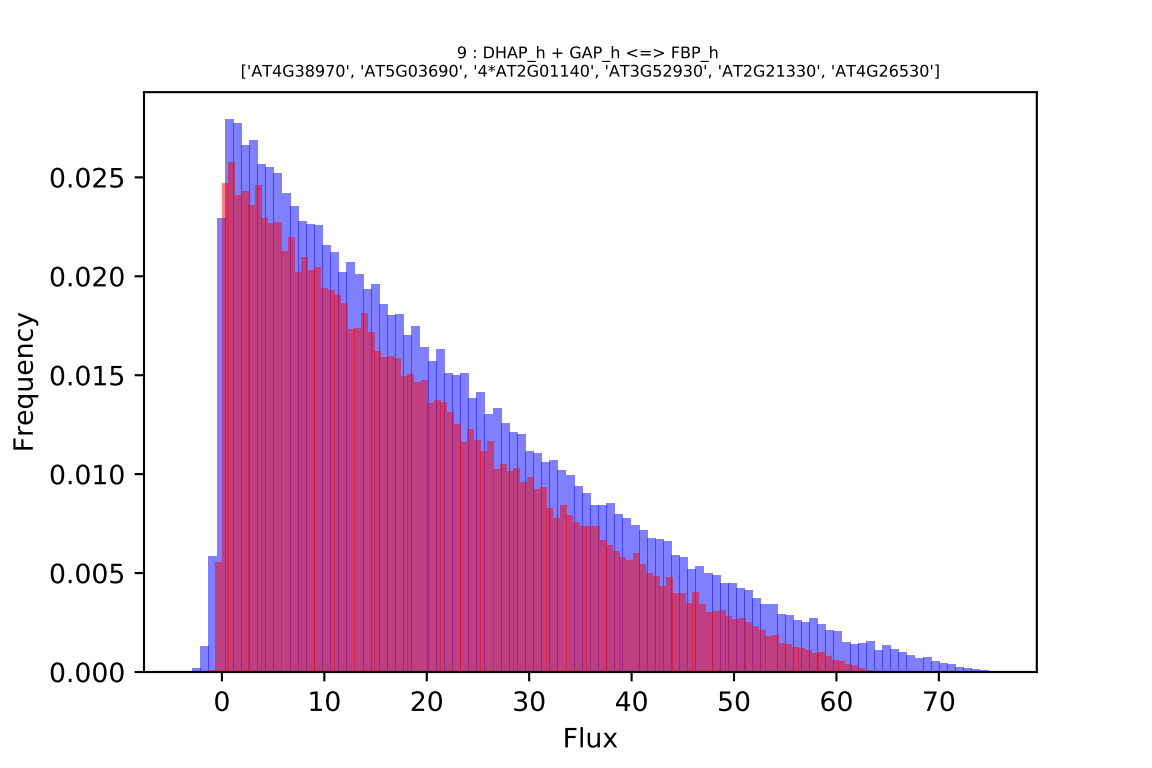

4 : 3.0 ADP_h + 14.0 H_l + 3.0 Pi_h <=> 3.0 ATP_h + 3.0 H2O_h + 11.0 H_h
['AT1G20020', 'AT5G66190']
Frequency
1.0
0.8
0.6
0.4
0.2
0.0
90
92
94
96
98
100
Flux

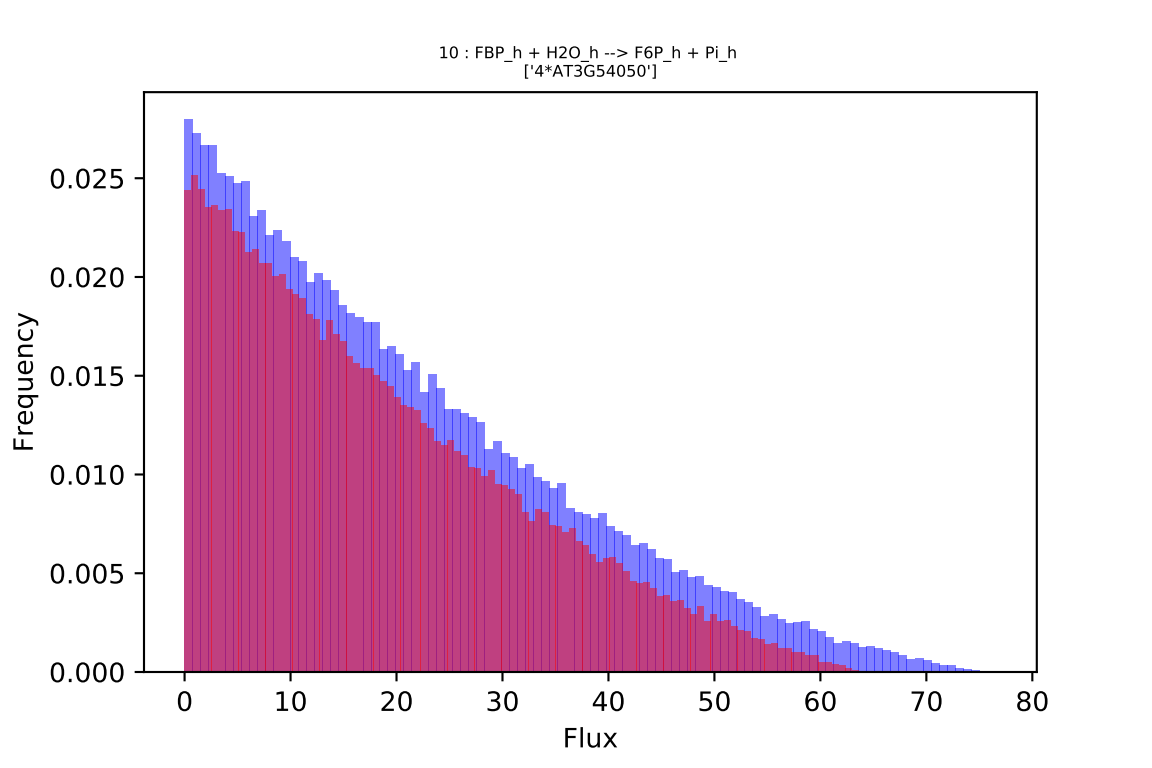

5 : CO2_h + H2O_h + RuBP_h --> 2.0 H_h + 2.0 PGA_h
['AT5G38410', '8*AT5G38430', '8*ATCG00490', 'AT5G38420', 'AT1G67090']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
86
88
90
92
94
96
98
Flux

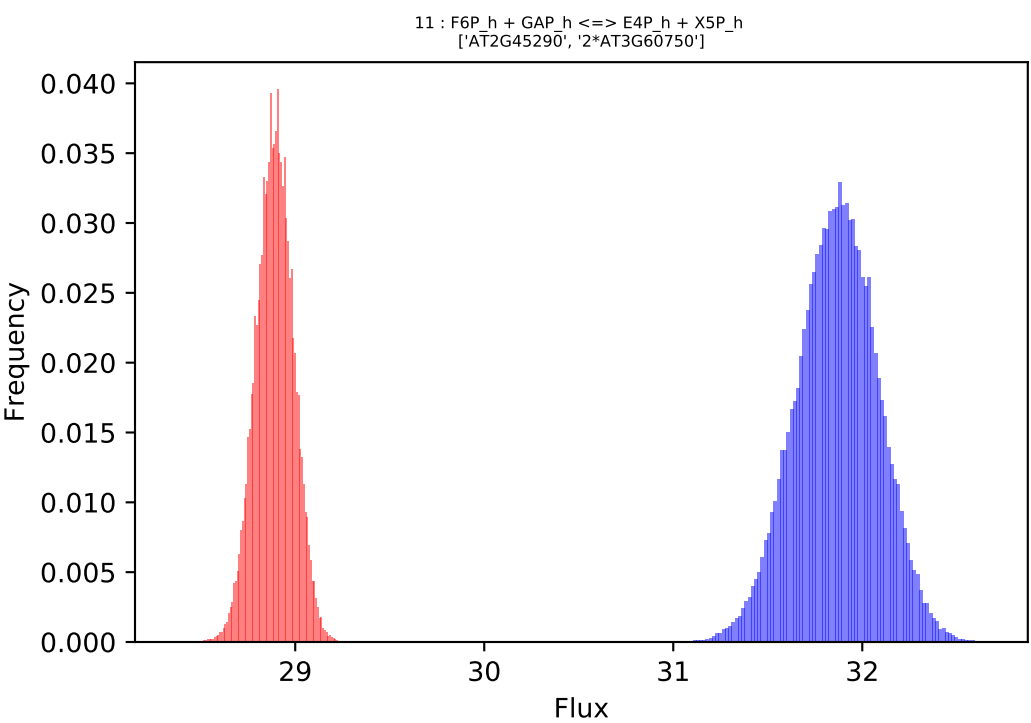

6 : ATP_h + PGA_h <=> ADP_h + DPGA_h
['AT3G12780', 'AT1G56190']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
205
210
215
220
225
230
Flux

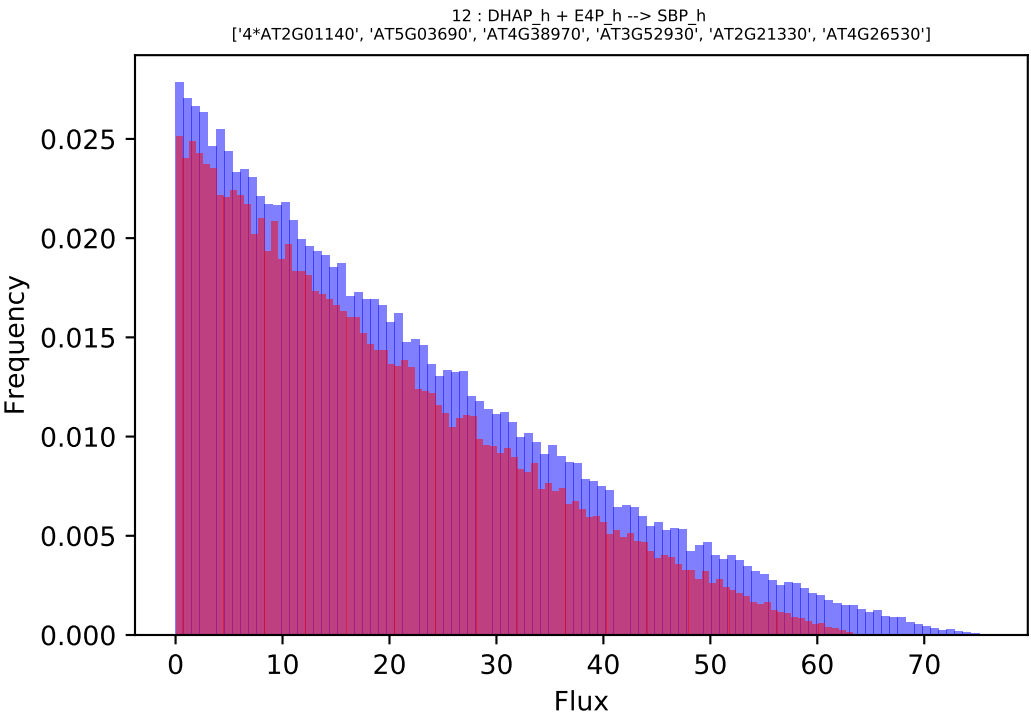

7 : DPGA_h + H_h + NADPH_h --> GAP_h + NADP_h + Pi_h
['2*AT1G42970', '2*AT3G26650', 'AT1G12900', '4*AT3G26650']
Frequency
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
50
100
150
200
250
300
Flux

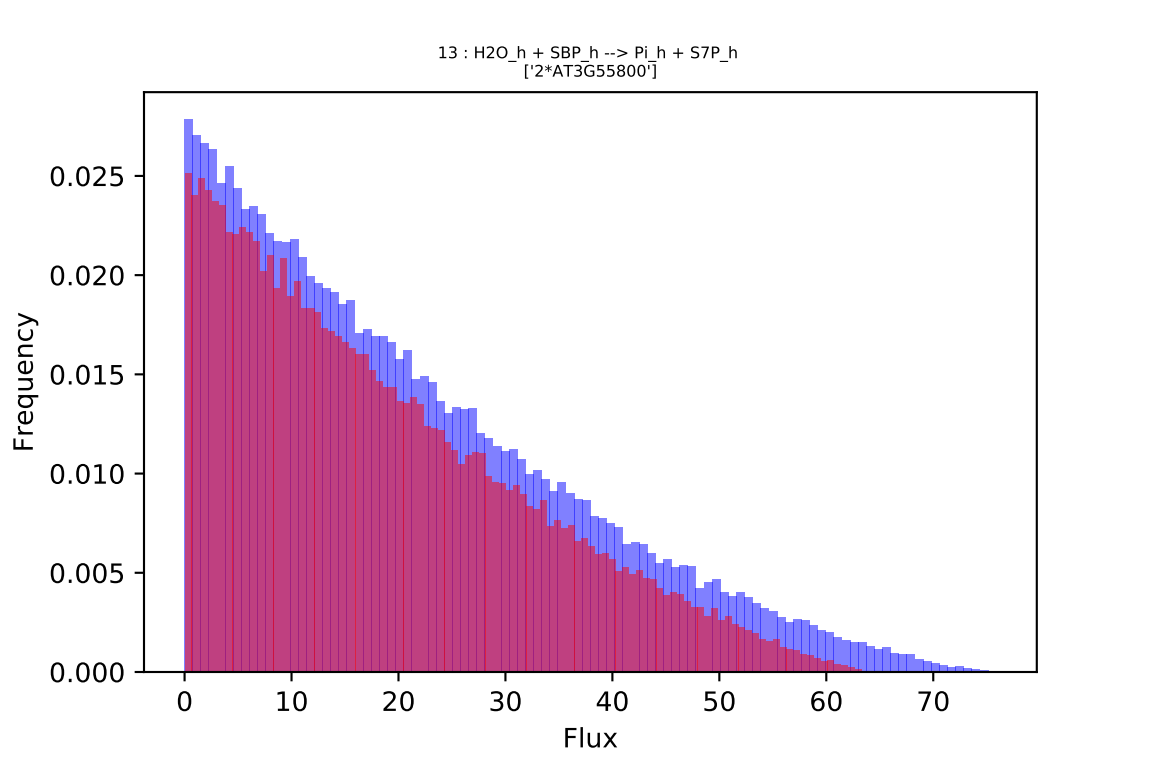

8 : GAP_h <=> DHAP_h
['AT2G21170', '2*AT3G55440']
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−750
−500
−250
0
250
500
750
1000
Flux

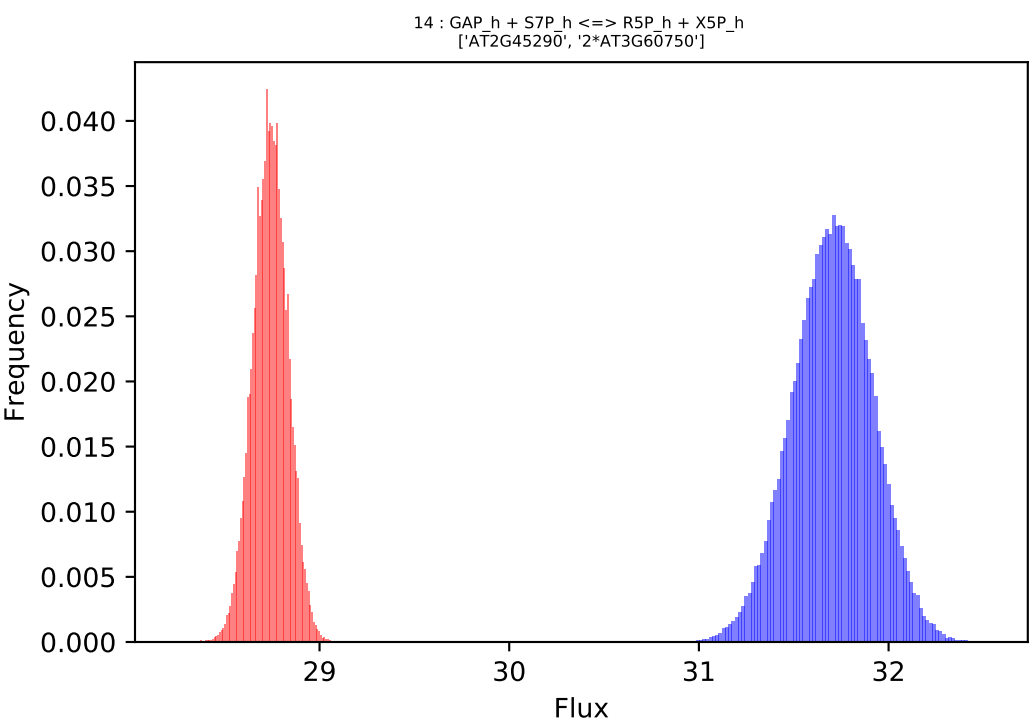

9 : DHAP_h + GAP_h <=> FBP_h
['AT4G38970', 'AT5G03690', '4*AT2G01140', 'AT3G52930', 'AT2G21330', 'AT4G26530']
Frequency
0.025
0.020
0.015
0.010
0.005
0.000
0
10
20
30
40
50
60
70
Flux

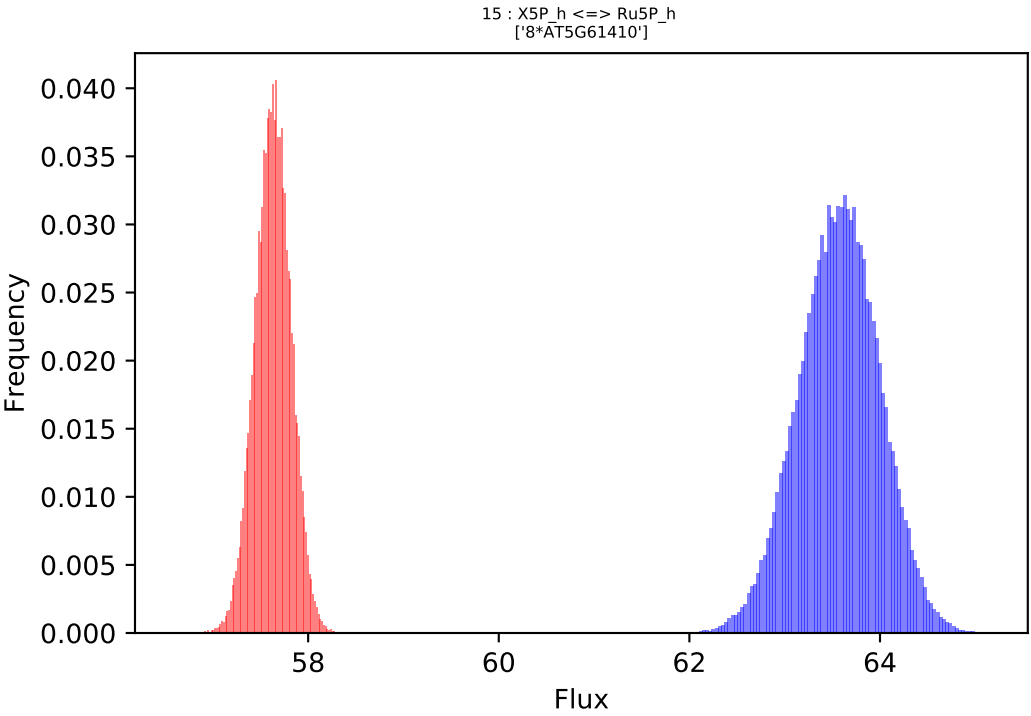

10 : FBP_h + H2O_h --> F6P_h + Pi_h
['4*AT3G54050']
Frequency
0.025
0.020
0.015
0.010
0.005
0.000
0
10
20
30
40
50
60
70
80
Flux

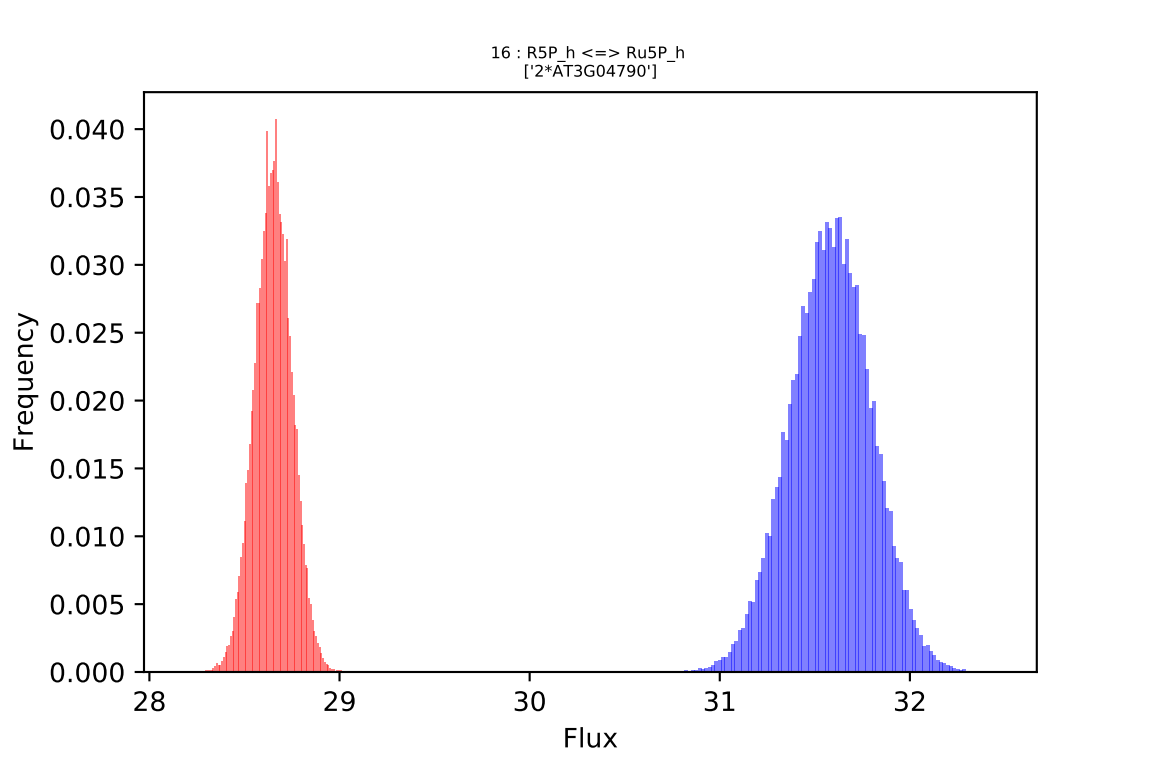

11 : F6P_h + GAP_h <=> E4P_h + X5P_h
['AT2G45290', '2*AT3G60750']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
29
30
31
32
Flux

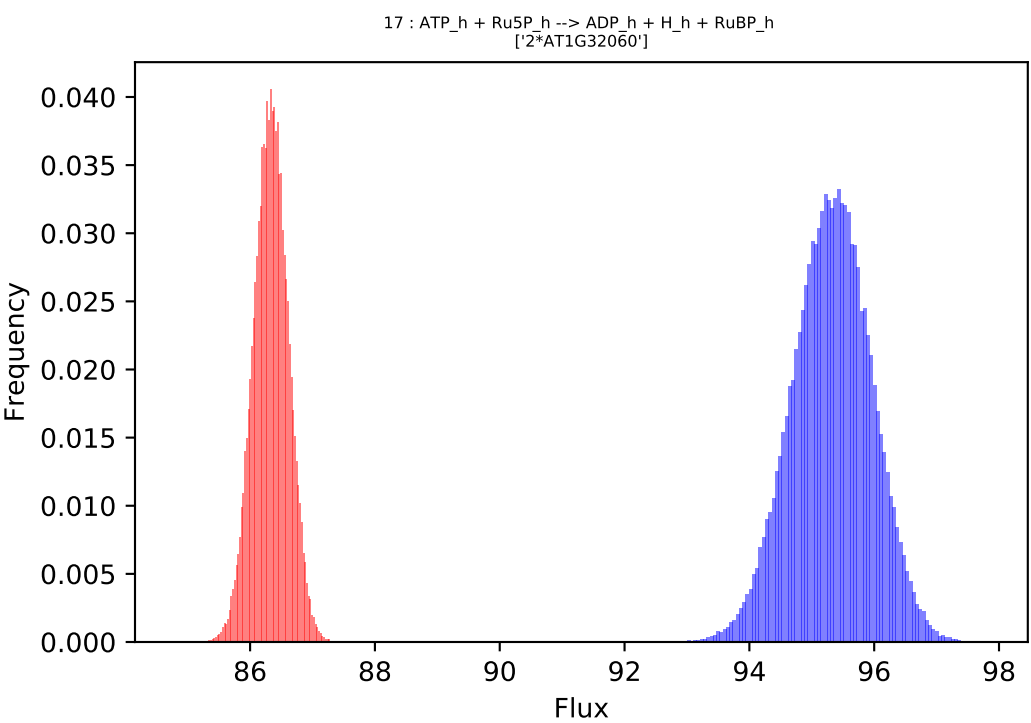

12 : DHAP_h + E4P_h --> SBP_h
['4*AT2G01140', 'AT5G03690', 'AT4G38970', 'AT3G52930', 'AT2G21330', 'AT4G26530']
Frequency
0.025
0.020
0.015
0.010
0.005
0.000
0
10
20
30
40
50
60
70
Flux

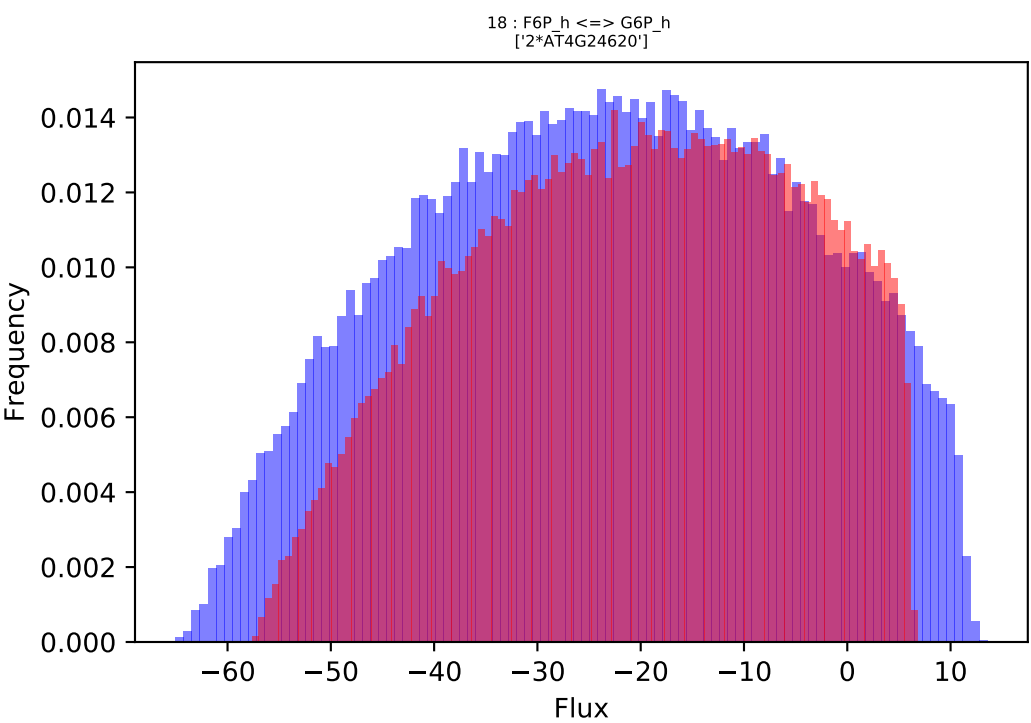

13 : H2O_h + SBP_h --> Pi_h + S7P_h
['2*AT3G55800']
Frequency
0.025
0.020
0.015
0.010
0.005
0.000
0
10
20
30
40
50
60
70
Flux

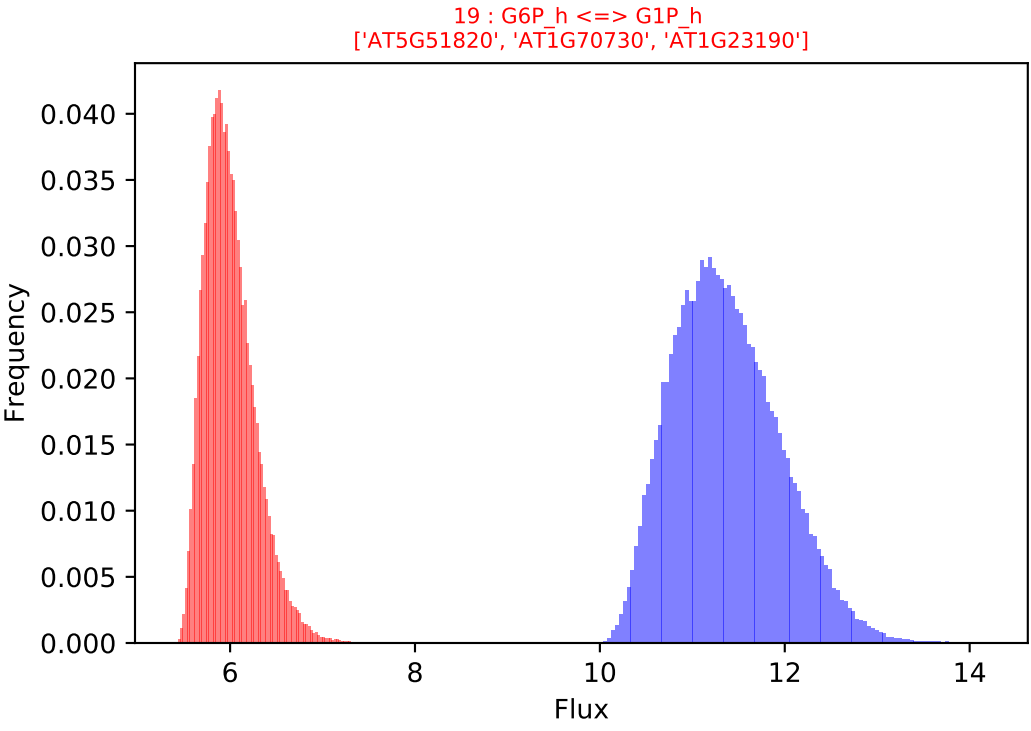

14 : GAP_h + S7P_h <=> R5P_h + X5P_h
['AT2G45290', '2*AT3G60750']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
29
30
31
32
Flux

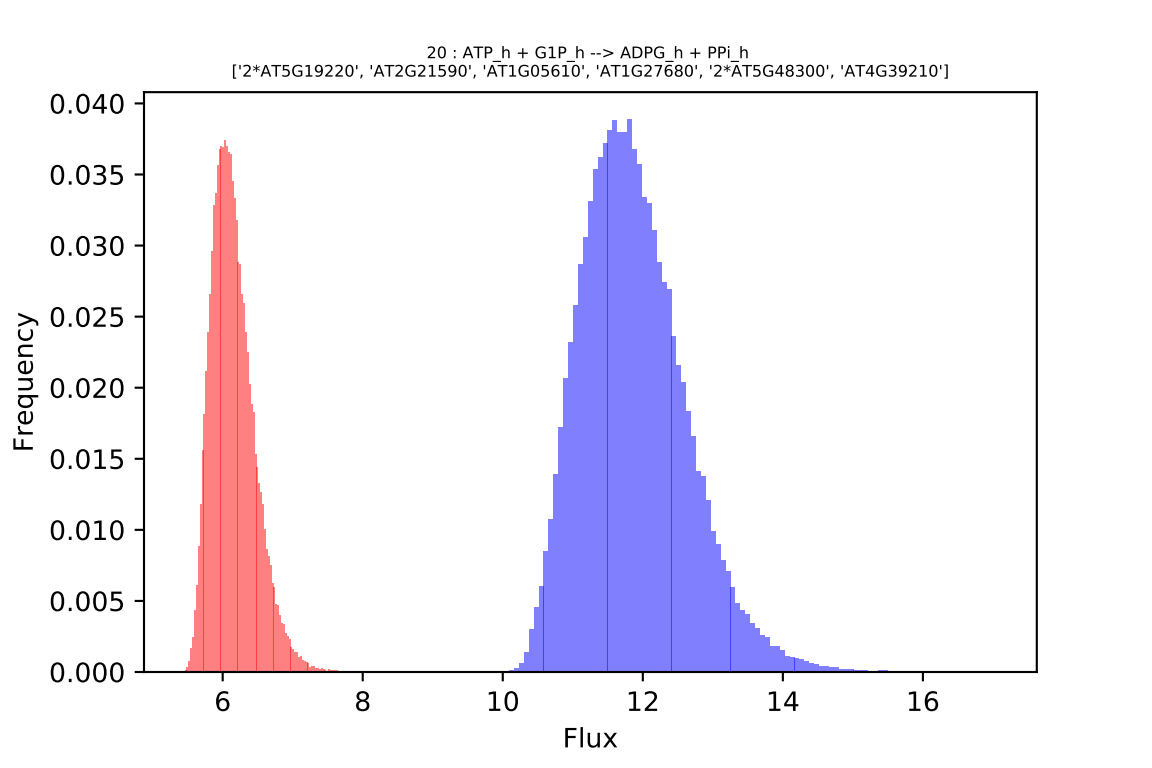

15 : X5P_h <=> Ru5P_h
['8*AT5G61410']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
58
60
62
64
Flux

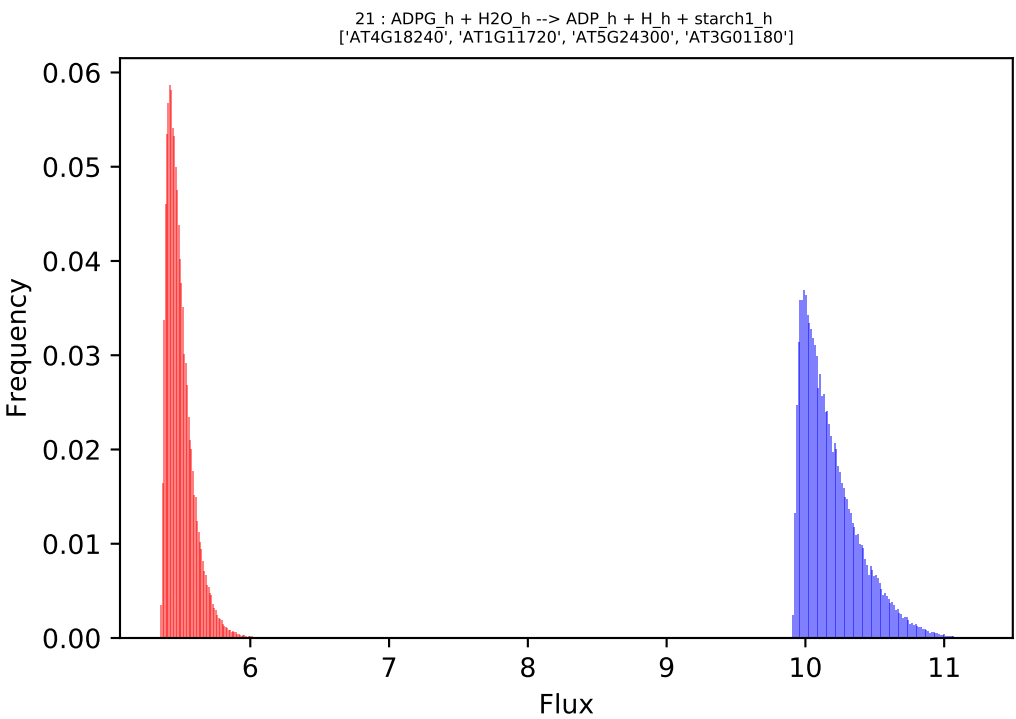

16 : R5P_h <=> Ru5P_h
['2*AT3G04790']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
28
29
30
31
32
Flux

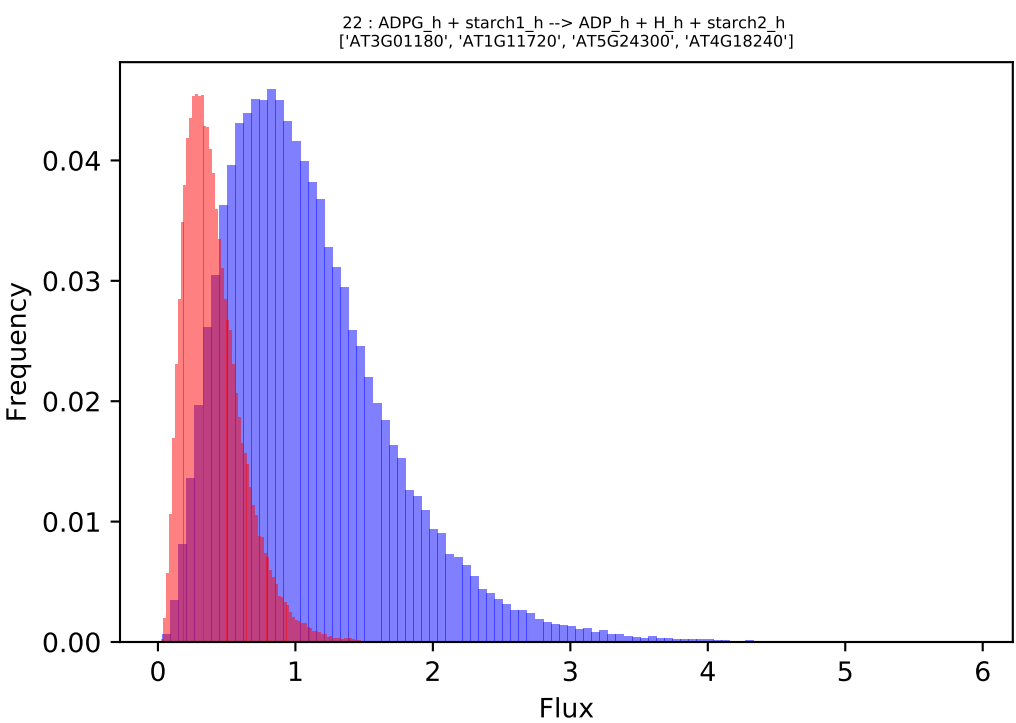

17 : ATP_h + Ru5P_h --> ADP_h + H_h + RuBP_h
['2*AT1G32060']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
86
88
90
92
94
96
98
Flux

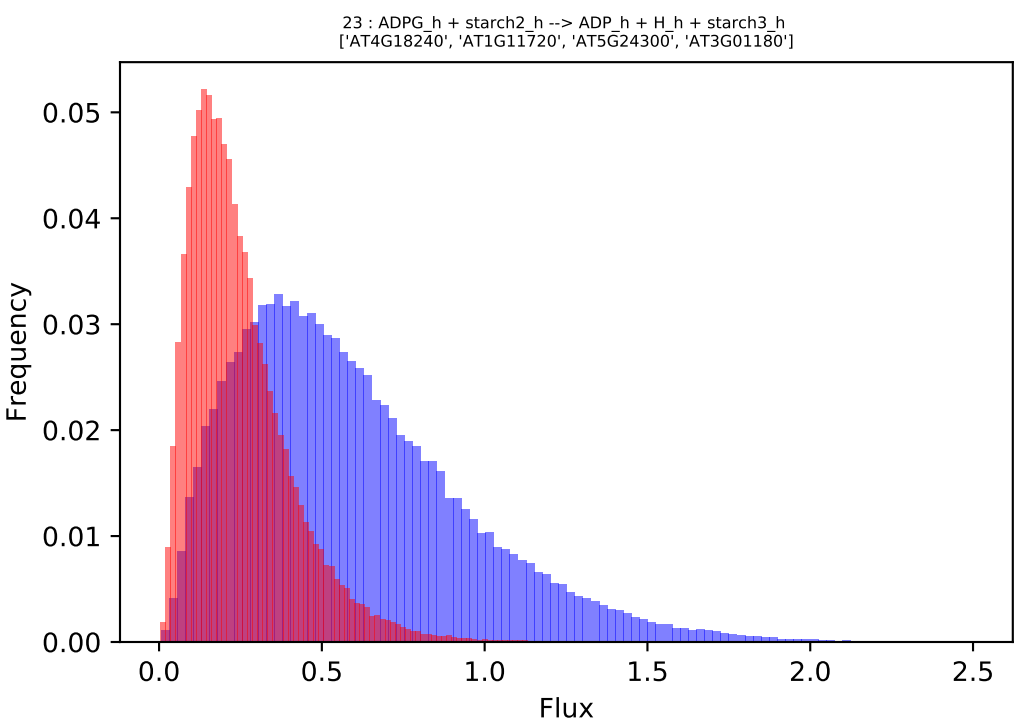

18 : F6P_h <=> G6P_h
['2*AT4G24620']
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−60
−50
−40
−30
−20
−10
0
10
Flux

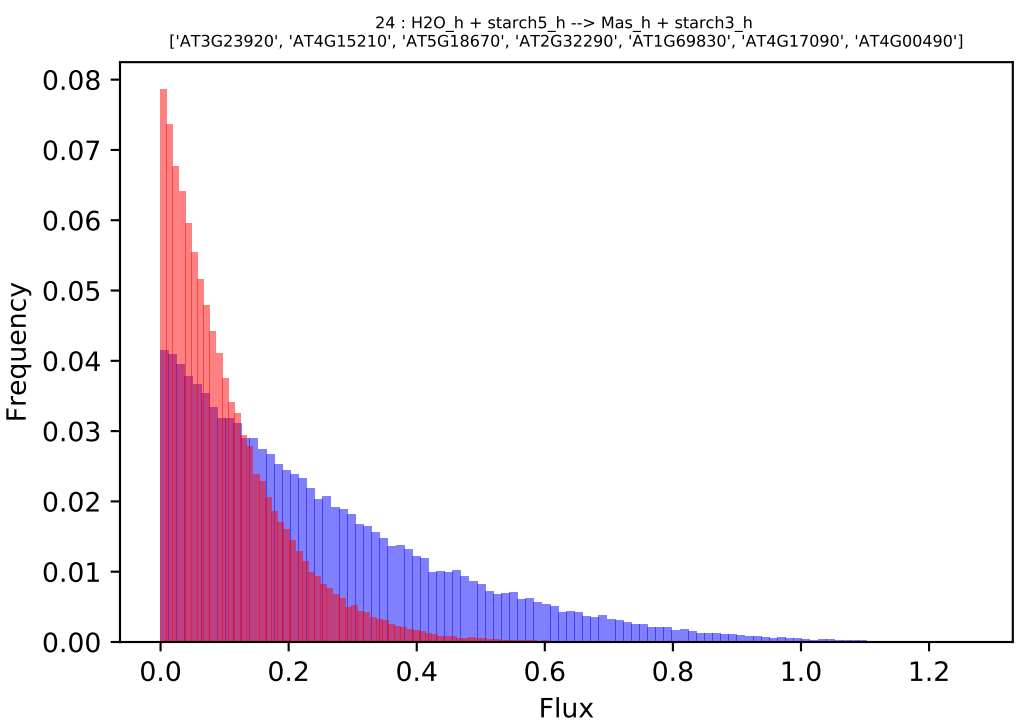

19 : G6P_h <=> G1P_h
['AT5G51820', 'AT1G70730', 'AT1G23190']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
6
8
10
12
14
Flux

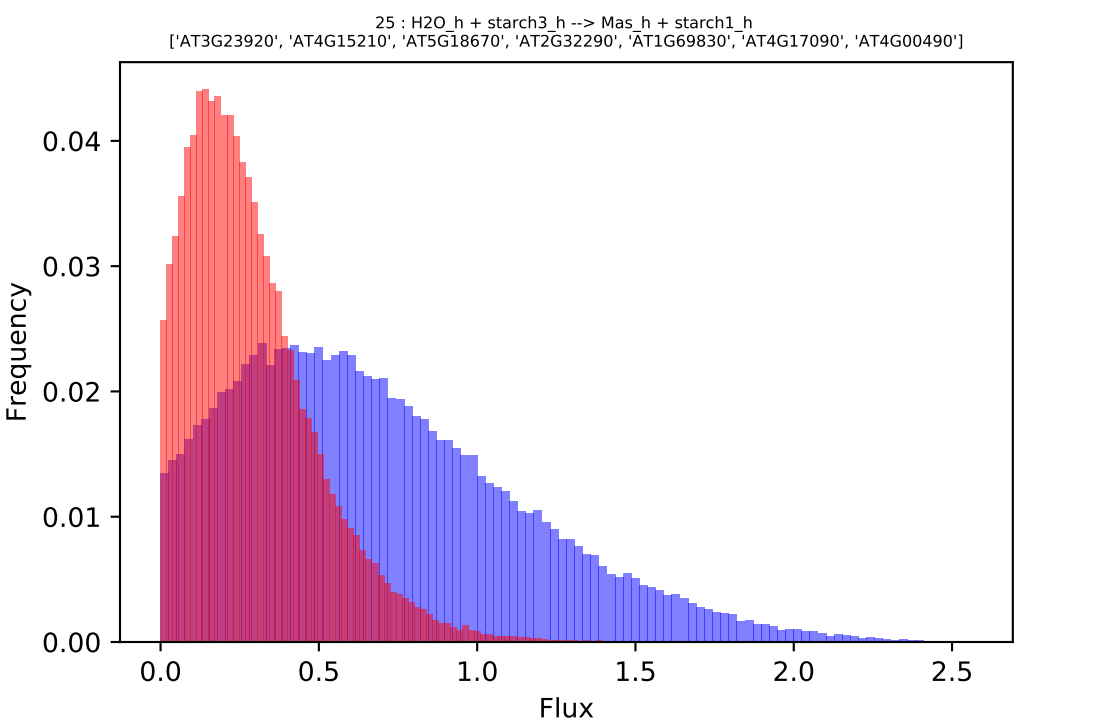

20 : ATP_h + G1P_h --> ADPG_h + PPi_h
['2*AT5G19220', 'AT2G21590', 'AT1G05610', 'AT1G27680', '2*AT5G48300', 'AT4G39210']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
6
8
10
12
14
16
Flux

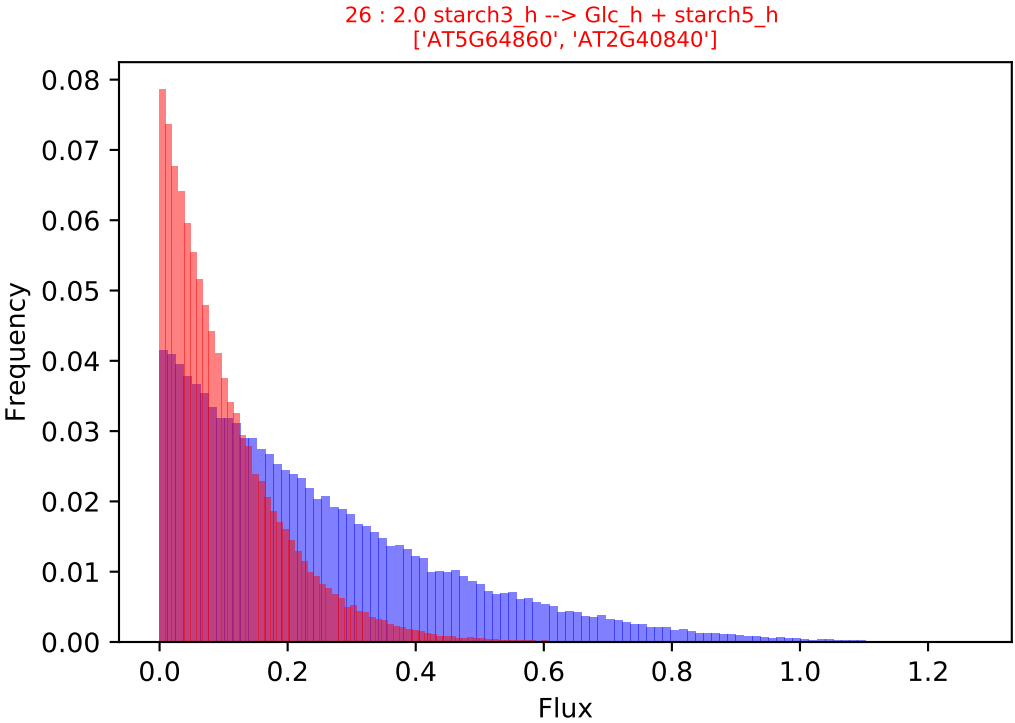

21 : ADPG_h + H2O_h --> ADP_h + H_h + starch1_h
['AT4G18240', 'AT1G11720', 'AT5G24300', 'AT3G01180']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
6
7
8
9
10
11
Flux

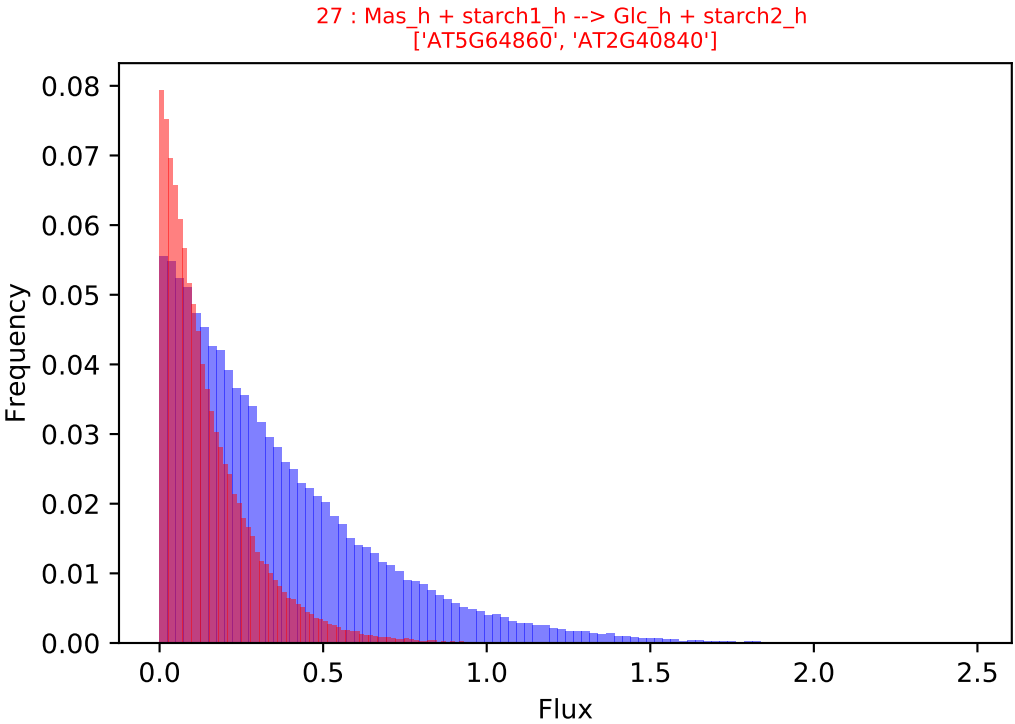

22 : ADPG_h + starch1_h --> ADP_h + H_h + starch2_h
['AT3G01180', 'AT1G11720', 'AT5G24300', 'AT4G18240']
Frequency
0.00
0.01
0.02
0.03
0.04
0
1
2
3
4
5
6
Flux

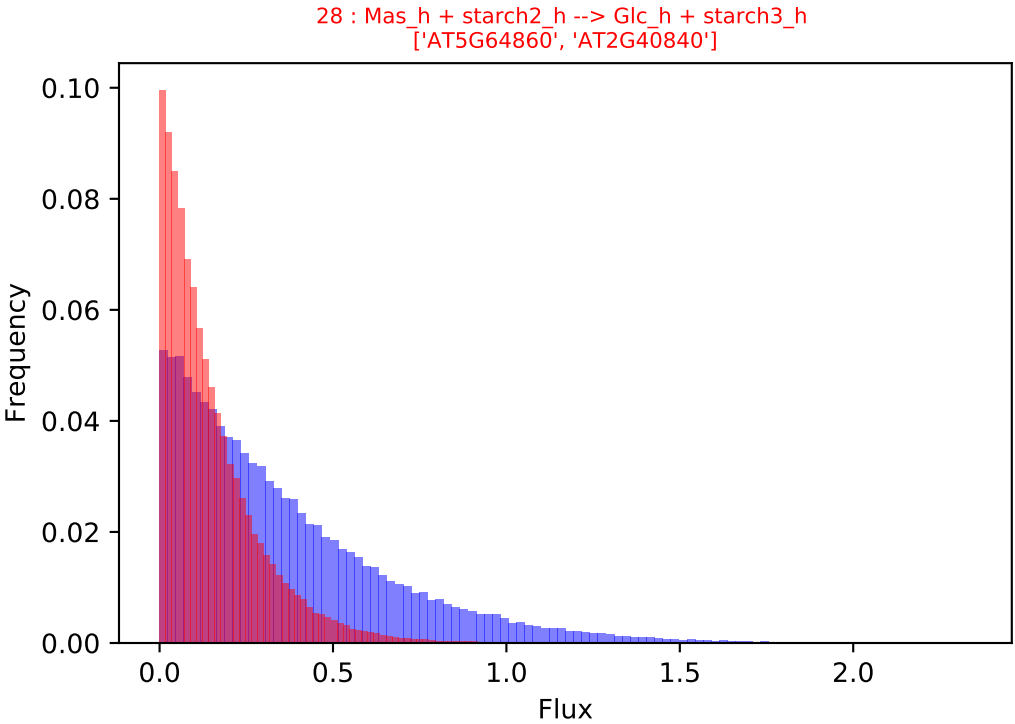

23 : ADPG_h + starch2_h --> ADP_h + H_h + starch3_h
['AT4G18240', 'AT1G11720', 'AT5G24300', 'AT3G01180']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.0
0.5
1.0
1.5
2.0
2.5
Flux

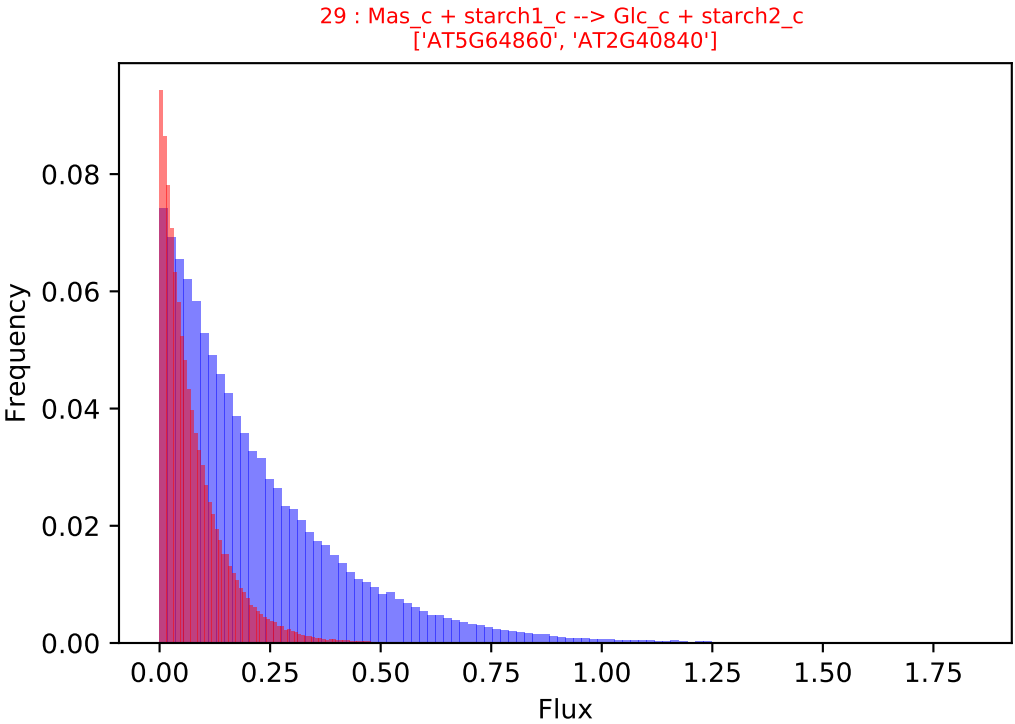

24 : H2O_h + starch5_h --> Mas_h + starch3_h
['AT3G23920', 'AT4G15210', 'AT5G18670', 'AT2G32290', 'AT1G69830', 'AT4G17090', 'AT4G00490']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Flux

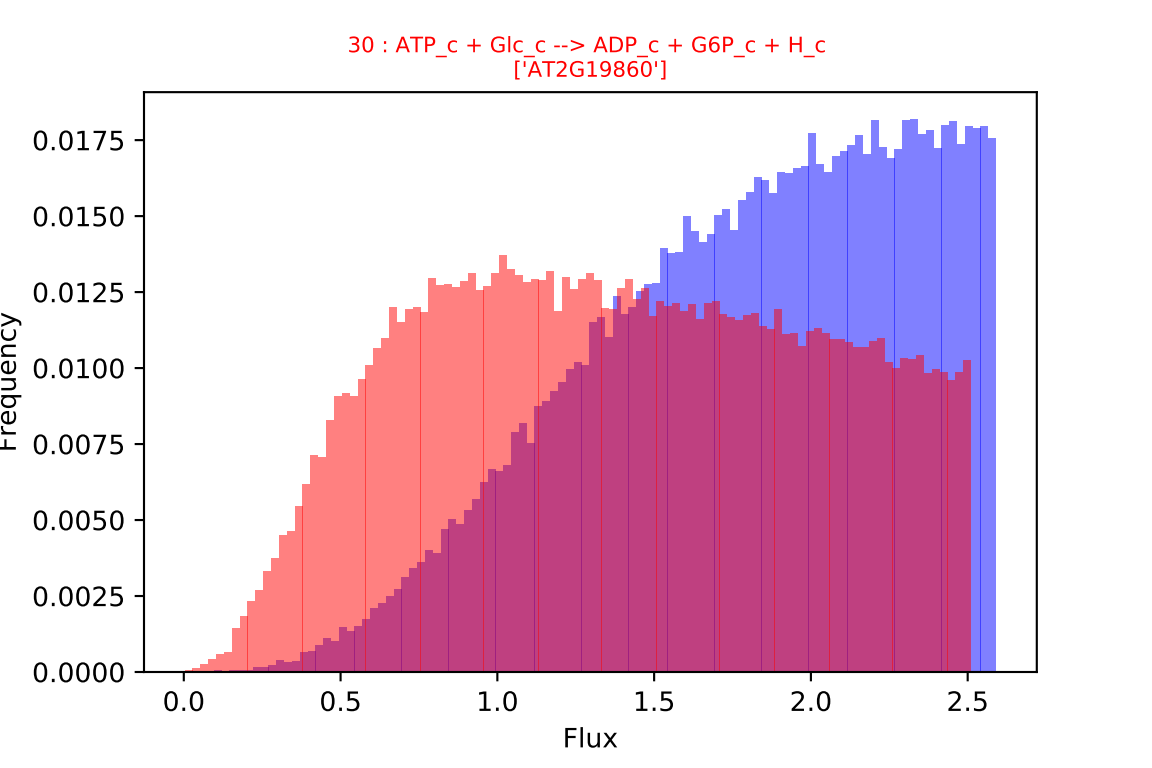

25 : H2O_h + starch3_h --> Mas_h + starch1_h
['AT3G23920', 'AT4G15210', 'AT5G18670', 'AT2G32290', 'AT1G69830', 'AT4G17090', 'AT4G00490']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.5
1.0
1.5
2.0
2.5
Flux

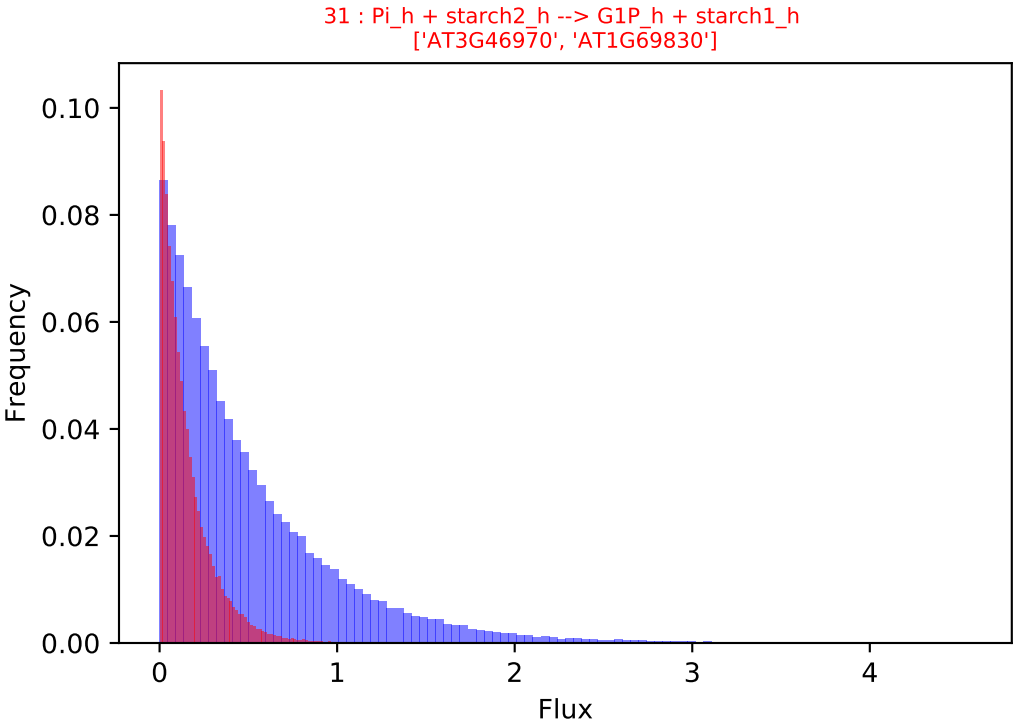

26 : 2.0 starch3_h --> Glc_h + starch5_h
['AT5G64860', 'AT2G40840']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.0
0.2
0.4
0.6
0.8
1.0
1.2

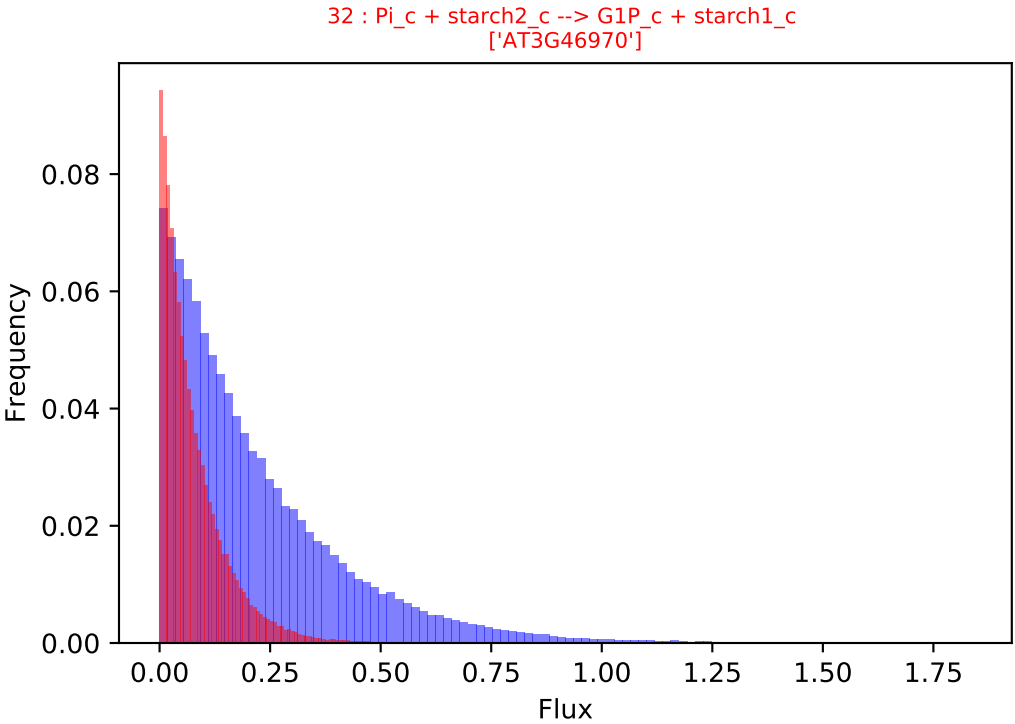

27 : Mas_h + starch1_h --> Glc_h + starch2_h
['AT5G64860', 'AT2G40840']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.0
0.5
1.0
1.5
2.0
2.5
Flux

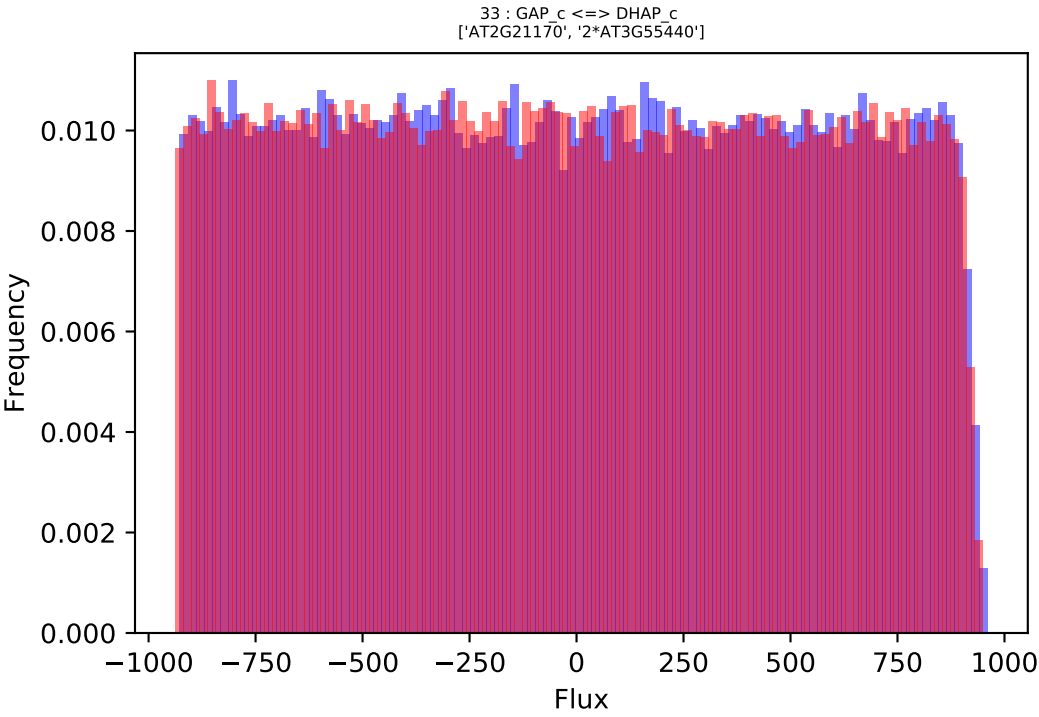

28 : Mas_h + starch2_h --> Glc_h + starch3_h
['AT5G64860', 'AT2G40840']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.5
1.0
1.5
2.0
Flux

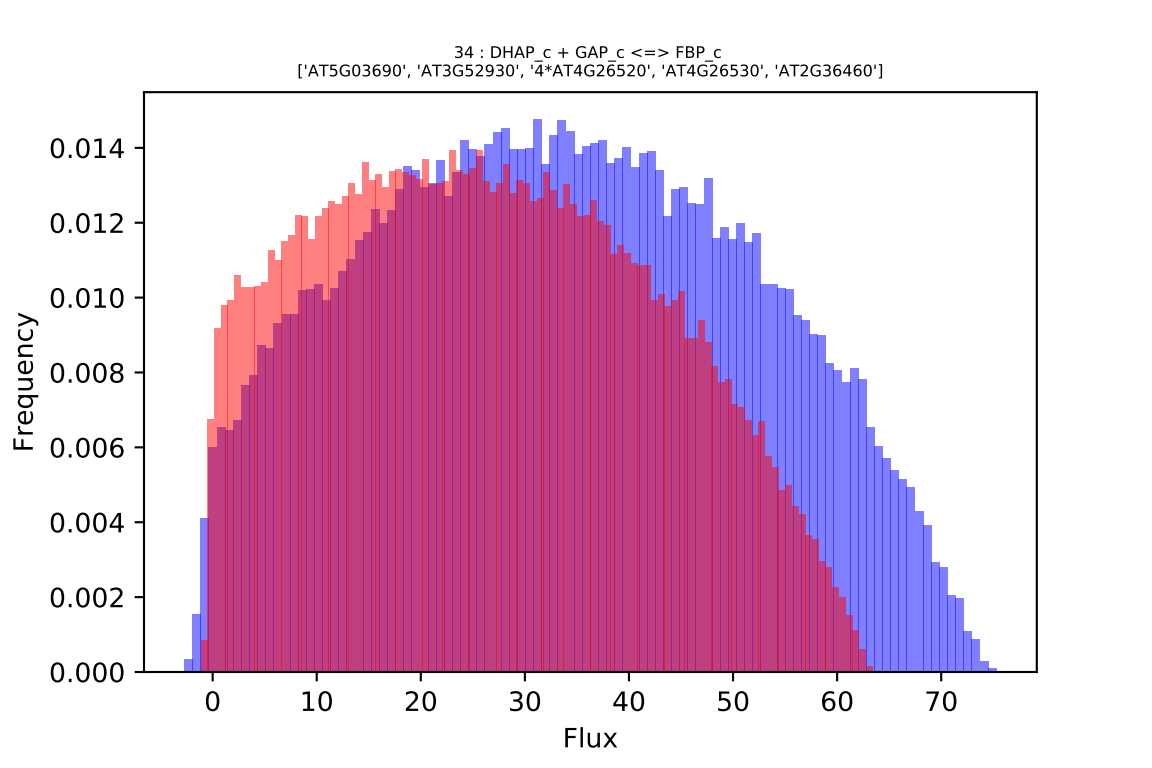

29 : Mas_c + starch1_c --> Glc_c + starch2_c
['AT5G64860', 'AT2G40840']
Frequency
0.00
0.02
0.04
0.06
0.08
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

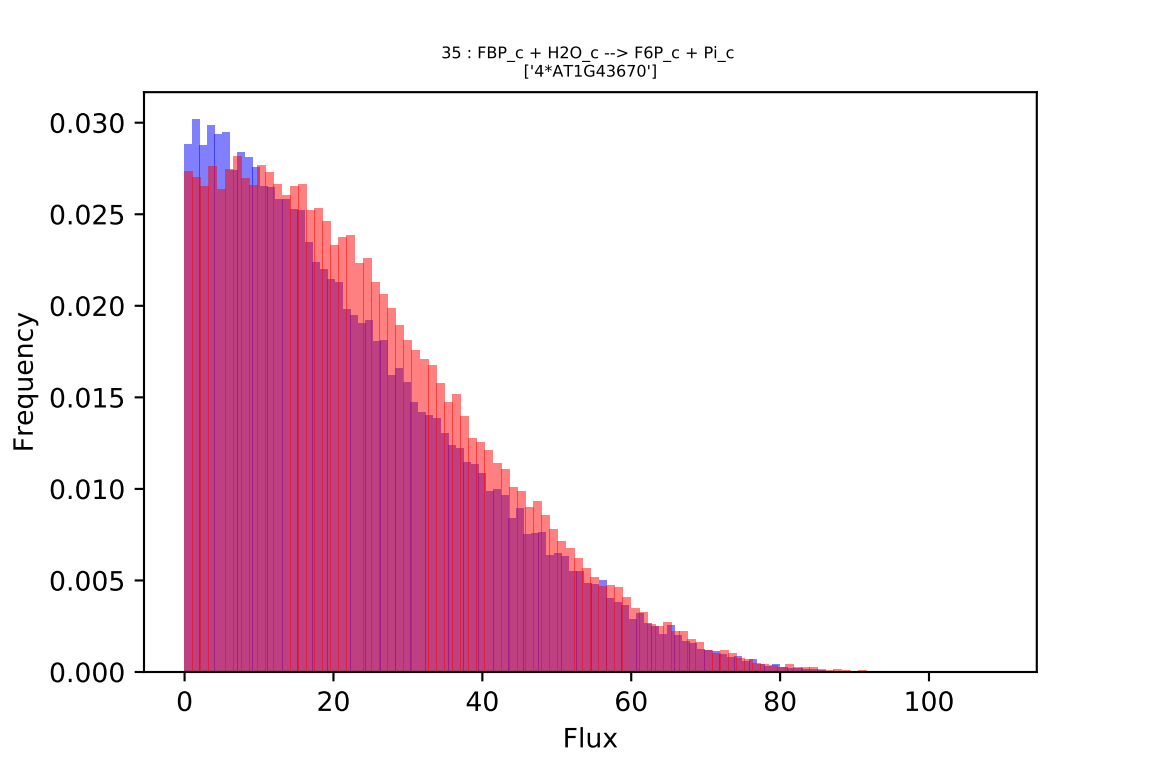

30 : ATP_c + Glc_c --> ADP_c + G6P_c + H_c
['AT2G19860']
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
Flux

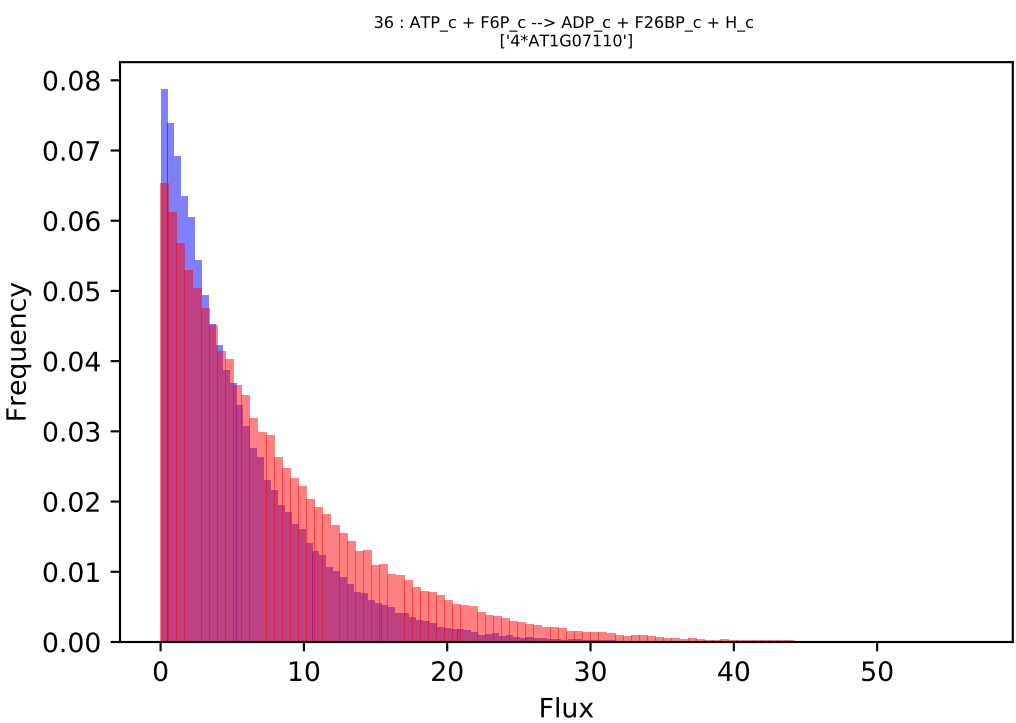

31 : Pi_h + starch2_h --> G1P_h + starch1_h
['AT3G46970', 'AT1G69830']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0
1
2
3
4
Flux

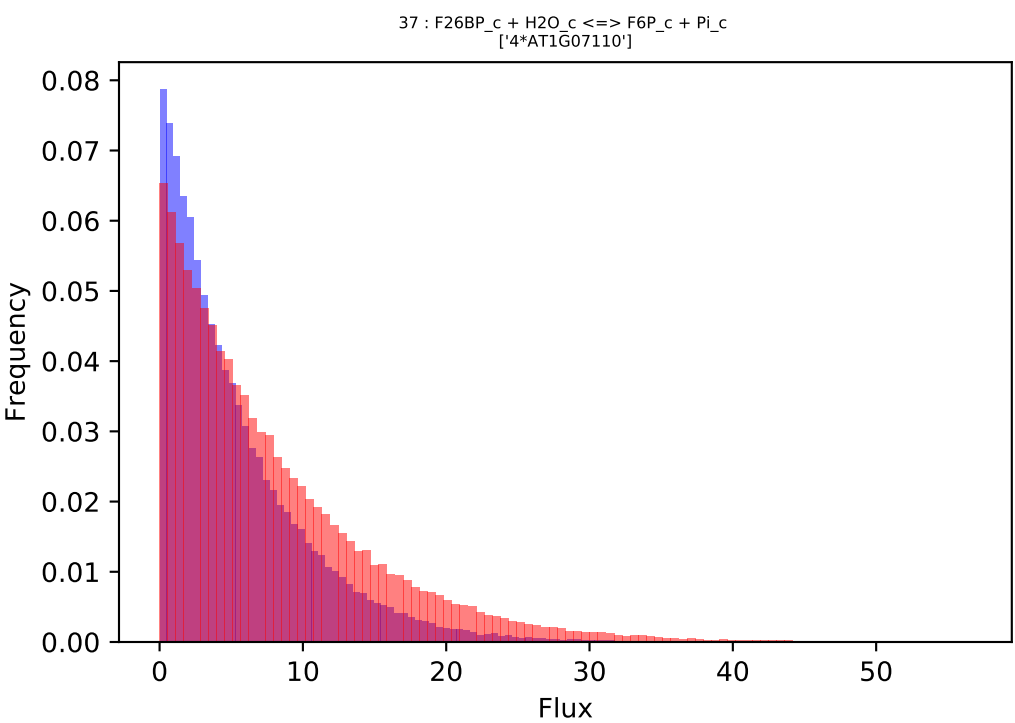

32 : Pi_c + starch2_c --> G1P_c + starch1_c
['AT3G46970']
Frequency
0.00
0.02
0.04
0.06
0.08
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

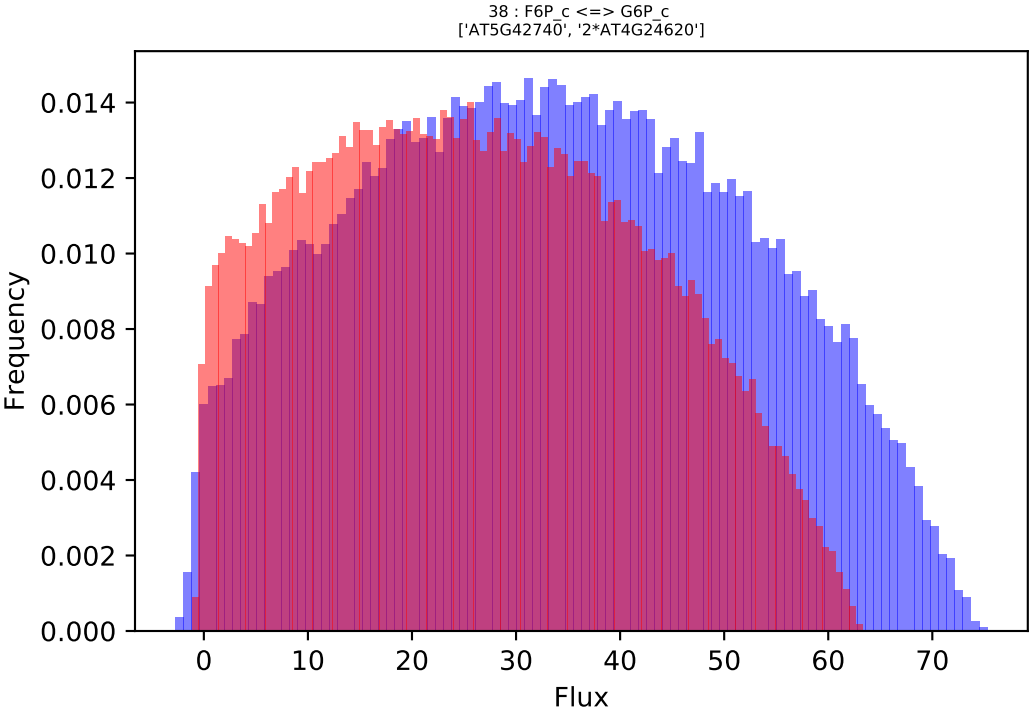

33 : GAP_c <=> DHAP_c
['AT2G21170', '2*AT3G55440']
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−1000
−750
−500
−250
0
250
500
750
1000
Flux

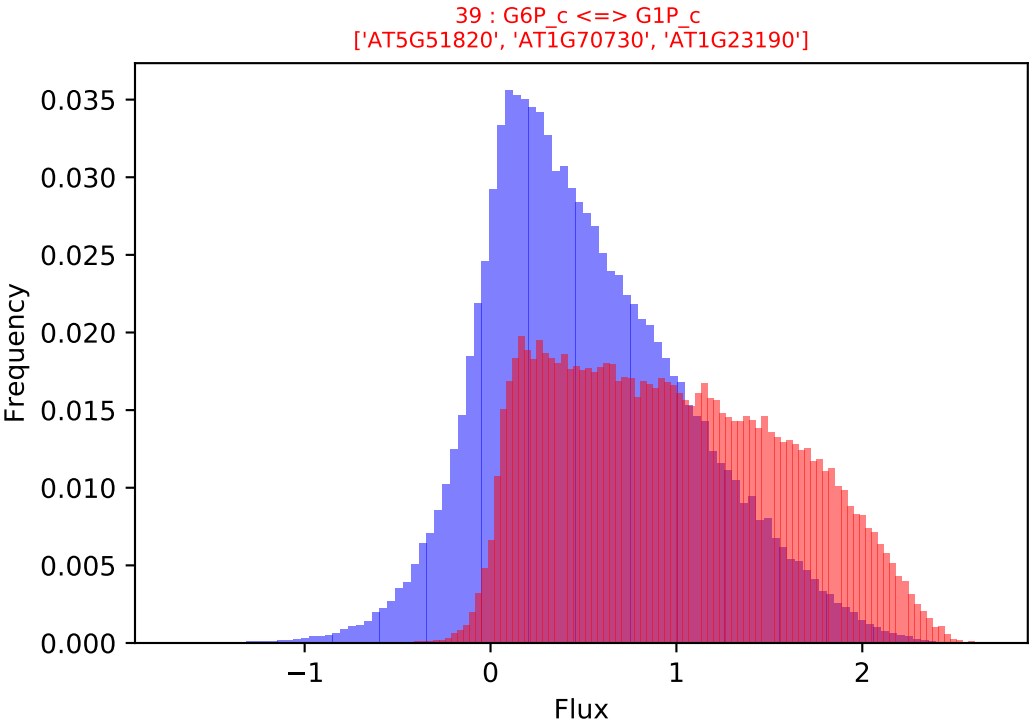

34 : DHAP_c + GAP_c <=> FBP_c
['AT5G03690', 'AT3G52930', '4*AT4G26520', 'AT4G26530', 'AT2G36460']
Frequency
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
0
10
20
30
40
50
60
70
Flux

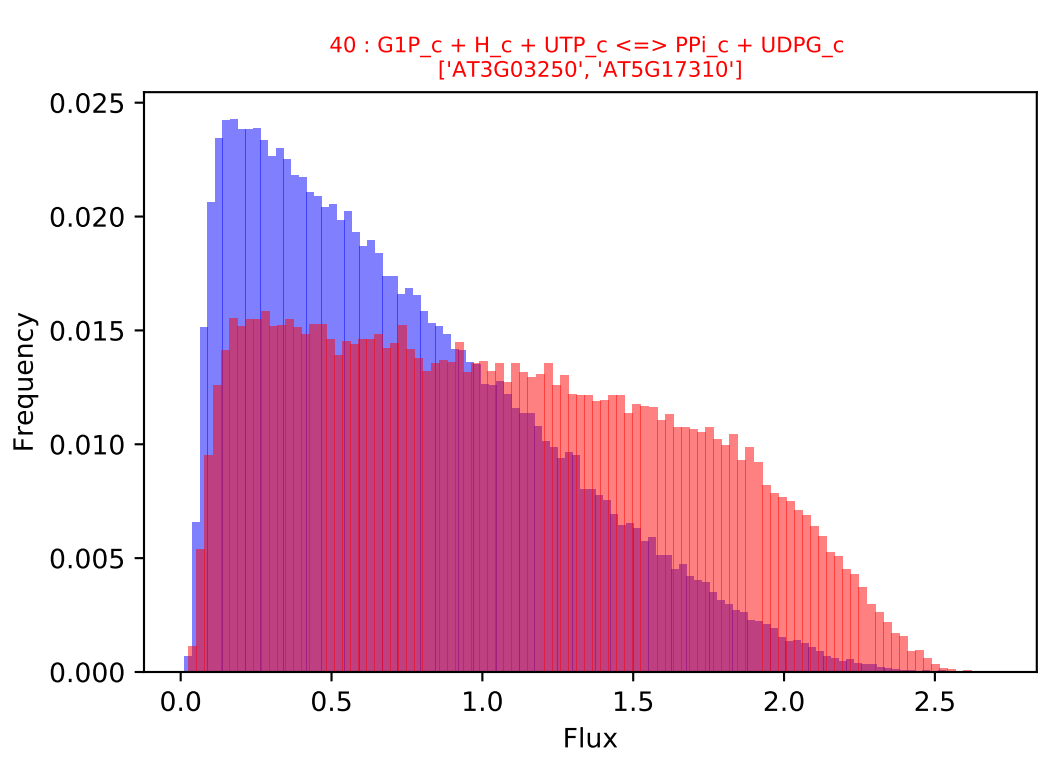

35 : FBP_c + H2O_c --> F6P_c + Pi_c
['4*AT1G43670']
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
20
40
60
80
100
Flux

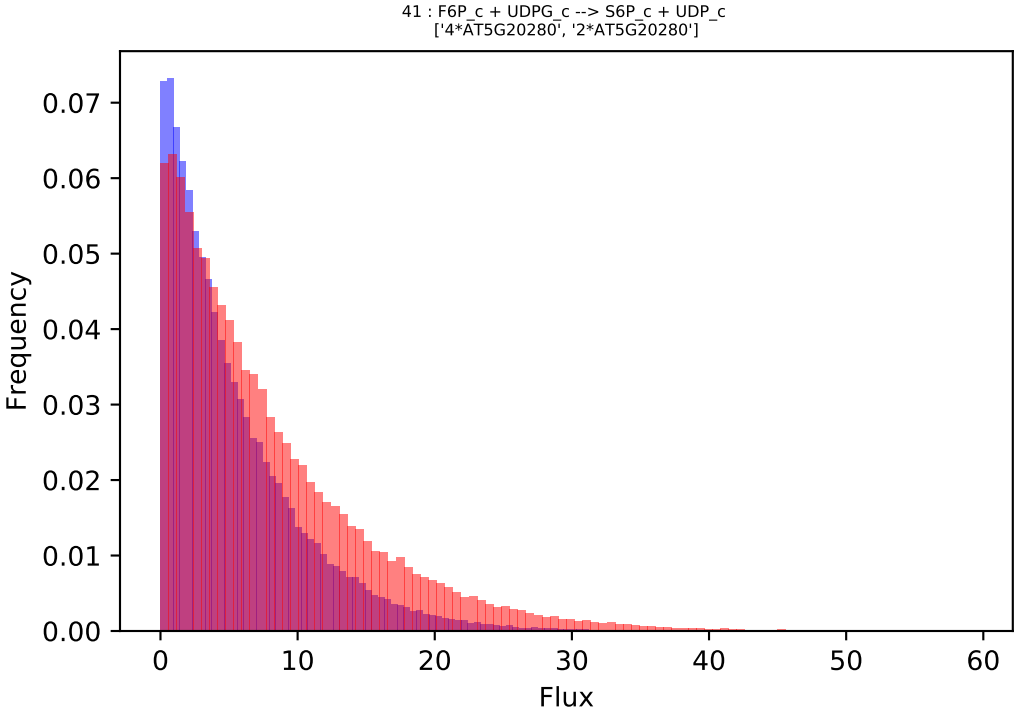

36 : ATP_c + F6P_c --> ADP_c + F26BP_c + H_c
['4*AT1G07110']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0
10
20
30
40
50

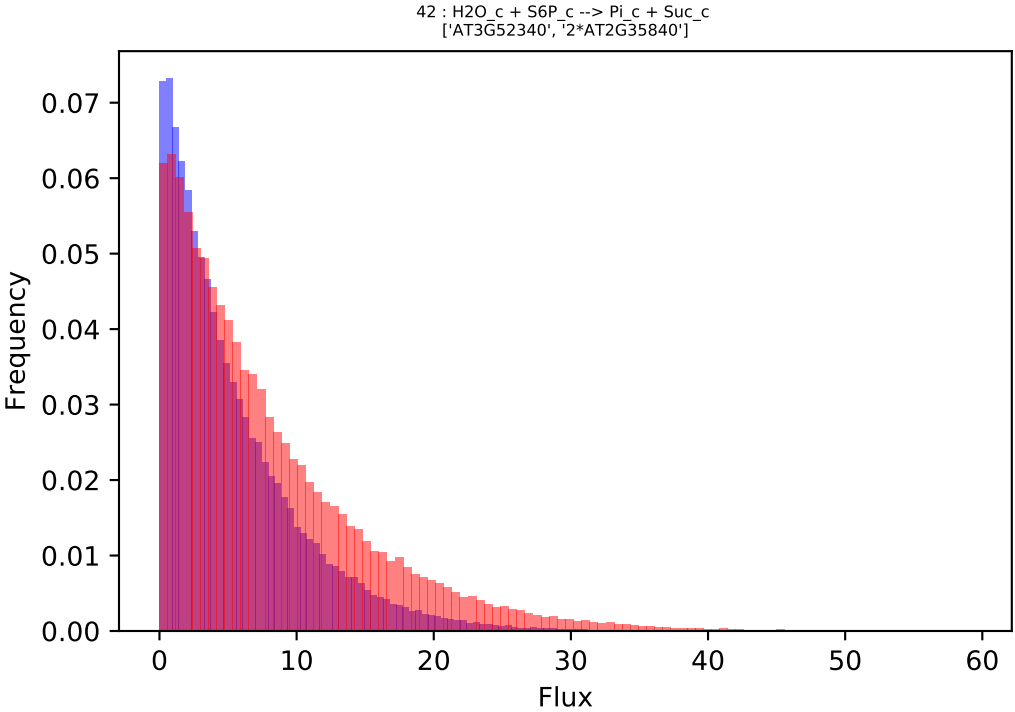

37 : F26BP_c + H2O_c <=> F6P_c + Pi_c
['4*AT1G07110']
Frequency
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0
10
20
30
40
50
Flux

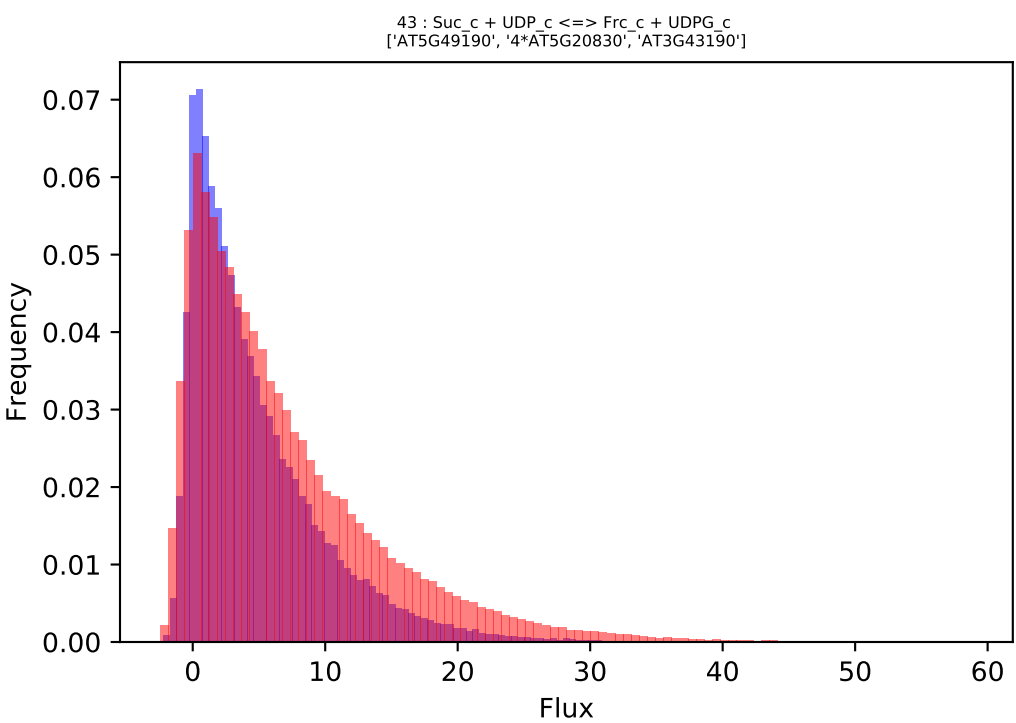

38 : F6P_c <=> G6P_c
['AT5G42740', '2*AT4G24620']
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
0
10
20
30
40
50
60
70
Flux

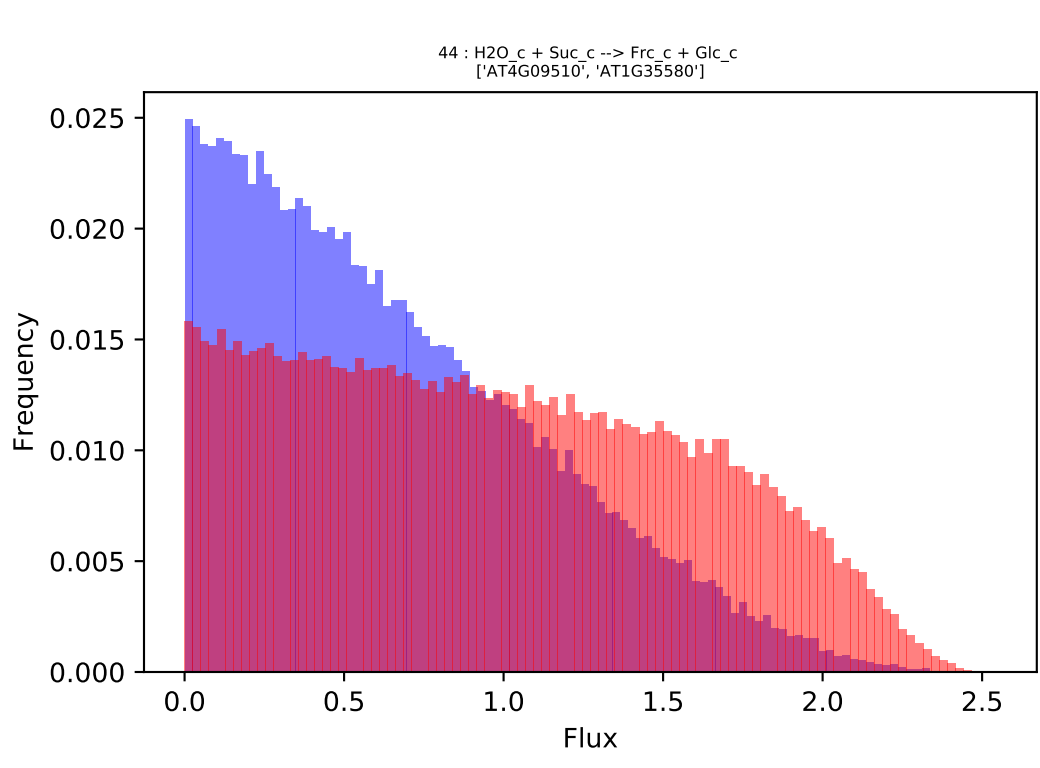

39 : G6P_c <=> G1P_c
['AT5G51820', 'AT1G70730', 'AT1G23190']
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−1
0
1
2
Flux

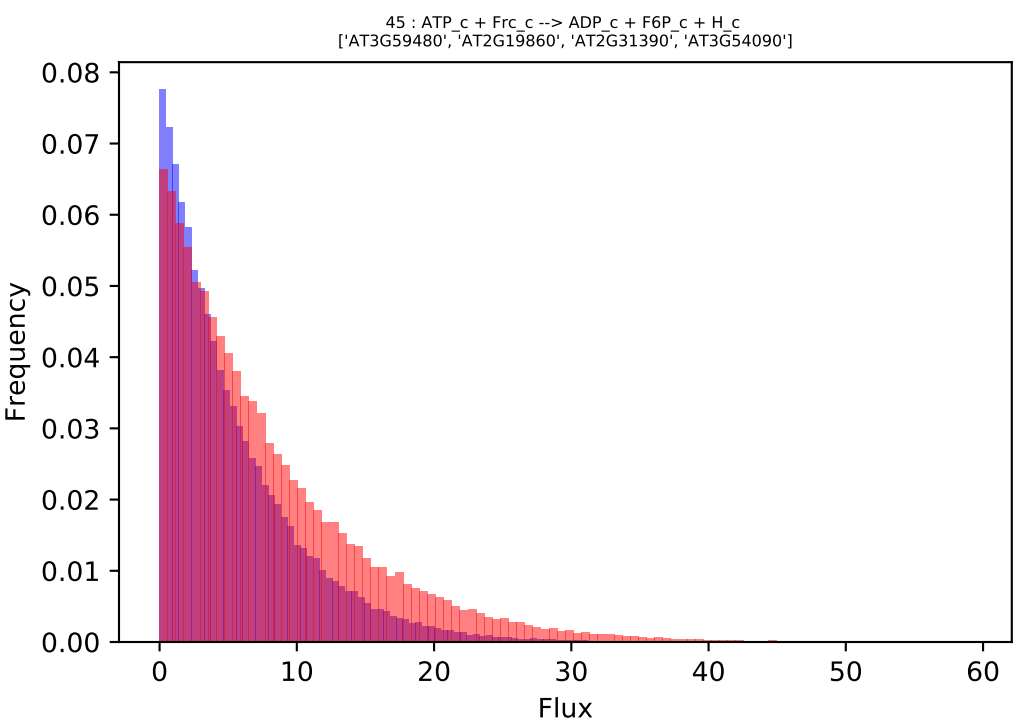

40 : G1P_c + H_c + UTP_c <=> PPi_c + UDPG_c
['AT3G03250', 'AT5G17310']
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
Flux

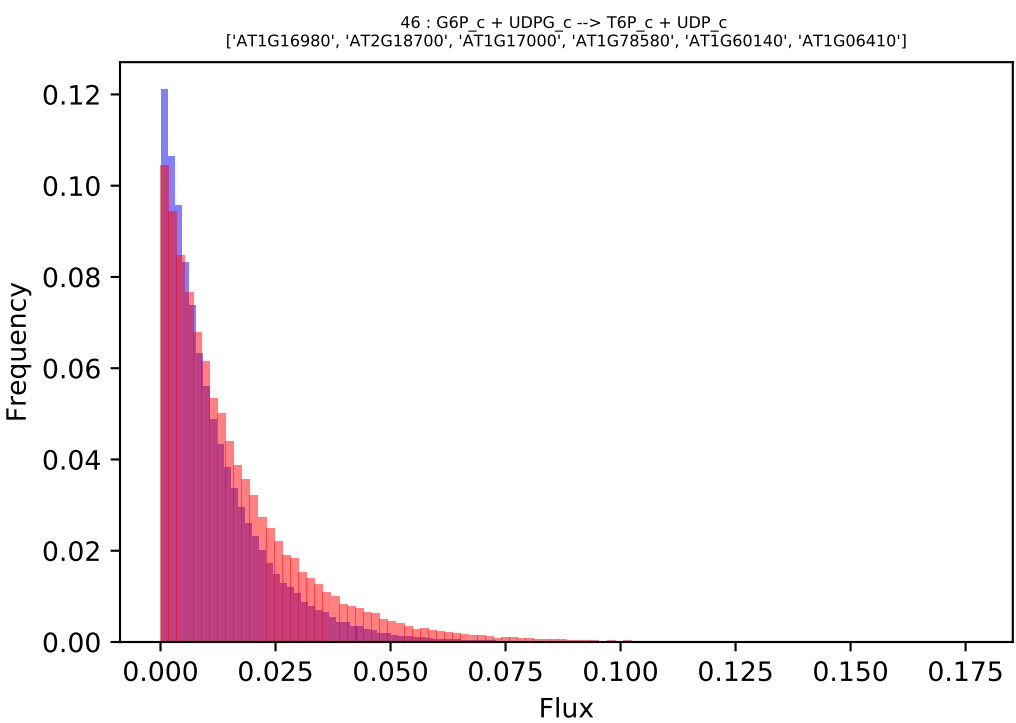

41 : F6P_c + UDPG_c --> S6P_c + UDP_c
['4*AT5G20280', '2*AT5G20280']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0
10
20
30
40
50
60
Flux

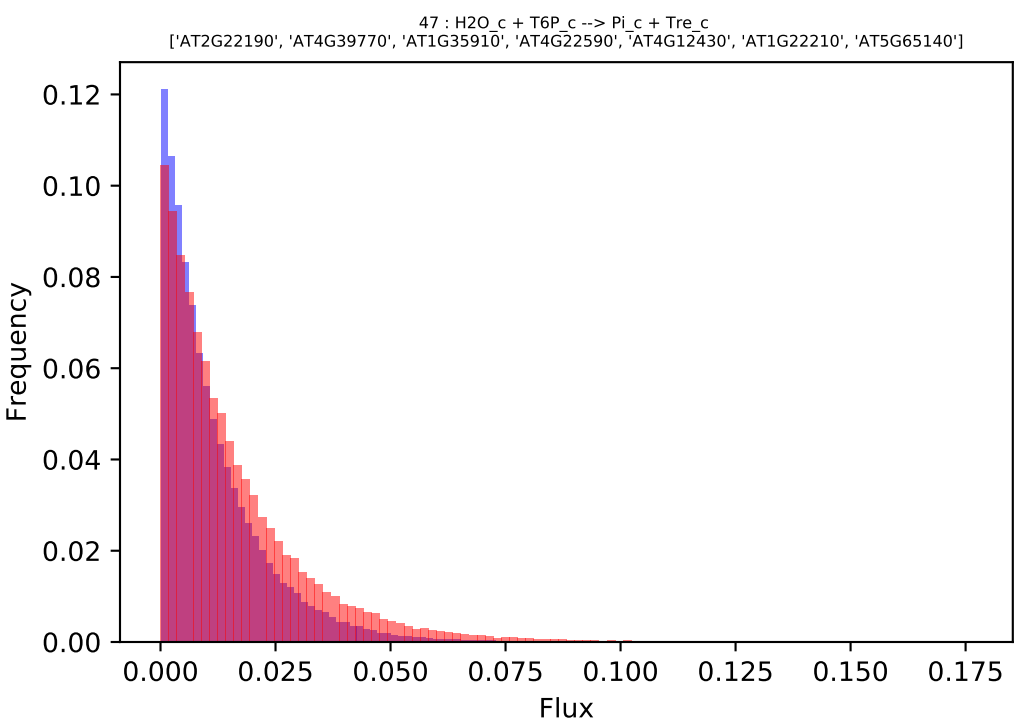

42 : H2O_c + S6P_c --> Pi_c + Suc_c
['AT3G52340', '2*AT2G35840']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0
10
20
30
40
50
60
Flux

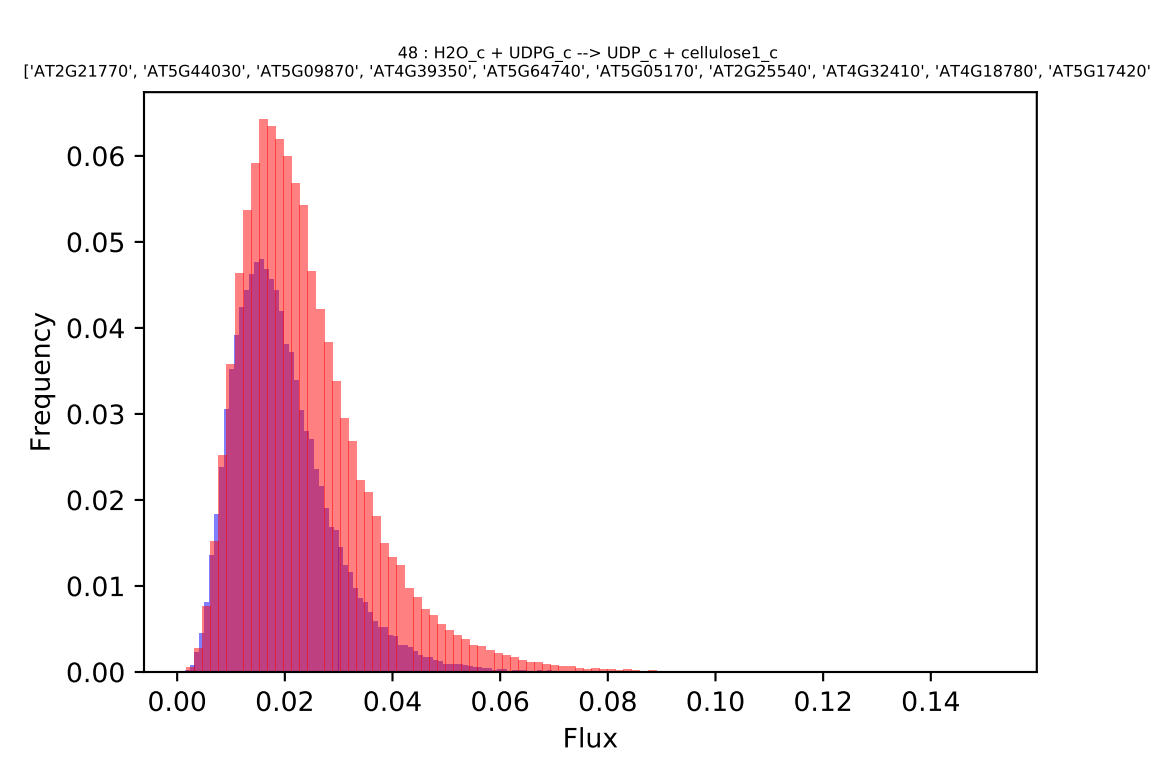

43 : Suc_c + UDP_c <=> Frc_c + UDPG_c
['AT5G49190', '4*AT5G20830', 'AT3G43190']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0
10
20
30
40
50
60
Flux

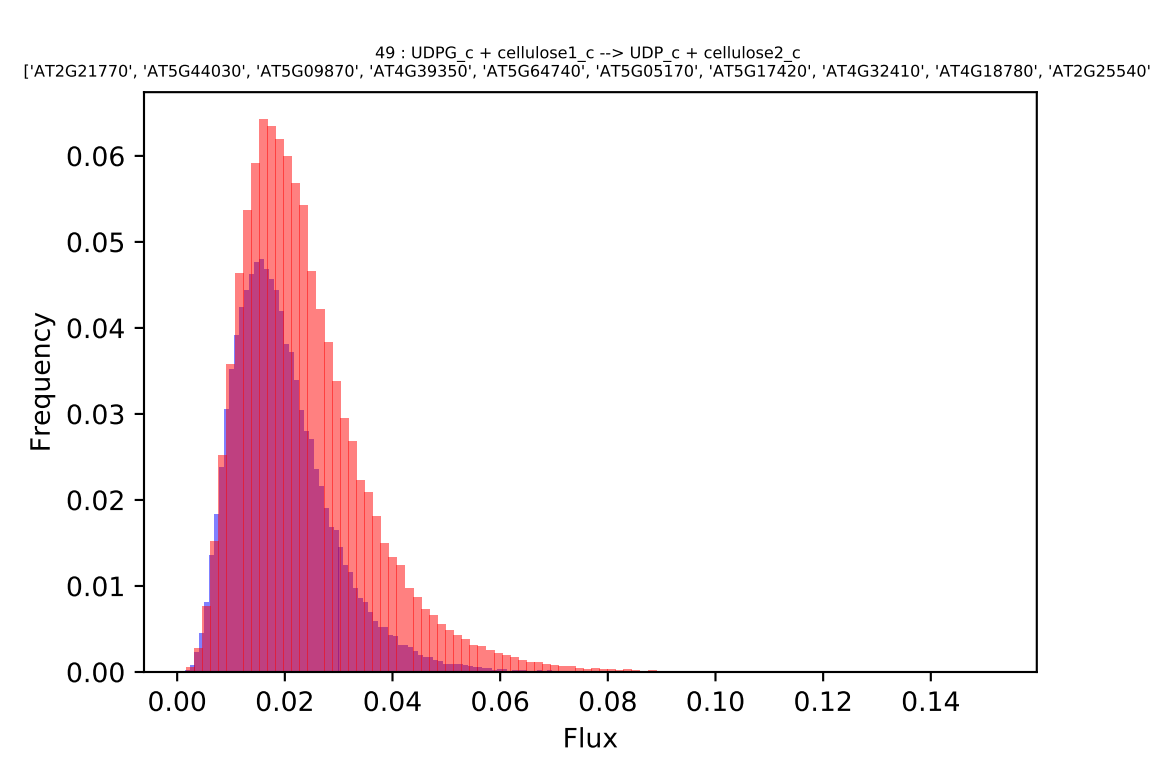

44 : H2O_c + Suc_c --> Frc_c + Glc_c
['AT4G09510', 'AT1G35580']
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
Flux

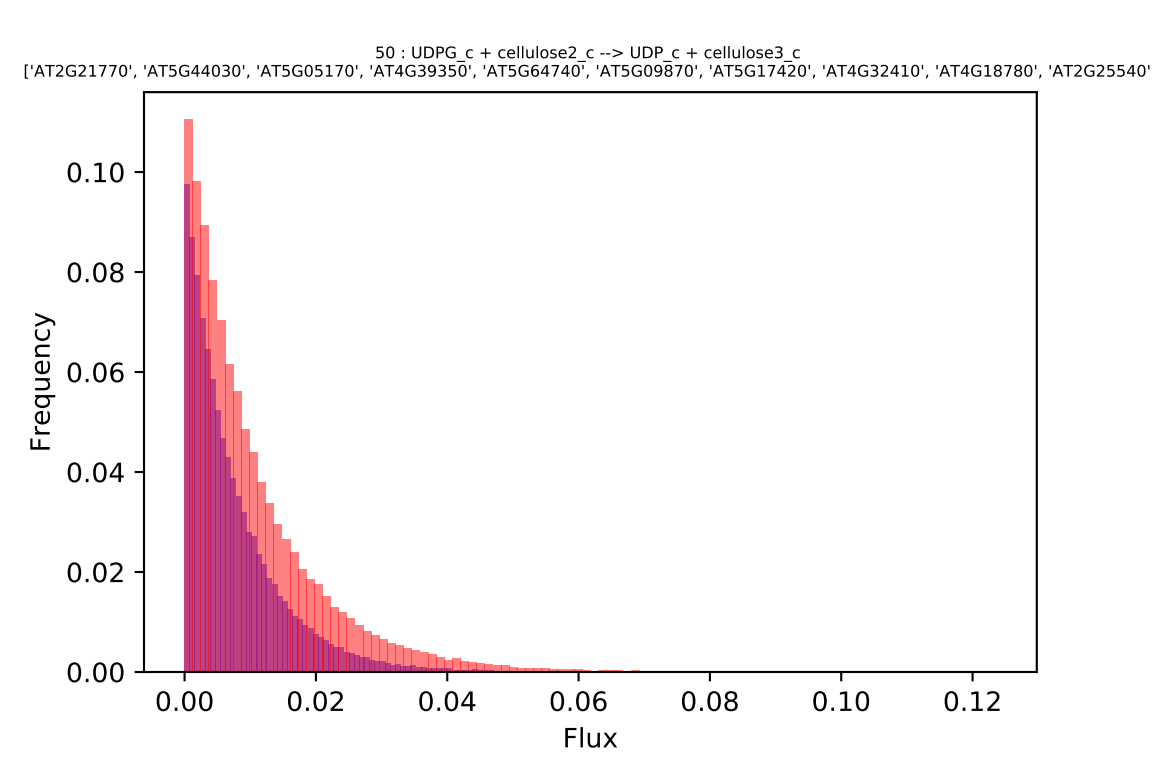

45 : ATP_c + Frc_c --> ADP_c + F6P_c + H_c
['AT3G59480', 'AT2G19860', 'AT2G31390', 'AT3G54090']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0
10
20
30
40
50
60
Flux

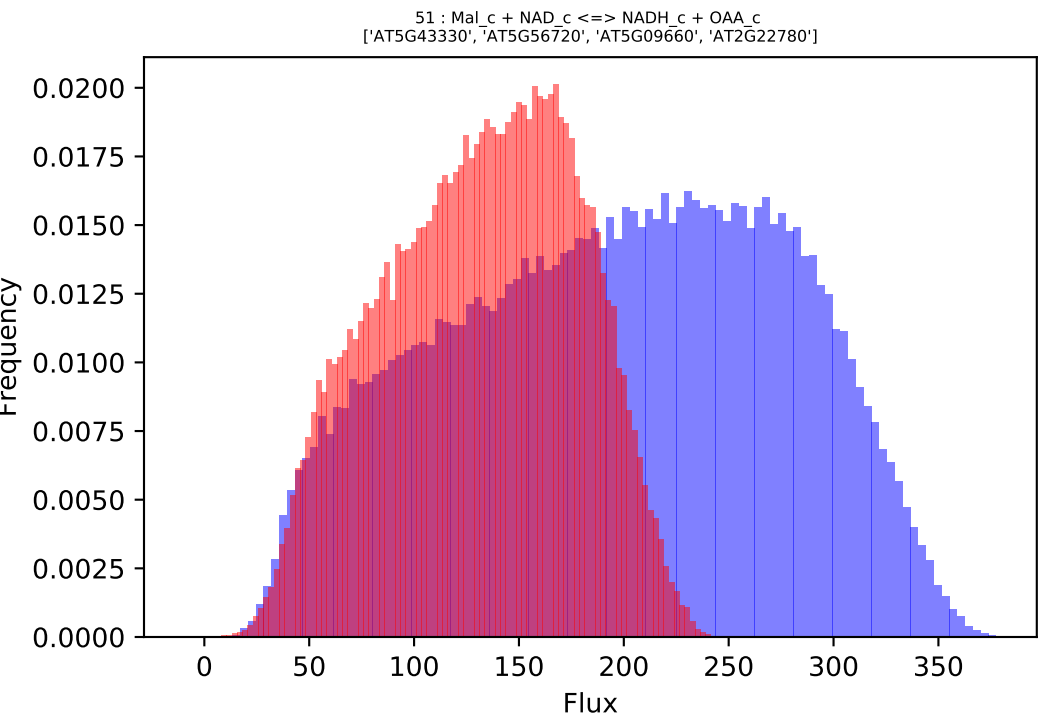

46 : G6P_c + UDPG_c --> T6P_c + UDP_c
['AT1G16980', 'AT2G18700', 'AT1G17000', 'AT1G78580', 'AT1G60140', 'AT1G06410']
Frequency
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0.000
0.025
0.050
0.075
0.100
0.125
0.150
0.175
Flux

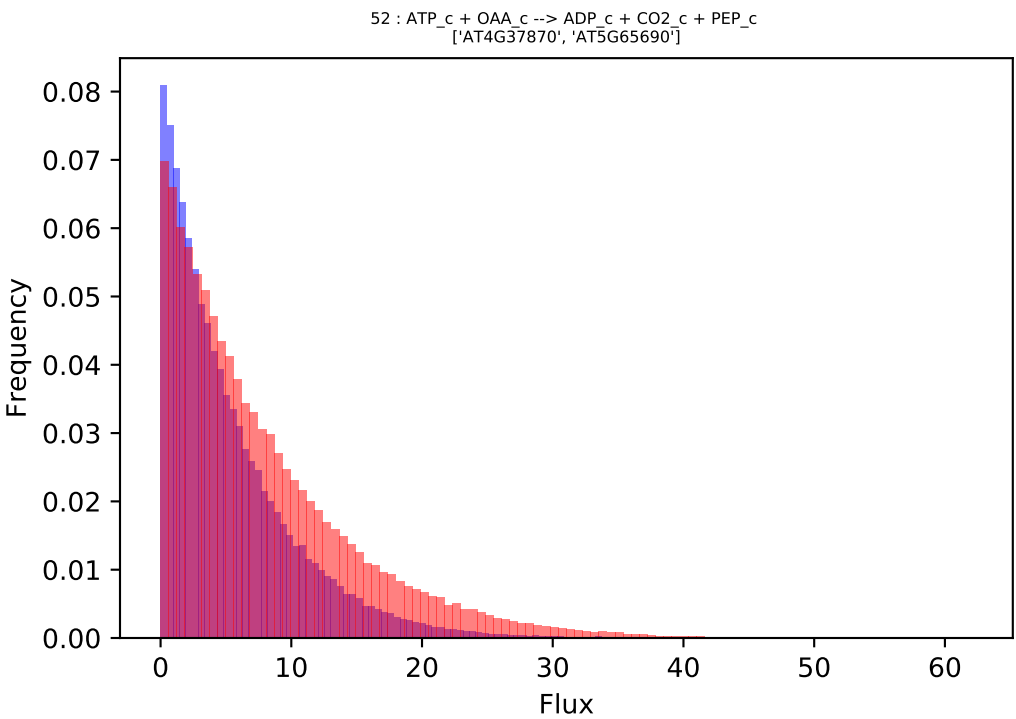

47 : H2O_c + T6P_c --> Pi_c + Tre_c
['AT2G22190', 'AT4G39770', 'AT1G35910', 'AT4G22590', 'AT4G12430', 'AT1G22210', 'AT5G65140']
Frequency
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0.000
0.025
0.050
0.075
0.100
0.125
0.150
0.175
Flux

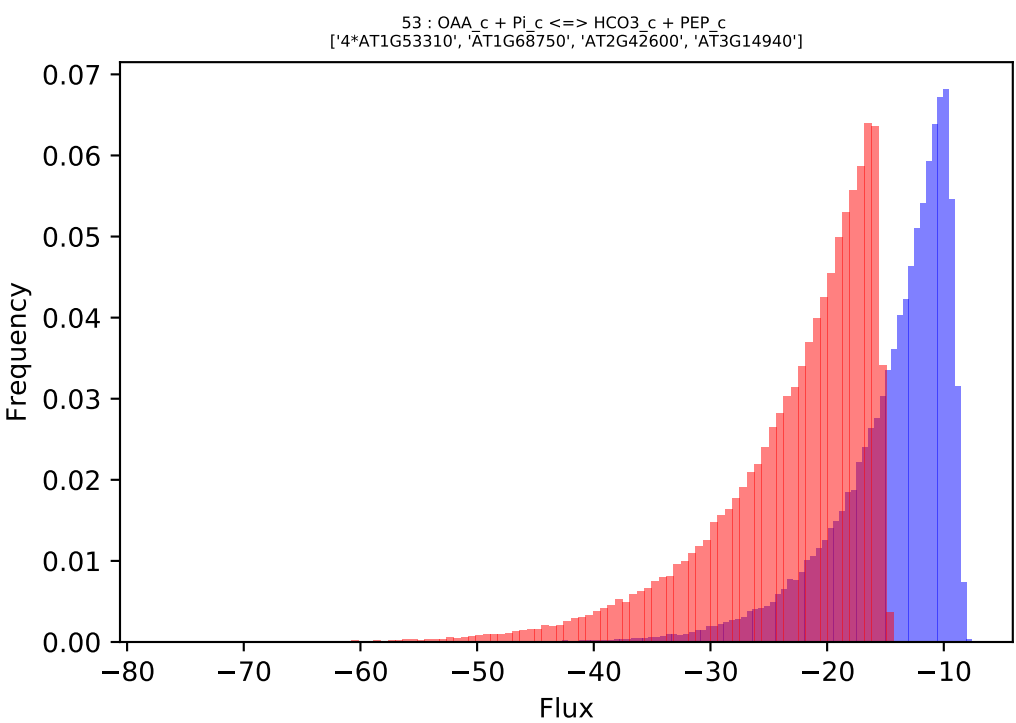

48 : H2O_c + UDPG_c --> UDP_c + cellulose1_c
['AT2G21770', 'AT5G44030', 'AT5G09870', 'AT4G39350', 'AT5G64740', 'AT5G05170', 'AT2G25540', 'AT4G32410', 'AT4G18780', 'AT5G17420'
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
Flux

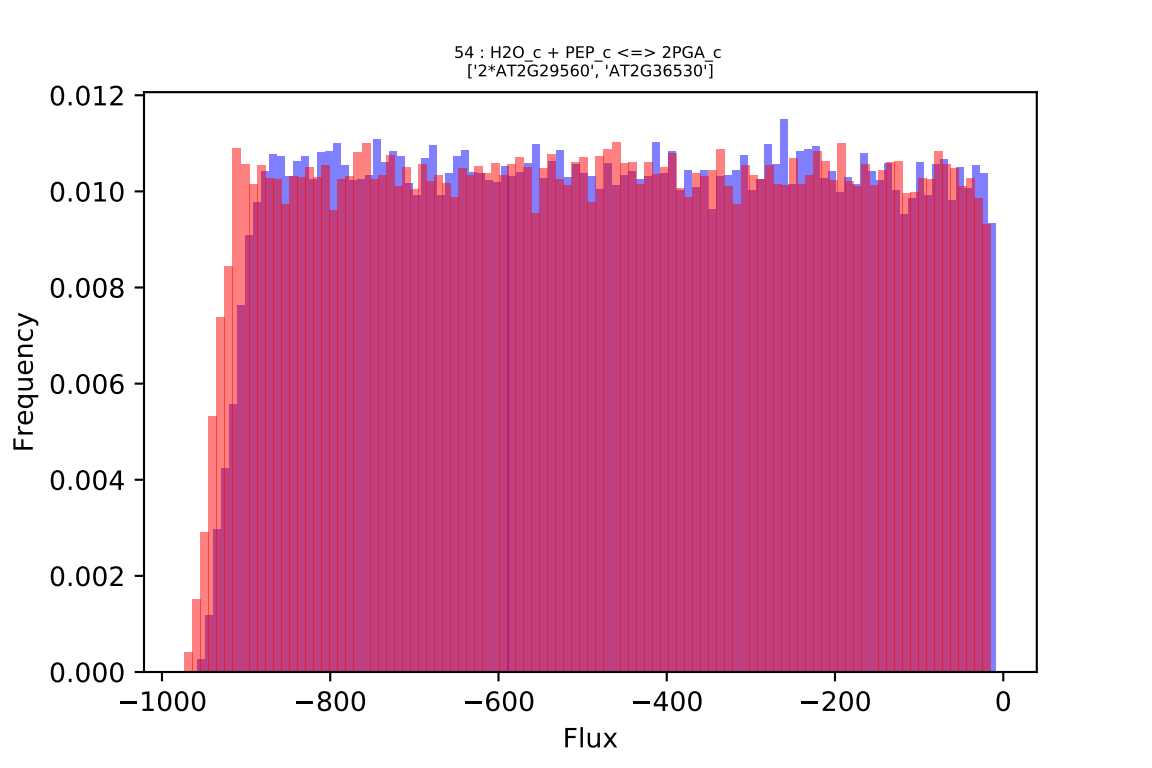

49 : UDPG_c + cellulose1_c --> UDP_c + cellulose2_c
['AT2G21770', 'AT5G44030', 'AT5G09870', 'AT4G39350', 'AT5G64740', 'AT5G05170', 'AT5G17420', 'AT4G32410', 'AT4G18780', 'AT2G25540'
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
Flux

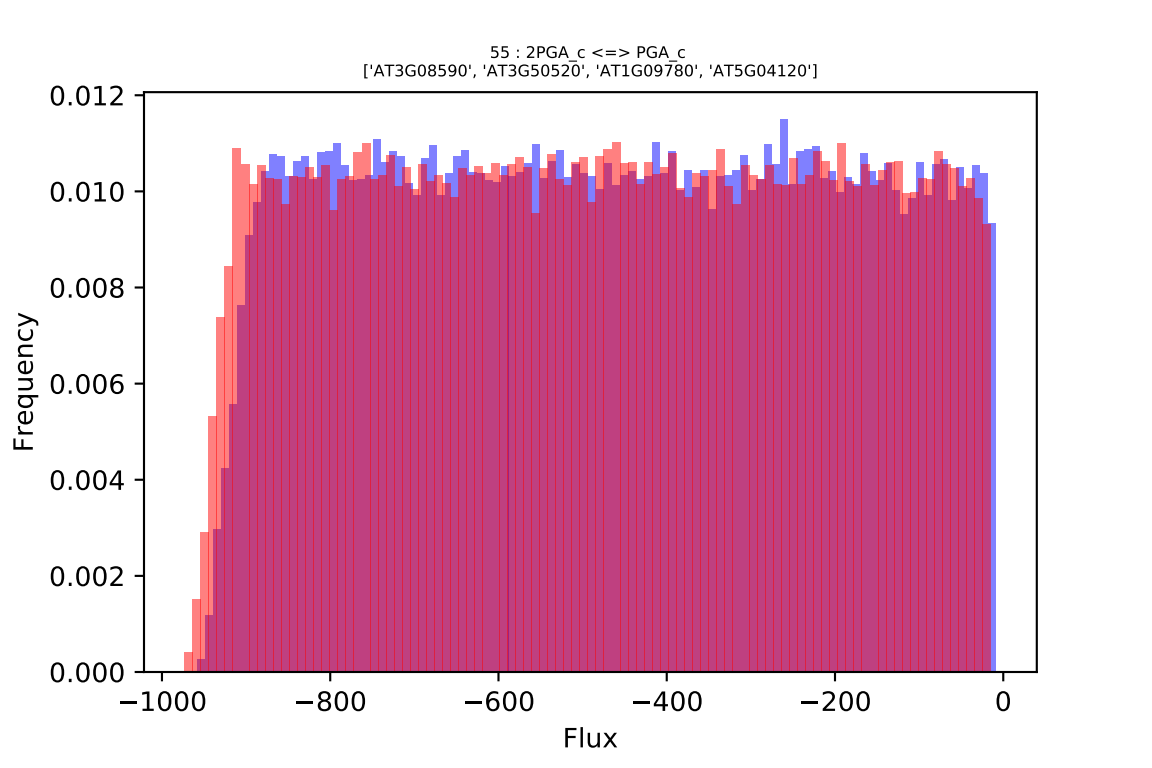

50 : UDPG_c + cellulose2_c --> UDP_c + cellulose3_c
['AT2G21770', 'AT5G44030', 'AT5G05170', 'AT4G39350', 'AT5G64740', 'AT5G09870', 'AT5G17420', 'AT4G32410', 'AT4G18780', 'AT2G25540'
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
Flux
0.00
0.02
0.04
0.06
0.08
0.10
0.12

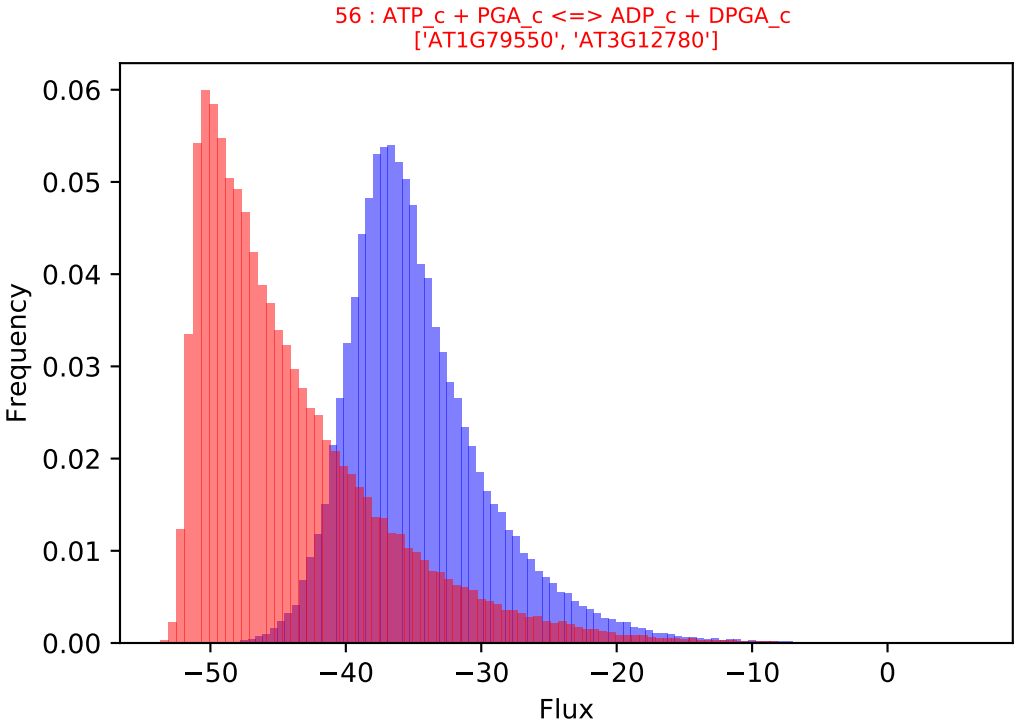

51 : Mal_c + NAD_c <=> NADH_c + OAA_c
['AT5G43330', 'AT5G56720', 'AT5G09660', 'AT2G22780']
Frequency
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
0
50
100
150
200
250
300
350
Flux

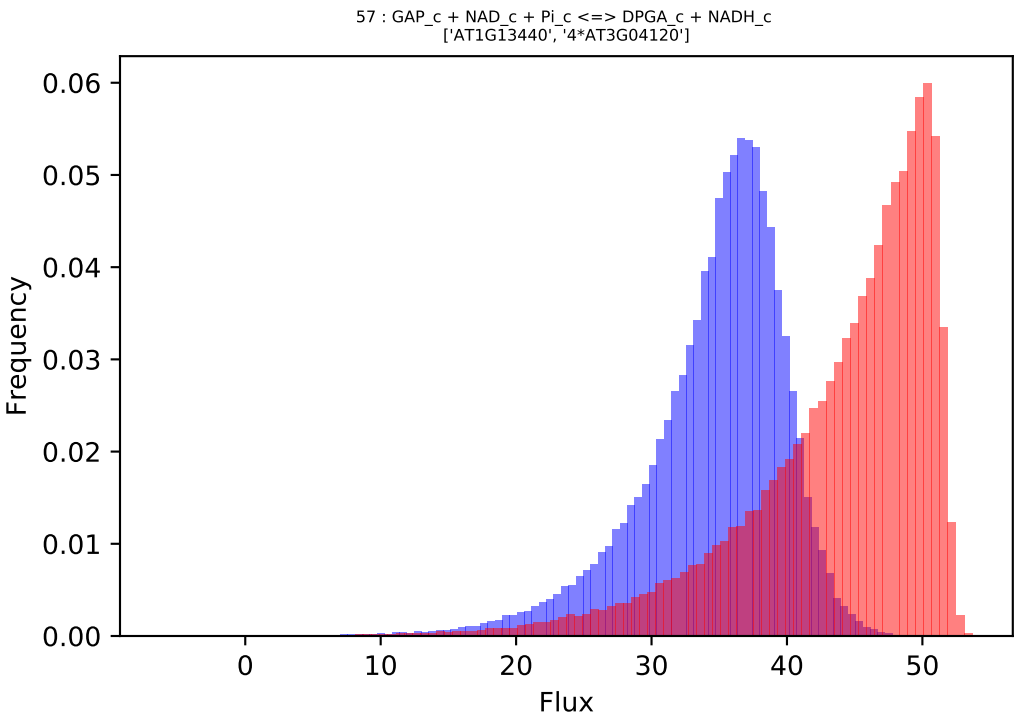

52 : ATP_c + OAA_c --> ADP_c + CO2_c + PEP_c
['AT4G37870', 'AT5G65690']
Frequency
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0
10
20
30
40
50
60
Flux

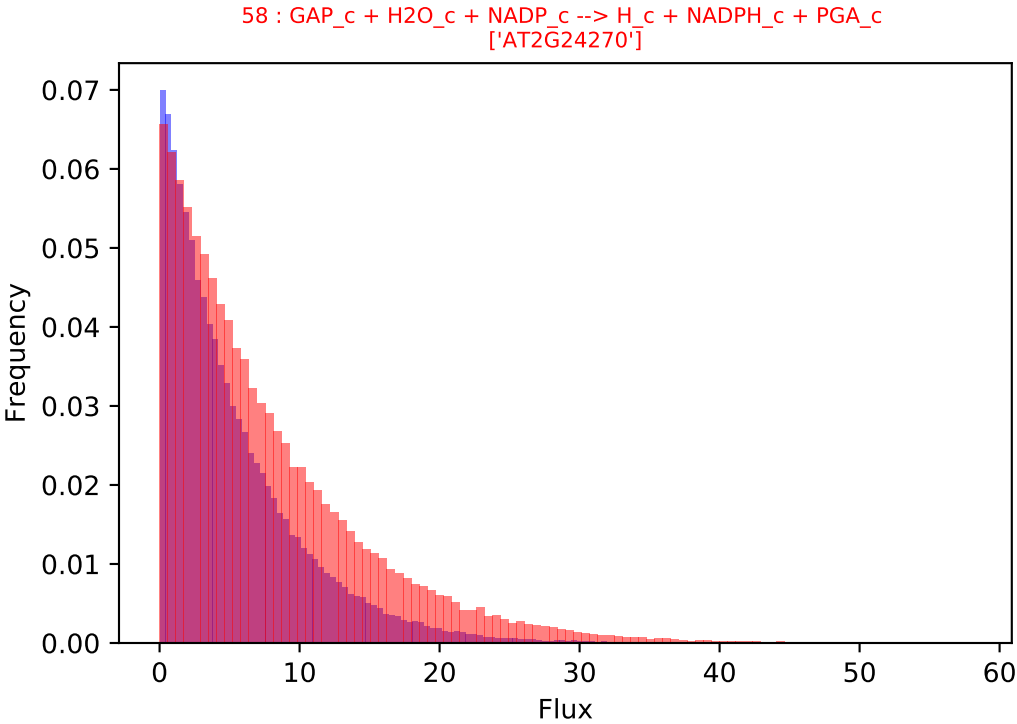

53 : OAA_c + Pi_c <=> HCO3_c + PEP_c
['4*AT1G53310', 'AT1G68750', 'AT2G42600', 'AT3G14940']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
−80
−70
−60
−50
−40
−30
−20
−10
Flux

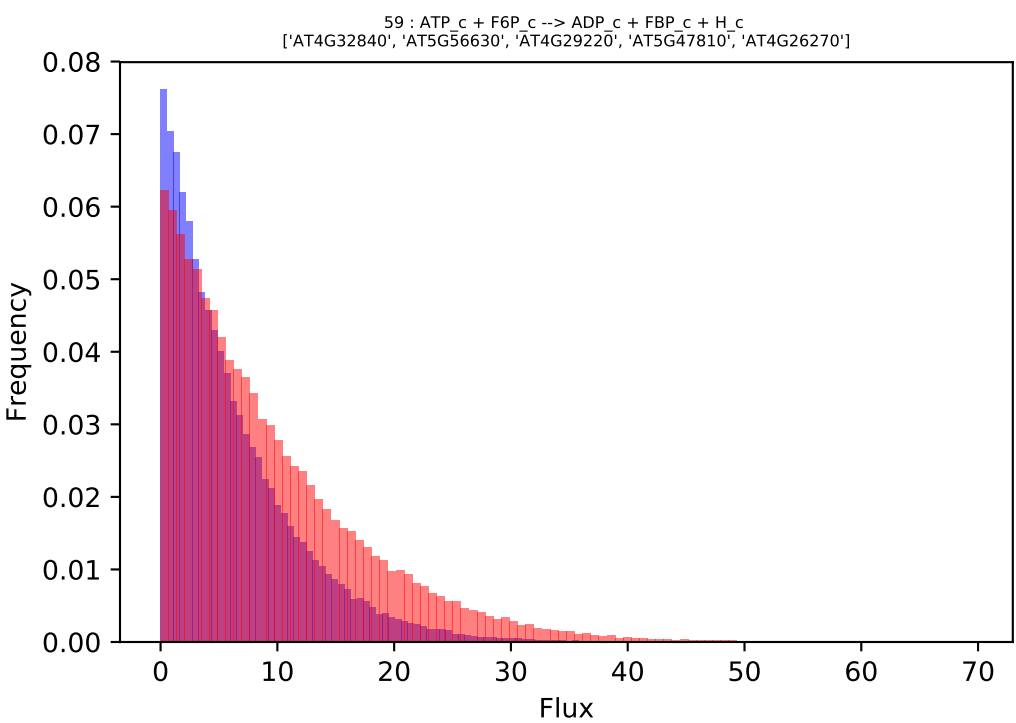

54 : H2O_c + PEP_c <=> 2PGA_c
['2*AT2G29560', 'AT2G36530']
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−1000
−800
−600
−400
−200
0
Flux

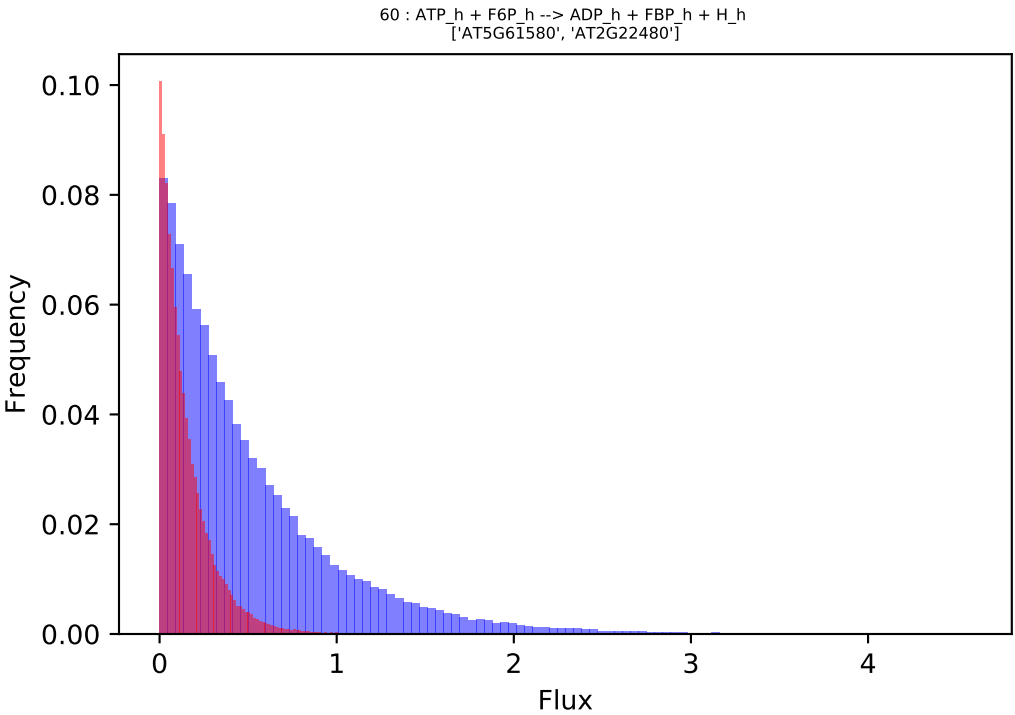

55 : 2PGA_c <=> PGA_c
['AT3G08590', 'AT3G50520', 'AT1G09780', 'AT5G04120']
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−1000
−800
−600
−400
−200
0
Flux

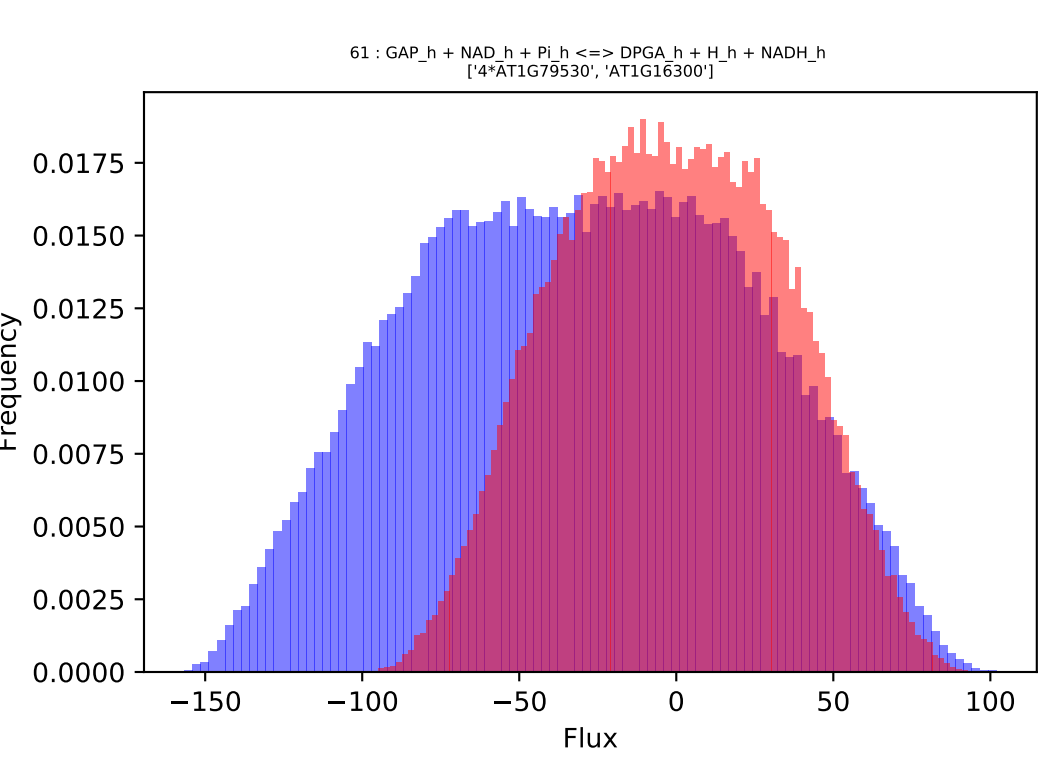

56 : ATP_c + PGA_c <=> ADP_c + DPGA_c
['AT1G79550', 'AT3G12780']
Frequency
0.06
0.05
0.04
0.03
0.02
0.01
0.00
−50
−40
−30
−20
−10
0
Flux

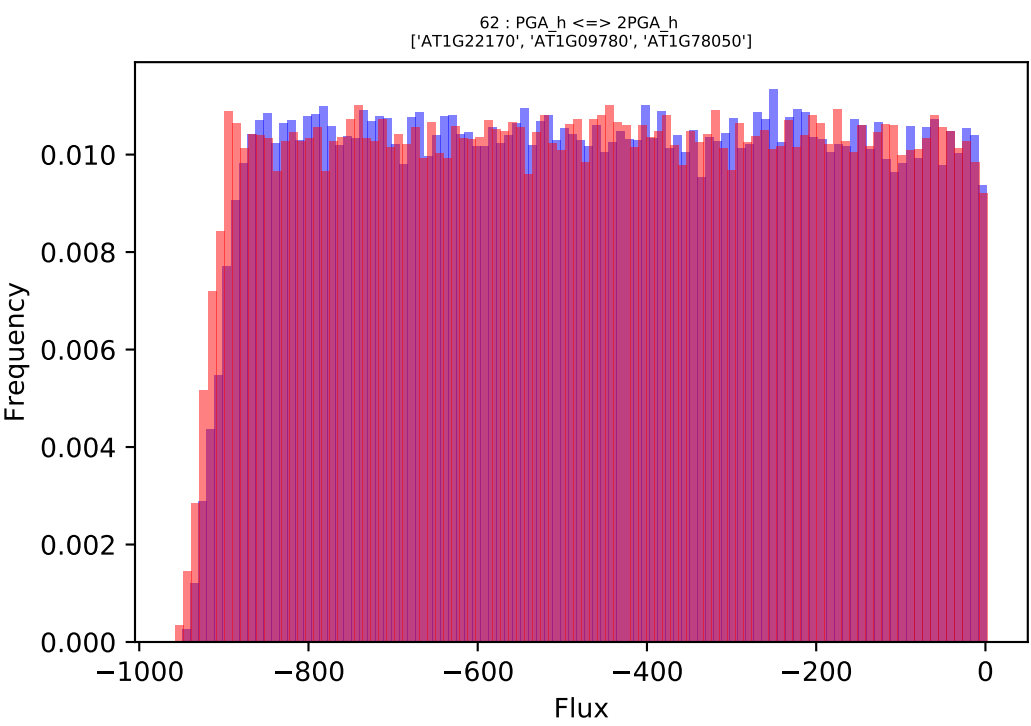

57 : GAP_c + NAD_c + Pi_c <=> DPGA_c + NADH_c
['AT1G13440', '4*AT3G04120']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0
10
20
30
40
50
Flux

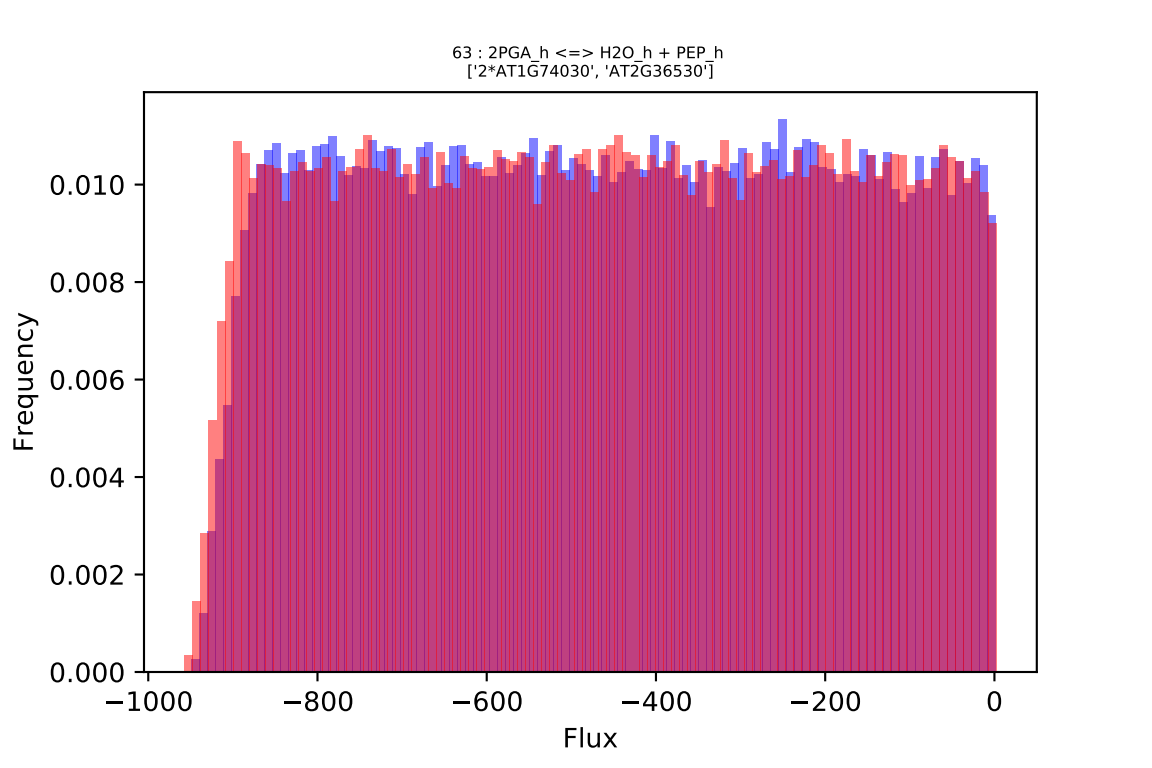

58 : GAP_c + H2O_c + NADP_c --> H_c + NADPH_c + PGA_c
['AT2G24270']
Frequency
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0
10
20
30
40
50
60
Flux

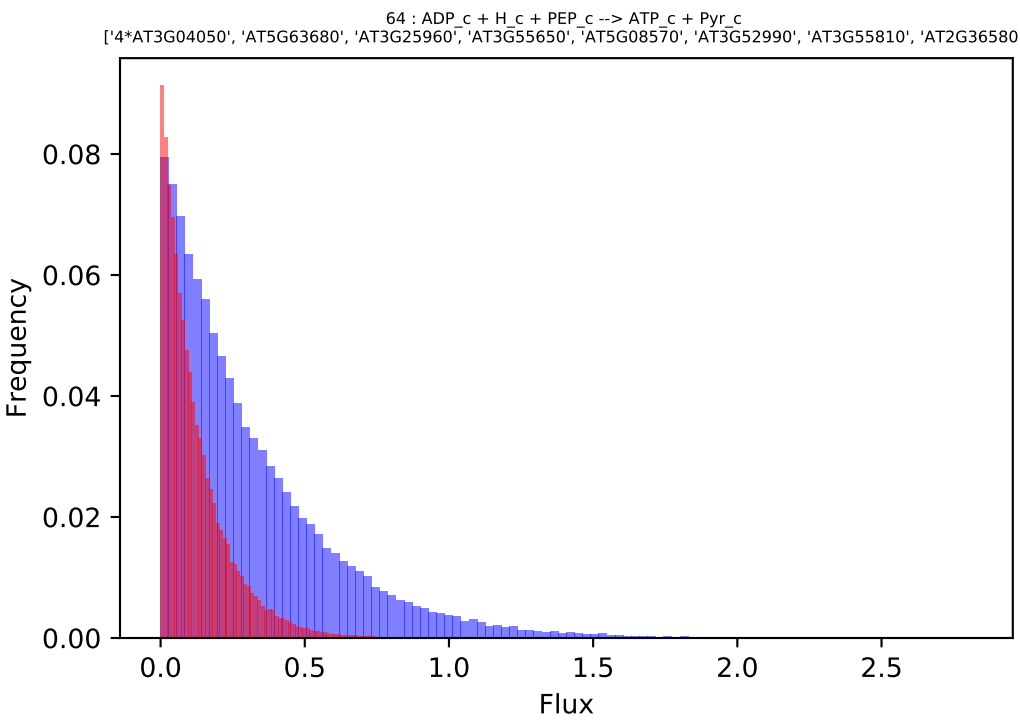

59 : ATP_c + F6P_c --> ADP_c + FBP_c + H_c
['AT4G32840', 'AT5G56630', 'AT4G29220', 'AT5G47810', 'AT4G26270']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0
10
20
30
40
50
60
70

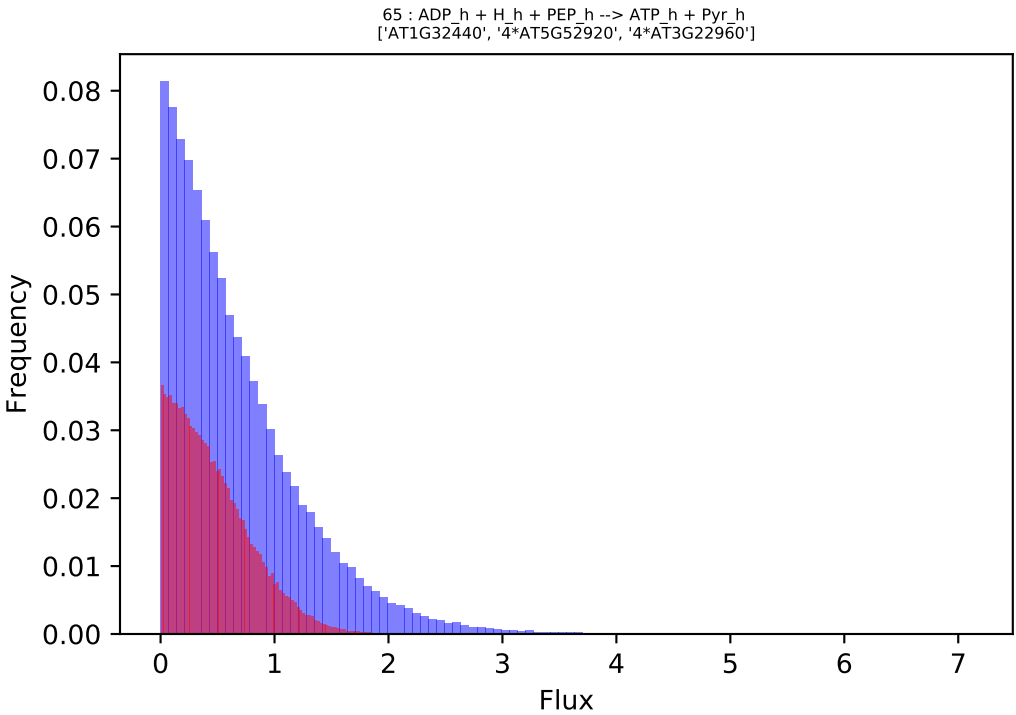

60 : ATP_h + F6P_h --> ADP_h + FBP_h + H_h
['AT5G61580', 'AT2G22480']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0
1
2
3
4
Flux

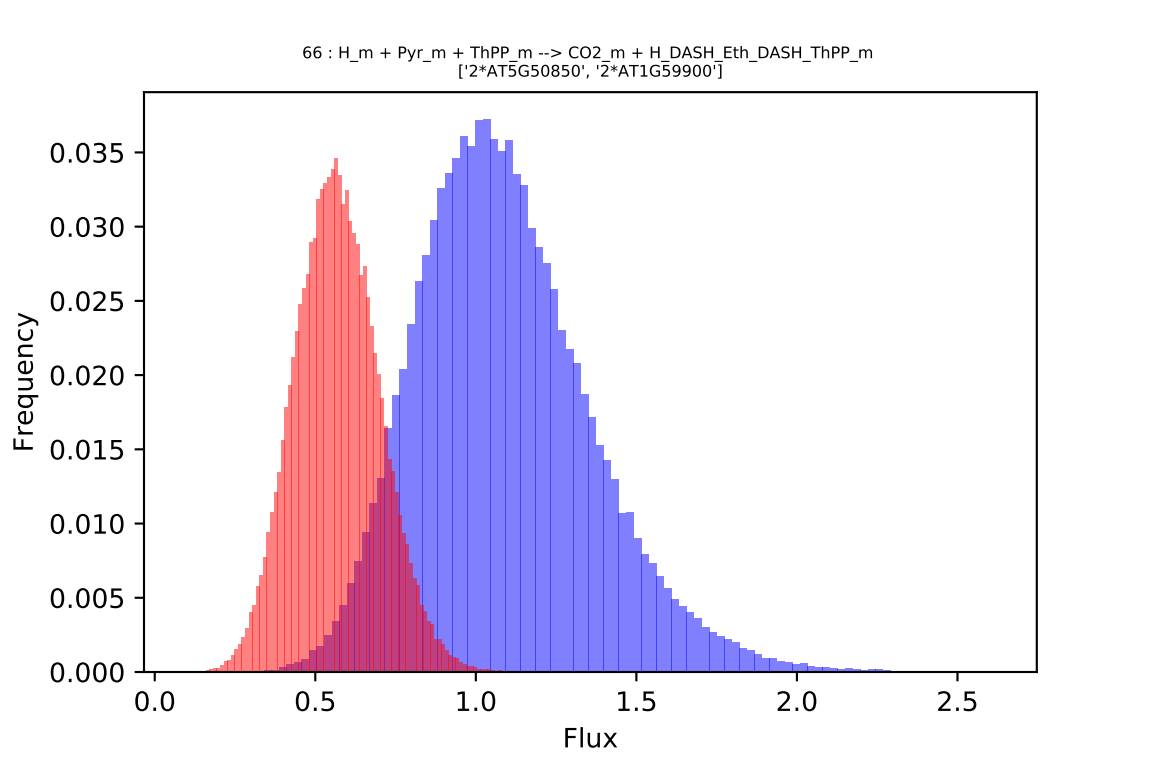

61 : GAP_h + NAD_h + Pi_h <=> DPGA_h + H_h + NADH_h
['4*AT1G79530', 'AT1G16300']
Frequency
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
−150
−100
−50
0
50
100
Flux

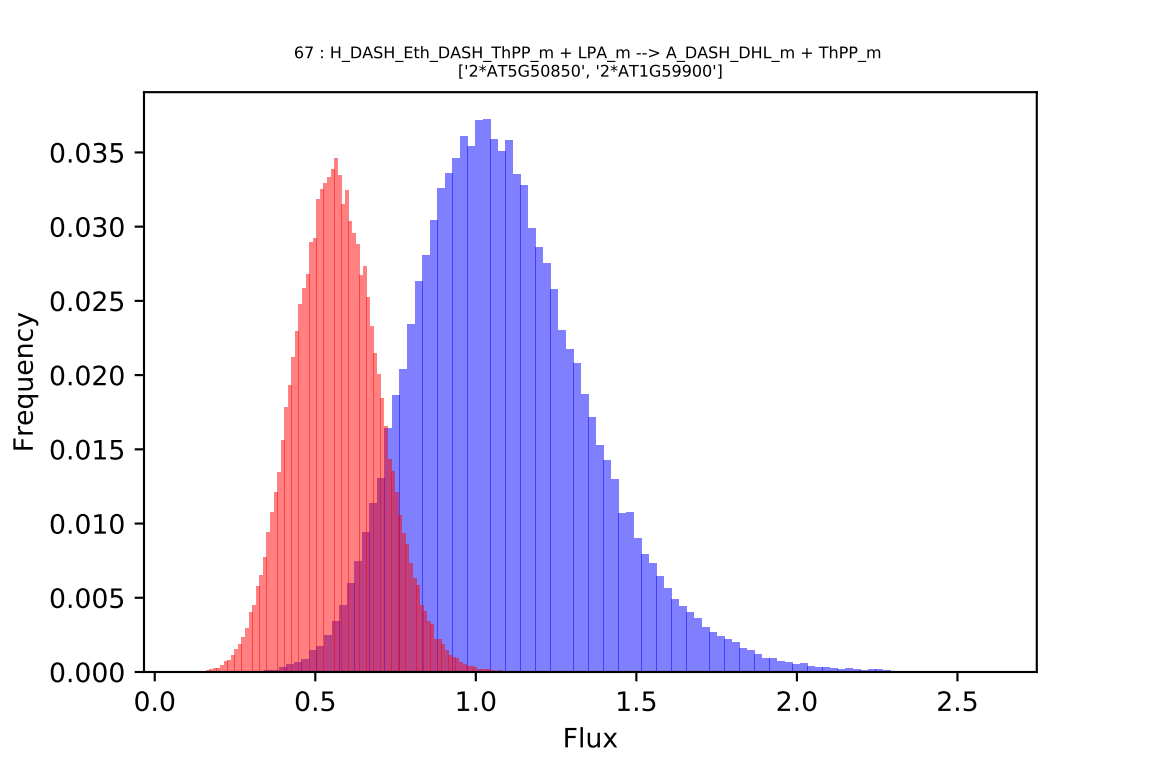

62 : PGA_h <=> 2PGA_h
['AT1G22170', 'AT1G09780', 'AT1G78050']
Frequency
0.010
0.008
0.006
0.004
0.002
0.000
−1000
−800
−600
−400
−200
0
Flux

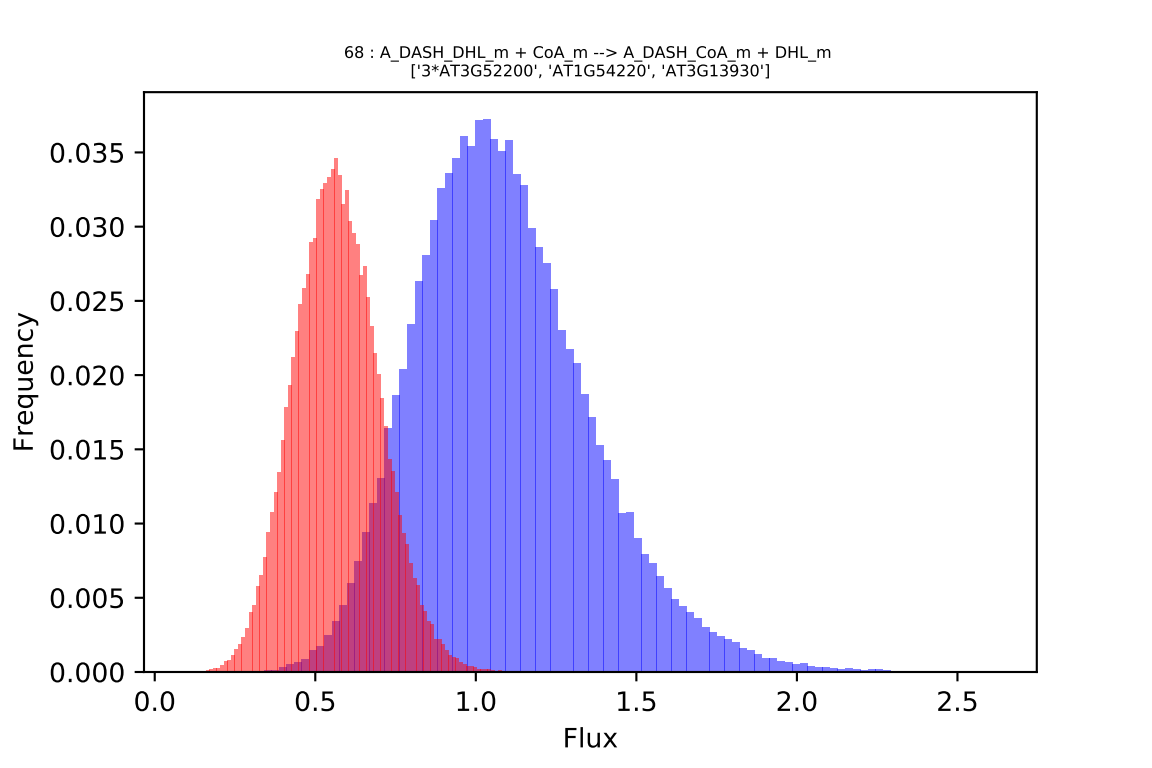

63 : 2PGA_h <=> H2O_h + PEP_h
['2*AT1G74030', 'AT2G36530']
Frequency
0.000
0.002
0.004
0.006
0.008
0.010
−1000
−800
−600
−400
−200
0
Flux

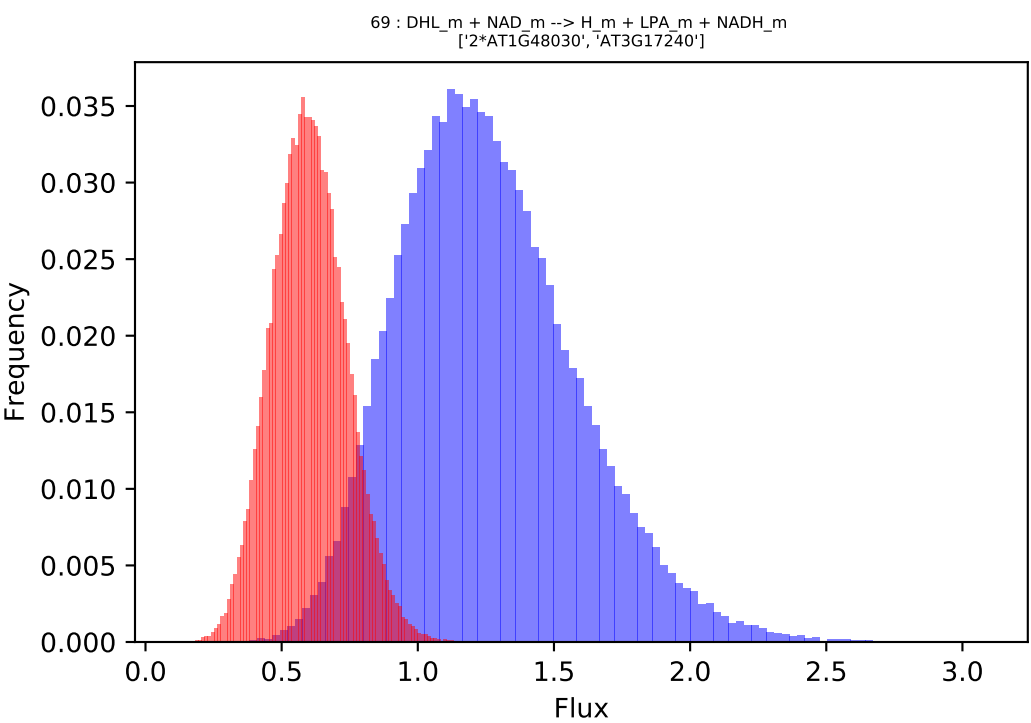

64 : ADP_c + H_c + PEP_c --> ATP_c + Pyr_c
['4*AT3G04050', 'AT5G63680', 'AT3G25960', 'AT3G55650', 'AT5G08570', 'AT3G52990', 'AT3G55810', 'AT2G36580']
Frequency
0.00
0.02
0.04
0.06
0.08
0.0
0.5
1.0
1.5
2.0
2.5
Flux

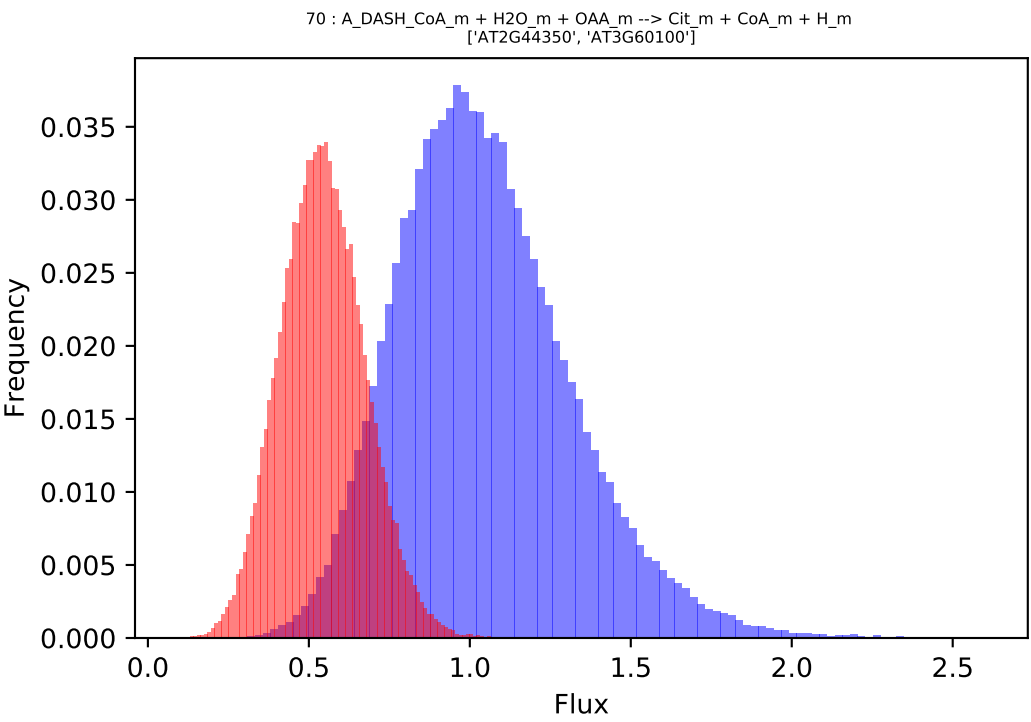

65 : ADP_h + H_h + PEP_h --> ATP_h + Pyr_h
['AT1G32440', '4*AT5G52920', '4*AT3G22960']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0
1
2
3
4
5
6
7
Flux

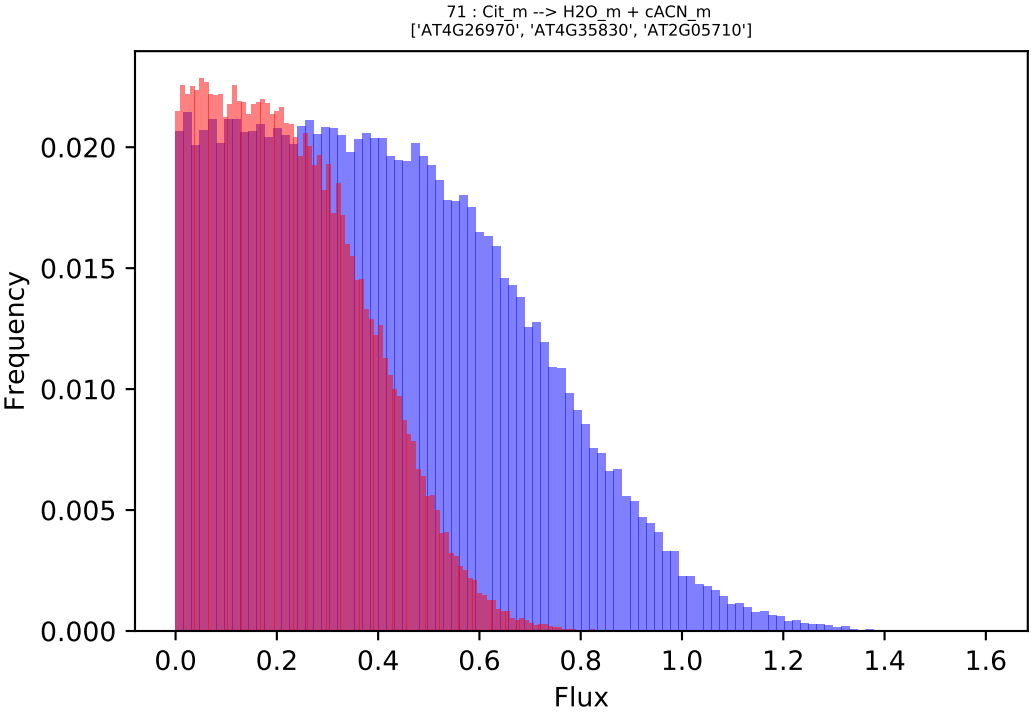

66 : H_m + Pyr_m + ThPP_m --> CO2_m + H_DASH_Eth_DASH_ThPP_m
['2*AT5G50850', '2*AT1G59900']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.5
1.0
1.5
2.0
2.5
Flux

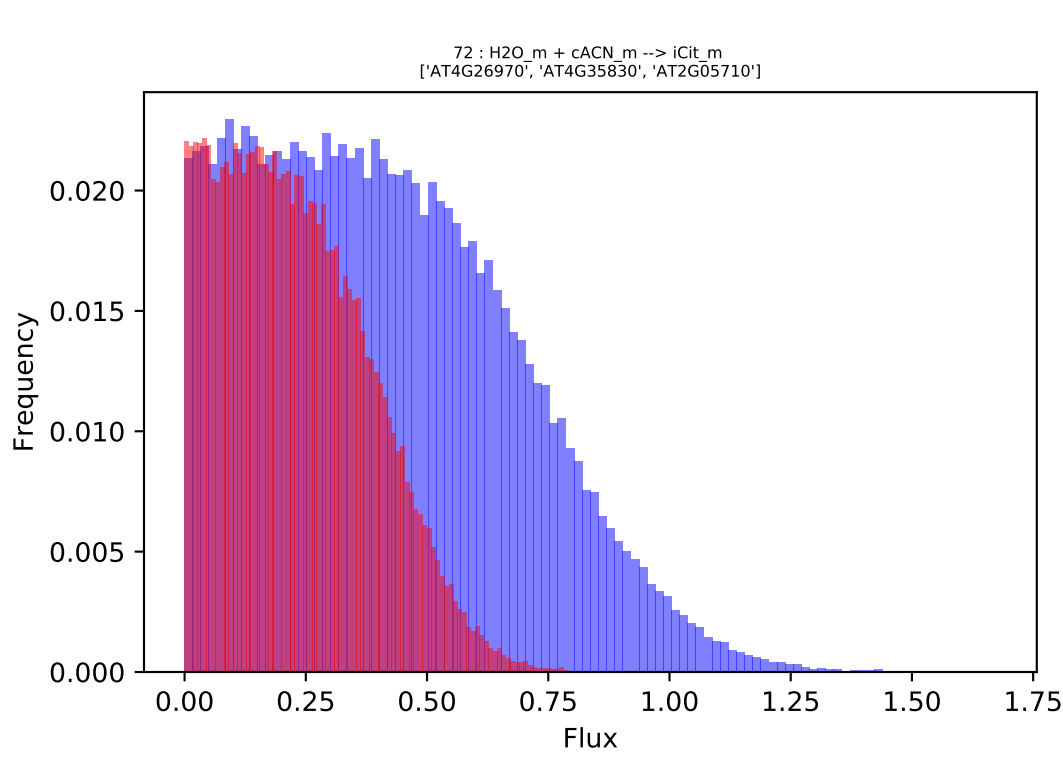

67 : H_DASH_Eth_DASH_ThPP_m + LPA_m --> A_DASH_DHL_m + ThPP_m
['2*AT5G50850', '2*AT1G59900']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.5
1.0
1.5
2.0
2.5
Flux

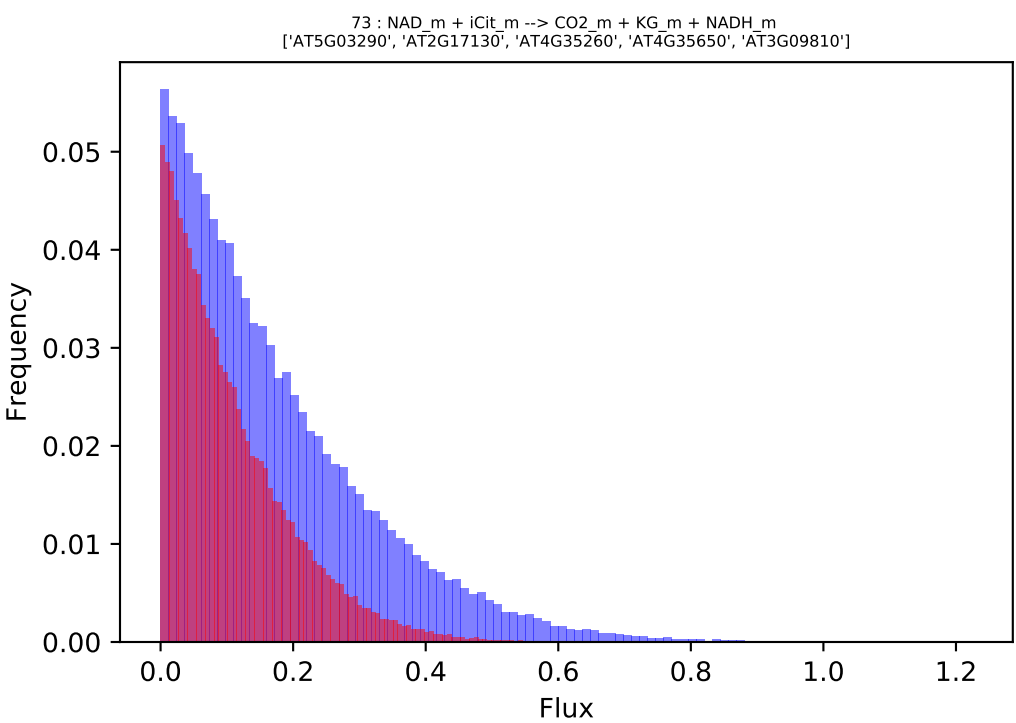

68 : A_DASH_DHL_m + CoA_m --> A_DASH_CoA_m + DHL_m
['3*AT3G52200', 'AT1G54220', 'AT3G13930']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.5
1.0
1.5
2.0
2.5
Flux

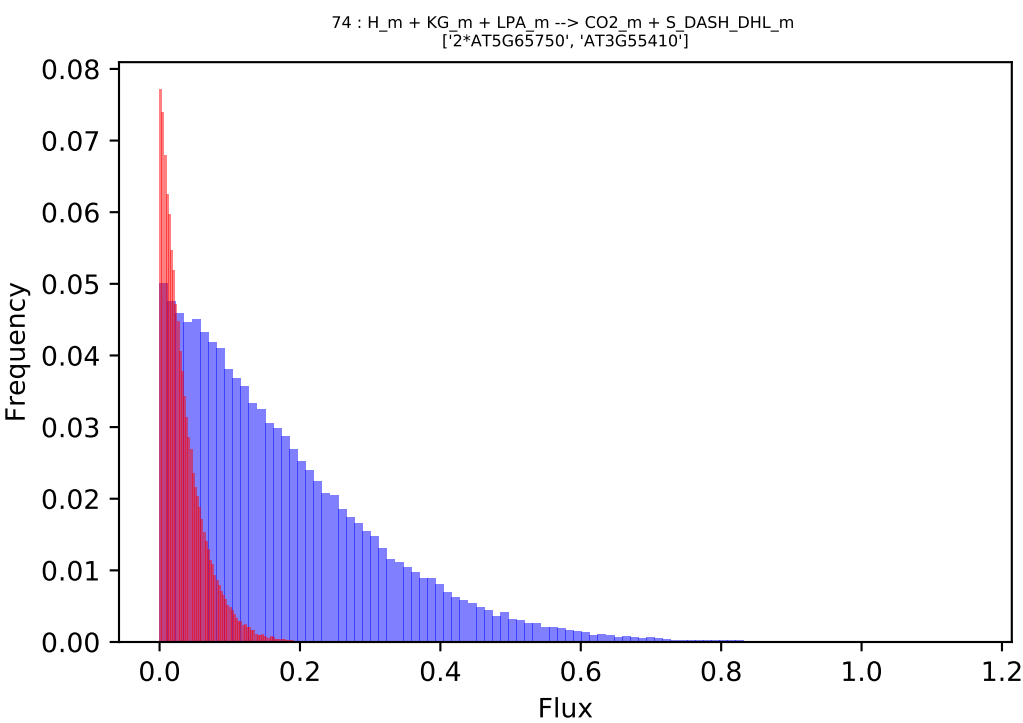

69 : DHL_m + NAD_m --> H_m + LPA_m + NADH_m
['2*AT1G48030', 'AT3G17240']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Flux

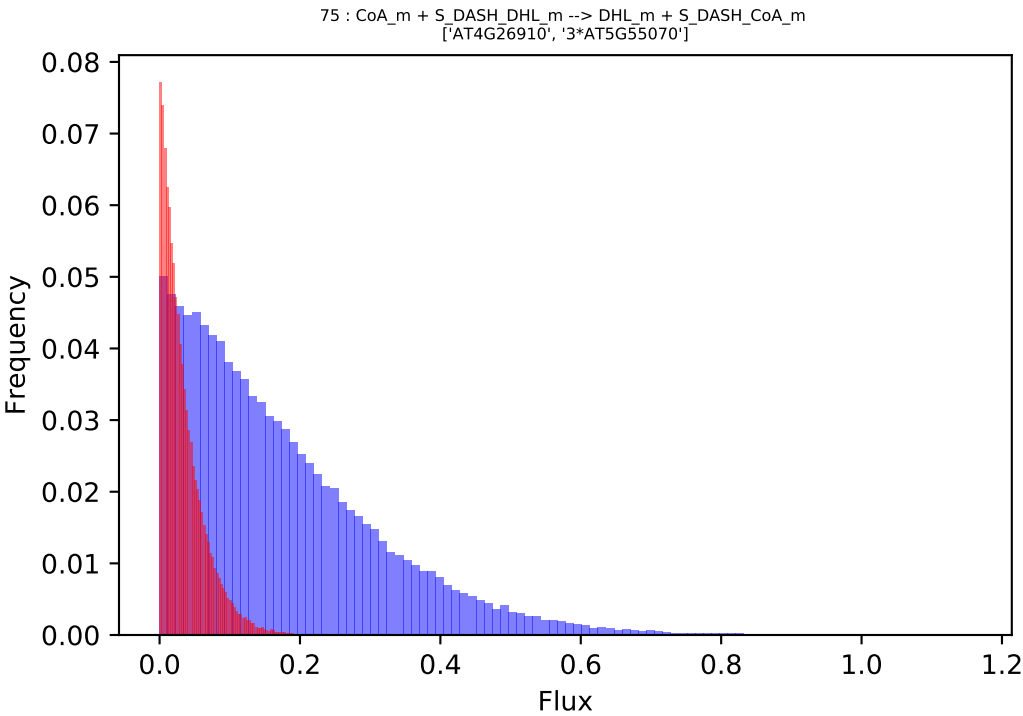

70 : A_DASH_CoA_m + H2O_m + OAA_m --> Cit_m + CoA_m + H_m
['AT2G44350', 'AT3G60100']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.5
1.0
1.5
2.0
2.5
Flux

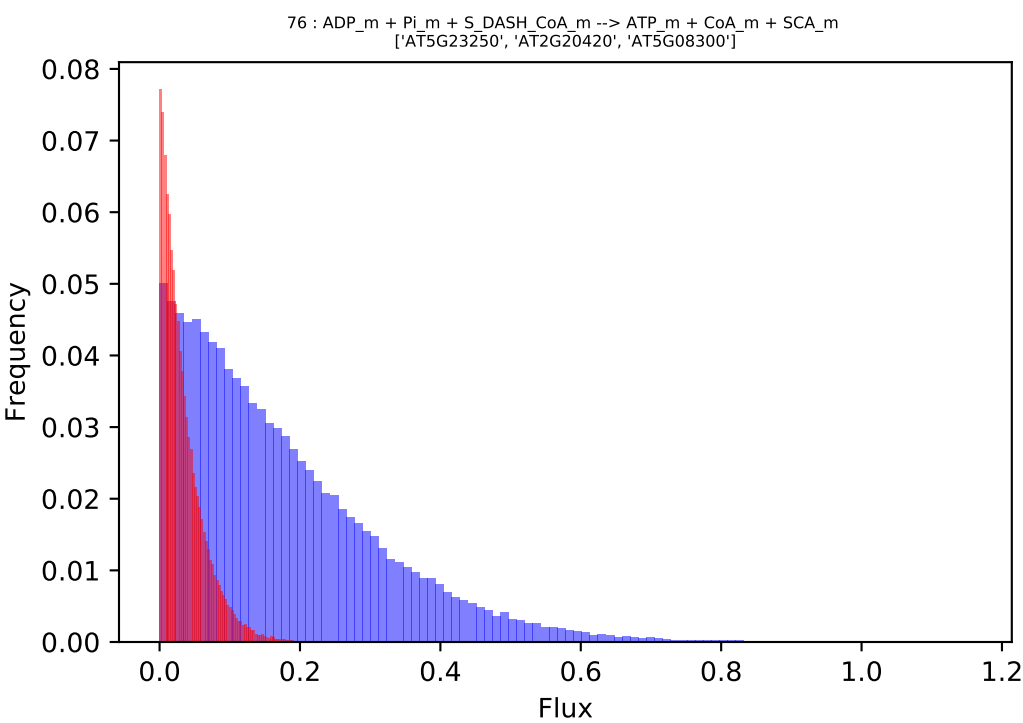

71 : Cit_m --> H2O_m + cACN_m
['AT4G26970', 'AT4G35830', 'AT2G05710']
Frequency
0.000
0.005
0.010
0.015
0.020
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Flux

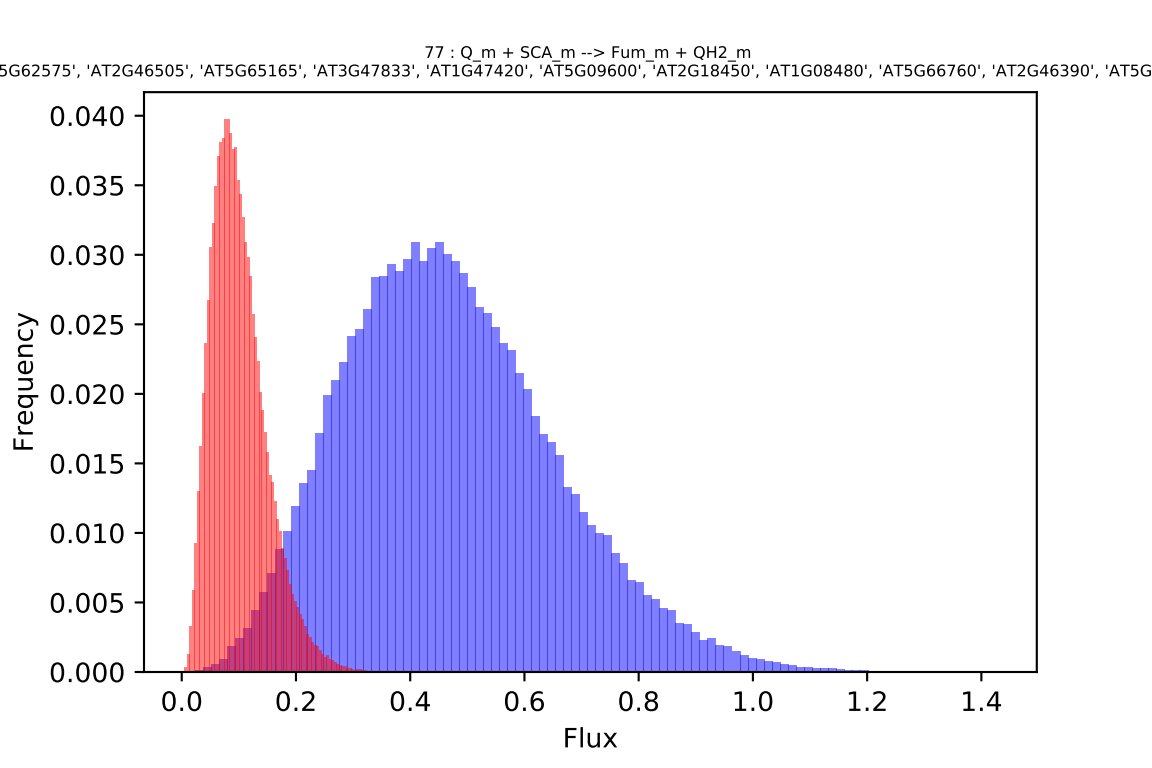

72 : H2O_m + cACN_m --> iCit_m
['AT4G26970', 'AT4G35830', 'AT2G05710']
Frequency
0.020
0.015
0.010
0.005
0.000
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

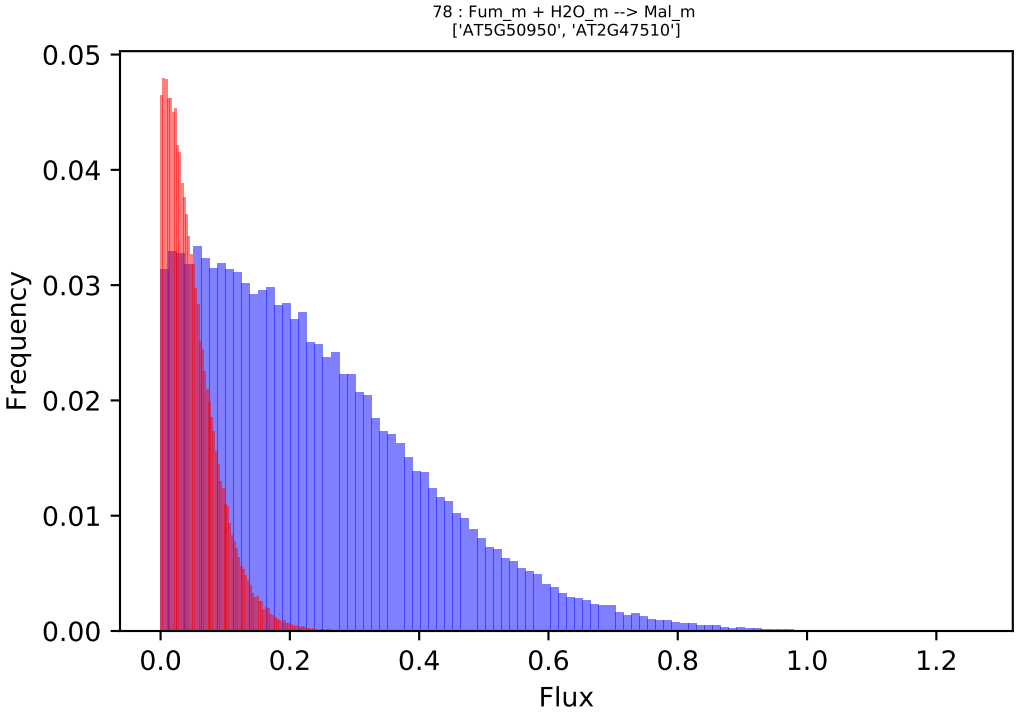

73 : NAD_m + iCit_m --> CO2_m + KG_m + NADH_m
['AT5G03290', 'AT2G17130', 'AT4G35260', 'AT4G35650', 'AT3G09810']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Flux

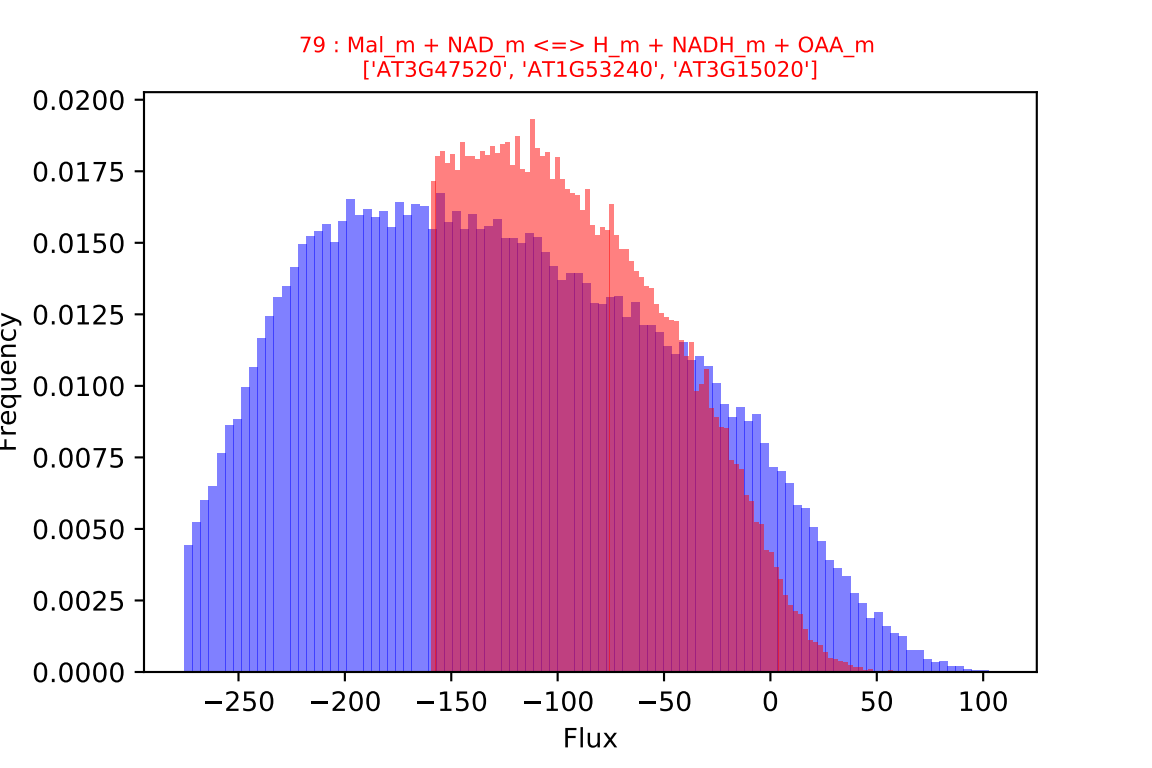

74 : H_m + KG_m + LPA_m --> CO2_m + S_DASH_DHL_m
['2*AT5G65750', 'AT3G55410']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.0
0.2
0.4
0.6
0.8
1.0
1.2

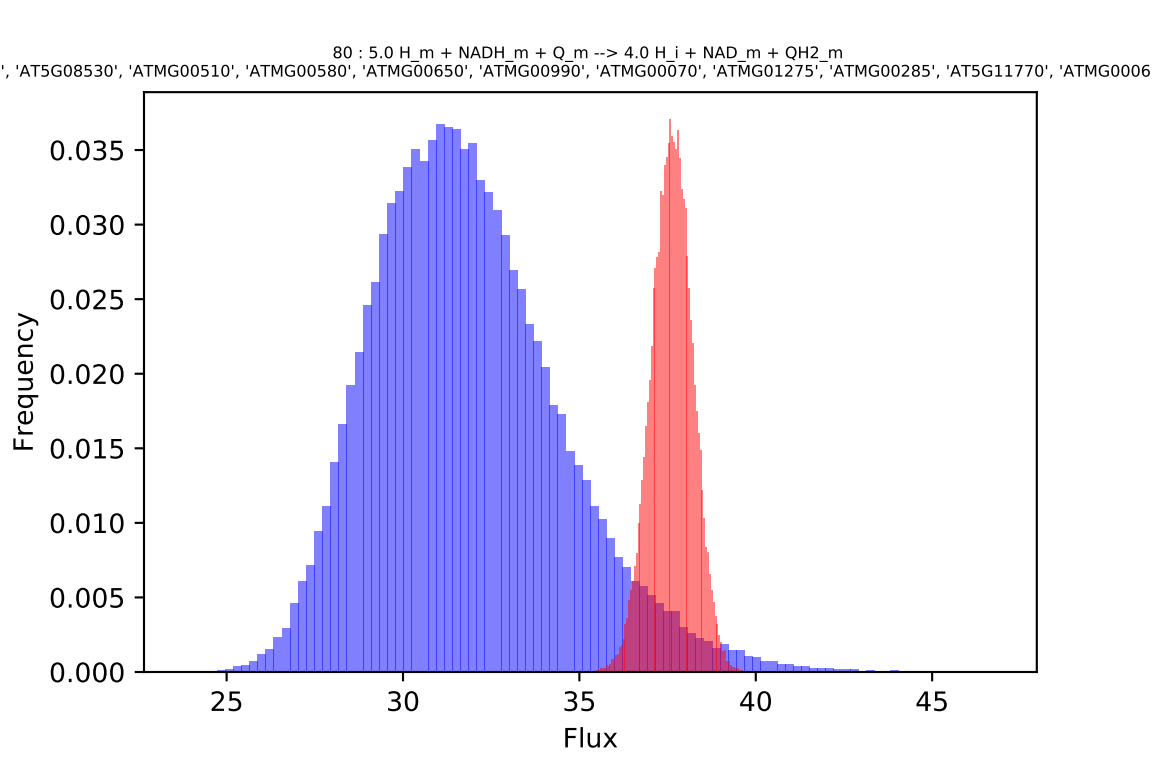

75 : CoA_m + S_DASH_DHL_m --> DHL_m + S_DASH_CoA_m
['AT4G26910', '3*AT5G55070']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.0
0.2
0.4
0.6
0.8
1.0
1.2

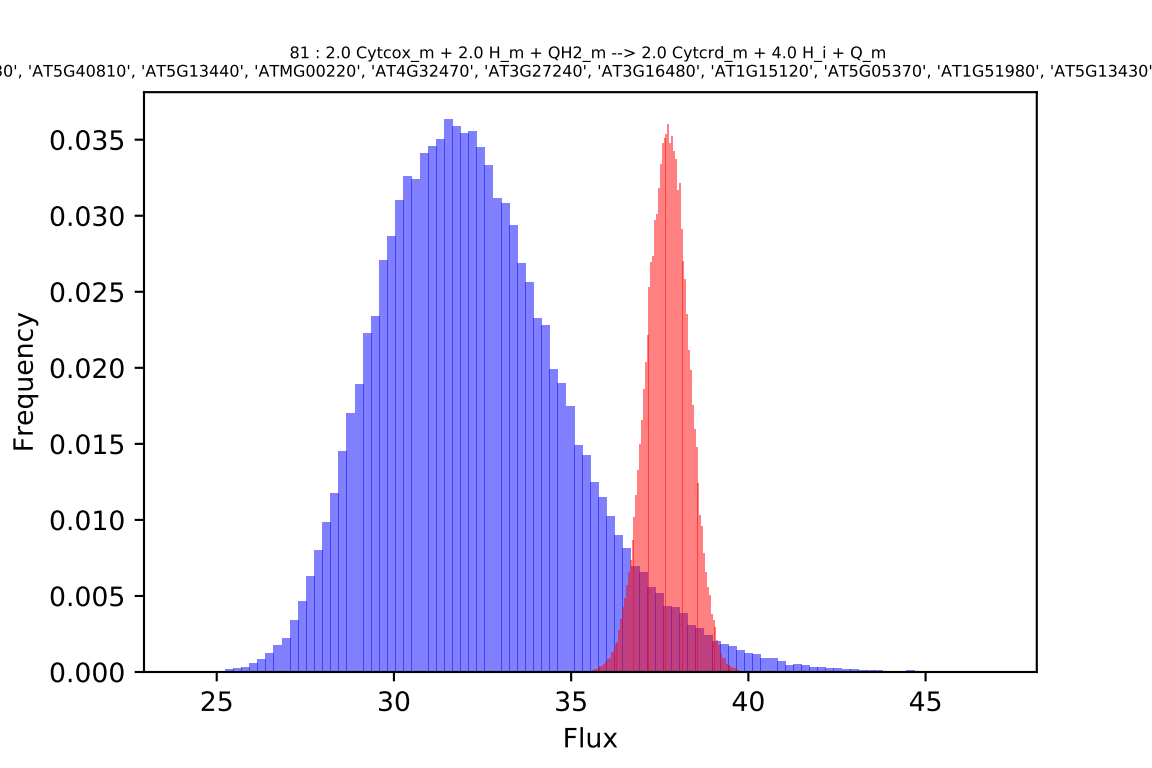

76 : ADP_m + Pi_m + S_DASH_CoA_m --> ATP_m + CoA_m + SCA_m
['AT5G23250', 'AT2G20420', 'AT5G08300']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Flux

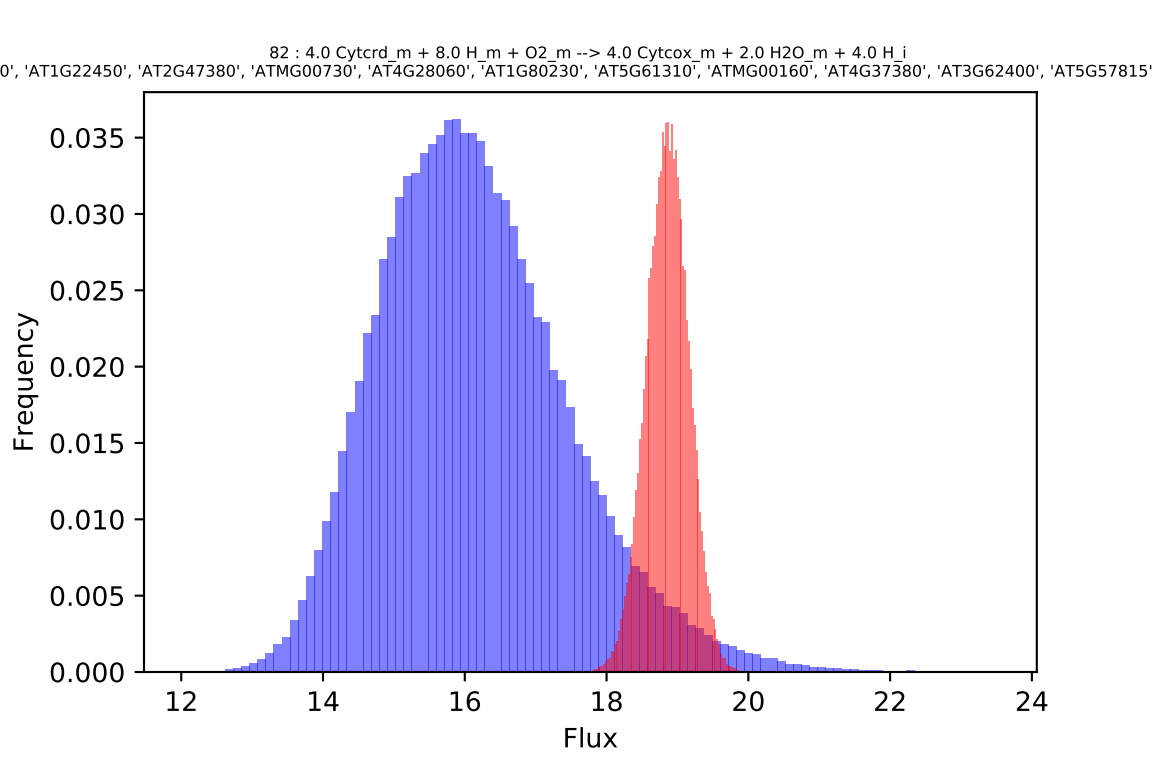

77 : Q_m + SCA_m --> Fum_m + QH2_m
5G62575', 'AT2G46505', 'AT5G65165', 'AT3G47833', 'AT1G47420', 'AT5G09600', 'AT2G18450', 'AT1G08480', 'AT5G66760', 'AT2G46390', 'AT5G
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

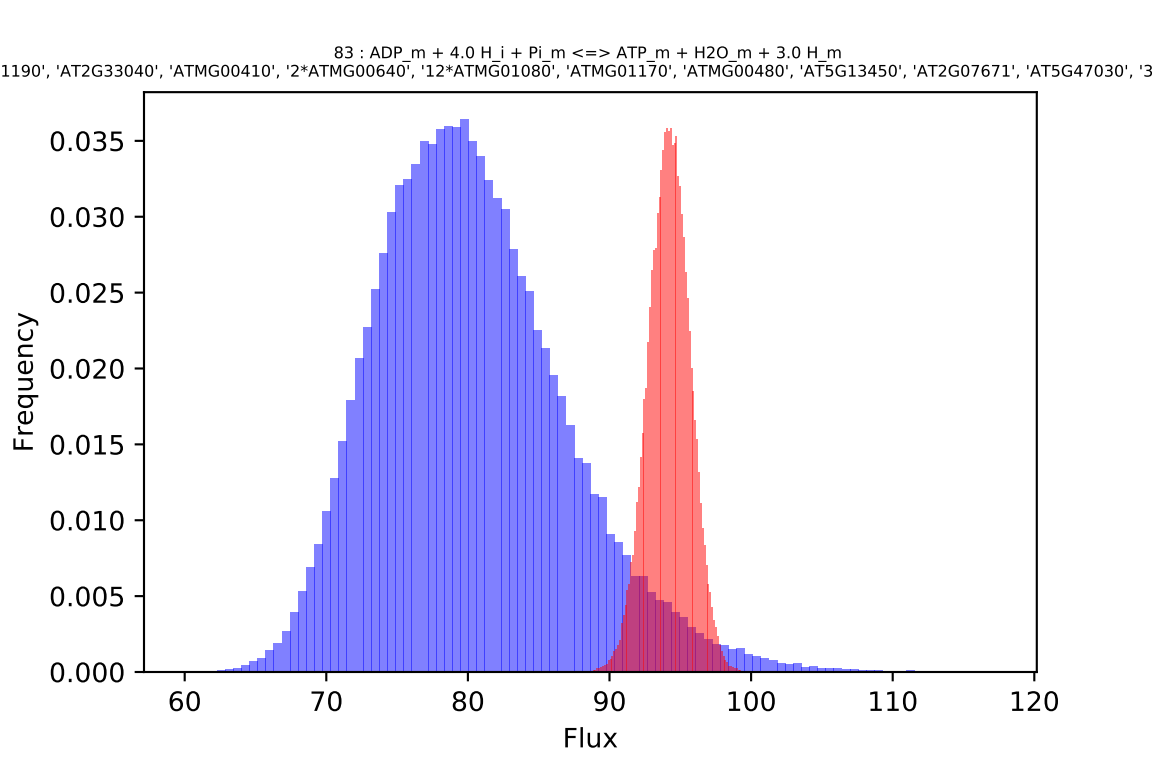

78 : Fum_m + H2O_m --> Mal_m
['AT5G50950', 'AT2G47510']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0.0
0.2
0.4
0.6
0.8
1.0
1.2

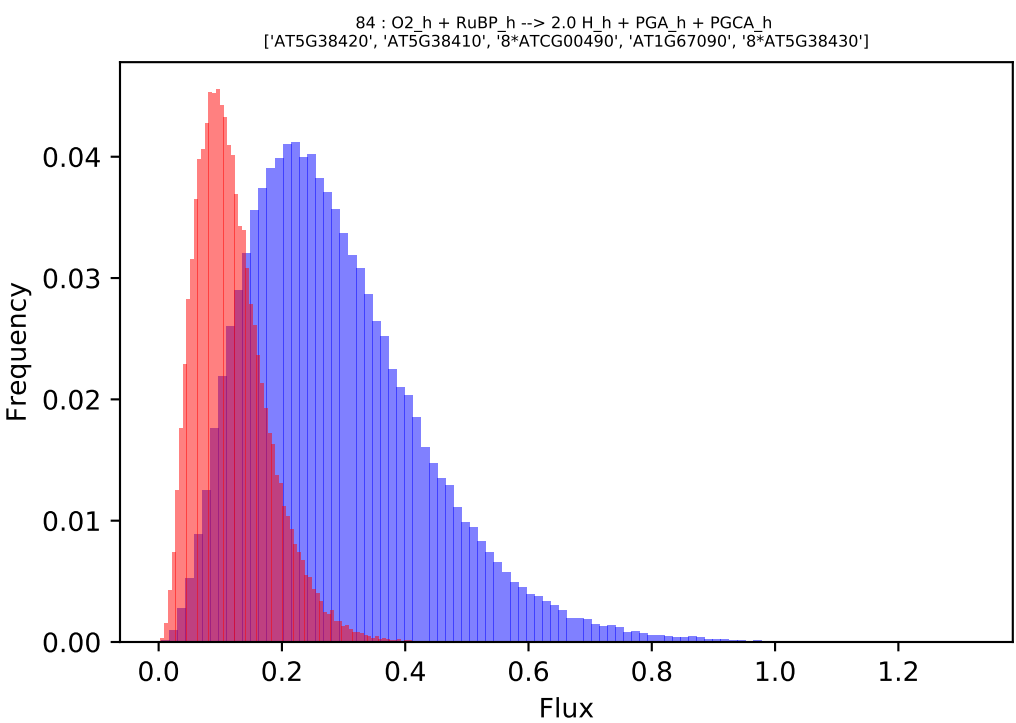

79 : Mal_m + NAD_m <=> H_m + NADH_m + OAA_m
['AT3G47520', 'AT1G53240', 'AT3G15020']
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
Frequency
−250
−200
−150
−100
−50
0
50
100
Flux

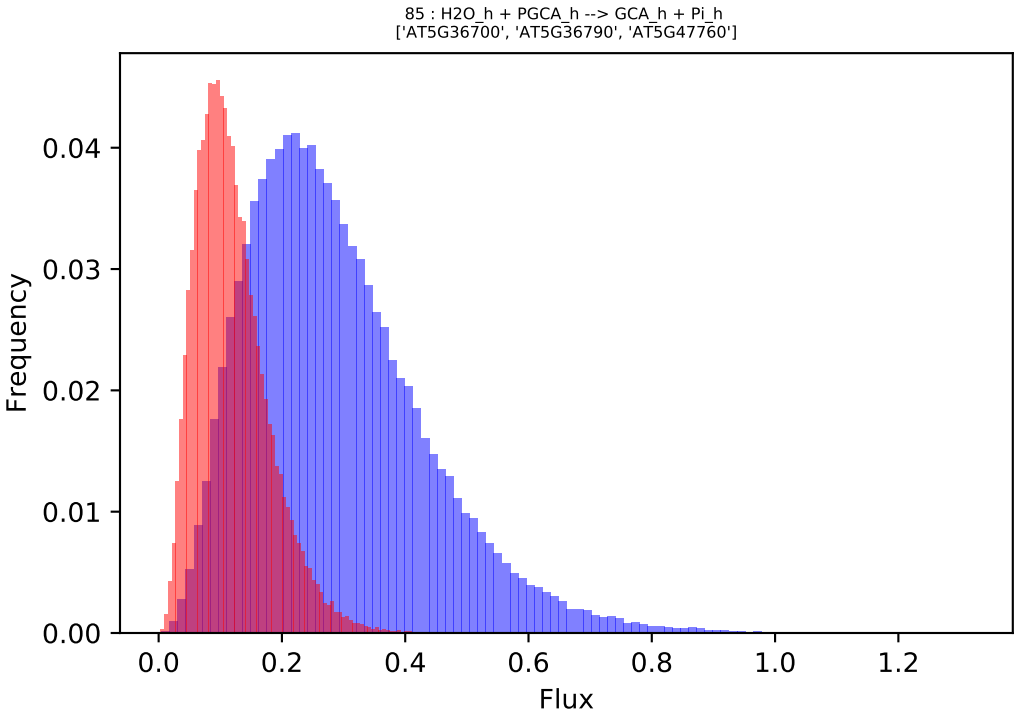

80 : 5.0 H_m + NADH_m + Q_m --> 4.0 H_i + NAD_m + QH2_m
', 'AT5G08530', 'ATMG00510', 'ATMG00580', 'ATMG00650', 'ATMG00990', 'ATMG00070', 'ATMG01275', 'ATMG00285', 'AT5G11770', 'ATMG0006
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
25
30
35
40
45
Flux

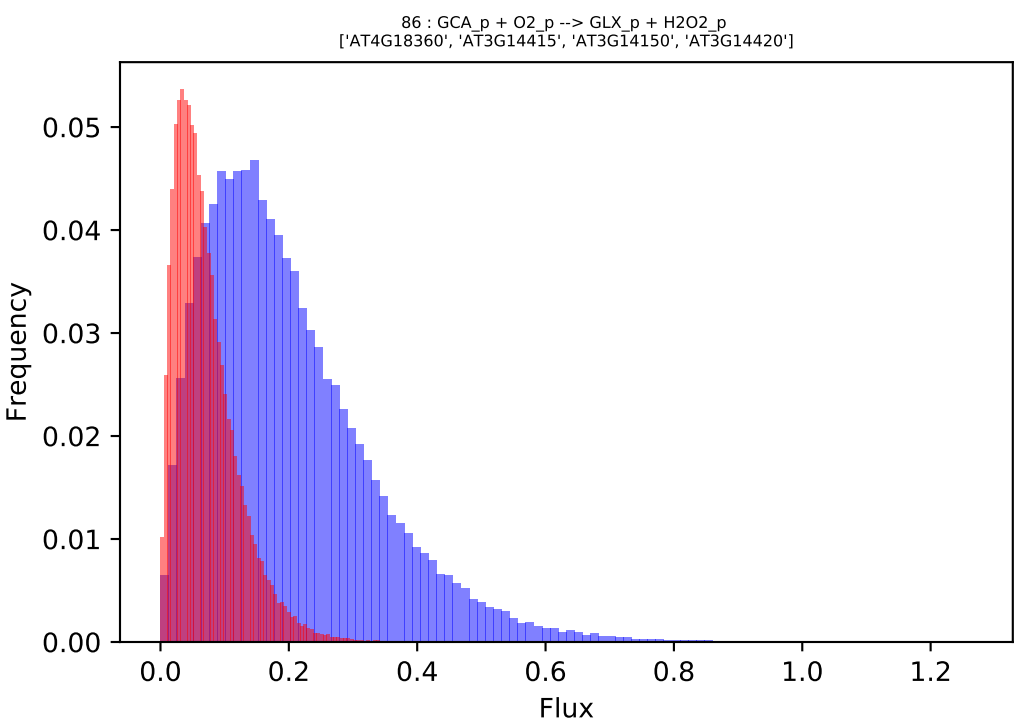

81 : 2.0 Cytcox_m + 2.0 H_m + QH2_m --> 2.0 Cytcrd_m + 4.0 H_i + Q_m
30', 'AT5G40810', 'AT5G13440', 'ATMG00220', 'AT4G32470', 'AT3G27240', 'AT3G16480', 'AT1G15120', 'AT5G05370', 'AT1G51980', 'AT5G13430'
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
25
30
35
40
45
Flux

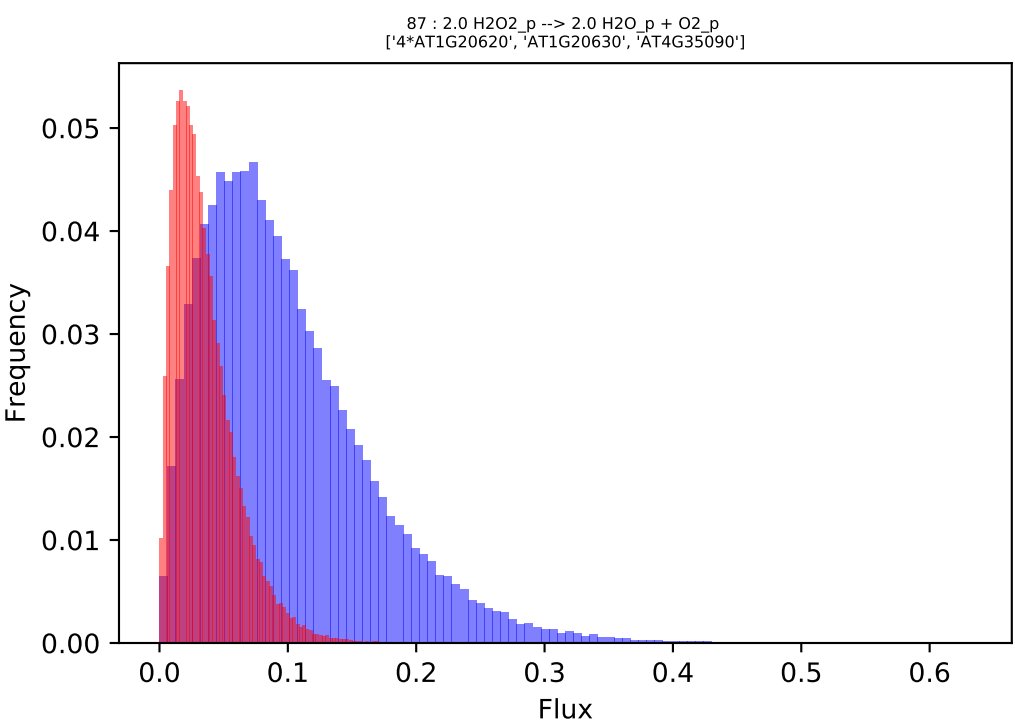

82 : 4.0 Cytcrd_m + 8.0 H_m + O2_m --> 4.0 Cytcox_m + 2.0 H2O_m + 4.0 H_i
0', 'AT1G22450', 'AT2G47380', 'ATMG00730', 'AT4G28060', 'AT1G80230', 'AT5G61310', 'ATMG00160', 'AT4G37380', 'AT3G62400', 'AT5G57815'
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
12
14
16
18
20
22
24
Flux

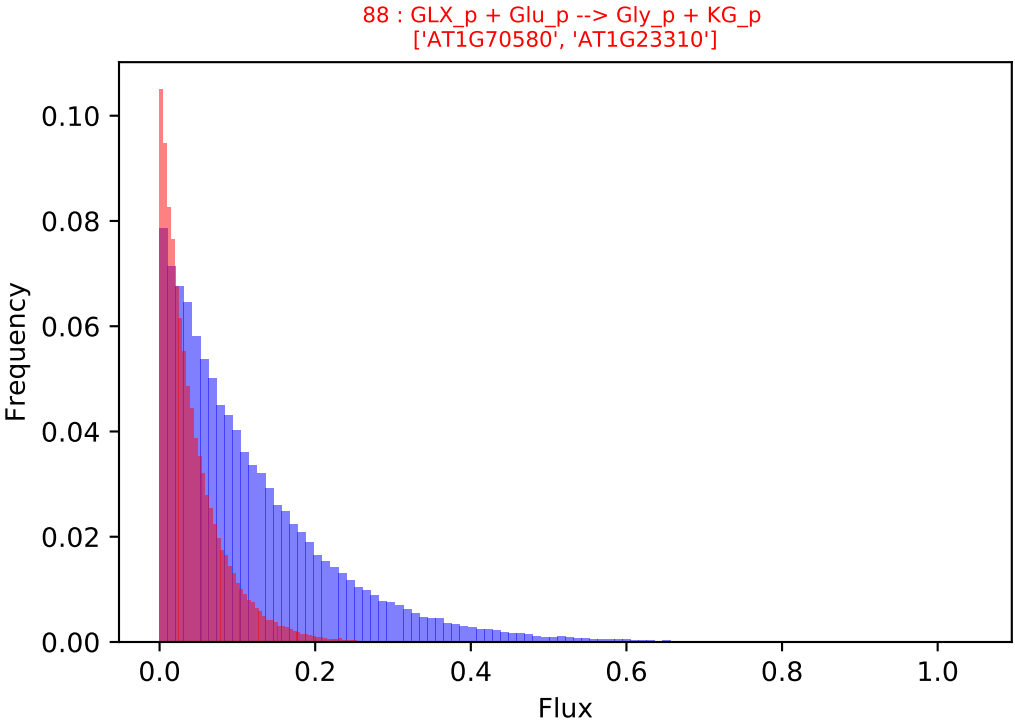

83 : ADP_m + 4.0 H_i + Pi_m <=> ATP_m + H2O_m + 3.0 H_m
1190', 'AT2G33040', 'ATMG00410', '2*ATMG00640', '12*ATMG01080', 'ATMG01170', 'ATMG00480', 'AT5G13450', 'AT2G07671', 'AT5G47030', '3
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
60
70
80
90
100
110
120
Flux

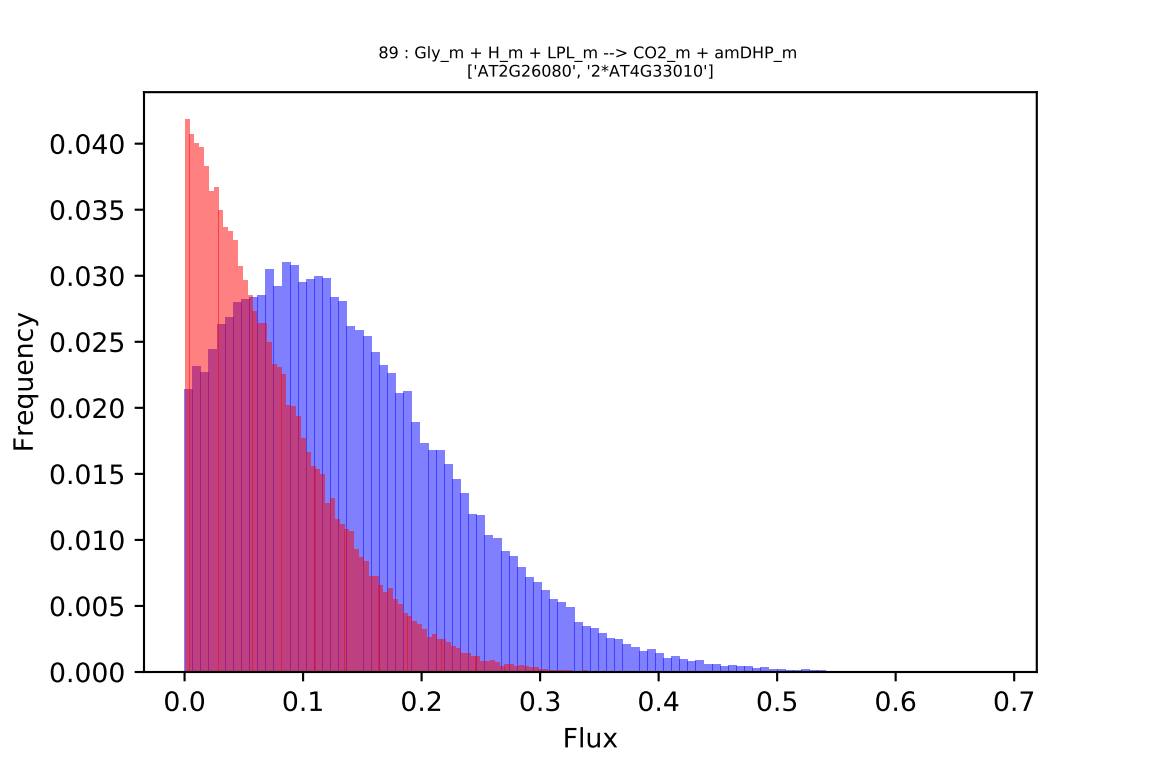

84 : O2_h + RuBP_h --> 2.0 H_h + PGA_h + PGCA_h
['AT5G38420', 'AT5G38410', '8*ATCG00490', 'AT1G67090', '8*AT5G38430']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Flux

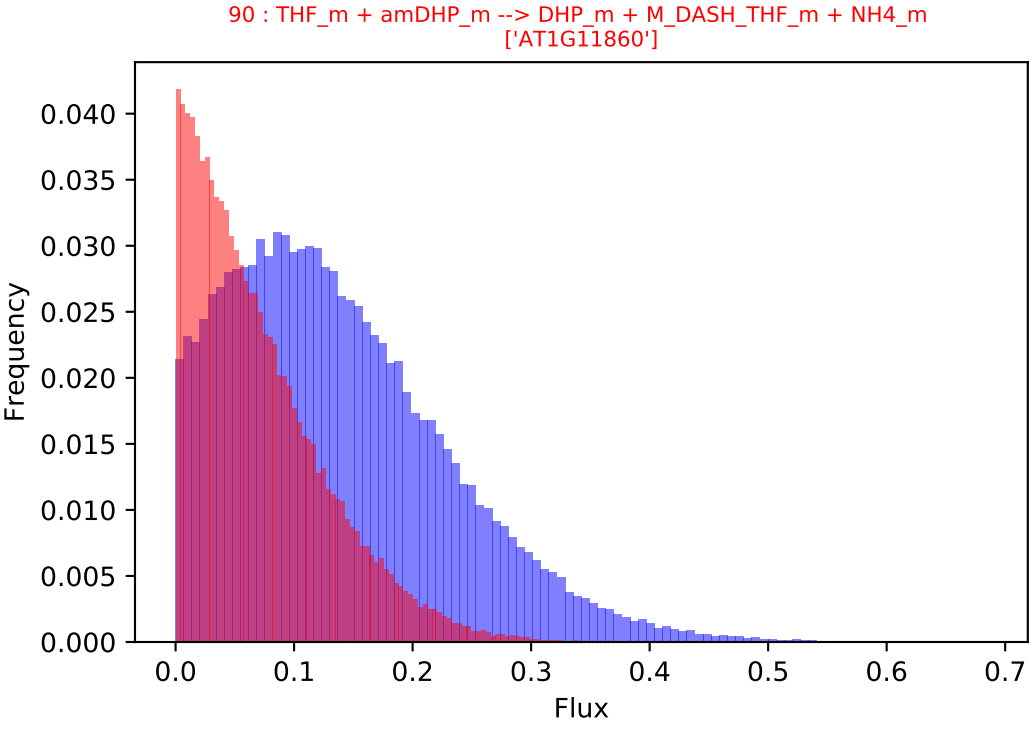

85 : H2O_h + PGCA_h --> GCA_h + Pi_h
['AT5G36700', 'AT5G36790', 'AT5G47760']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Flux

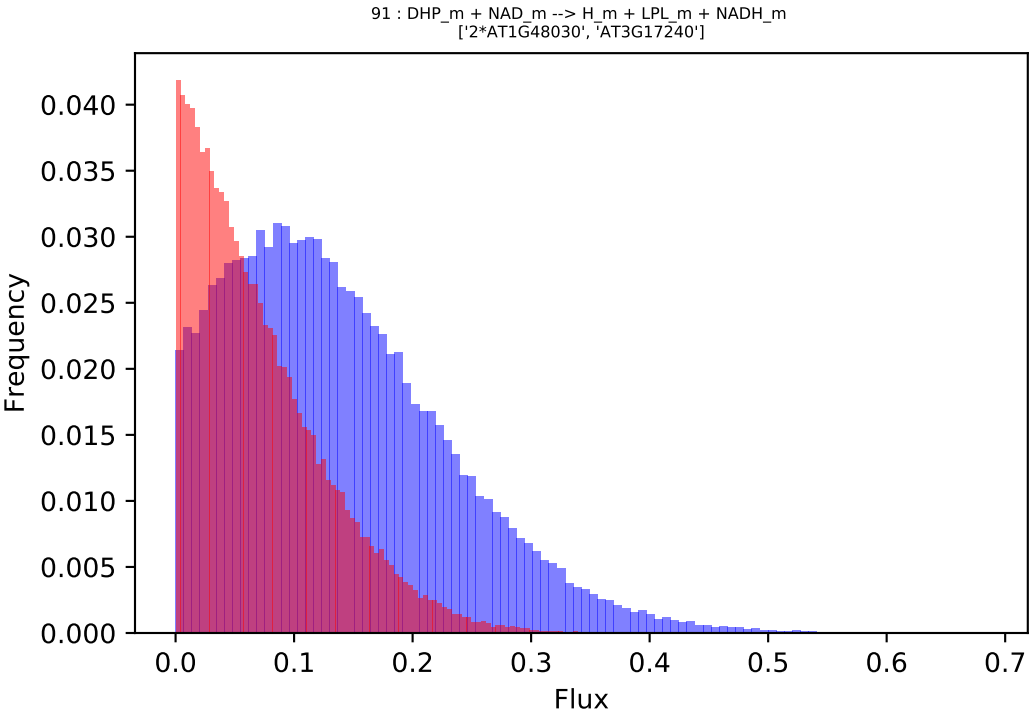

86 : GCA_p + O2_p --> GLX_p + H2O2_p
['AT4G18360', 'AT3G14415', 'AT3G14150', 'AT3G14420']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Flux

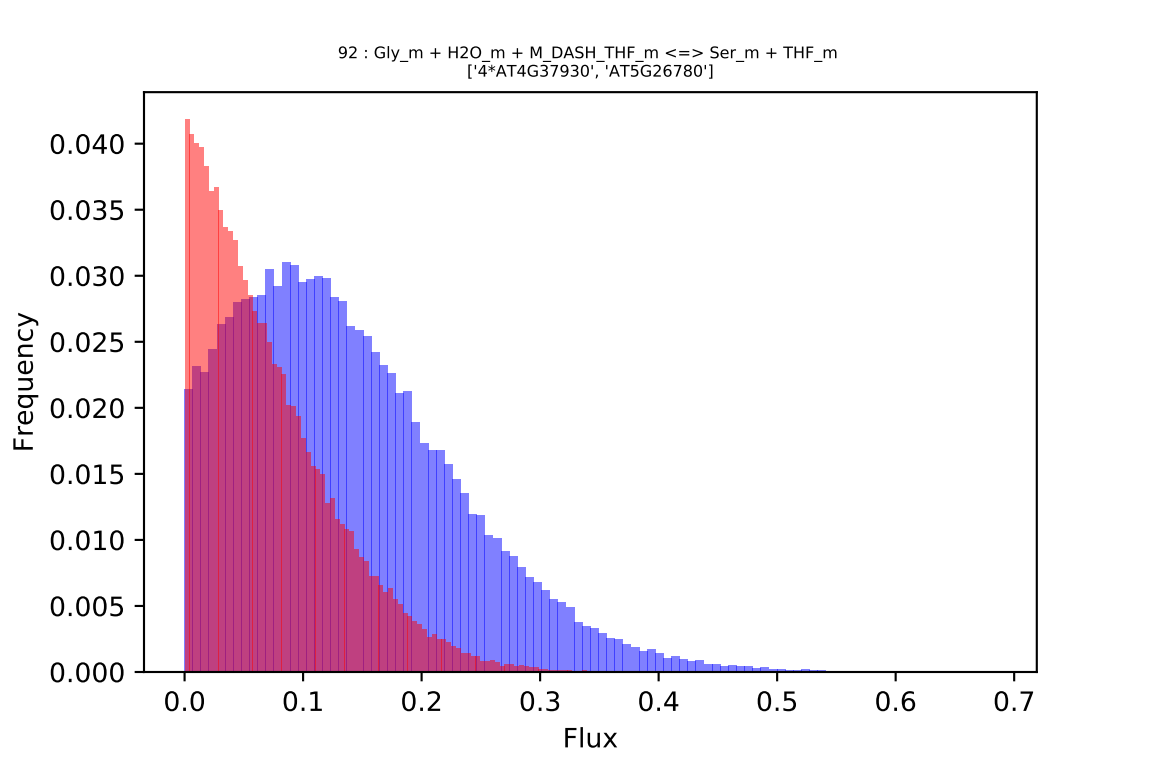

87 : 2.0 H2O2_p --> 2.0 H2O_p + O2_p
['4*AT1G20620', 'AT1G20630', 'AT4G35090']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Flux

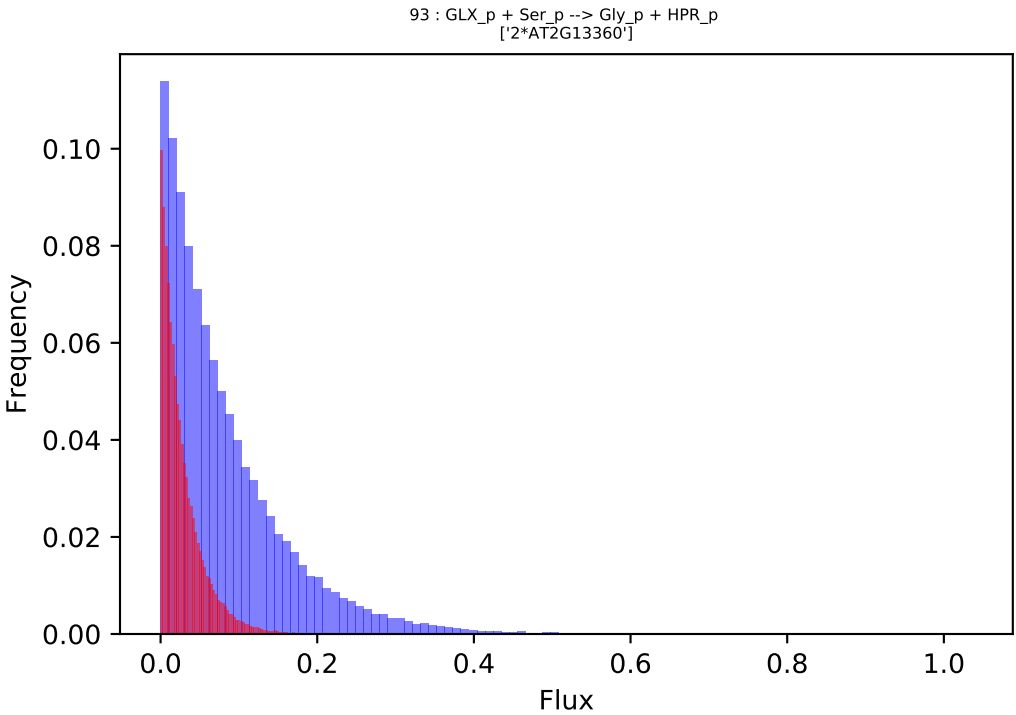

88 : GLX_p + Glu_p --> Gly_p + KG_p
['AT1G70580', 'AT1G23310']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.0
0.2
0.4
0.6
0.8
1.0
Flux

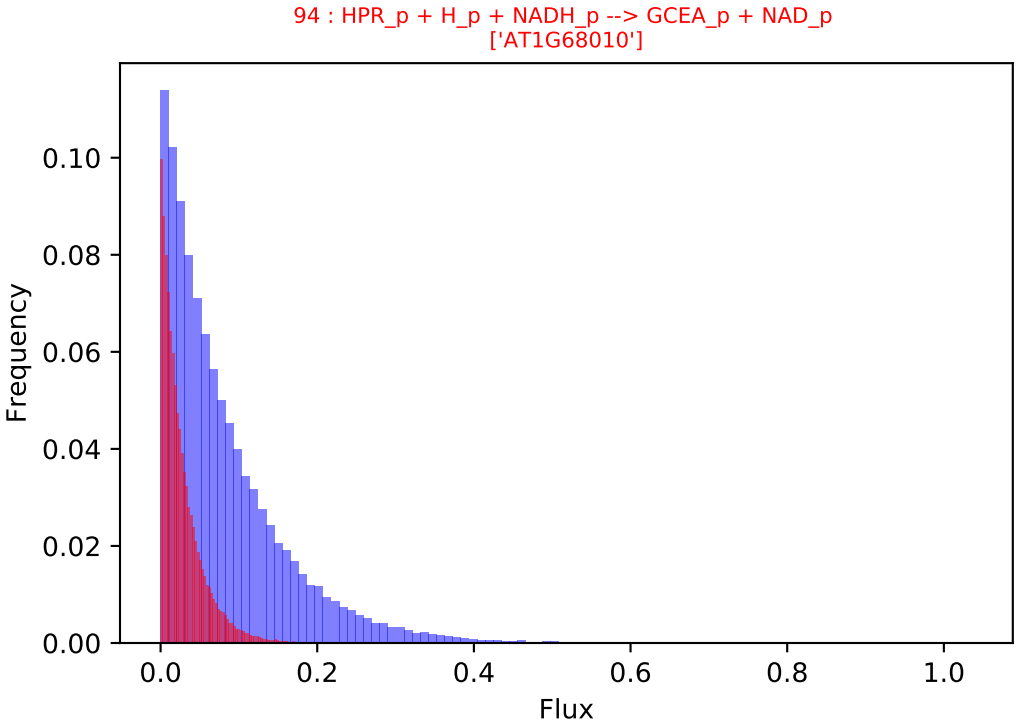

89 : Gly_m + H_m + LPL_m --> CO2_m + amDHP_m
['AT2G26080', '2*AT4G33010']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Flux

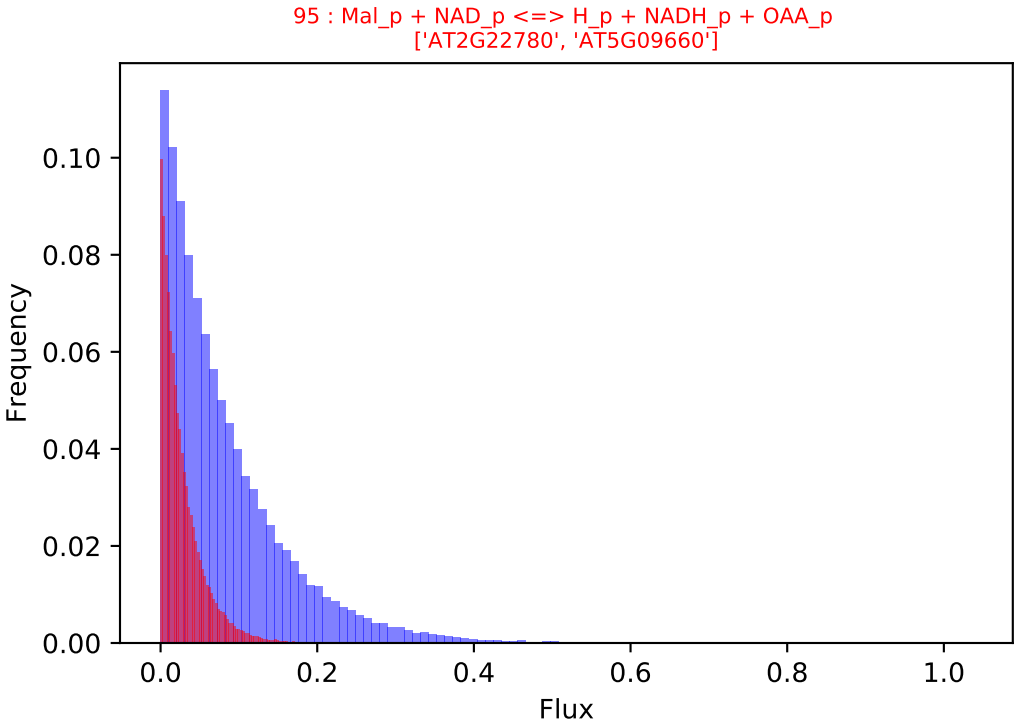

90 : THF_m + amDHP_m --> DHP_m + M_DASH_THF_m + NH4_m
['AT1G11860']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Flux

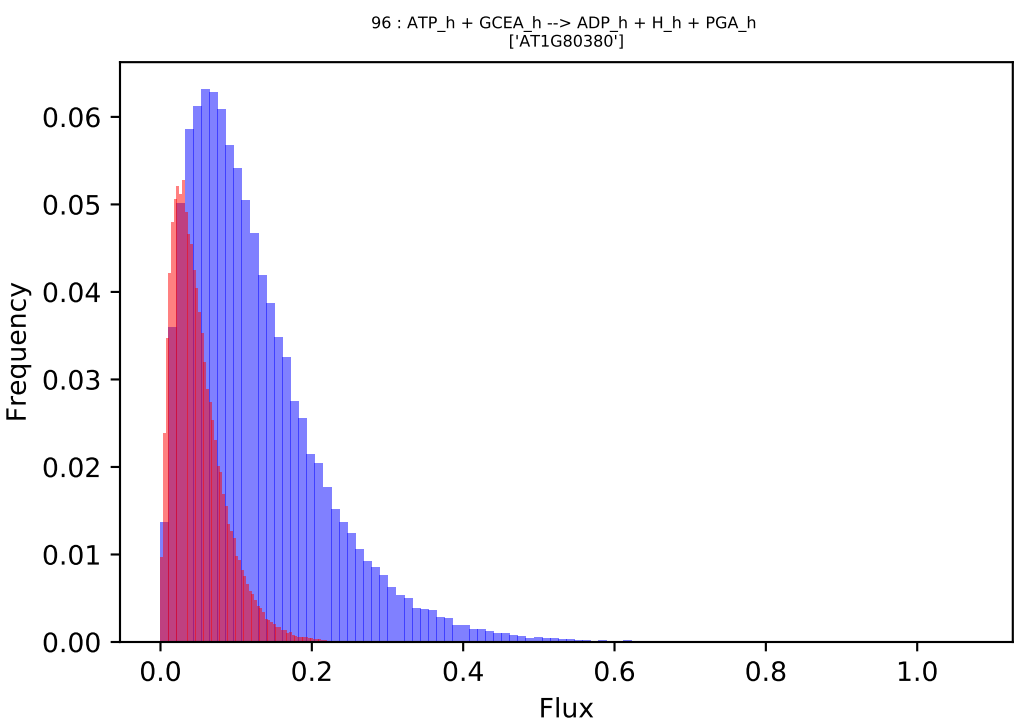

91 : DHP_m + NAD_m --> H_m + LPL_m + NADH_m
['2*AT1G48030', 'AT3G17240']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Flux

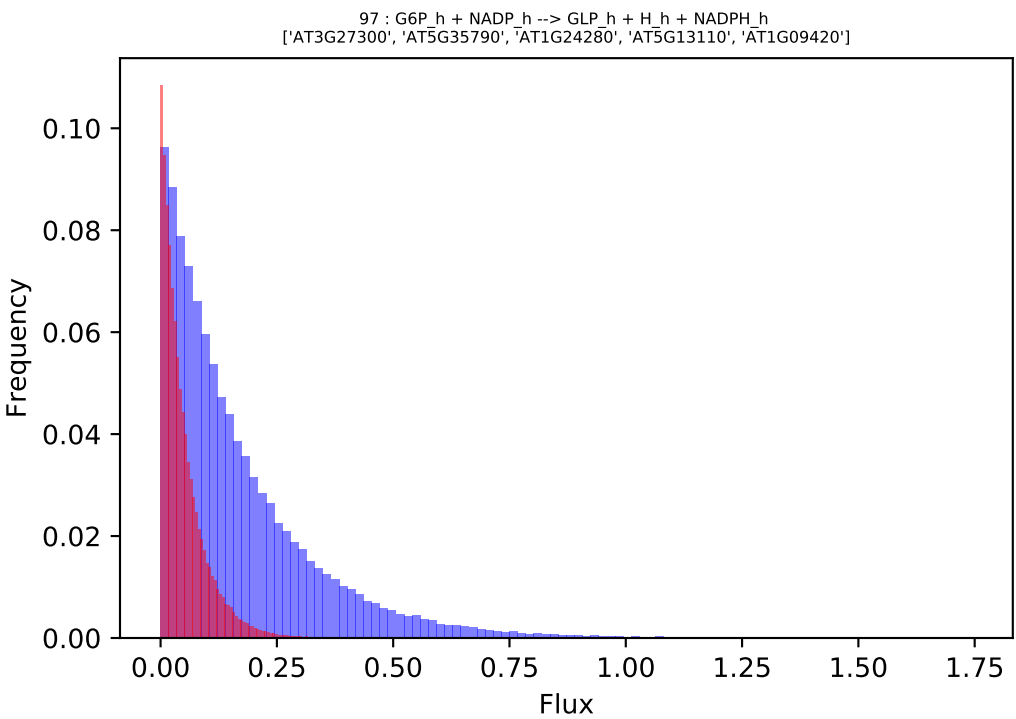

92 : Gly_m + H2O_m + M_DASH_THF_m <=> Ser_m + THF_m
['4*AT4G37930', 'AT5G26780']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Flux

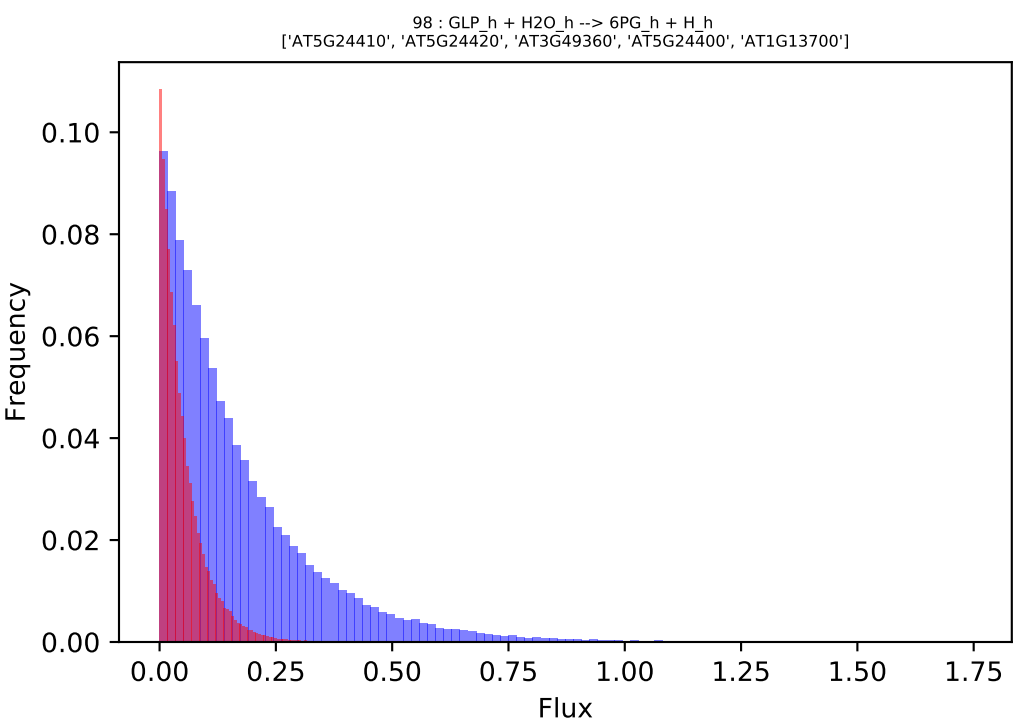

93 : GLX_p + Ser_p --> Gly_p + HPR_p
['2*AT2G13360']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.0
0.2
0.4
0.6
0.8
1.0
Flux

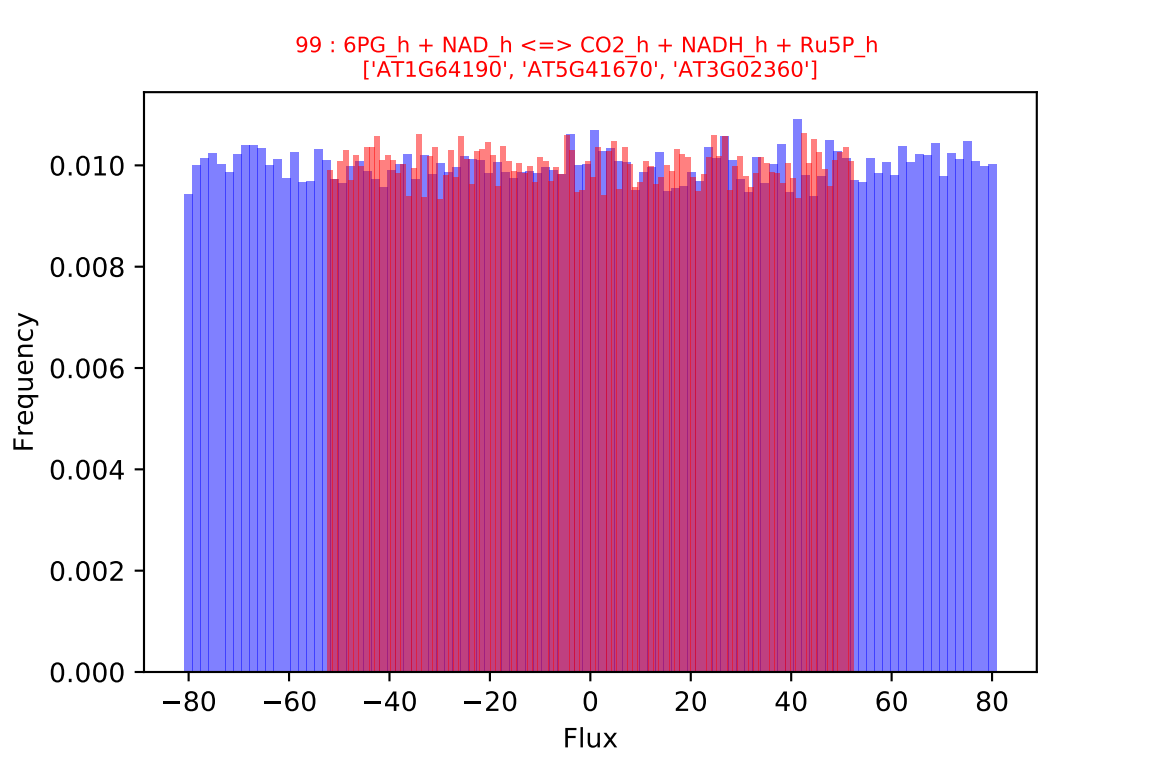

94 : HPR_p + H_p + NADH_p --> GCEA_p + NAD_p
['AT1G68010']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.0
0.2
0.4
0.6
0.8
1.0
Flux

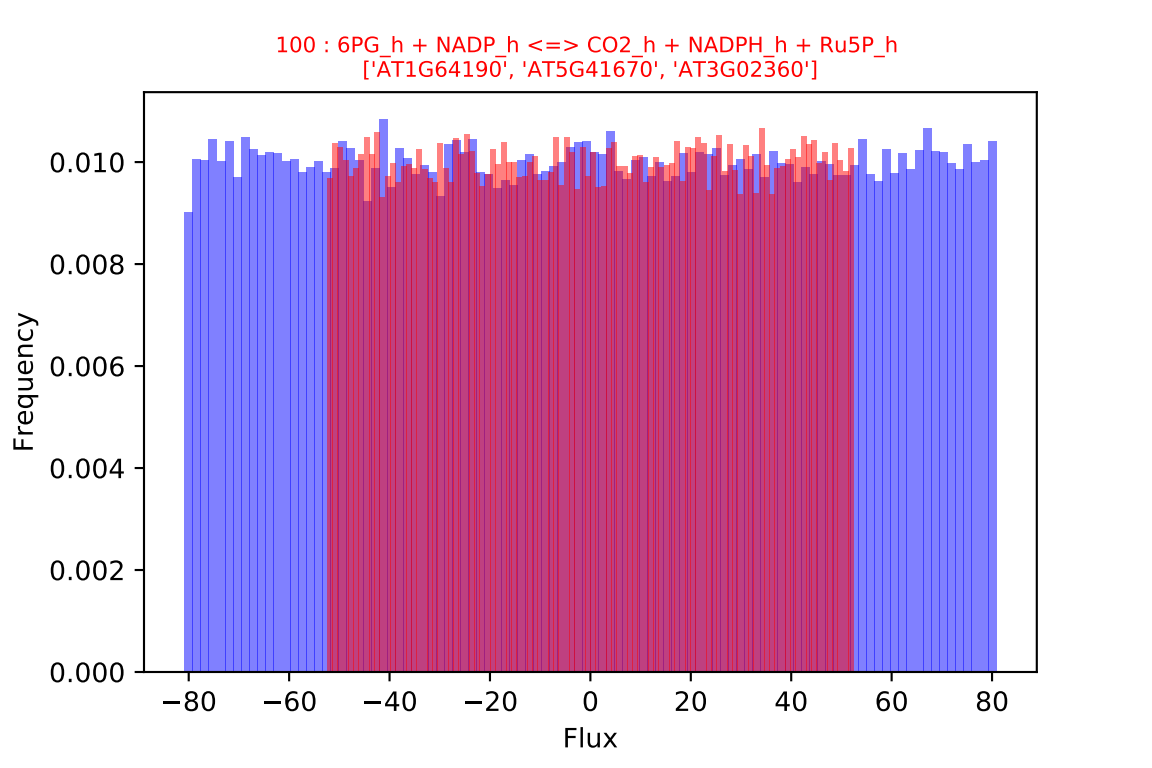

95 : Mal_p + NAD_p <=> H_p + NADH_p + OAA_p
['AT2G22780', 'AT5G09660']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.0
0.2
0.4
0.6
0.8
1.0
Flux

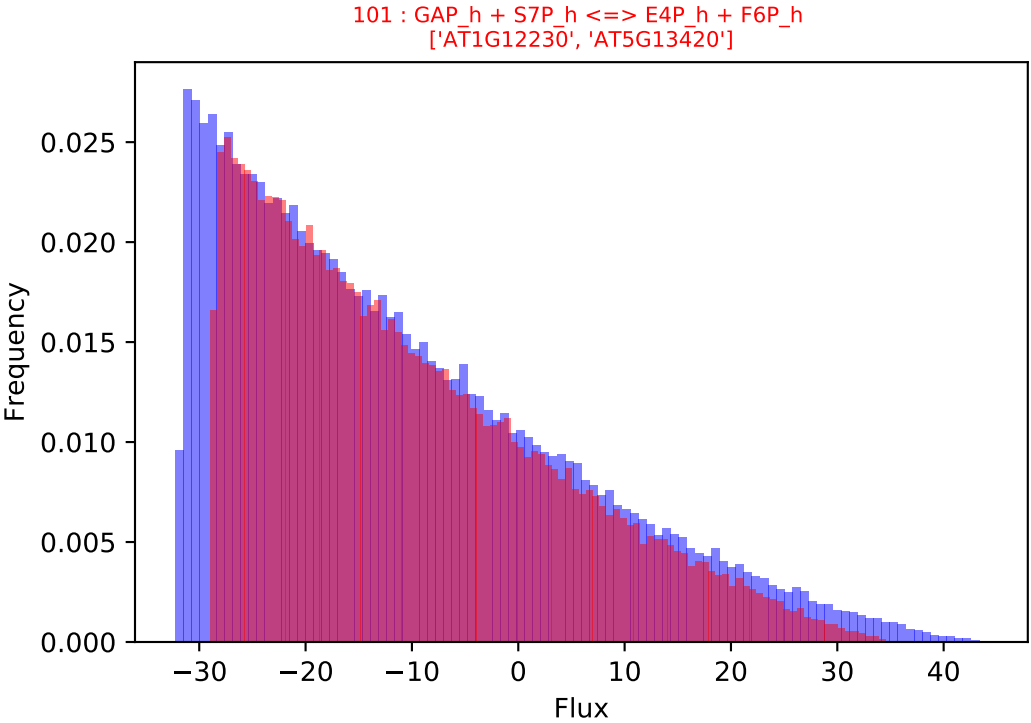

96 : ATP_h + GCEA_h --> ADP_h + H_h + PGA_h
['AT1G80380']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.2
0.4
0.6
0.8
1.0
Flux

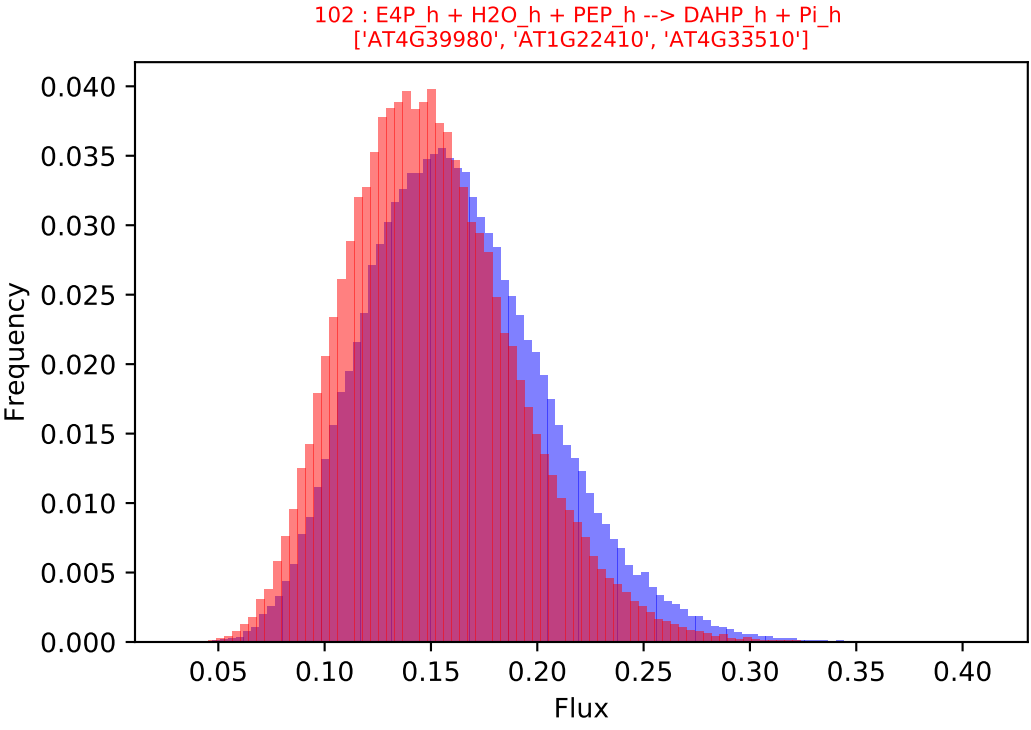

97 : G6P_h + NADP_h --> GLP_h + H_h + NADPH_h
['AT3G27300', 'AT5G35790', 'AT1G24280', 'AT5G13110', 'AT1G09420']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

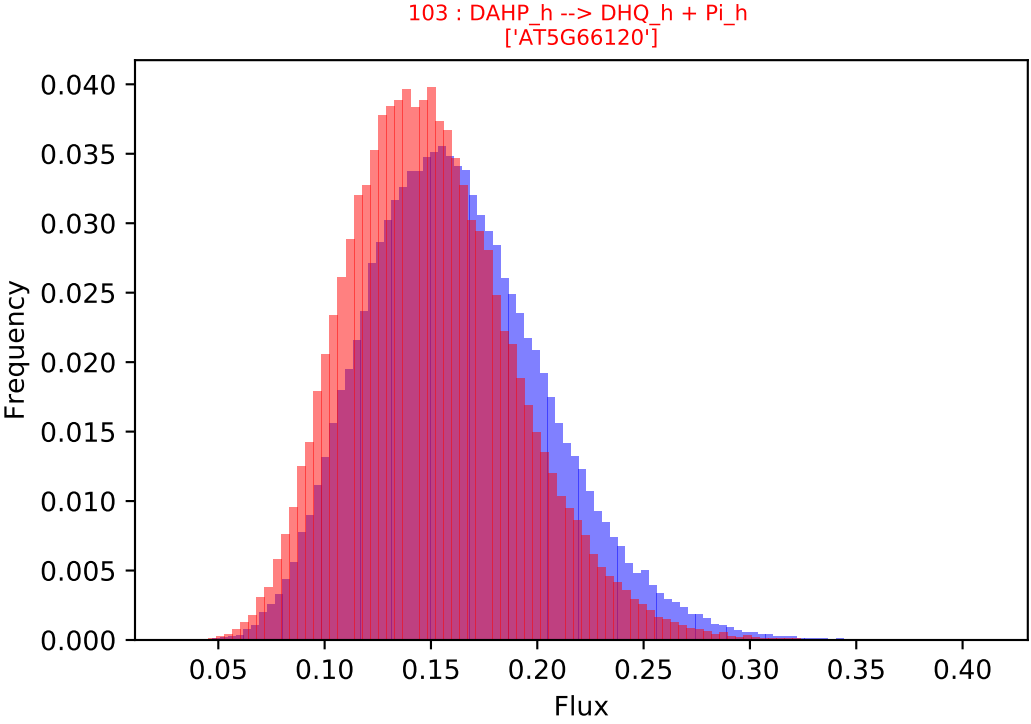

98 : GLP_h + H2O_h --> 6PG_h + H_h
['AT5G24410', 'AT5G24420', 'AT3G49360', 'AT5G24400', 'AT1G13700']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

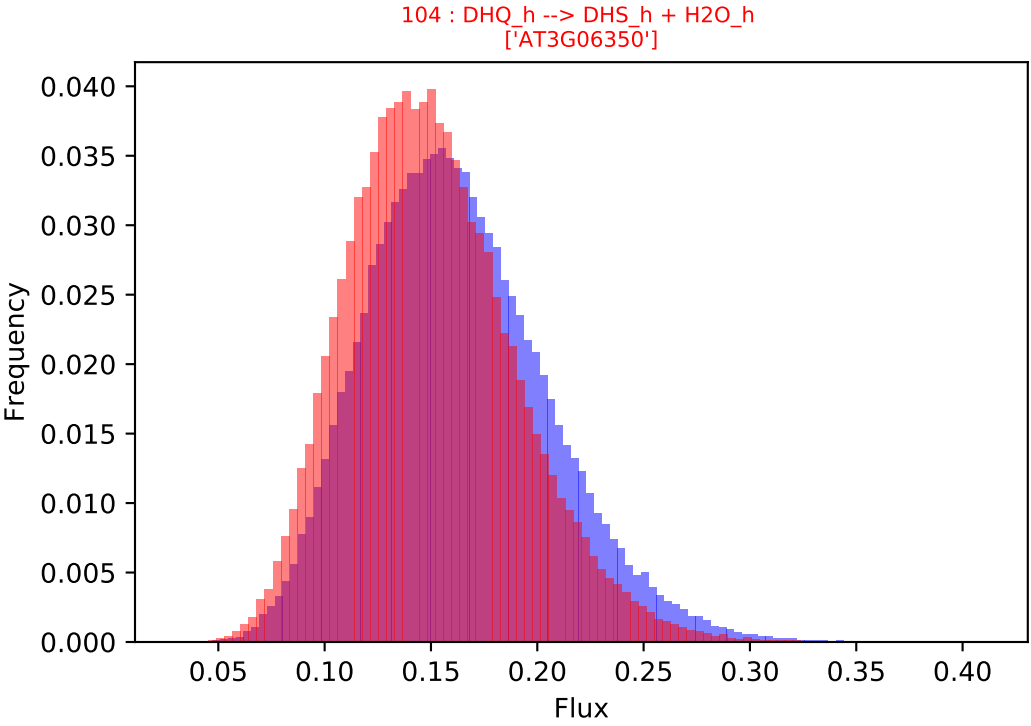

99 : 6PG_h + NAD_h <=> CO2_h + NADH_h + Ru5P_h
['AT1G64190', 'AT5G41670', 'AT3G02360']
Frequency
0.010
0.008
0.006
0.004
0.002
0.000
−80
−60
−40
−20
0
20
40
60
80
Flux

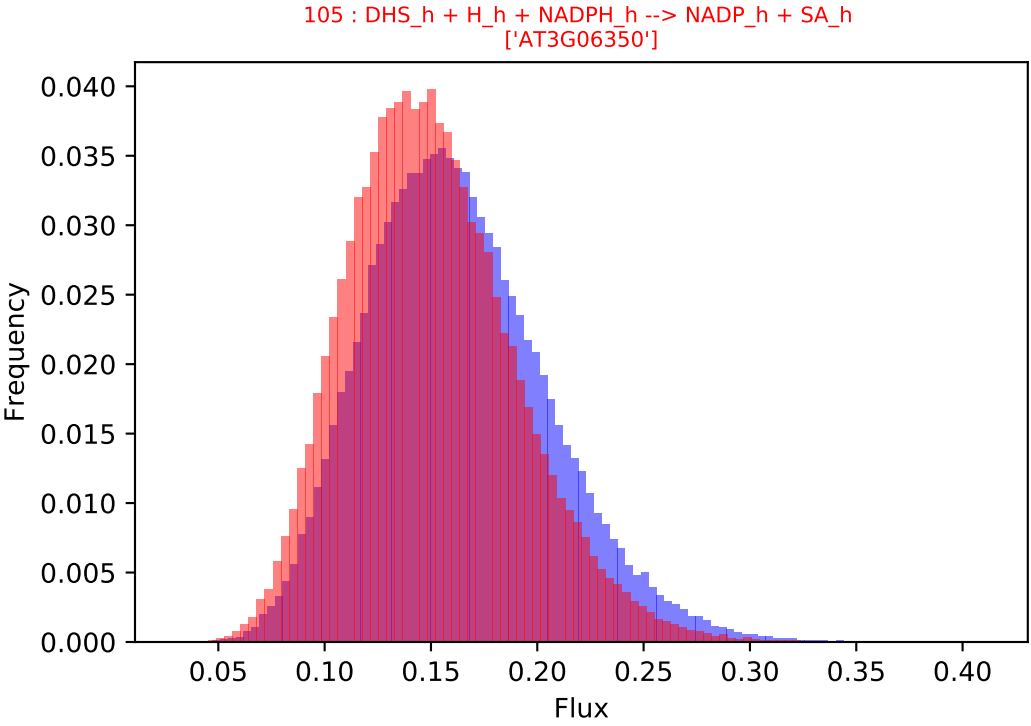

100 : 6PG_h + NADP_h <=> CO2_h + NADPH_h + Ru5P_h
['AT1G64190', 'AT5G41670', 'AT3G02360']
Frequency
0.010
0.008
0.006
0.004
0.002
0.000
−80
−60
−40
−20
0
20
40
60
80
Flux

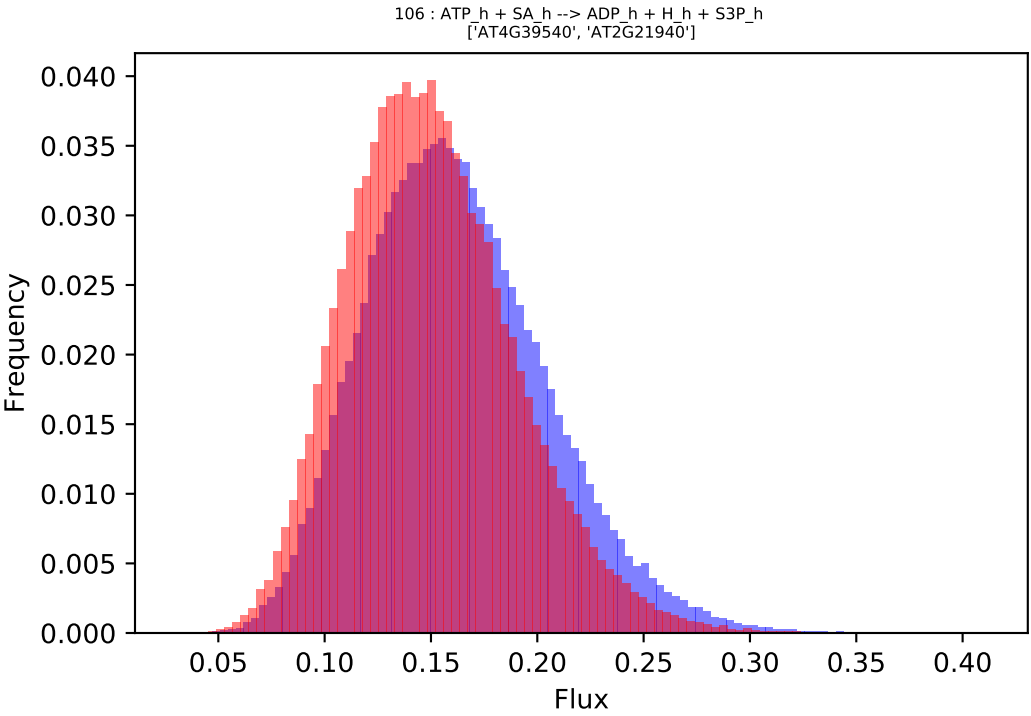

101 : GAP_h + S7P_h <=> E4P_h + F6P_h
['AT1G12230', 'AT5G13420']
Frequency
0.025
0.020
0.015
0.010
0.005
0.000
−30
−20
−10
0
10
20
30
40
Flux

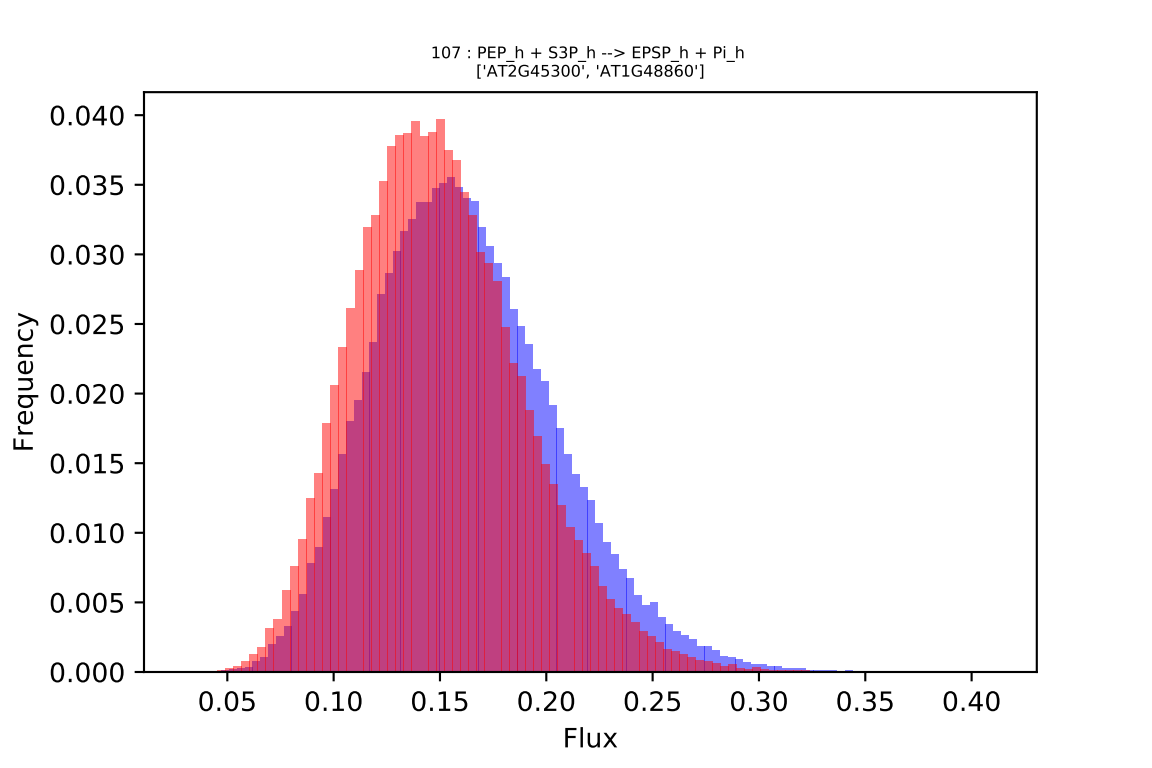

102 : E4P_h + H2O_h + PEP_h --> DAHP_h + Pi_h
['AT4G39980', 'AT1G22410', 'AT4G33510']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
Flux

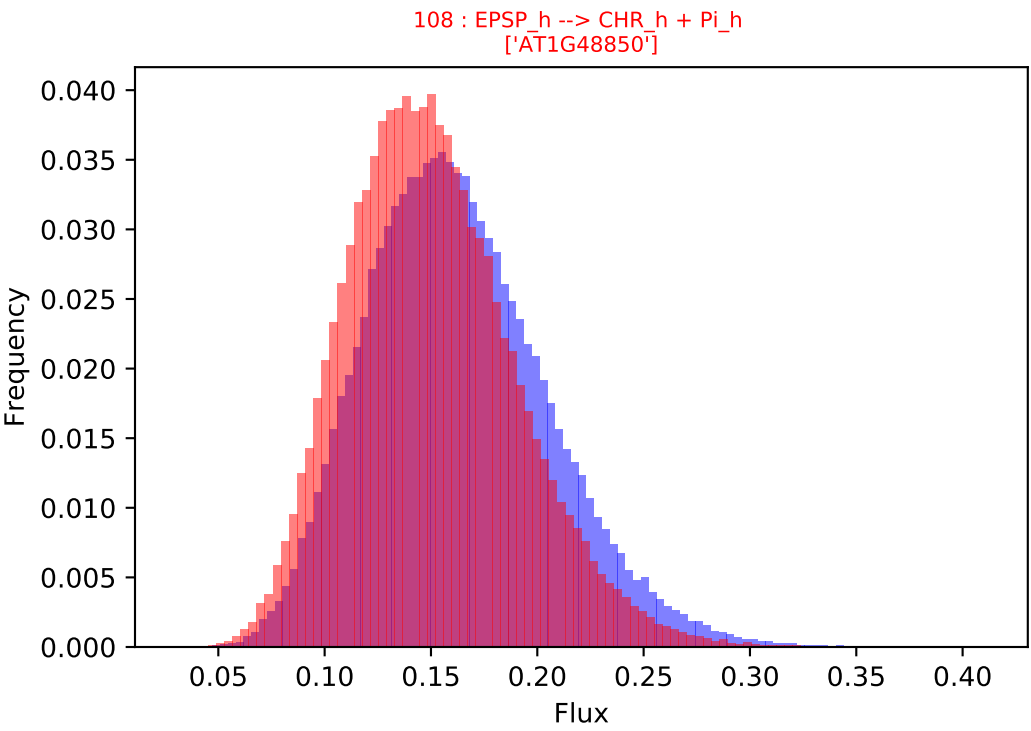

103 : DAHP_h --> DHQ_h + Pi_h
['AT5G66120']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
Flux

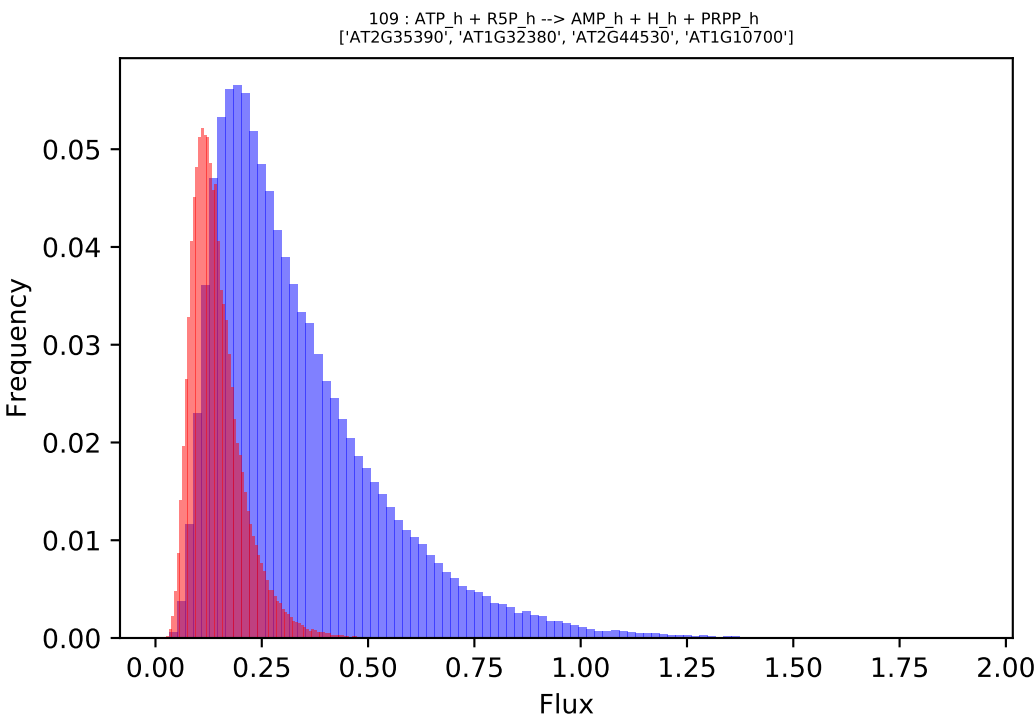

104 : DHQ_h --> DHS_h + H2O_h
['AT3G06350']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
Flux

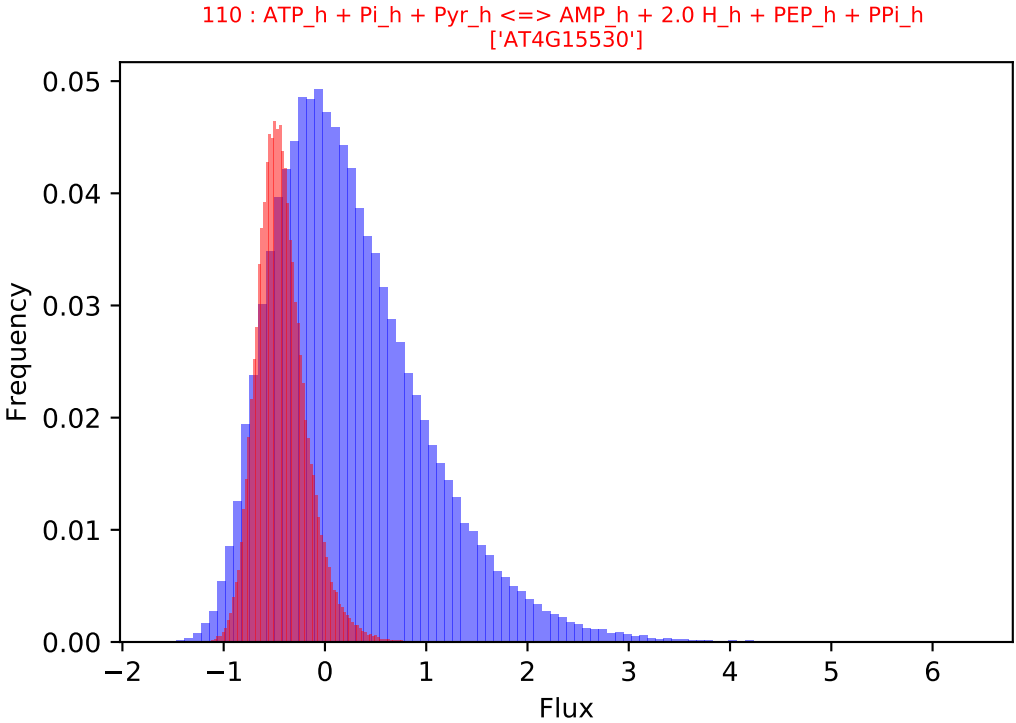

105 : DHS_h + H_h + NADPH_h --> NADP_h + SA_h
['AT3G06350']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
Flux

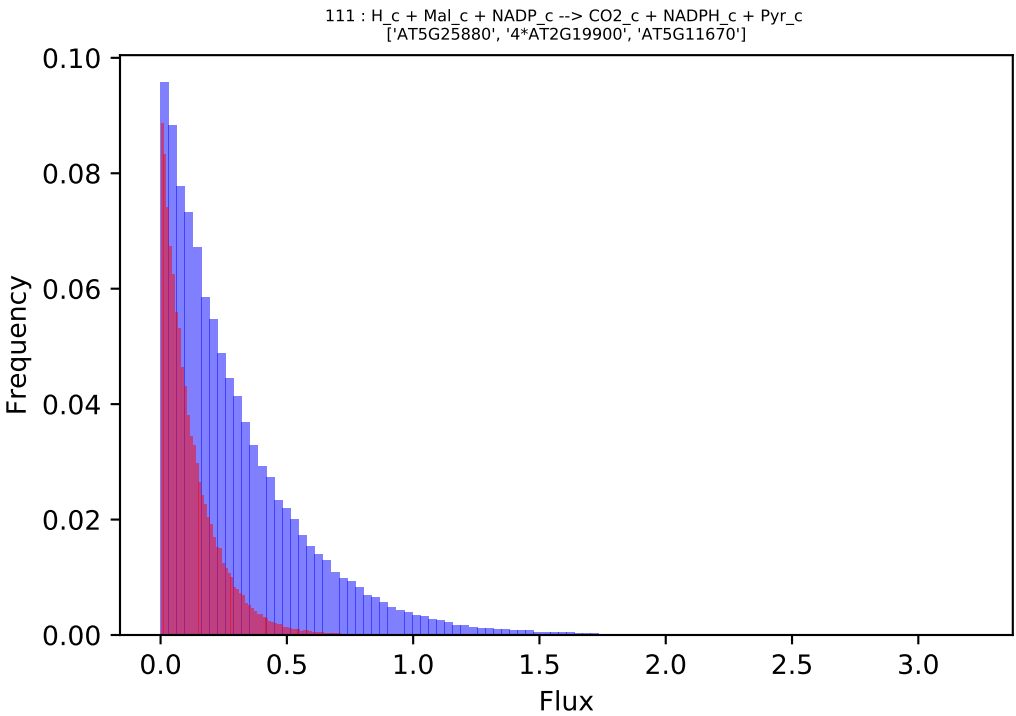

106 : ATP_h + SA_h --> ADP_h + H_h + S3P_h
['AT4G39540', 'AT2G21940']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
Flux

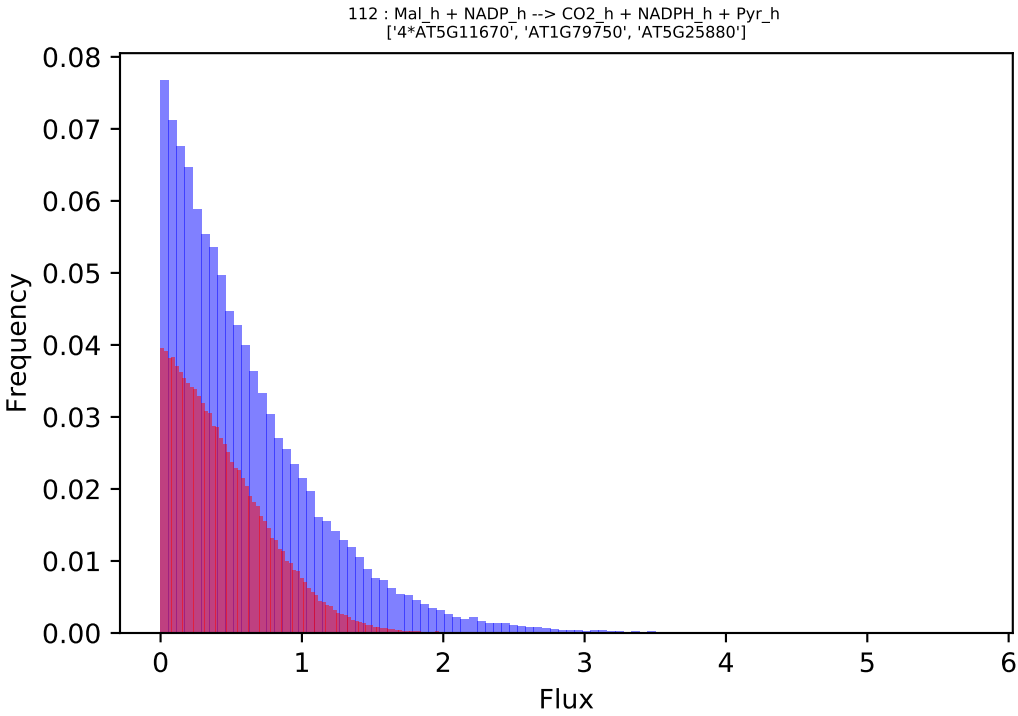

107 : PEP_h + S3P_h --> EPSP_h + Pi_h
['AT2G45300', 'AT1G48860']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
Flux

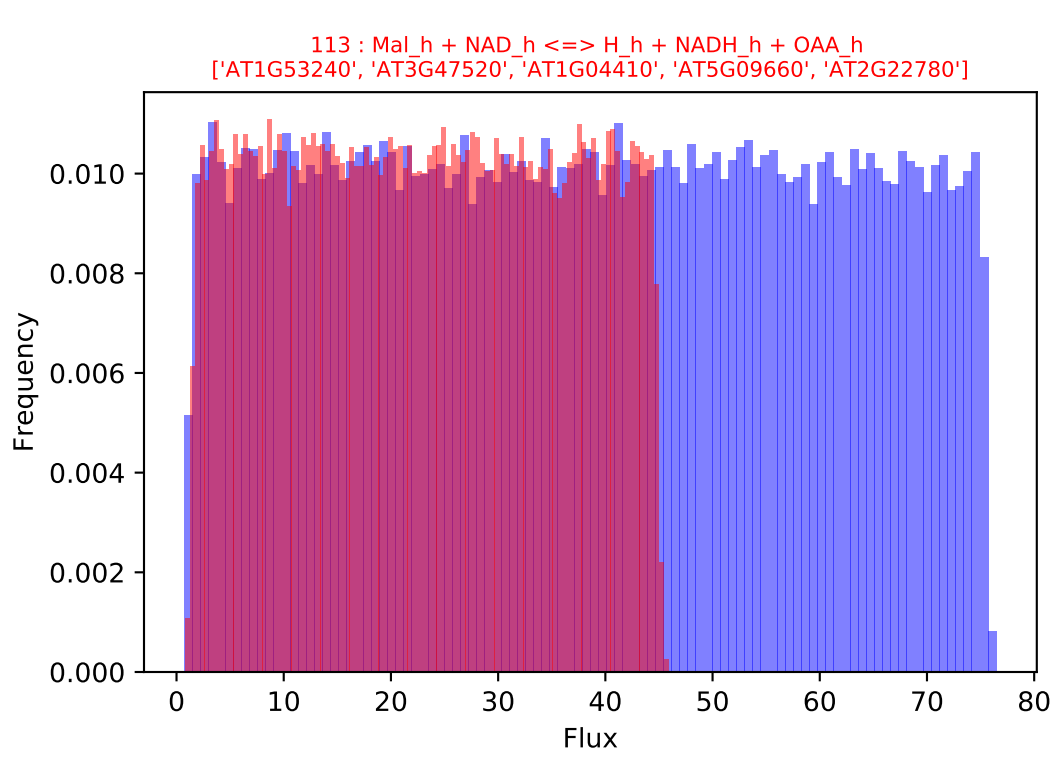

108 : EPSP_h --> CHR_h + Pi_h
['AT1G48850']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
Flux

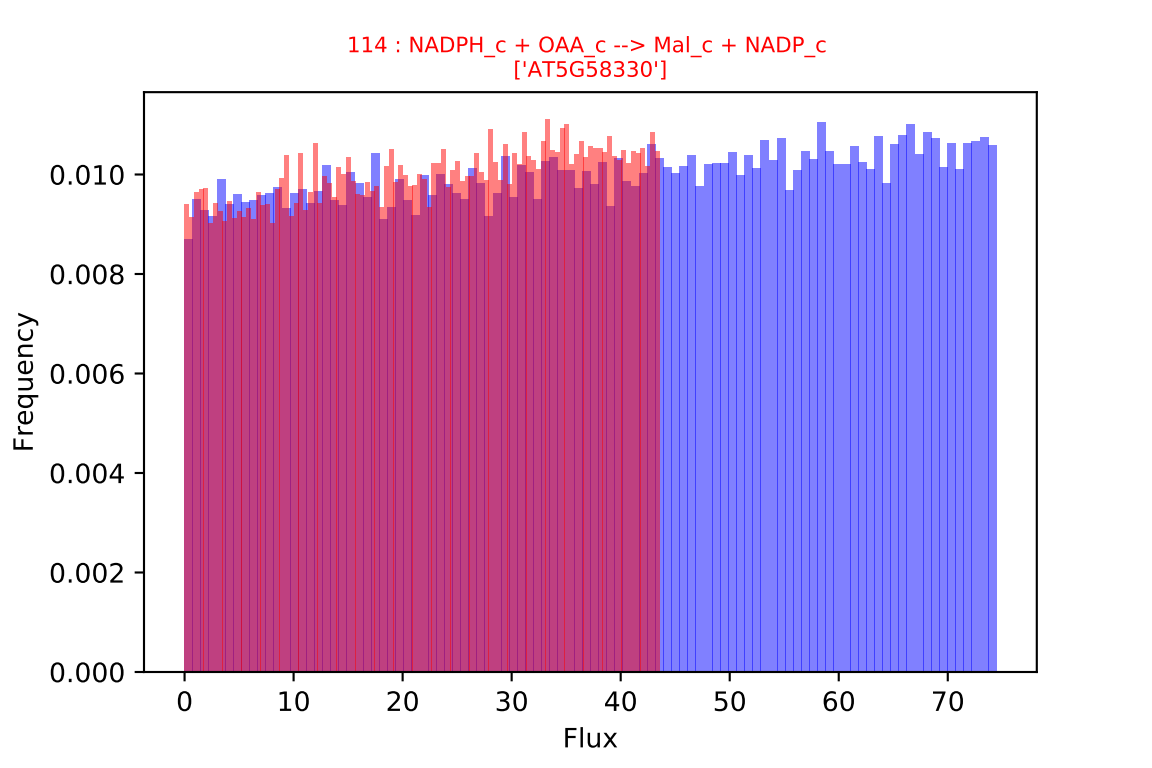

109 : ATP_h + R5P_h --> AMP_h + H_h + PRPP_h
['AT2G35390', 'AT1G32380', 'AT2G44530', 'AT1G10700']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
2.00
Flux

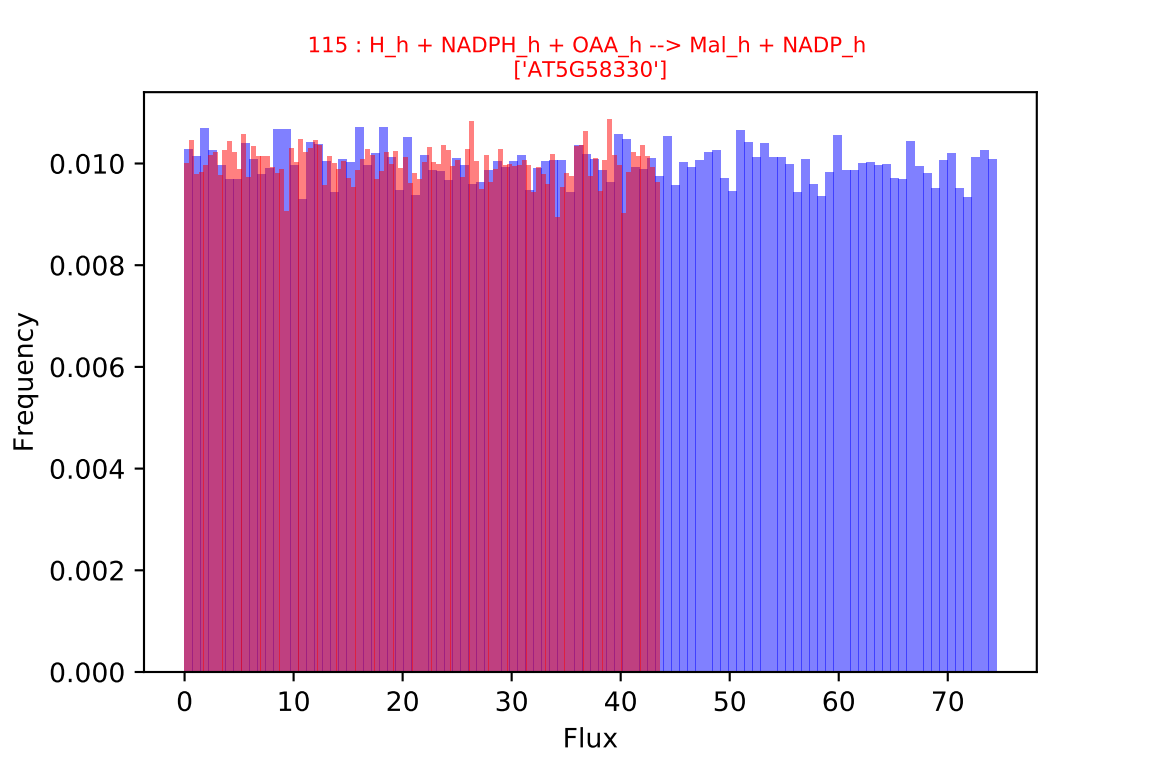

110 : ATP_h + Pi_h + Pyr_h <=> AMP_h + 2.0 H_h + PEP_h + PPi_h
['AT4G15530']
Frequency
0.05
0.04
0.03
0.02
0.01
0.00
−2
−1
0
1
2
3
4
5
6
Flux

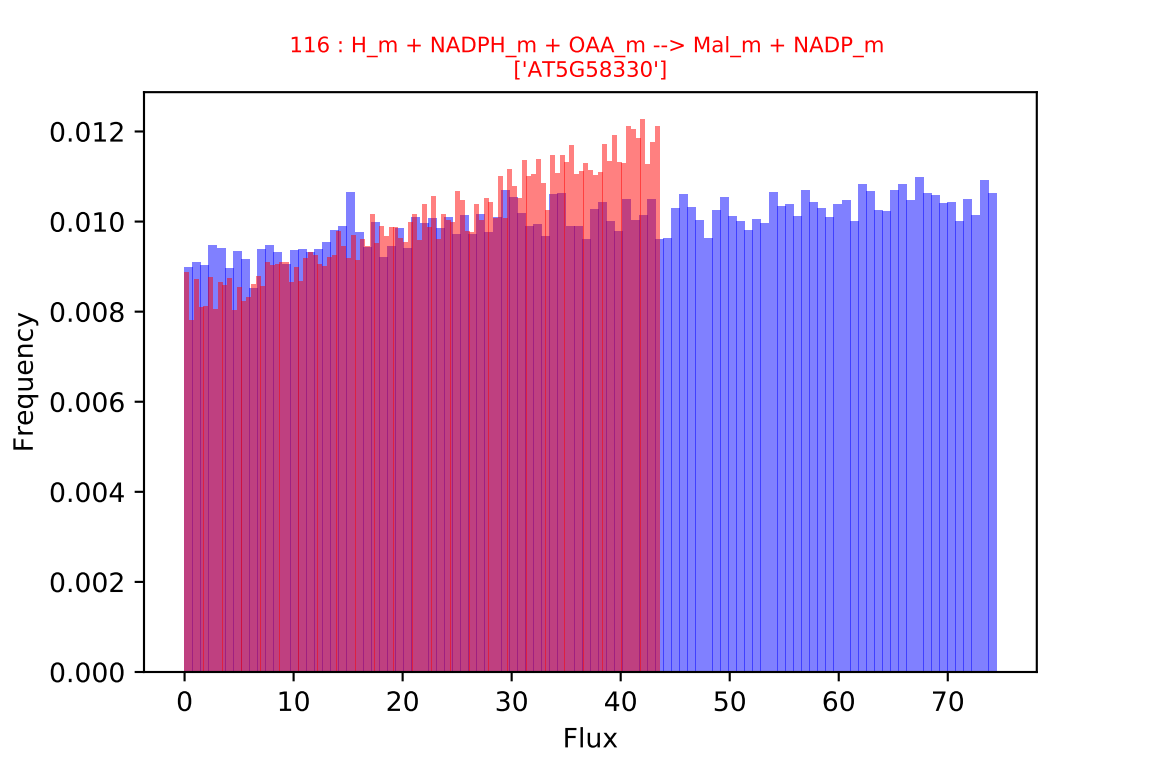

111 : H_c + Mal_c + NADP_c --> CO2_c + NADPH_c + Pyr_c
['AT5G25880', '4*AT2G19900', 'AT5G11670']
Frequency
0.10
0.08
0.06
0.04
0.02
0.00
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Flux

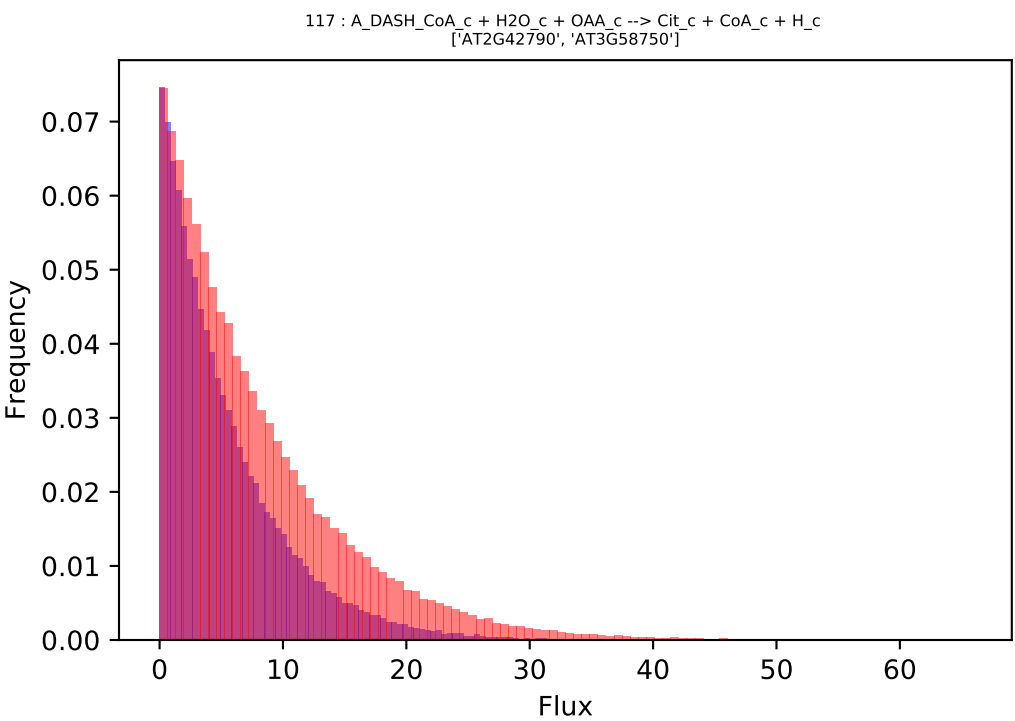

112 : Mal_h + NADP_h --> CO2_h + NADPH_h + Pyr_h
['4*AT5G11670', 'AT1G79750', 'AT5G25880']
Frequency
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0
1
2
3
4
5
6
Flux

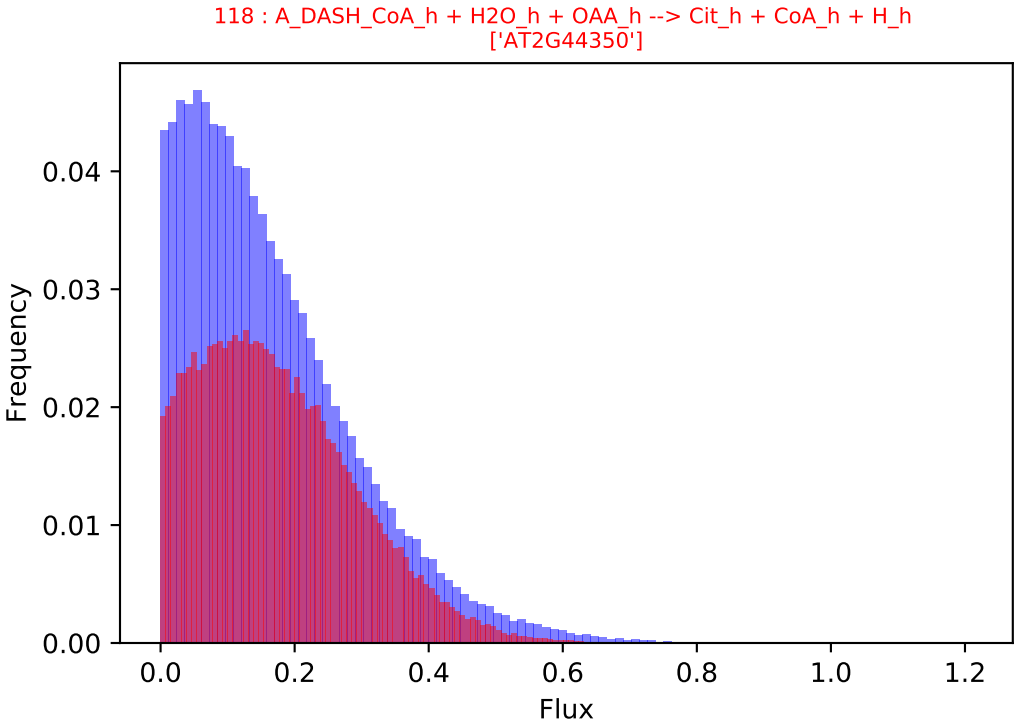

113 : Mal_h + NAD_h <=> H_h + NADH_h + OAA_h
['AT1G53240', 'AT3G47520', 'AT1G04410', 'AT5G09660', 'AT2G22780']
Frequency
0.000
0.002
0.004
0.006
0.008
0.010
0
10
20
30
40
50
60
70
80
Flux

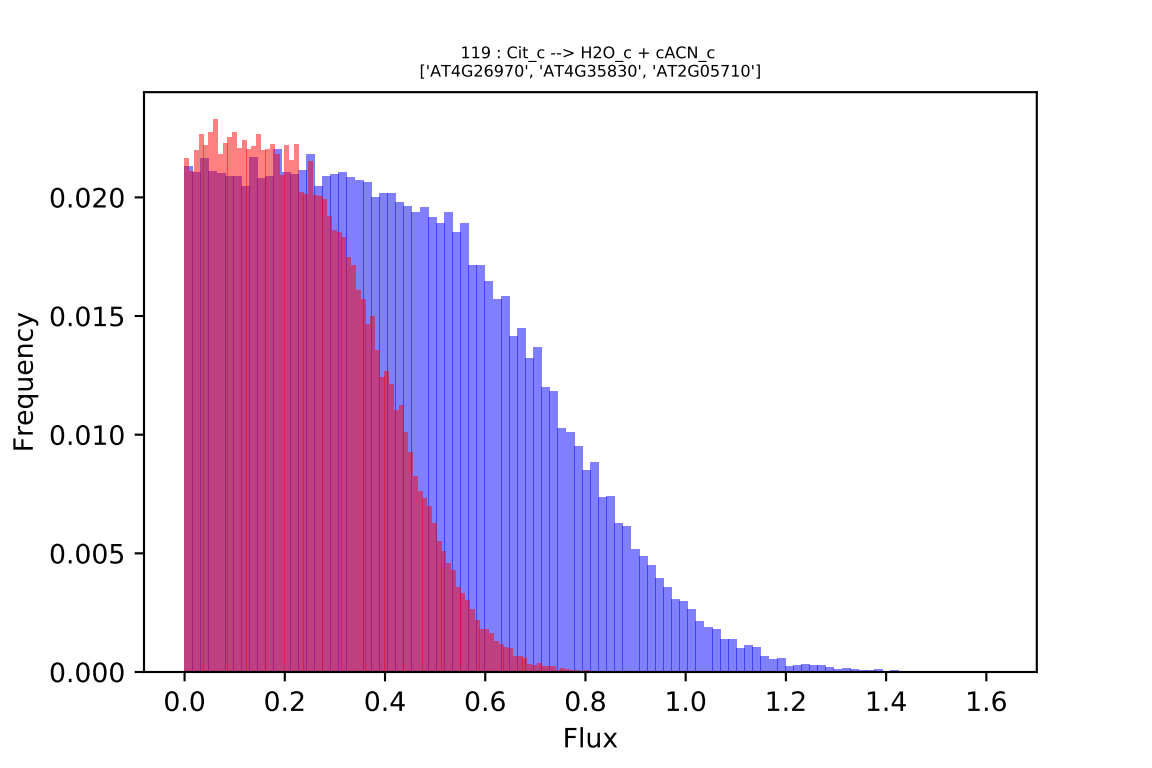

114 : NADPH_c + OAA_c --> Mal_c + NADP_c
['AT5G58330']
Frequency
0.000
0.002
0.004
0.006
0.008
0.010
0
10
20
30
40
50
60
70
Flux

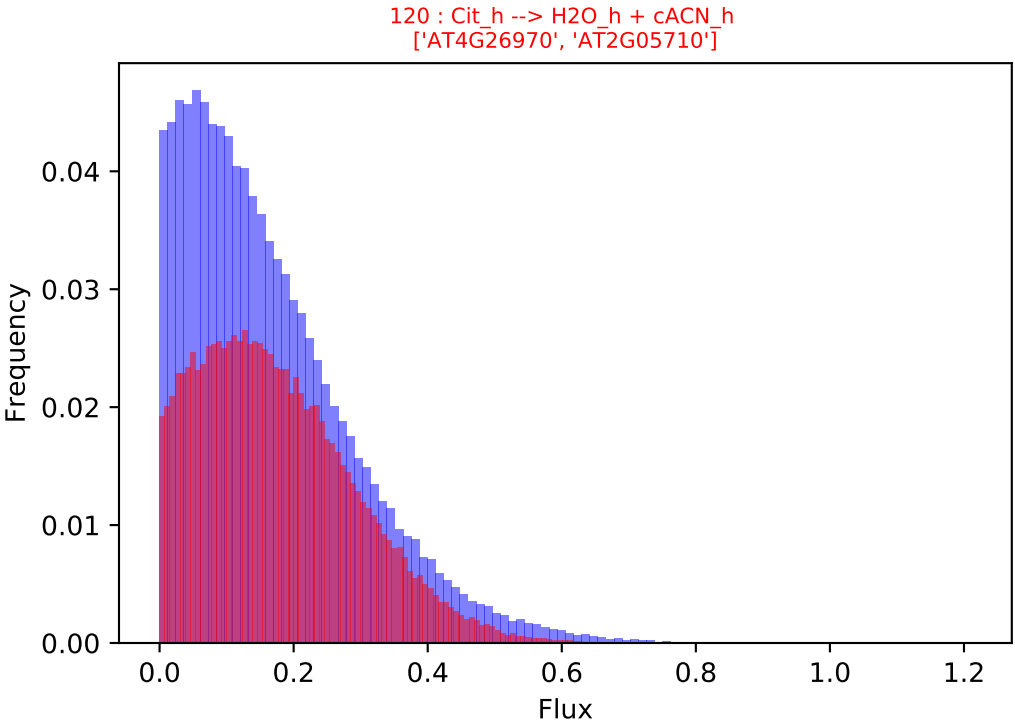

115 : H_h + NADPH_h + OAA_h --> Mal_h + NADP_h
['AT5G58330']
Frequency
0.000
0.002
0.004
0.006
0.008
0.010
0
10
20
30
40
50
60
70
Flux

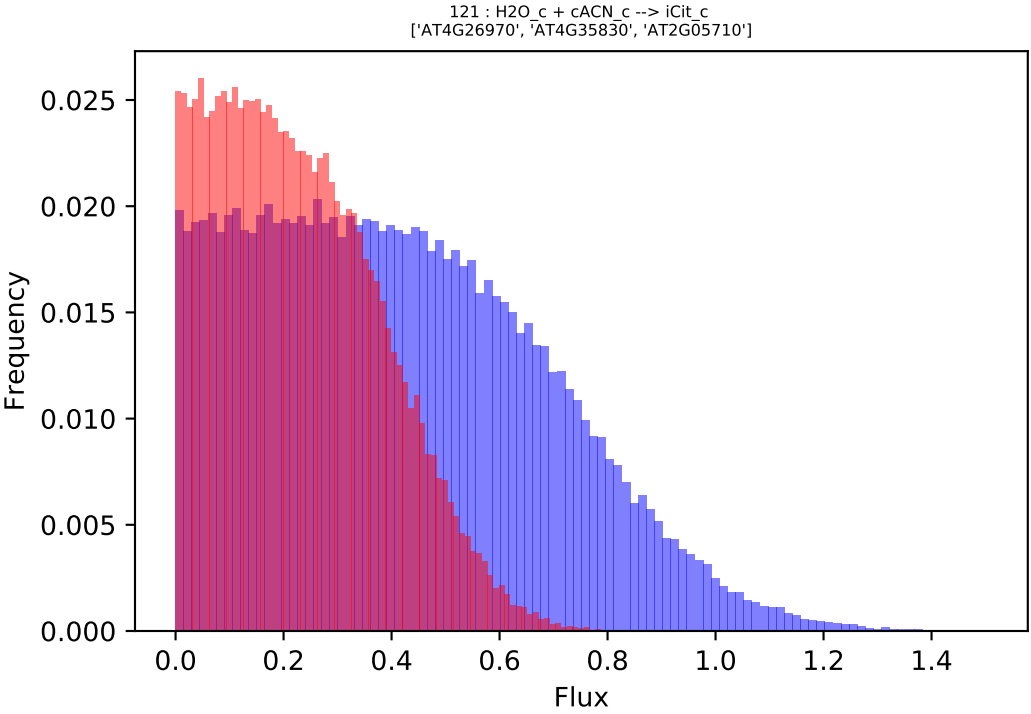

116 : H_m + NADPH_m + OAA_m --> Mal_m + NADP_m
['AT5G58330']
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
0
10
20
30
40
50
60
70
Flux

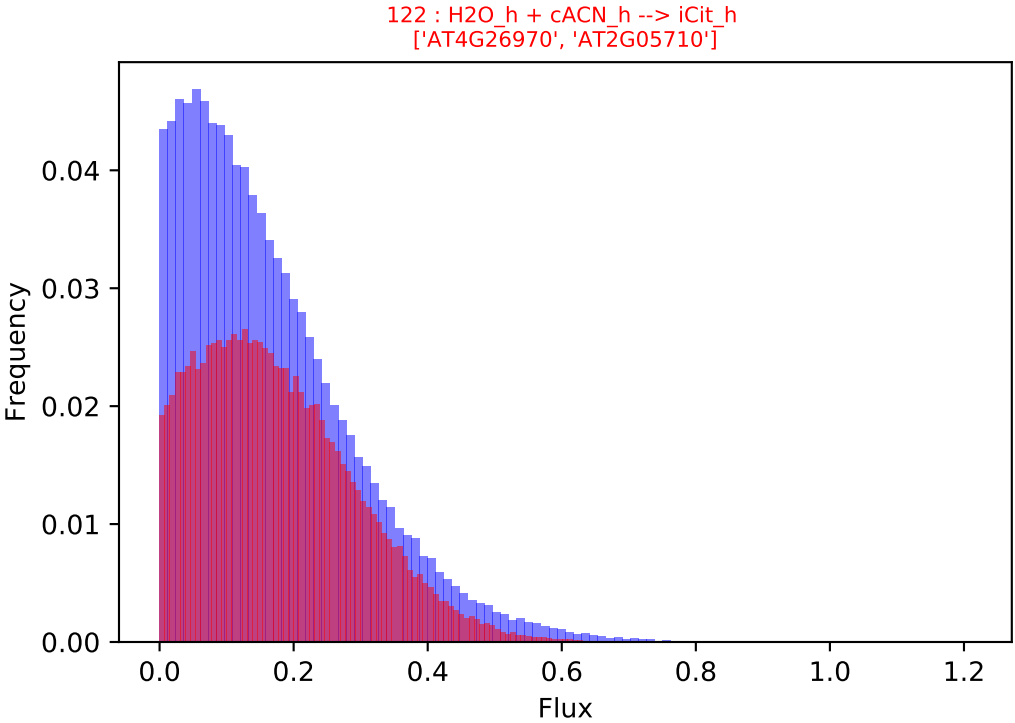

117 : A_DASH_CoA_c + H2O_c + OAA_c --> Cit_c + CoA_c + H_c
['AT2G42790', 'AT3G58750']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0
10
20
30
40
50
60
Flux

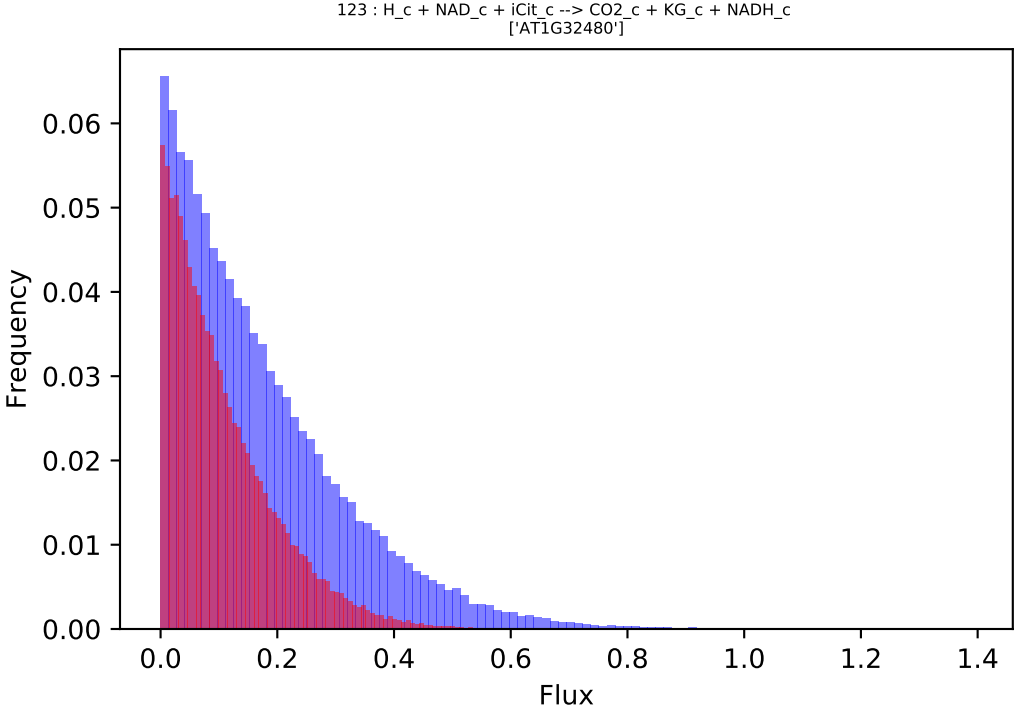

118 : A_DASH_CoA_h + H2O_h + OAA_h --> Cit_h + CoA_h + H_h
['AT2G44350']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Flux

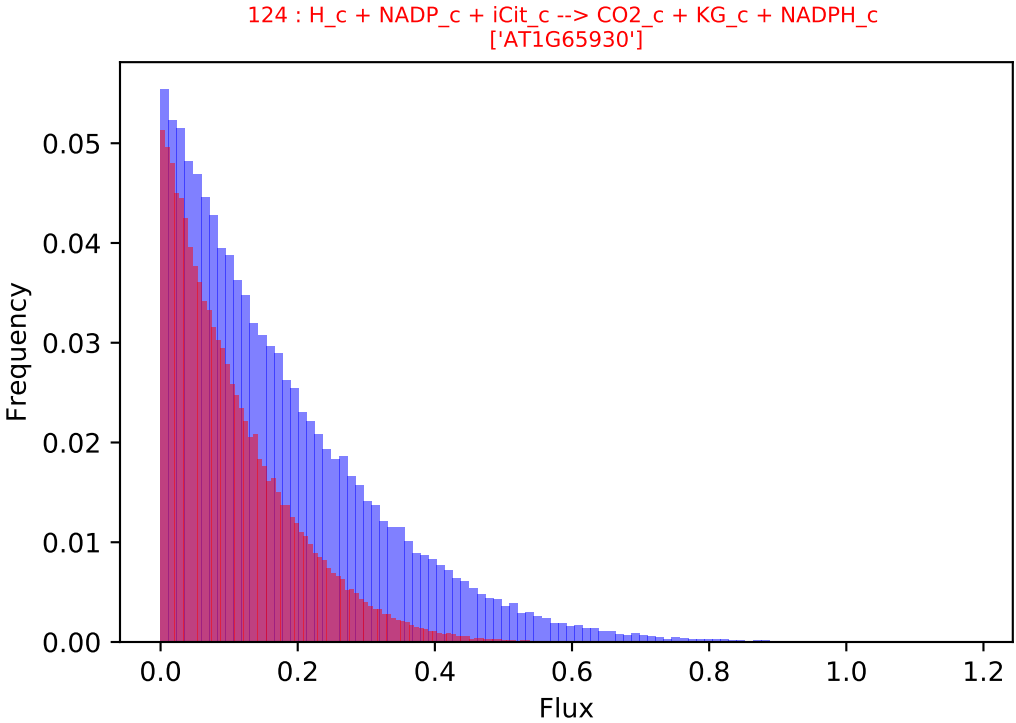

119 : Cit_c --> H2O_c + cACN_c
['AT4G26970', 'AT4G35830', 'AT2G05710']
Frequency
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Flux

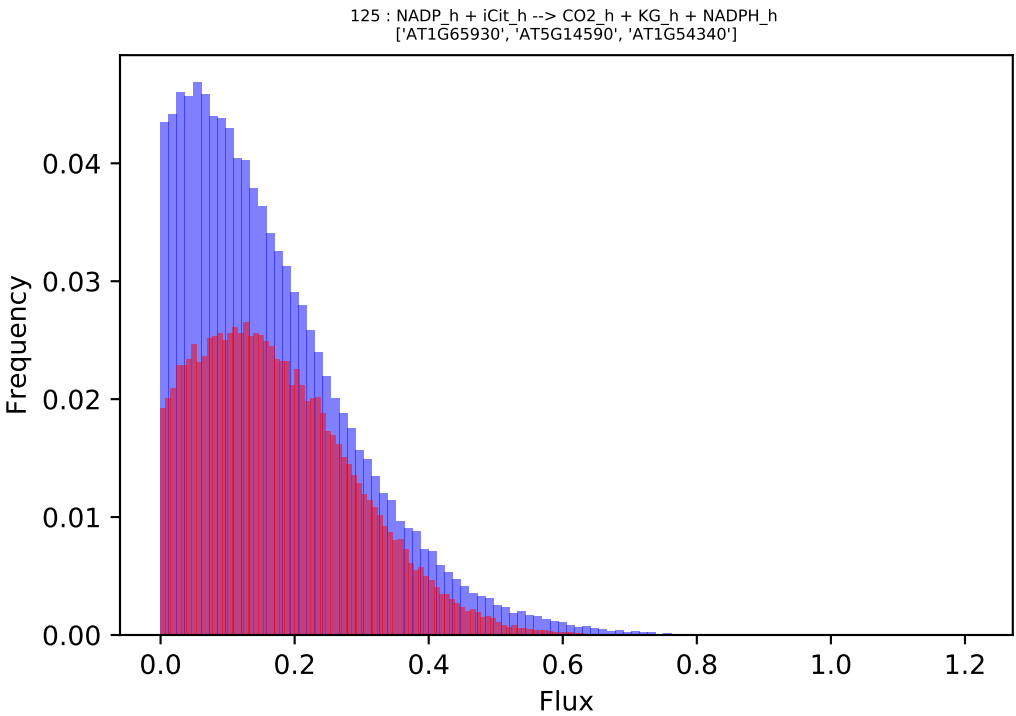

120 : Cit_h --> H2O_h + cACN_h
['AT4G26970', 'AT2G05710']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Flux

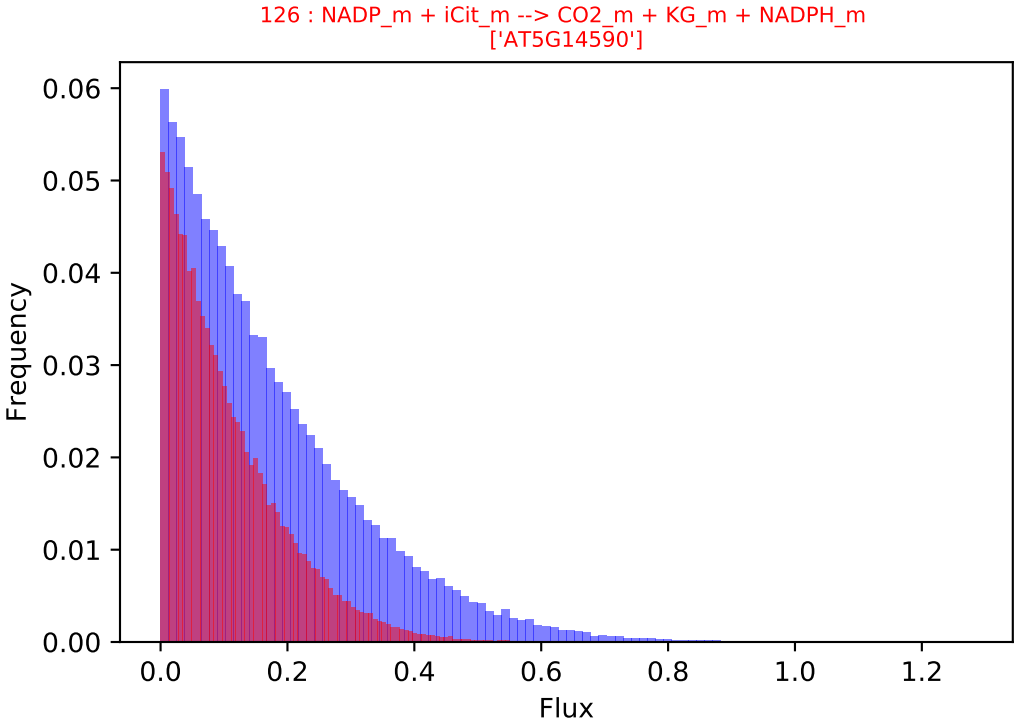

121 : H2O_c + cACN_c --> iCit_c
['AT4G26970', 'AT4G35830', 'AT2G05710']
Frequency
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

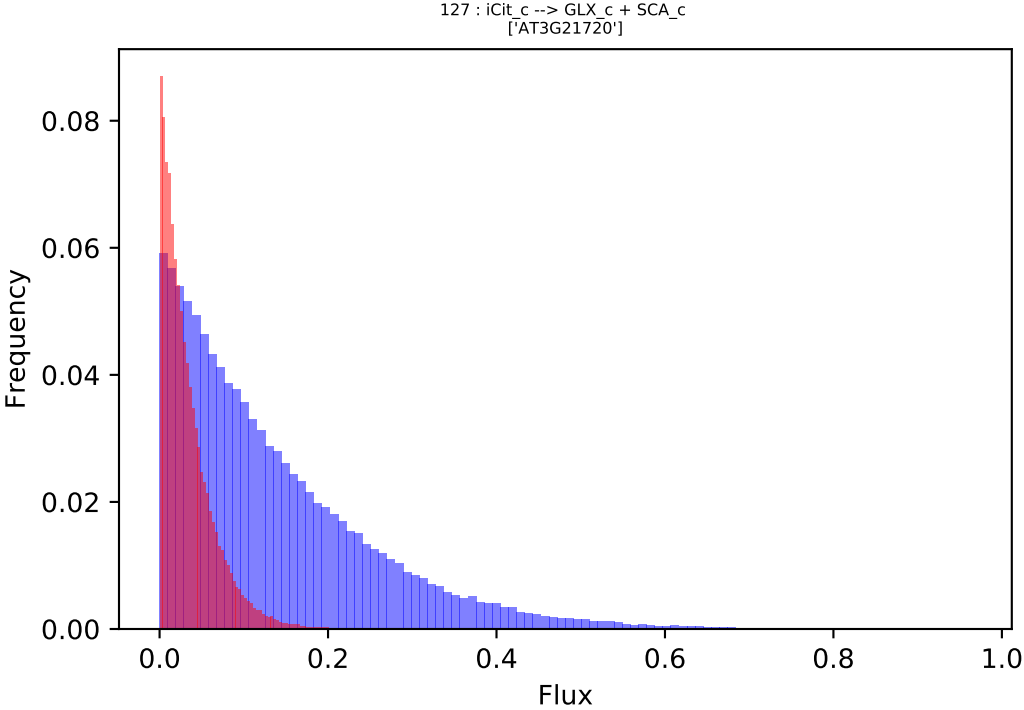

122 : H2O_h + cACN_h --> iCit_h
['AT4G26970', 'AT2G05710']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Flux

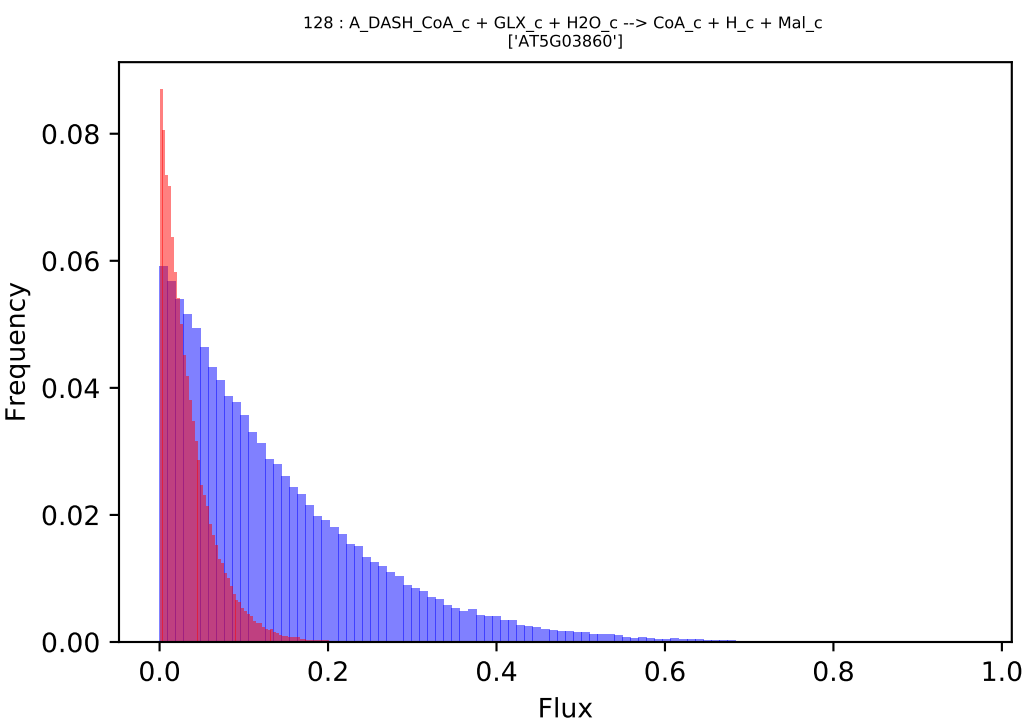

123 : H_c + NAD_c + iCit_c --> CO2_c + KG_c + NADH_c
['AT1G32480']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

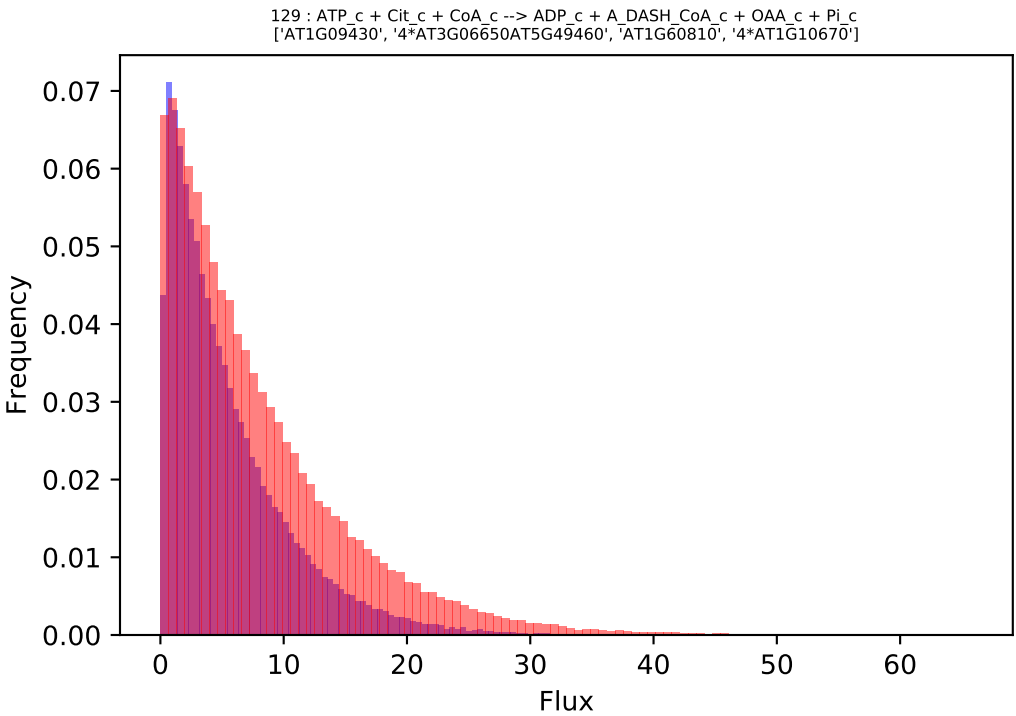

124 : H_c + NADP_c + iCit_c --> CO2_c + KG_c + NADPH_c
['AT1G65930']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Flux

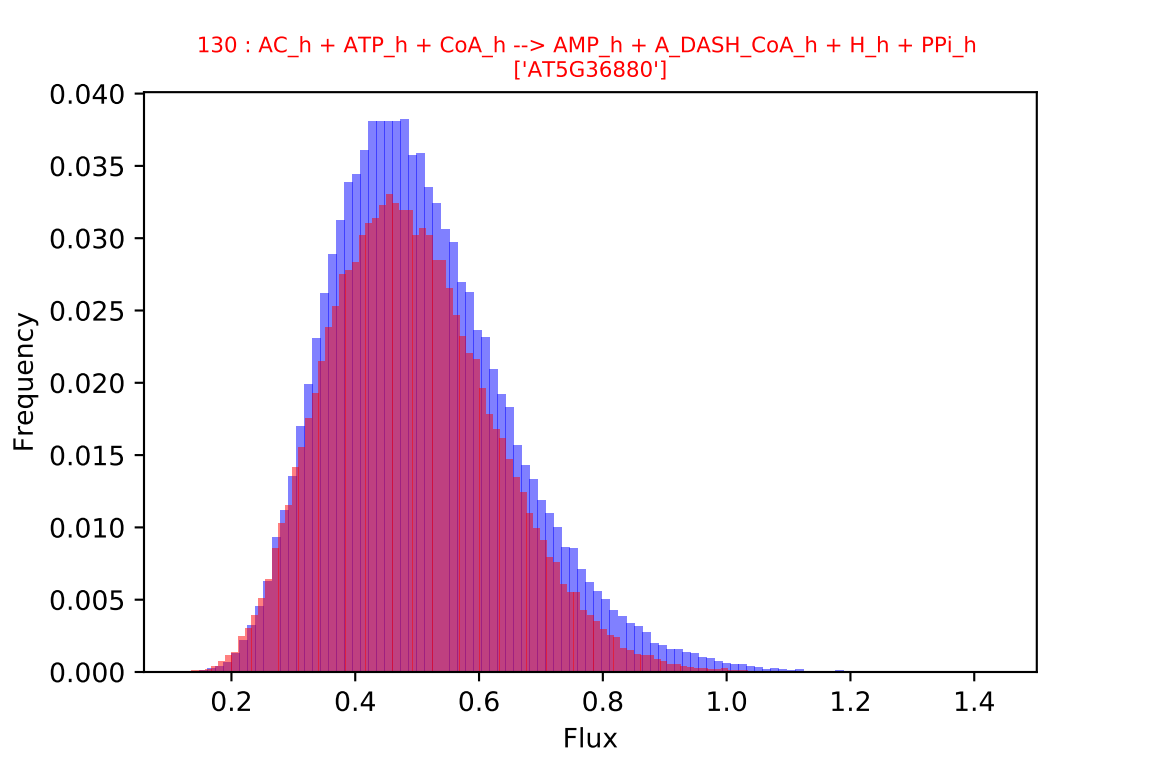

125 : NADP_h + iCit_h --> CO2_h + KG_h + NADPH_h
['AT1G65930', 'AT5G14590', 'AT1G54340']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Flux

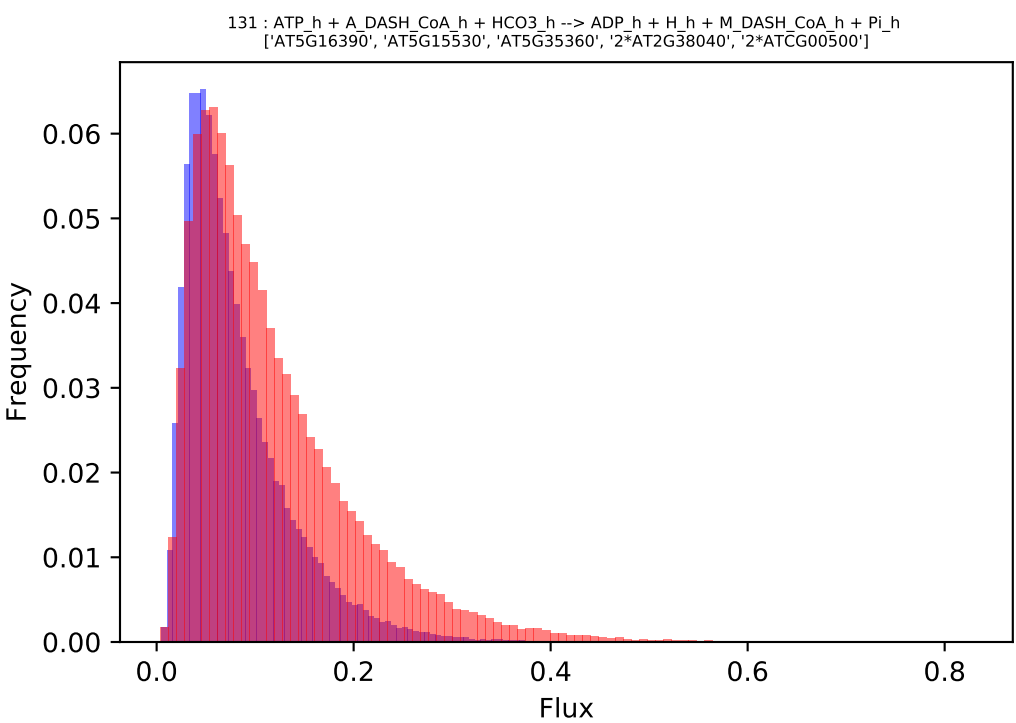

126 : NADP_m + iCit_m --> CO2_m + KG_m + NADPH_m
['AT5G14590']
Frequency
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Flux

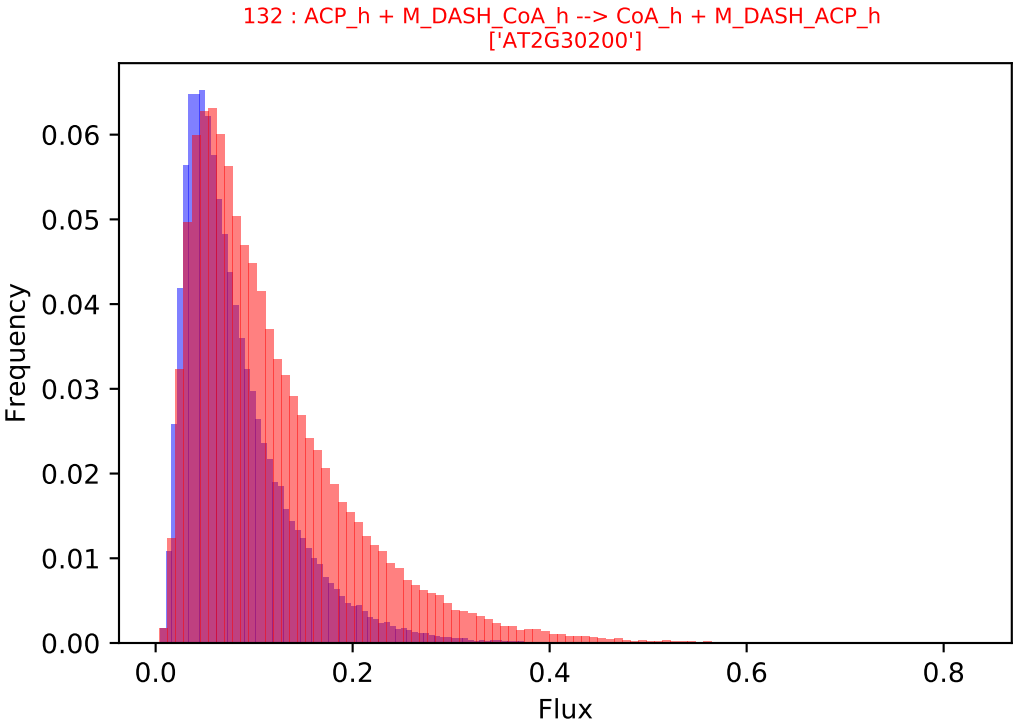

127 : iCit_c --> GLX_c + SCA_c
['AT3G21720']
Frequency
0.00
0.02
0.04
0.06
0.08
0.0
0.2
0.4
0.6
0.8
1.0
Flux

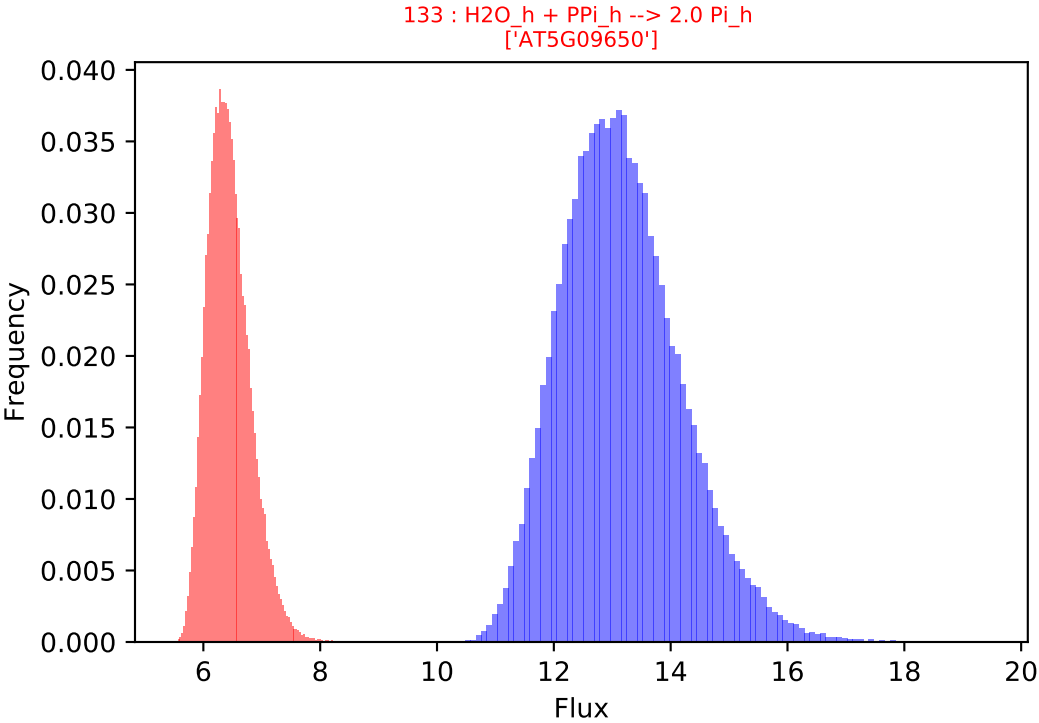

128 : A_DASH_CoA_c + GLX_c + H2O_c --> CoA_c + H_c + Mal_c
['AT5G03860']
Frequency
0.00
0.02
0.04
0.06
0.08
0.0
0.2
0.4
0.6
0.8
1.0
Flux

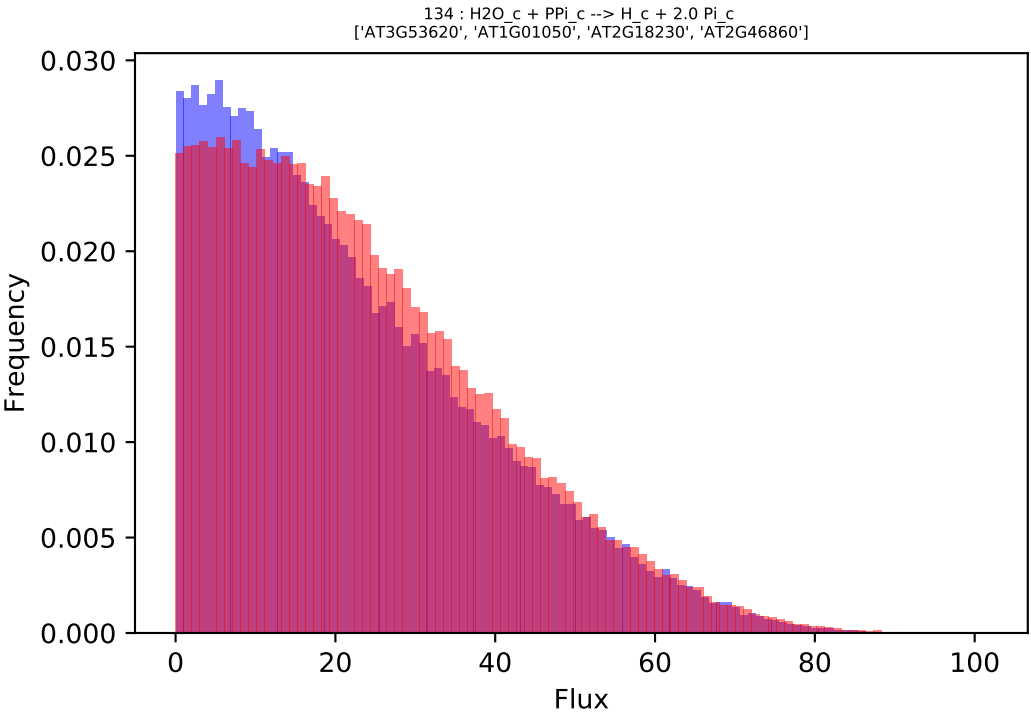

129 : ATP_c + Cit_c + CoA_c --> ADP_c + A_DASH_CoA_c + OAA_c + Pi_c
['AT1G09430', '4*AT3G06650AT5G49460', 'AT1G60810', '4*AT1G10670']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0
10
20
30
40
50
60
Flux

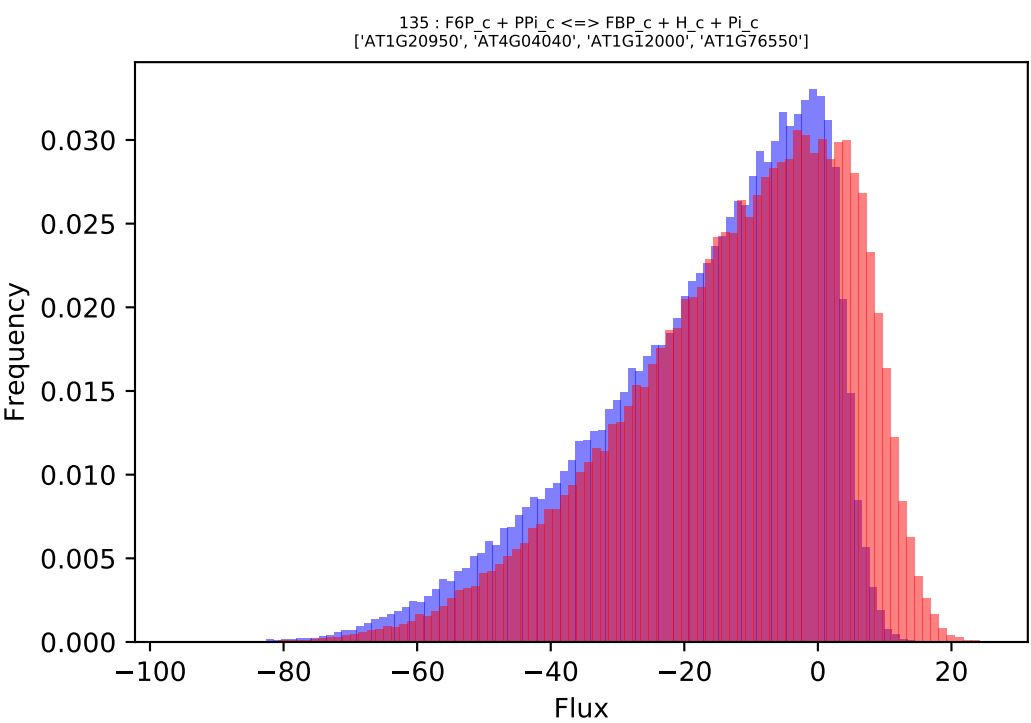

130 : AC_h + ATP_h + CoA_h --> AMP_h + A_DASH_CoA_h + H_h + PPi_h
['AT5G36880']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

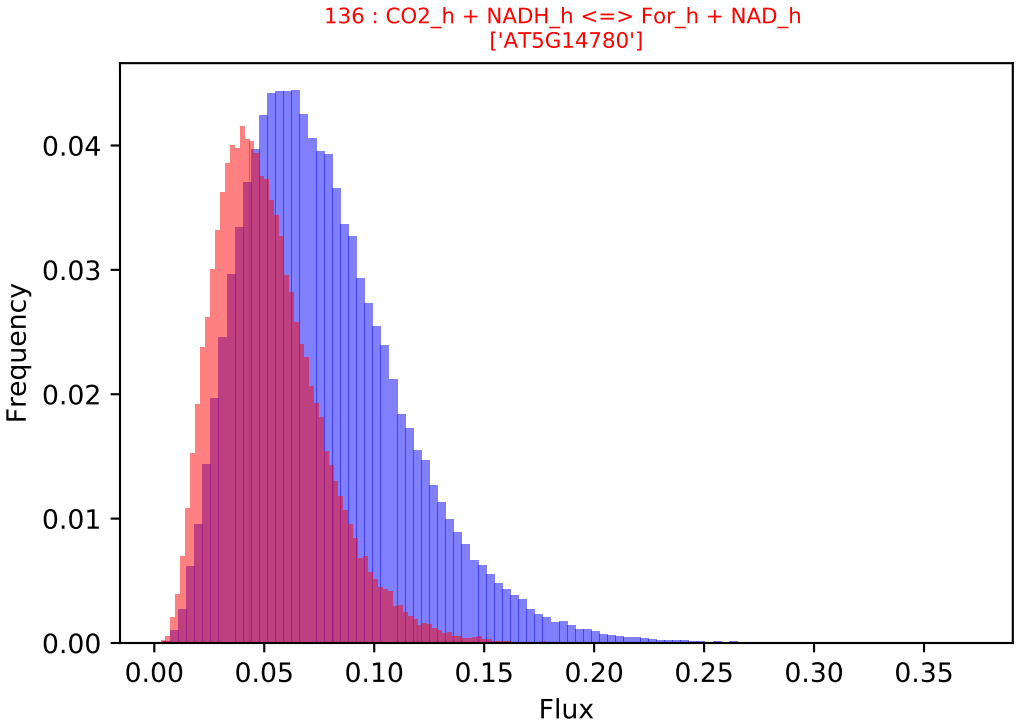

131 : ATP_h + A_DASH_CoA_h + HCO3_h --> ADP_h + H_h + M_DASH_CoA_h + Pi_h
['AT5G16390', 'AT5G15530', 'AT5G35360', '2*AT2G38040', '2*ATCG00500']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.2
0.4
0.6
0.8
Flux

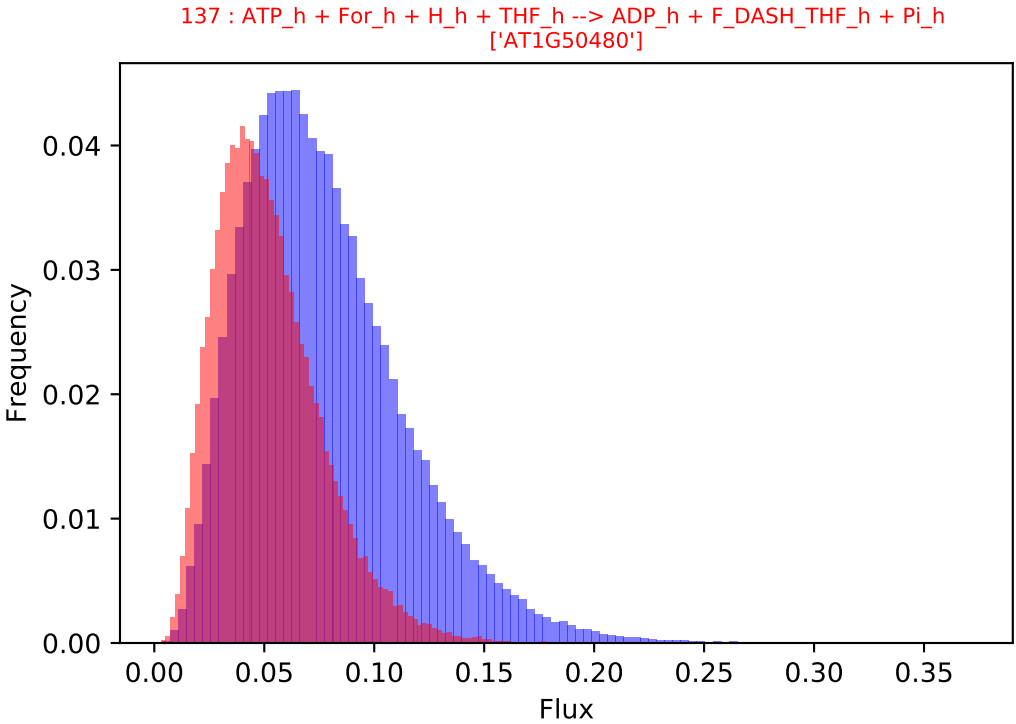

132 : ACP_h + M_DASH_CoA_h --> CoA_h + M_DASH_ACP_h
['AT2G30200']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.2
0.4
0.6
0.8
Flux

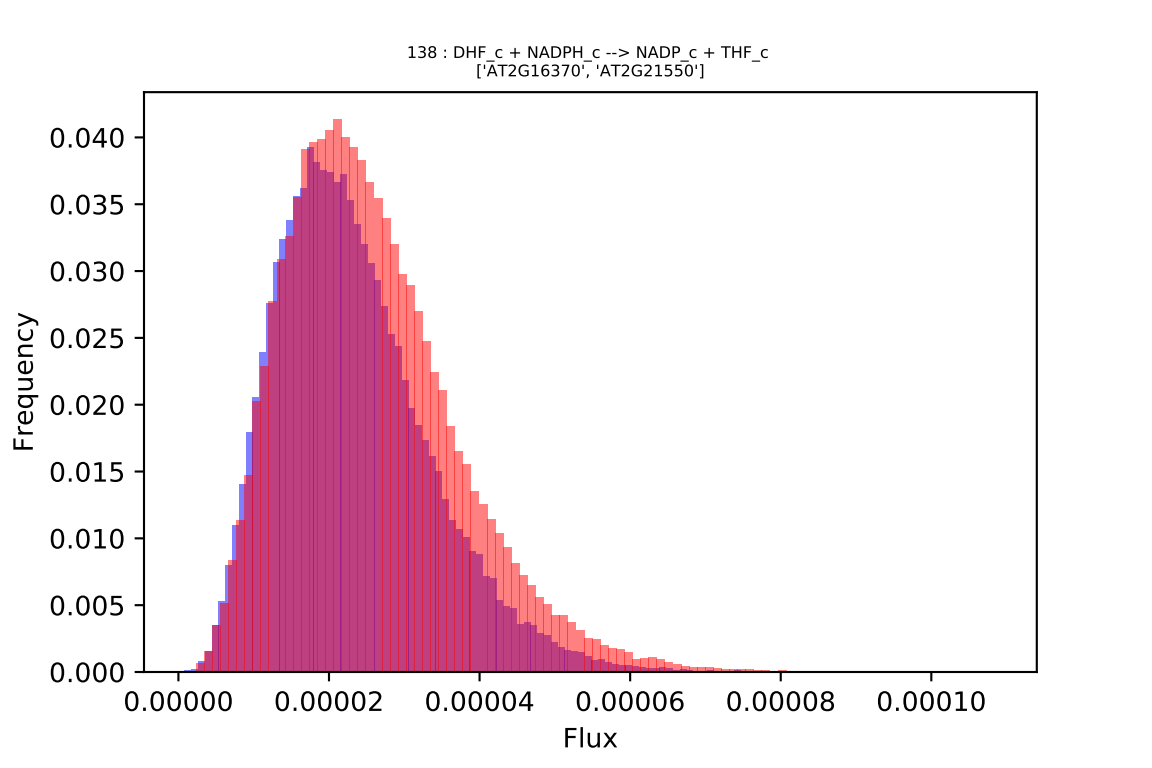

133 : H2O_h + PPi_h --> 2.0 Pi_h
['AT5G09650']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
6
8
10
12
14
16
18
20
Flux

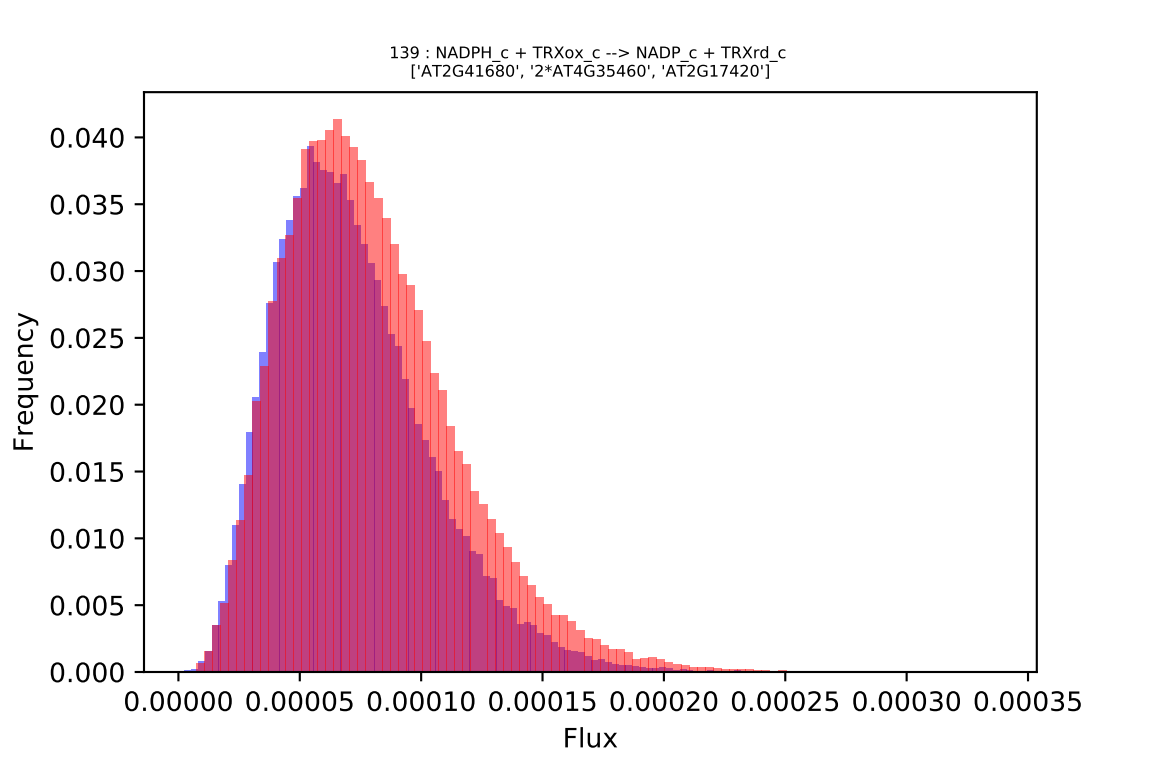

134 : H2O_c + PPi_c --> H_c + 2.0 Pi_c
['AT3G53620', 'AT1G01050', 'AT2G18230', 'AT2G46860']
Frequency
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0
20
40
60
80
100
Flux

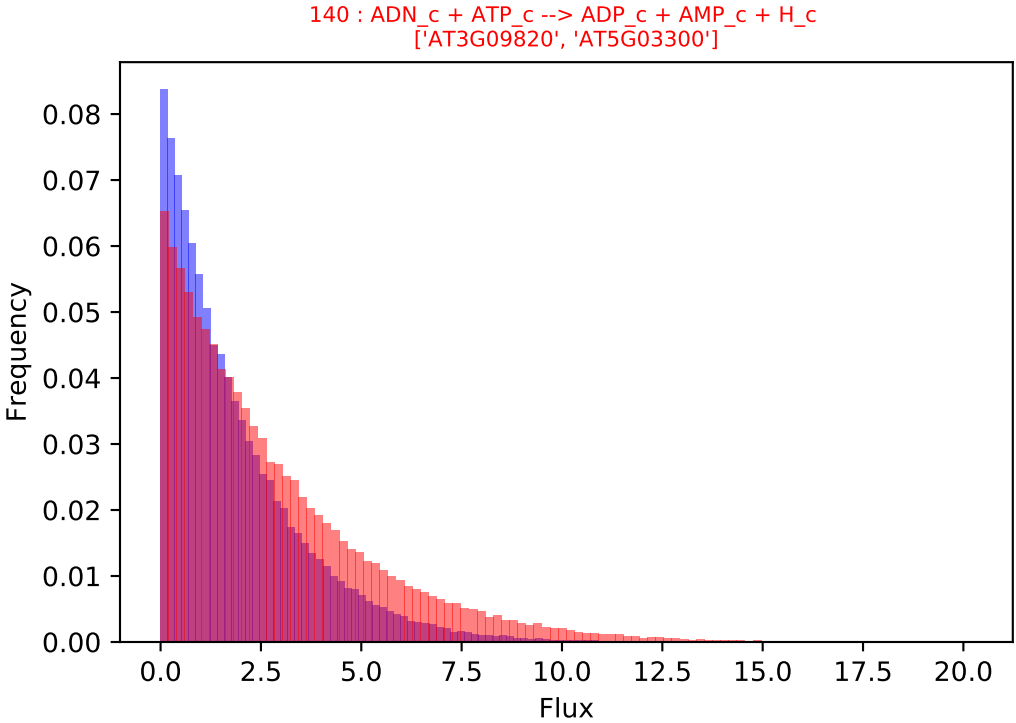

135 : F6P_c + PPi_c <=> FBP_c + H_c + Pi_c
['AT1G20950', 'AT4G04040', 'AT1G12000', 'AT1G76550']
Frequency
0.030
0.025
0.020
0.015
0.010
0.005
0.000
−100
−80
−60
−40
−20
0
20
Flux

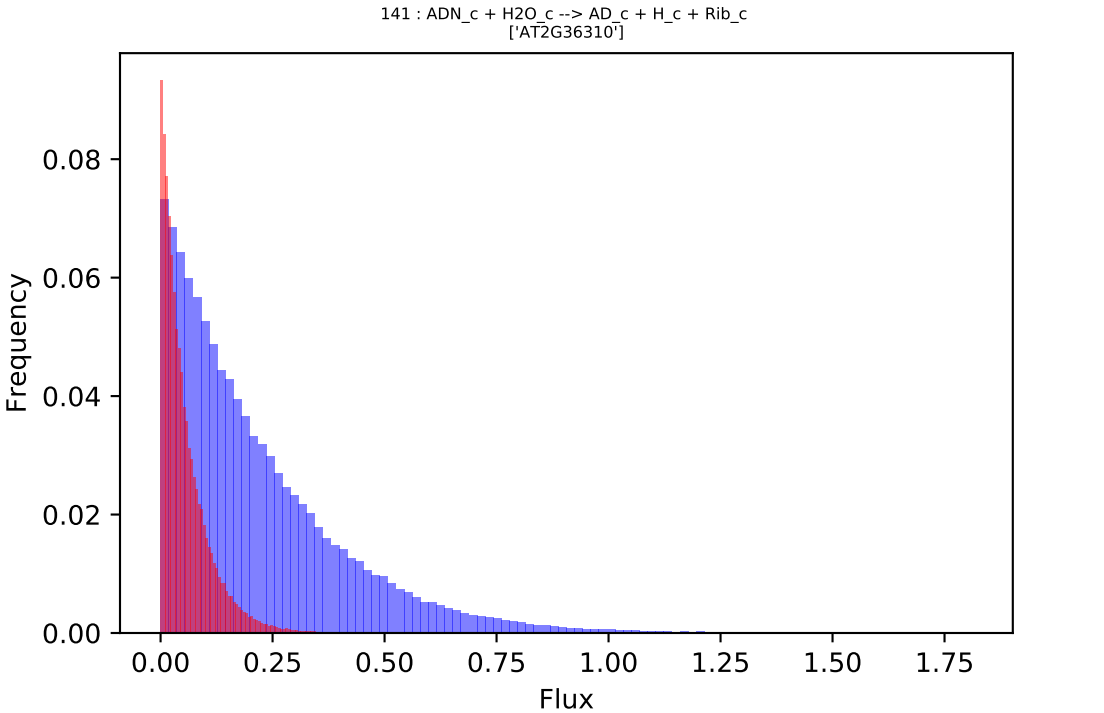

136 : CO2_h + NADH_h <=> For_h + NAD_h
['AT5G14780']
Frequency
0.04
0.03
0.02
0.01
0.00
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Flux

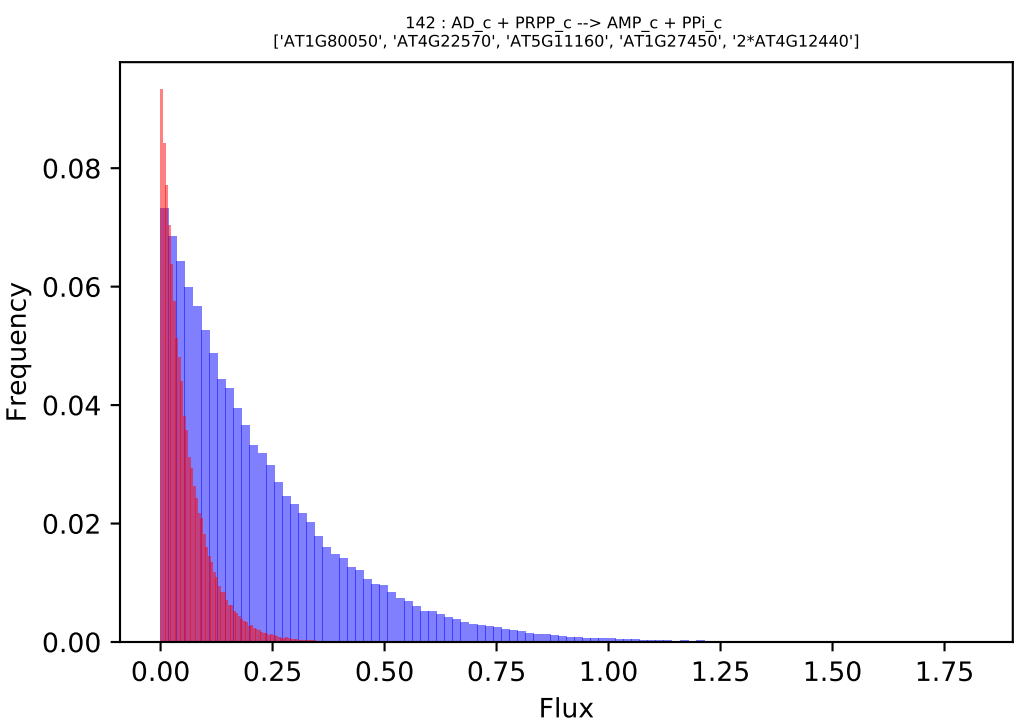

137 : ATP_h + For_h + H_h + THF_h --> ADP_h + F_DASH_THF_h + Pi_h
['AT1G50480']
Frequency
0.00
0.01
0.02
0.03
0.04
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Flux

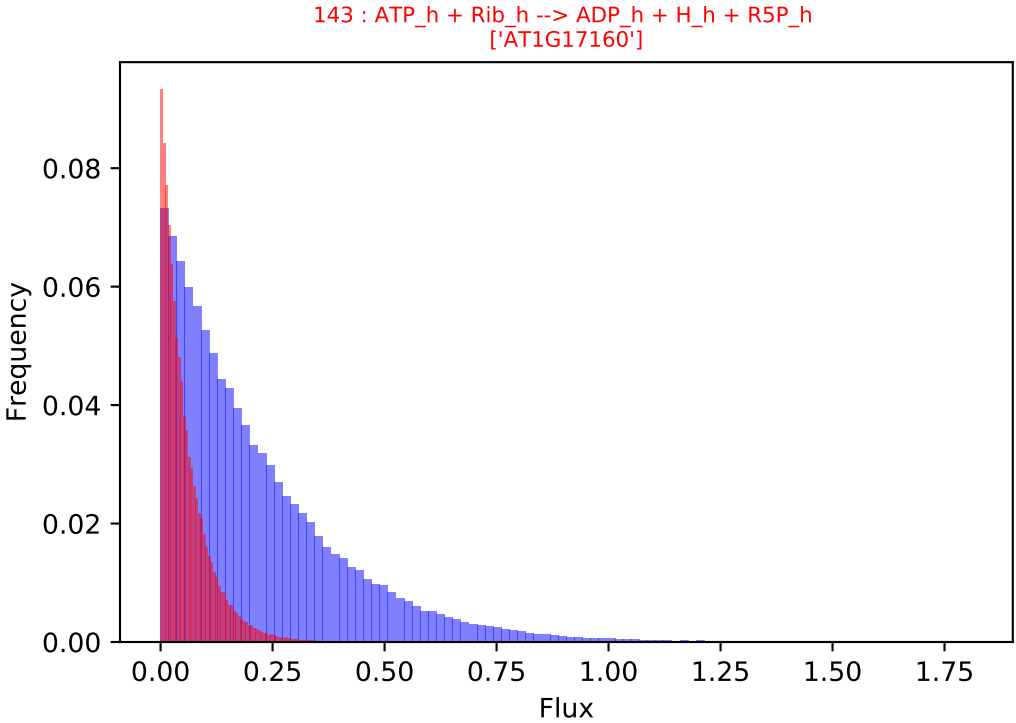

138 : DHF_c + NADPH_c --> NADP_c + THF_c
['AT2G16370', 'AT2G21550']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00002
0.00004
0.00006
0.00008
0.00010
Flux

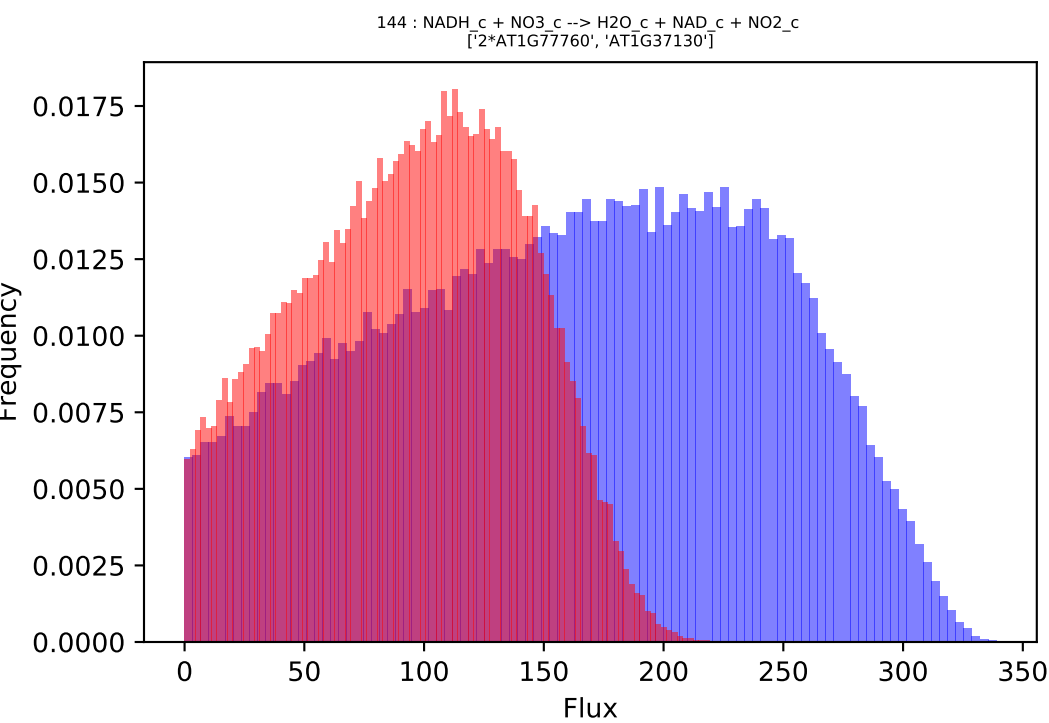

139 : NADPH_c + TRXox_c --> NADP_c + TRXrd_c
['AT2G41680', '2*AT4G35460', 'AT2G17420']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00005
0.00010
0.00015
0.00020
0.00025
0.00030
0.00035
Flux

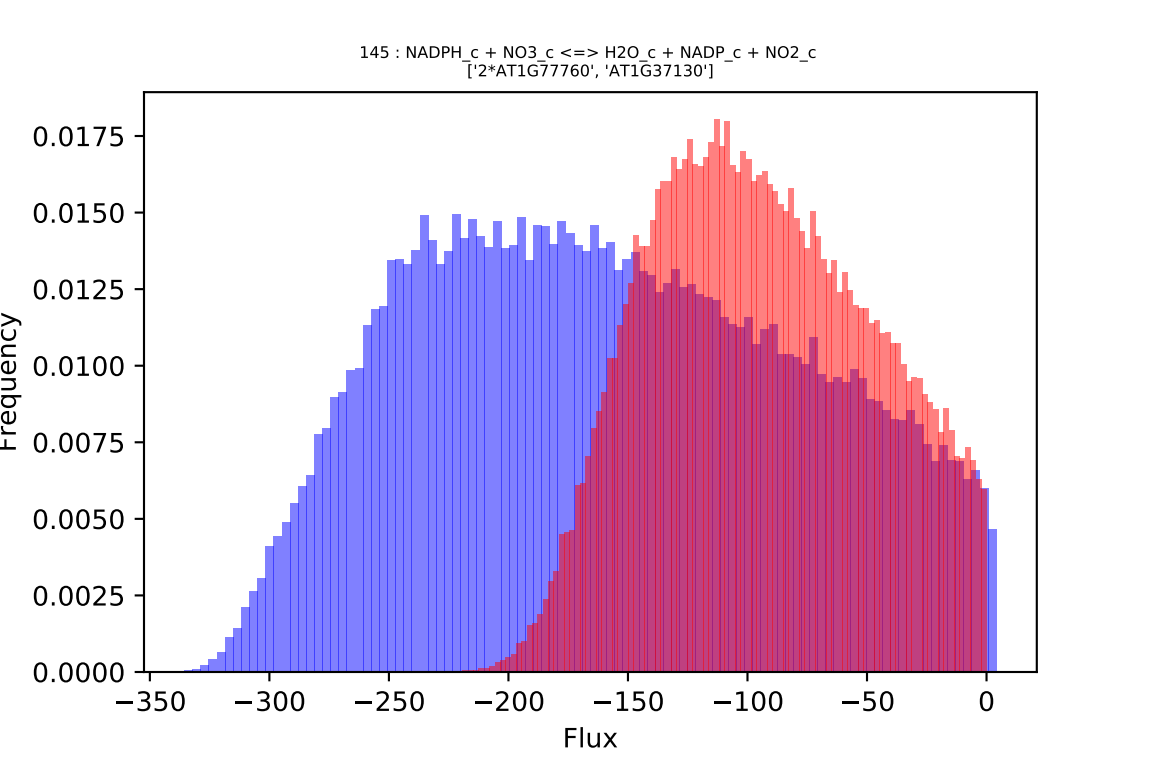

140 : ADN_c + ATP_c --> ADP_c + AMP_c + H_c
['AT3G09820', 'AT5G03300']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
Flux

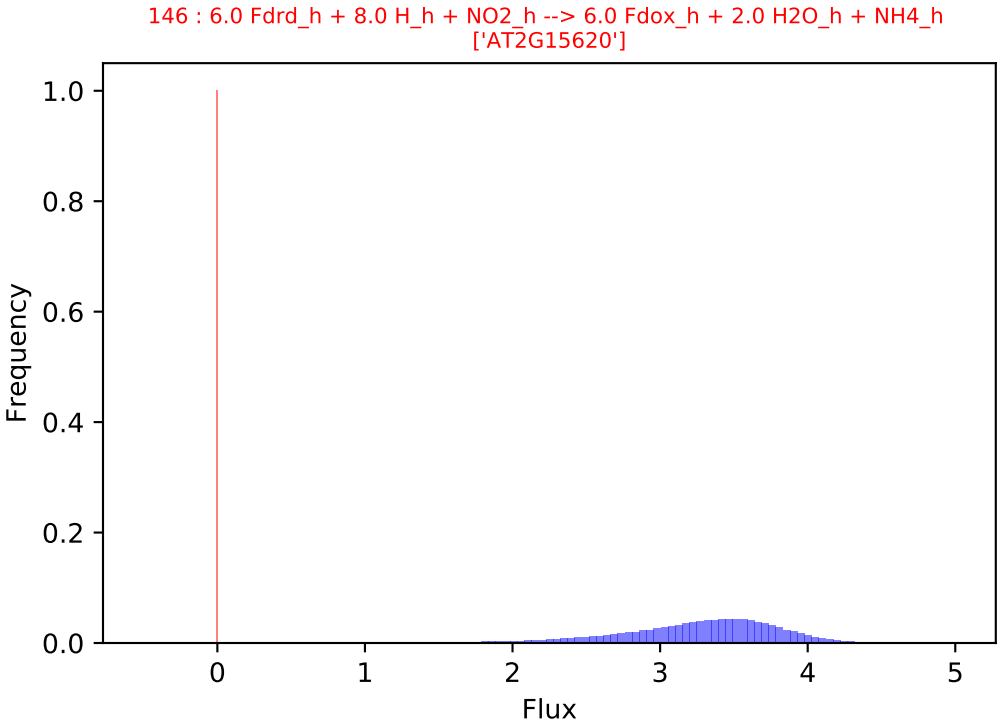

141 : ADN_c + H2O_c --> AD_c + H_c + Rib_c
['AT2G36310']
Frequency
0.00
0.02
0.04
0.06
0.08
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

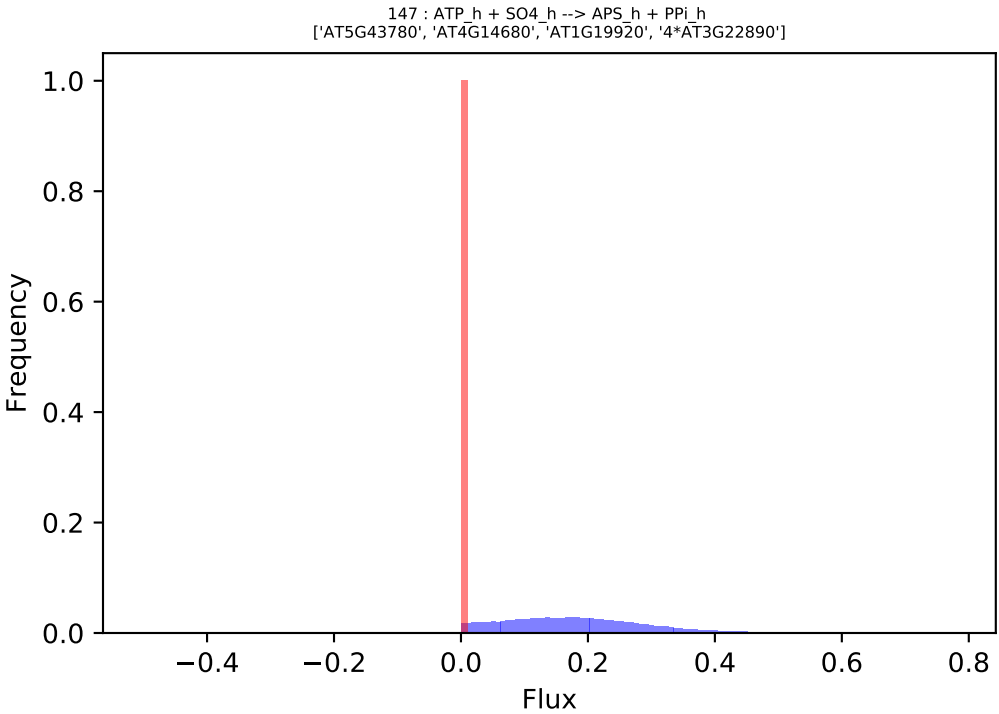

142 : AD_c + PRPP_c --> AMP_c + PPi_c
['AT1G80050', 'AT4G22570', 'AT5G11160', 'AT1G27450', '2*AT4G12440']
Frequency
0.00
0.02
0.04
0.06
0.08
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

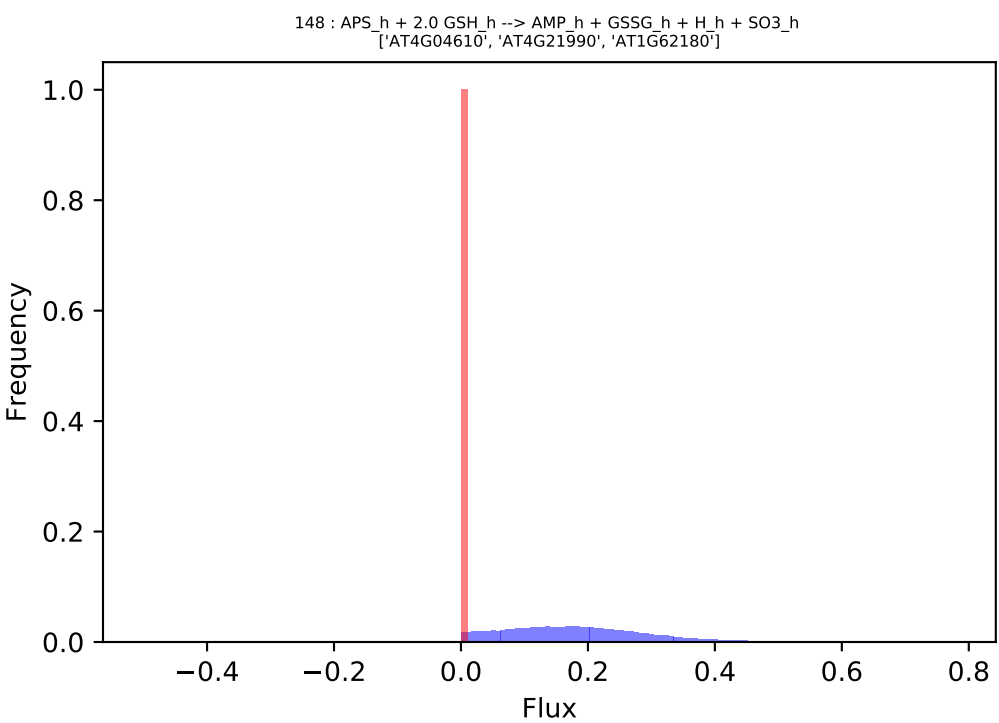

143 : ATP_h + Rib_h --> ADP_h + H_h + R5P_h
['AT1G17160']
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

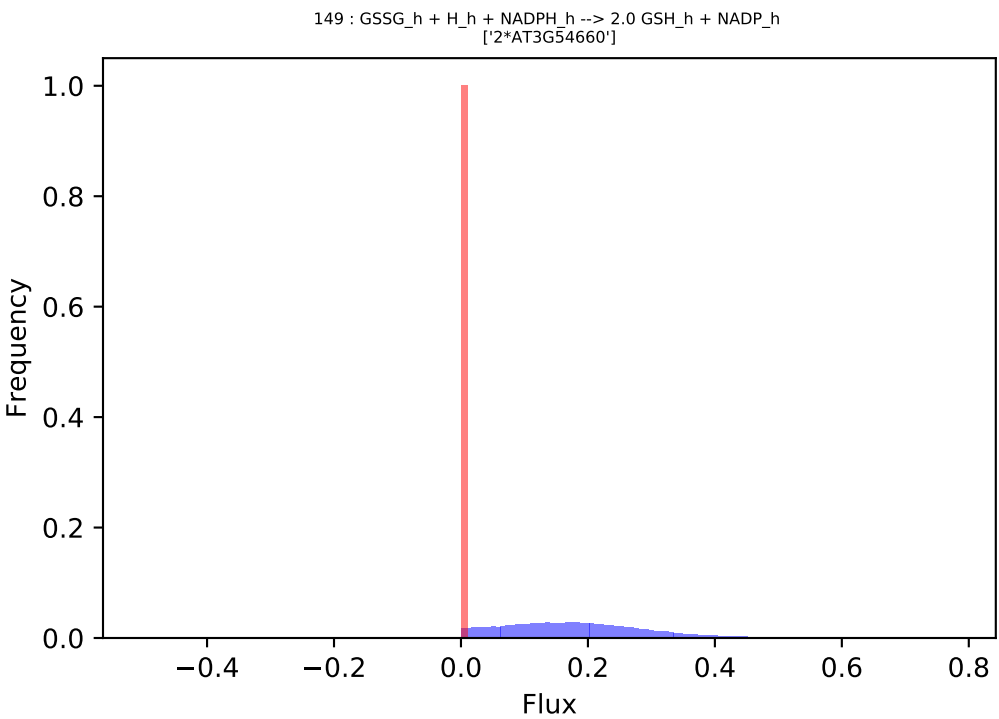

144 : NADH_c + NO3_c --> H2O_c + NAD_c + NO2_c
['2*AT1G77760', 'AT1G37130']
Frequency
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
0
50
100
150
200
250
300
350
Flux

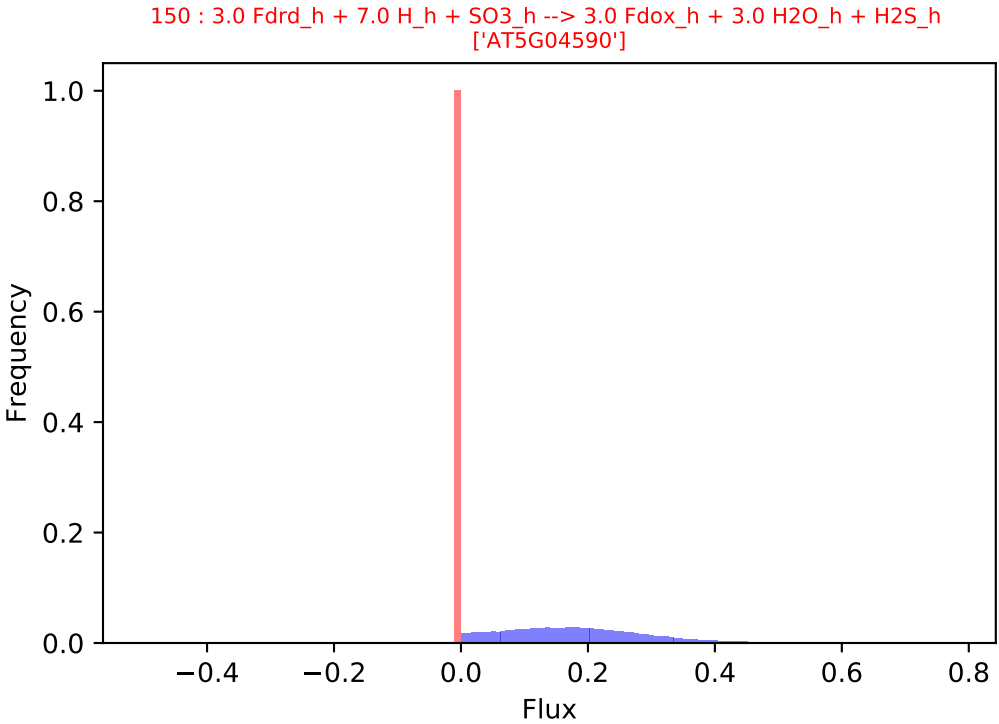

145 : NADPH_c + NO3_c <=> H2O_c + NADP_c + NO2_c
['2*AT1G77760', 'AT1G37130']
Frequency
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
−350
−300
−250
−200
−150
−100
−50
0
Flux

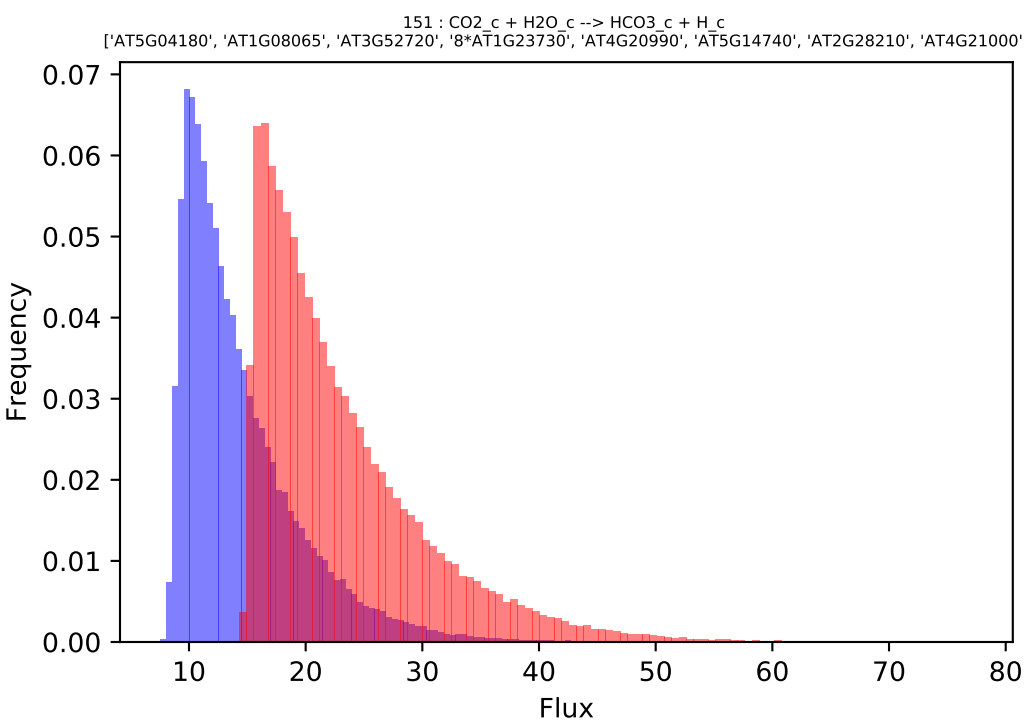

146 : 6.0 Fdrd_h + 8.0 H_h + NO2_h --> 6.0 Fdox_h + 2.0 H2O_h + NH4_h
['AT2G15620']
Frequency
Flux
0.0
0.2
0.4
0.6
0.8
1.0
0
1
2
3
4
5

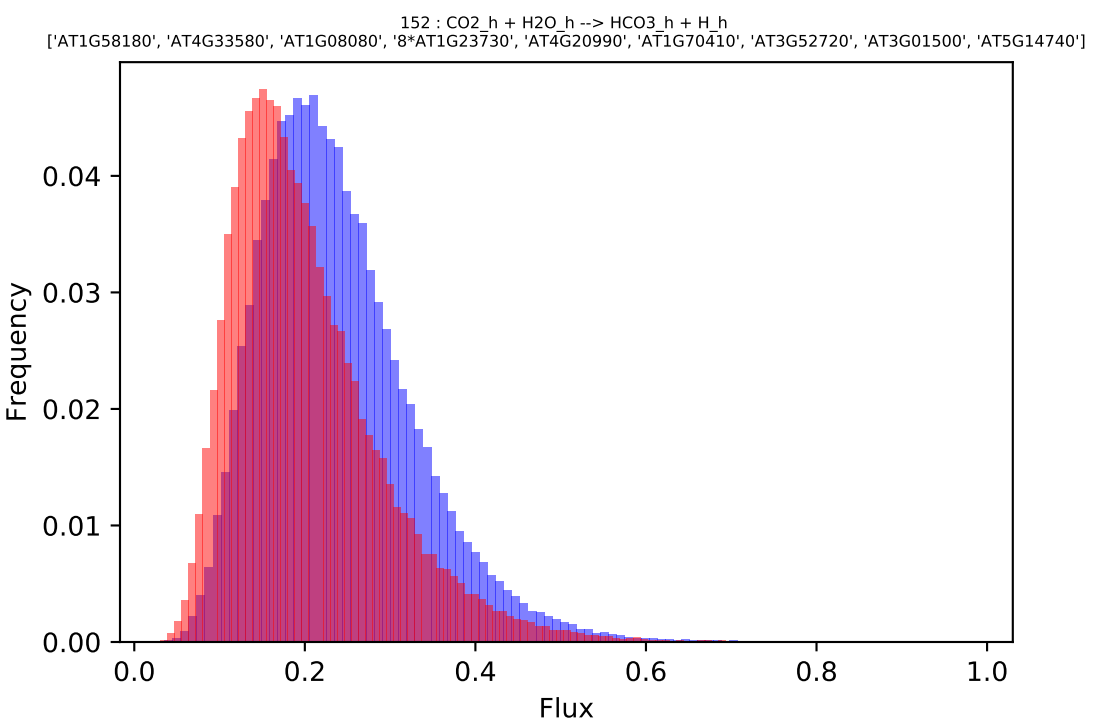

147 : ATP_h + SO4_h --> APS_h + PPi_h
['AT5G43780', 'AT4G14680', 'AT1G19920', '4*AT3G22890']
Frequency
Flux
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
−0.2
0.0
0.2
0.4
0.6
0.8

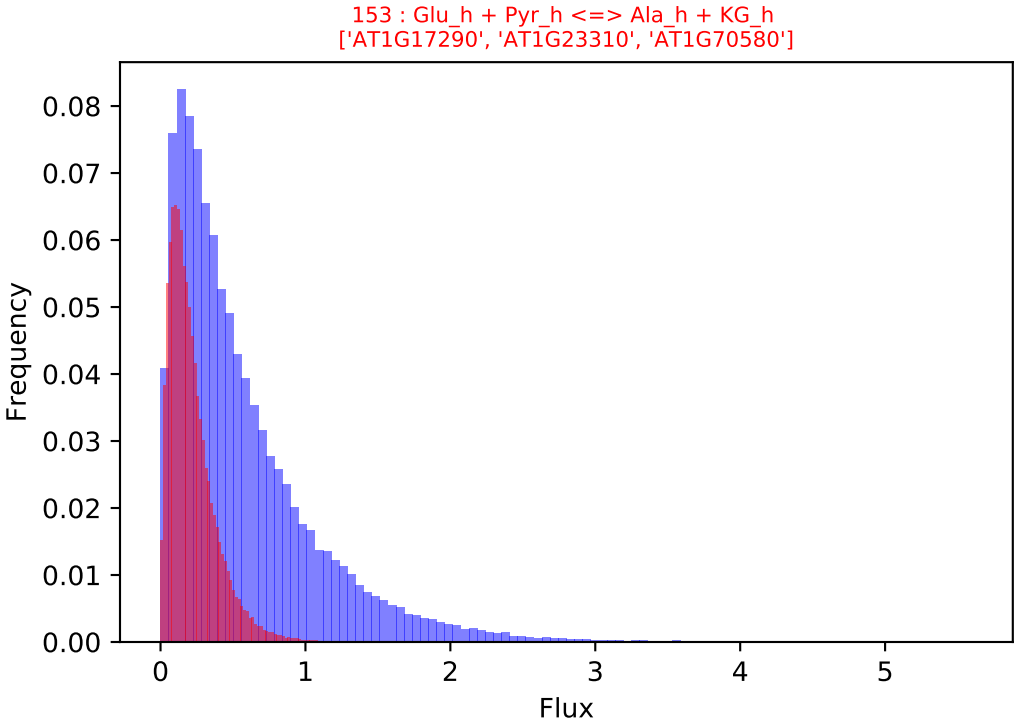

148 : APS_h + 2.0 GSH_h --> AMP_h + GSSG_h + H_h + SO3_h
['AT4G04610', 'AT4G21990', 'AT1G62180']
Frequency
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
−0.2
0.0
0.2
0.4
0.6
0.8
Flux

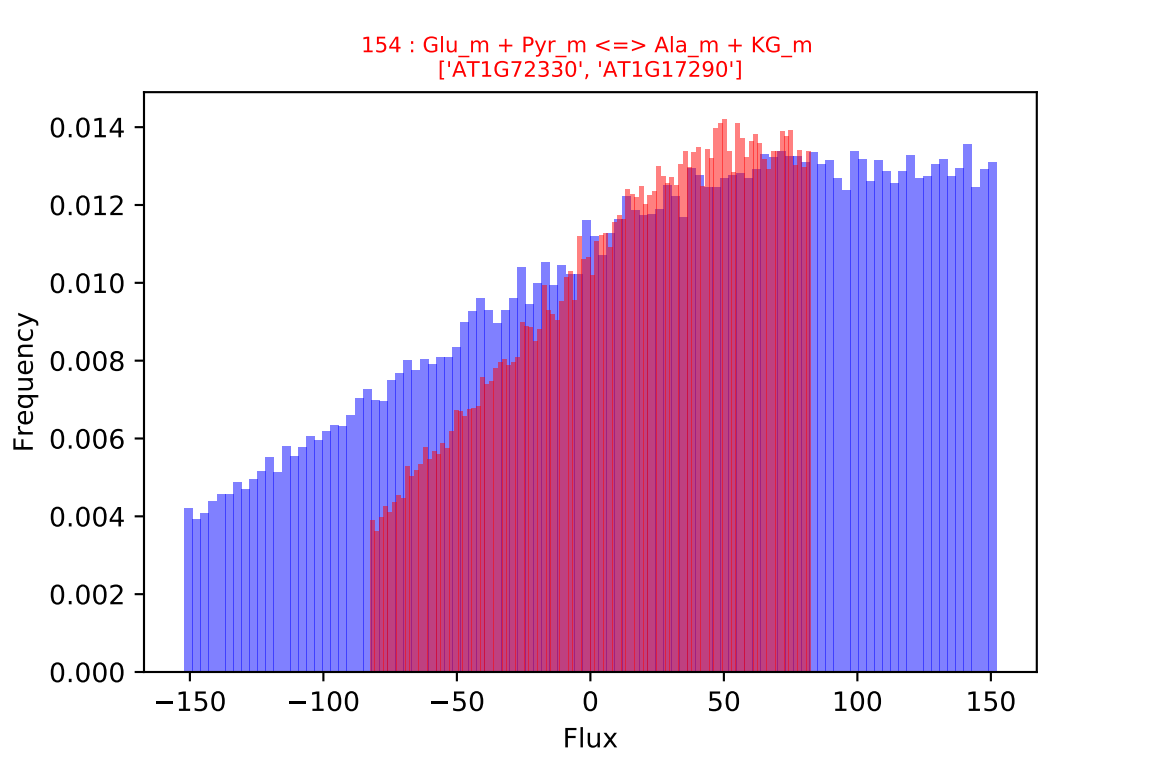

149 : GSSG_h + H_h + NADPH_h --> 2.0 GSH_h + NADP_h
['2*AT3G54660']
Frequency
Flux
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
−0.2
0.0
0.2
0.4
0.6
0.8

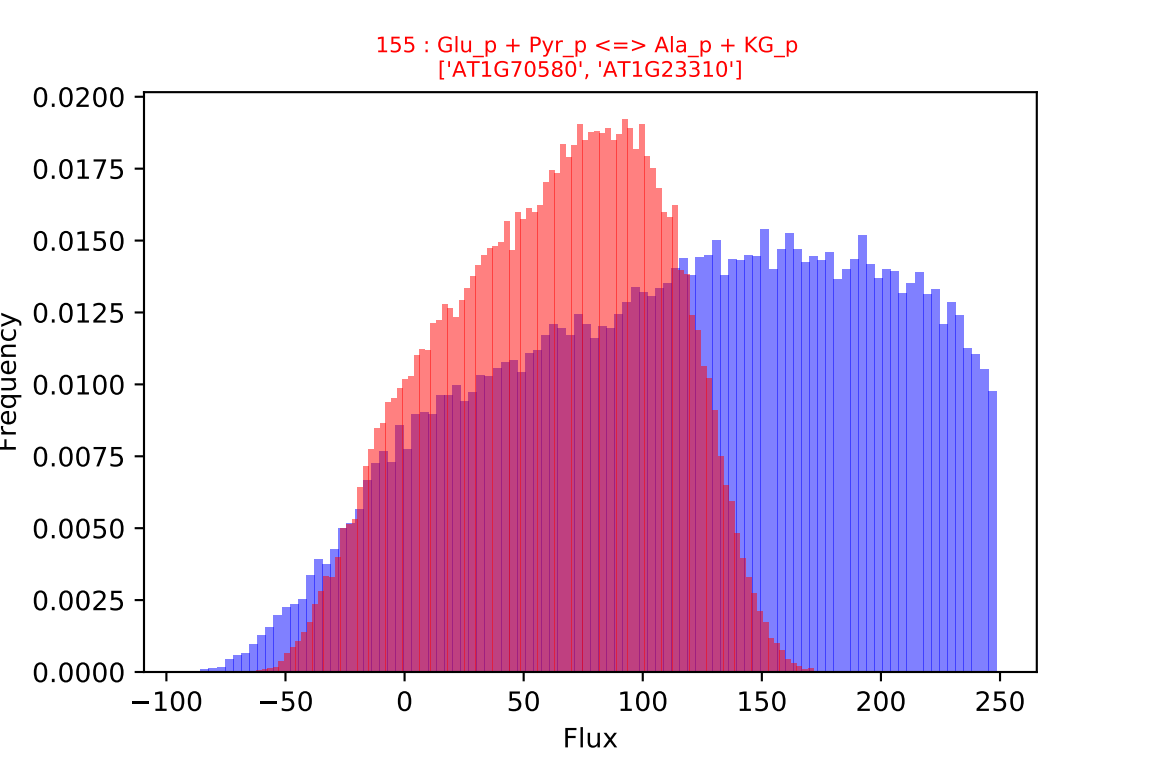

150 : 3.0 Fdrd_h + 7.0 H_h + SO3_h --> 3.0 Fdox_h + 3.0 H2O_h + H2S_h
['AT5G04590']
Frequency
Flux
0.0
0.2
0.4
0.6
0.8
1.0
−0.4
−0.2
0.0
0.2
0.4
0.6
0.8

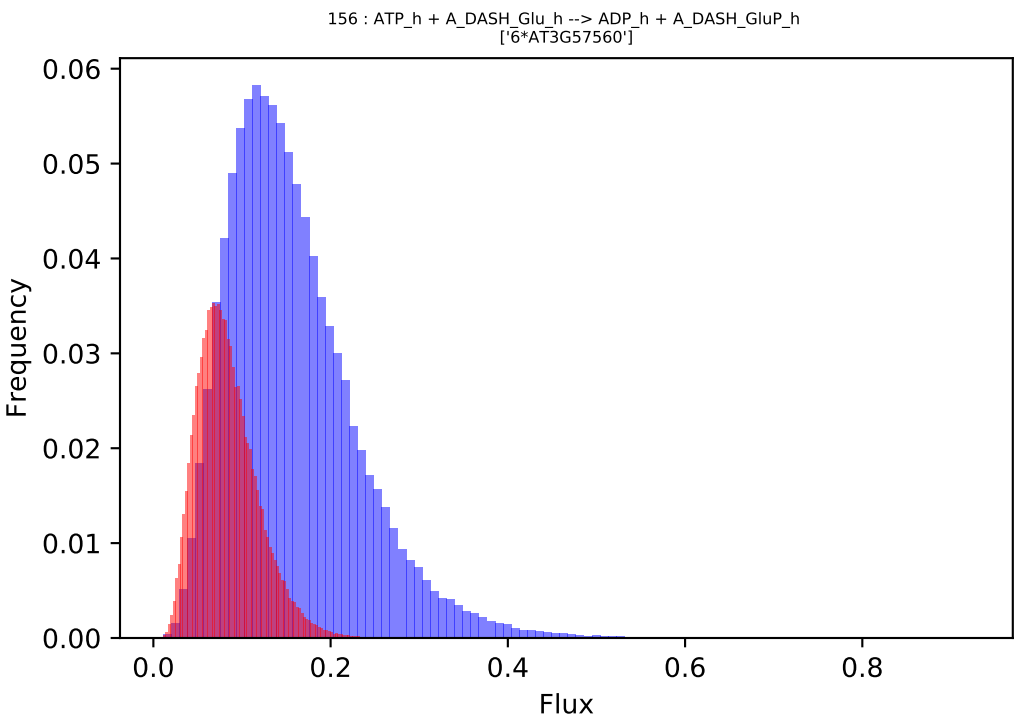

151 : CO2_c + H2O_c --> HCO3_c + H_c
['AT5G04180', 'AT1G08065', 'AT3G52720', '8*AT1G23730', 'AT4G20990', 'AT5G14740', 'AT2G28210', 'AT4G21000']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
10
20
30
40
50
60
70
80
Flux

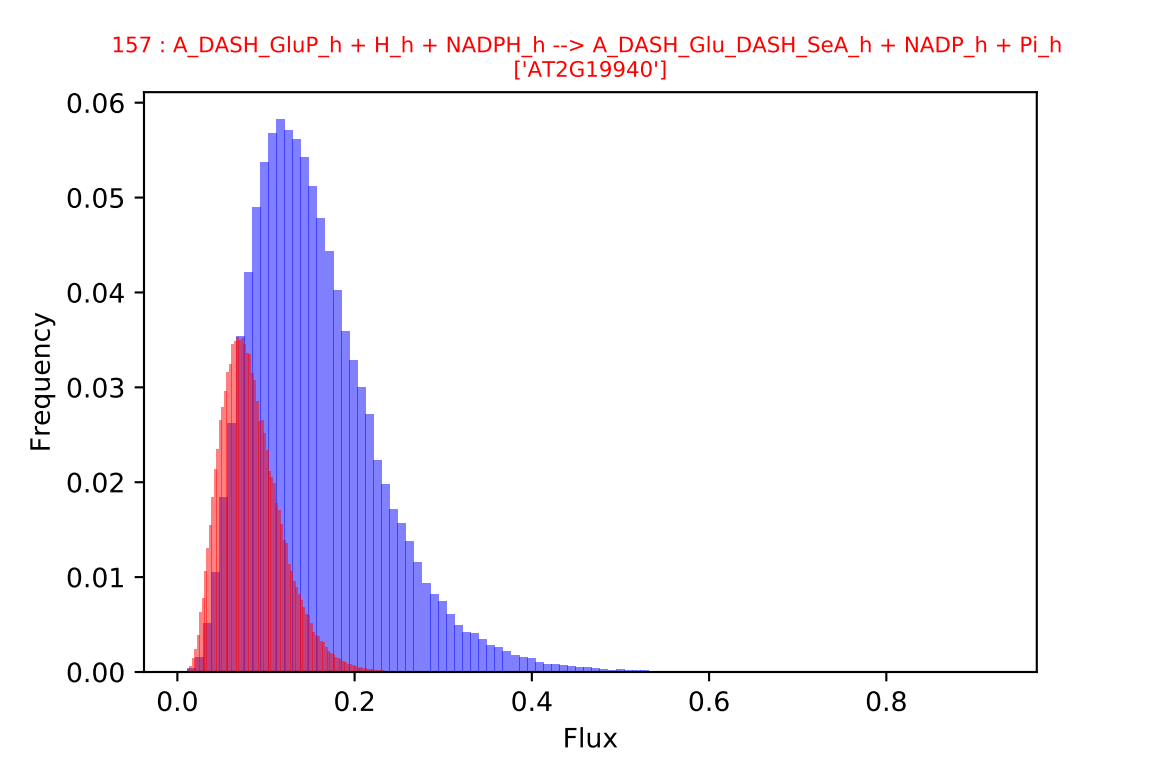

152 : CO2_h + H2O_h --> HCO3_h + H_h
['AT1G58180', 'AT4G33580', 'AT1G08080', '8*AT1G23730', 'AT4G20990', 'AT1G70410', 'AT3G52720', 'AT3G01500', 'AT5G14740']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.2
0.4
0.6
0.8
1.0
Flux

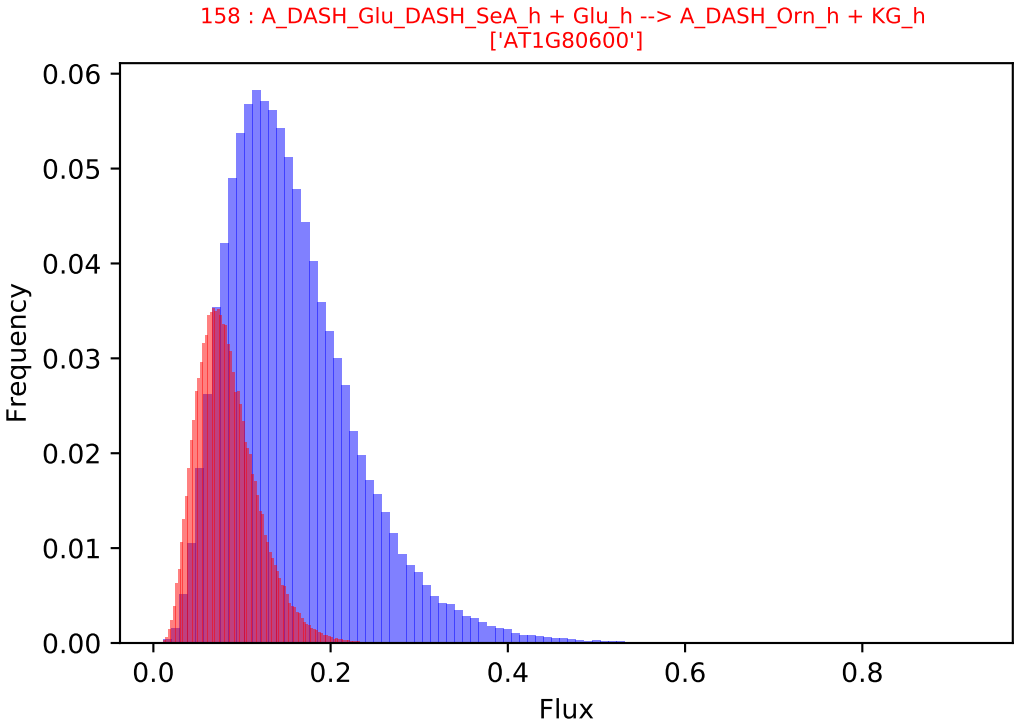

153 : Glu_h + Pyr_h <=> Ala_h + KG_h
['AT1G17290', 'AT1G23310', 'AT1G70580']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0
1
2
3
4
5
Flux

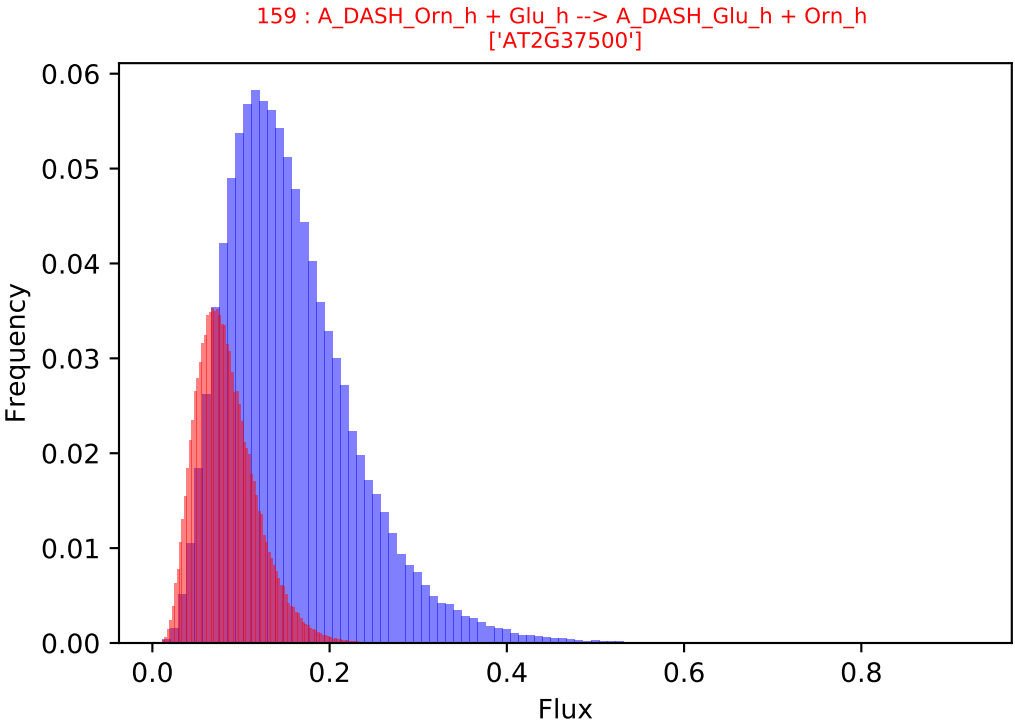

154 : Glu_m + Pyr_m <=> Ala_m + KG_m
['AT1G72330', 'AT1G17290']
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−150
−100
−50
0
50
100
150
Flux

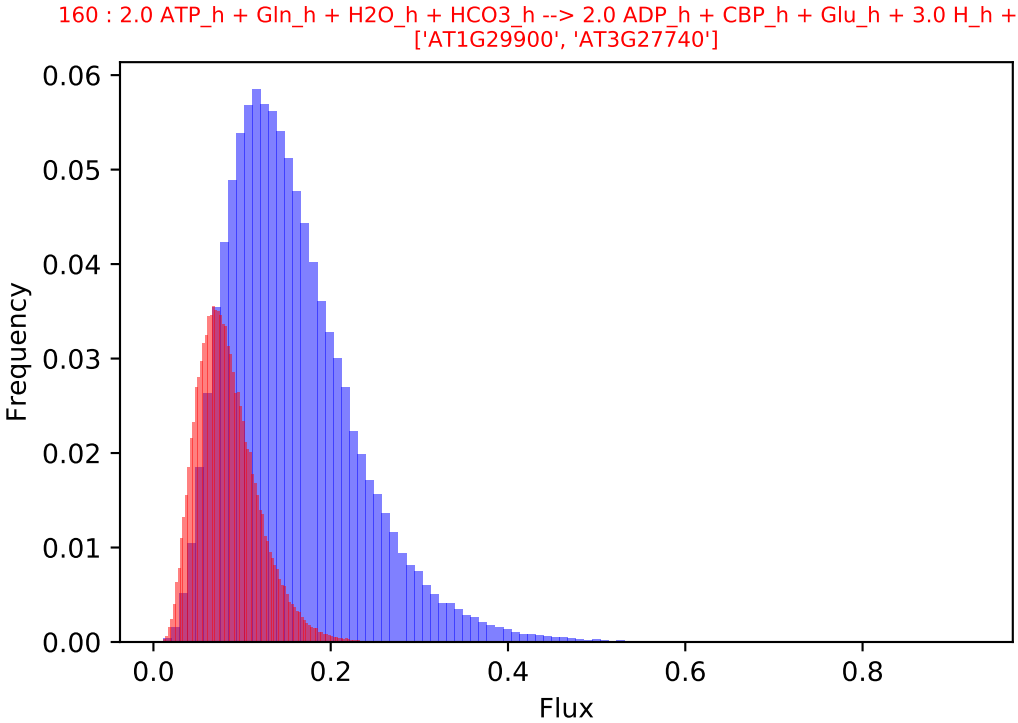

155 : Glu_p + Pyr_p <=> Ala_p + KG_p
['AT1G70580', 'AT1G23310']
Frequency
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
−100
−50
0
50
100
150
200
250
Flux

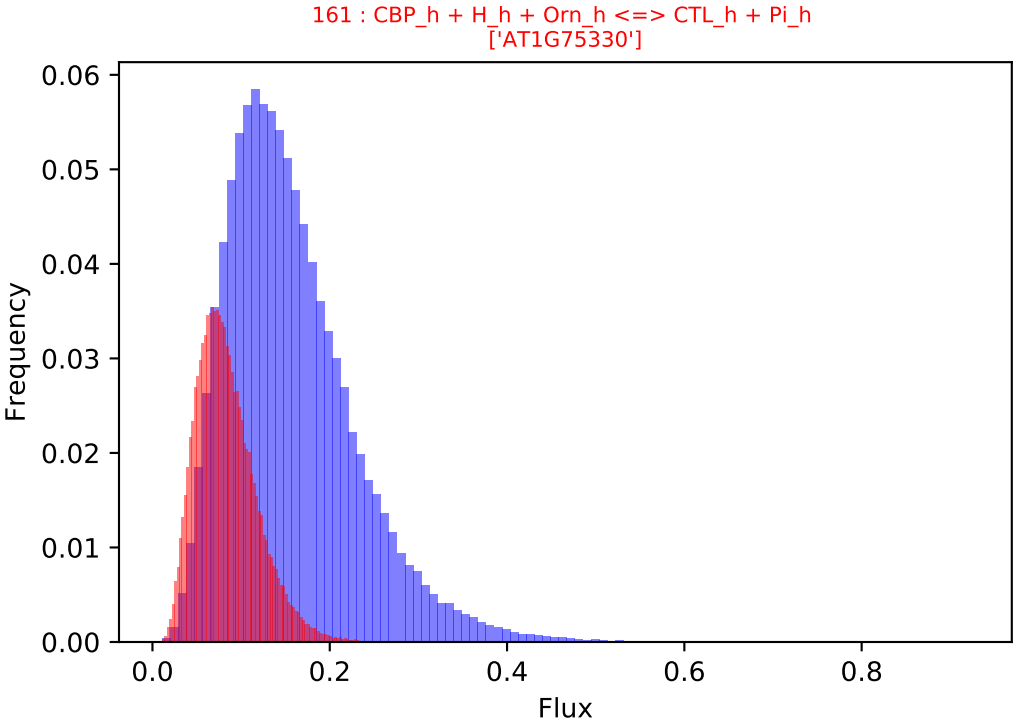

156 : ATP_h + A_DASH_Glu_h --> ADP_h + A_DASH_GluP_h
['6*AT3G57560']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.2
0.4
0.6
0.8

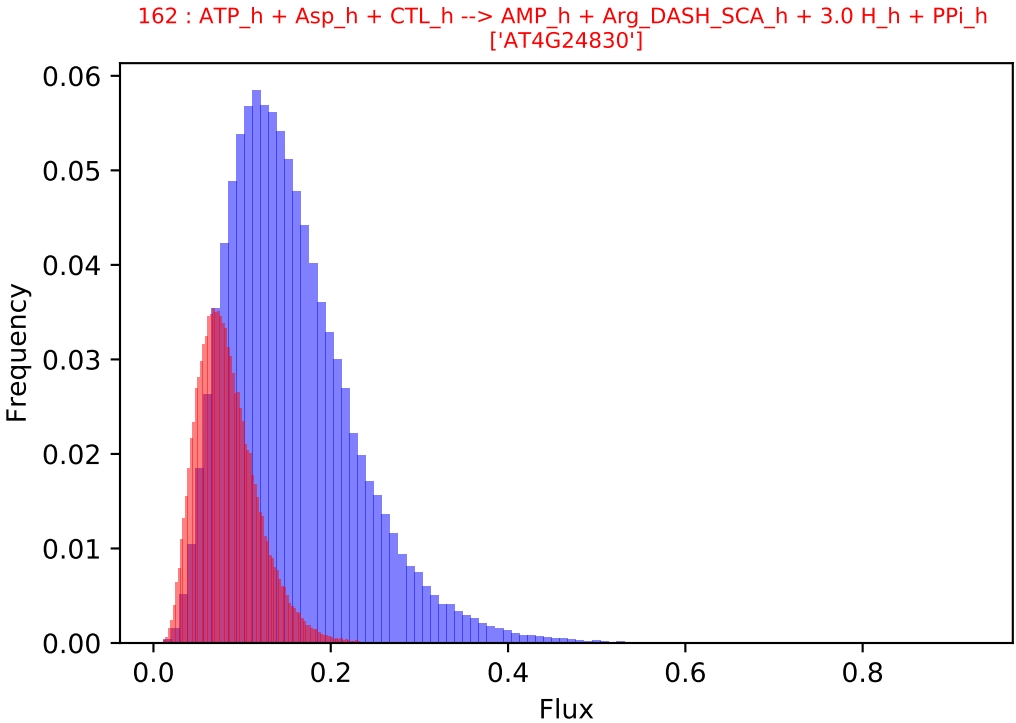

157 : A_DASH_GluP_h + H_h + NADPH_h --> A_DASH_Glu_DASH_SeA_h + NADP_h + Pi_h
['AT2G19940']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.2
0.4
0.6
0.8

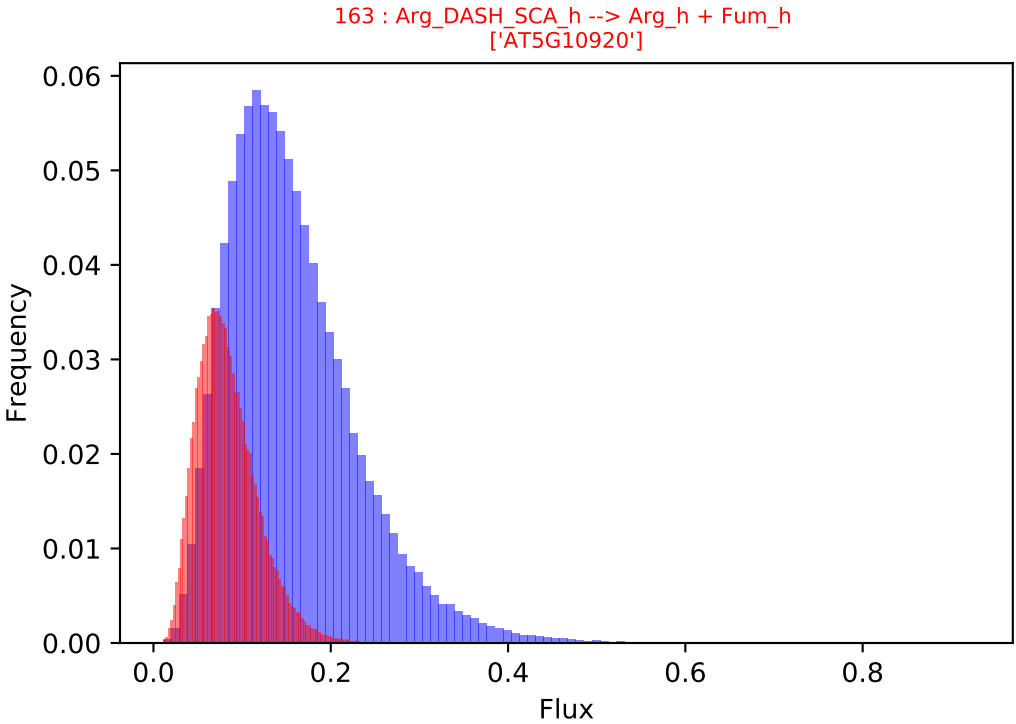

158 : A_DASH_Glu_DASH_SeA_h + Glu_h --> A_DASH_Orn_h + KG_h
['AT1G80600']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.2
0.4
0.6
0.8

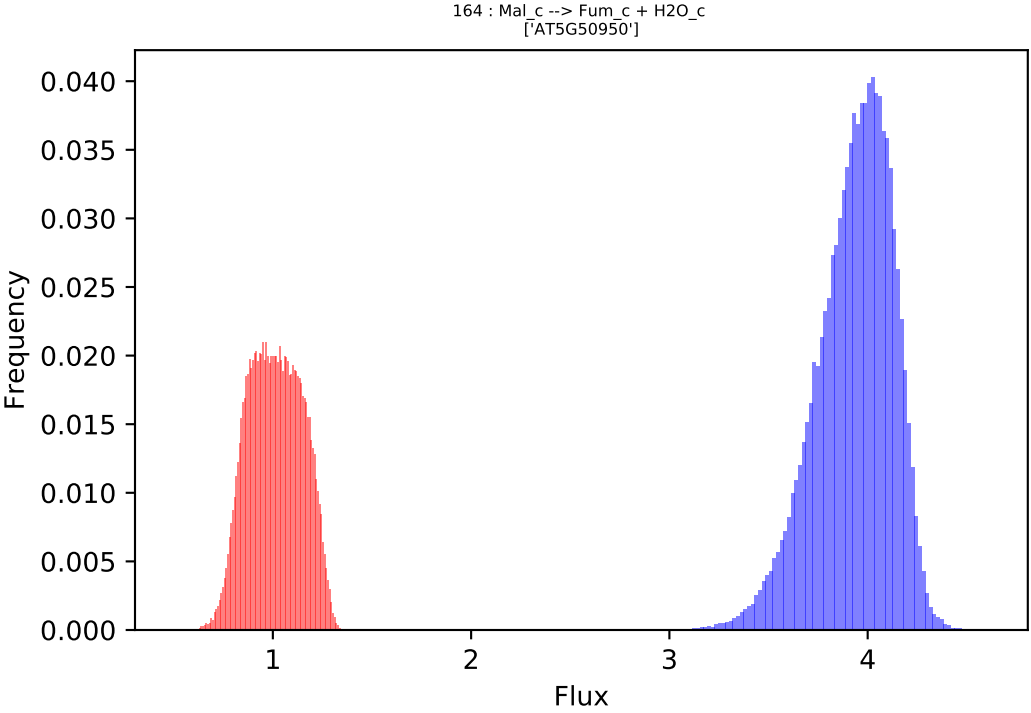

159 : A_DASH_Orn_h + Glu_h --> A_DASH_Glu_h + Orn_h
['AT2G37500']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.2
0.4
0.6
0.8

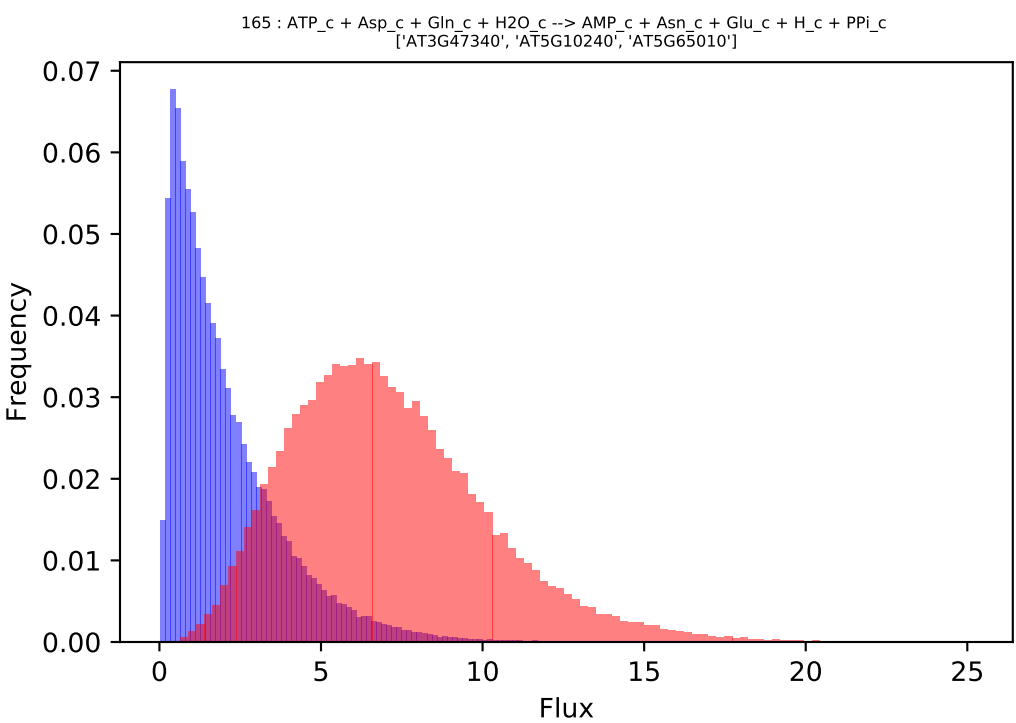

160 : 2.0 ATP_h + Gln_h + H2O_h + HCO3_h --> 2.0 ADP_h + CBP_h + Glu_h + 3.0 H_h + Pi_h
['AT1G29900', 'AT3G27740']
Frequency
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0.0
0.2
0.4
0.6
0.8
Flux

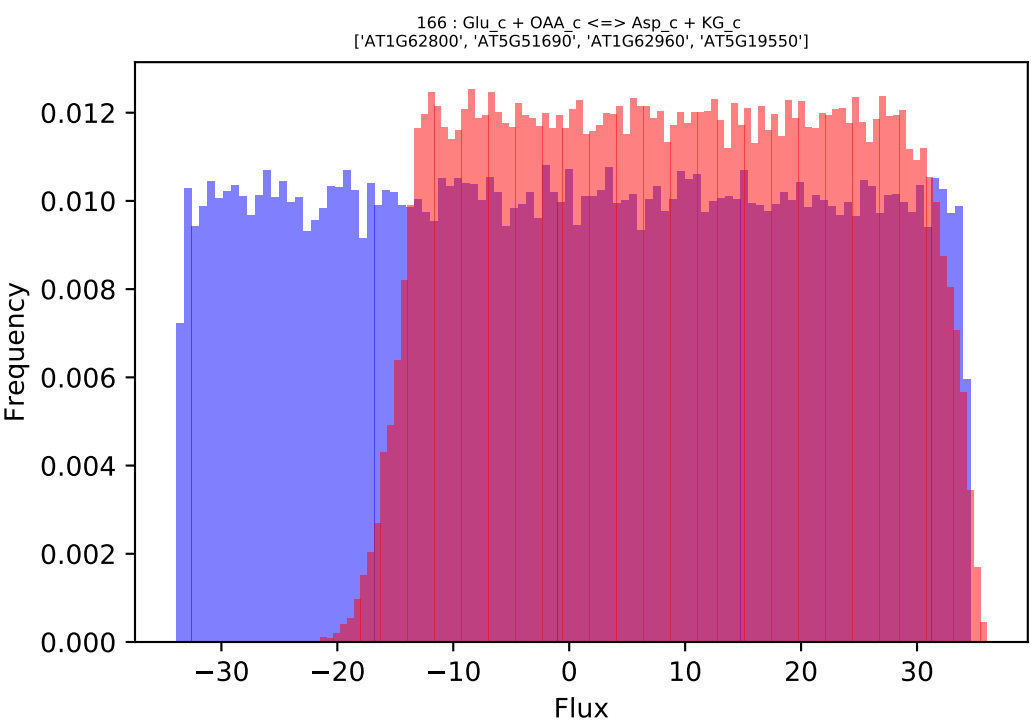

161 : CBP_h + H_h + Orn_h <=> CTL_h + Pi_h
['AT1G75330']
Frequency
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0.0
0.2
0.4
0.6
0.8
Flux

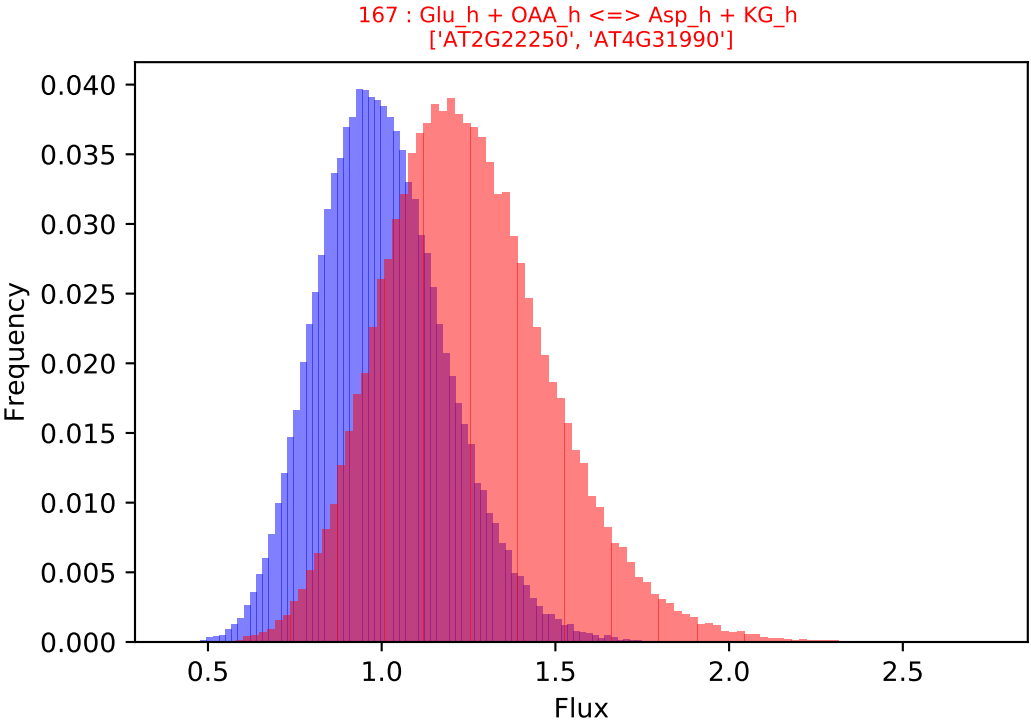

162 : ATP_h + Asp_h + CTL_h --> AMP_h + Arg_DASH_SCA_h + 3.0 H_h + PPi_h
['AT4G24830']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.2
0.4
0.6
0.8

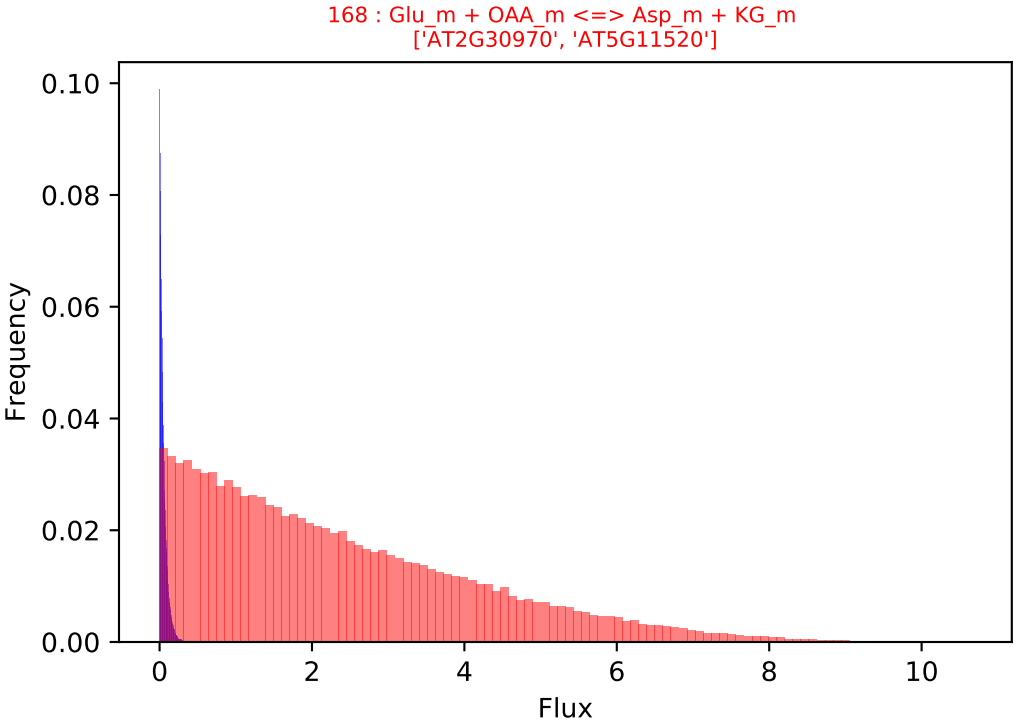

163 : Arg_DASH_SCA_h --> Arg_h + Fum_h
['AT5G10920']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.2
0.4
0.6
0.8

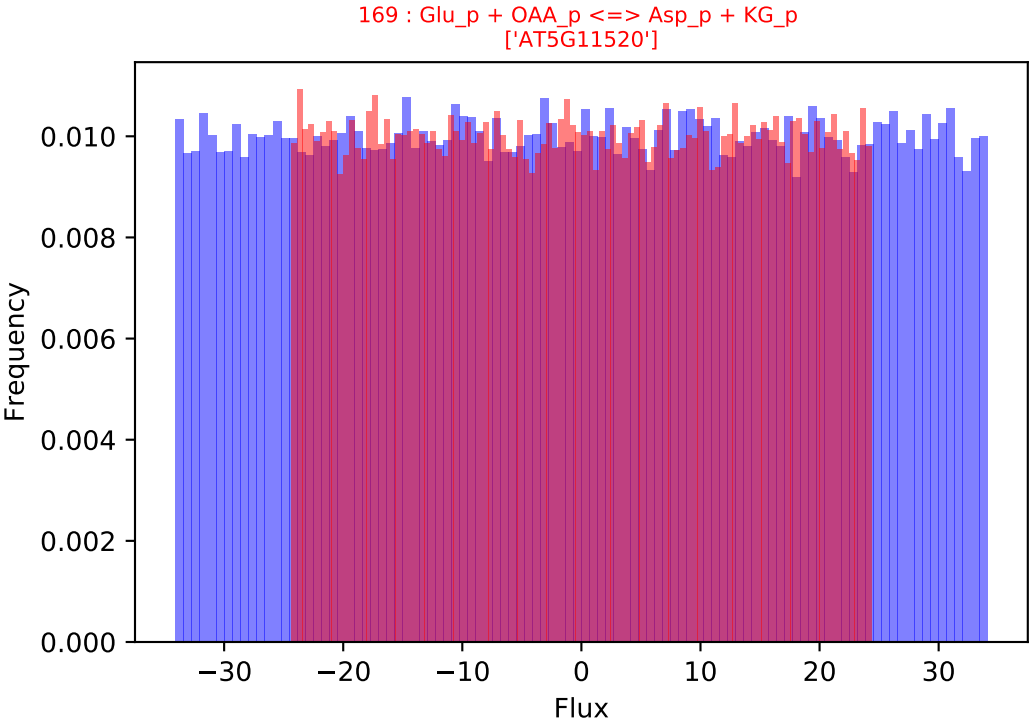

164 : Mal_c --> Fum_c + H2O_c
['AT5G50950']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
1
2
3
4
Flux

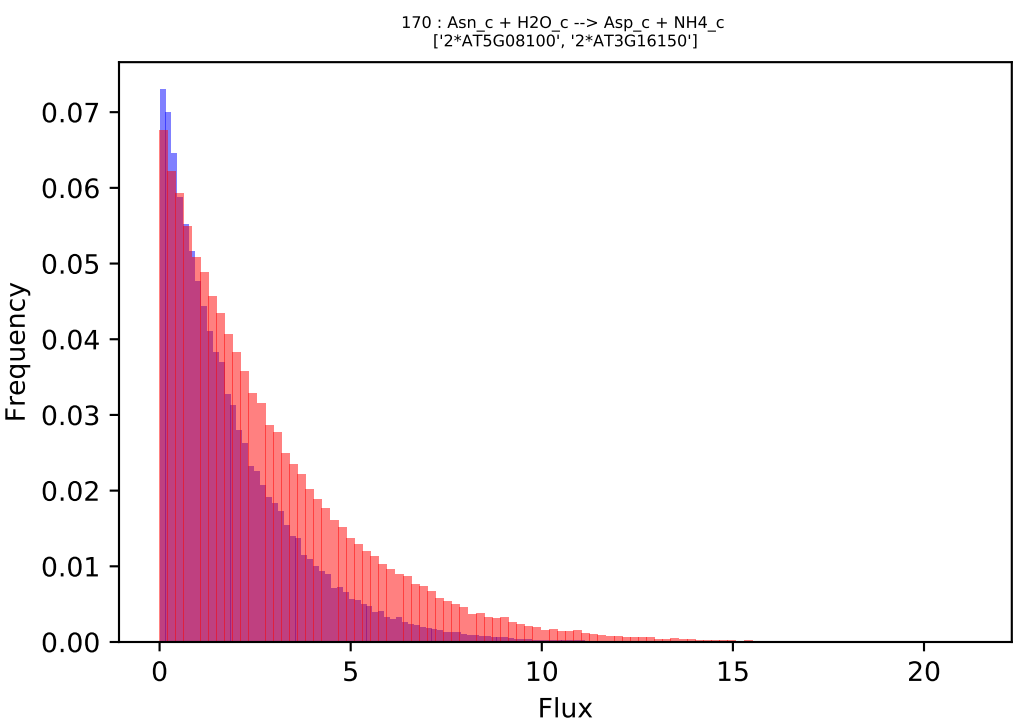

165 : ATP_c + Asp_c + Gln_c + H2O_c --> AMP_c + Asn_c + Glu_c + H_c + PPi_c
['AT3G47340', 'AT5G10240', 'AT5G65010']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0
5
10
15
20
25
Flux

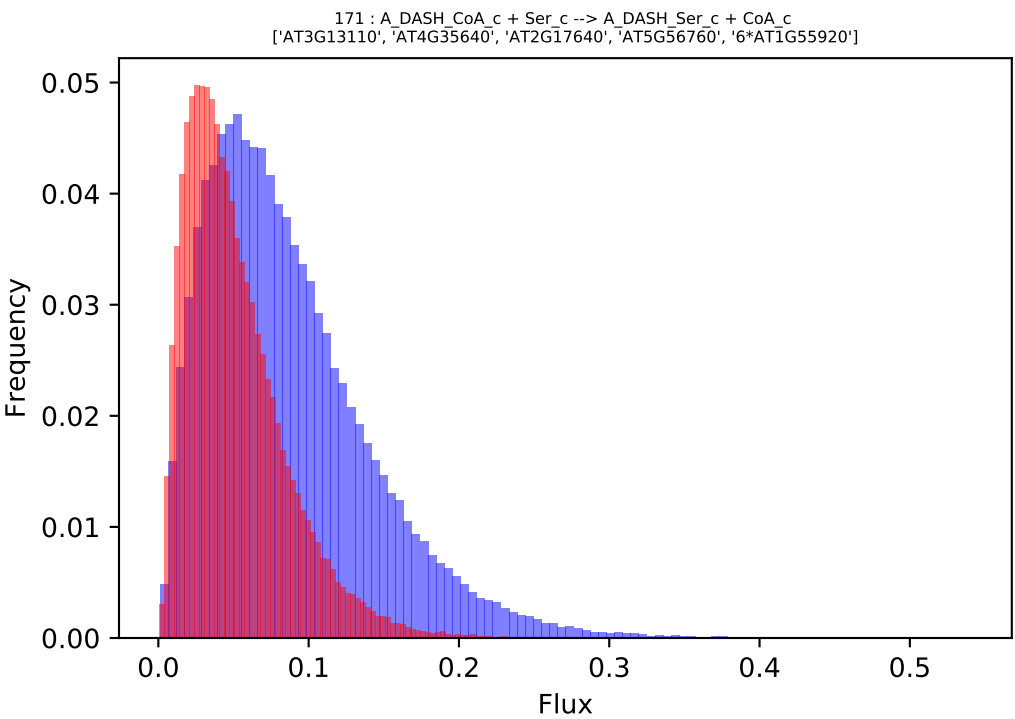

166 : Glu_c + OAA_c <=> Asp_c + KG_c
['AT1G62800', 'AT5G51690', 'AT1G62960', 'AT5G19550']
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−30
−20
−10
0
10
20
30
Flux

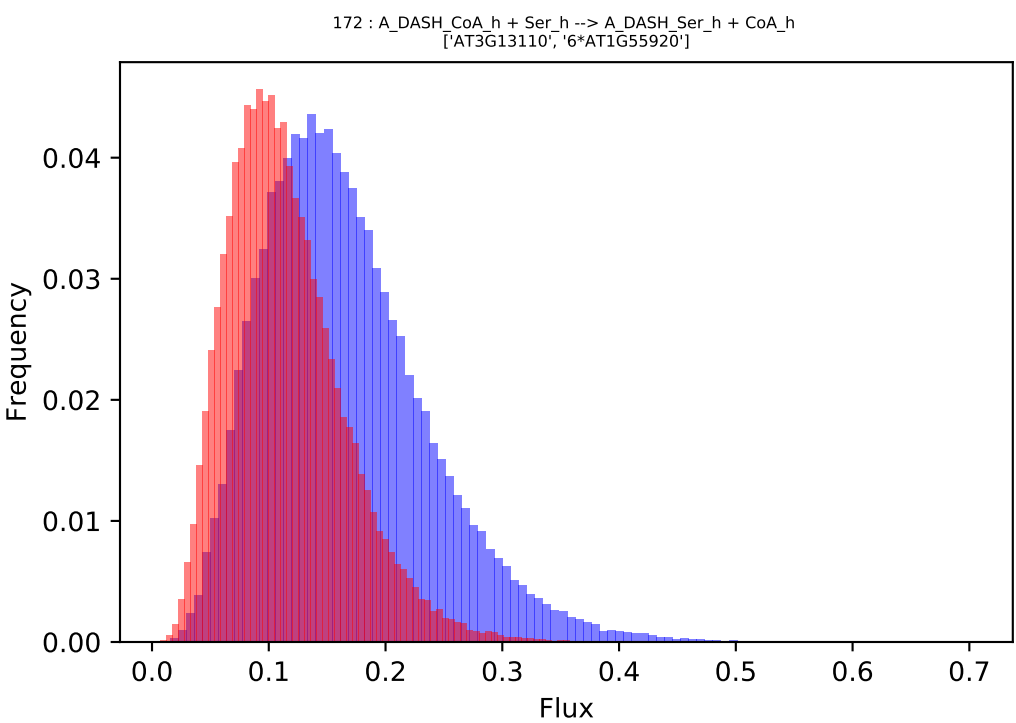

167 : Glu_h + OAA_h <=> Asp_h + KG_h
['AT2G22250', 'AT4G31990']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.5
1.0
1.5
2.0
2.5
Flux

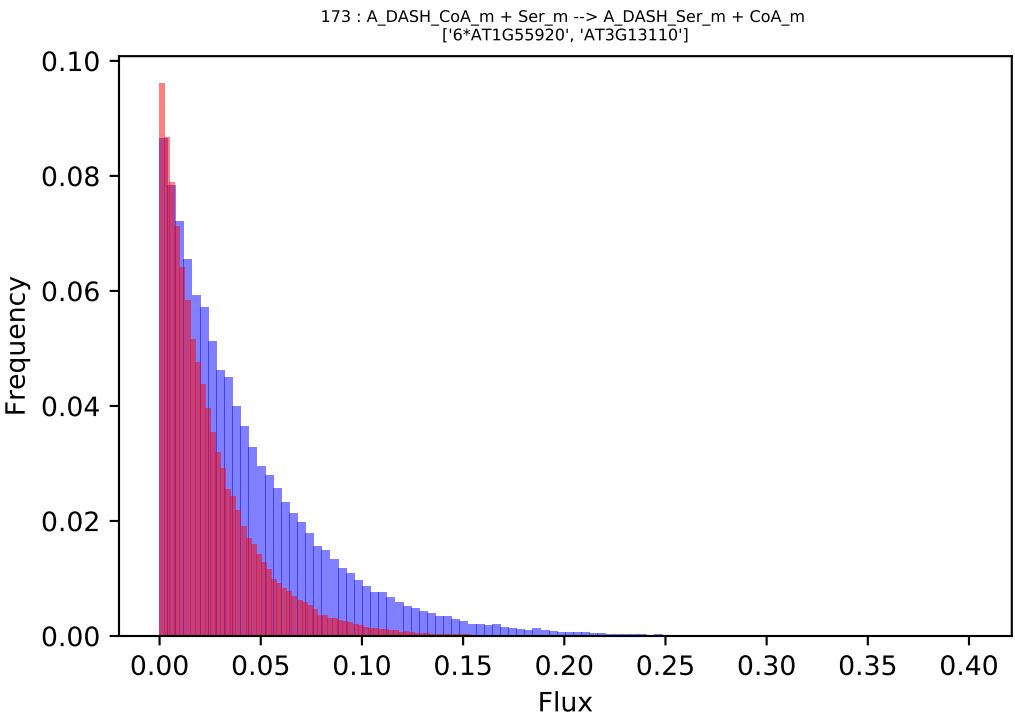

168 : Glu_m + OAA_m <=> Asp_m + KG_m
['AT2G30970', 'AT5G11520']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0
2
4
6
8
10
Flux

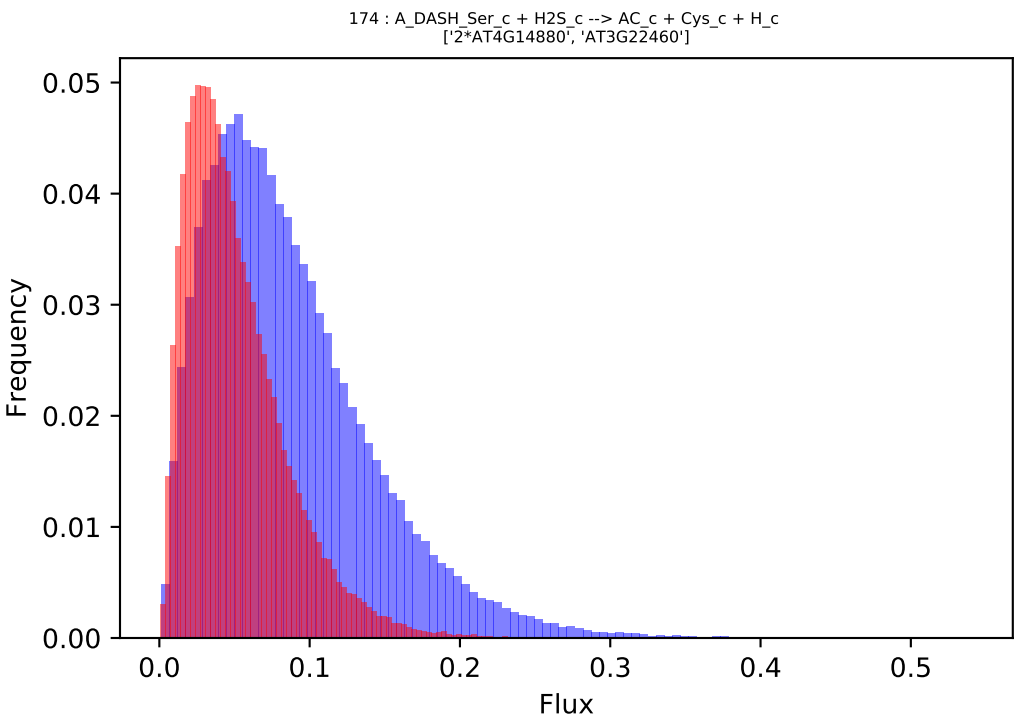

169 : Glu_p + OAA_p <=> Asp_p + KG_p
['AT5G11520']
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−30
−20
−10
0
10
20
30
Flux

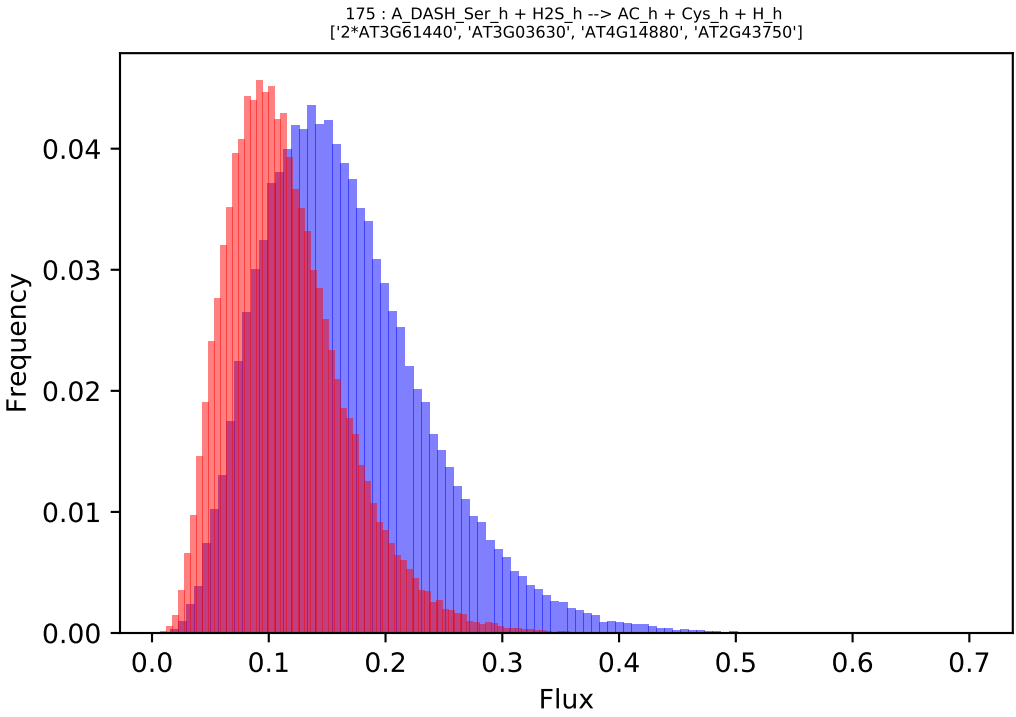

170 : Asn_c + H2O_c --> Asp_c + NH4_c
['2*AT5G08100', '2*AT3G16150']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0
5
10
15
20
Flux

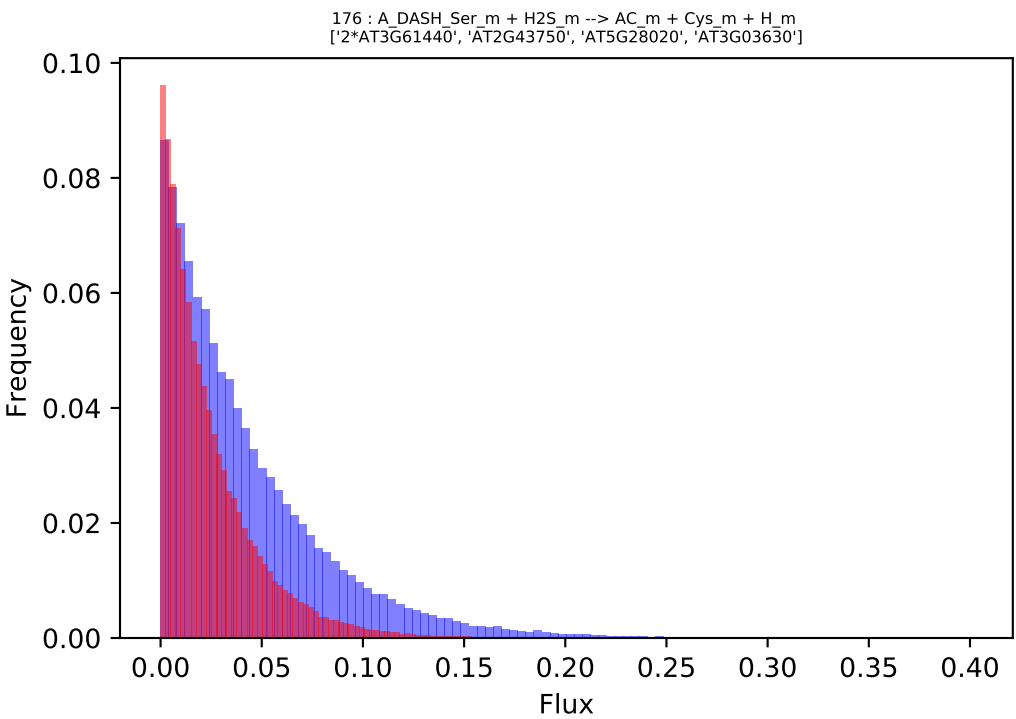

171 : A_DASH_CoA_c + Ser_c --> A_DASH_Ser_c + CoA_c
['AT3G13110', 'AT4G35640', 'AT2G17640', 'AT5G56760', '6*AT1G55920']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.0
0.1
0.2
0.3
0.4
0.5
Flux

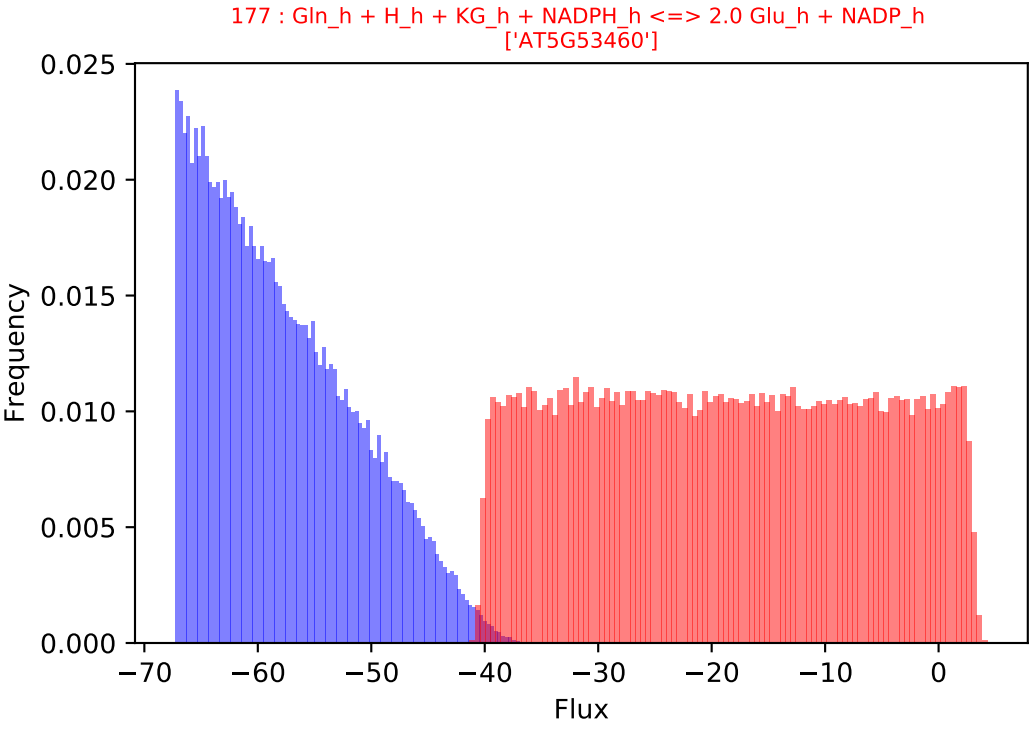

172 : A_DASH_CoA_h + Ser_h --> A_DASH_Ser_h + CoA_h
['AT3G13110', '6*AT1G55920']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Flux

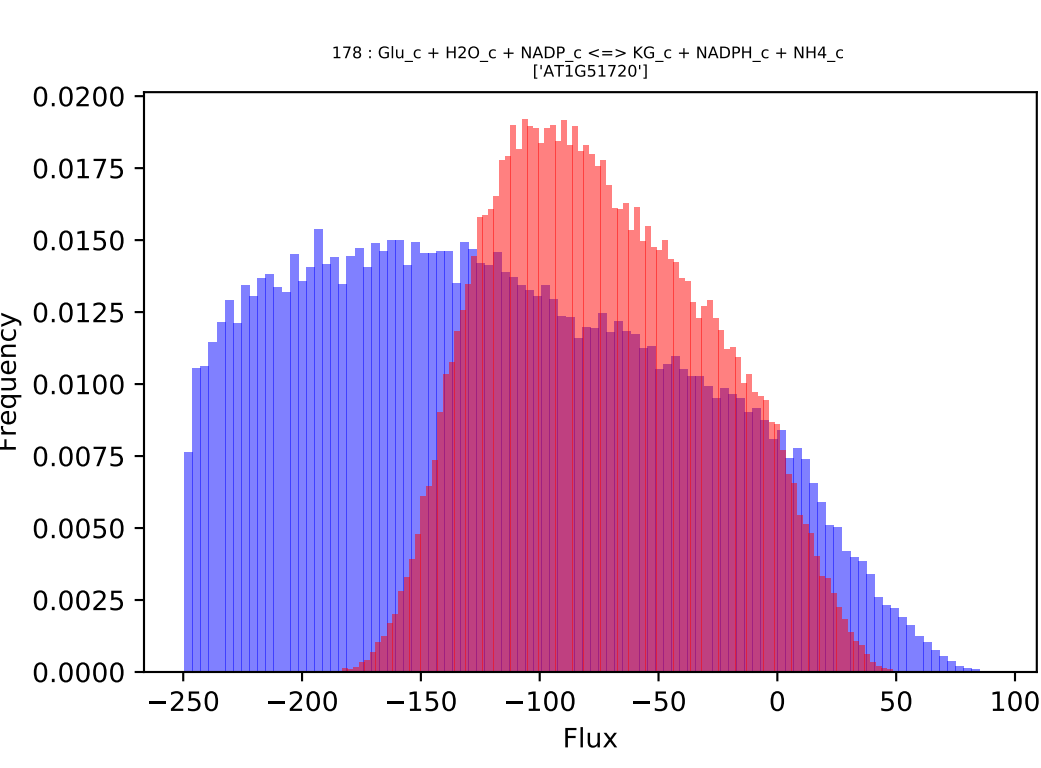

173 : A_DASH_CoA_m + Ser_m --> A_DASH_Ser_m + CoA_m
['6*AT1G55920', 'AT3G13110']
Frequency
Flux
0.00
0.02
0.04
0.06
0.08
0.10
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40

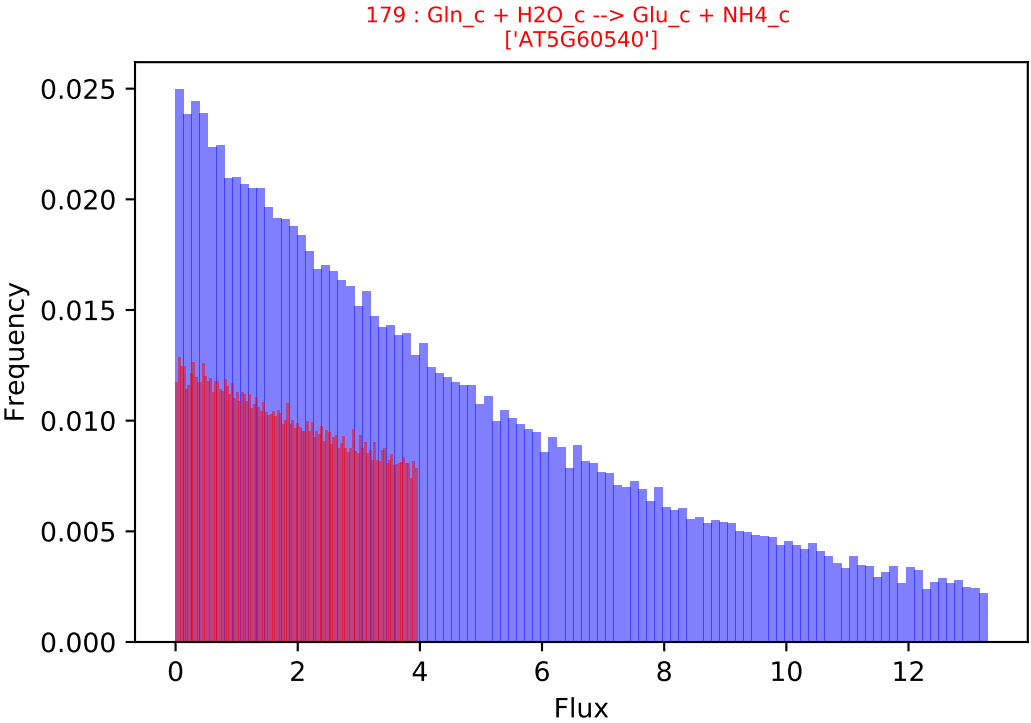

174 : A_DASH_Ser_c + H2S_c --> AC_c + Cys_c + H_c
['2*AT4G14880', 'AT3G22460']
Frequency
0.05
0.04
0.03
0.02
0.01
0.00
0.0
0.1
0.2
0.3
0.4
0.5
Flux

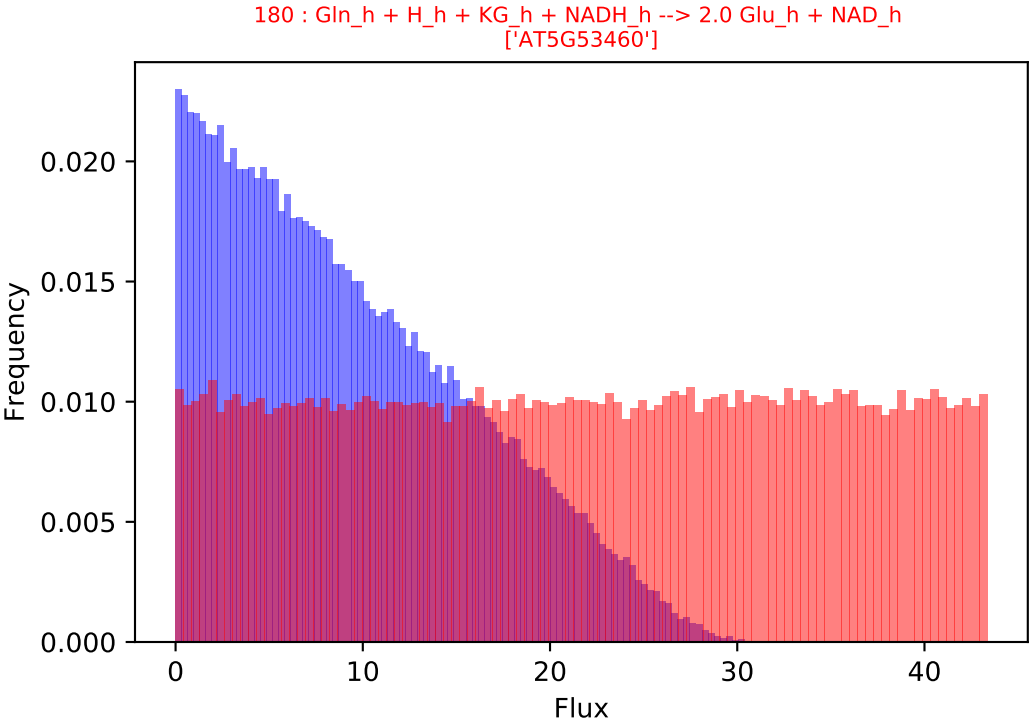

175 : A_DASH_Ser_h + H2S_h --> AC_h + Cys_h + H_h
['2*AT3G61440', 'AT3G03630', 'AT4G14880', 'AT2G43750']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Flux

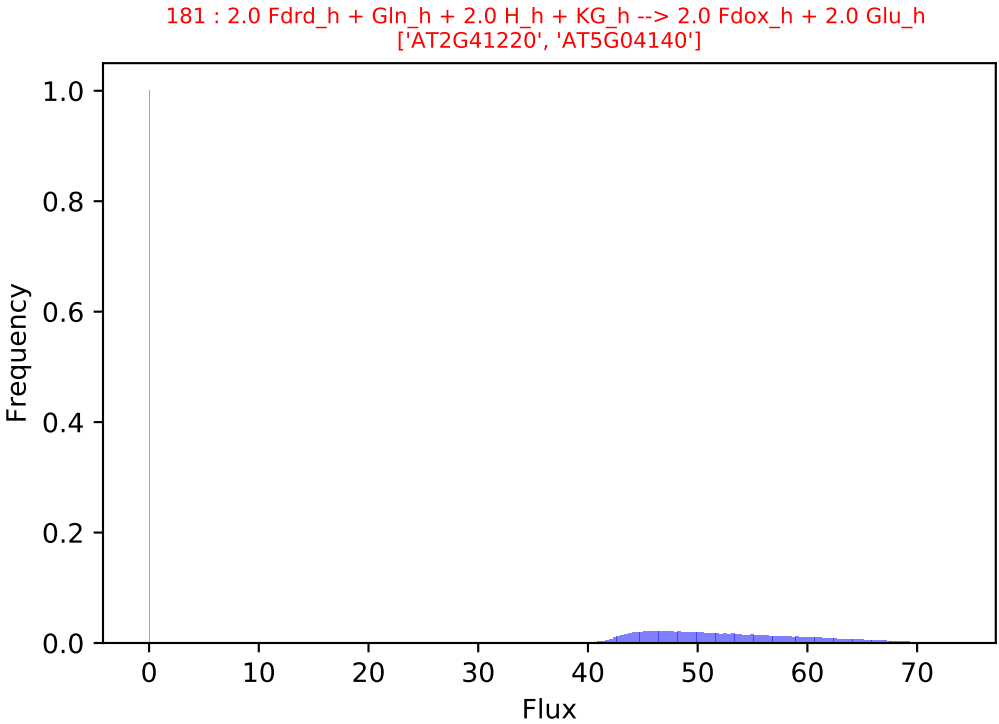

176 : A_DASH_Ser_m + H2S_m --> AC_m + Cys_m + H_m
['2*AT3G61440', 'AT2G43750', 'AT5G28020', 'AT3G03630']
Frequency
Flux
0.00
0.02
0.04
0.06
0.08
0.10
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40

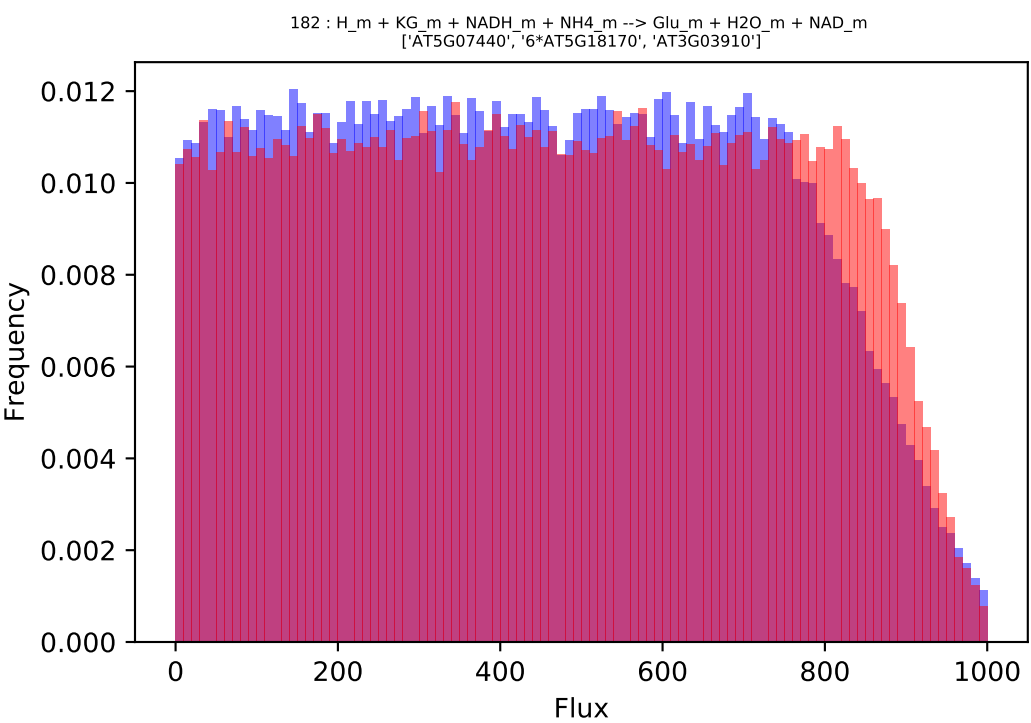

177 : Gln_h + H_h + KG_h + NADPH_h <=> 2.0 Glu_h + NADP_h
['AT5G53460']
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−70
−60
−50
−40
−30
−20
−10
0
Flux

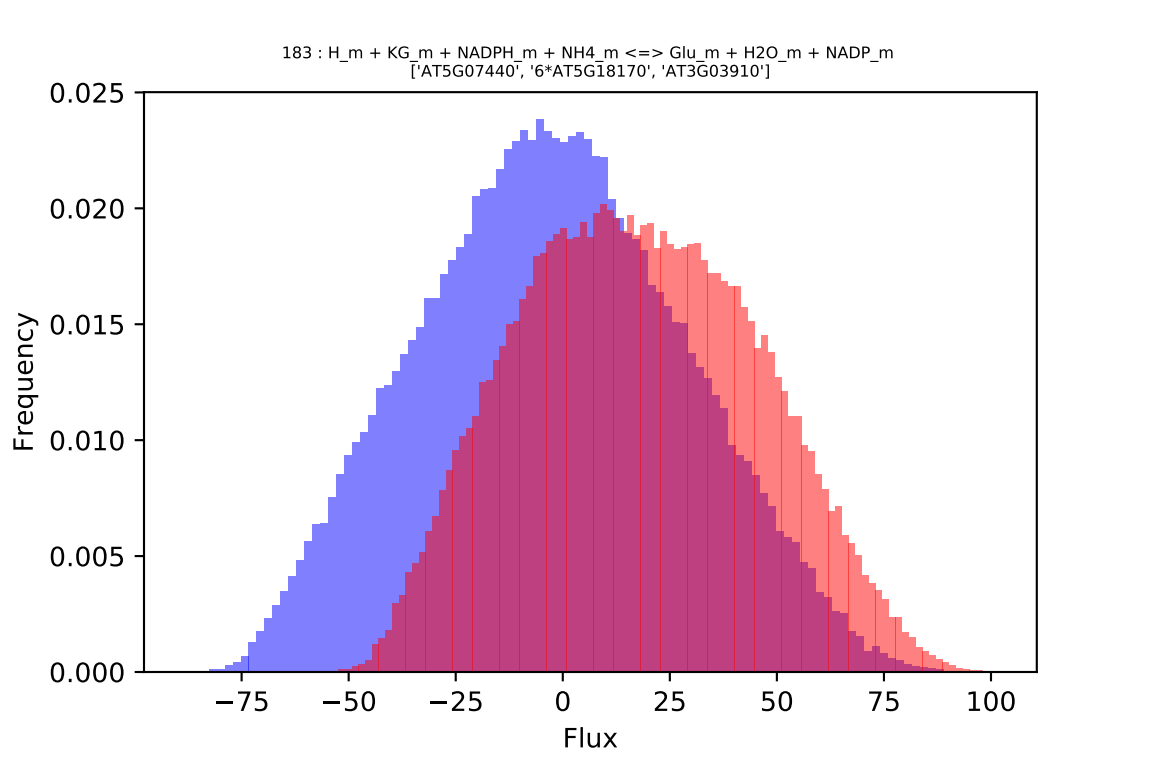

178 : Glu_c + H2O_c + NADP_c <=> KG_c + NADPH_c + NH4_c
['AT1G51720']
Frequency
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
−250
−200
−150
−100
−50
0
50
100
Flux

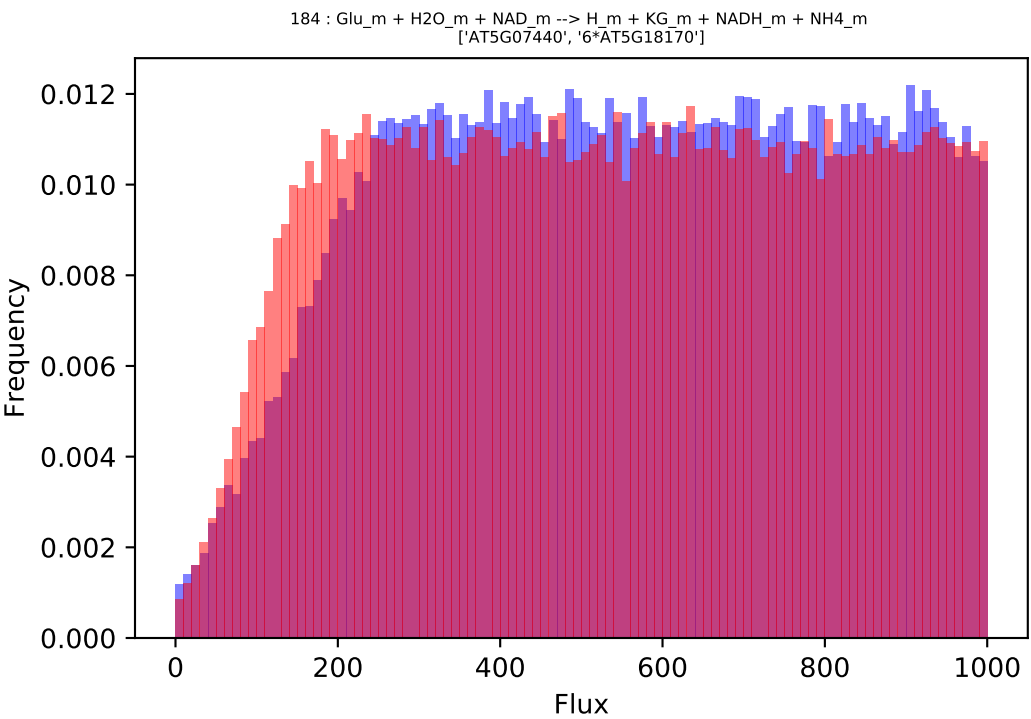

179 : Gln_c + H2O_c --> Glu_c + NH4_c
['AT5G60540']
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
2
4
6
8
10
12
Flux

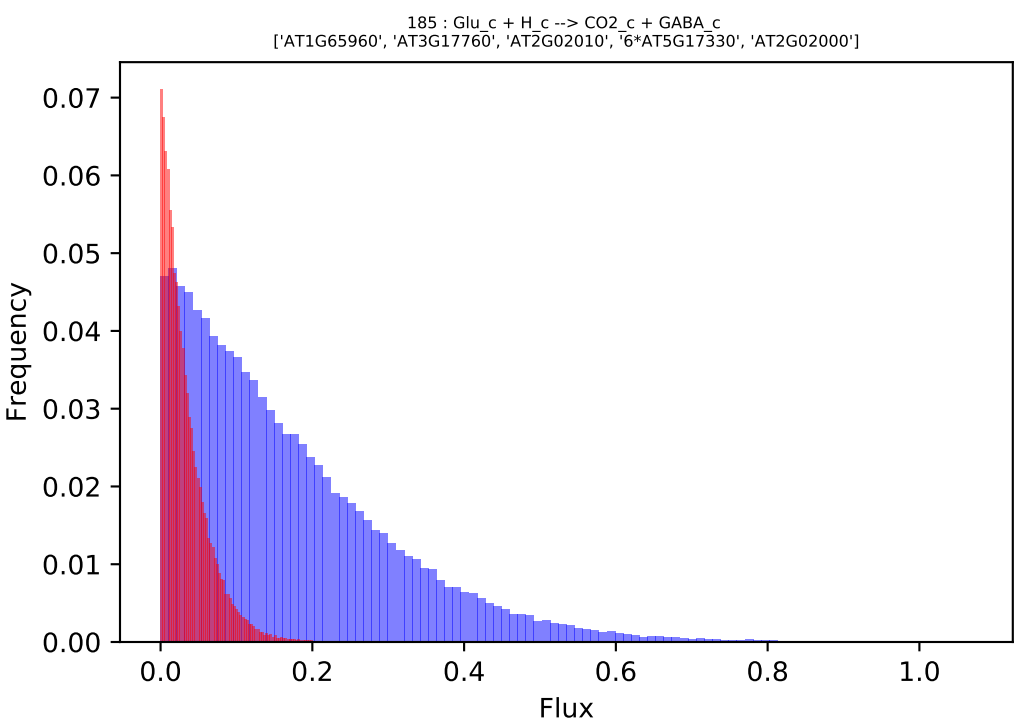

180 : Gln_h + H_h + KG_h + NADH_h --> 2.0 Glu_h + NAD_h
['AT5G53460']
0.020
0.015
0.010
0.005
0.000
Frequency
0
10
20
30
40
Flux

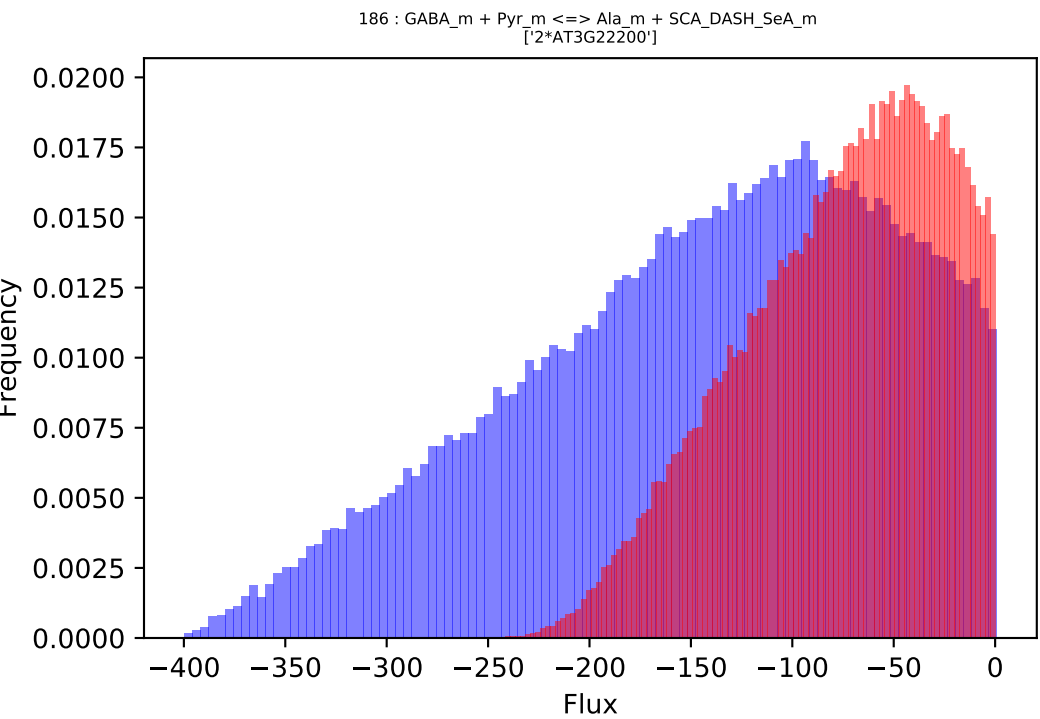

181 : 2.0 Fdrd_h + Gln_h + 2.0 H_h + KG_h --> 2.0 Fdox_h + 2.0 Glu_h
['AT2G41220', 'AT5G04140']
Frequency
1.0
0.8
0.6
0.4
0.2
0.0
0
10
20
30
40
50
60
70
Flux

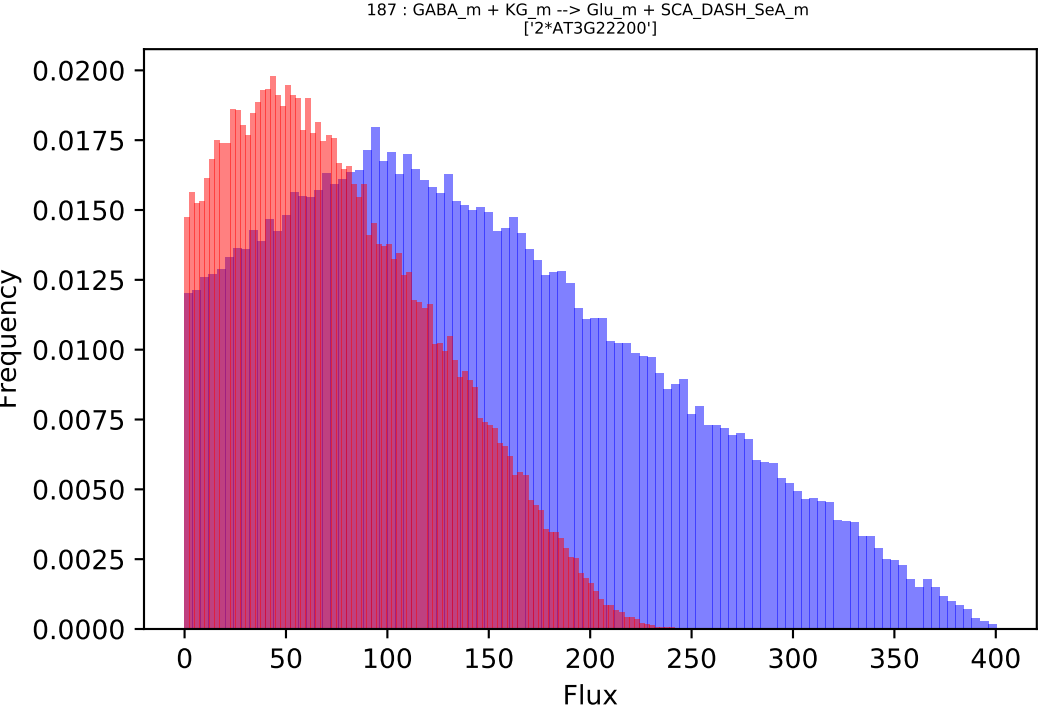

182 : H_m + KG_m + NADH_m + NH4_m --> Glu_m + H2O_m + NAD_m
['AT5G07440', '6*AT5G18170', 'AT3G03910']
Frequency
0.012
0.010
0.008
0.006
0.004
0.002
0.000
0
200
400
600
800
1000
Flux

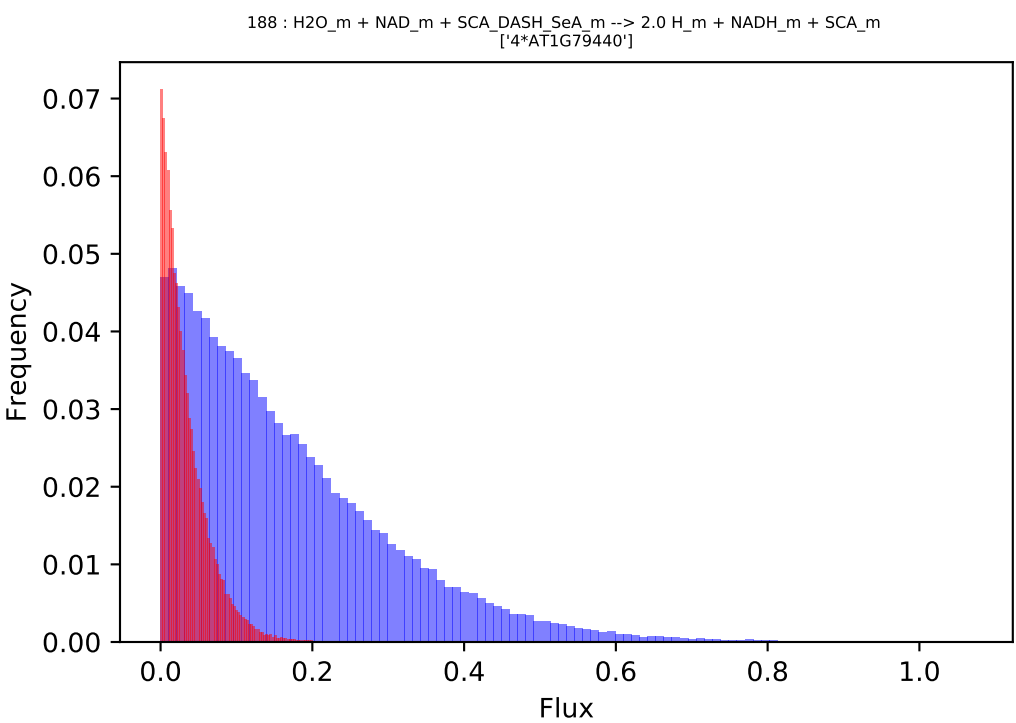

183 : H_m + KG_m + NADPH_m + NH4_m <=> Glu_m + H2O_m + NADP_m
['AT5G07440', '6*AT5G18170', 'AT3G03910']
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−75
−50
−25
0
25
50
75
100
Flux

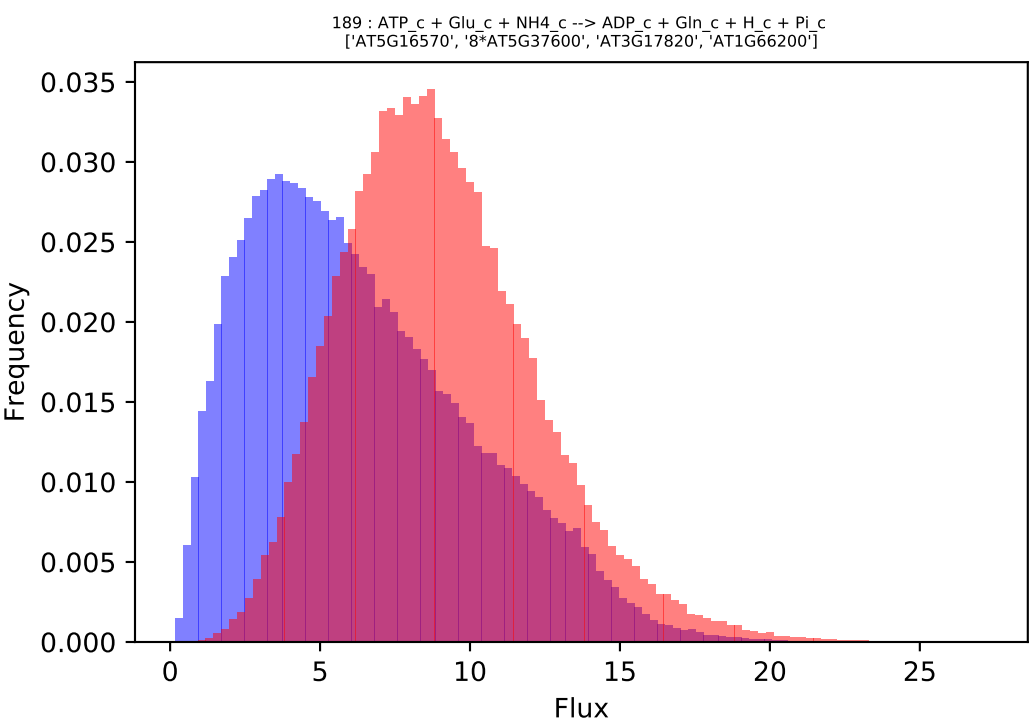

184 : Glu_m + H2O_m + NAD_m --> H_m + KG_m + NADH_m + NH4_m
['AT5G07440', '6*AT5G18170']
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
0
200
400
600
800
1000
Flux

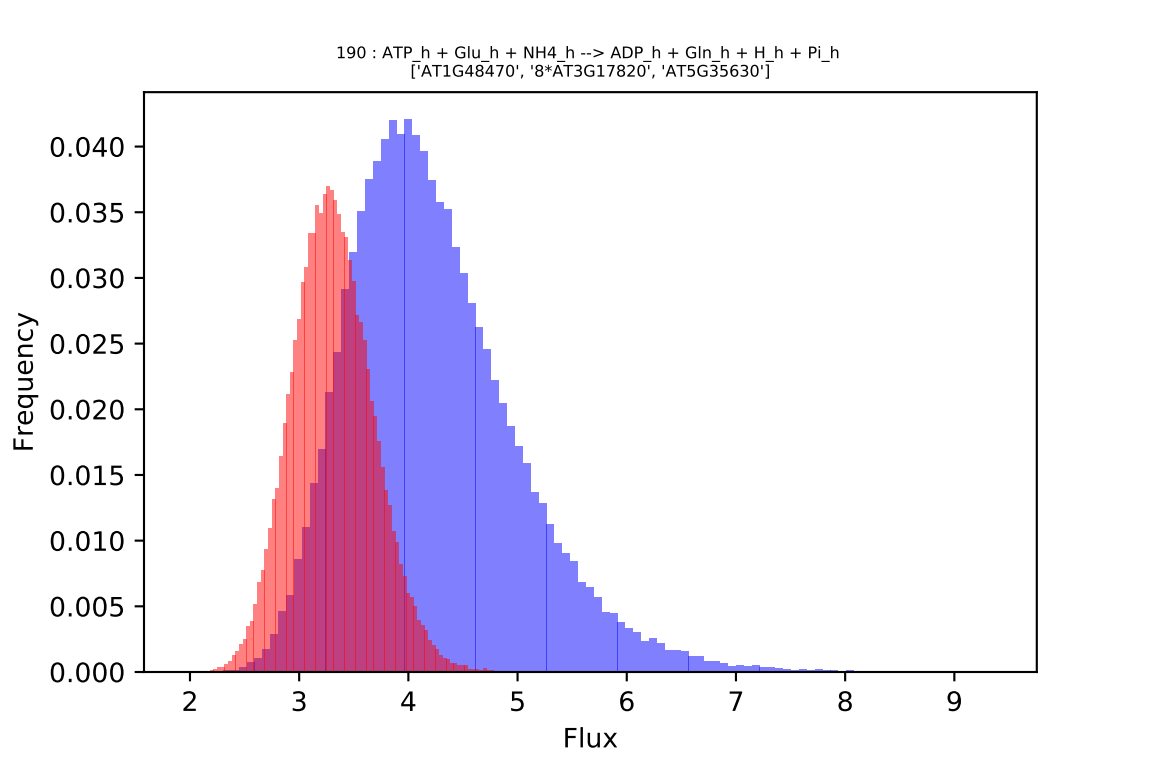

185 : Glu_c + H_c --> CO2_c + GABA_c
['AT1G65960', 'AT3G17760', 'AT2G02010', '6*AT5G17330', 'AT2G02000']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.0
0.2
0.4
0.6
0.8
1.0
Flux

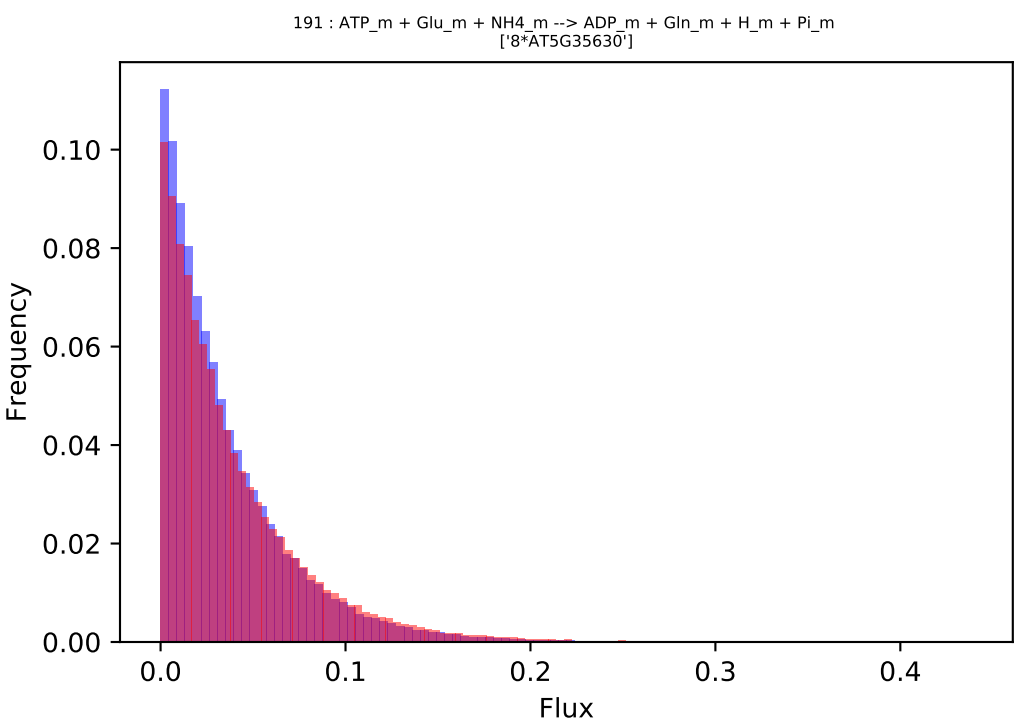

186 : GABA_m + Pyr_m <=> Ala_m + SCA_DASH_SeA_m
['2*AT3G22200']
Frequency
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
−400
−350
−300
−250
−200
−150
−100
−50
0
Flux

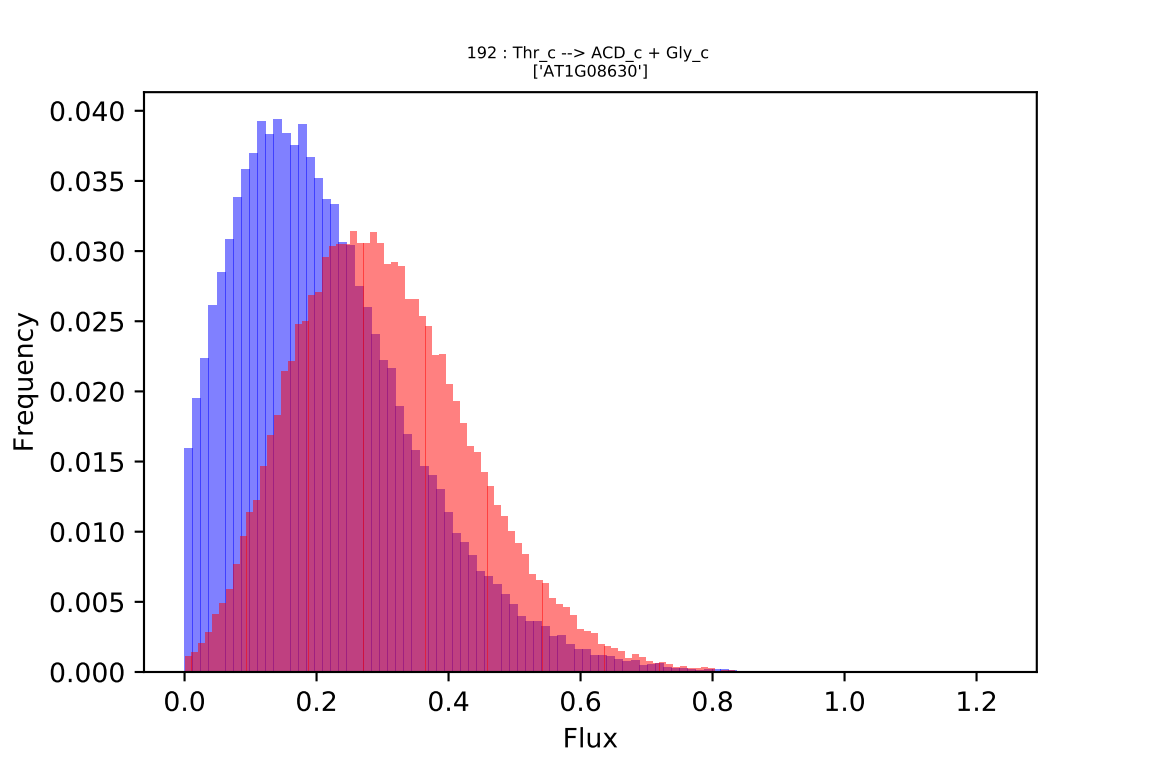

187 : GABA_m + KG_m --> Glu_m + SCA_DASH_SeA_m
['2*AT3G22200']
Frequency
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
0
50
100
150
200
250
300
350
400
Flux

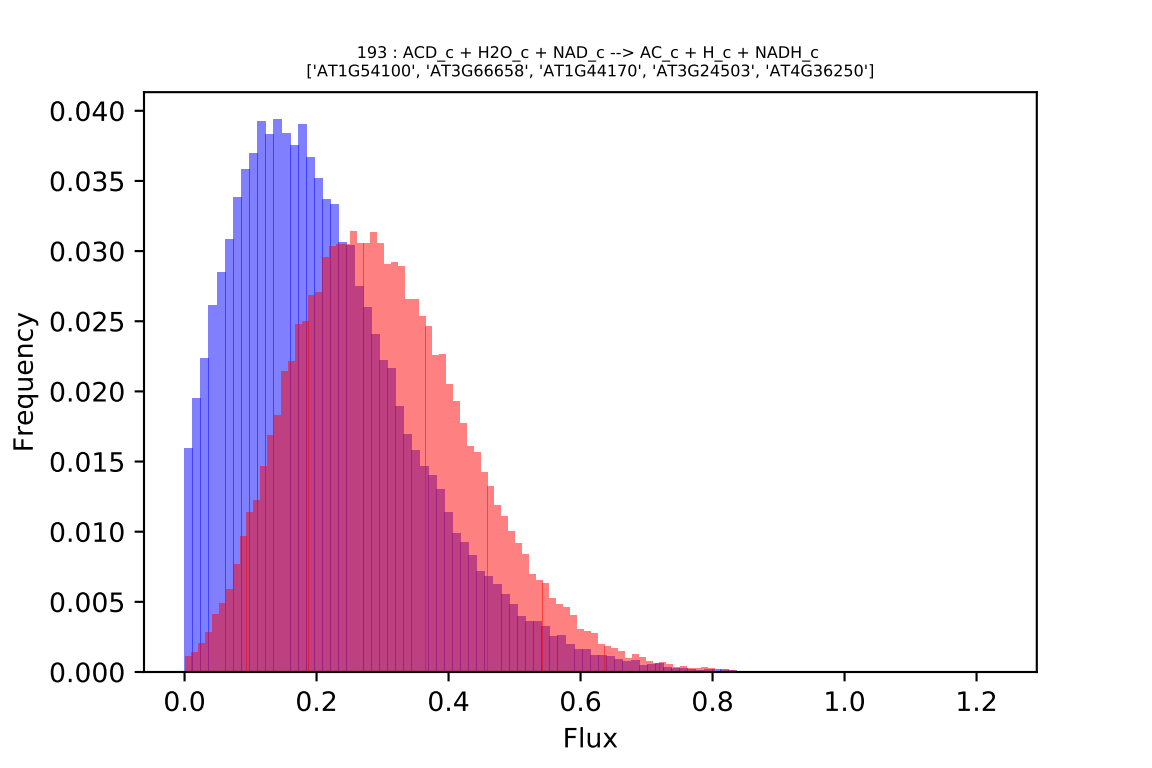

188 : H2O_m + NAD_m + SCA_DASH_SeA_m --> 2.0 H_m + NADH_m + SCA_m
['4*AT1G79440']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.0
0.2
0.4
0.6
0.8
1.0
Flux

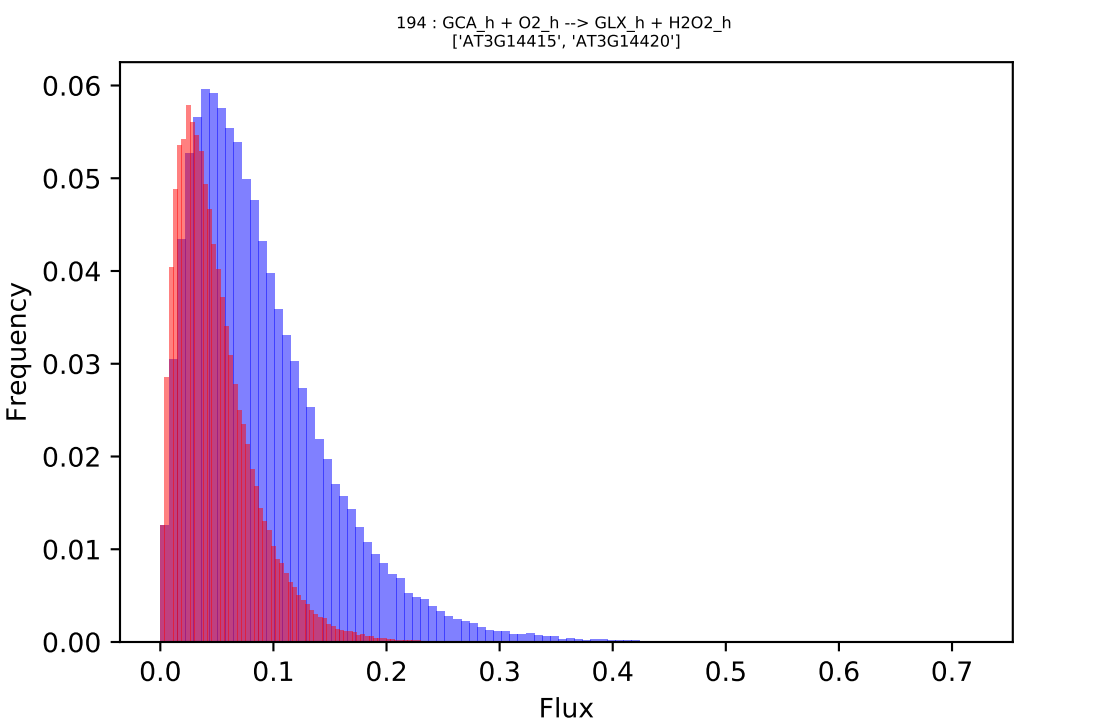

189 : ATP_c + Glu_c + NH4_c --> ADP_c + Gln_c + H_c + Pi_c
['AT5G16570', '8*AT5G37600', 'AT3G17820', 'AT1G66200']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0
5
10
15
20
25
Flux

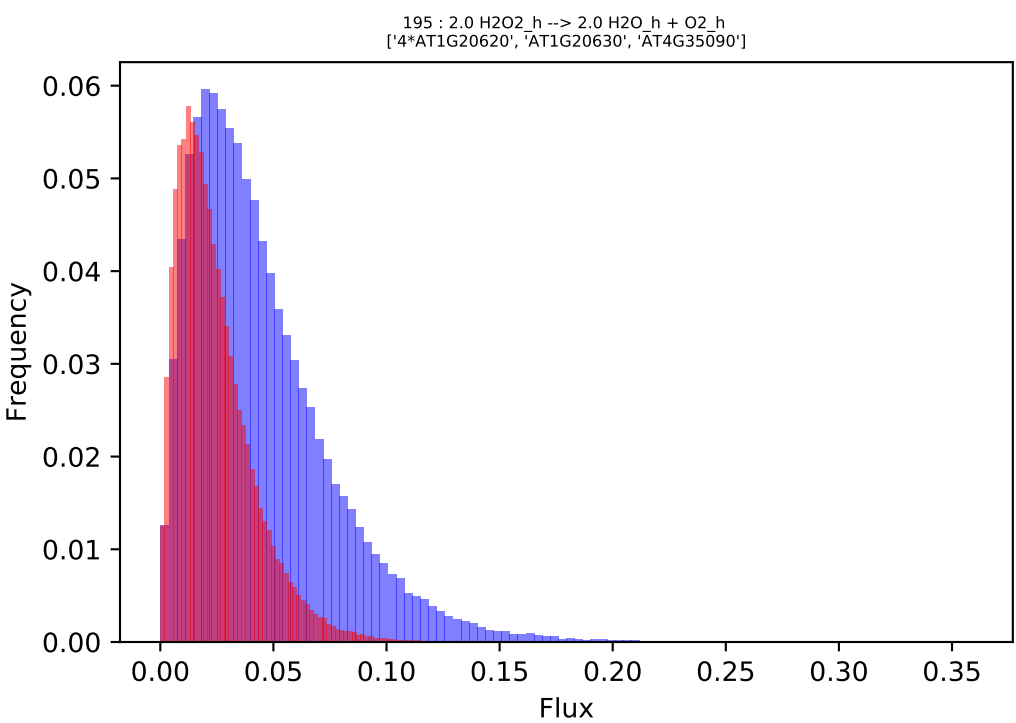

190 : ATP_h + Glu_h + NH4_h --> ADP_h + Gln_h + H_h + Pi_h
['AT1G48470', '8*AT3G17820', 'AT5G35630']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
2
3
4
5
6
7
8
9
Flux

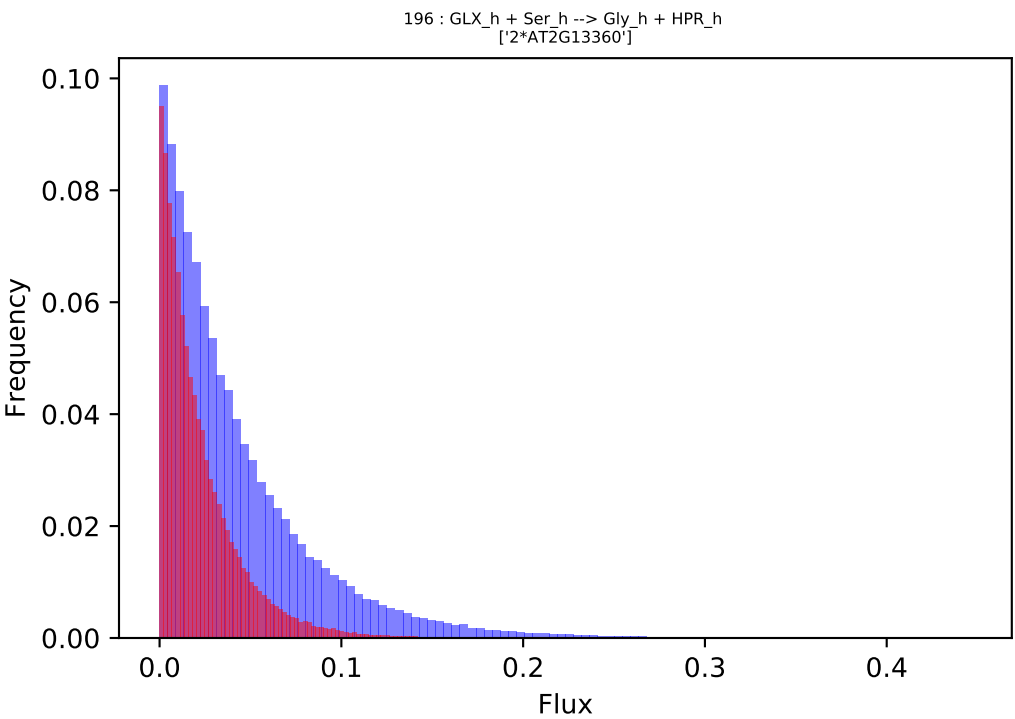

191 : ATP_m + Glu_m + NH4_m --> ADP_m + Gln_m + H_m + Pi_m
['8*AT5G35630']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.0
0.1
0.2
0.3
0.4
Flux

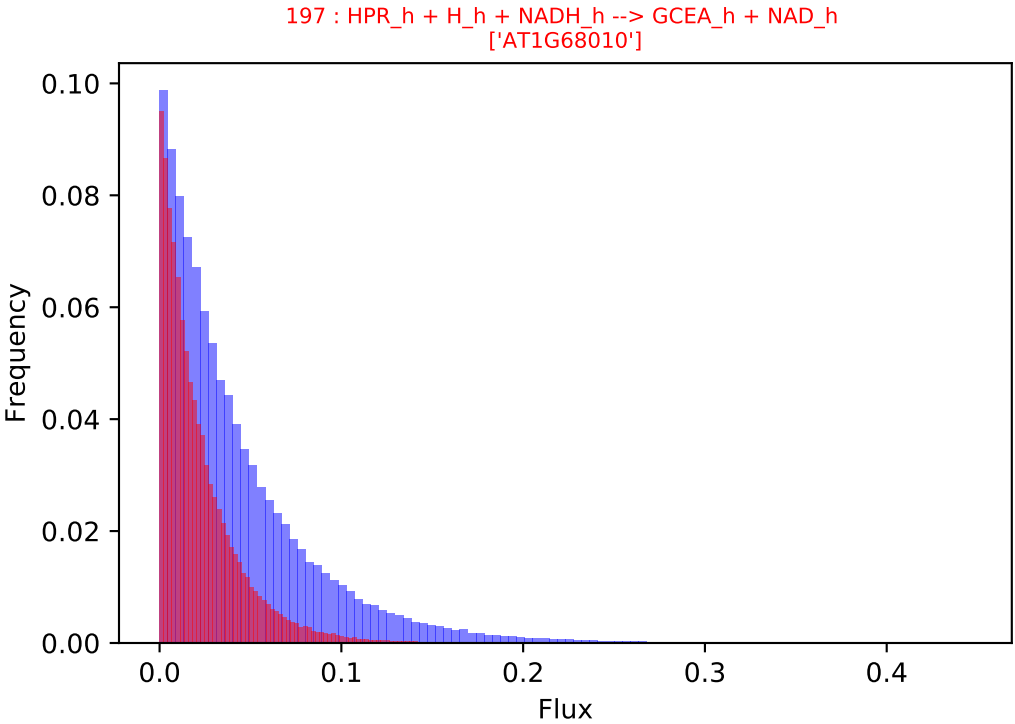

192 : Thr_c --> ACD_c + Gly_c
['AT1G08630']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Flux

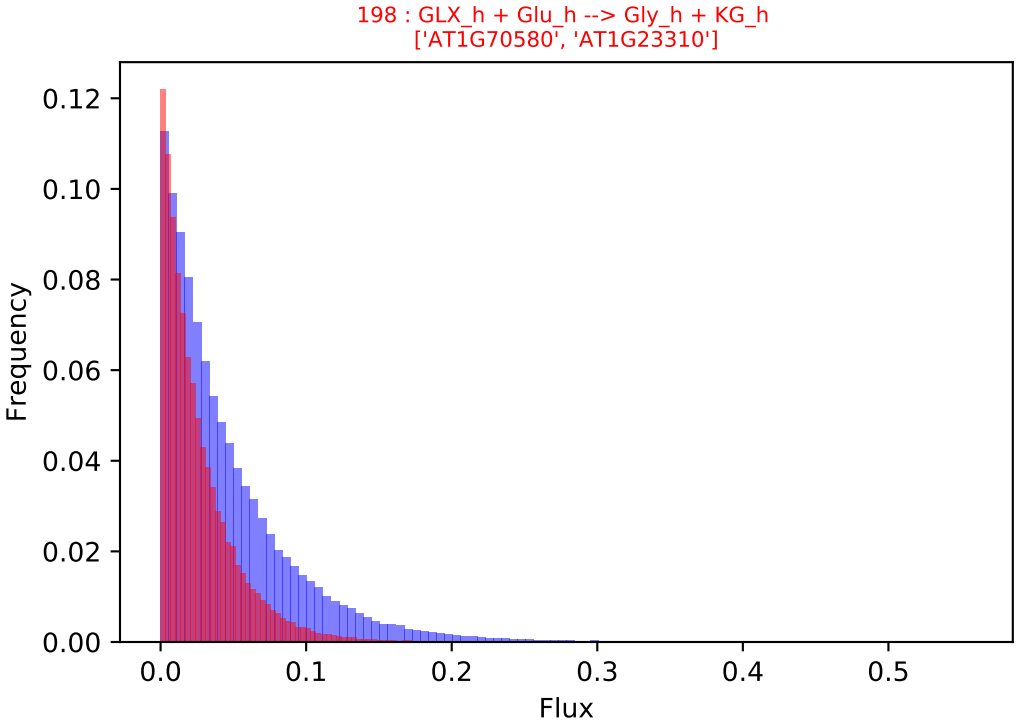

193 : ACD_c + H2O_c + NAD_c --> AC_c + H_c + NADH_c
['AT1G54100', 'AT3G66658', 'AT1G44170', 'AT3G24503', 'AT4G36250']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Flux

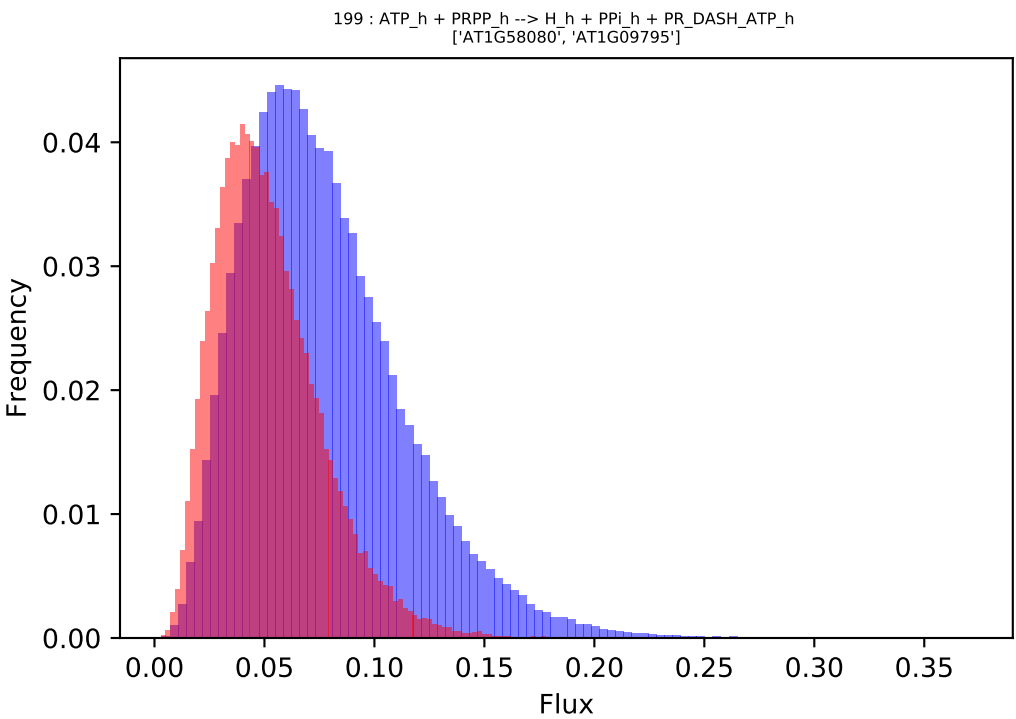

194 : GCA_h + O2_h --> GLX_h + H2O2_h
['AT3G14415', 'AT3G14420']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7

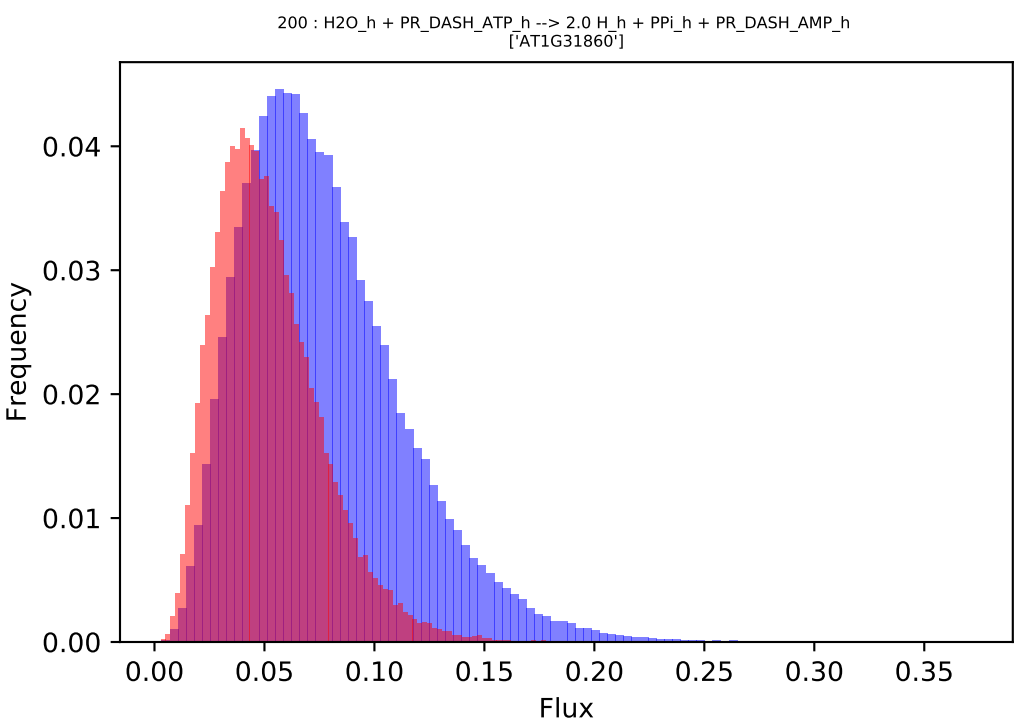

195 : 2.0 H2O2_h --> 2.0 H2O_h + O2_h
['4*AT1G20620', 'AT1G20630', 'AT4G35090']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35

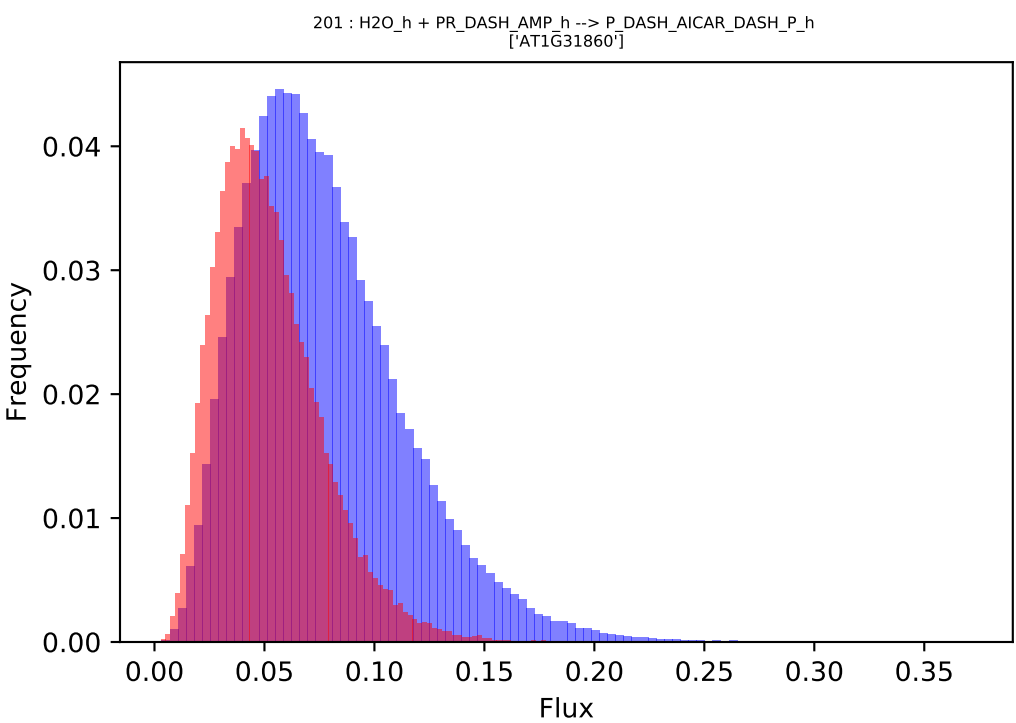

196 : GLX_h + Ser_h --> Gly_h + HPR_h
['2*AT2G13360']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
Flux

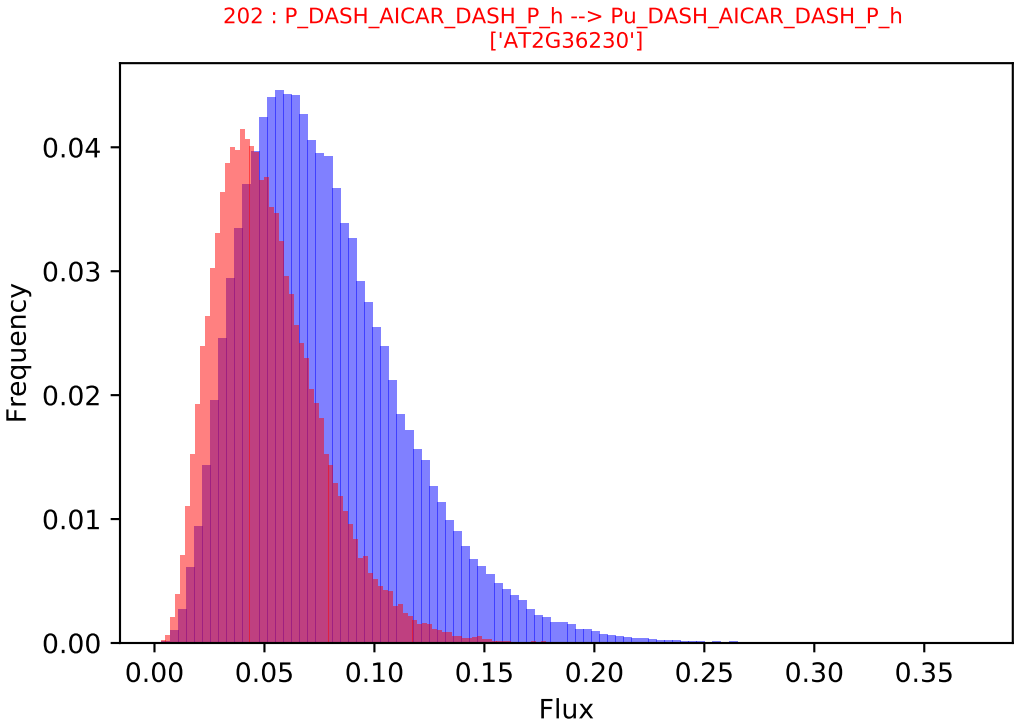

197 : HPR_h + H_h + NADH_h --> GCEA_h + NAD_h
['AT1G68010']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
Flux

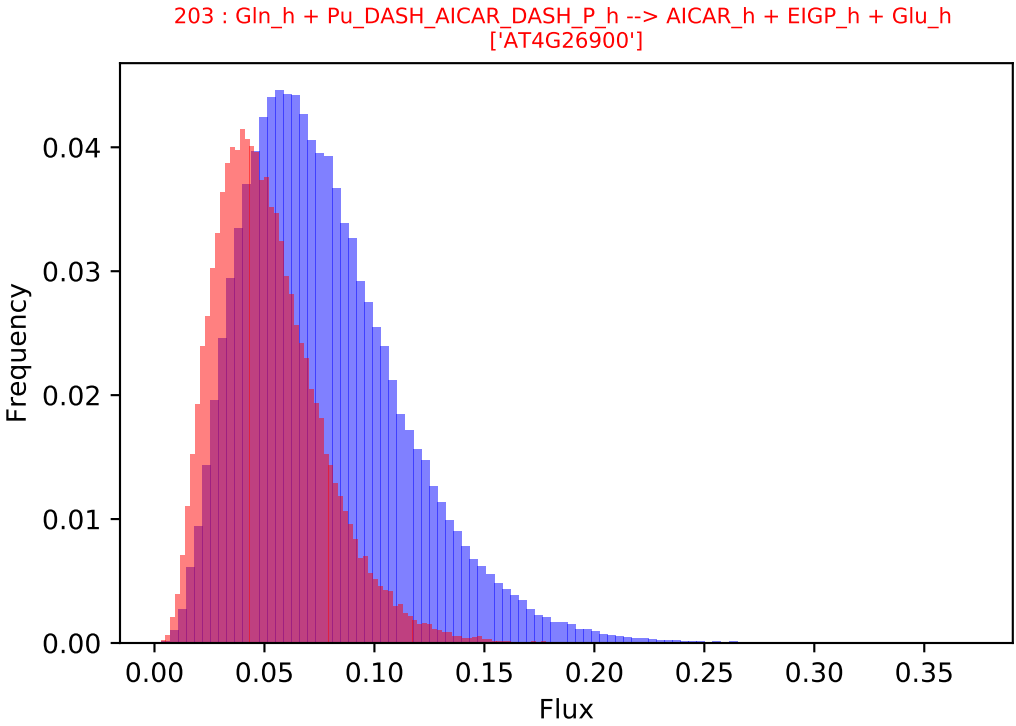

198 : GLX_h + Glu_h --> Gly_h + KG_h
['AT1G70580', 'AT1G23310']
Frequency
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0.0
0.1
0.2
0.3
0.4
0.5
Flux

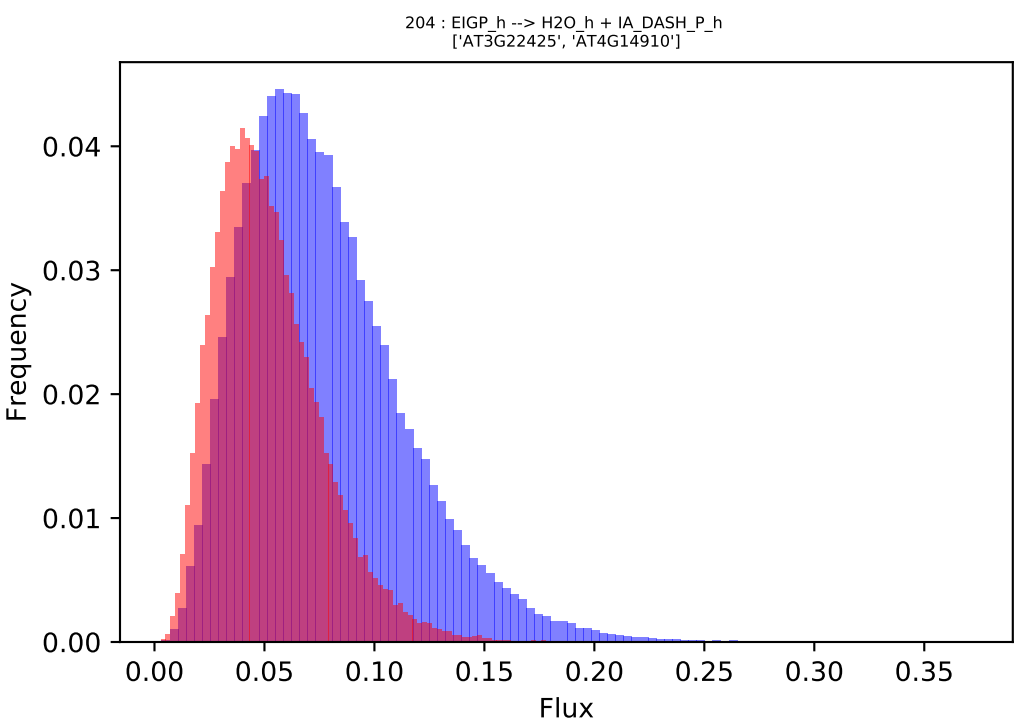

199 : ATP_h + PRPP_h --> H_h + PPi_h + PR_DASH_ATP_h
['AT1G58080', 'AT1G09795']
Frequency
0.00
0.01
0.02
0.03
0.04
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Flux

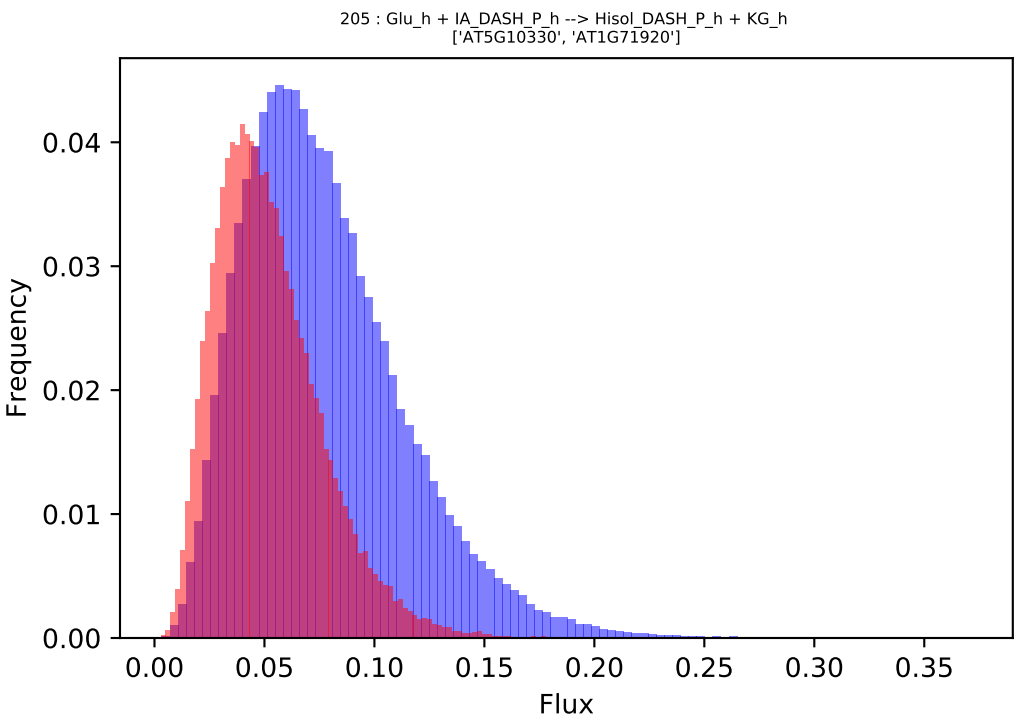

200 : H2O_h + PR_DASH_ATP_h --> 2.0 H_h + PPi_h + PR_DASH_AMP_h
['AT1G31860']
Frequency
0.00
0.01
0.02
0.03
0.04
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Flux

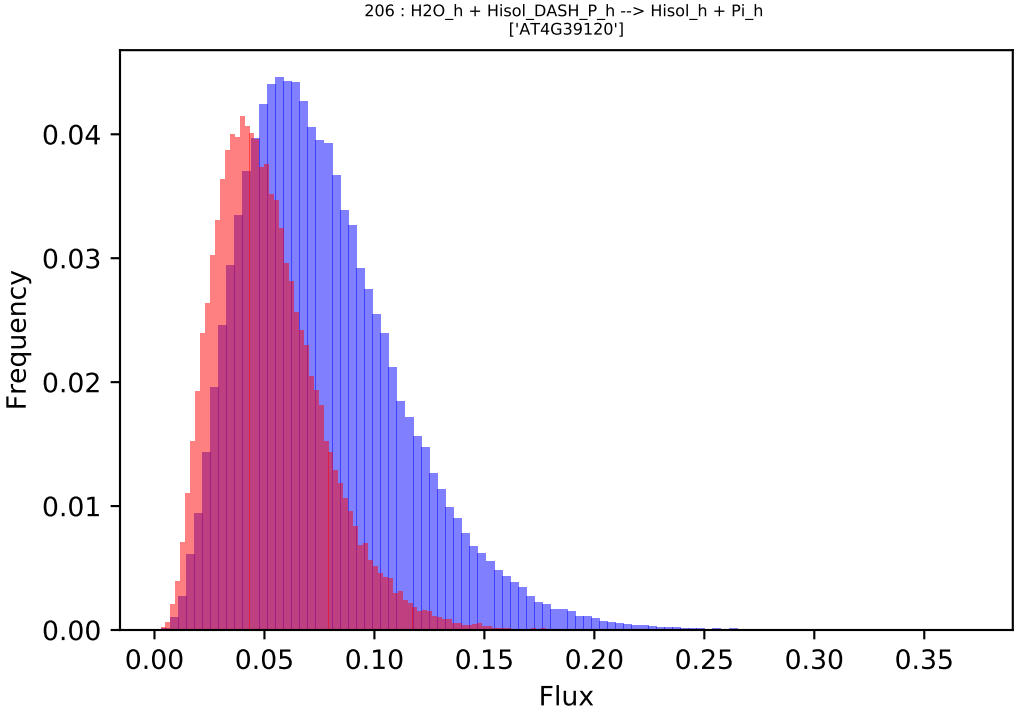

201 : H2O_h + PR_DASH_AMP_h --> P_DASH_AICAR_DASH_P_h
['AT1G31860']
Frequency
0.00
0.01
0.02
0.03
0.04
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Flux

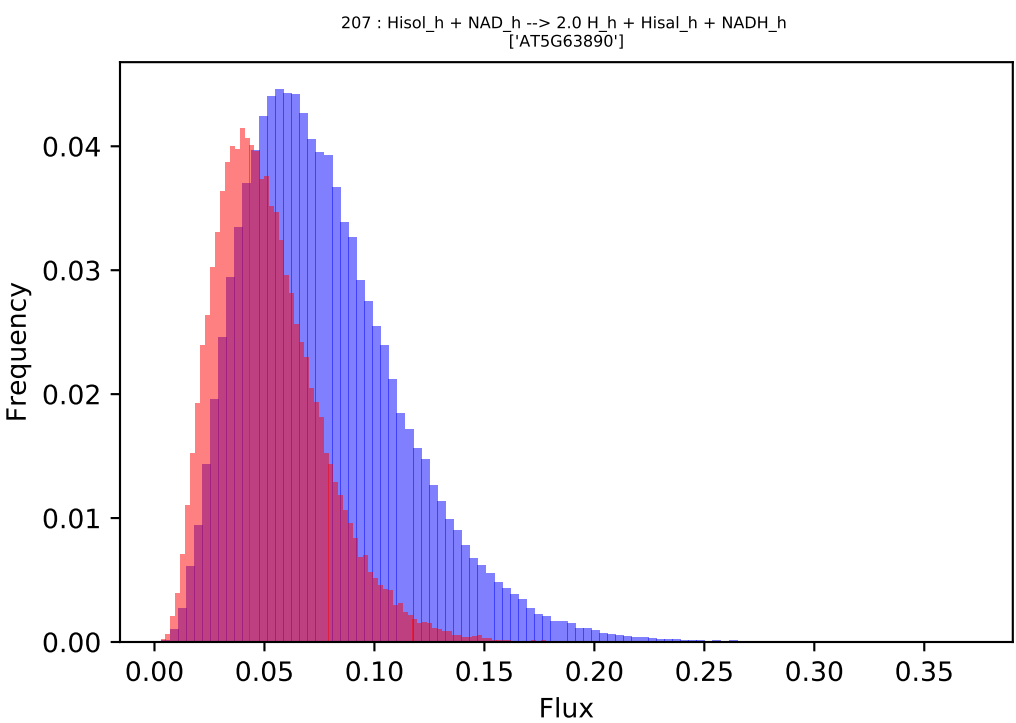

202 : P_DASH_AICAR_DASH_P_h --> Pu_DASH_AICAR_DASH_P_h
['AT2G36230']
Frequency
0.00
0.01
0.02
0.03
0.04
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Flux

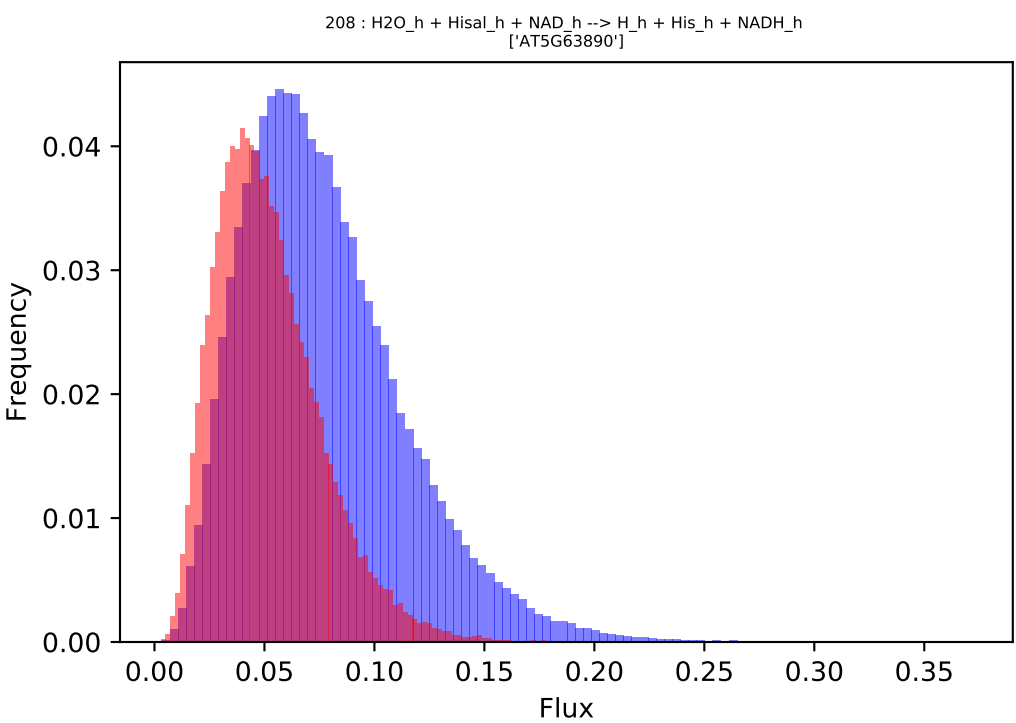

203 : Gln_h + Pu_DASH_AICAR_DASH_P_h --> AICAR_h + EIGP_h + Glu_h
['AT4G26900']
Frequency
0.00
0.01
0.02
0.03
0.04
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Flux

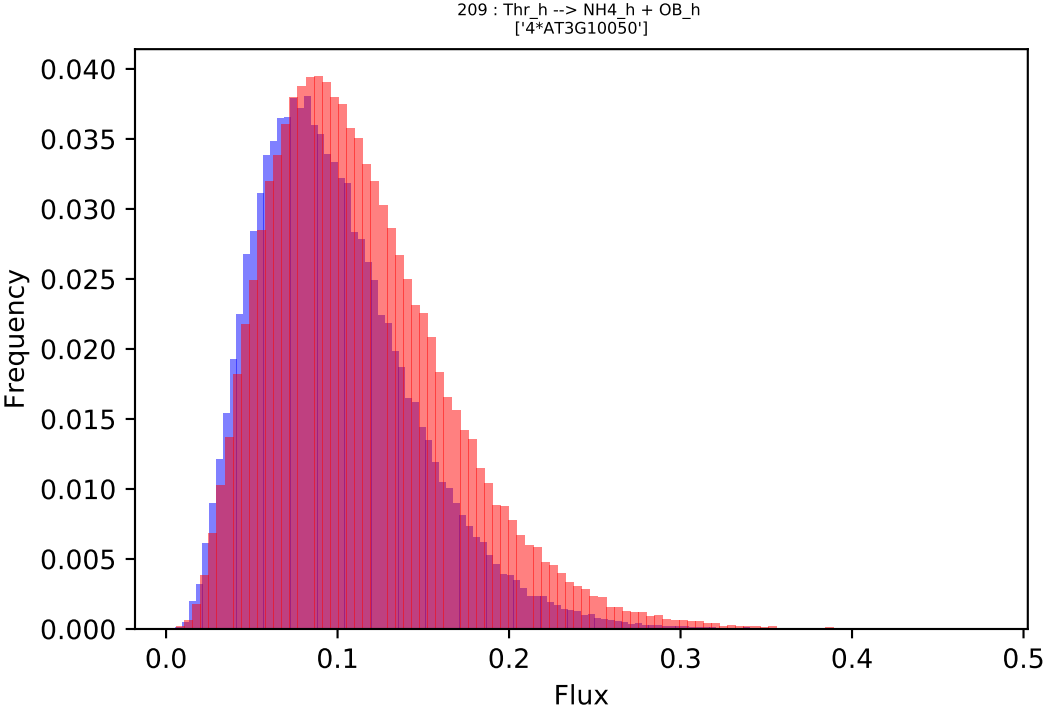

204 : EIGP_h --> H2O_h + IA_DASH_P_h
['AT3G22425', 'AT4G14910']
Frequency
0.00
0.01
0.02
0.03
0.04
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Flux

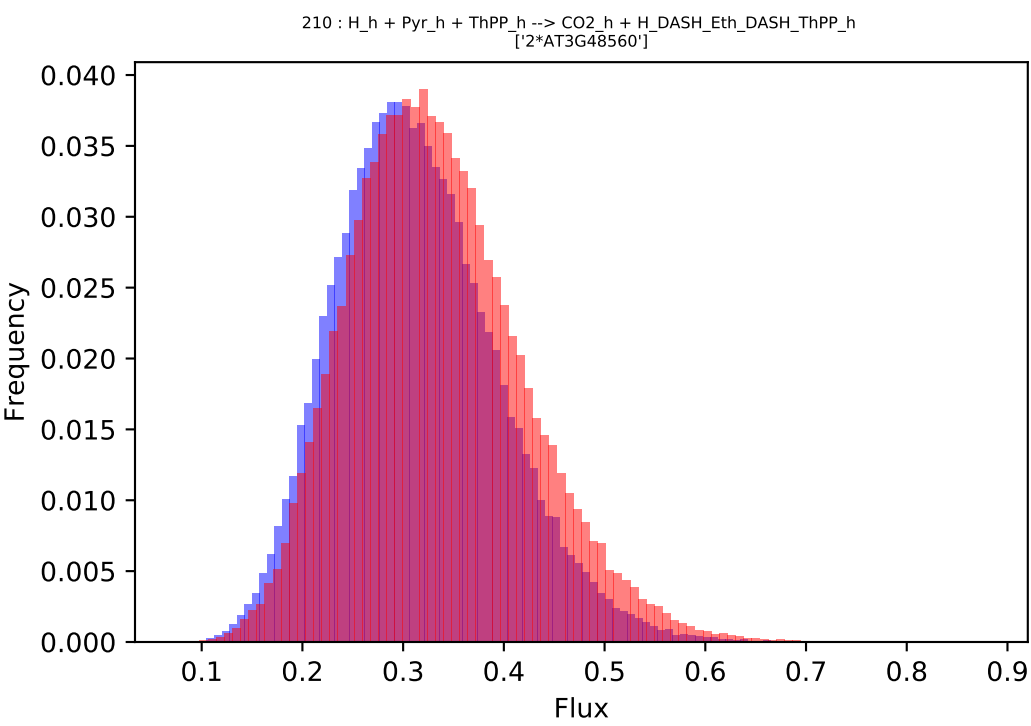

205 : Glu_h + IA_DASH_P_h --> Hisol_DASH_P_h + KG_h
['AT5G10330', 'AT1G71920']
Frequency
0.00
0.01
0.02
0.03
0.04
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Flux

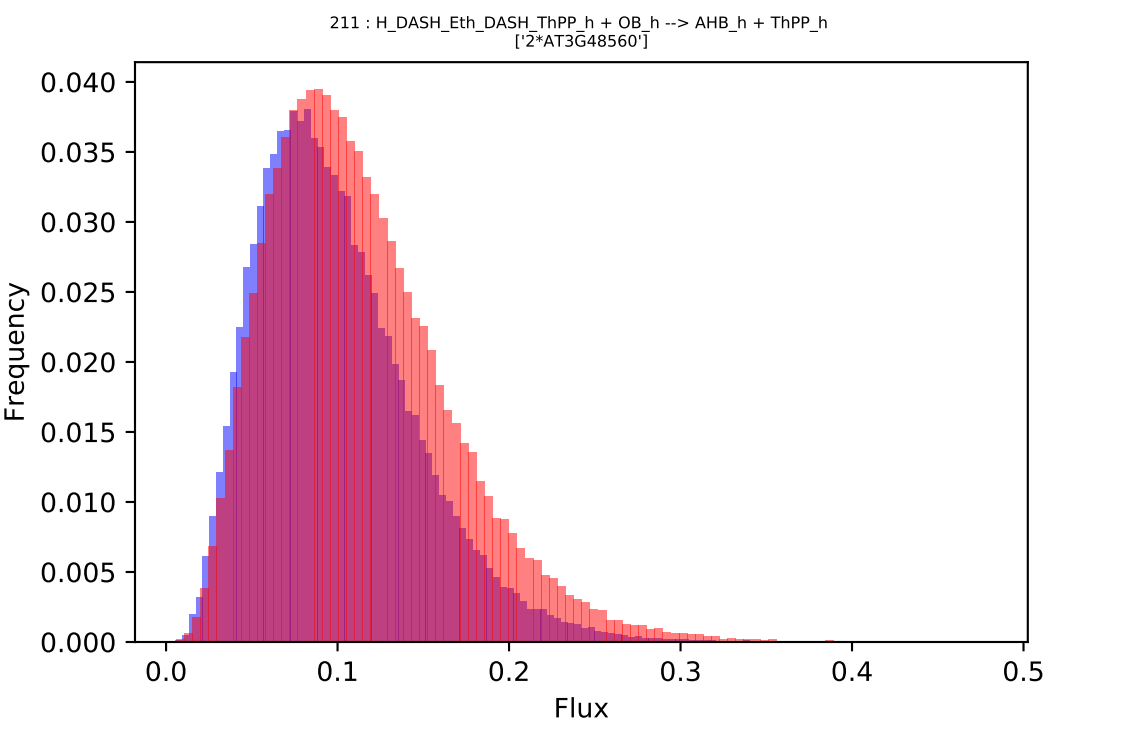

206 : H2O_h + Hisol_DASH_P_h --> Hisol_h + Pi_h
['AT4G39120']
Frequency
0.00
0.01
0.02
0.03
0.04
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Flux

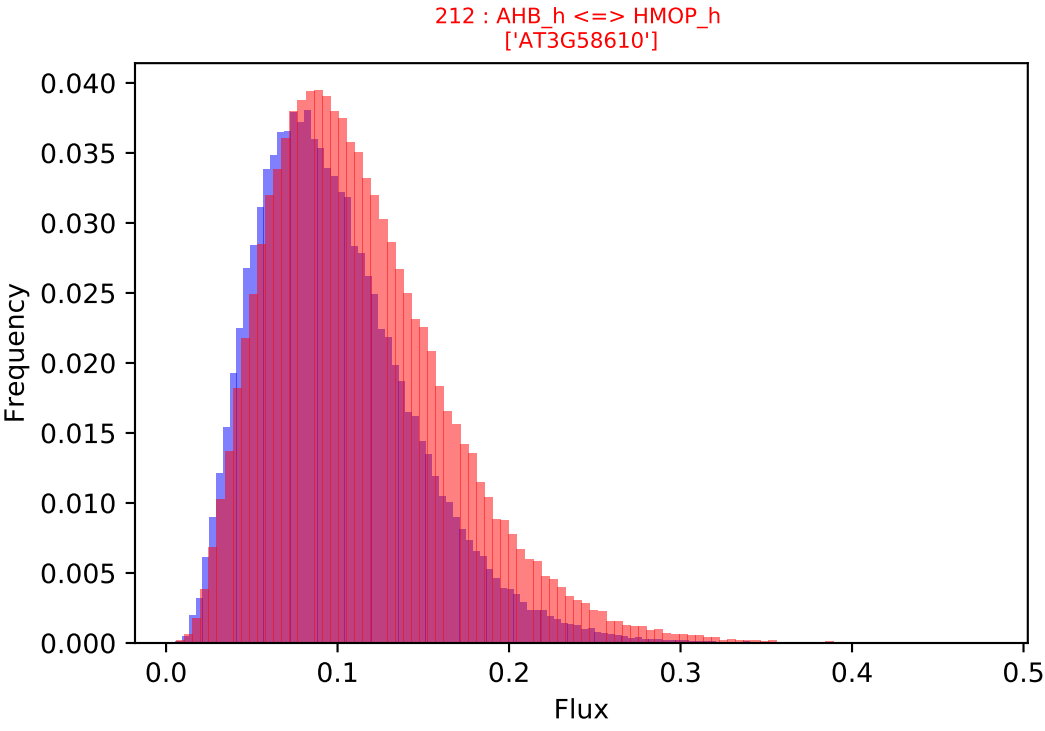

207 : Hisol_h + NAD_h --> 2.0 H_h + Hisal_h + NADH_h
['AT5G63890']
Frequency
0.00
0.01
0.02
0.03
0.04
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Flux

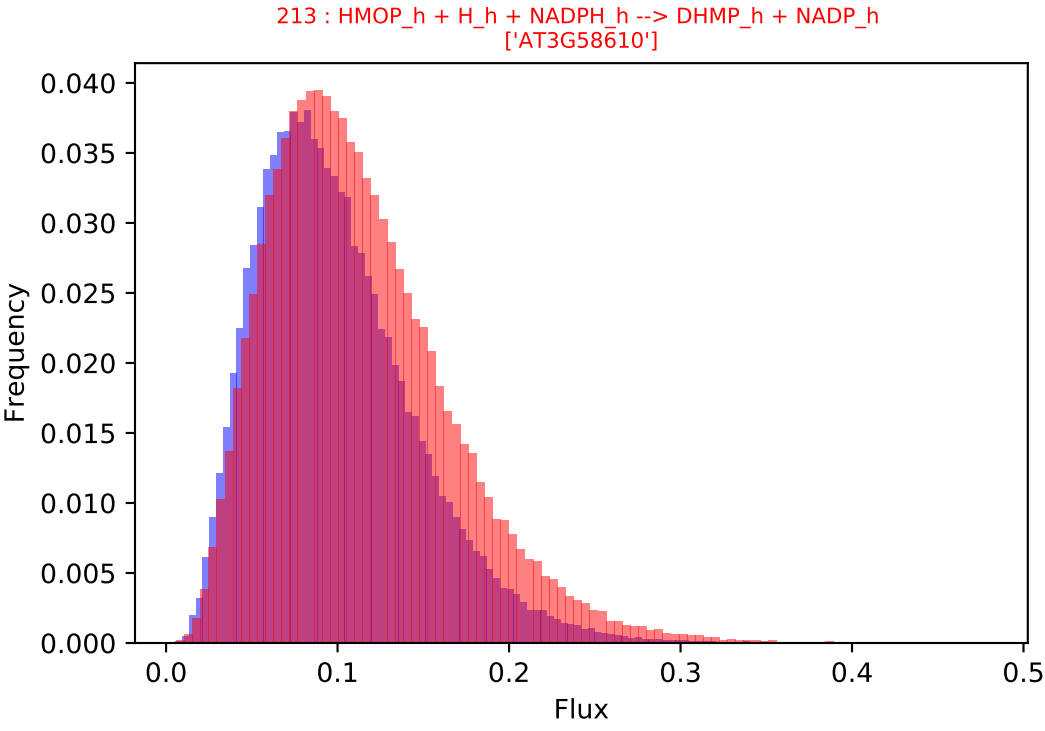

208 : H2O_h + Hisal_h + NAD_h --> H_h + His_h + NADH_h
['AT5G63890']
Frequency
0.00
0.01
0.02
0.03
0.04
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Flux

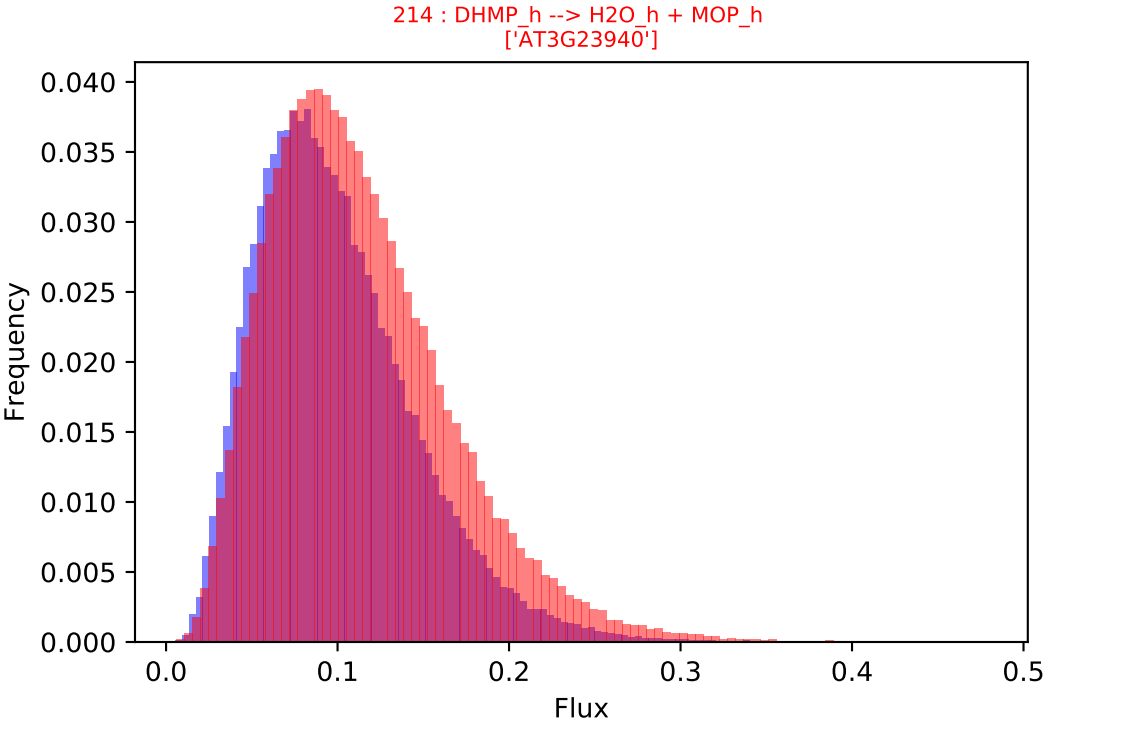

209 : Thr_h --> NH4_h + OB_h
['4*AT3G10050']
Frequency
Flux
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.1
0.2
0.3
0.4
0.5

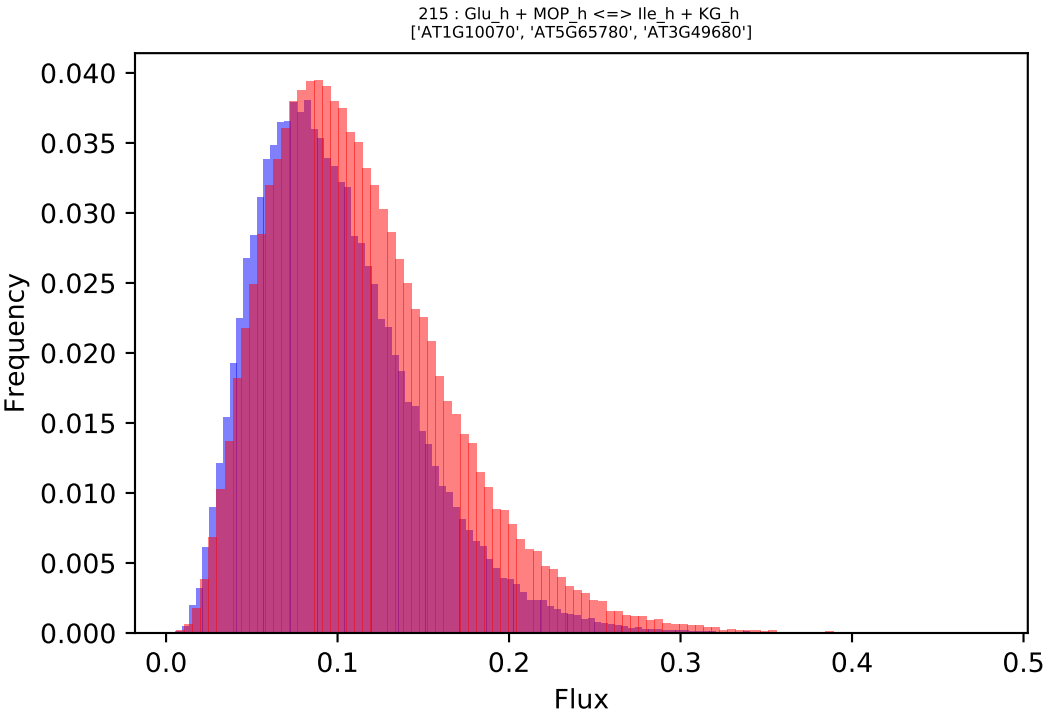

210 : H_h + Pyr_h + ThPP_h --> CO2_h + H_DASH_Eth_DASH_ThPP_h
['2*AT3G48560']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
Flux

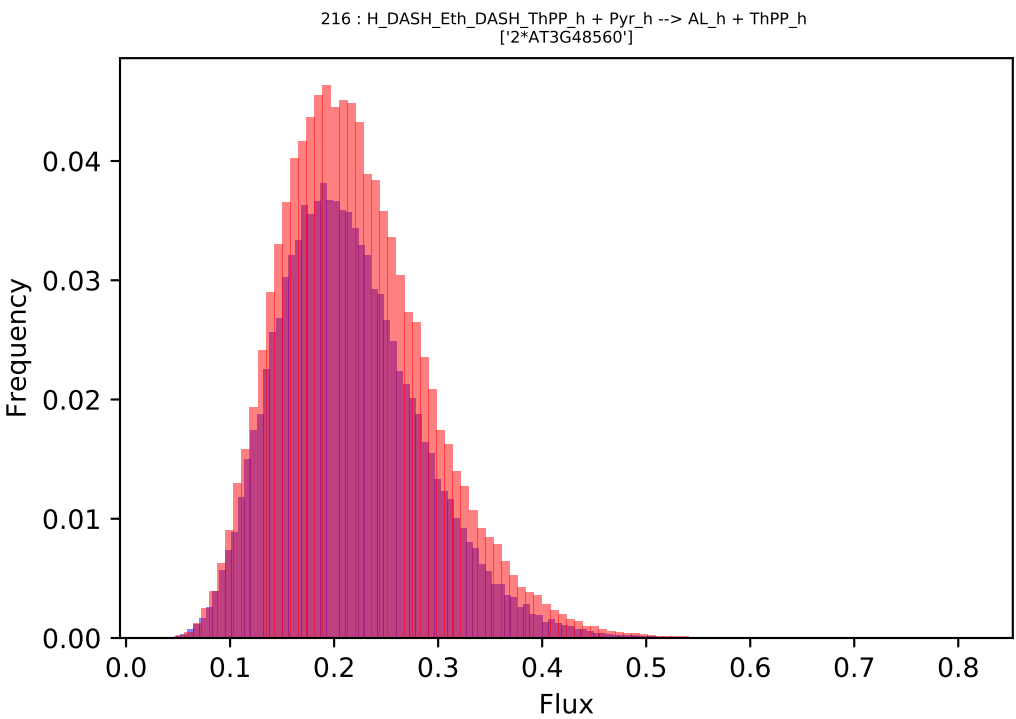

211 : H_DASH_Eth_DASH_ThPP_h + OB_h --> AHB_h + ThPP_h
['2*AT3G48560']
Frequency
Flux
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
0.040
0.0
0.1
0.2
0.3
0.4
0.5

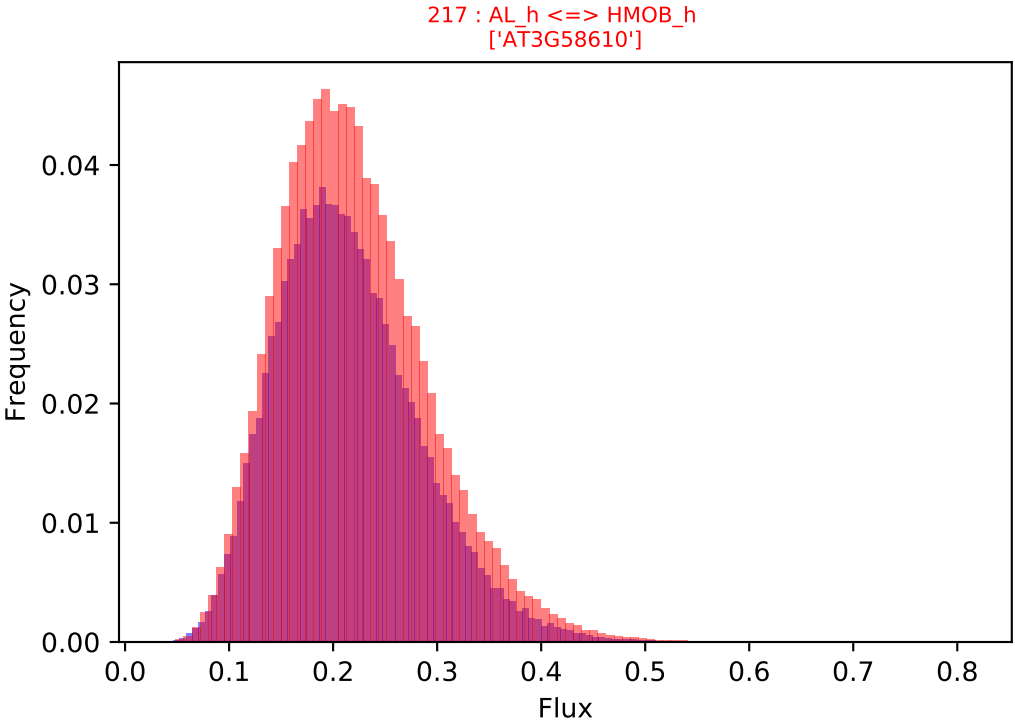

212 : AHB_h <=> HMOP_h
['AT3G58610']
Frequency
Flux
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.1
0.2
0.3
0.4
0.5

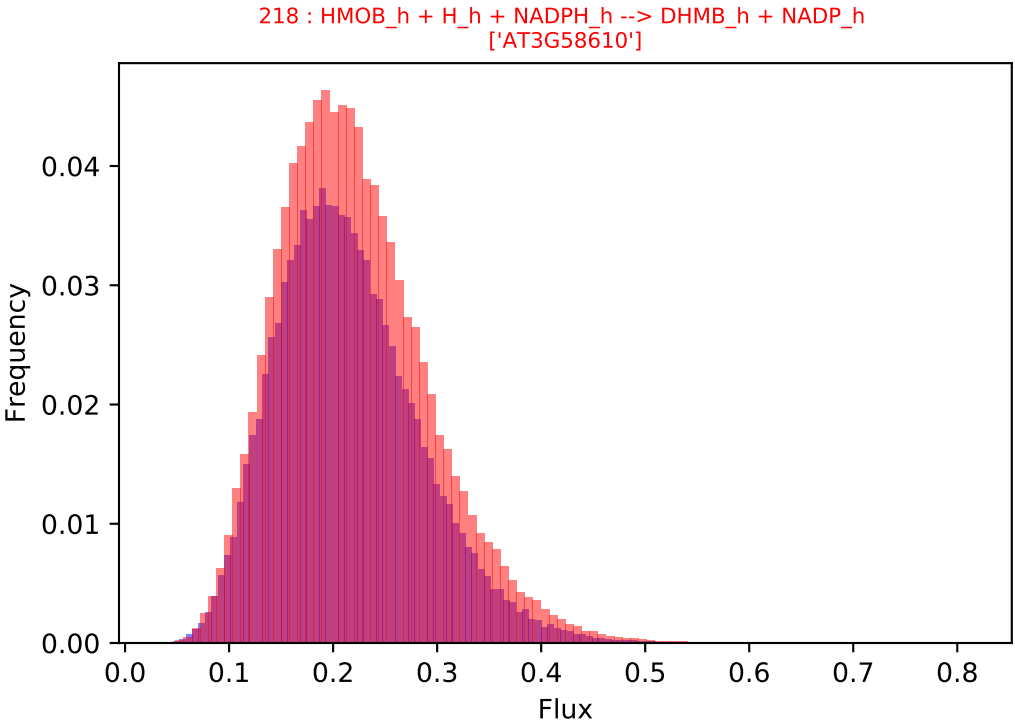

213 : HMOP_h + H_h + NADPH_h --> DHMP_h + NADP_h
['AT3G58610']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
Flux

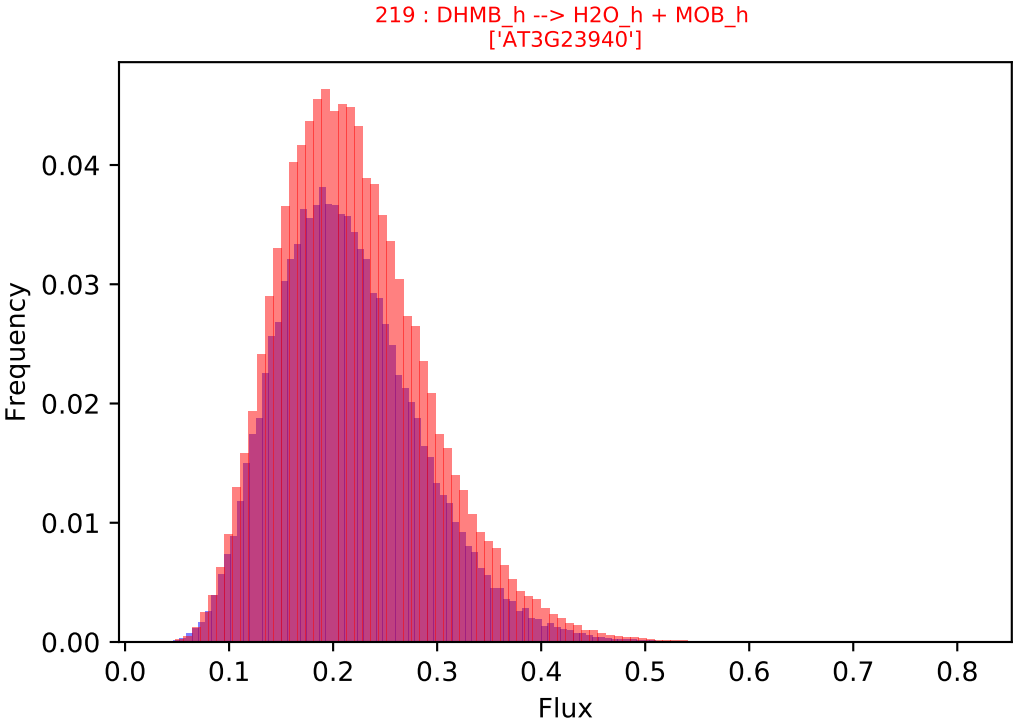

214 : DHMP_h --> H2O_h + MOP_h
['AT3G23940']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.1
0.2
0.3
0.4
0.5
Flux

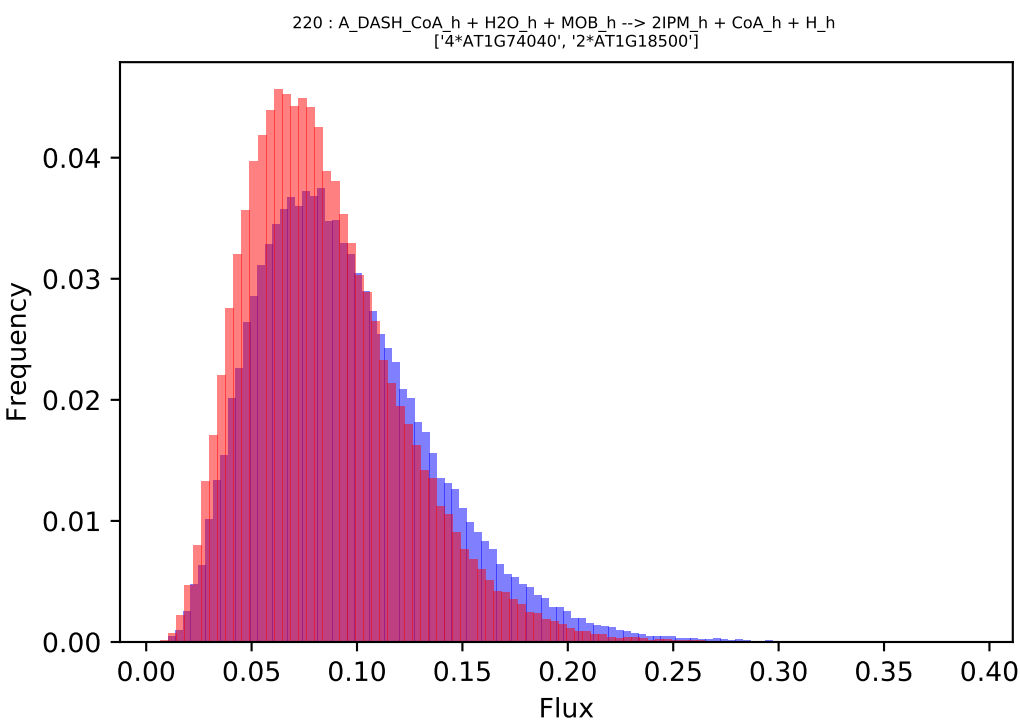

215 : Glu_h + MOP_h <=> Ile_h + KG_h
['AT1G10070', 'AT5G65780', 'AT3G49680']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.1
0.2
0.3
0.4
0.5
Flux

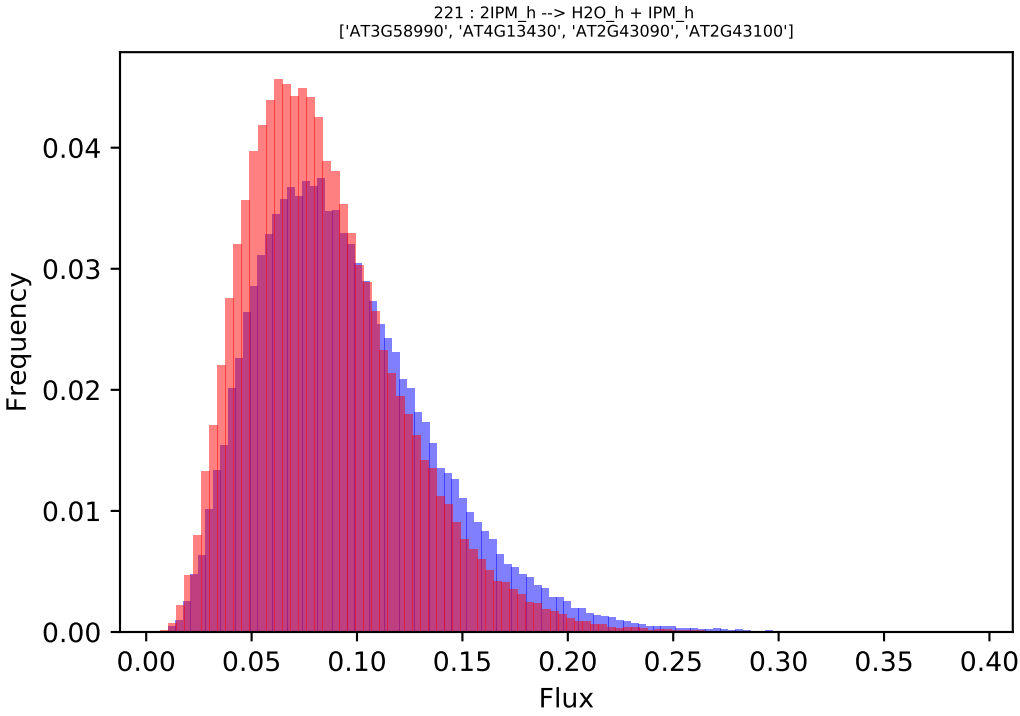

216 : H_DASH_Eth_DASH_ThPP_h + Pyr_h --> AL_h + ThPP_h
['2*AT3G48560']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
Flux

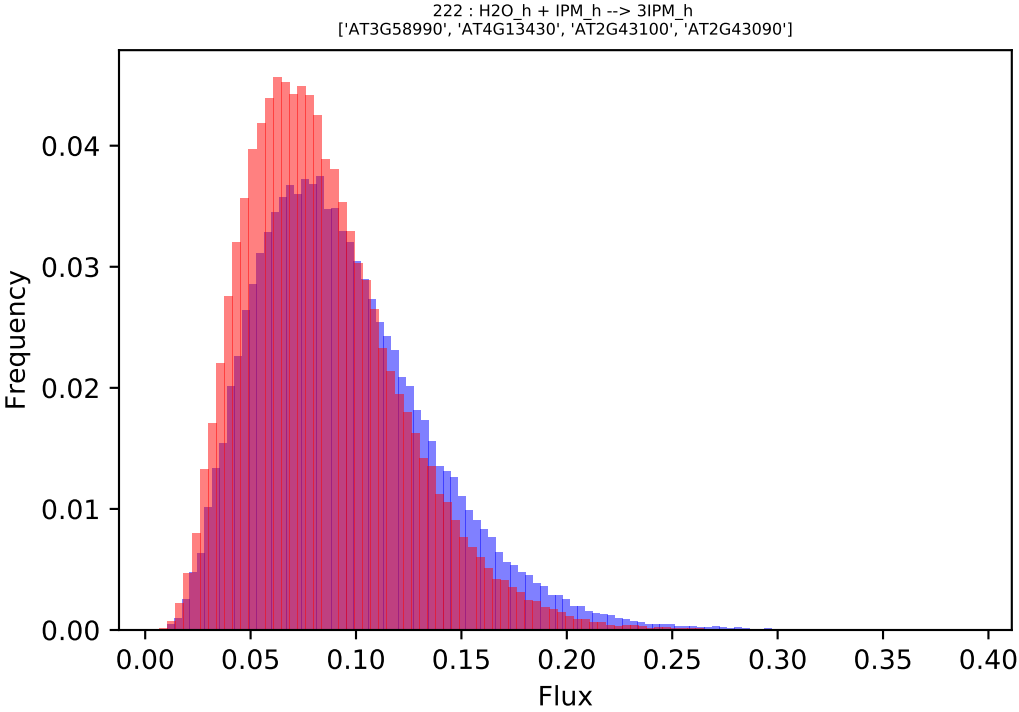

217 : AL_h <=> HMOB_h
['AT3G58610']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
Flux

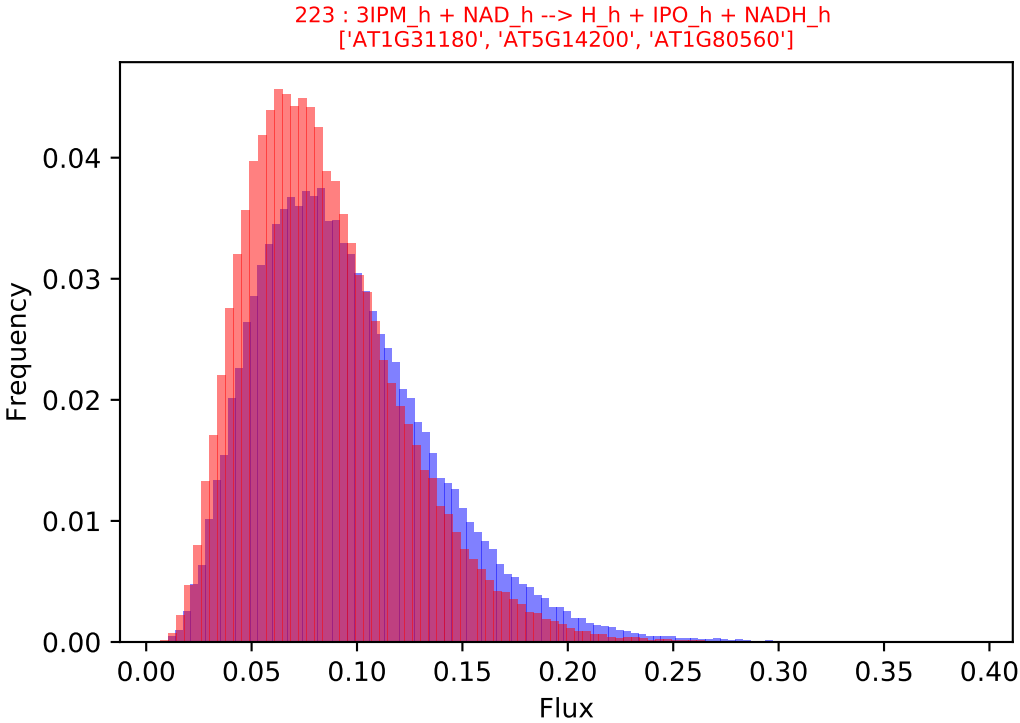

218 : HMOB_h + H_h + NADPH_h --> DHMB_h + NADP_h
['AT3G58610']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
Flux

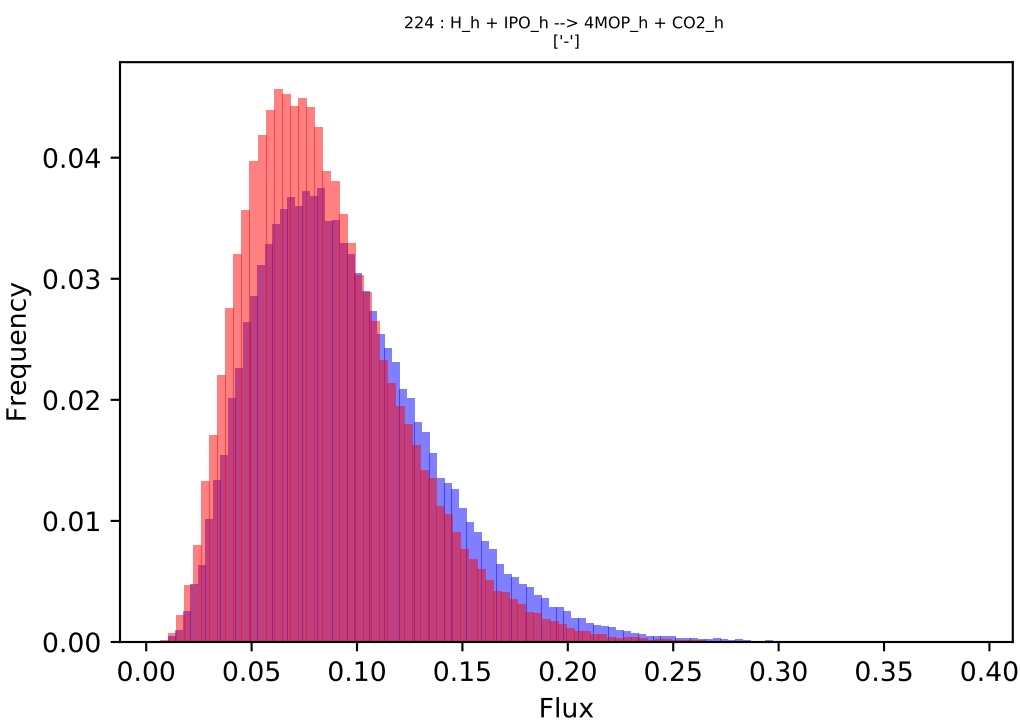

219 : DHMB_h --> H2O_h + MOB_h
['AT3G23940']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
Flux

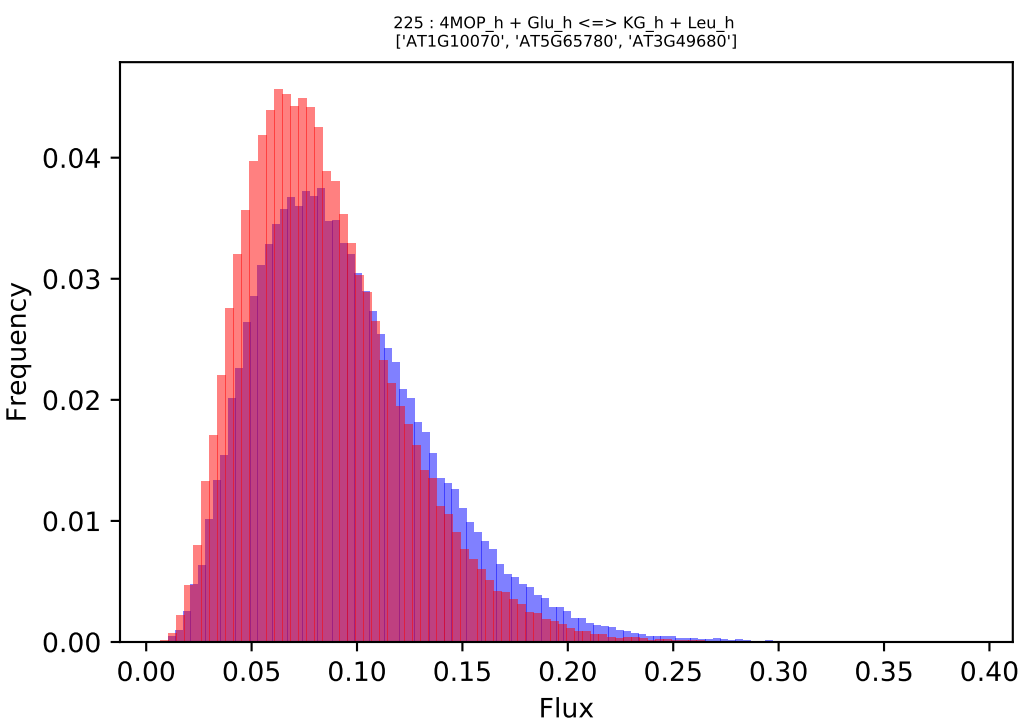

220 : A_DASH_CoA_h + H2O_h + MOB_h --> 2IPM_h + CoA_h + H_h
['4*AT1G74040', '2*AT1G18500']
Frequency
0.00
0.01
0.02
0.03
0.04
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
Flux

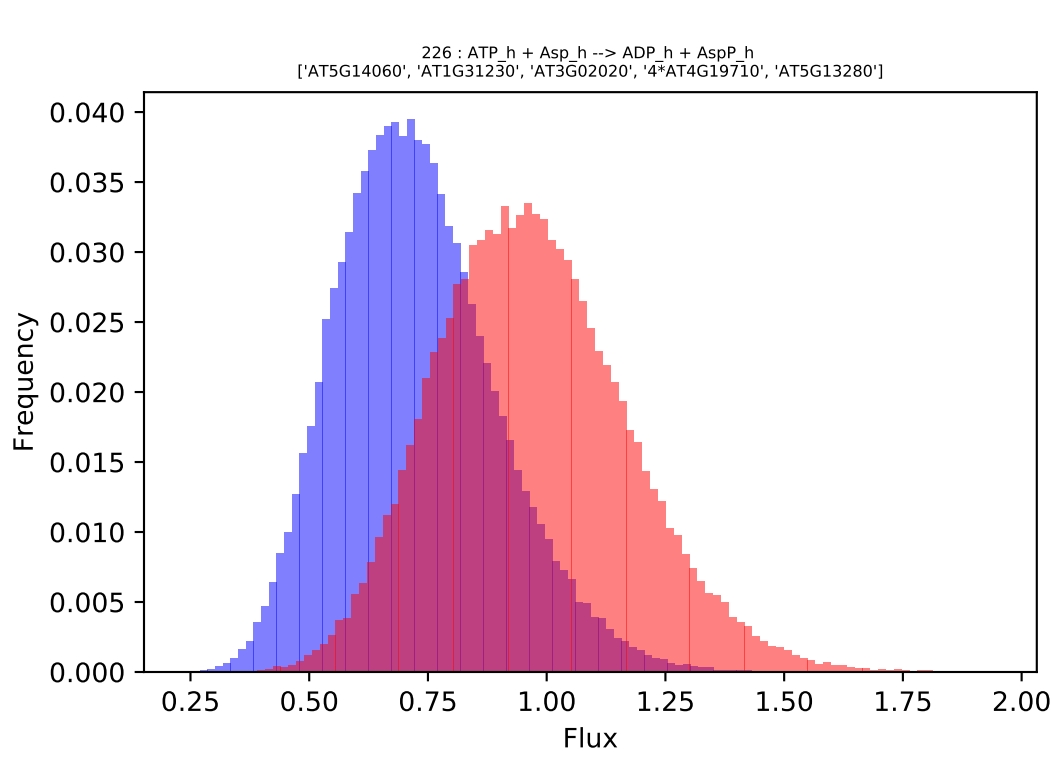

221 : 2IPM_h --> H2O_h + IPM_h
['AT3G58990', 'AT4G13430', 'AT2G43090', 'AT2G43100']
Frequency
0.00
0.01
0.02
0.03
0.04
Flux
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40

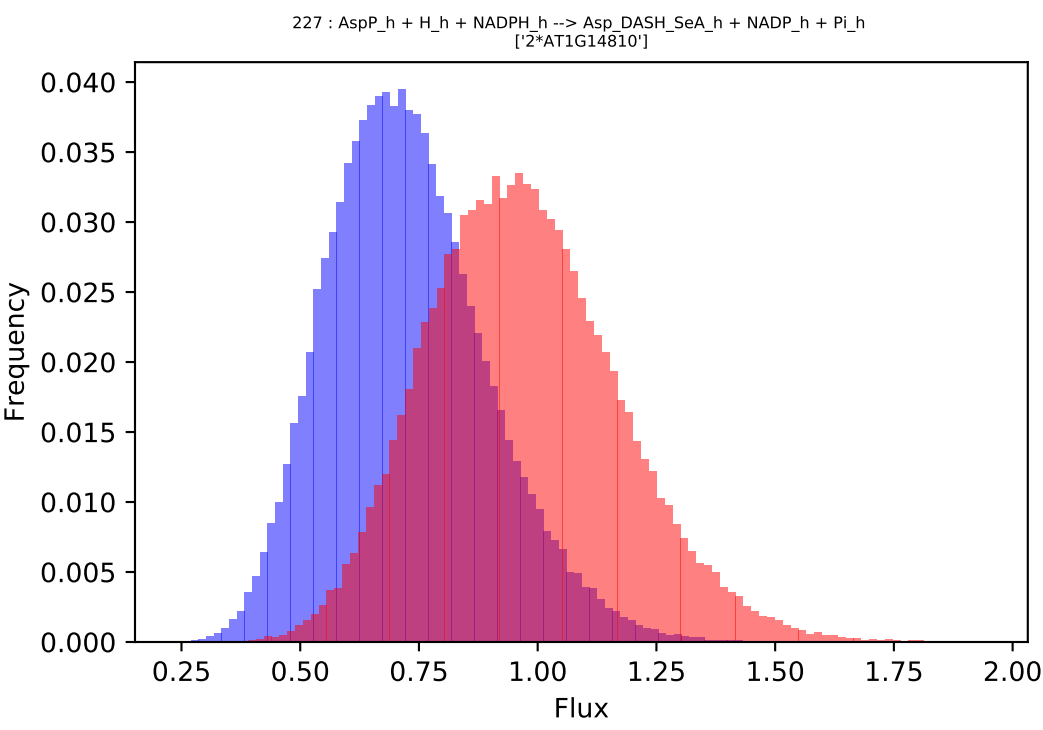

222 : H2O_h + IPM_h --> 3IPM_h
['AT3G58990', 'AT4G13430', 'AT2G43100', 'AT2G43090']
Frequency
0.00
0.01
0.02
0.03
0.04
Flux
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40

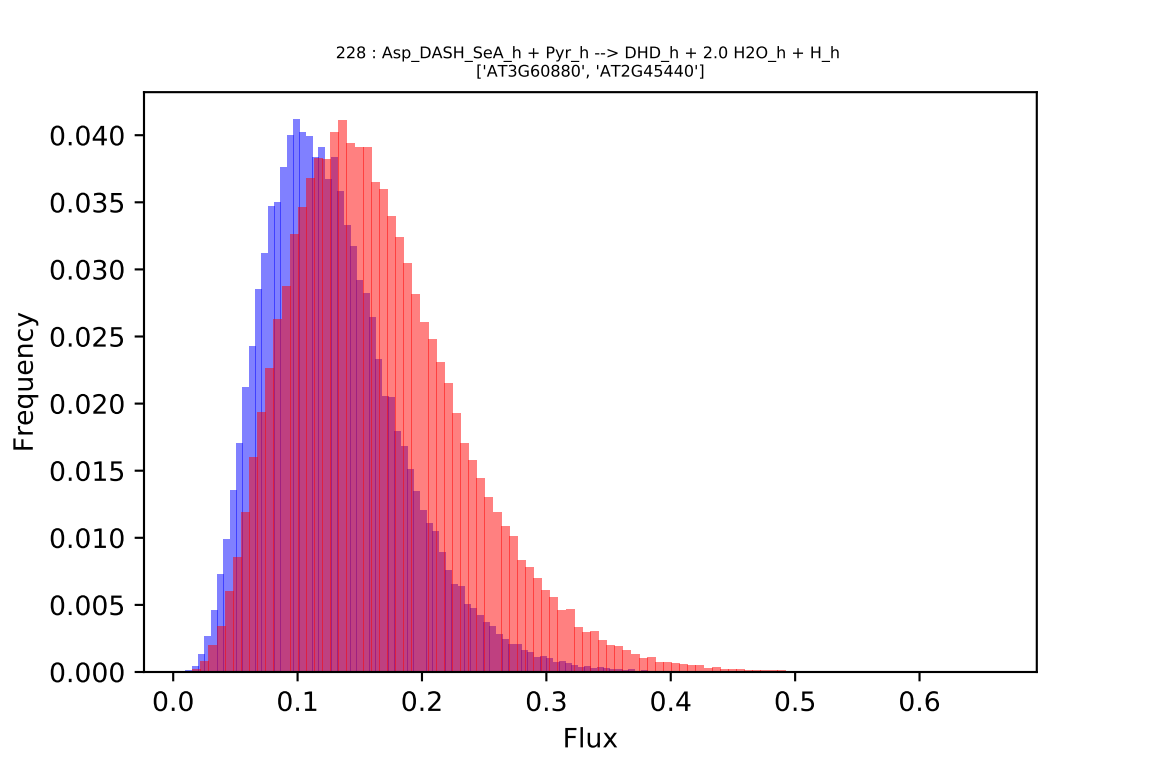

223 : 3IPM_h + NAD_h --> H_h + IPO_h + NADH_h
['AT1G31180', 'AT5G14200', 'AT1G80560']
Frequency
0.00
0.01
0.02
0.03
0.04
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
Flux

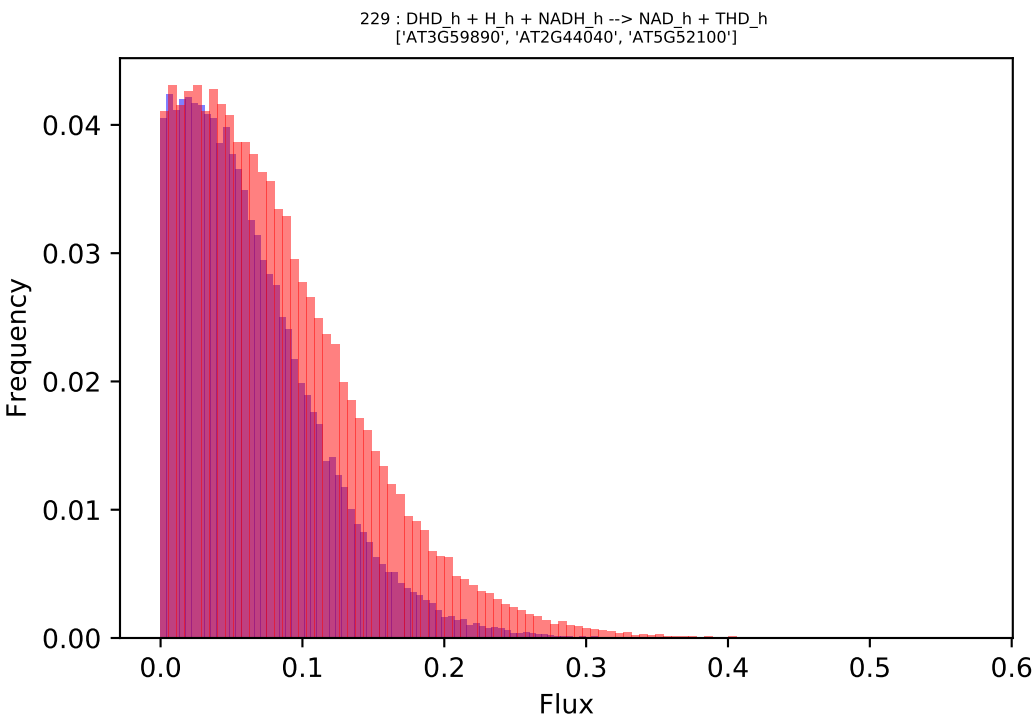

224 : H_h + IPO_h --> 4MOP_h + CO2_h
['-']
Frequency
0.00
0.01
0.02
0.03
0.04
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
Flux

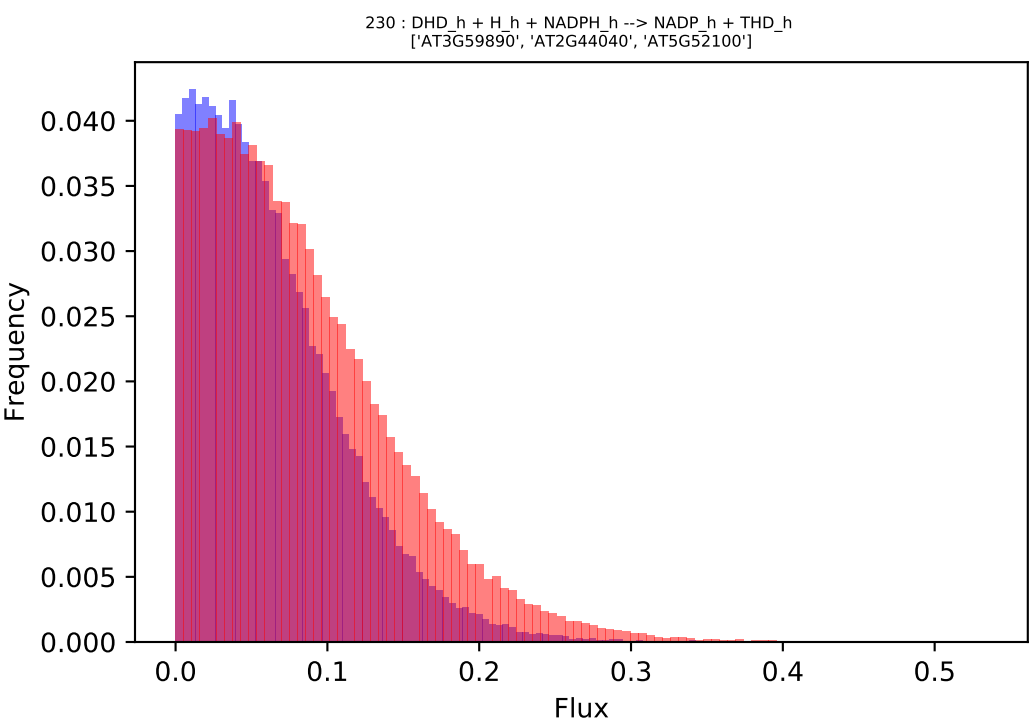

225 : 4MOP_h + Glu_h <=> KG_h + Leu_h
['AT1G10070', 'AT5G65780', 'AT3G49680']
Frequency
0.00
0.01
0.02
0.03
0.04
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
Flux

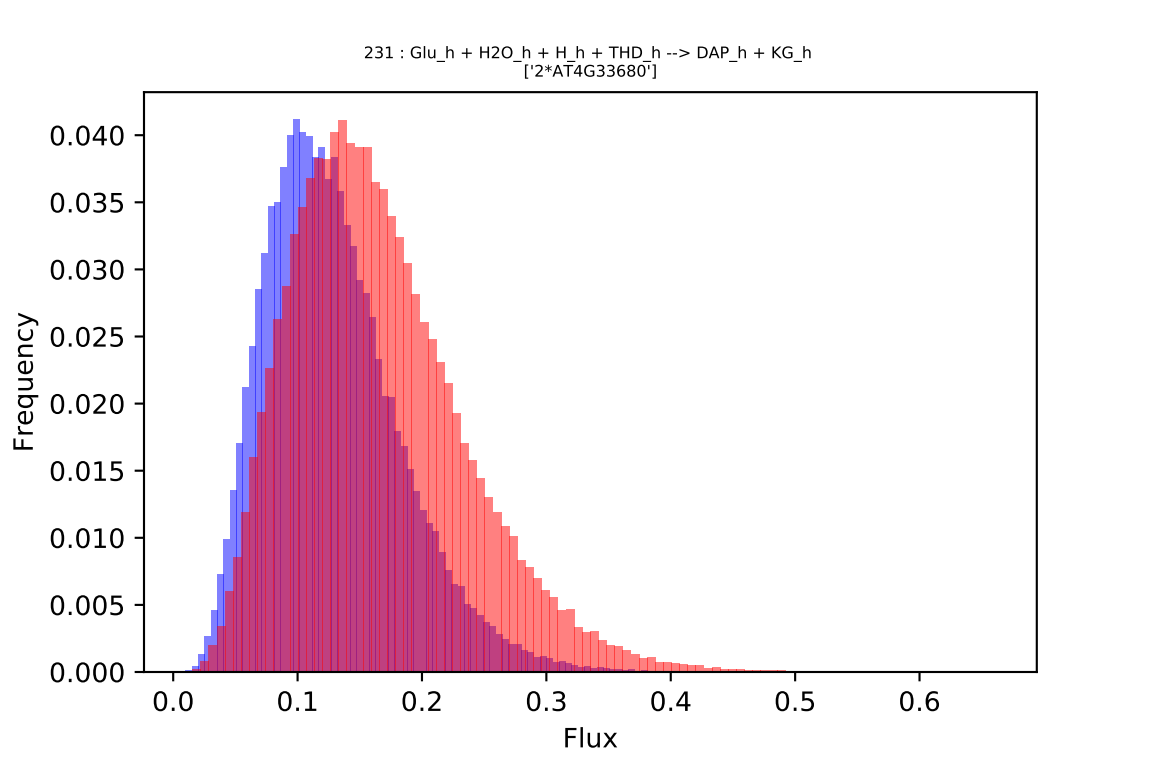

226 : ATP_h + Asp_h --> ADP_h + AspP_h
['AT5G14060', 'AT1G31230', 'AT3G02020', '4*AT4G19710', 'AT5G13280']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.25
0.50
0.75
1.00
1.25
1.50
1.75
2.00
Flux

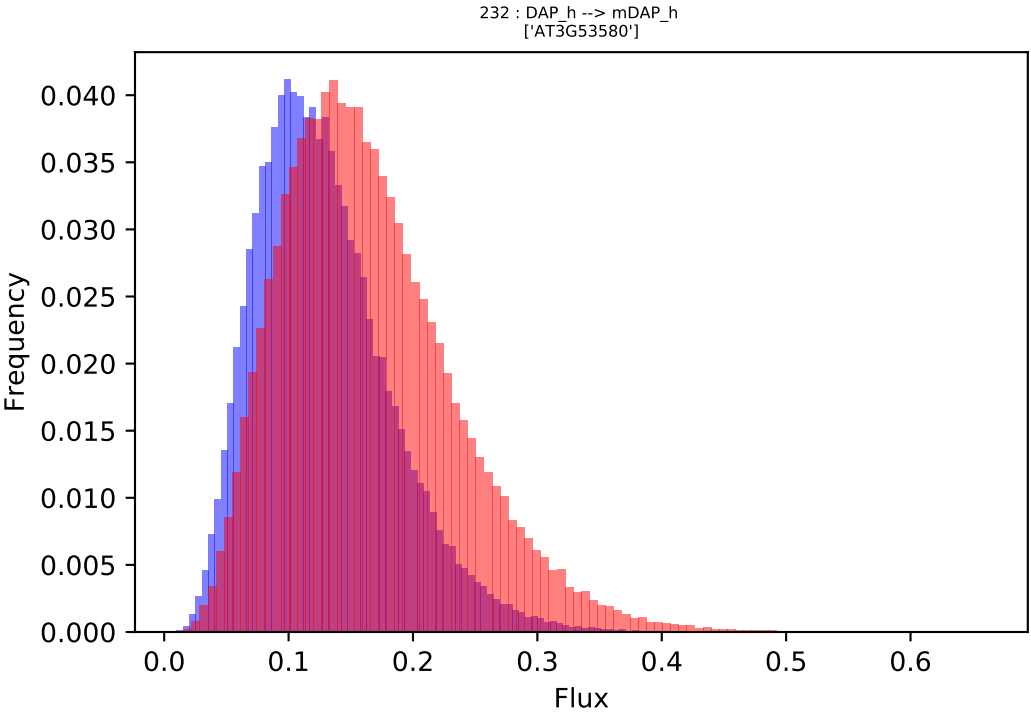

227 : AspP_h + H_h + NADPH_h --> Asp_DASH_SeA_h + NADP_h + Pi_h
['2*AT1G14810']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.25
0.50
0.75
1.00
1.25
1.50
1.75
2.00
Flux

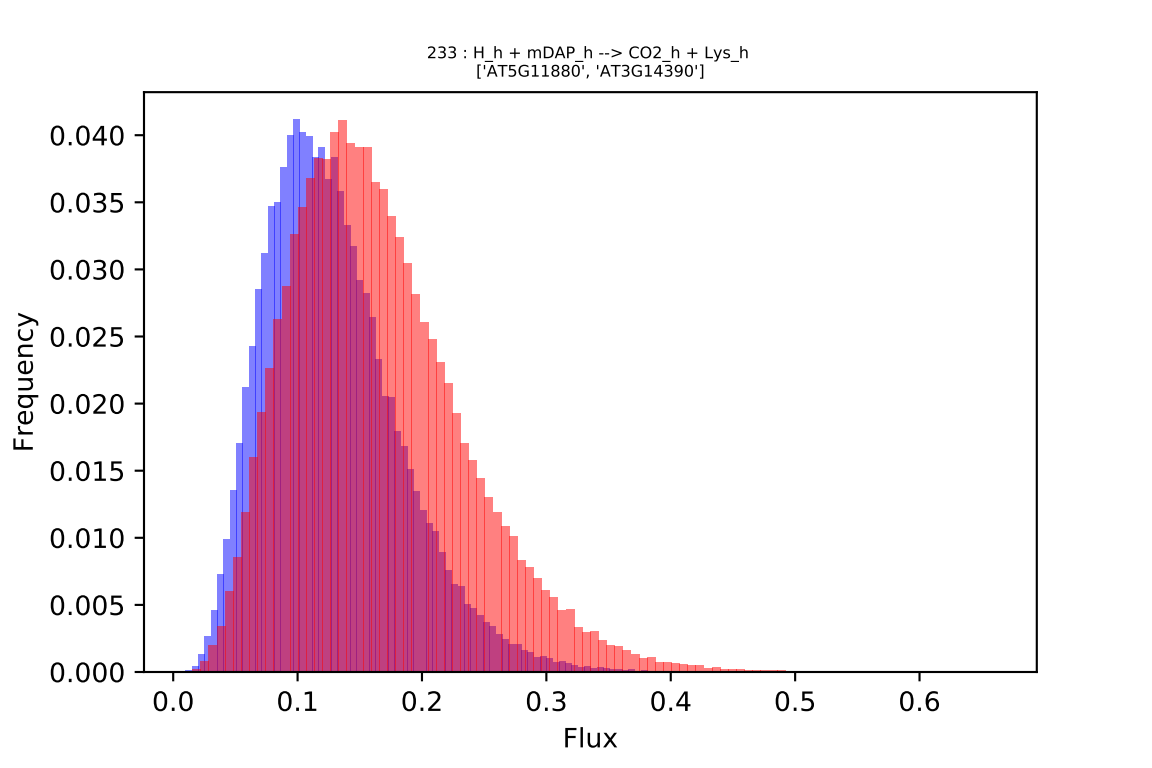

228 : Asp_DASH_SeA_h + Pyr_h --> DHD_h + 2.0 H2O_h + H_h
['AT3G60880', 'AT2G45440']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Flux

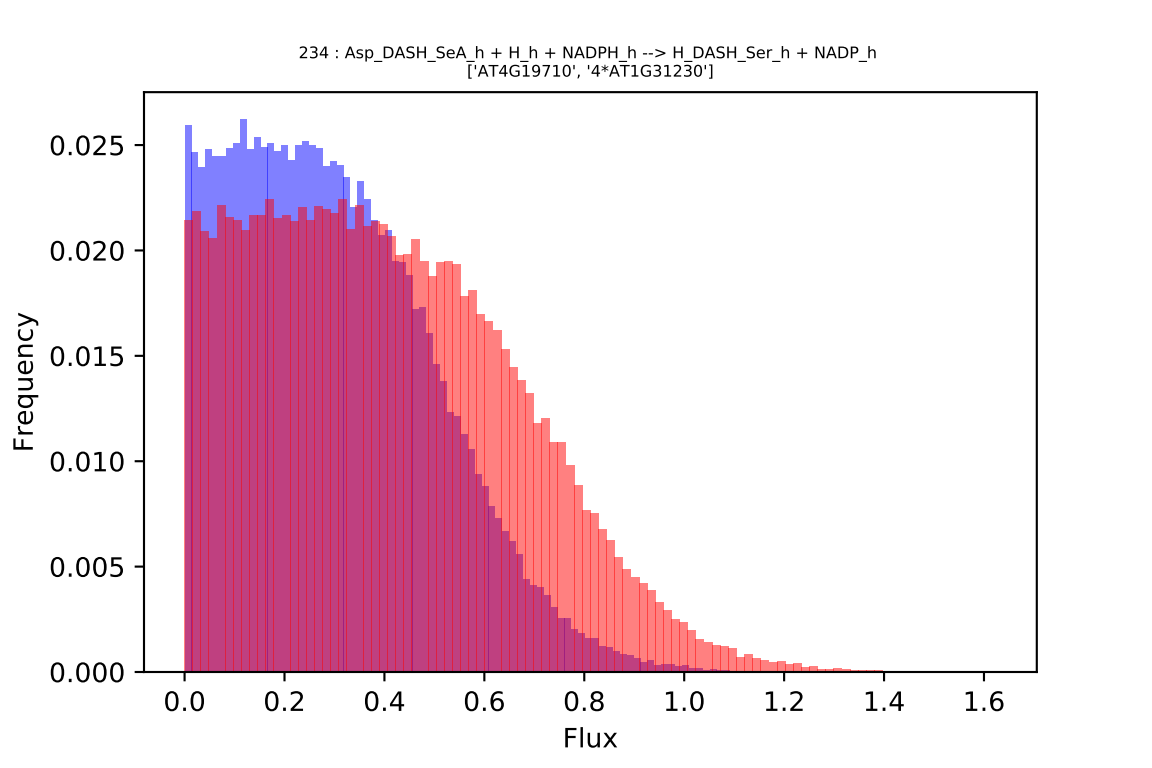

229 : DHD_h + H_h + NADH_h --> NAD_h + THD_h
['AT3G59890', 'AT2G44040', 'AT5G52100']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Flux

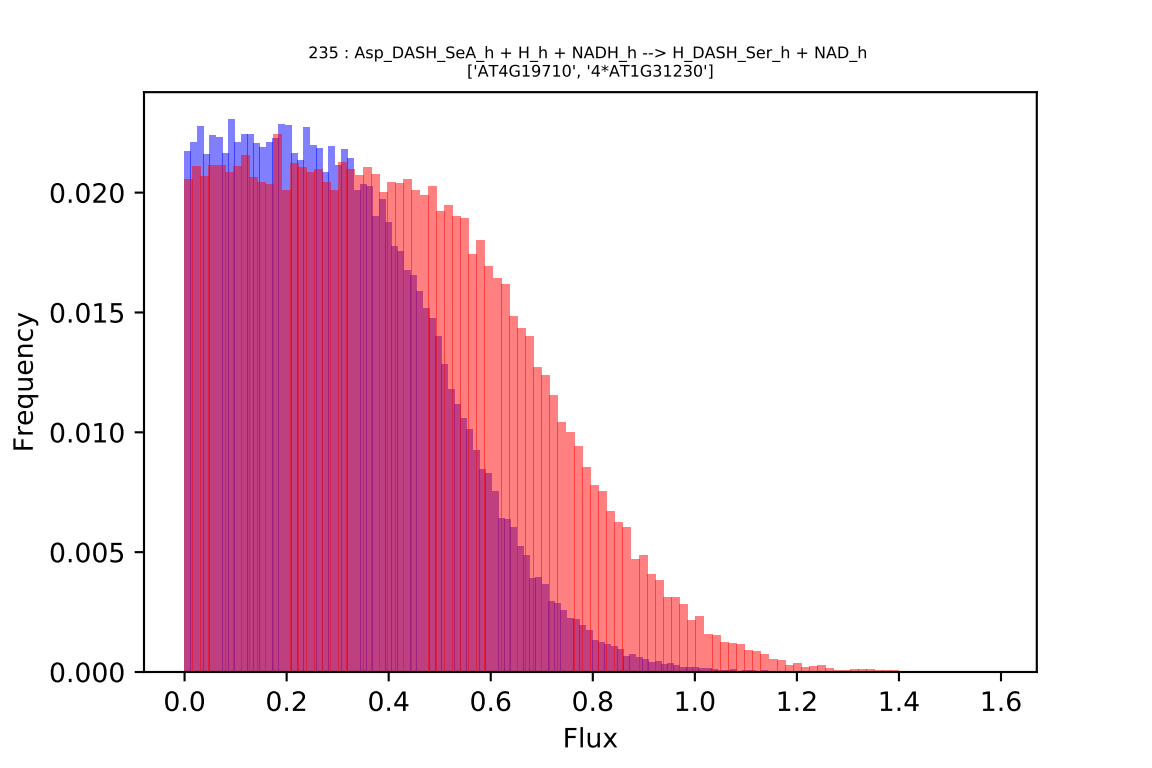

230 : DHD_h + H_h + NADPH_h --> NADP_h + THD_h
['AT3G59890', 'AT2G44040', 'AT5G52100']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.1
0.2
0.3
0.4
0.5
Flux

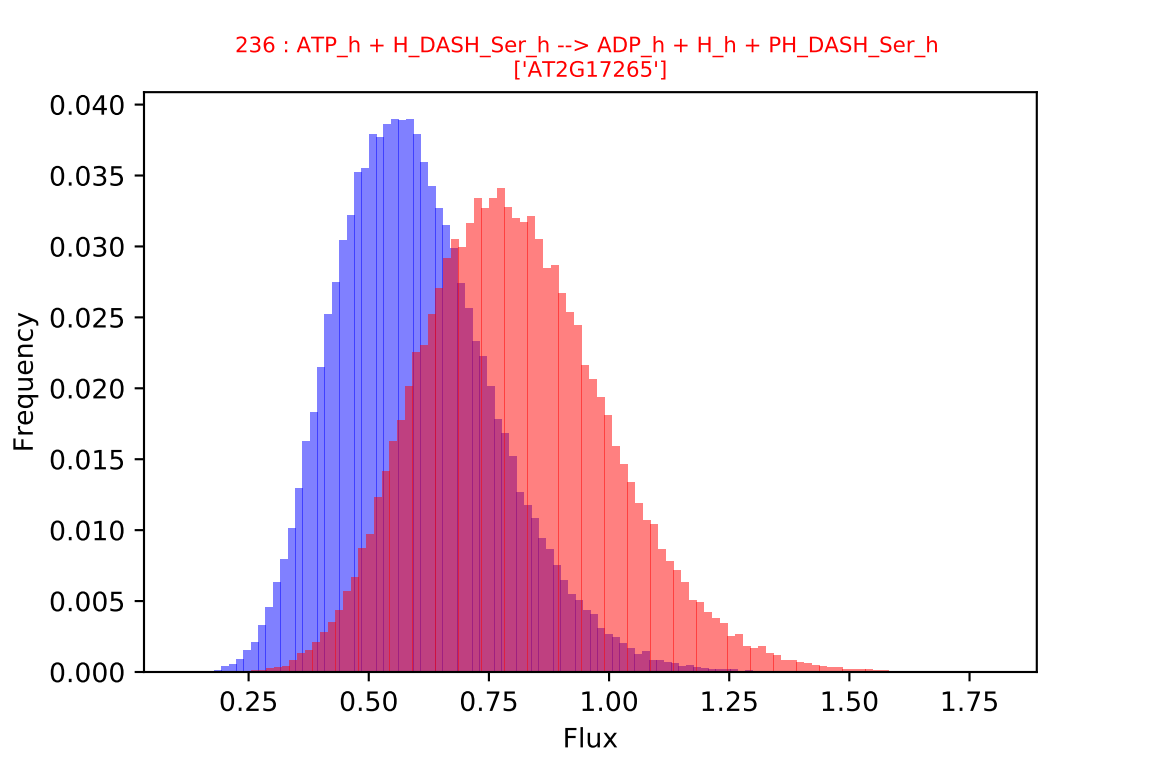

231 : Glu_h + H2O_h + H_h + THD_h --> DAP_h + KG_h
['2*AT4G33680']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Flux


232 : DAP_h --> mDAP_h
['AT3G53580']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Flux


233 : H_h + mDAP_h --> CO2_h + Lys_h
['AT5G11880', 'AT3G14390']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Flux


234 : Asp_DASH_SeA_h + H_h + NADPH_h --> H_DASH_Ser_h + NADP_h
['AT4G19710', '4*AT1G31230']
Frequency
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Flux


235 : Asp_DASH_SeA_h + H_h + NADH_h --> H_DASH_Ser_h + NAD_h
['AT4G19710', '4*AT1G31230']
Frequency
0.000
0.005
0.010
0.015
0.020
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Flux


236 : ATP_h + H_DASH_Ser_h --> ADP_h + H_h + PH_DASH_Ser_h
['AT2G17265']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
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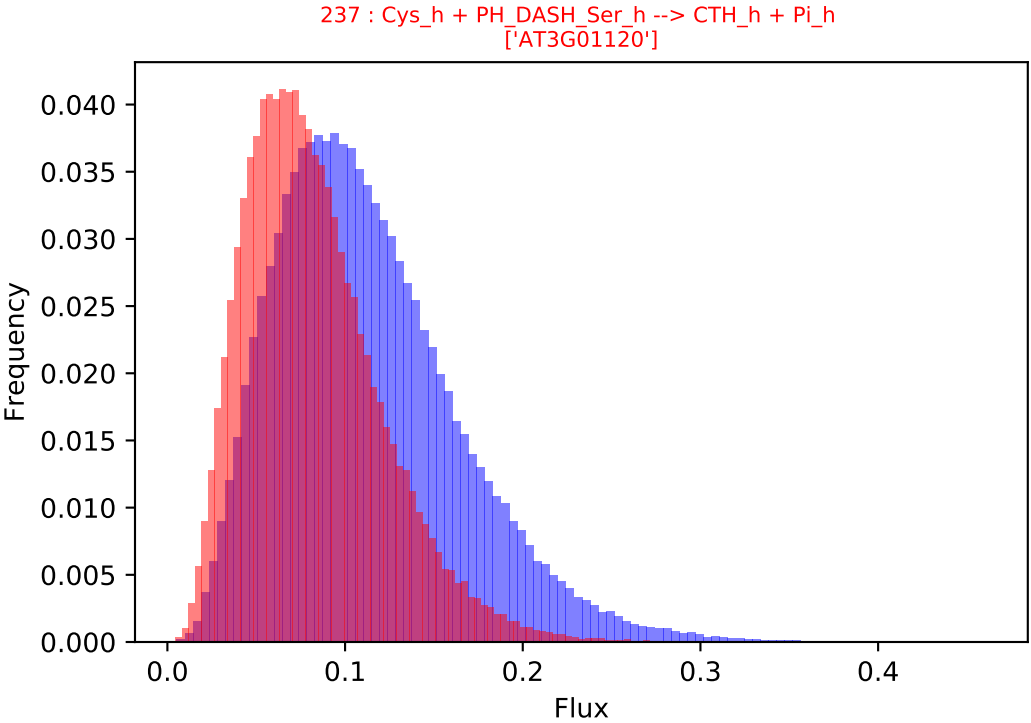
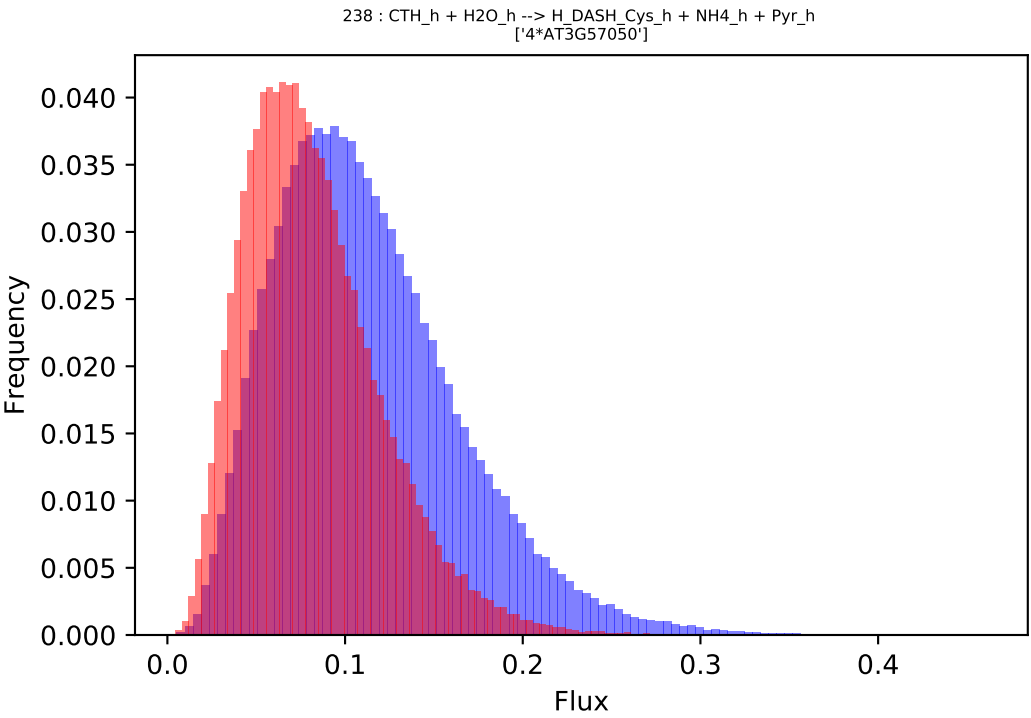
0.50
0.75
1.00
1.25
1.50
1.75
Flux


237 : Cys_h + PH_DASH_Ser_h --> CTH_h + Pi_h
['AT3G01120']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.1
0.2
0.3
0.4
Flux


238 : CTH_h + H2O_h --> H_DASH_Cys_h + NH4_h + Pyr_h
['4*AT3G57050']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
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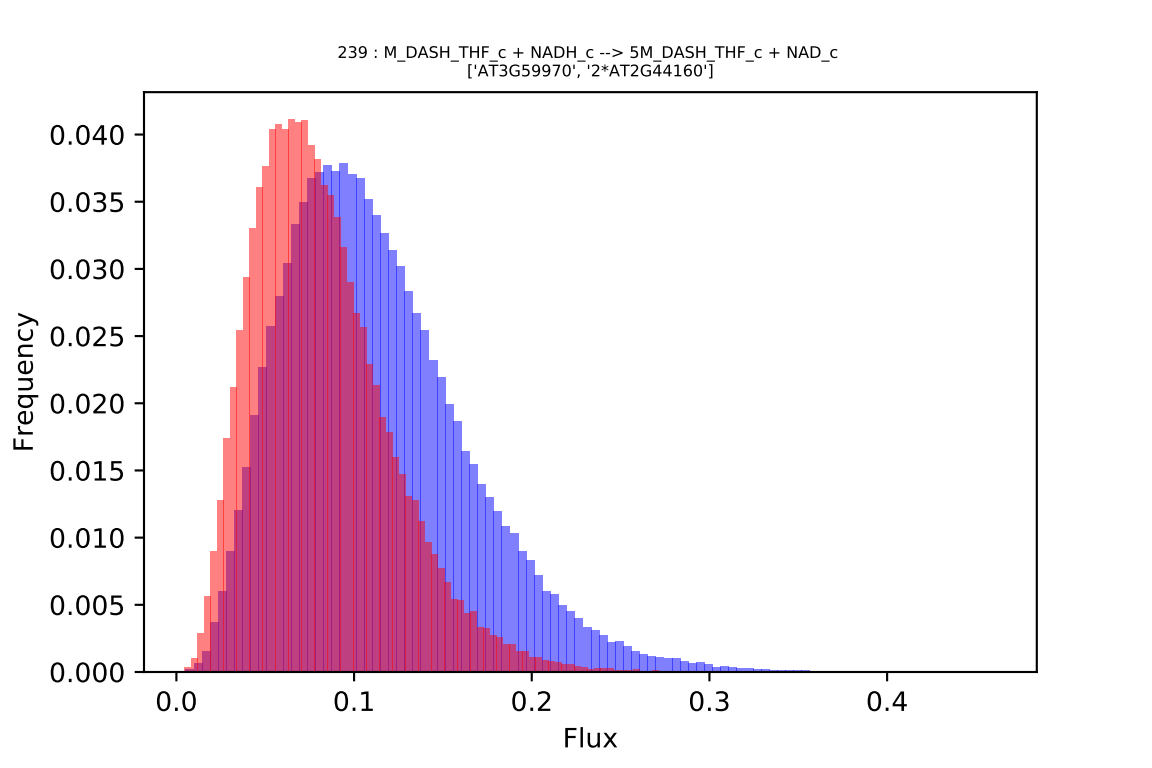
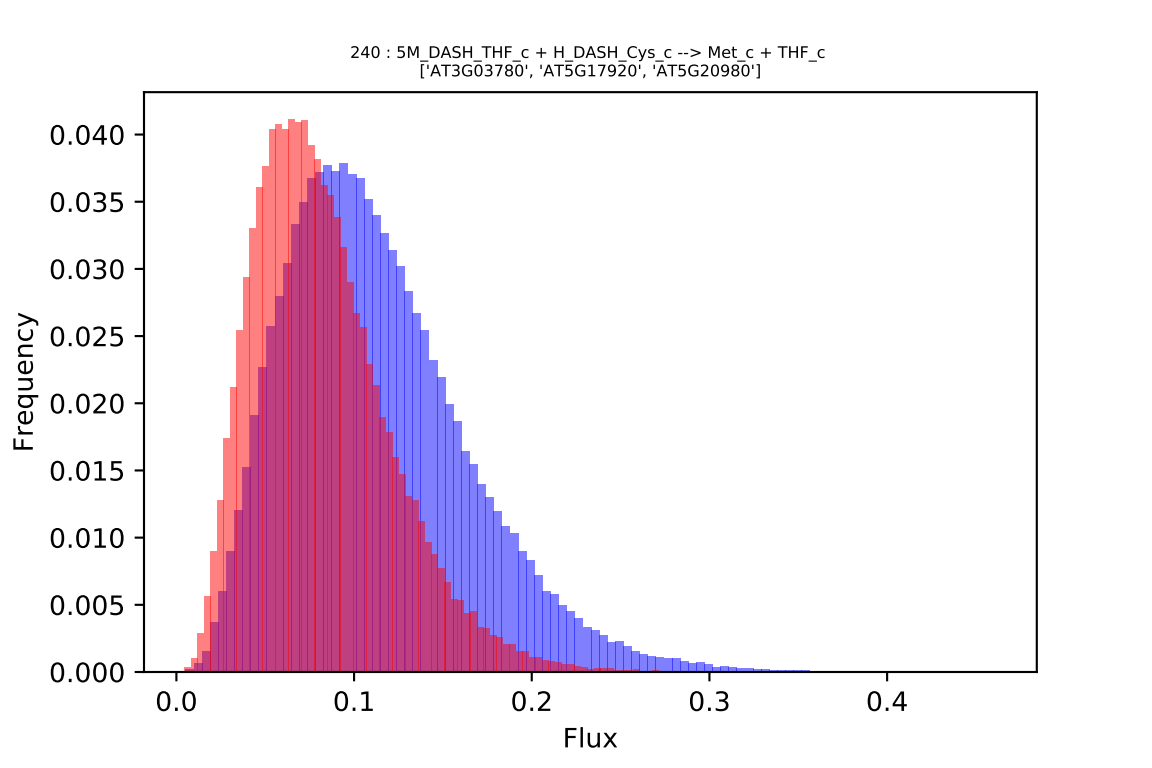
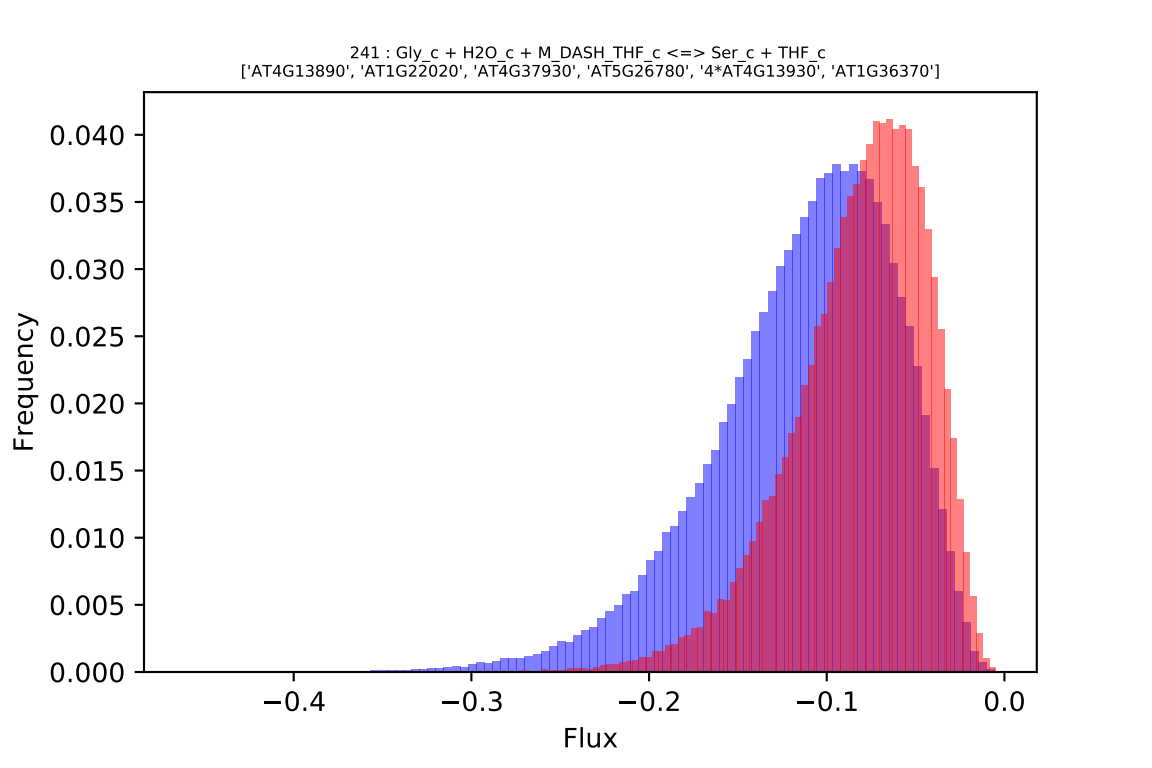
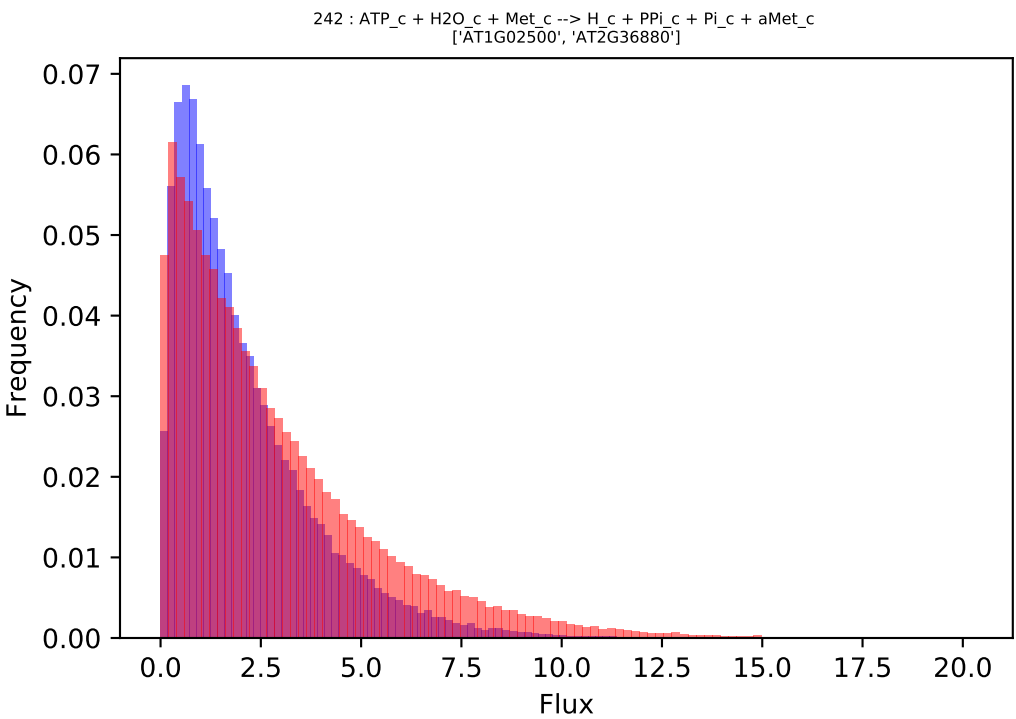
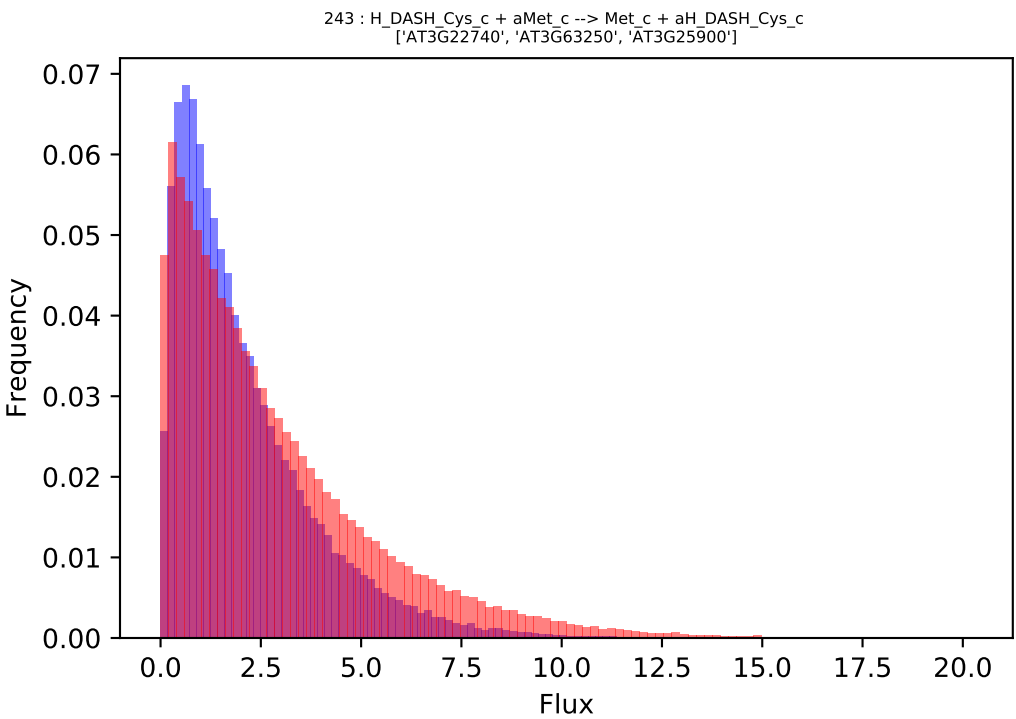
0.1
0.2
0.3
0.4
Flux

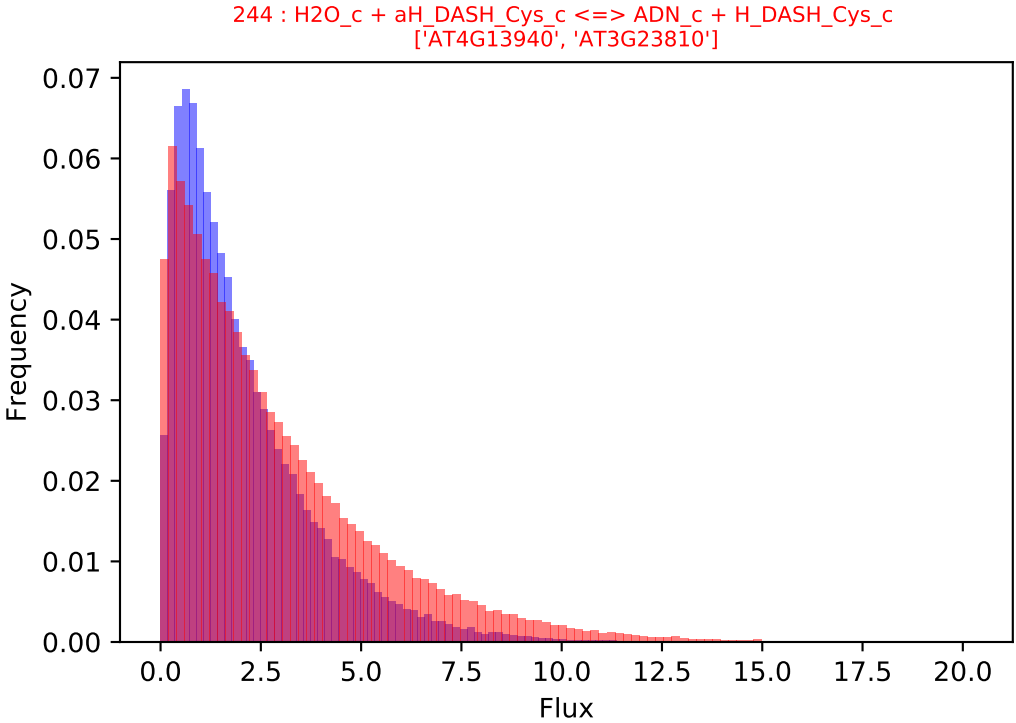

239 : M_DASH_THF_c + NADH_c --> 5M_DASH_THF_c + NAD_c
['AT3G59970', '2*AT2G44160']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.1
0.2
0.3
0.4
Flux

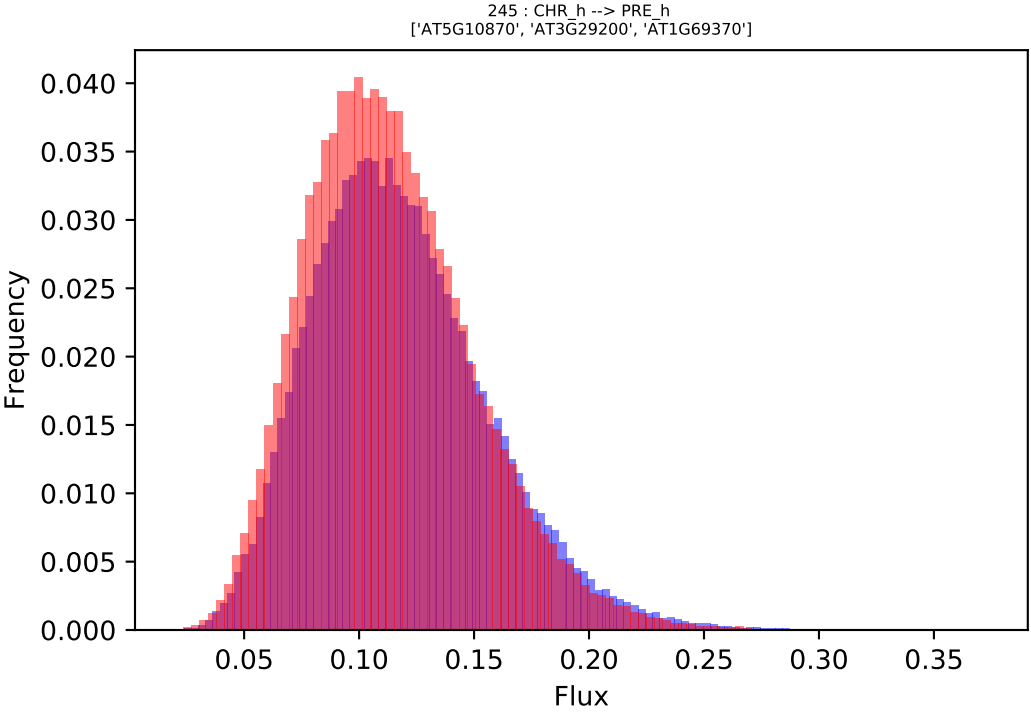

240 : 5M_DASH_THF_c + H_DASH_Cys_c --> Met_c + THF_c
['AT3G03780', 'AT5G17920', 'AT5G20980']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.1
0.2
0.3
0.4
Flux

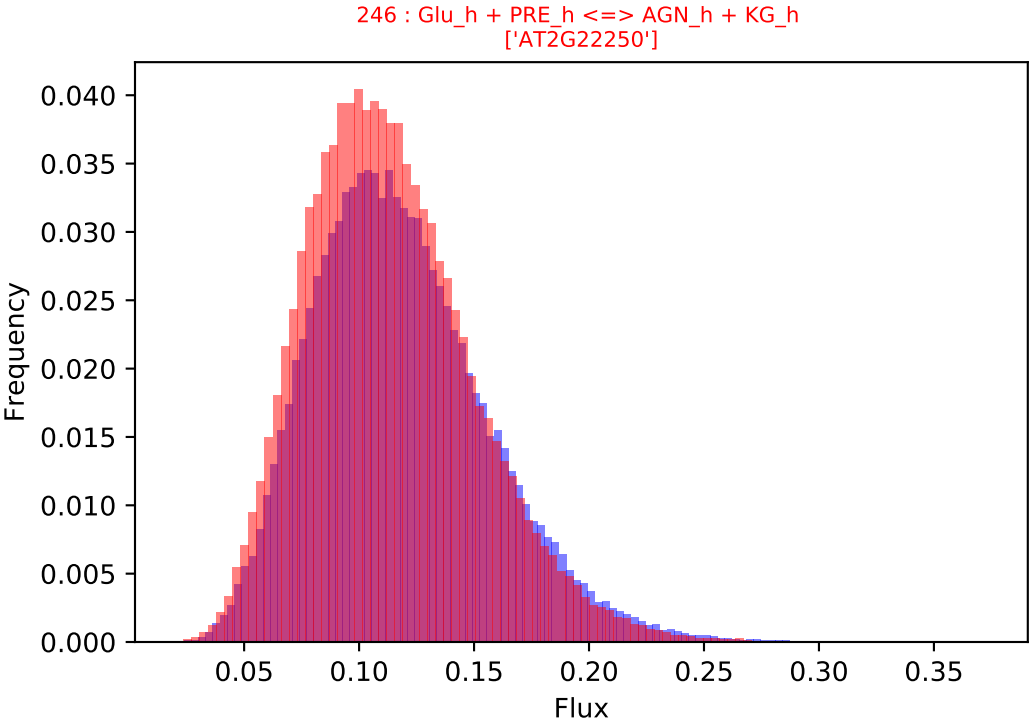

241 : Gly_c + H2O_c + M_DASH_THF_c <=> Ser_c + THF_c
['AT4G13890', 'AT1G22020', 'AT4G37930', 'AT5G26780', '4*AT4G13930', 'AT1G36370']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
−0.4
−0.3
−0.2
−0.1
0.0
Flux

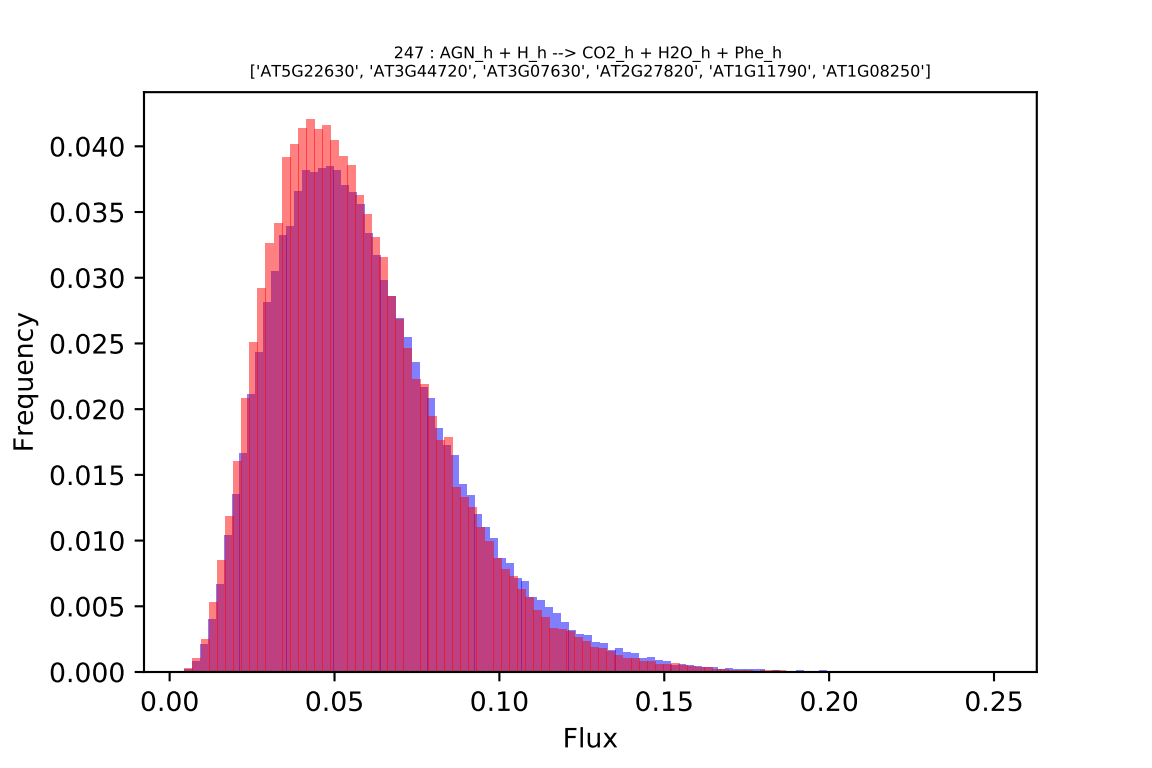

242 : ATP_c + H2O_c + Met_c --> H_c + PPi_c + Pi_c + aMet_c
['AT1G02500', 'AT2G36880']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
Flux

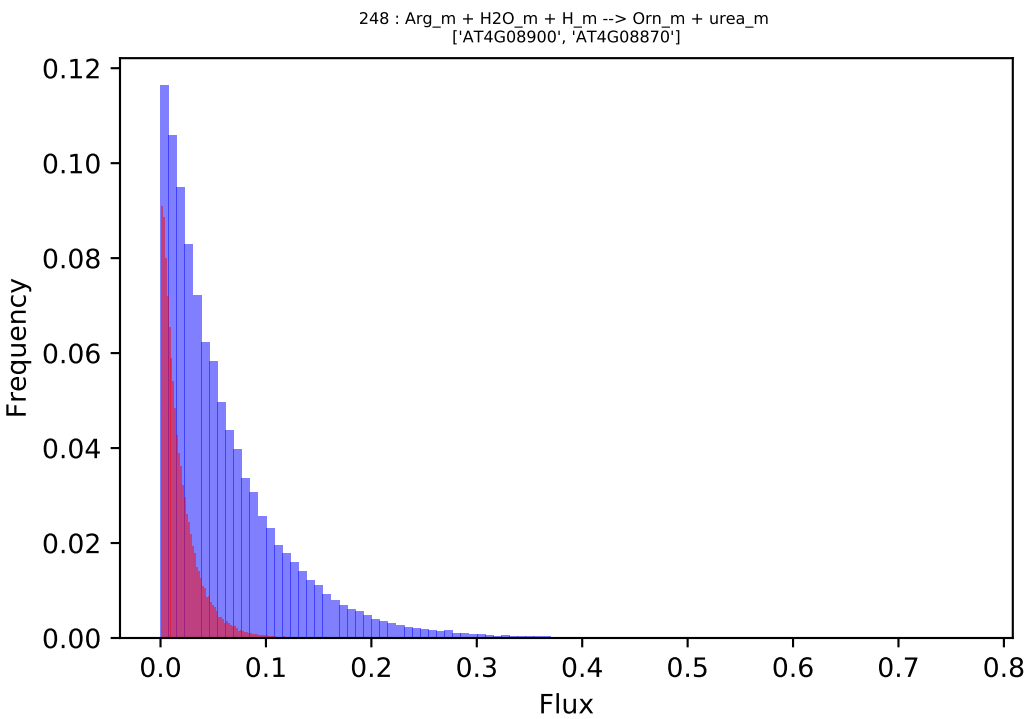

243 : H_DASH_Cys_c + aMet_c --> Met_c + aH_DASH_Cys_c
['AT3G22740', 'AT3G63250', 'AT3G25900']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
Flux

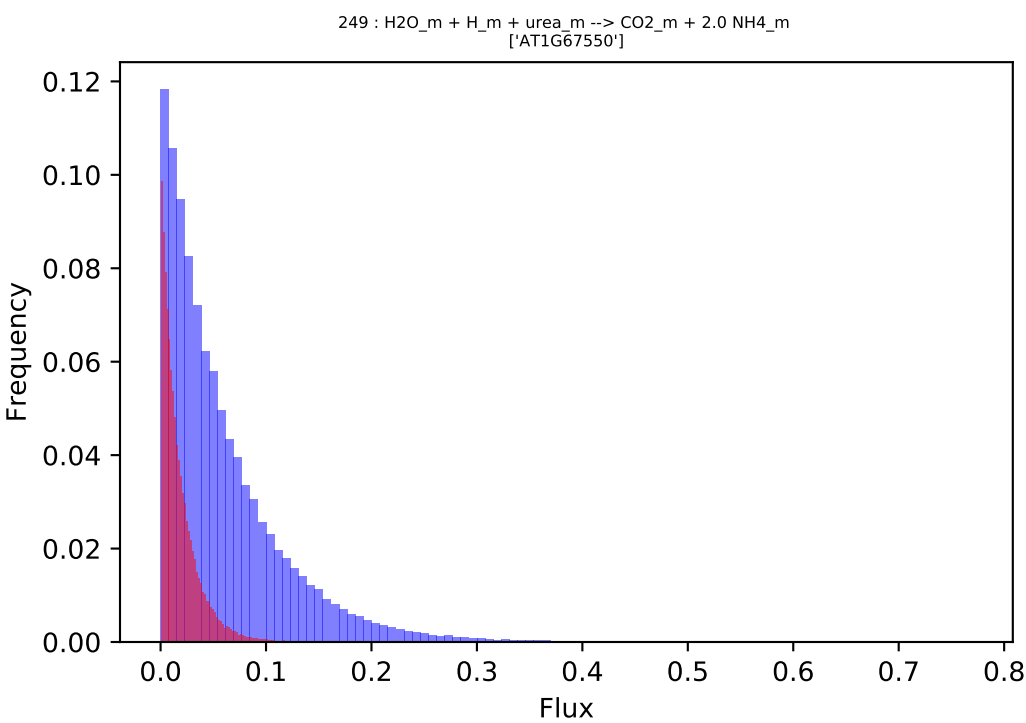

244 : H2O_c + aH_DASH_Cys_c <=> ADN_c + H_DASH_Cys_c
['AT4G13940', 'AT3G23810']
Frequency
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
Flux

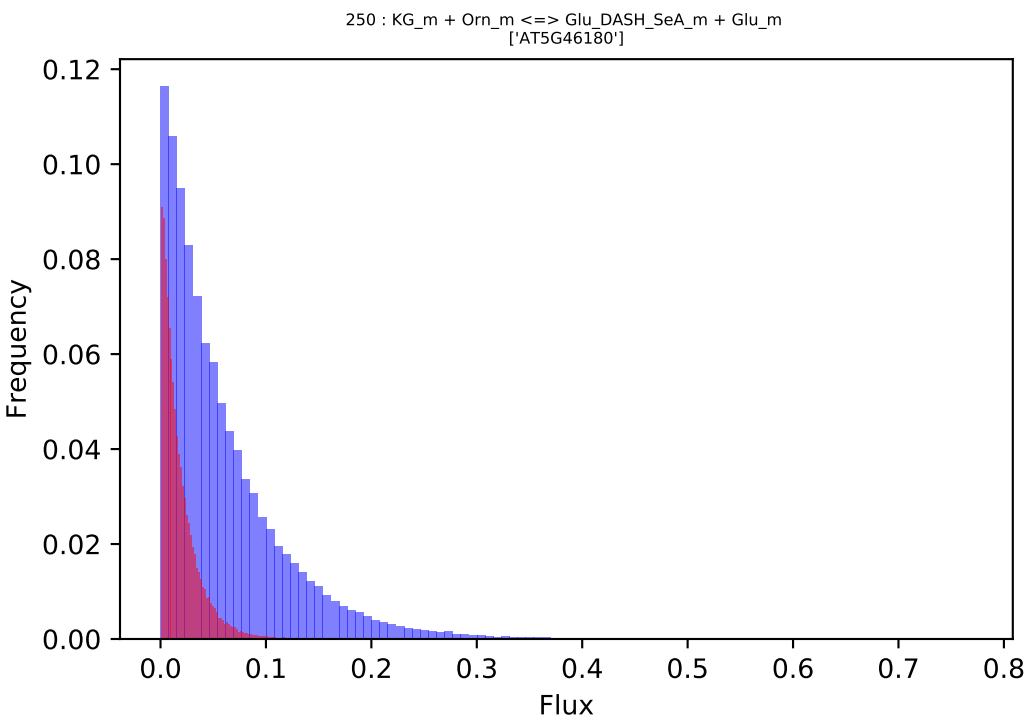

245 : CHR_h --> PRE_h
['AT5G10870', 'AT3G29200', 'AT1G69370']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Flux

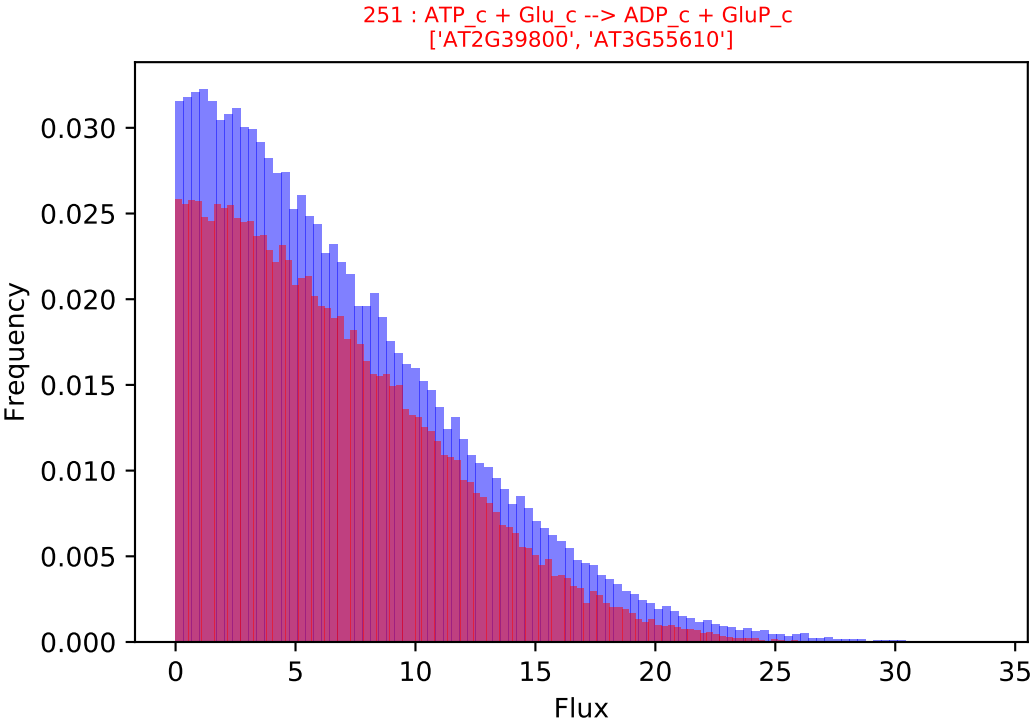

246 : Glu_h + PRE_h <=> AGN_h + KG_h
['AT2G22250']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Flux

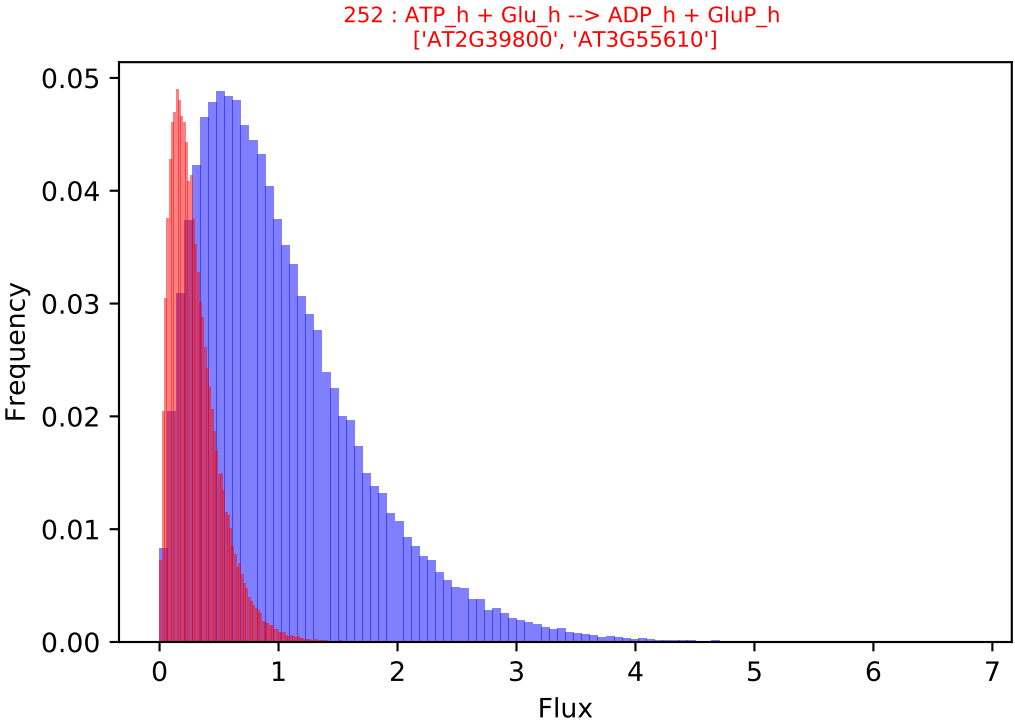

247 : AGN_h + H_h --> CO2_h + H2O_h + Phe_h
['AT5G22630', 'AT3G44720', 'AT3G07630', 'AT2G27820', 'AT1G11790', 'AT1G08250']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00
0.05
0.10
0.15
0.20
0.25
Flux

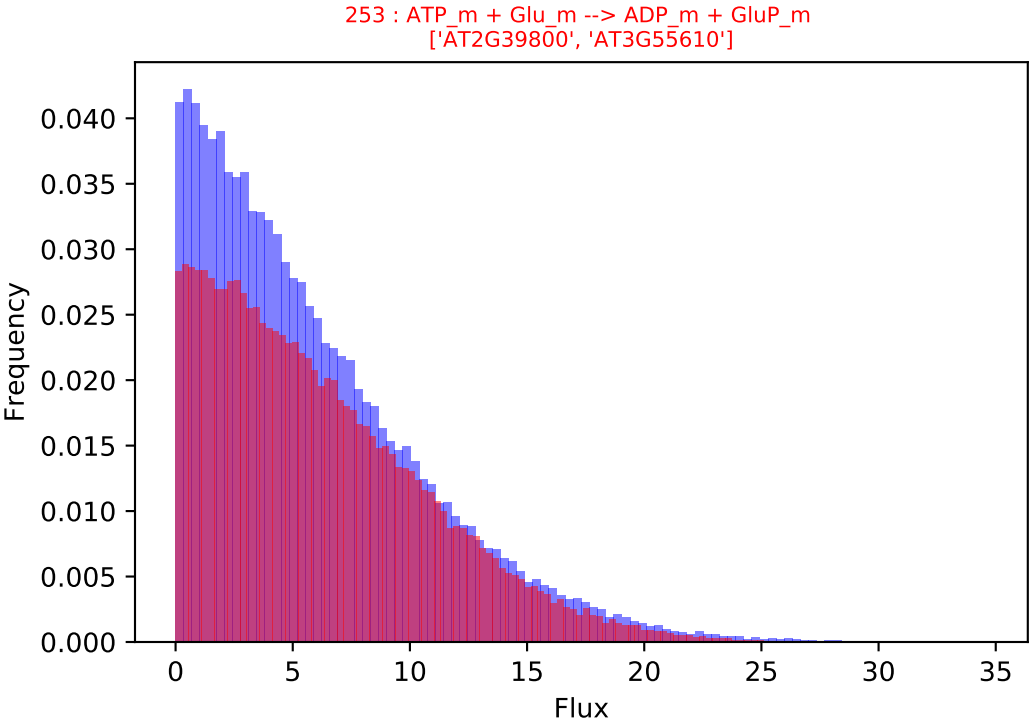

248 : Arg_m + H2O_m + H_m --> Orn_m + urea_m
['AT4G08900', 'AT4G08870']
Frequency
Flux
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8

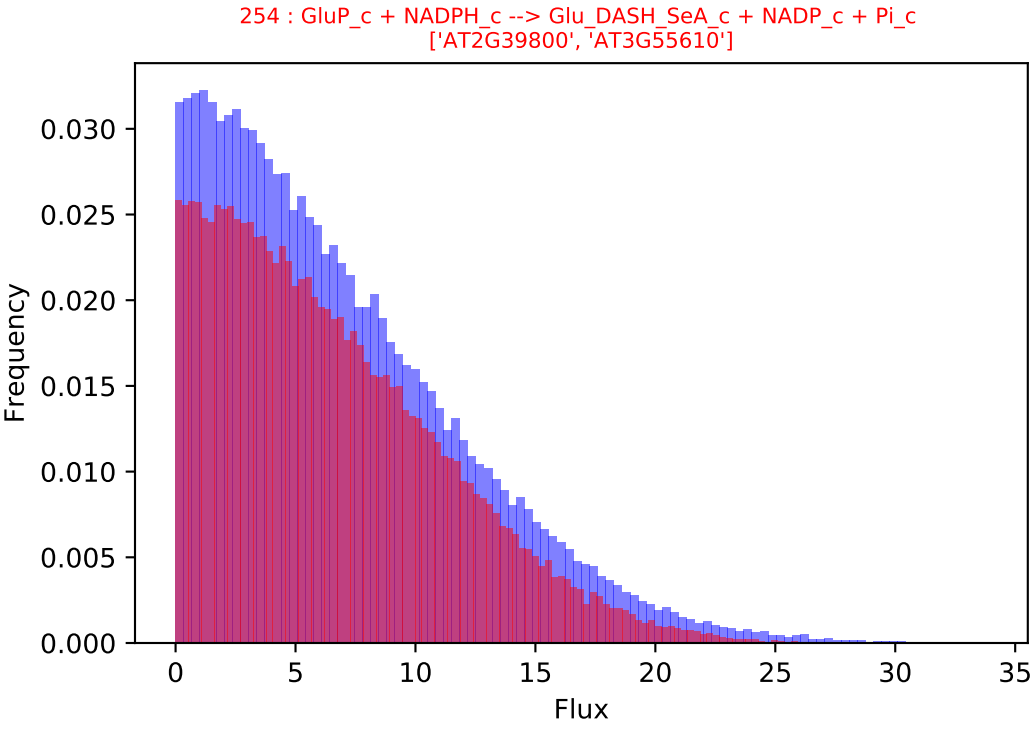

249 : H2O_m + H_m + urea_m --> CO2_m + 2.0 NH4_m
['AT1G67550']
Frequency
Flux
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8

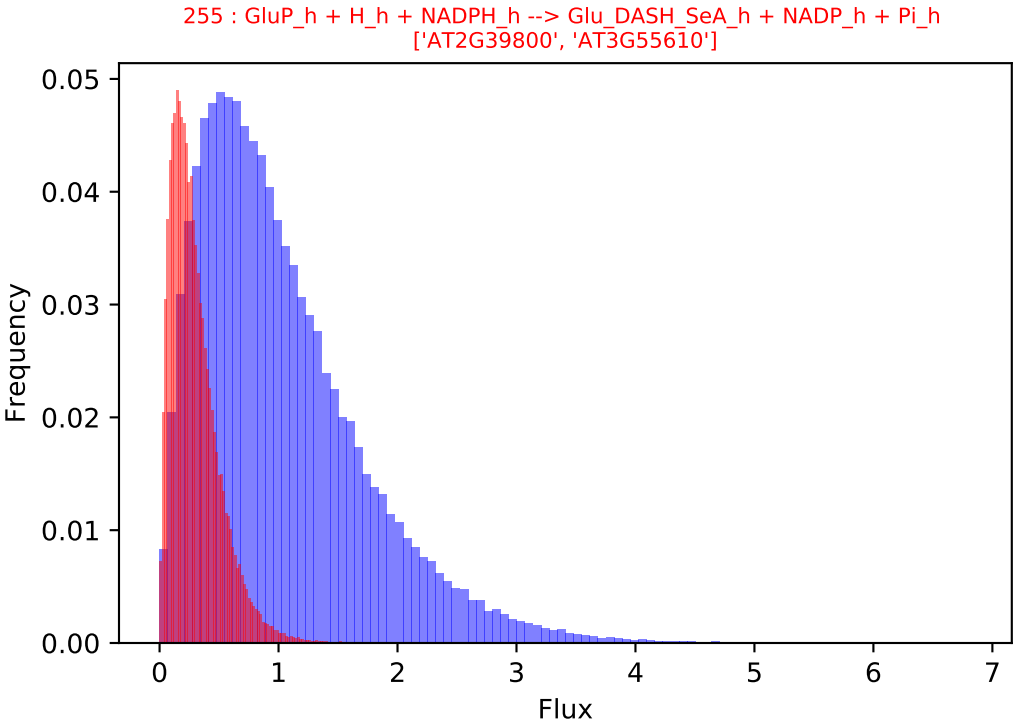

250 : KG_m + Orn_m <=> Glu_DASH_SeA_m + Glu_m
['AT5G46180']
Frequency
Flux
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8

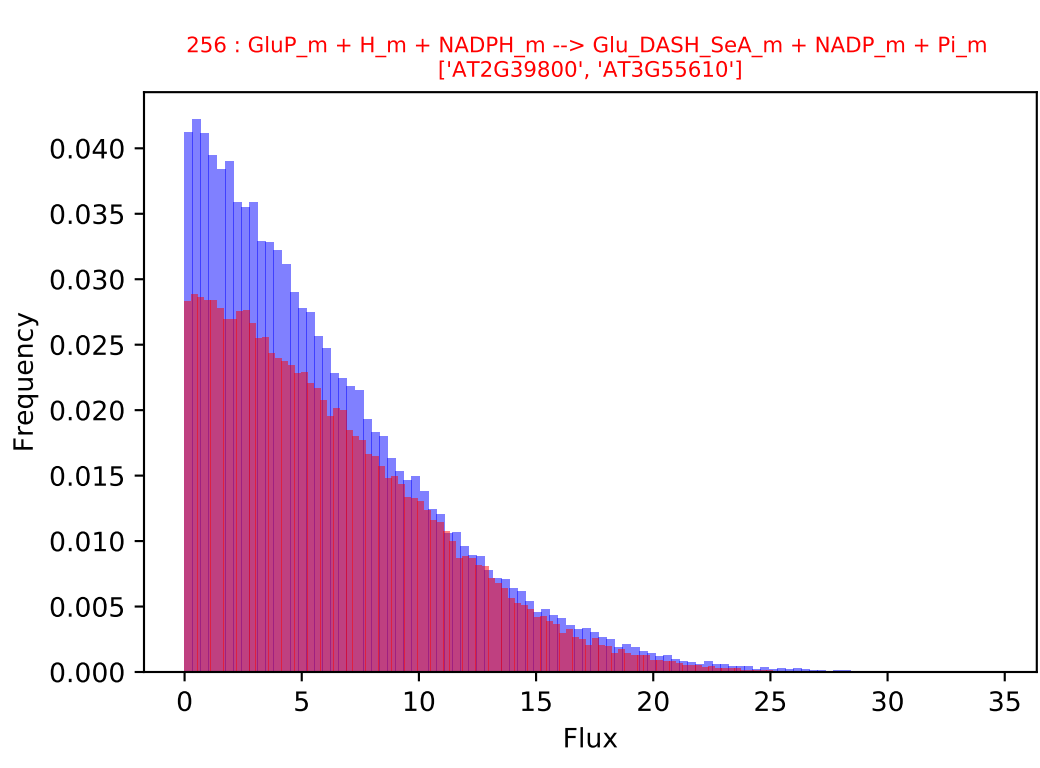

251 : ATP_c + Glu_c --> ADP_c + GluP_c
['AT2G39800', 'AT3G55610']
Frequency
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0
5
10
15
20
25
30
35
Flux

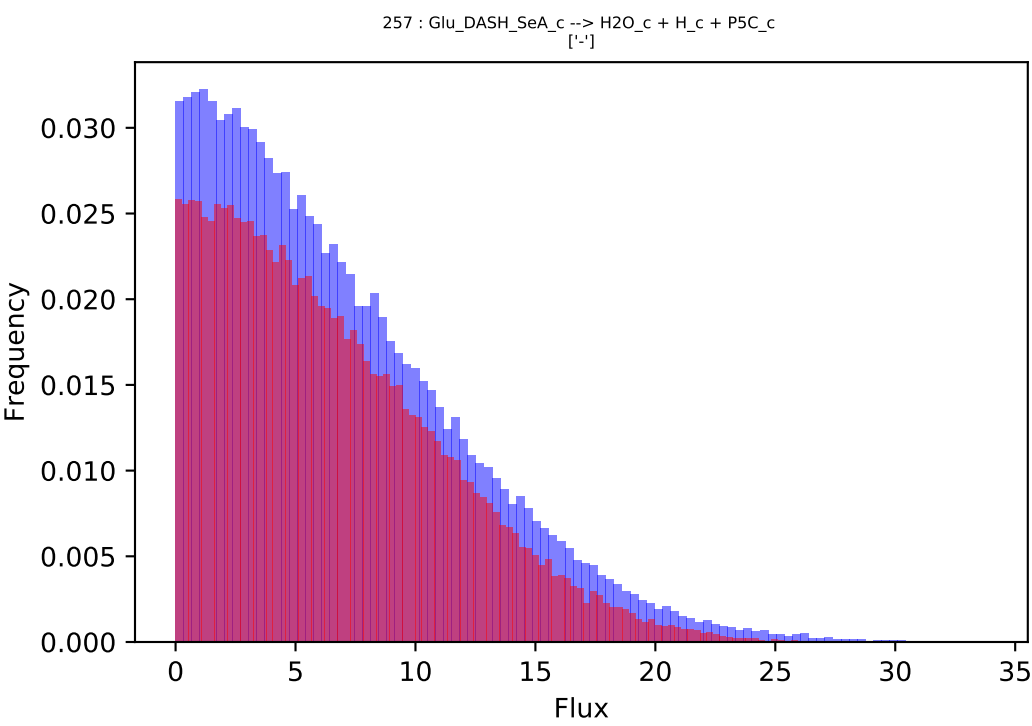

252 : ATP_h + Glu_h --> ADP_h + GluP_h
['AT2G39800', 'AT3G55610']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0
1
2
3
4
5
6
7
Flux

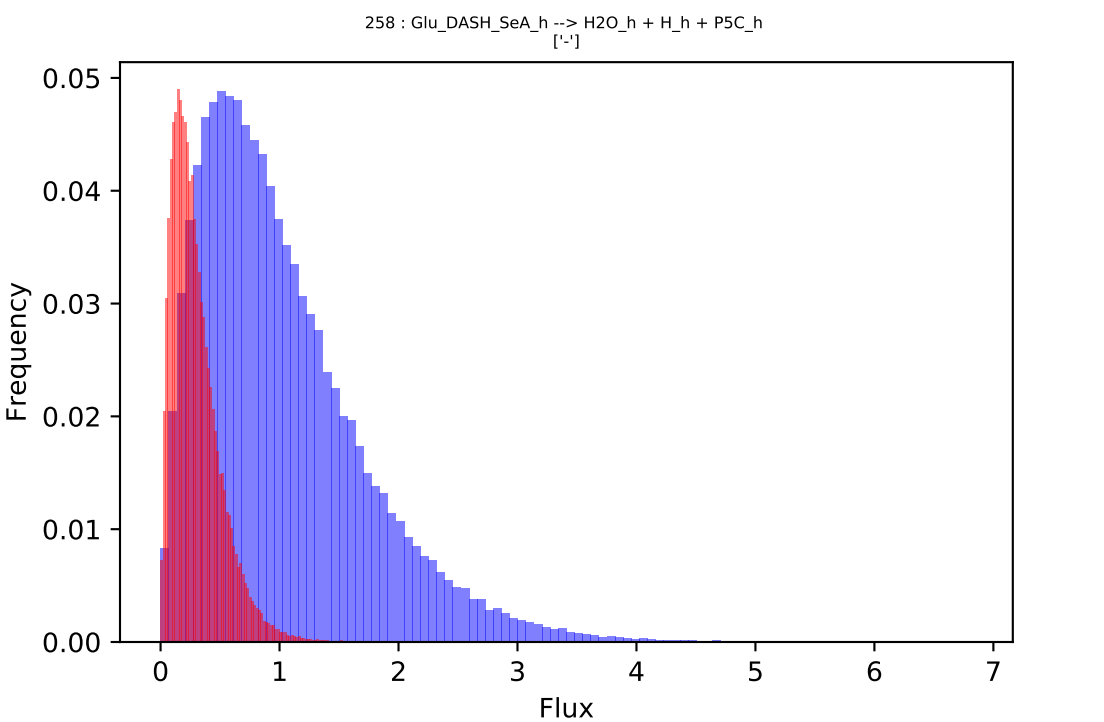

253 : ATP_m + Glu_m --> ADP_m + GluP_m
['AT2G39800', 'AT3G55610']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0
5
10
15
20
25
30
35
Flux

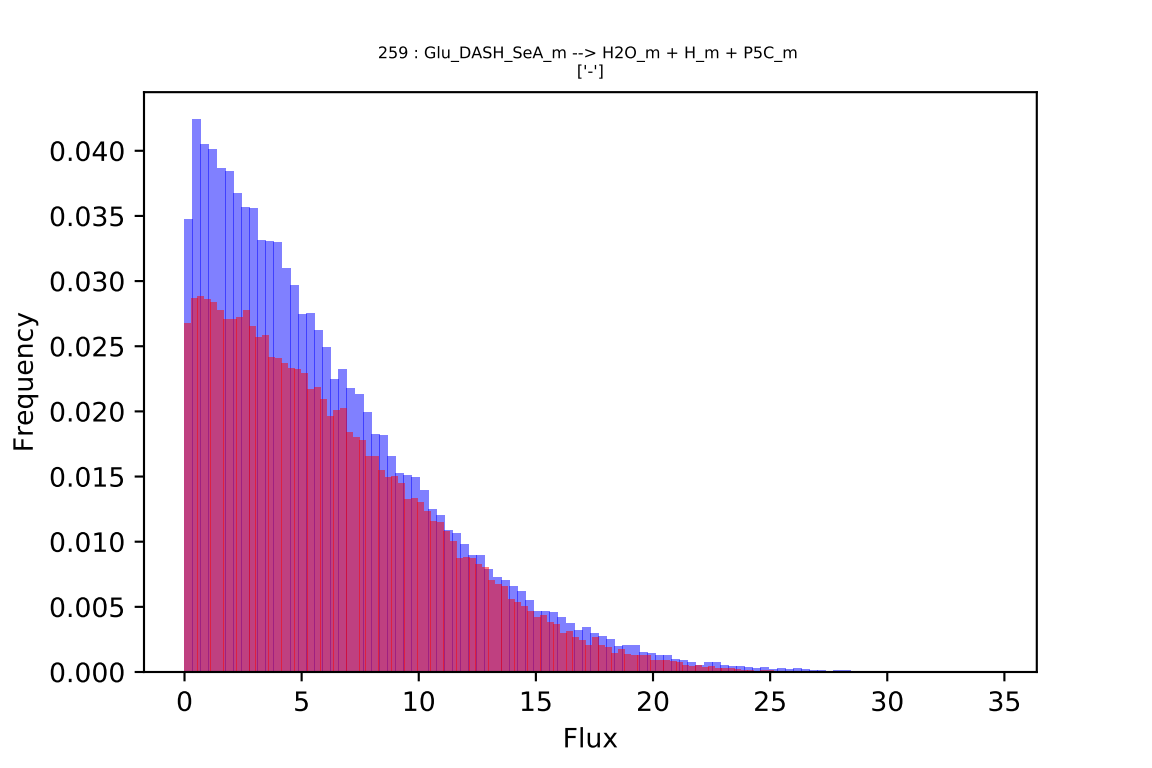

254 : GluP_c + NADPH_c --> Glu_DASH_SeA_c + NADP_c + Pi_c
['AT2G39800', 'AT3G55610']
Frequency
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0
5
10
15
20
25
30
35
Flux

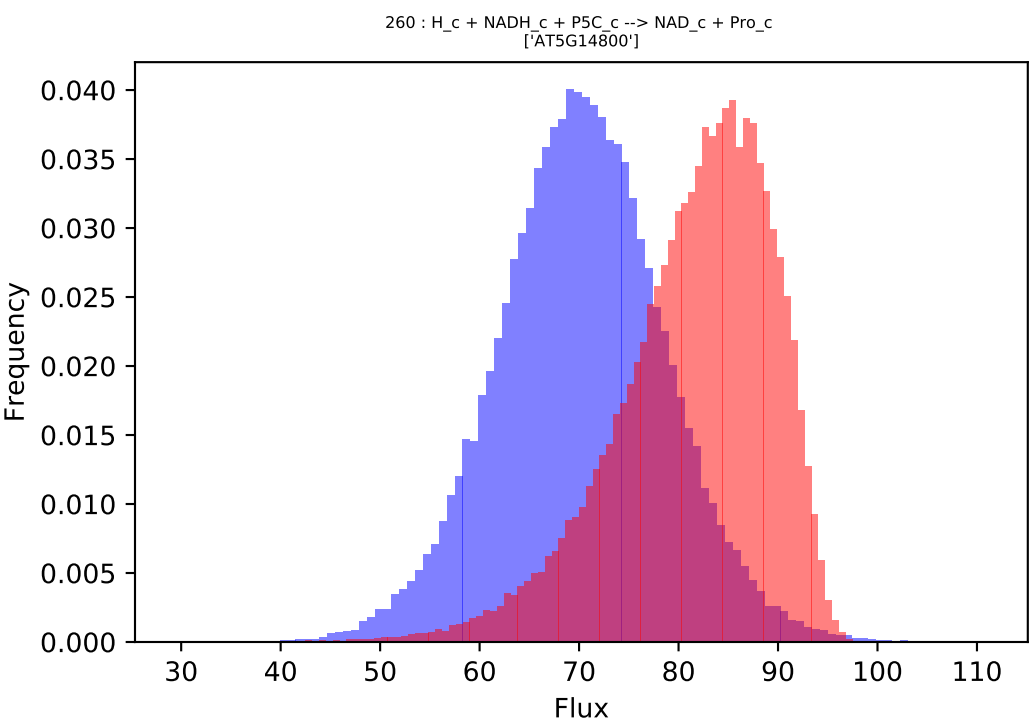

255 : GluP_h + H_h + NADPH_h --> Glu_DASH_SeA_h + NADP_h + Pi_h
['AT2G39800', 'AT3G55610']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0
1
2
3
4
5
6
7

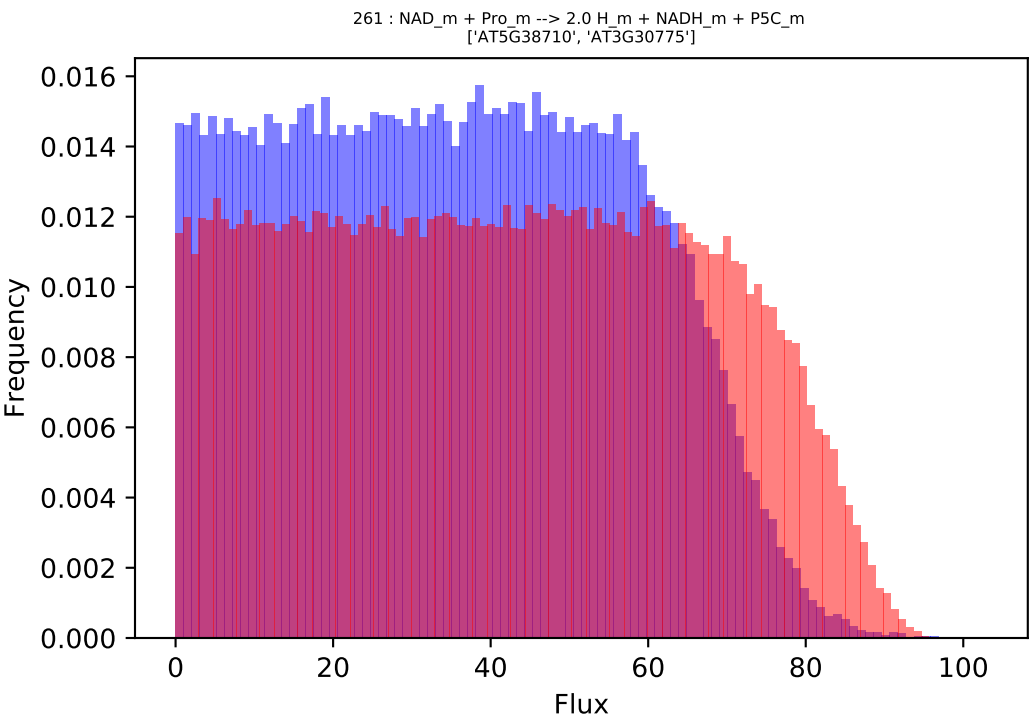

256 : GluP_m + H_m + NADPH_m --> Glu_DASH_SeA_m + NADP_m + Pi_m
['AT2G39800', 'AT3G55610']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0
5
10
15
20
25
30
35
Flux

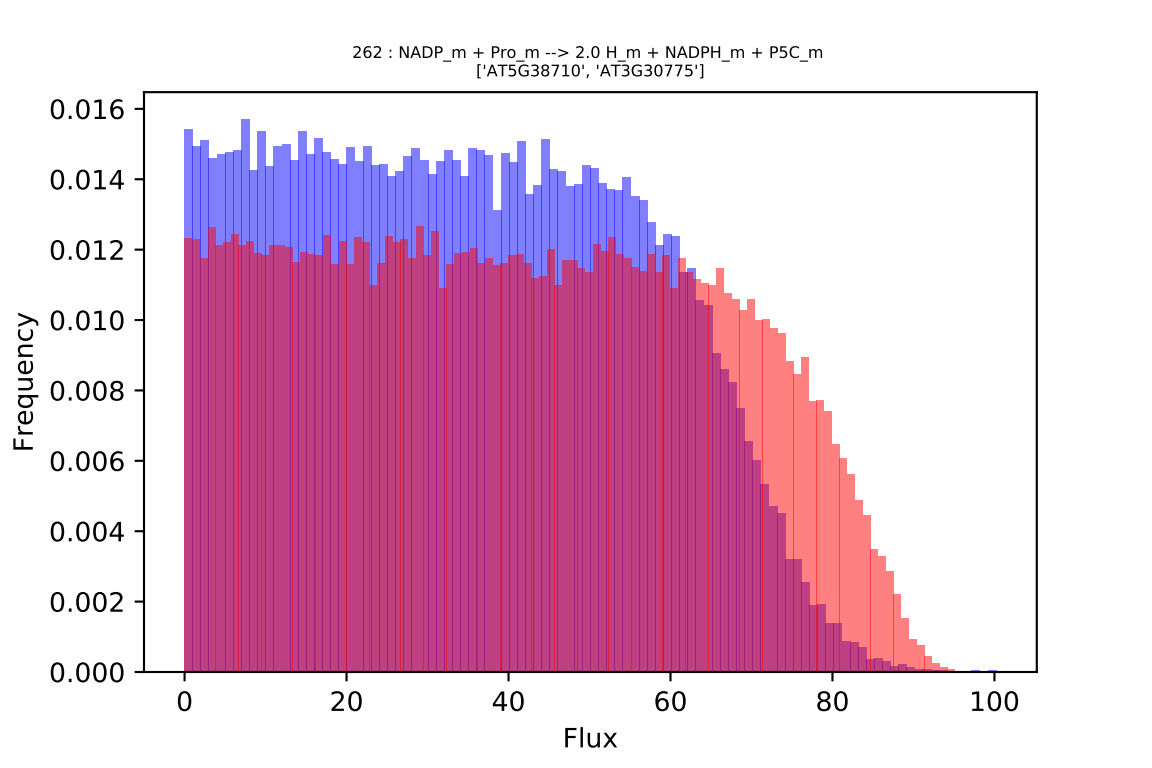

257 : Glu_DASH_SeA_c --> H2O_c + H_c + P5C_c
['-']
Frequency
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0
5
10
15
20
25
30
35
Flux

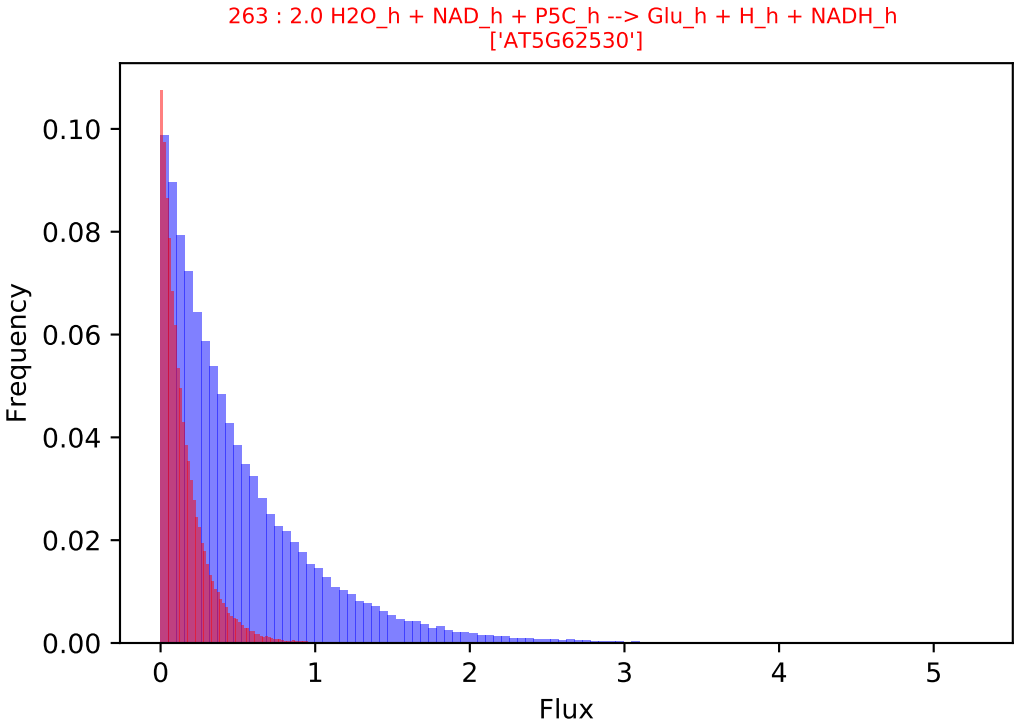

258 : Glu_DASH_SeA_h --> H2O_h + H_h + P5C_h
['-']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0
1
2
3
4
5
6
7

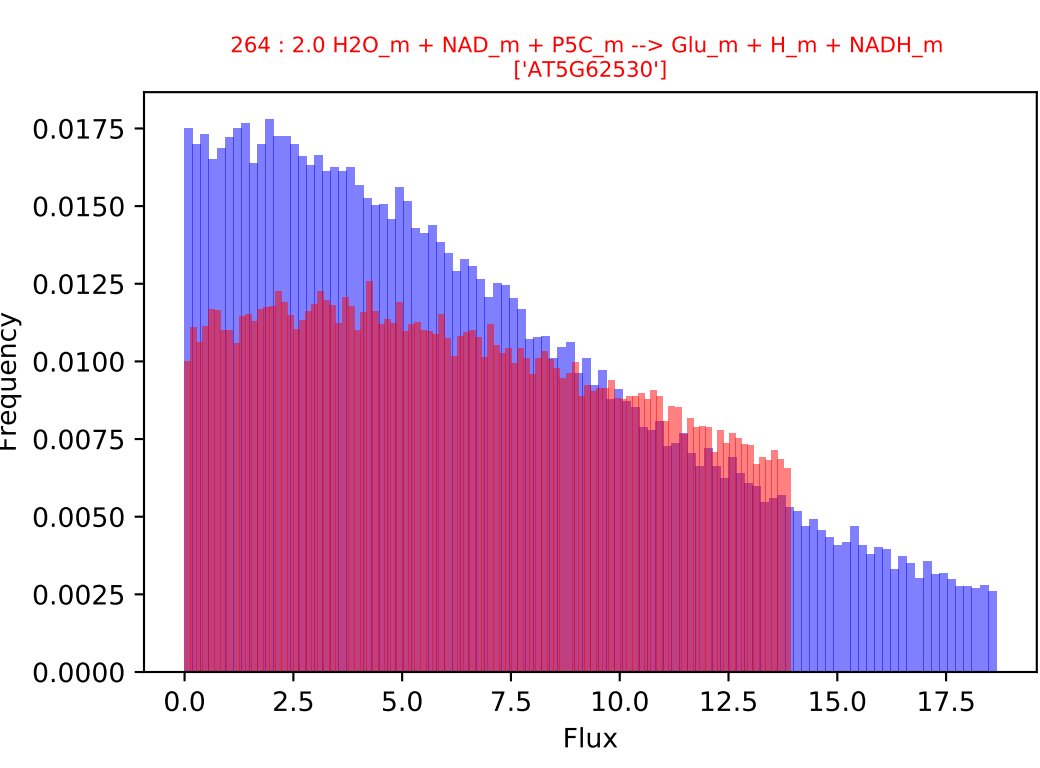

259 : Glu_DASH_SeA_m --> H2O_m + H_m + P5C_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
5
10
15
20
25
30
35
Flux

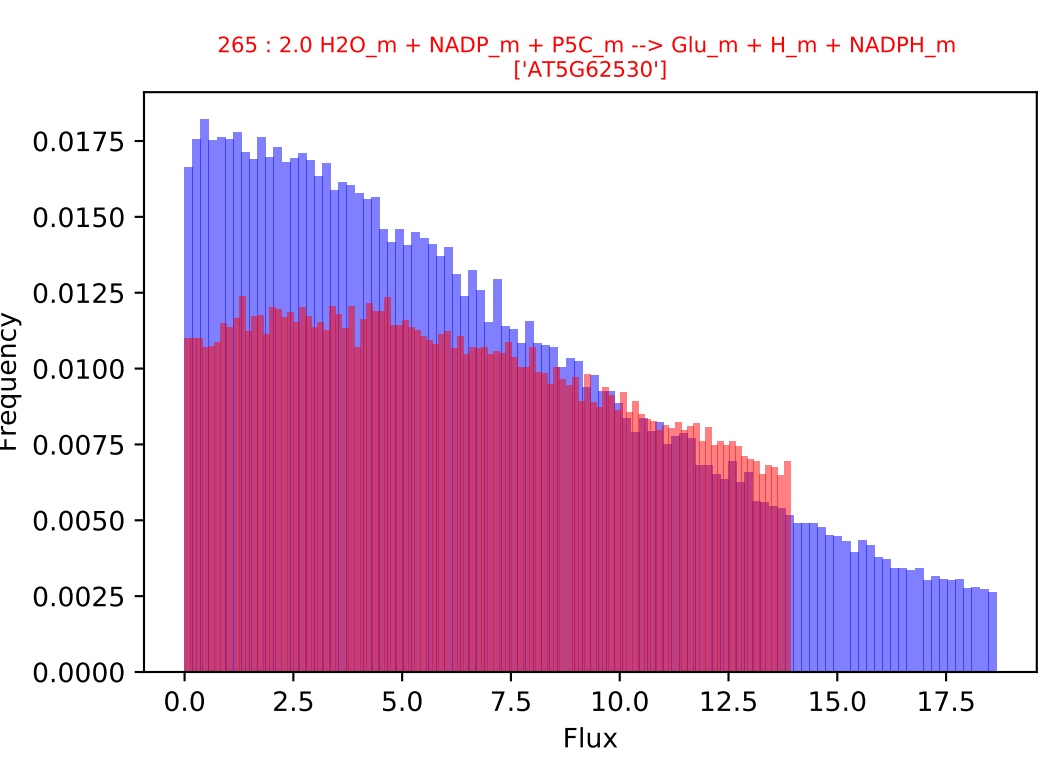

260 : H_c + NADH_c + P5C_c --> NAD_c + Pro_c
['AT5G14800']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
30
40
50
60
70
80
90
100
110
Flux

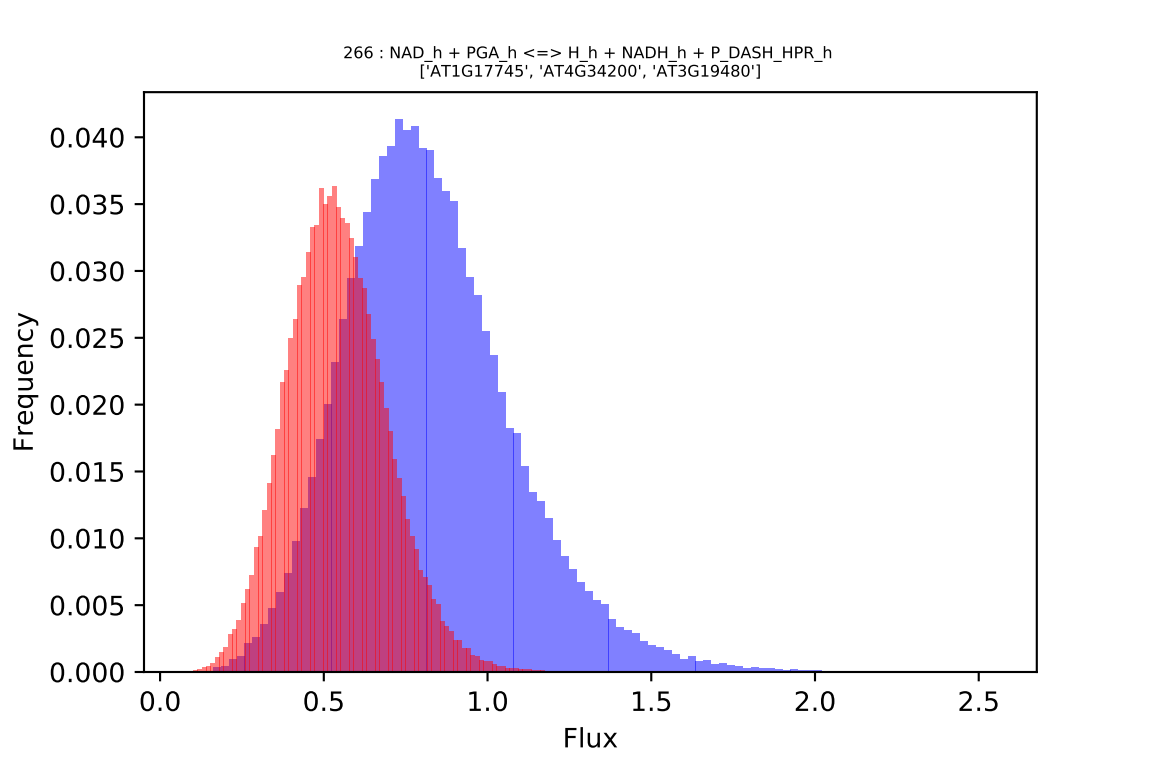

261 : NAD_m + Pro_m --> 2.0 H_m + NADH_m + P5C_m
['AT5G38710', 'AT3G30775']
0.016
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
0
20
40
60
80
100
Flux

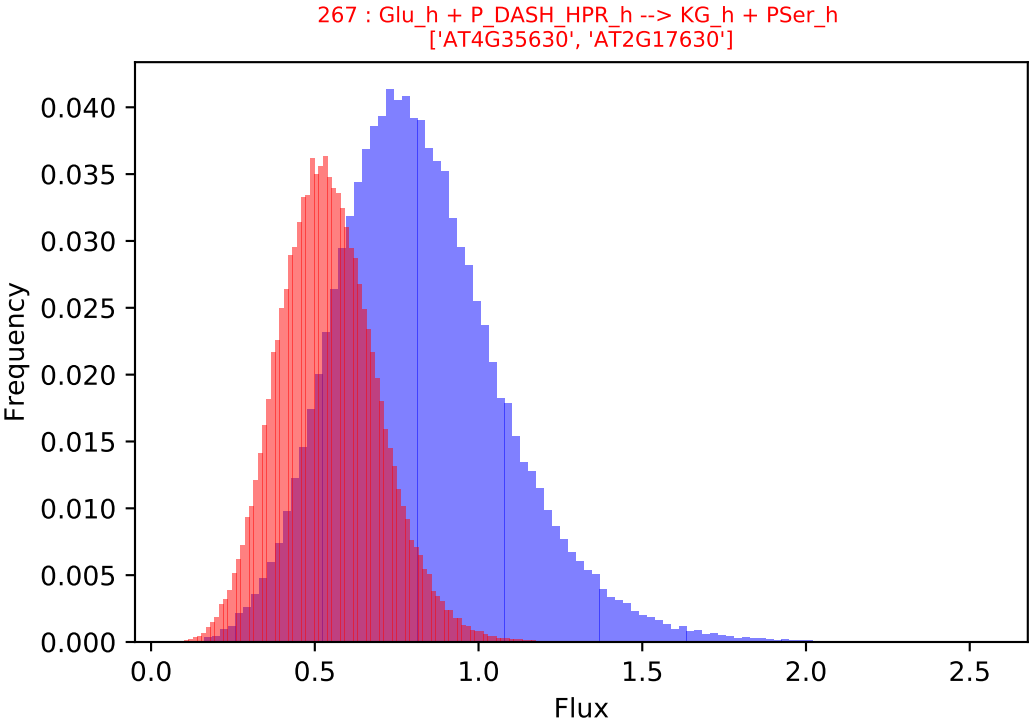

262 : NADP_m + Pro_m --> 2.0 H_m + NADPH_m + P5C_m
['AT5G38710', 'AT3G30775']
Frequency
0.016
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
0
20
40
60
80
100
Flux

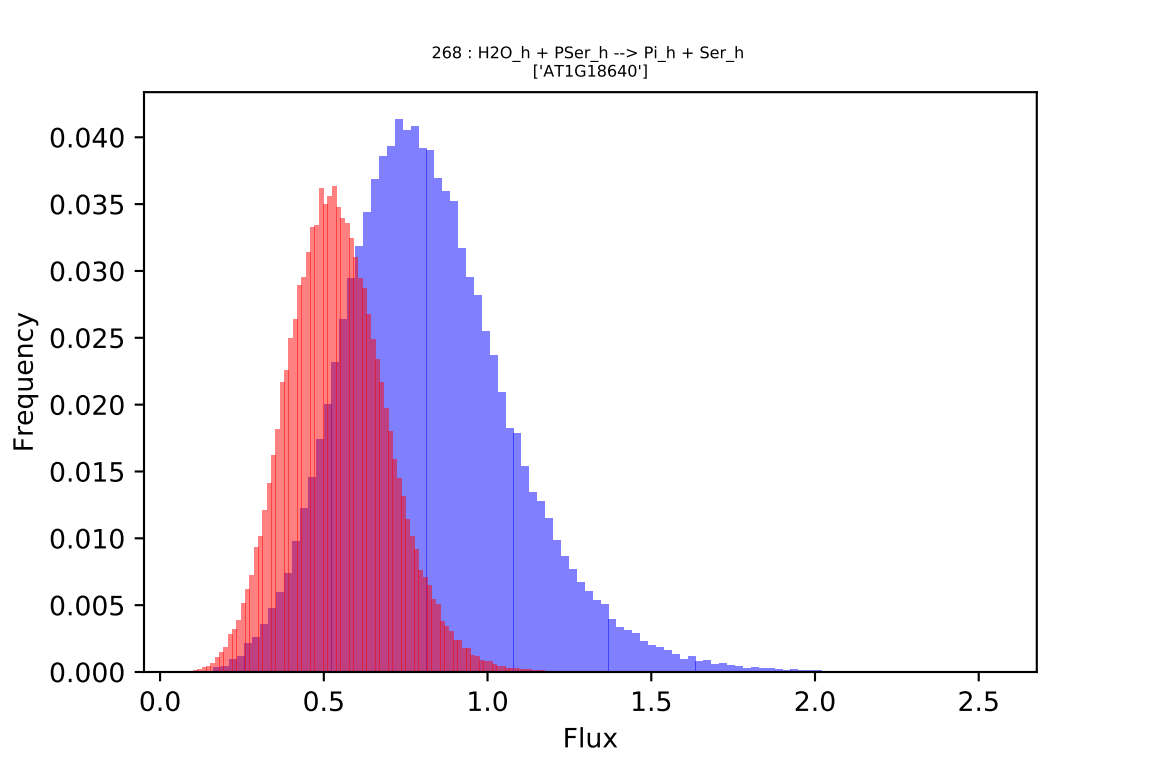

263 : 2.0 H2O_h + NAD_h + P5C_h --> Glu_h + H_h + NADH_h
['AT5G62530']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0
1
2
3
4
5
Flux

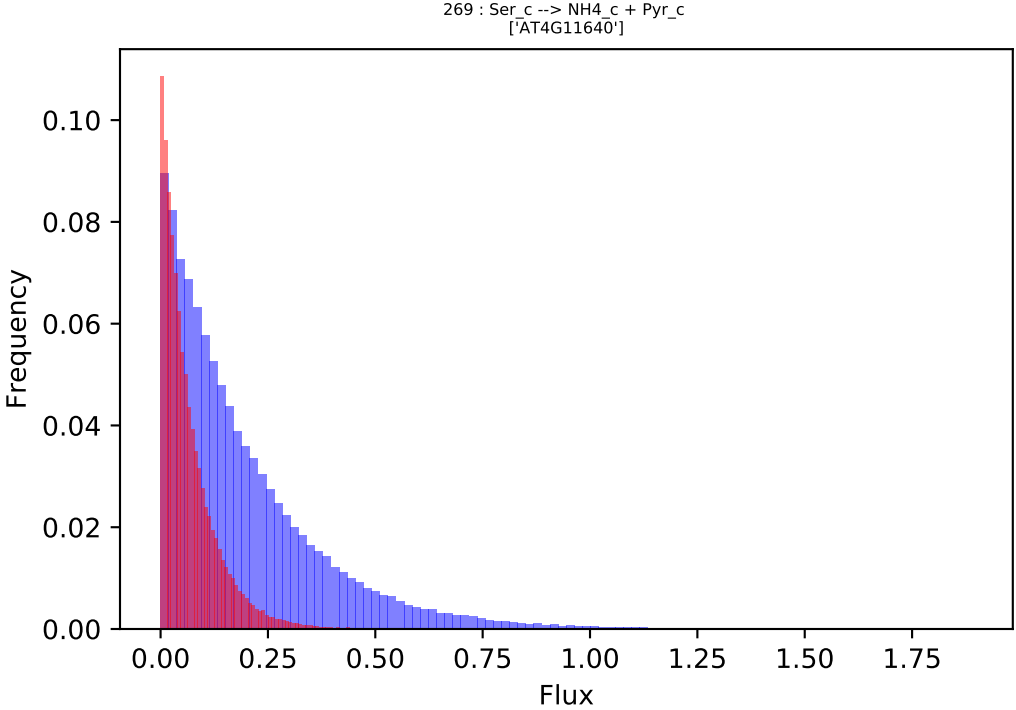

264 : 2.0 H2O_m + NAD_m + P5C_m --> Glu_m + H_m + NADH_m
['AT5G62530']
Frequency
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
Flux

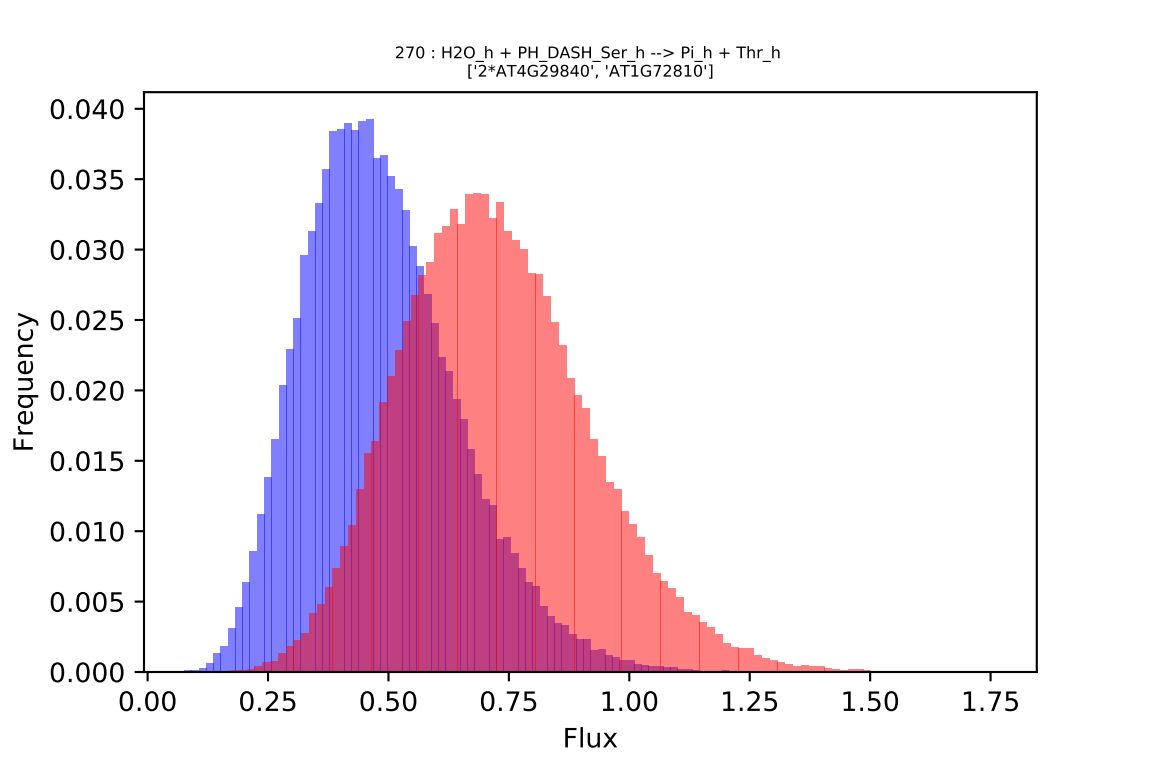

265 : 2.0 H2O_m + NADP_m + P5C_m --> Glu_m + H_m + NADPH_m
['AT5G62530']
Frequency
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
Flux

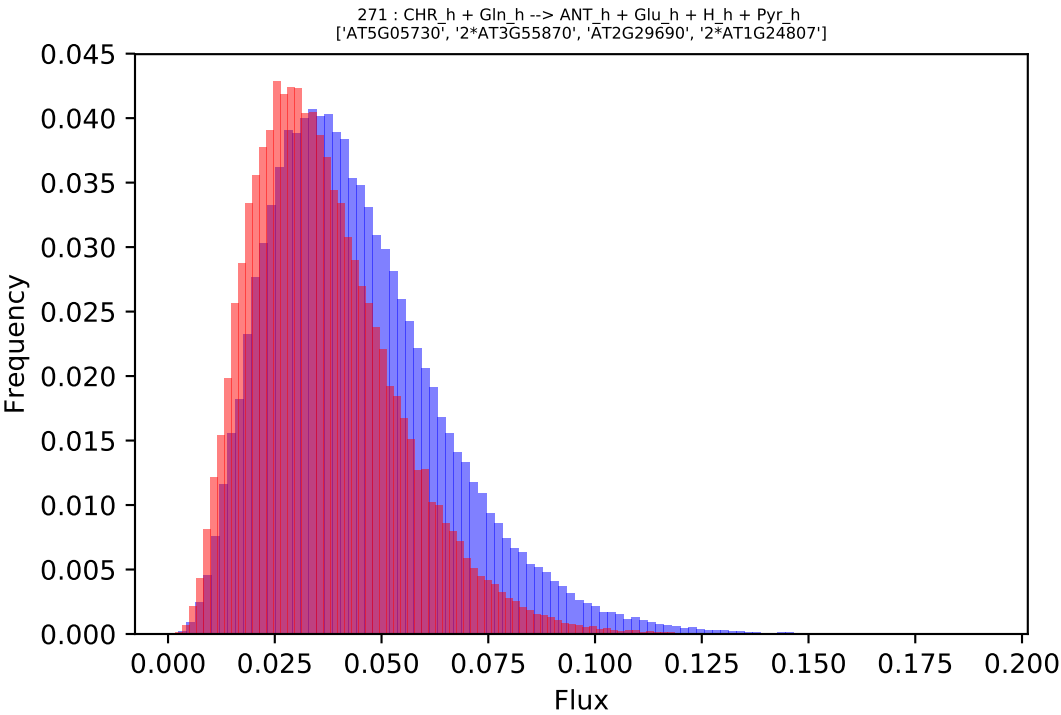

266 : NAD_h + PGA_h <=> H_h + NADH_h + P_DASH_HPR_h
['AT1G17745', 'AT4G34200', 'AT3G19480']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.5
1.0
1.5
2.0
2.5
Flux

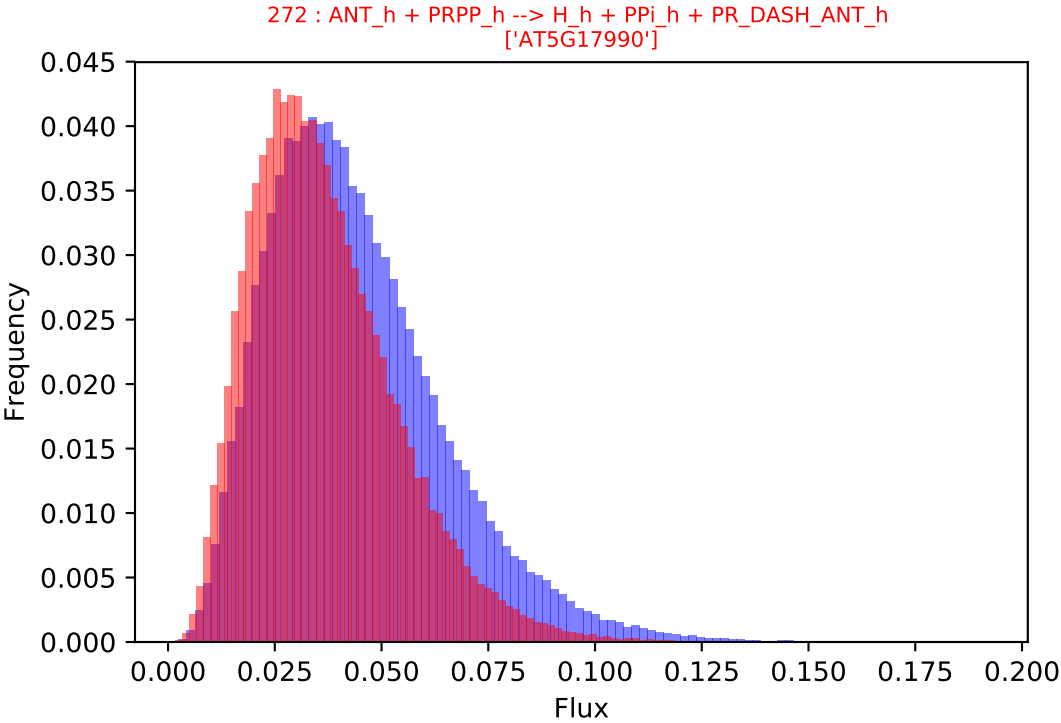

267 : Glu_h + P_DASH_HPR_h --> KG_h + PSer_h
['AT4G35630', 'AT2G17630']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.5
1.0
1.5
2.0
2.5
Flux

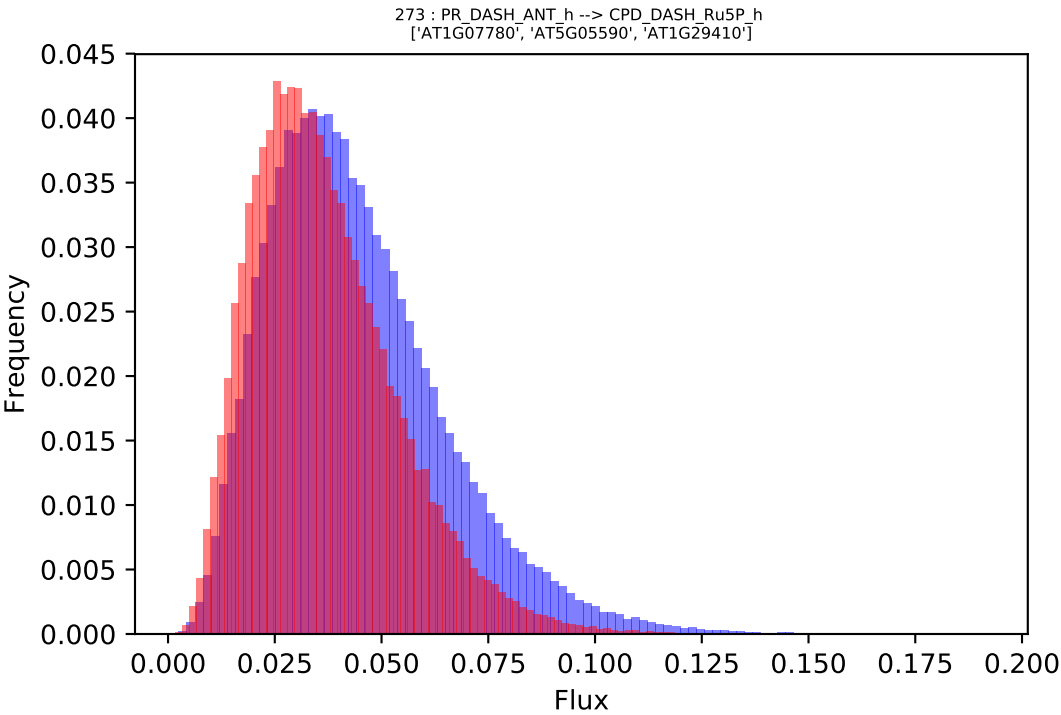

268 : H2O_h + PSer_h --> Pi_h + Ser_h
['AT1G18640']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.5
1.0
1.5
2.0
2.5
Flux

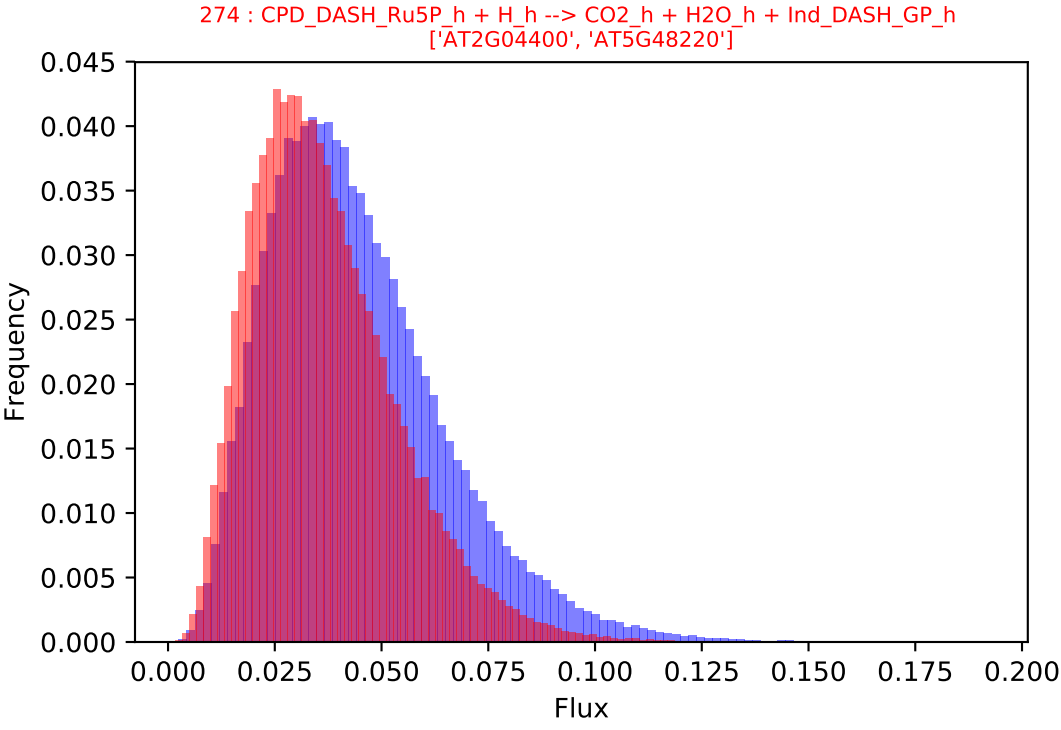

269 : Ser_c --> NH4_c + Pyr_c
['AT4G11640']
Frequency
0.10
0.08
0.06
0.04
0.02
0.00
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

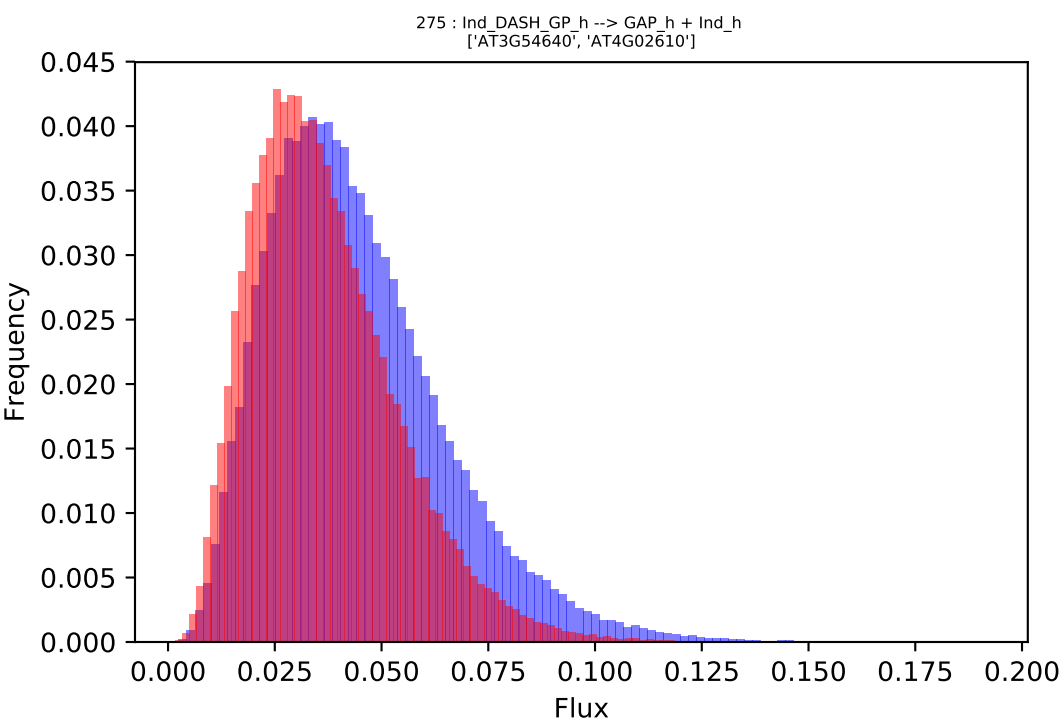

270 : H2O_h + PH_DASH_Ser_h --> Pi_h + Thr_h
['2*AT4G29840', 'AT1G72810']
Frequency
Flux
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75

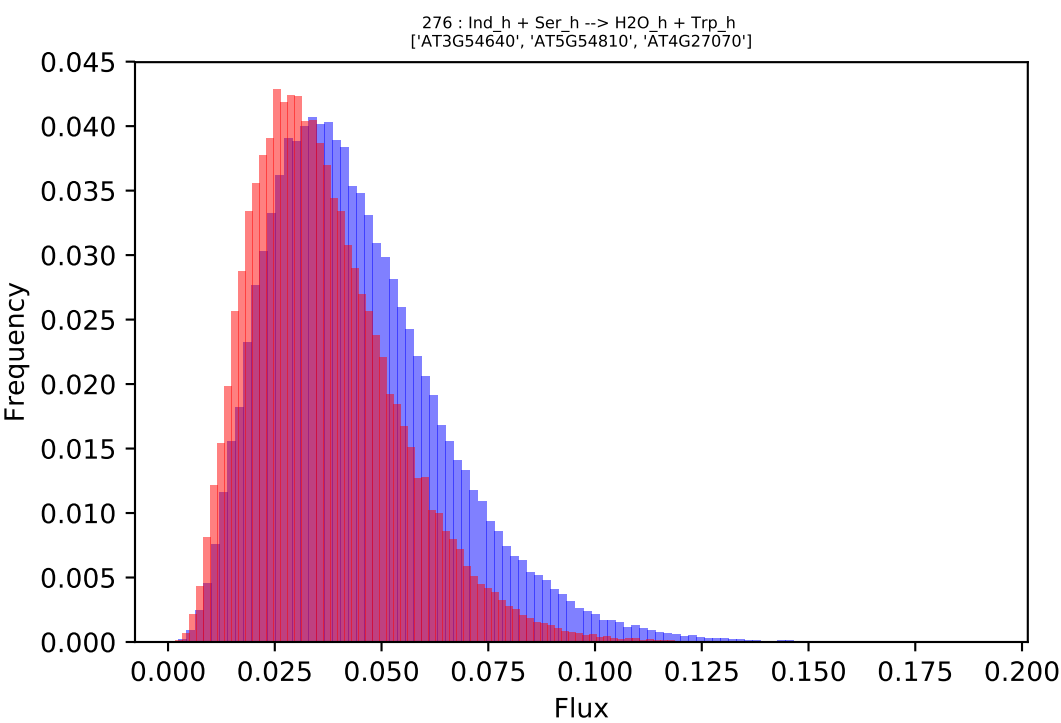

271 : CHR_h + Gln_h --> ANT_h + Glu_h + H_h + Pyr_h
['AT5G05730', '2*AT3G55870', 'AT2G29690', '2*AT1G24807']
Frequency
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.000
0.025
0.050
0.075
0.100
0.125
0.150
0.175
0.200
Flux

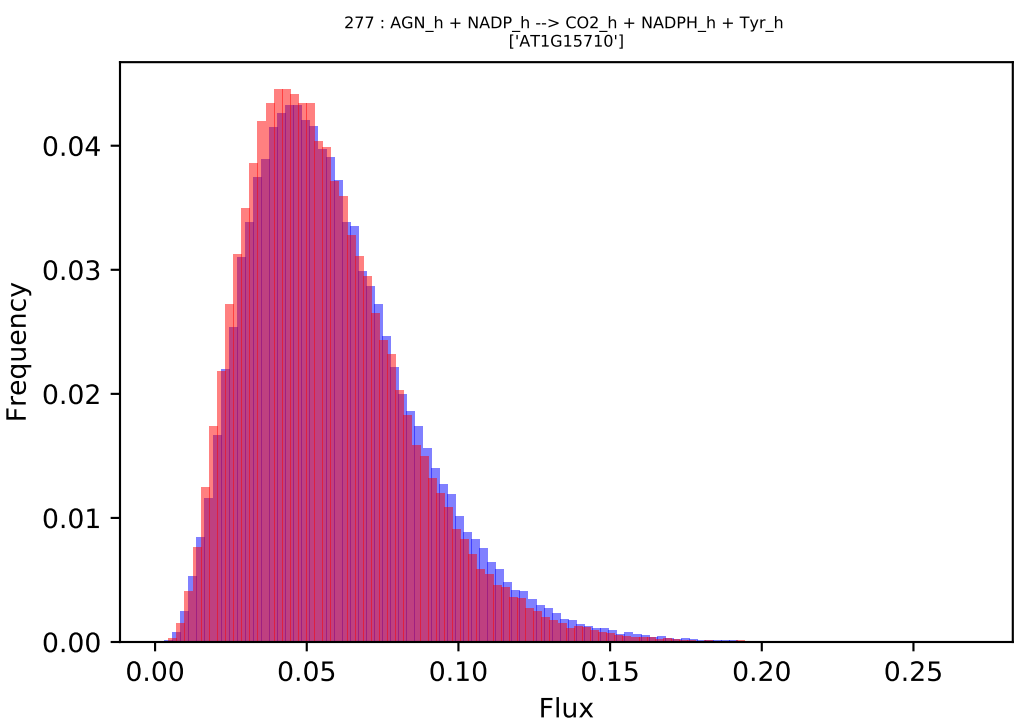

272 : ANT_h + PRPP_h --> H_h + PPi_h + PR_DASH_ANT_h
['AT5G17990']
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.000
0.025
0.050
0.075
0.100
0.125
0.150
0.175
0.200
Flux

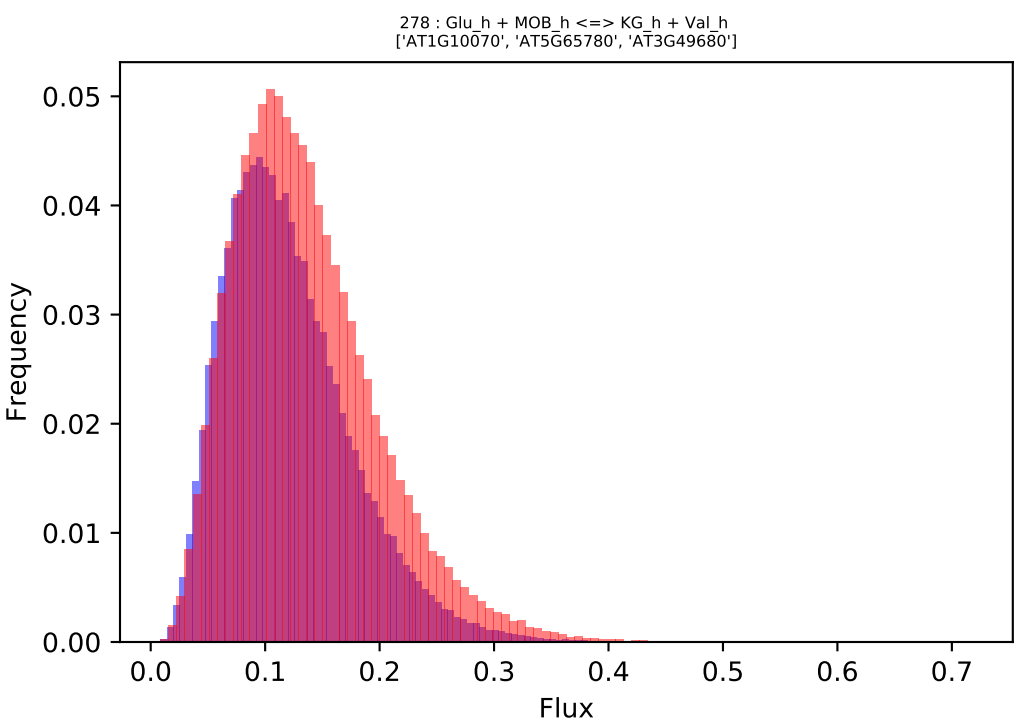

273 : PR_DASH_ANT_h --> CPD_DASH_Ru5P_h
['AT1G07780', 'AT5G05590', 'AT1G29410']
Frequency
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.000
0.025
0.050
0.075
0.100
0.125
0.150
0.175
0.200
Flux

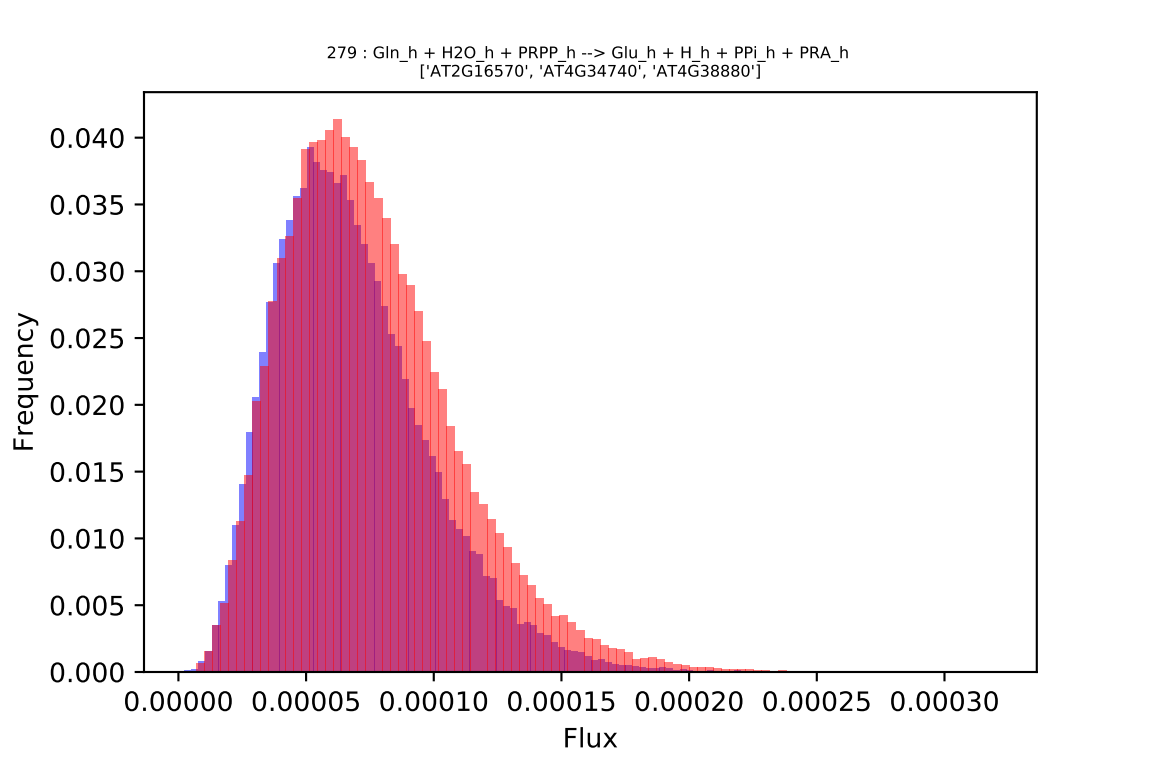

274 : CPD_DASH_Ru5P_h + H_h --> CO2_h + H2O_h + Ind_DASH_GP_h
['AT2G04400', 'AT5G48220']
Frequency
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.000
0.025
0.050
0.075
0.100
0.125
0.150
0.175
0.200
Flux

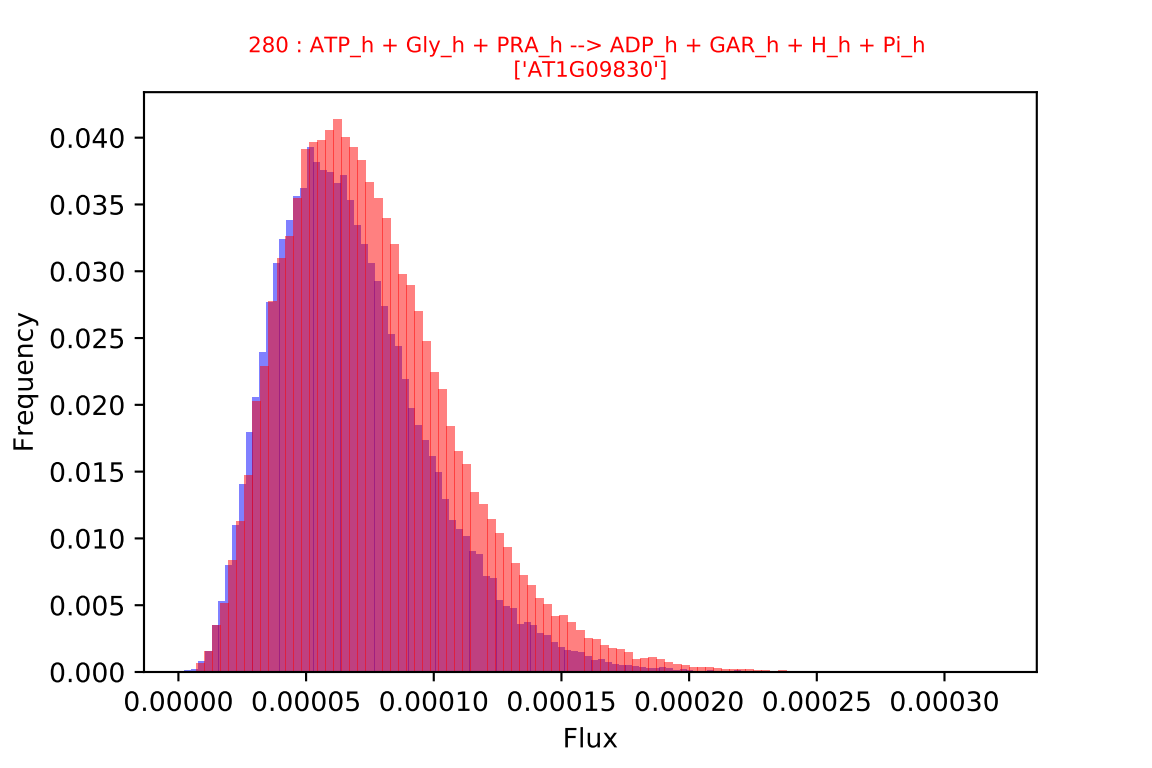

275 : Ind_DASH_GP_h --> GAP_h + Ind_h
['AT3G54640', 'AT4G02610']
Frequency
Flux
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.000
0.025
0.050
0.075
0.100
0.125
0.150
0.175
0.200

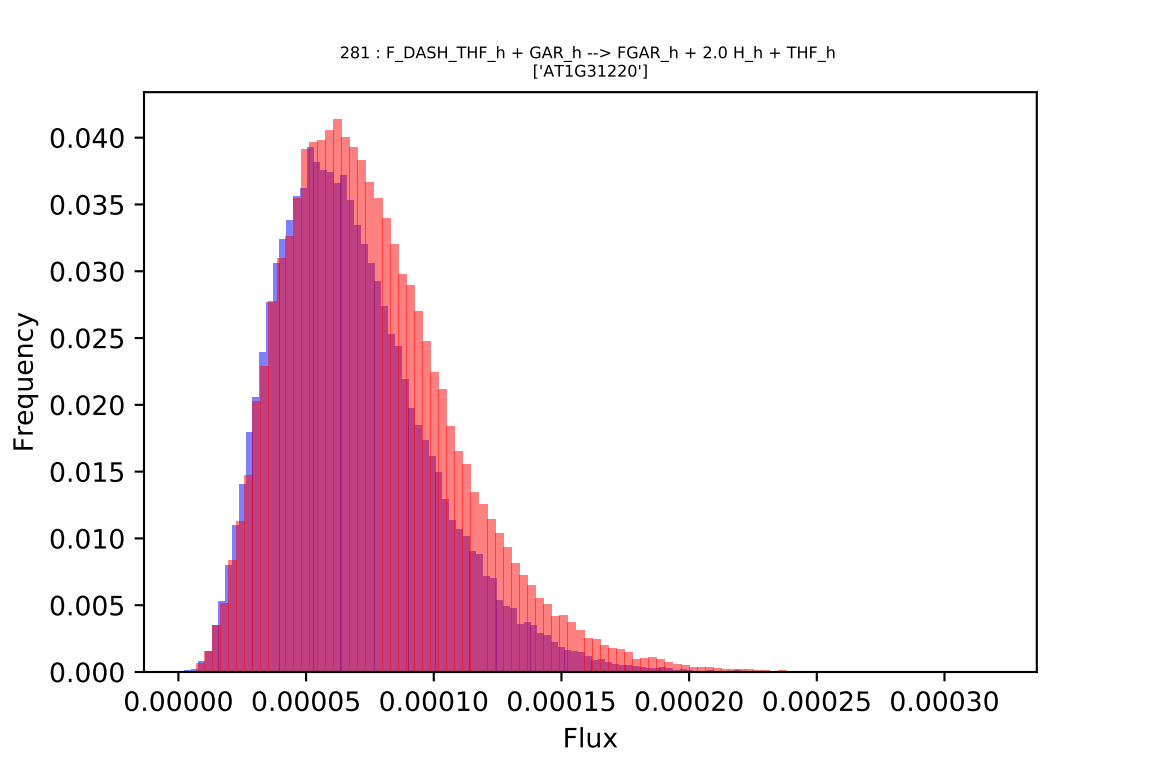

276 : Ind_h + Ser_h --> H2O_h + Trp_h
['AT3G54640', 'AT5G54810', 'AT4G27070']
Frequency
Flux
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.000
0.025
0.050
0.075
0.100
0.125
0.150
0.175
0.200

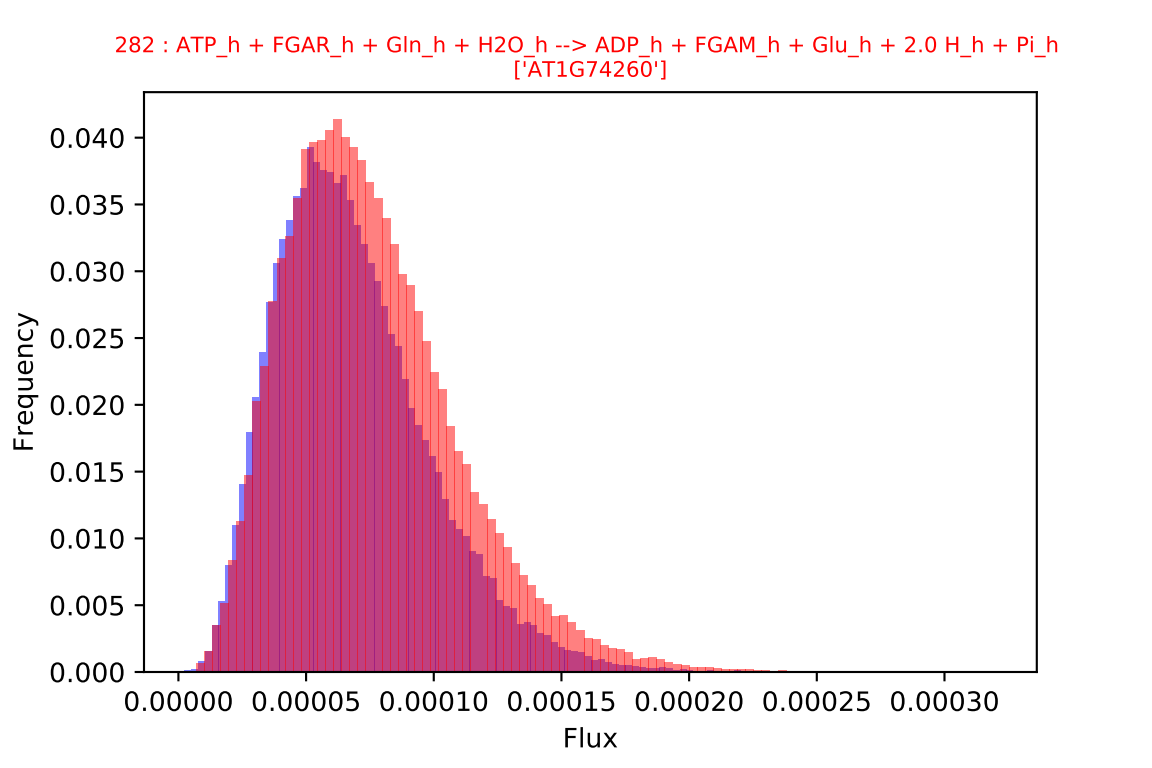

277 : AGN_h + NADP_h --> CO2_h + NADPH_h + Tyr_h
['AT1G15710']
Frequency
0.00
0.01
0.02
0.03
0.04
0.00
0.05
0.10
0.15
0.20
0.25
Flux

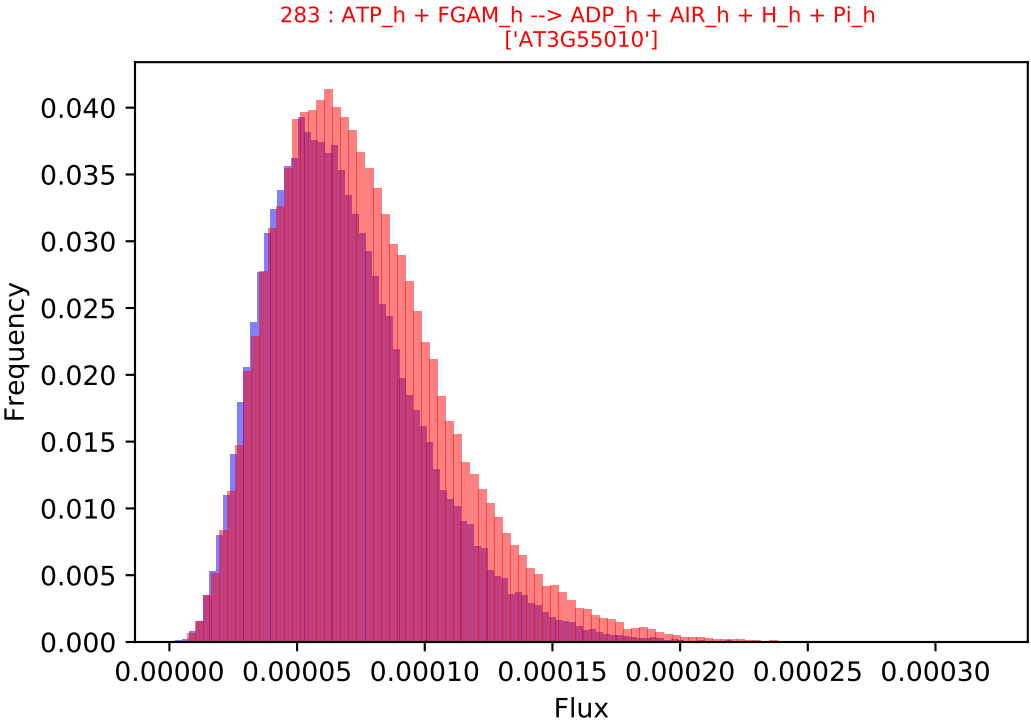

278 : Glu_h + MOB_h <=> KG_h + Val_h
['AT1G10070', 'AT5G65780', 'AT3G49680']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Flux

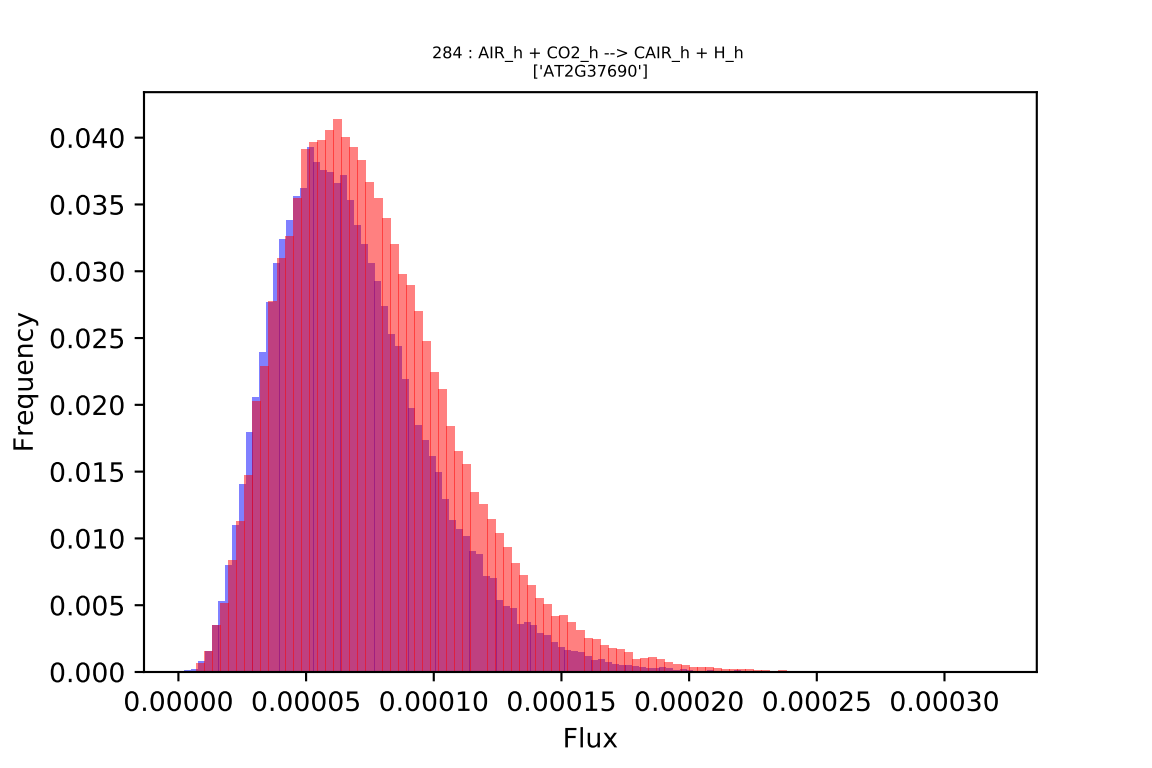

279 : Gln_h + H2O_h + PRPP_h --> Glu_h + H_h + PPi_h + PRA_h
['AT2G16570', 'AT4G34740', 'AT4G38880']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00005
0.00010
0.00015
0.00020
0.00025
0.00030
Flux

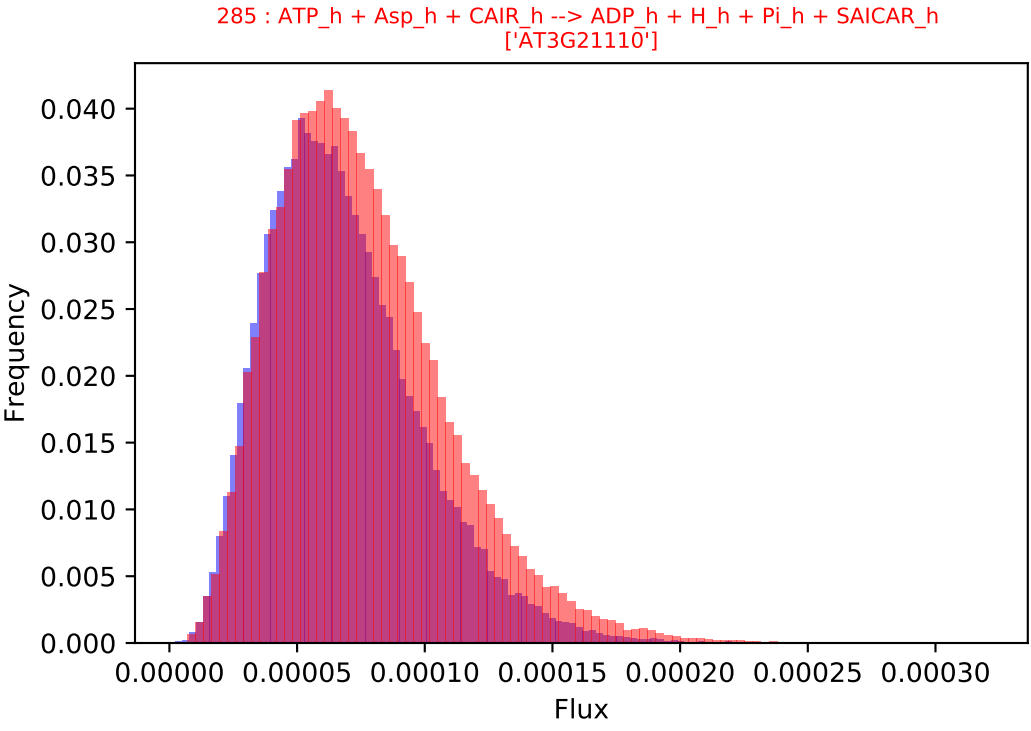

280 : ATP_h + Gly_h + PRA_h --> ADP_h + GAR_h + H_h + Pi_h
['AT1G09830']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00005
0.00010
0.00015
0.00020
0.00025
0.00030
Flux

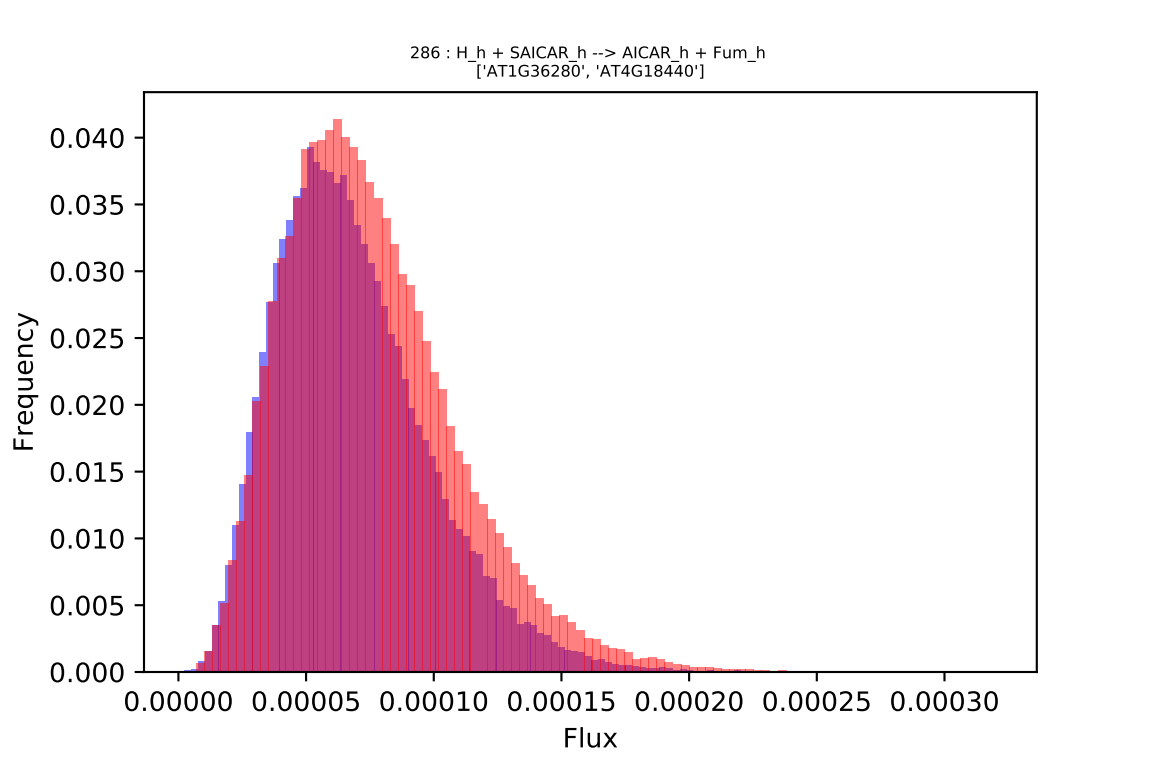

281 : F_DASH_THF_h + GAR_h --> FGAR_h + 2.0 H_h + THF_h
['AT1G31220']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00005
0.00010
0.00015
0.00020
0.00025
0.00030
Flux

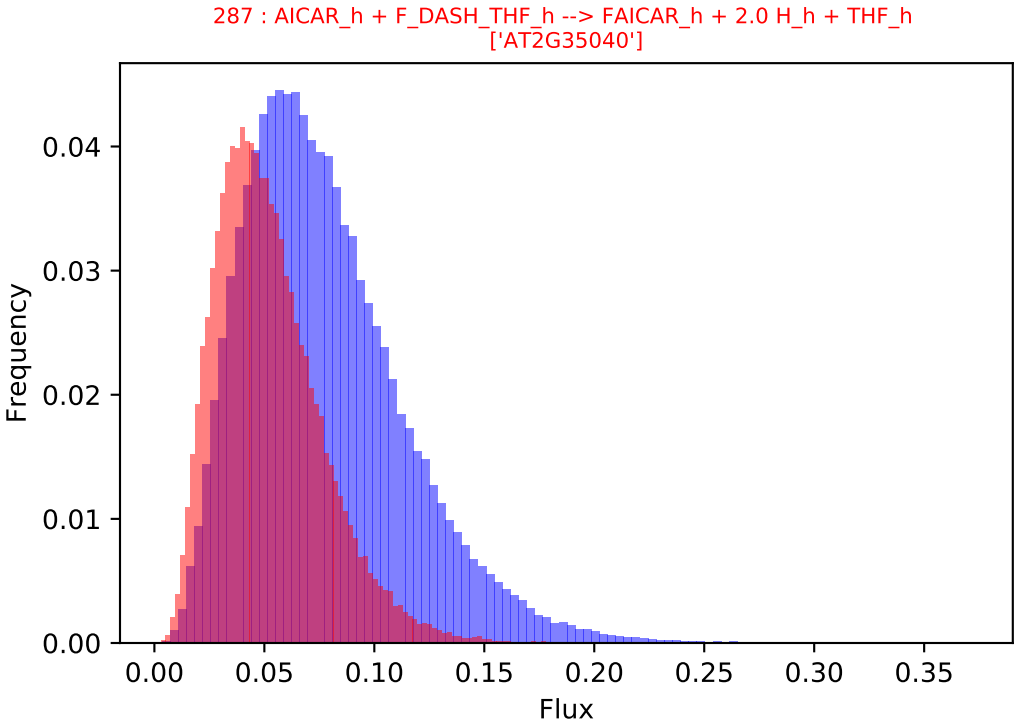

282 : ATP_h + FGAR_h + Gln_h + H2O_h --> ADP_h + FGAM_h + Glu_h + 2.0 H_h + Pi_h
['AT1G74260']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00005
0.00010
0.00015
0.00020
0.00025
0.00030
Flux

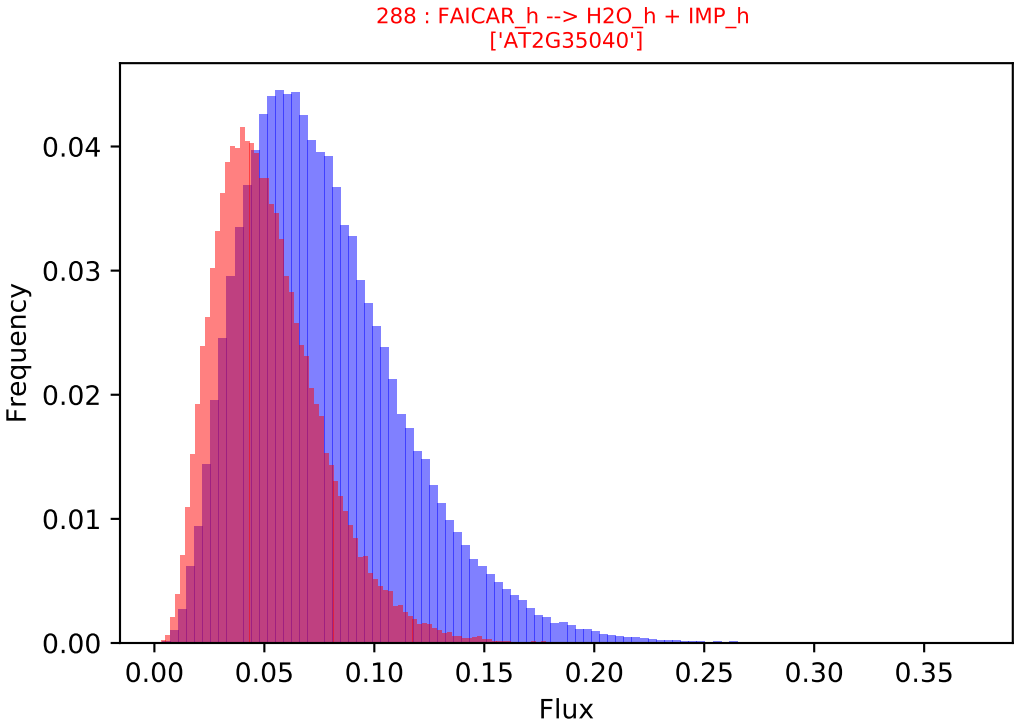

283 : ATP_h + FGAM_h --> ADP_h + AIR_h + H_h + Pi_h
['AT3G55010']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.00000
0.00005
0.00010
0.00015
0.00020
0.00025
0.00030
Flux

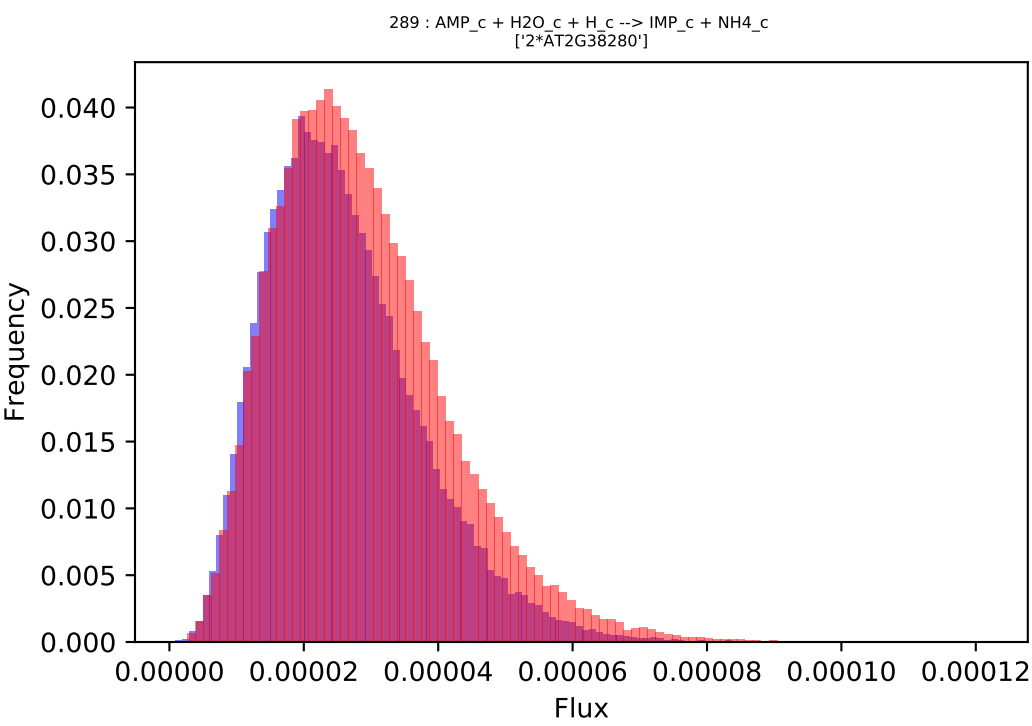

284 : AIR_h + CO2_h --> CAIR_h + H_h
['AT2G37690']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00005
0.00010
0.00015
0.00020
0.00025
0.00030
Flux

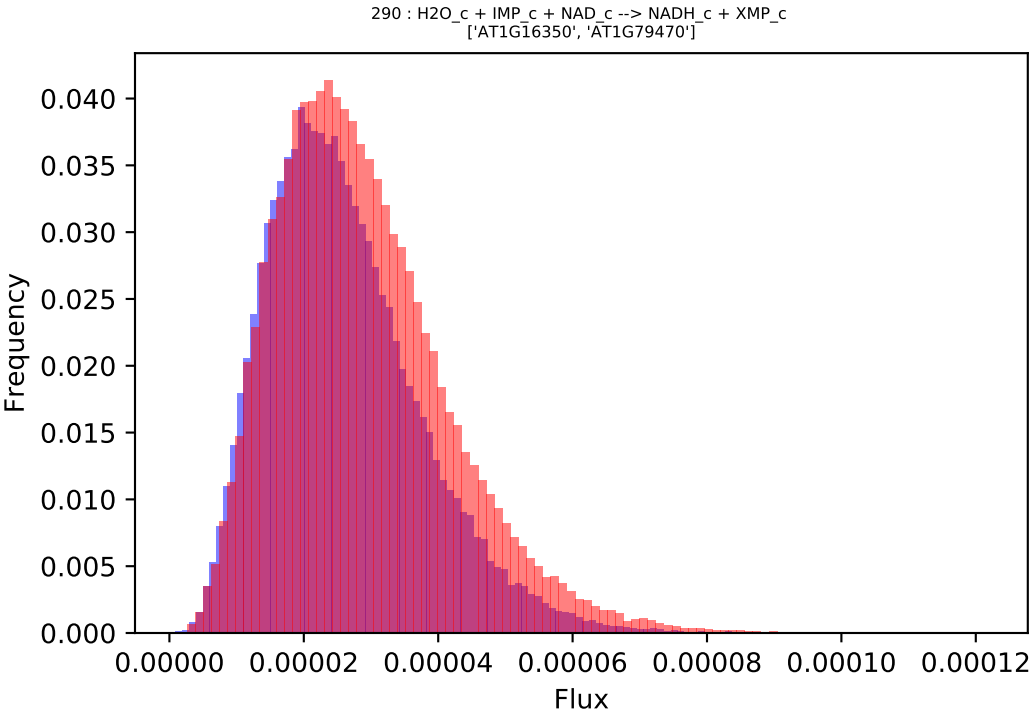

285 : ATP_h + Asp_h + CAIR_h --> ADP_h + H_h + Pi_h + SAICAR_h
['AT3G21110']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00005
0.00010
0.00015
0.00020
0.00025
0.00030
Flux

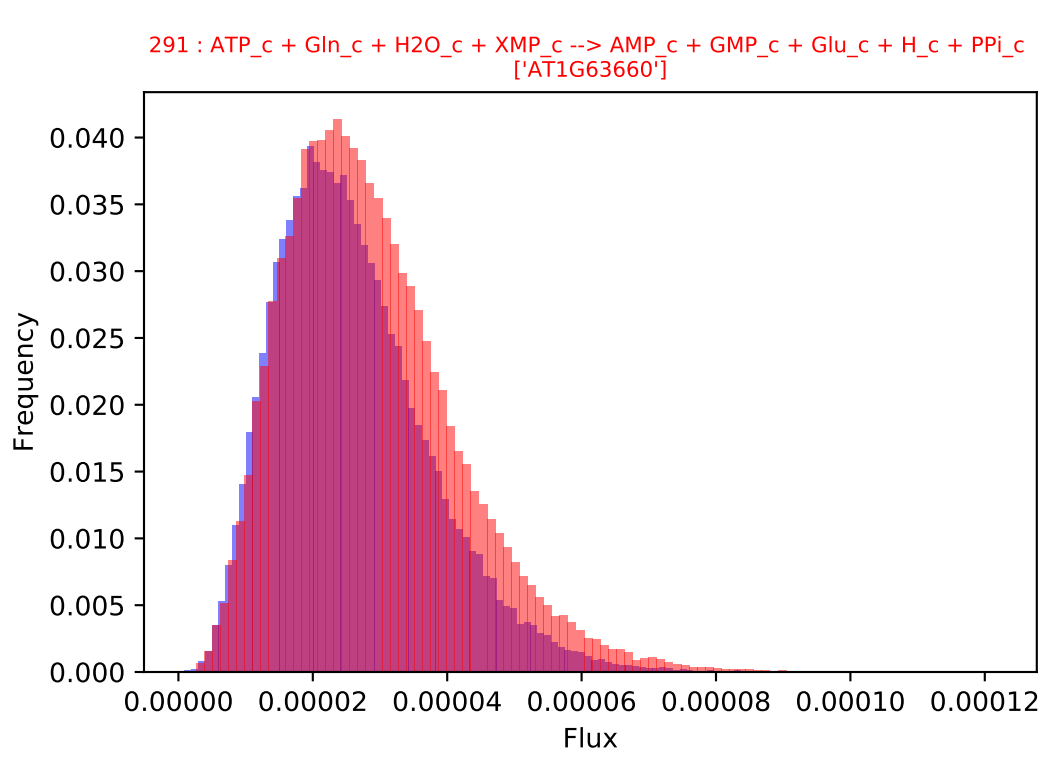

286 : H_h + SAICAR_h --> AICAR_h + Fum_h
['AT1G36280', 'AT4G18440']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00005
0.00010
0.00015
0.00020
0.00025
0.00030
Flux

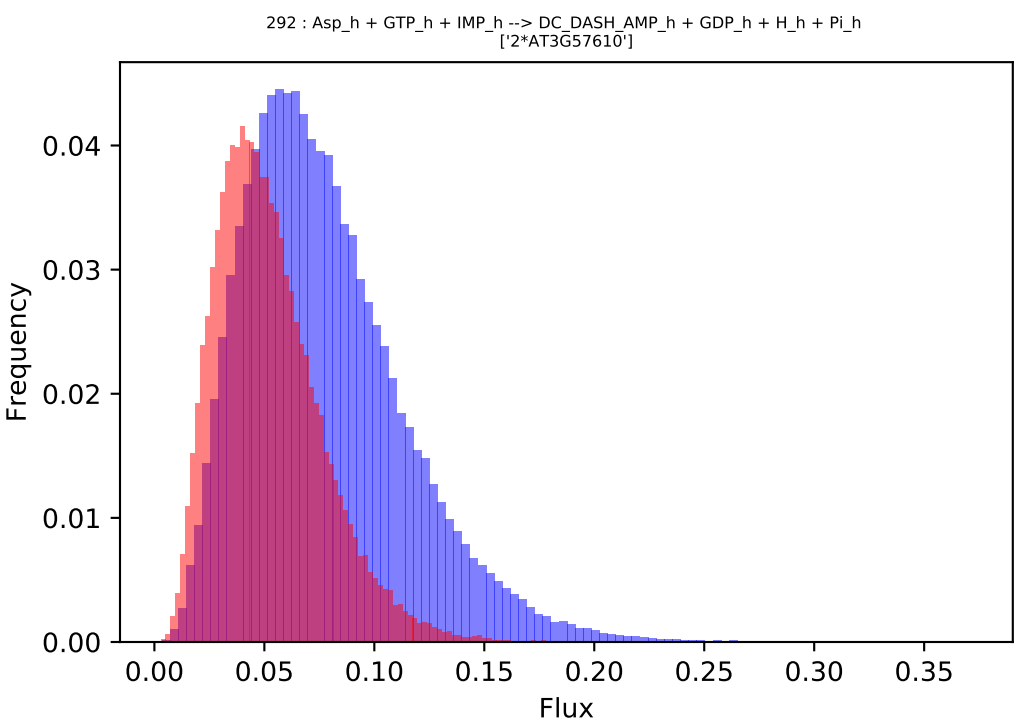

287 : AICAR_h + F_DASH_THF_h --> FAICAR_h + 2.0 H_h + THF_h
['AT2G35040']
Frequency
0.00
0.01
0.02
0.03
0.04
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Flux

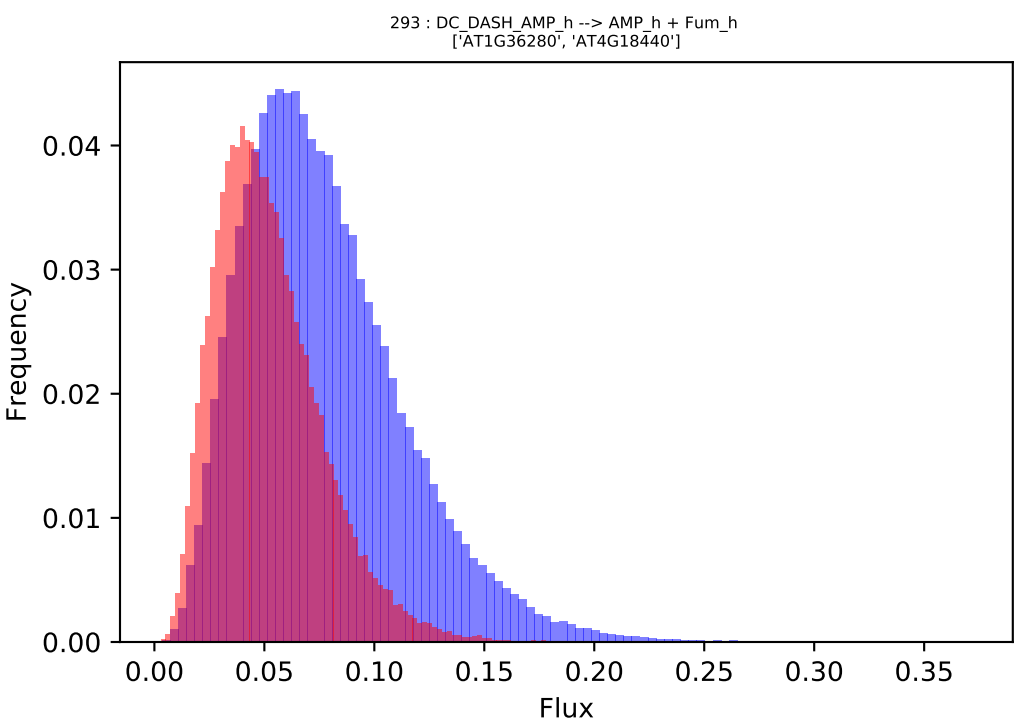

288 : FAICAR_h --> H2O_h + IMP_h
['AT2G35040']
Frequency
0.00
0.01
0.02
0.03
0.04
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Flux

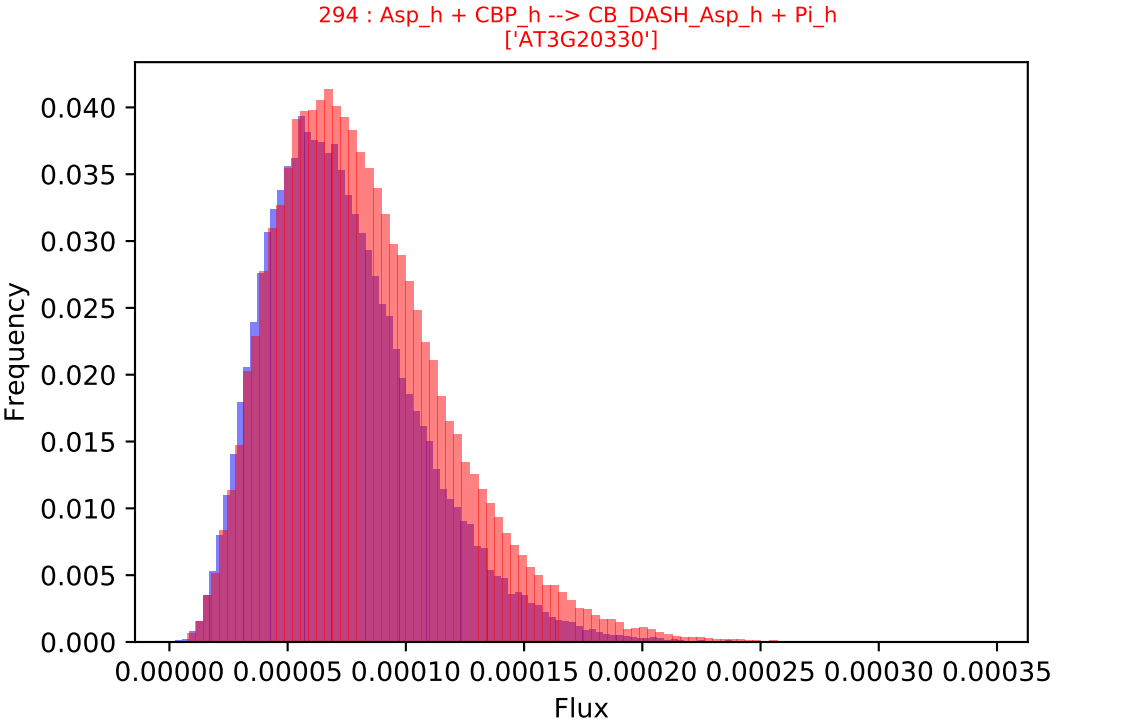

289 : AMP_c + H2O_c + H_c --> IMP_c + NH4_c
['2*AT2G38280']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.00000
0.00002
0.00004
0.00006
0.00008
0.00010
0.00012
Flux

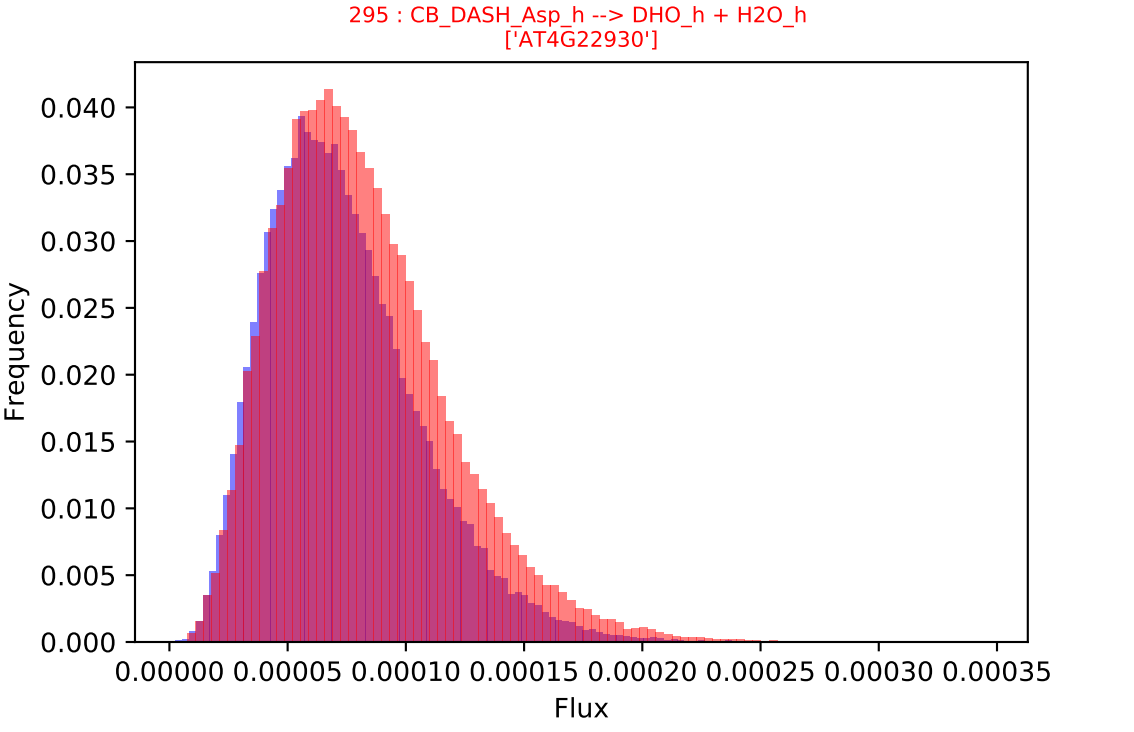

290 : H2O_c + IMP_c + NAD_c --> NADH_c + XMP_c
['AT1G16350', 'AT1G79470']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00002
0.00004
0.00006
0.00008
0.00010
0.00012
Flux

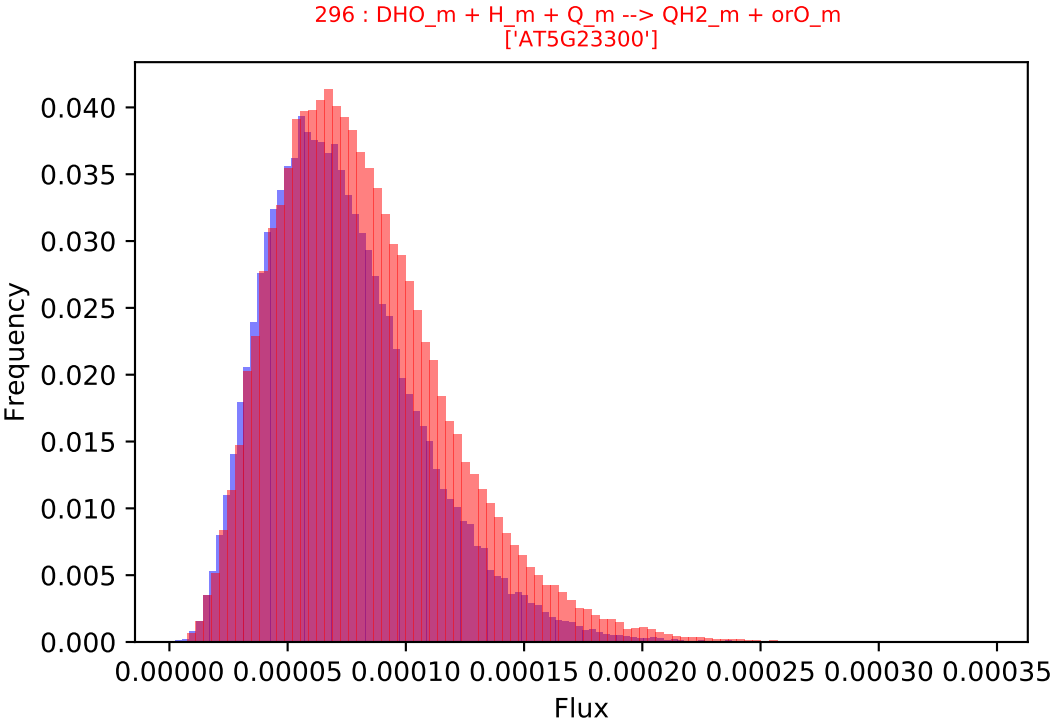

291 : ATP_c + Gln_c + H2O_c + XMP_c --> AMP_c + GMP_c + Glu_c + H_c + PPi_c
['AT1G63660']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00002
0.00004
0.00006
0.00008
0.00010
0.00012
Flux

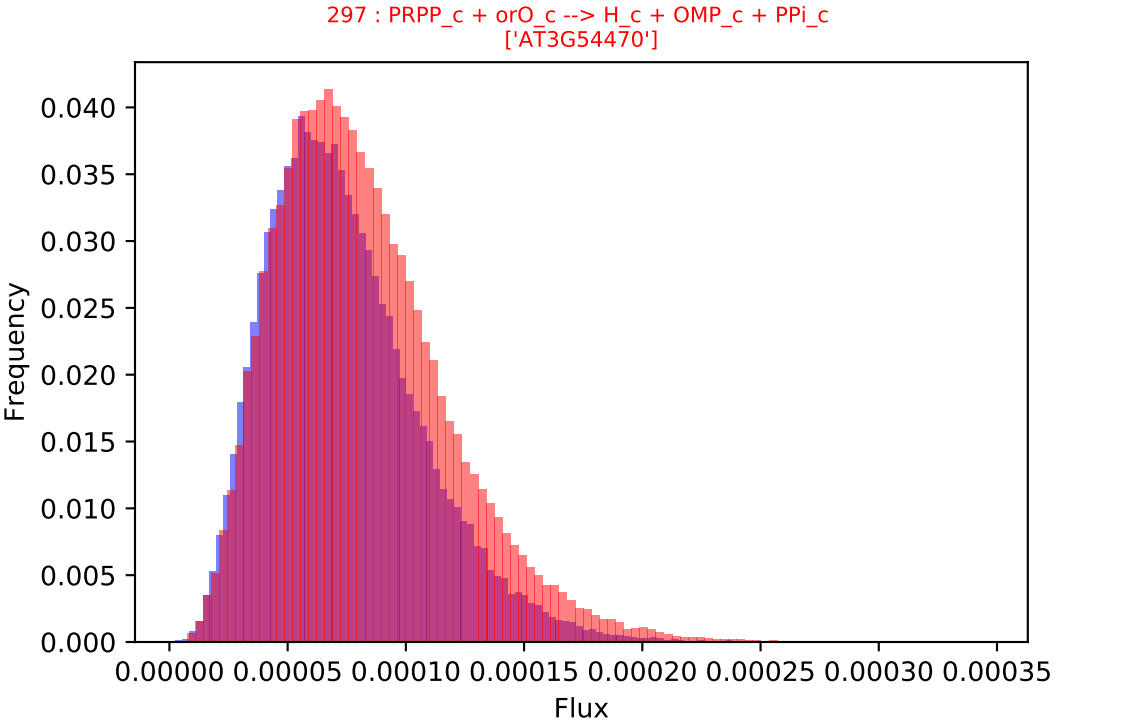

292 : Asp_h + GTP_h + IMP_h --> DC_DASH_AMP_h + GDP_h + H_h + Pi_h
['2*AT3G57610']
Frequency
0.00
0.01
0.02
0.03
0.04
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Flux

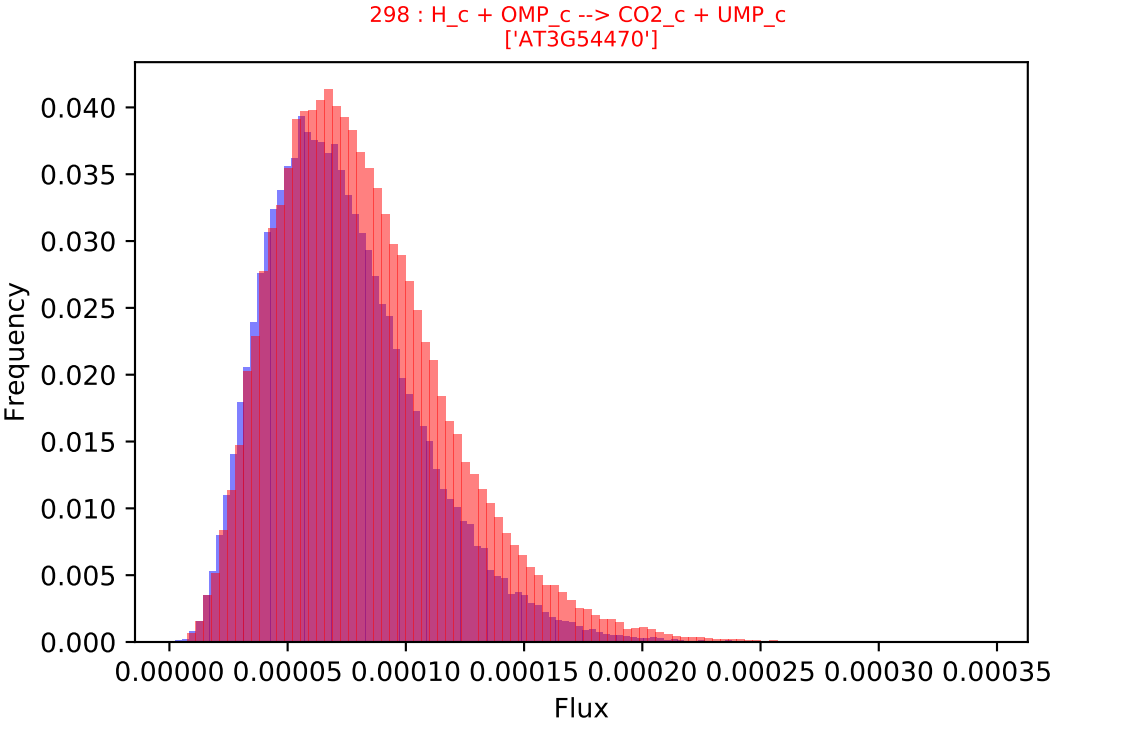

293 : DC_DASH_AMP_h --> AMP_h + Fum_h
['AT1G36280', 'AT4G18440']
Frequency
0.00
0.01
0.02
0.03
0.04
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Flux

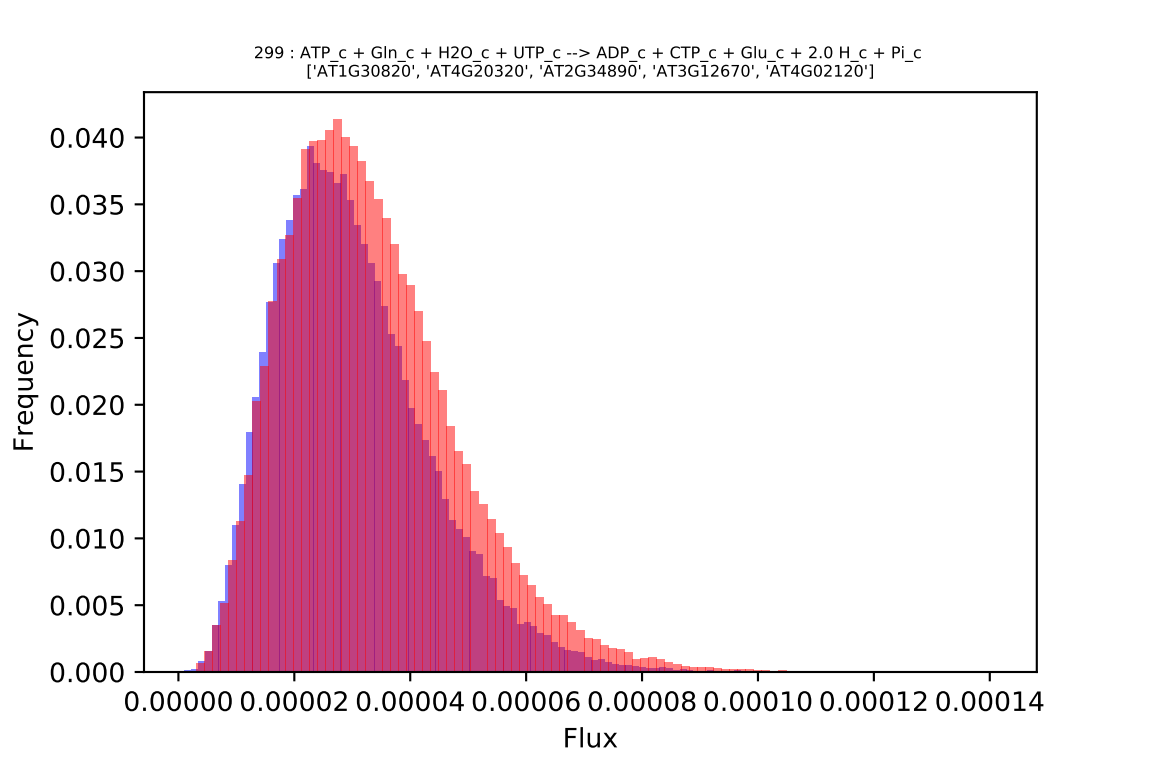

294 : Asp_h + CBP_h --> CB_DASH_Asp_h + Pi_h
['AT3G20330']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000 0.00005 0.00010 0.00015 0.00020 0.00025 0.00030 0.00035
Flux

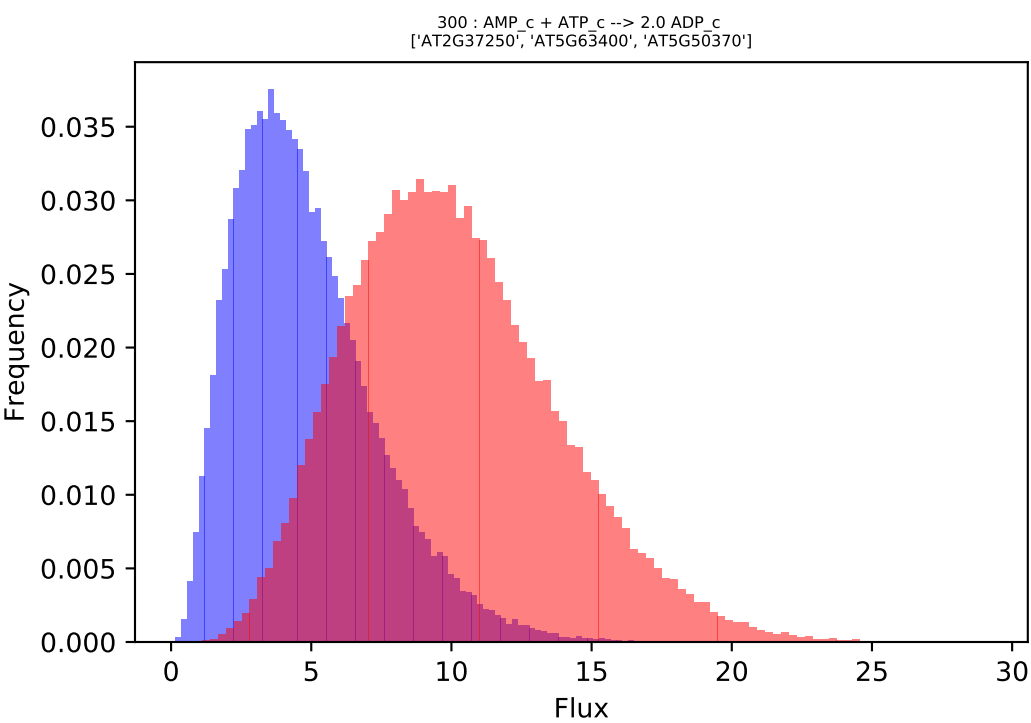

295 : CB_DASH_Asp_h --> DHO_h + H2O_h
['AT4G22930']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000 0.00005 0.00010 0.00015 0.00020 0.00025 0.00030 0.00035
Flux

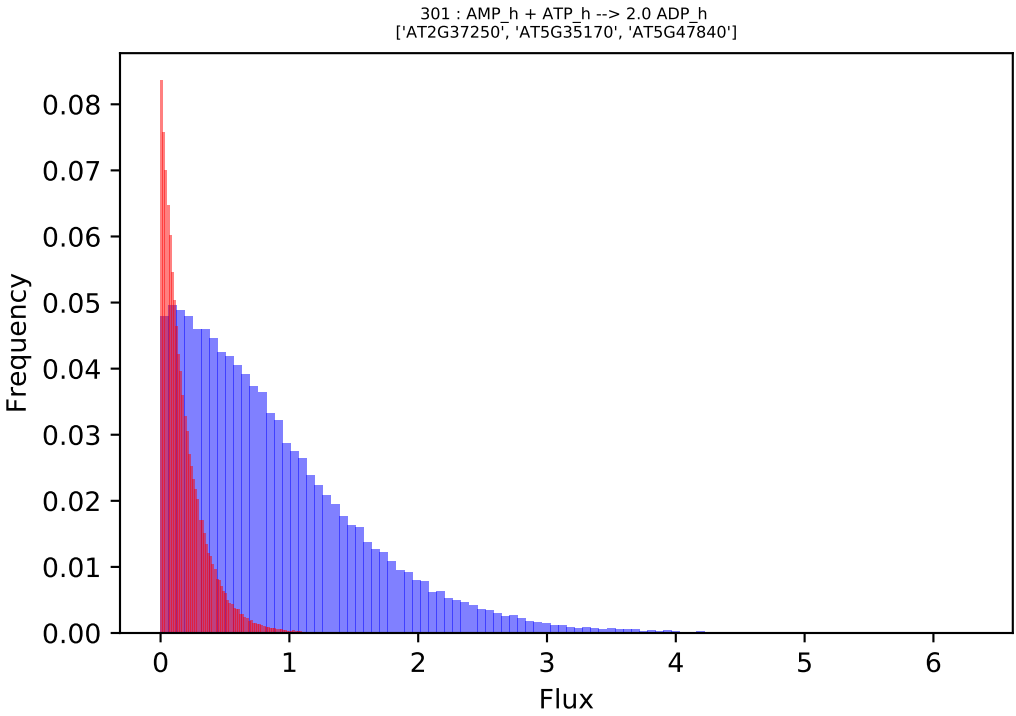

296 : DHO_m + H_m + Q_m --> QH2_m + orO_m
['AT5G23300']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000 0.00005 0.00010 0.00015 0.00020 0.00025 0.00030 0.00035
Flux

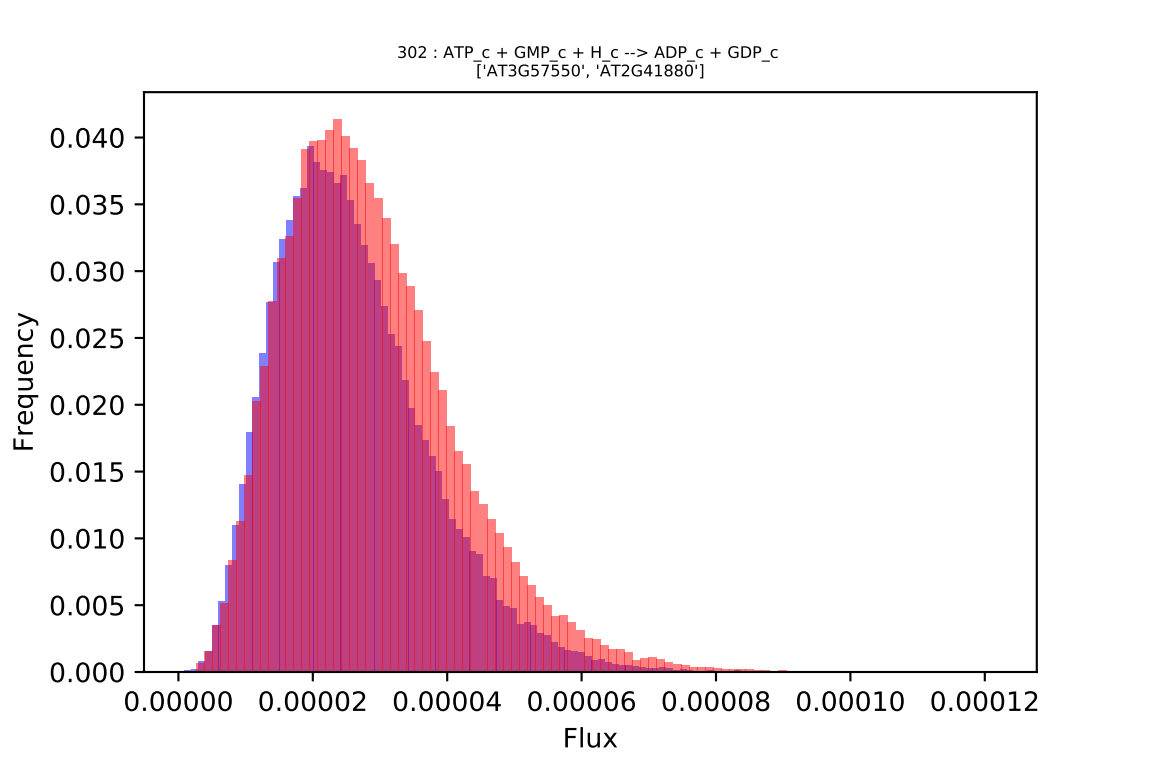

297 : PRPP_c + orO_c --> H_c + OMP_c + PPi_c
['AT3G54470']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.00000 0.00005 0.00010 0.00015 0.00020 0.00025 0.00030 0.00035
Flux

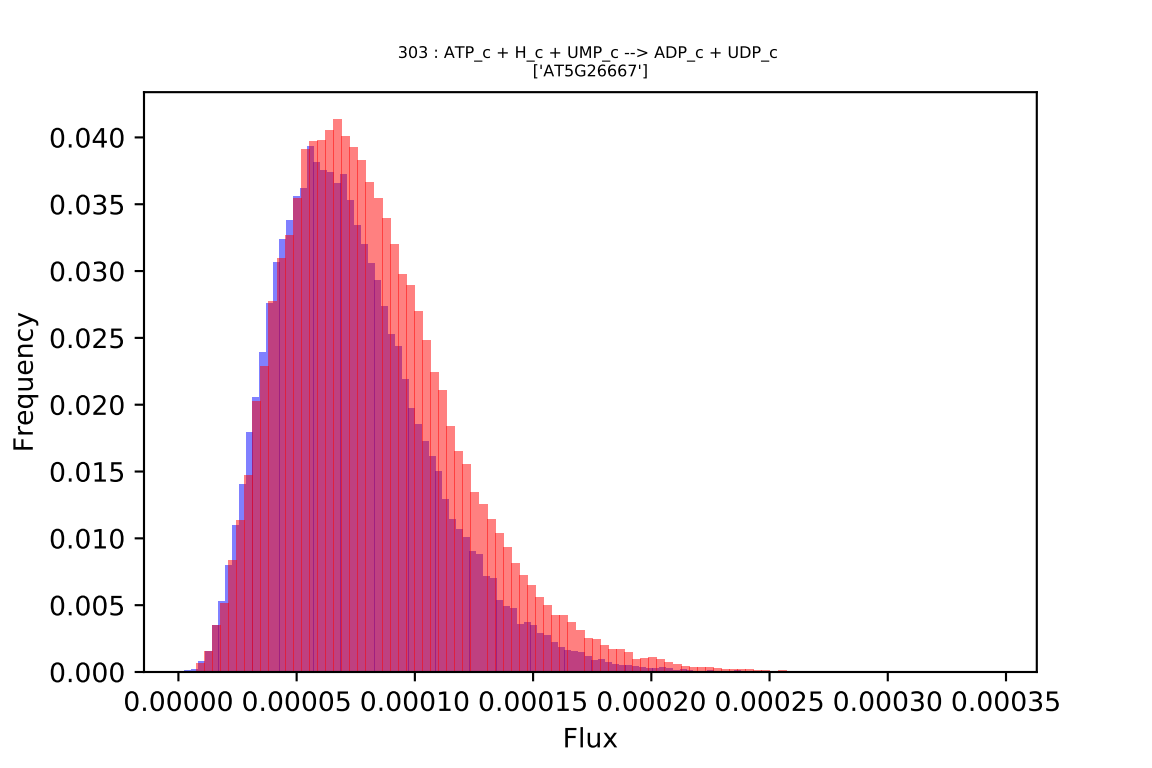

298 : H_c + OMP_c --> CO2_c + UMP_c
['AT3G54470']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000 0.00005 0.00010 0.00015 0.00020 0.00025 0.00030 0.00035
Flux

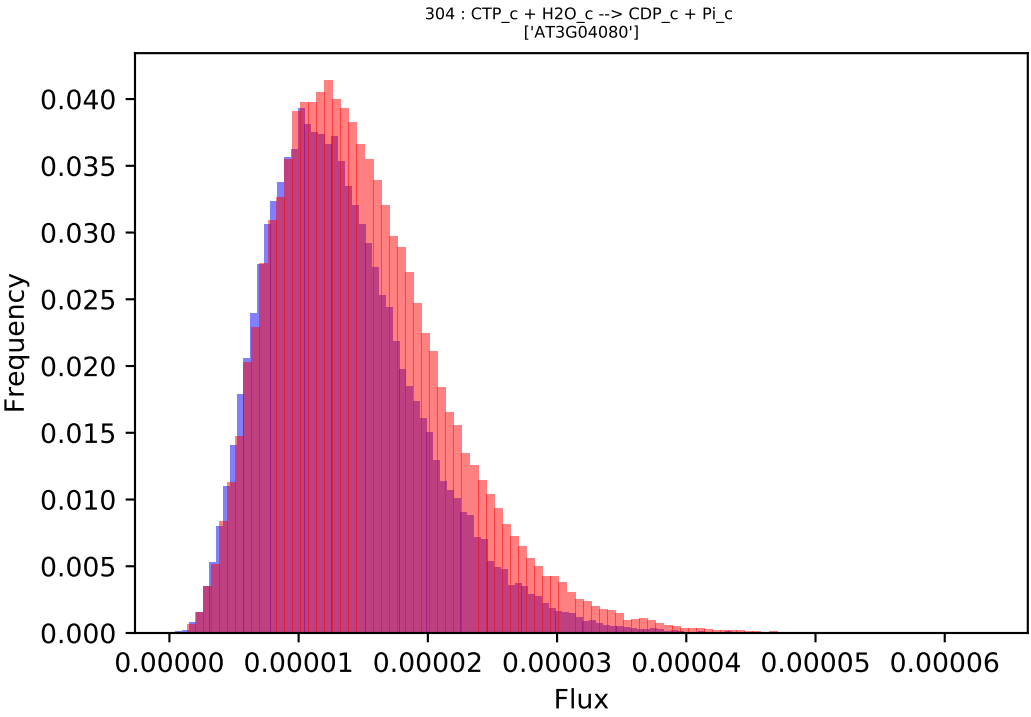

299 : ATP_c + Gln_c + H2O_c + UTP_c --> ADP_c + CTP_c + Glu_c + 2.0 H_c + Pi_c
['AT1G30820', 'AT4G20320', 'AT2G34890', 'AT3G12670', 'AT4G02120']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00002
0.00004
0.00006
0.00008
0.00010
0.00012
0.00014
Flux

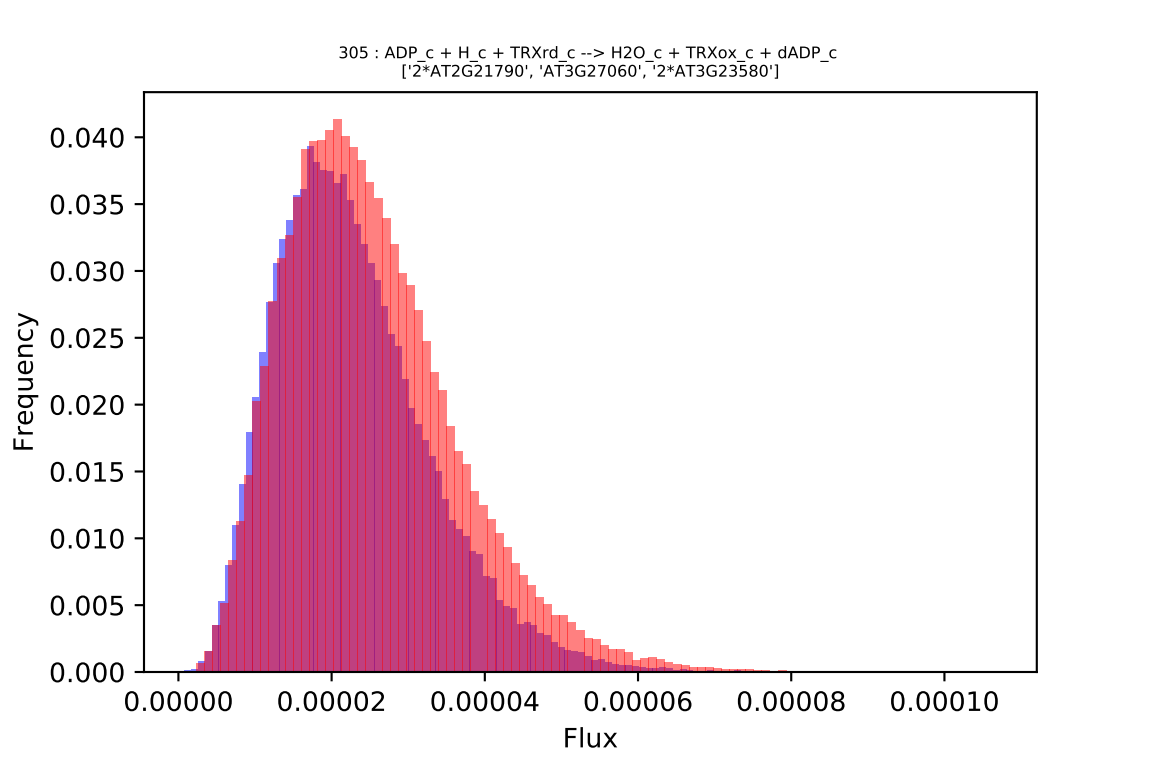

300 : AMP_c + ATP_c --> 2.0 ADP_c
['AT2G37250', 'AT5G63400', 'AT5G50370']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0
5
10
15
20
25
30
Flux

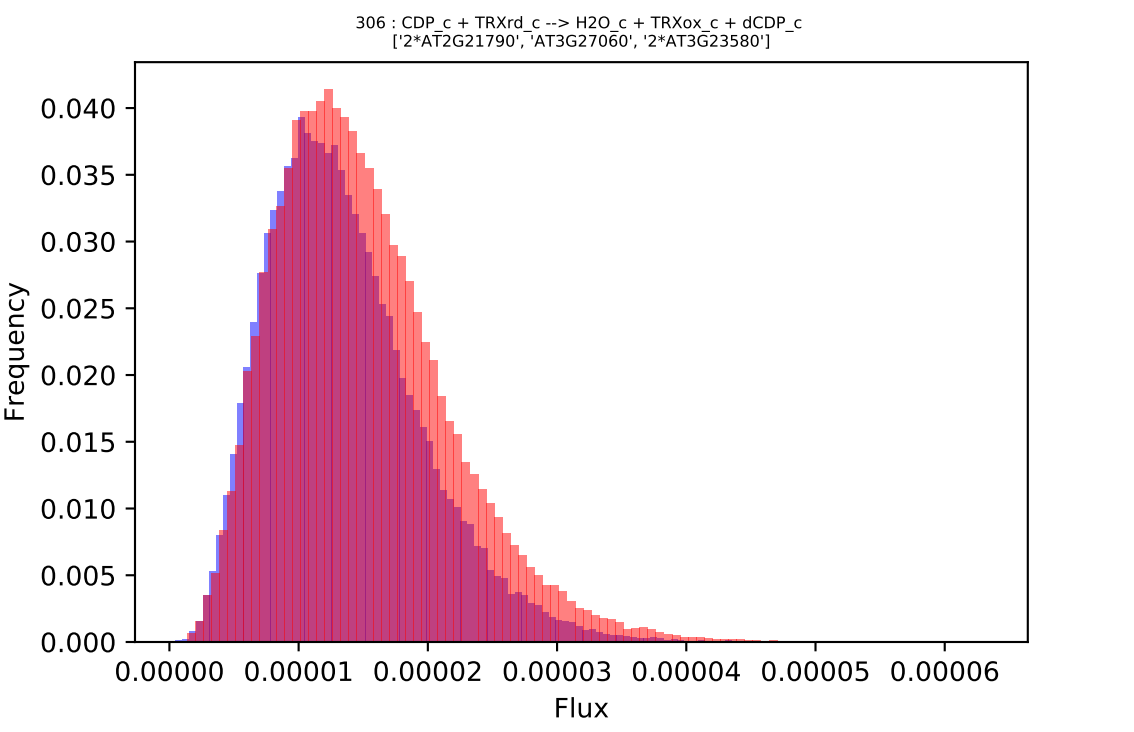

301 : AMP_h + ATP_h --> 2.0 ADP_h
['AT2G37250', 'AT5G35170', 'AT5G47840']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0
1
2
3
4
5
6
Flux

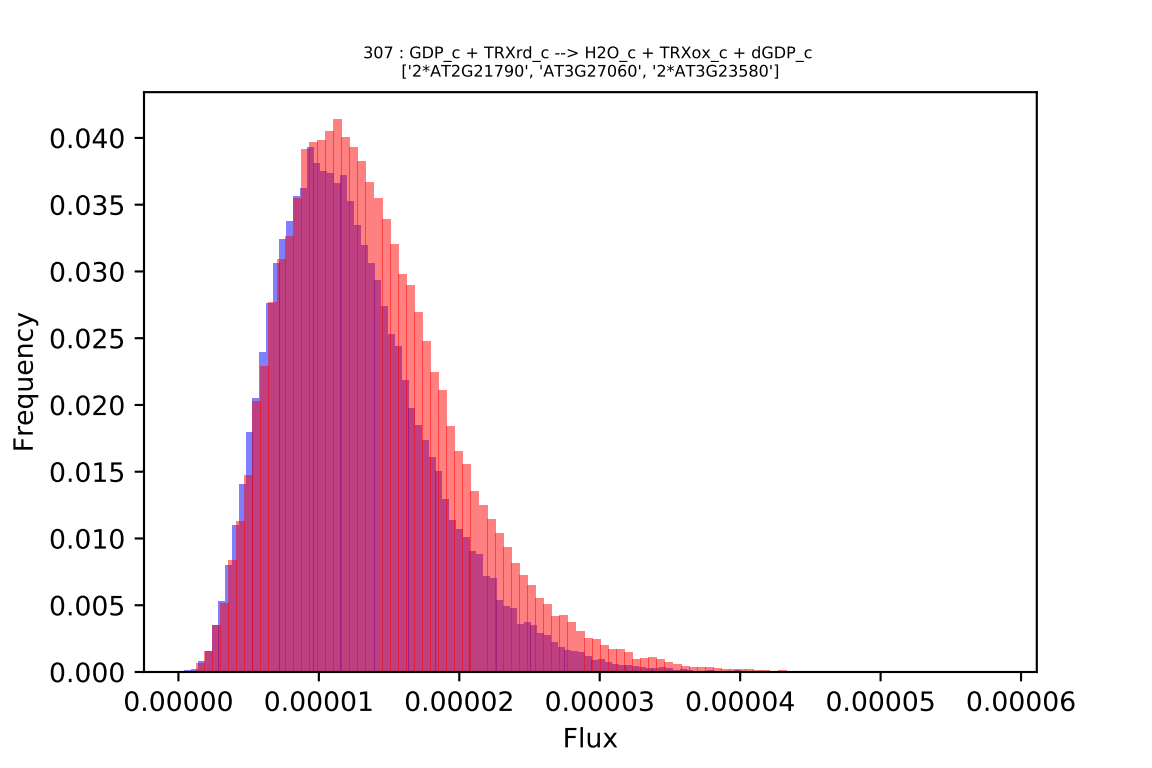

302 : ATP_c + GMP_c + H_c --> ADP_c + GDP_c
['AT3G57550', 'AT2G41880']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00002
0.00004
0.00006
0.00008
0.00010
0.00012
Flux

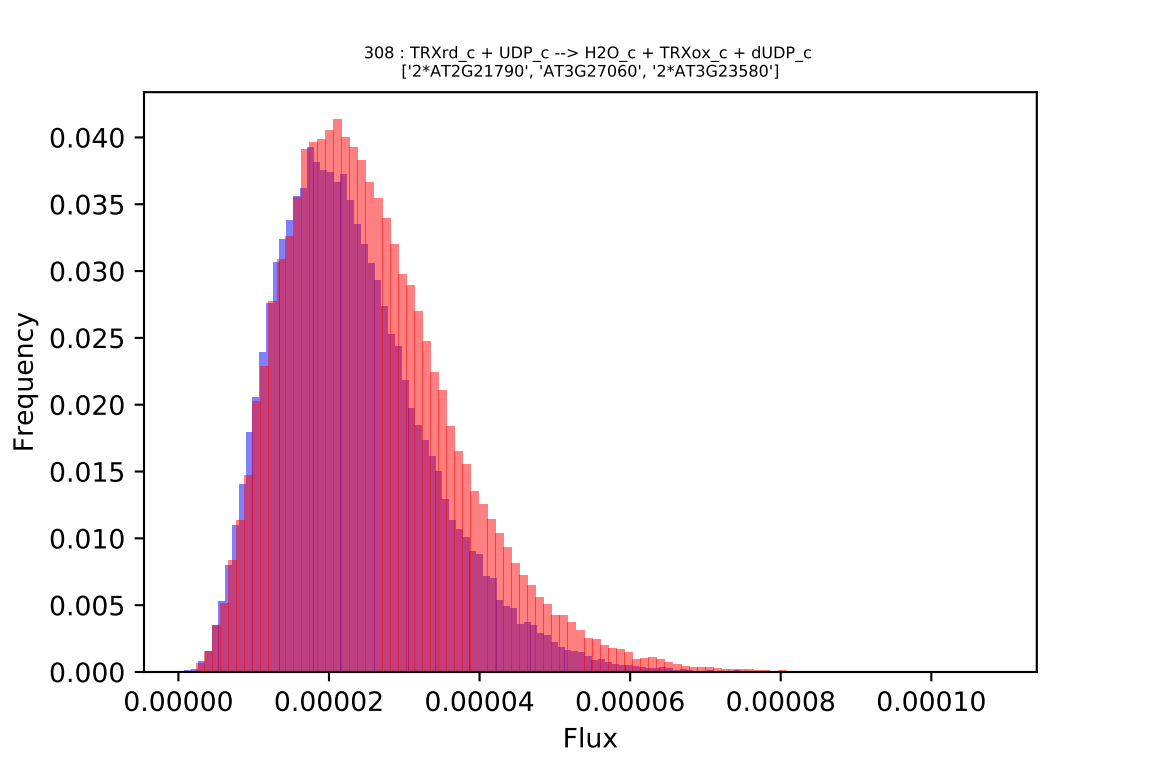

303 : ATP_c + H_c + UMP_c --> ADP_c + UDP_c
['AT5G26667']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000 0.00005 0.00010 0.00015 0.00020 0.00025 0.00030 0.00035
Flux

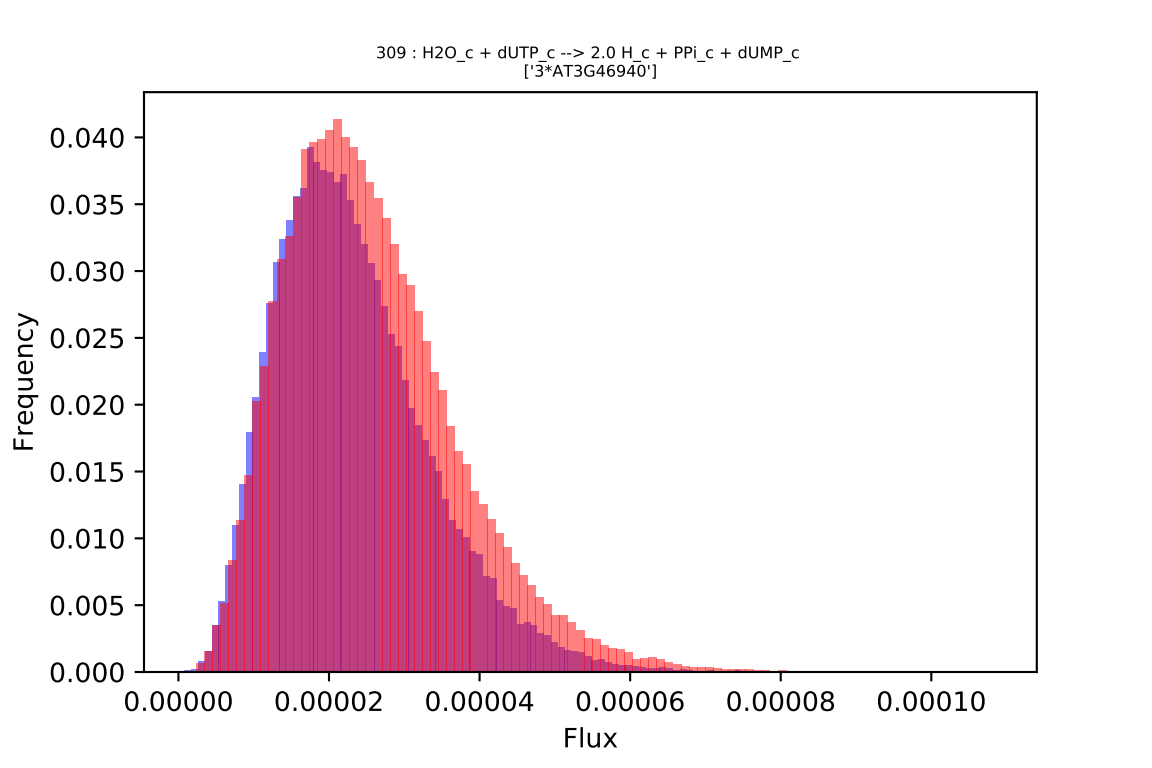

304 : CTP_c + H2O_c --> CDP_c + Pi_c
['AT3G04080']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00001
0.00002
0.00003
0.00004
0.00005
0.00006
Flux

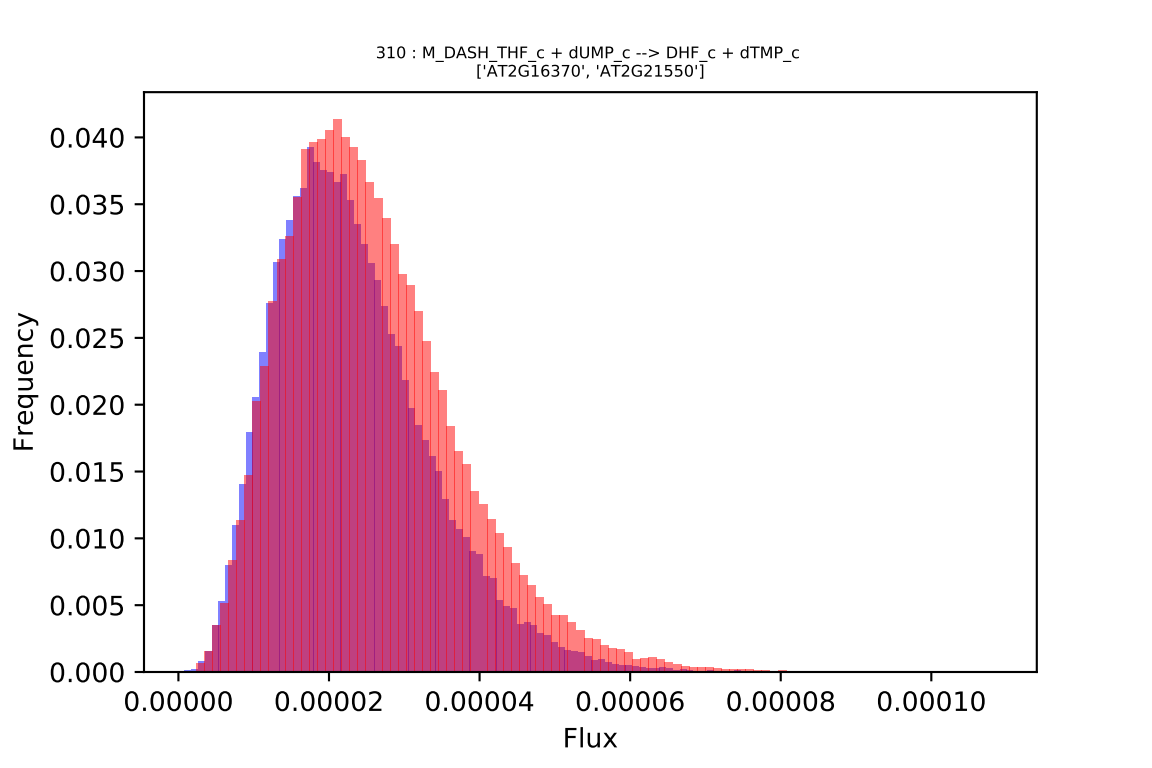

305 : ADP_c + H_c + TRXrd_c --> H2O_c + TRXox_c + dADP_c
['2*AT2G21790', 'AT3G27060', '2*AT3G23580']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00002
0.00004
0.00006
0.00008
0.00010
Flux

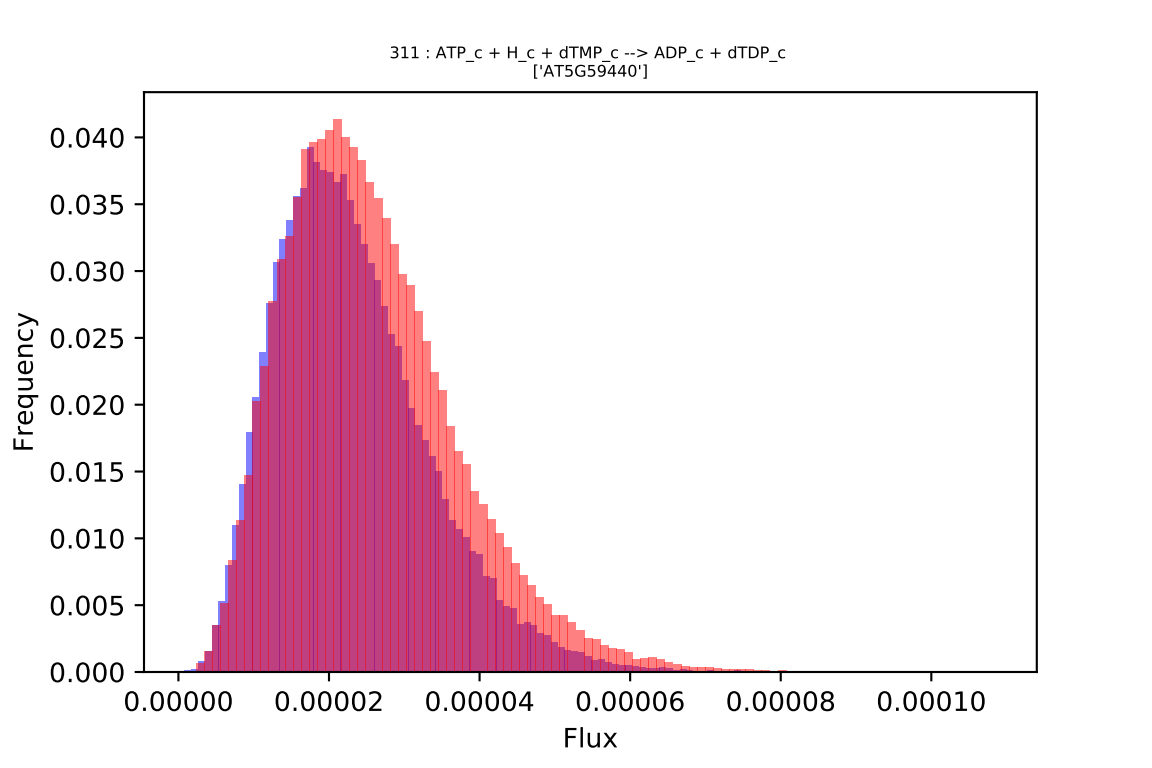

306 : CDP_c + TRXrd_c --> H2O_c + TRXox_c + dCDP_c
['2*AT2G21790', 'AT3G27060', '2*AT3G23580']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00001
0.00002
0.00003
0.00004
0.00005
0.00006
Flux

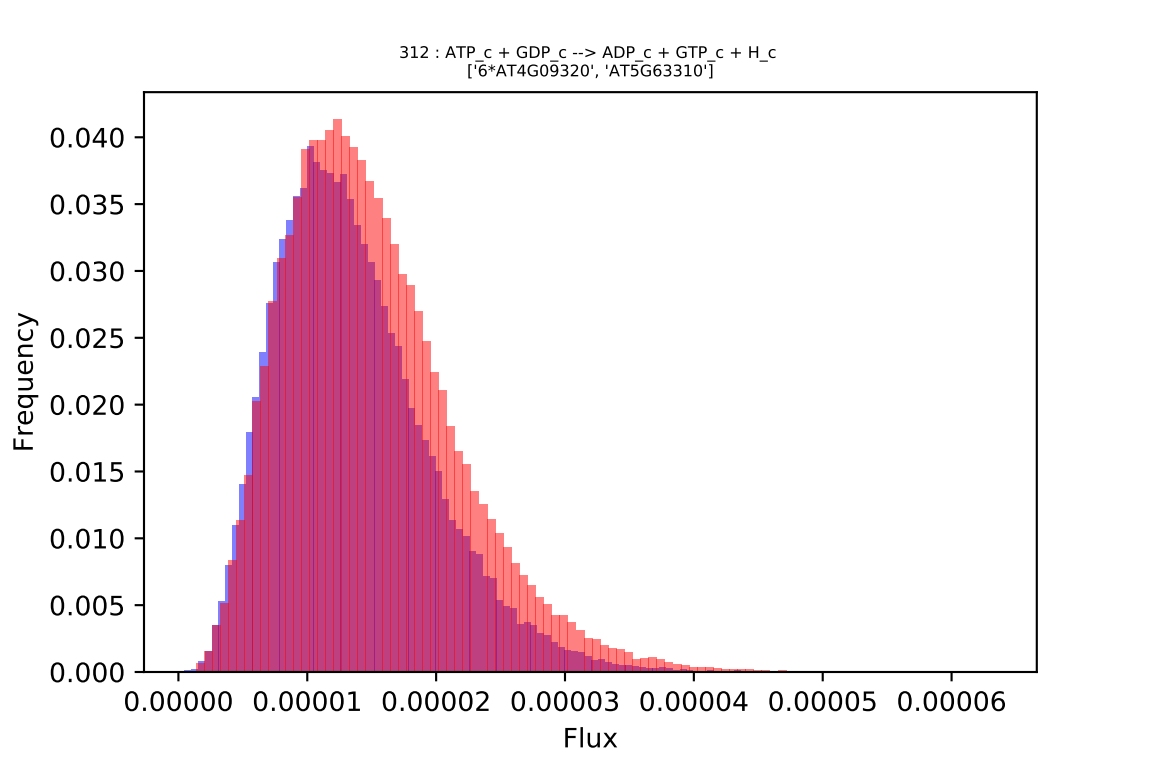

307 : GDP_c + TRXrd_c --> H2O_c + TRXox_c + dGDP_c
['2*AT2G21790', 'AT3G27060', '2*AT3G23580']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00001
0.00002
0.00003
0.00004
0.00005
0.00006
Flux

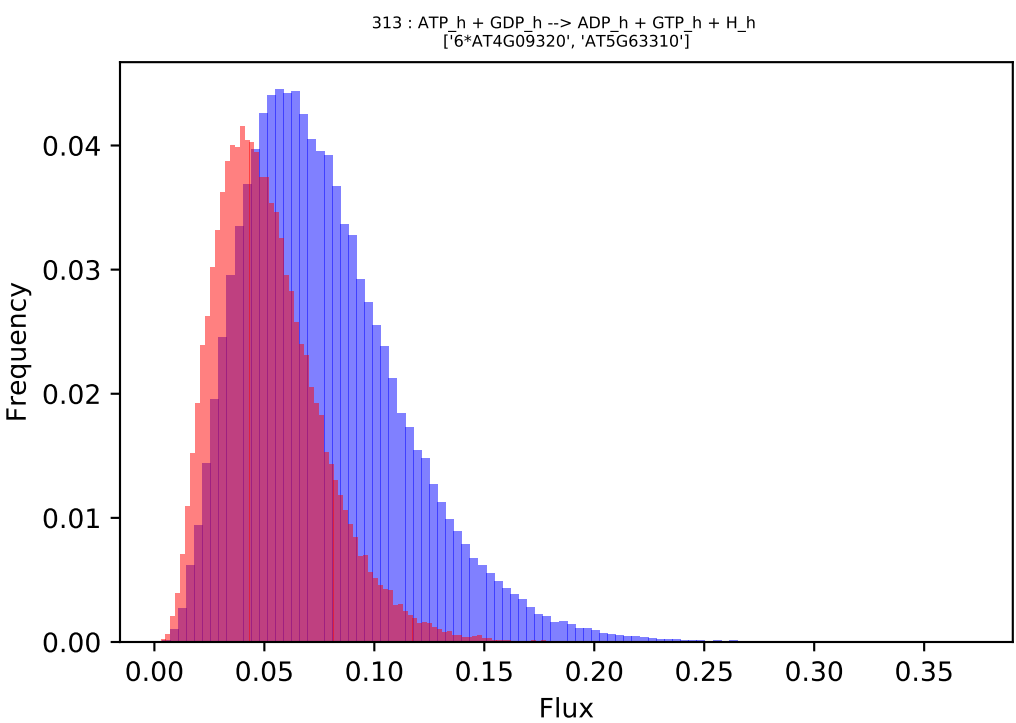

308 : TRXrd_c + UDP_c --> H2O_c + TRXox_c + dUDP_c
['2*AT2G21790', 'AT3G27060', '2*AT3G23580']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00002
0.00004
0.00006
0.00008
0.00010
Flux

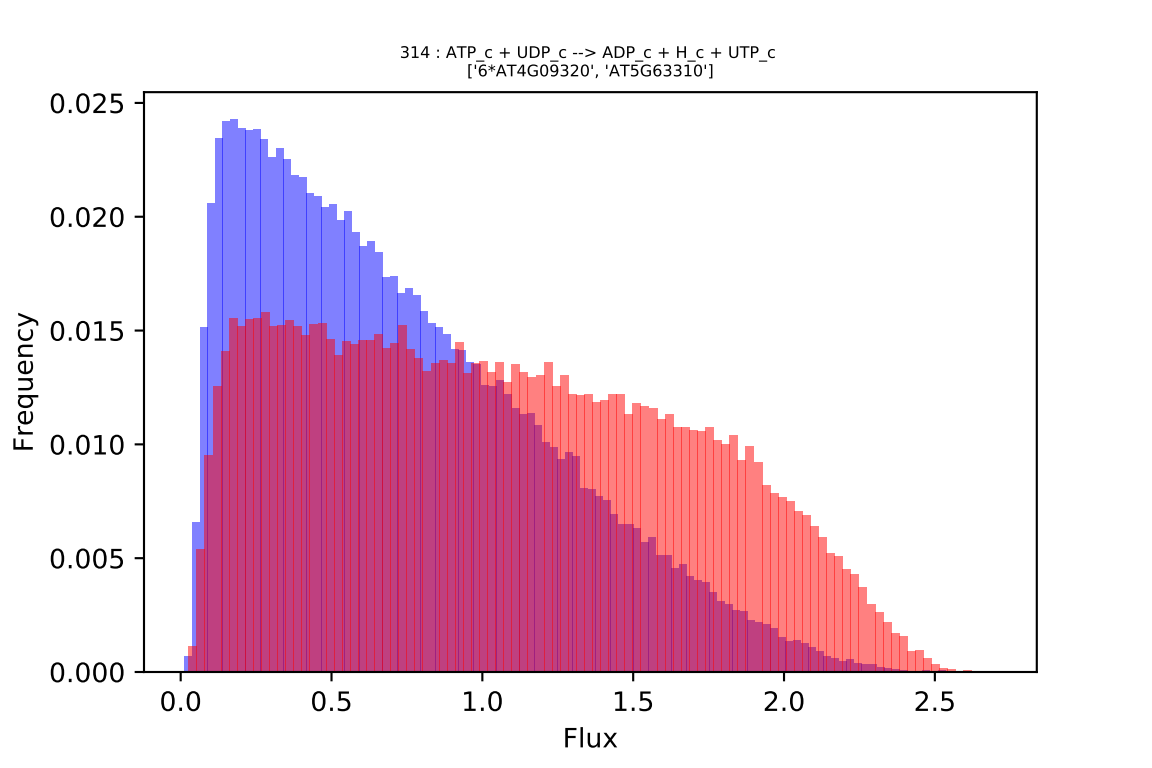

309 : H2O_c + dUTP_c --> 2.0 H_c + PPi_c + dUMP_c
['3*AT3G46940']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00002
0.00004
0.00006
0.00008
0.00010
Flux

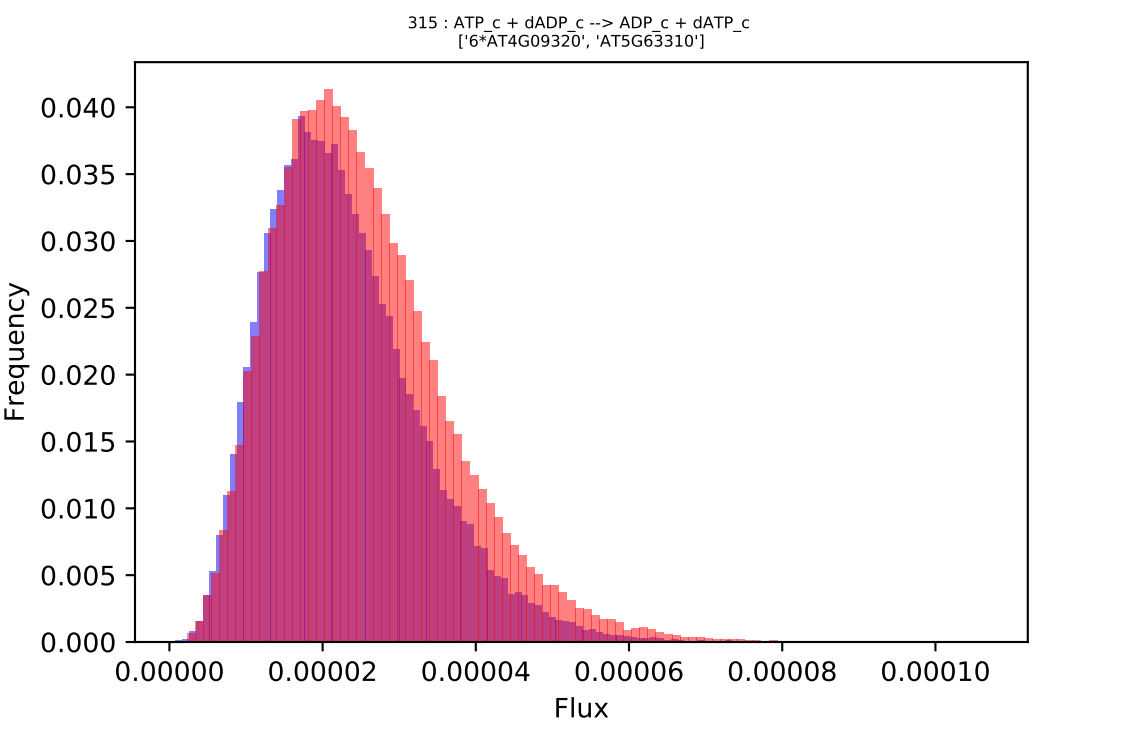

310 : M_DASH_THF_c + dUMP_c --> DHF_c + dTMP_c
['AT2G16370', 'AT2G21550']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00002
0.00004
0.00006
0.00008
0.00010
Flux

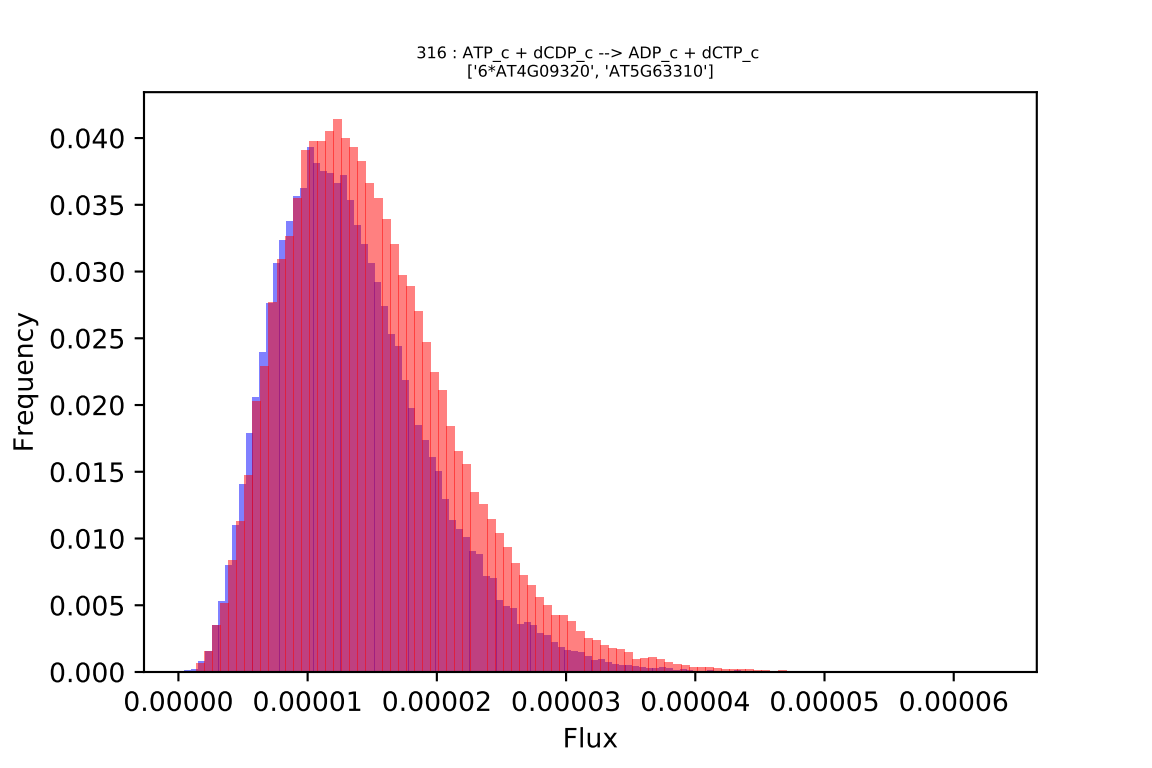

311 : ATP_c + H_c + dTMP_c --> ADP_c + dTDP_c
['AT5G59440']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00002
0.00004
0.00006
0.00008
0.00010
Flux

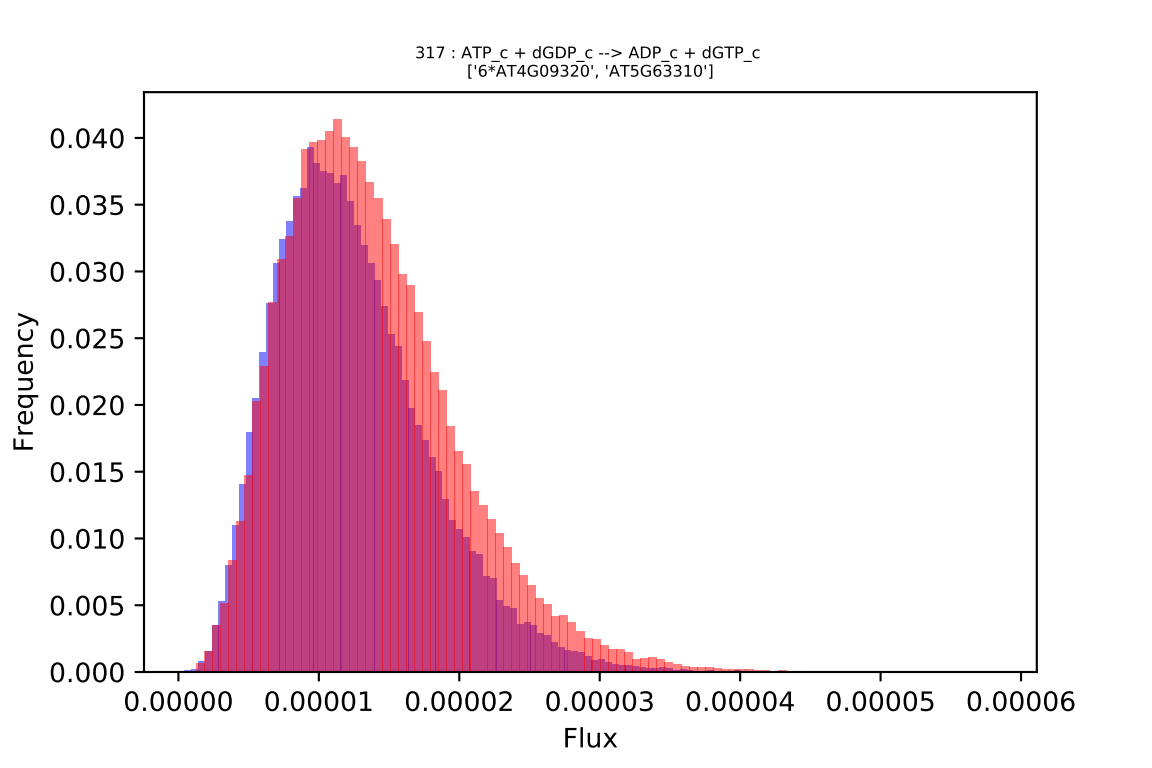

312 : ATP_c + GDP_c --> ADP_c + GTP_c + H_c
['6*AT4G09320', 'AT5G63310']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00001
0.00002
0.00003
0.00004
0.00005
0.00006
Flux

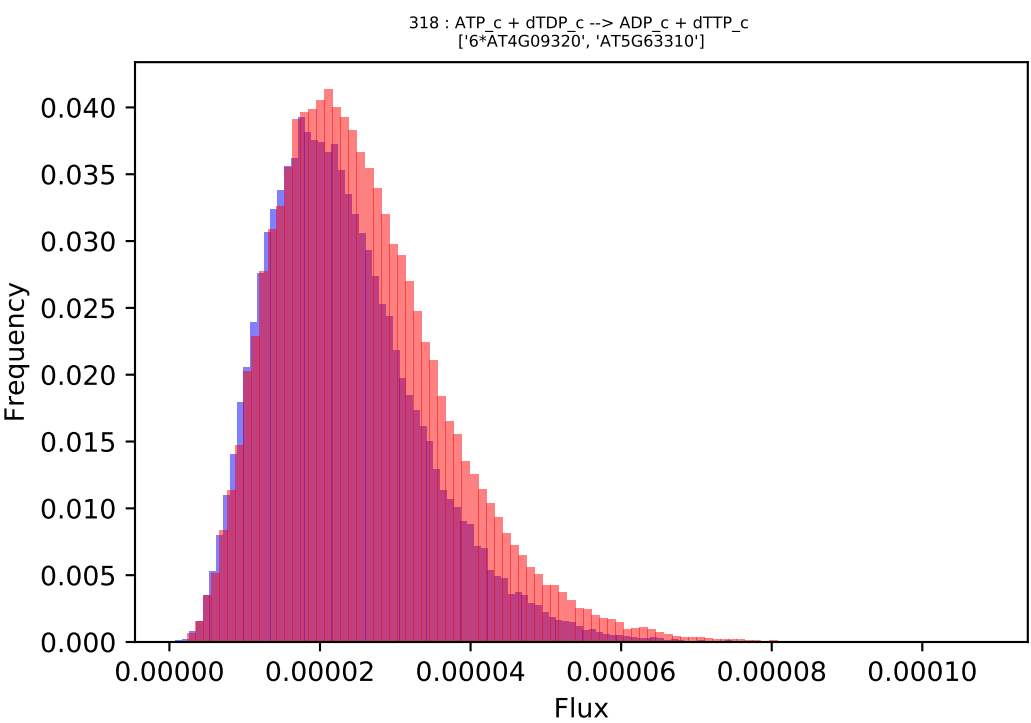

313 : ATP_h + GDP_h --> ADP_h + GTP_h + H_h
['6*AT4G09320', 'AT5G63310']
Frequency
0.00
0.01
0.02
0.03
0.04
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Flux

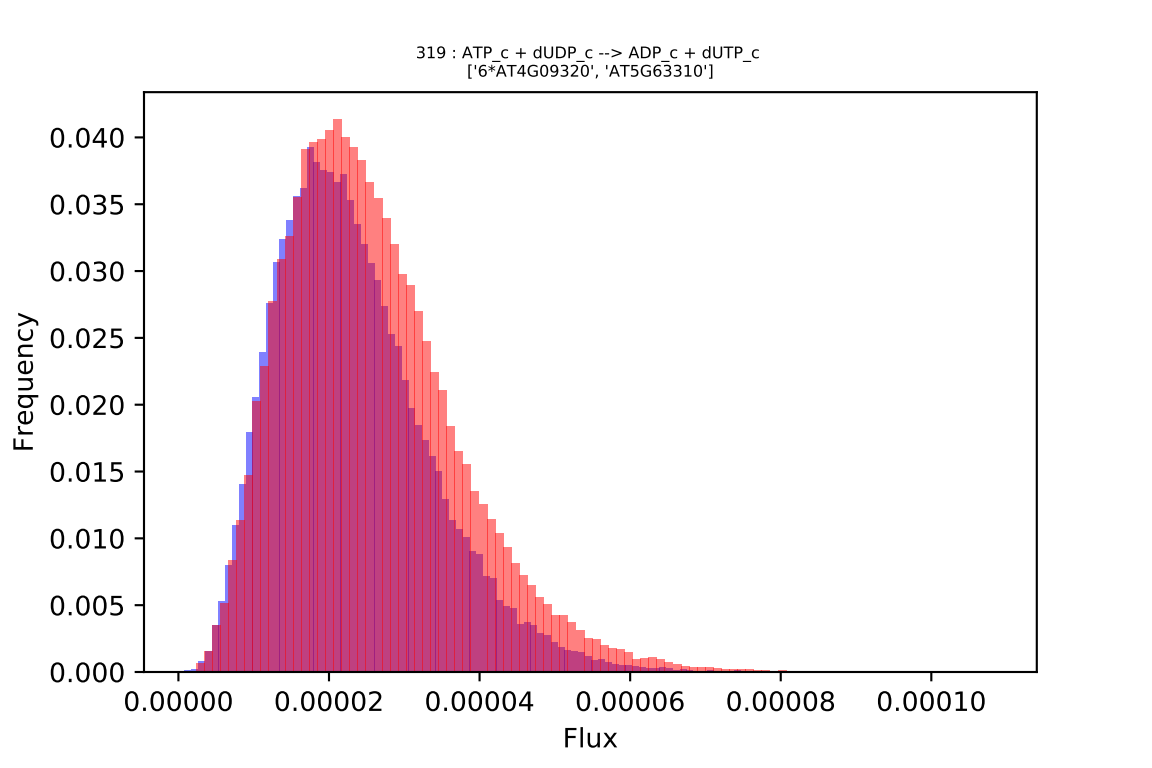

314 : ATP_c + UDP_c --> ADP_c + H_c + UTP_c
['6*AT4G09320', 'AT5G63310']
Frequency
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.5
1.0
1.5
2.0
2.5
Flux

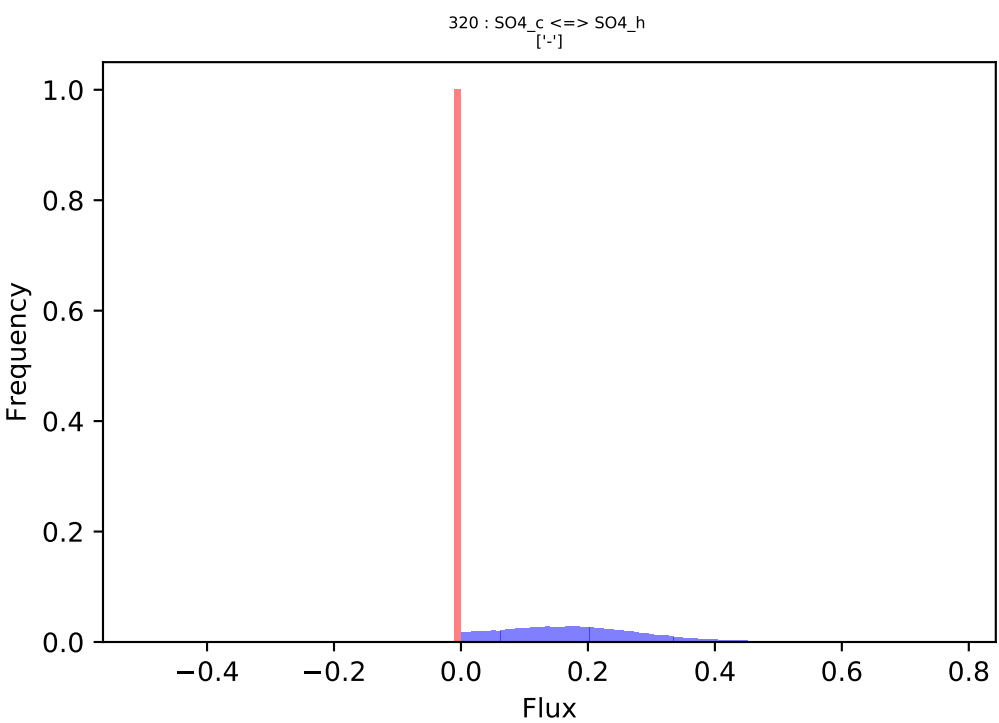

315 : ATP_c + dADP_c --> ADP_c + dATP_c
['6*AT4G09320', 'AT5G63310']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00002
0.00004
0.00006
0.00008
0.00010
Flux

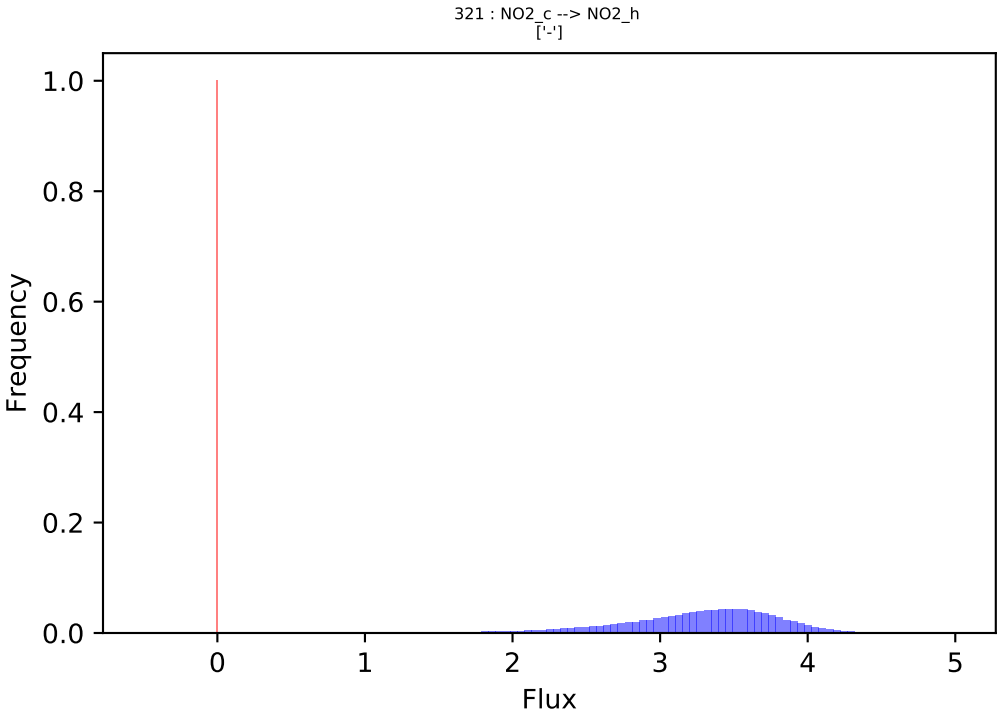

316 : ATP_c + dCDP_c --> ADP_c + dCTP_c
['6*AT4G09320', 'AT5G63310']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00001
0.00002
0.00003
0.00004
0.00005
0.00006
Flux

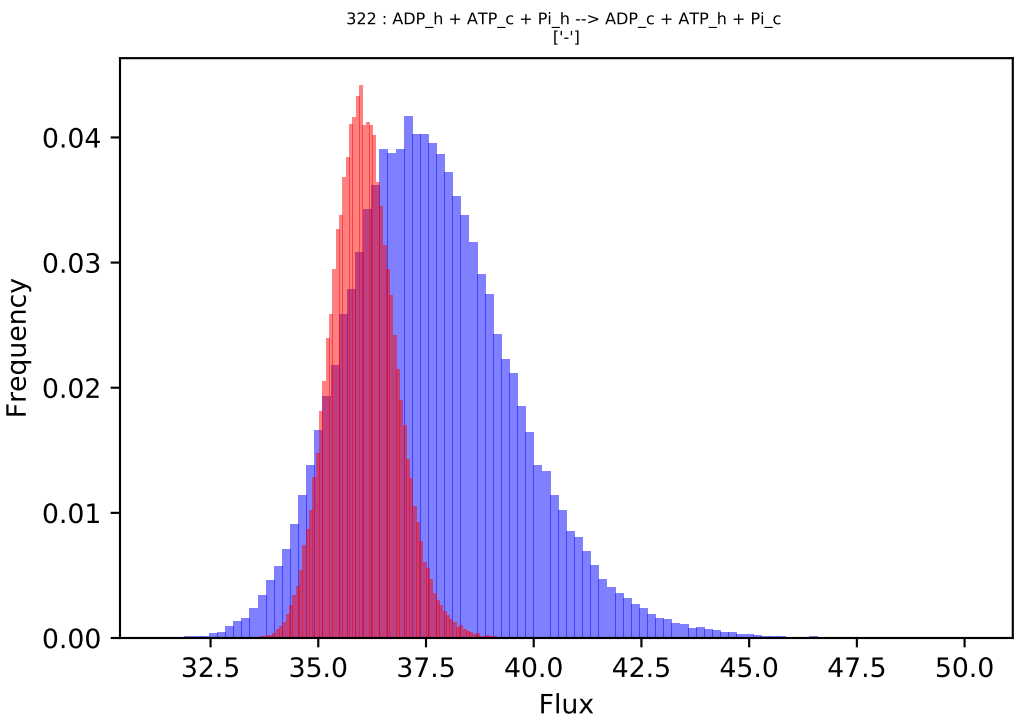

317 : ATP_c + dGDP_c --> ADP_c + dGTP_c
['6*AT4G09320', 'AT5G63310']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00001
0.00002
0.00003
0.00004
0.00005
0.00006
Flux

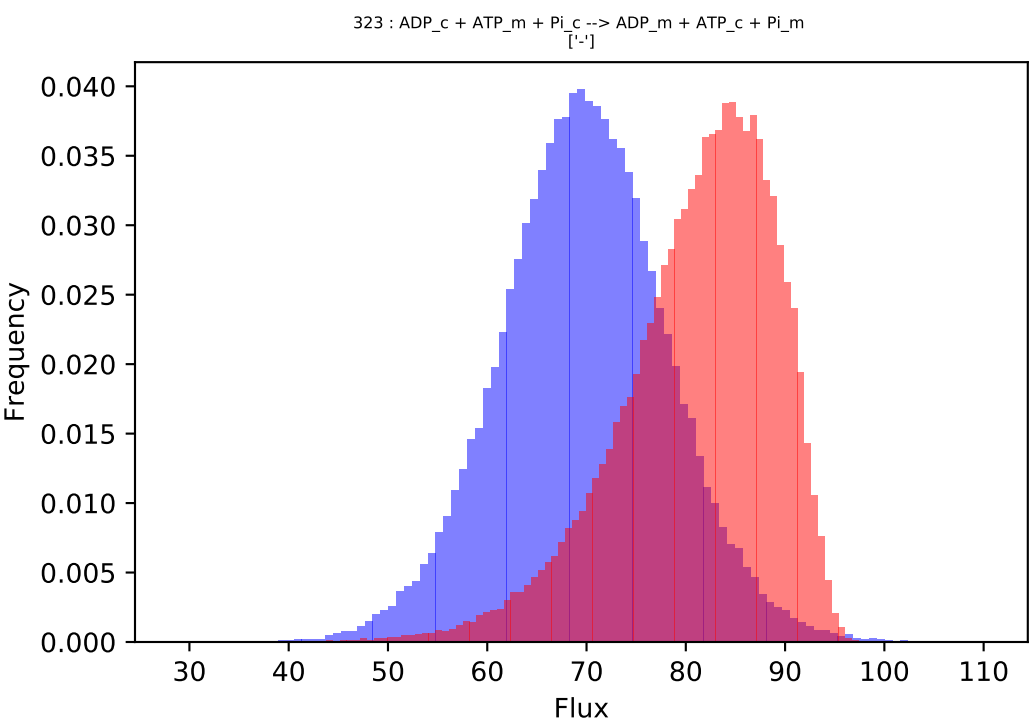

318 : ATP_c + dTDP_c --> ADP_c + dTTP_c
['6*AT4G09320', 'AT5G63310']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00002
0.00004
0.00006
0.00008
0.00010
Flux

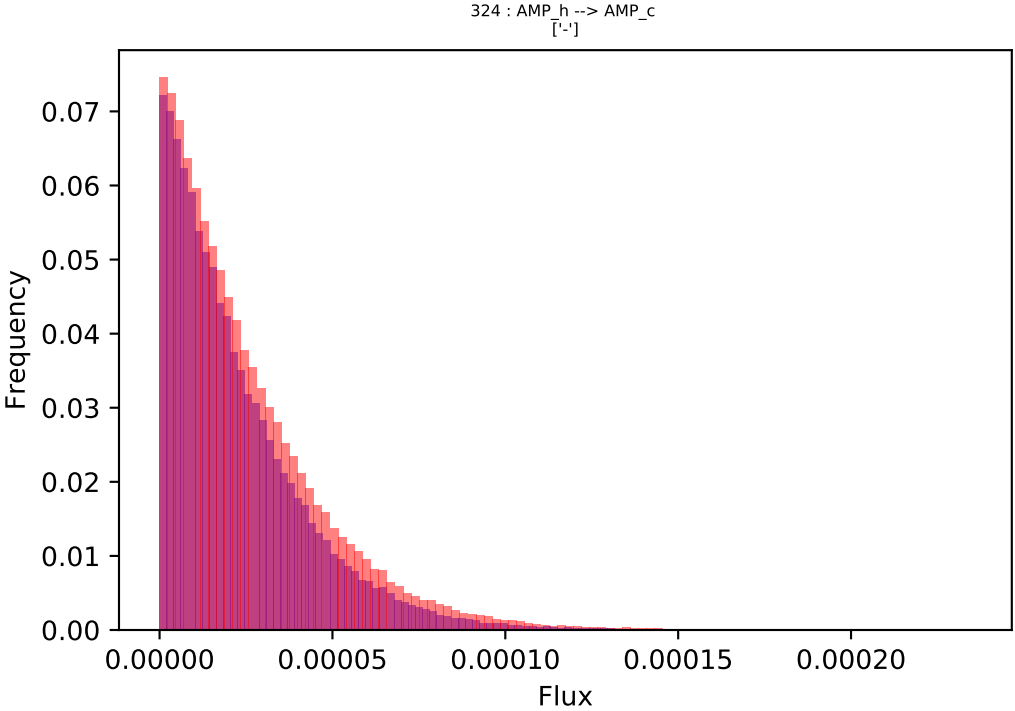

319 : ATP_c + dUDP_c --> ADP_c + dUTP_c
['6*AT4G09320', 'AT5G63310']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00002
0.00004
0.00006
0.00008
0.00010
Flux

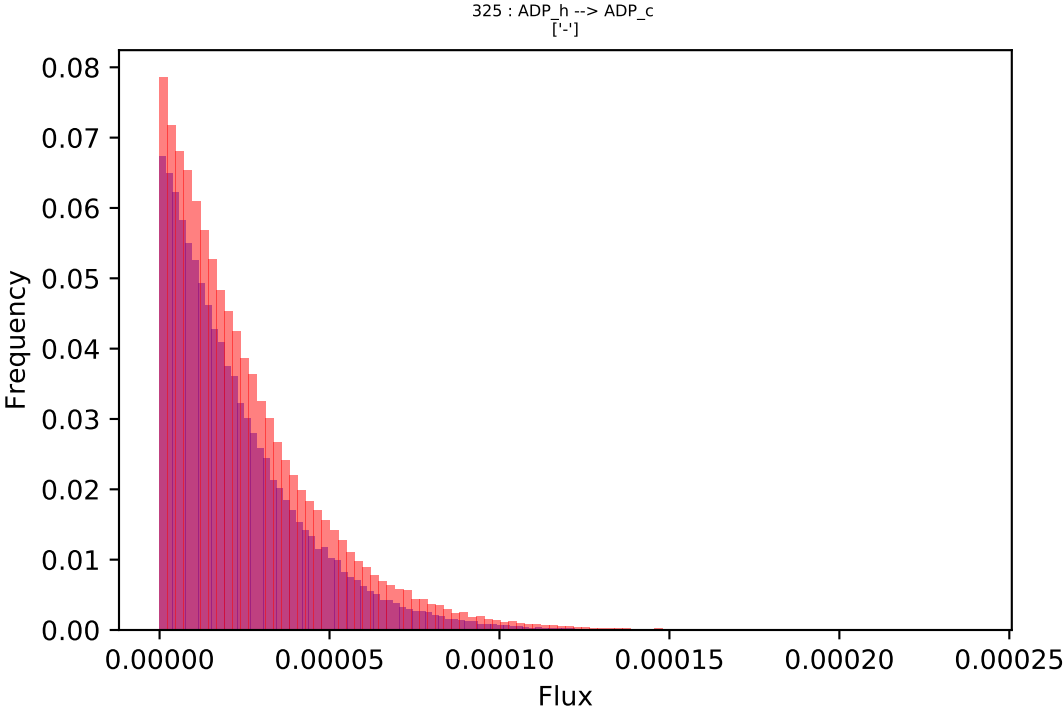

320 : SO4_c <=> SO4_h
['-']
1.0
0.8
0.6
0.4
0.2
0.0
Frequency
−0.4
−0.2
0.0
0.2
0.4
0.6
0.8
Flux

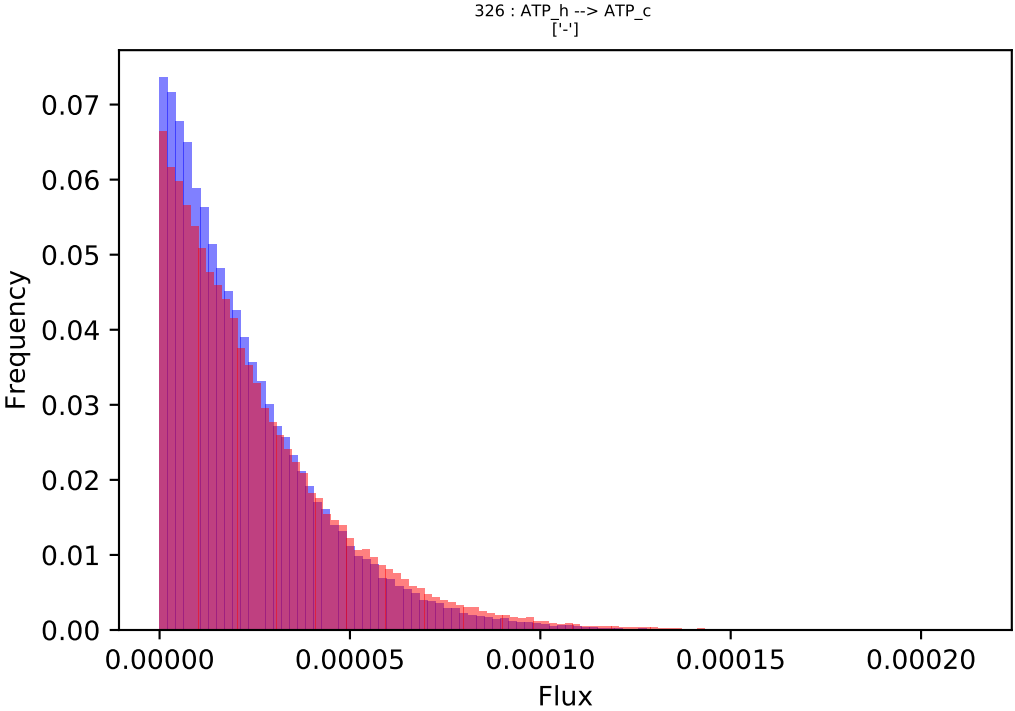

321 : NO2_c --> NO2_h
['-']
1.0
0.8
0.6
0.4
0.2
0.0
Frequency
0
1
2
3
4
5
Flux

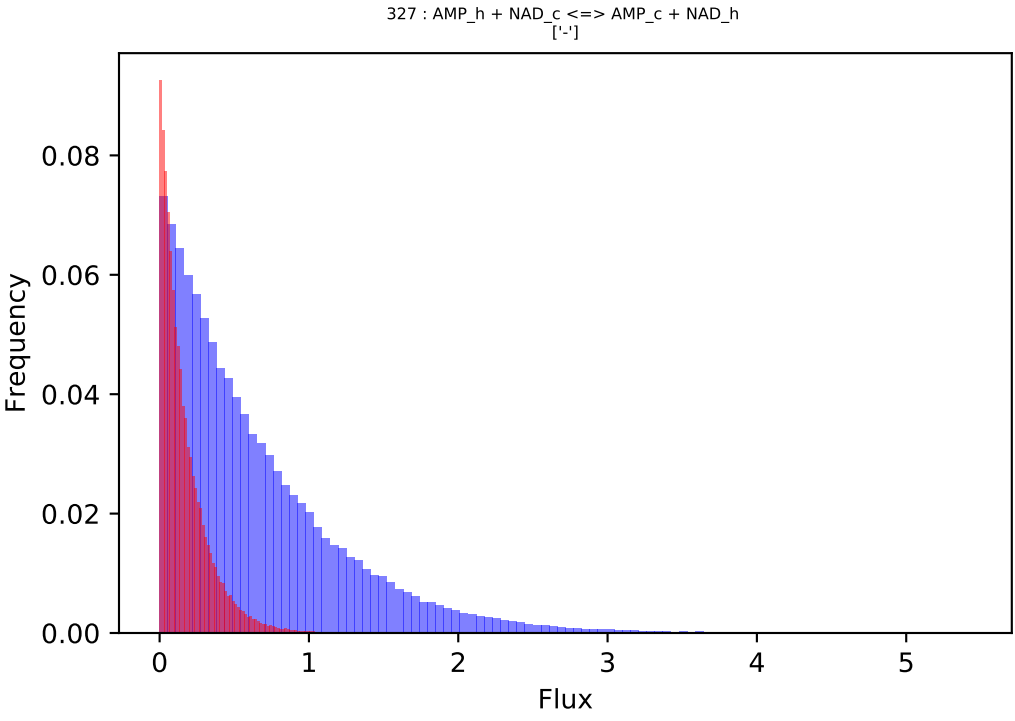

322 : ADP_h + ATP_c + Pi_h --> ADP_c + ATP_h + Pi_c
['-']
Frequency
0.00
0.01
0.02
0.03
0.04
32.5
35.0
37.5
40.0
42.5
45.0
47.5
50.0
Flux

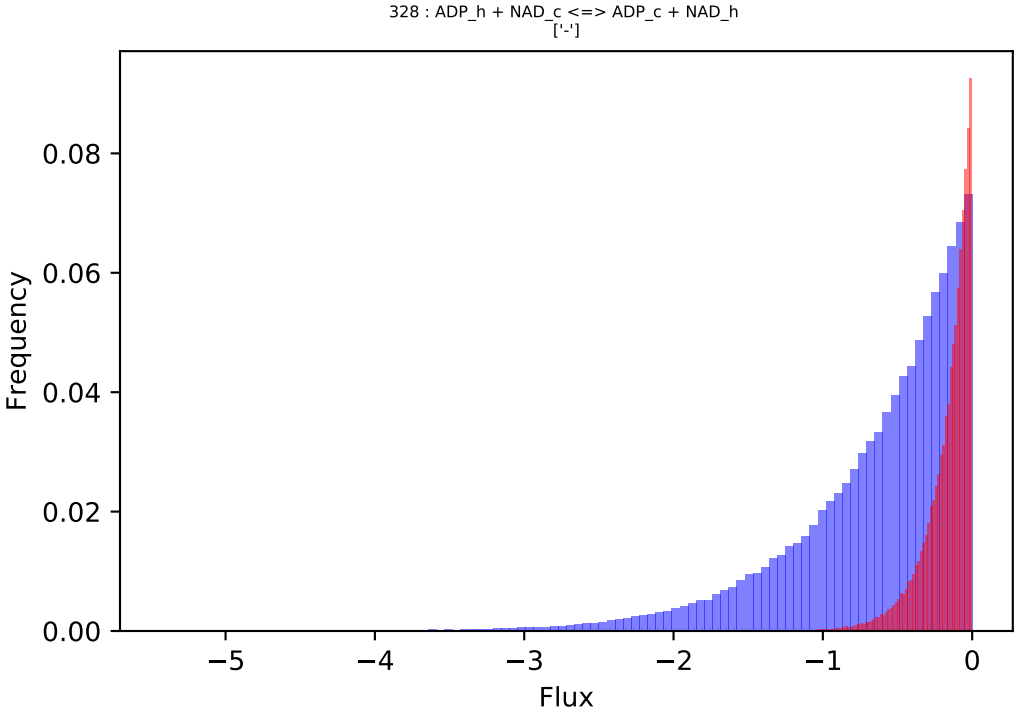

323 : ADP_c + ATP_m + Pi_c --> ADP_m + ATP_c + Pi_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
30
40
50
60
70
80
90
100
110
Flux

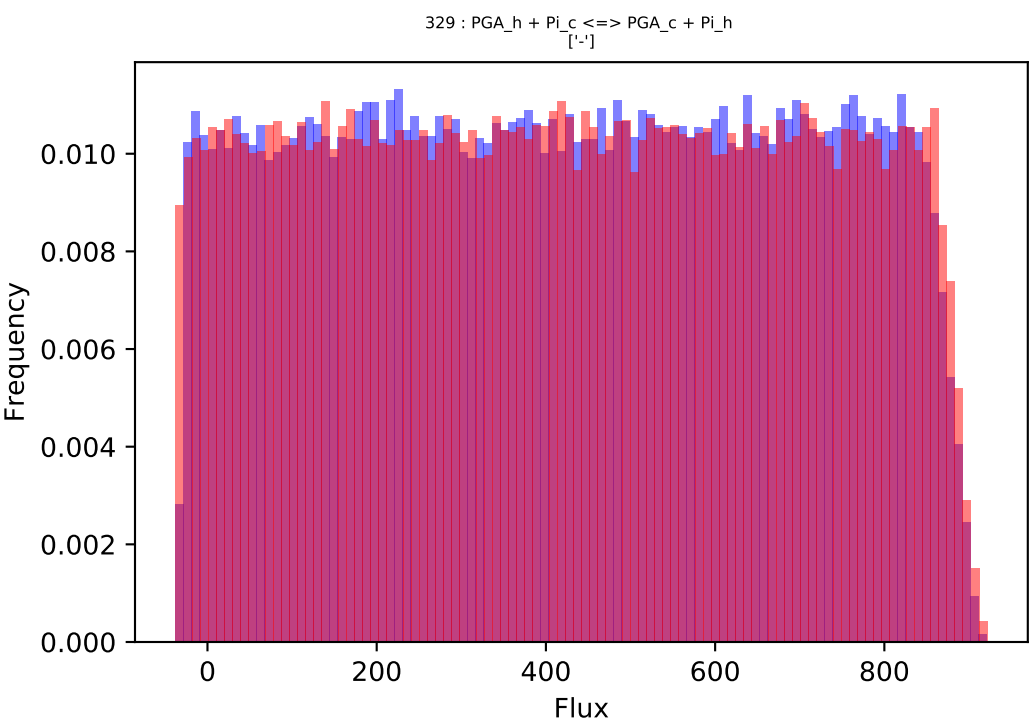

324 : AMP_h --> AMP_c
['-']
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
0.00000
0.00005
0.00010
0.00015
0.00020
Flux

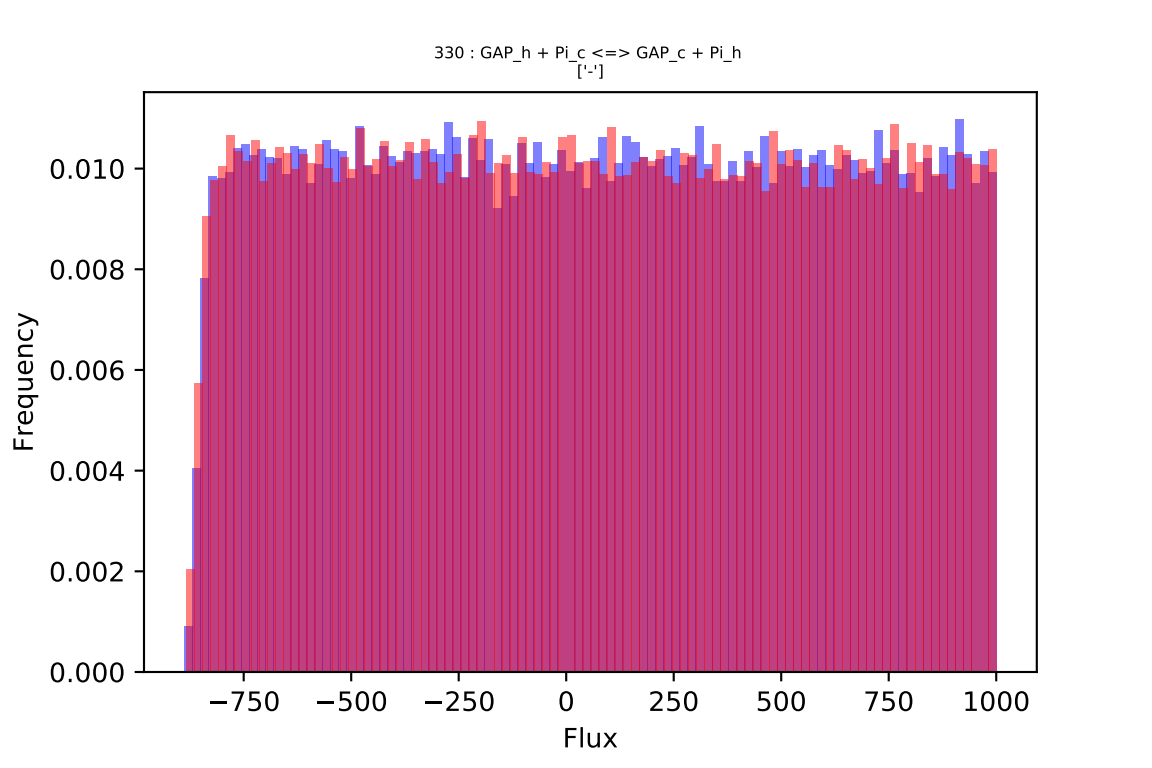

325 : ADP_h --> ADP_c
['-']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.00000
0.00005
0.00010
0.00015
0.00020
0.00025

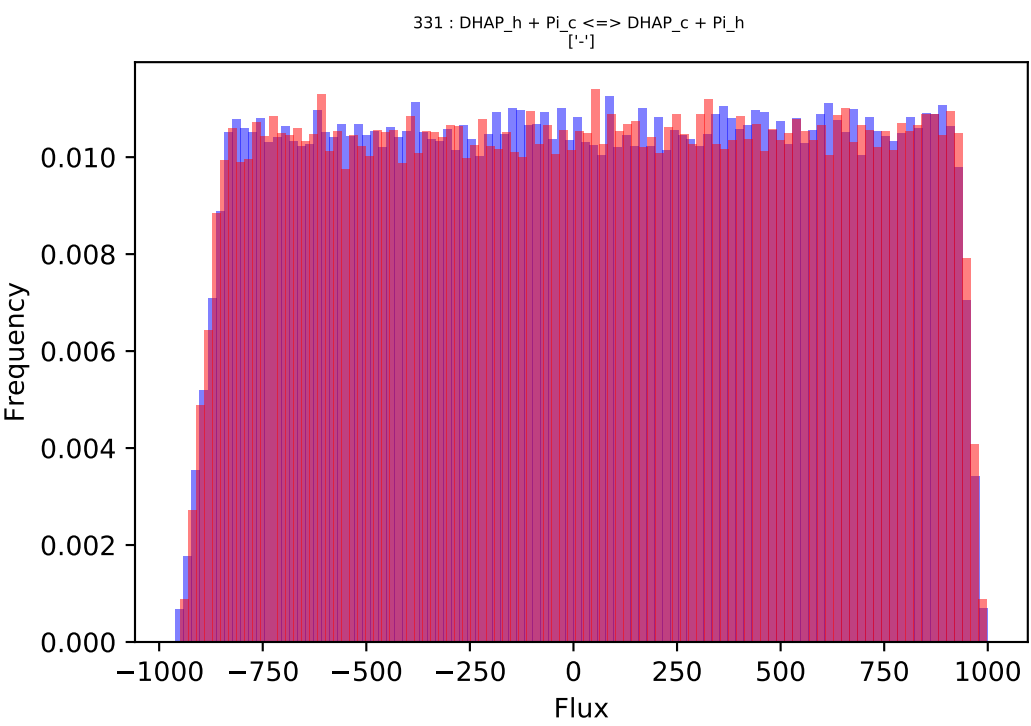

326 : ATP_h --> ATP_c
['-']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.00000
0.00005
0.00010
0.00015
0.00020
Flux

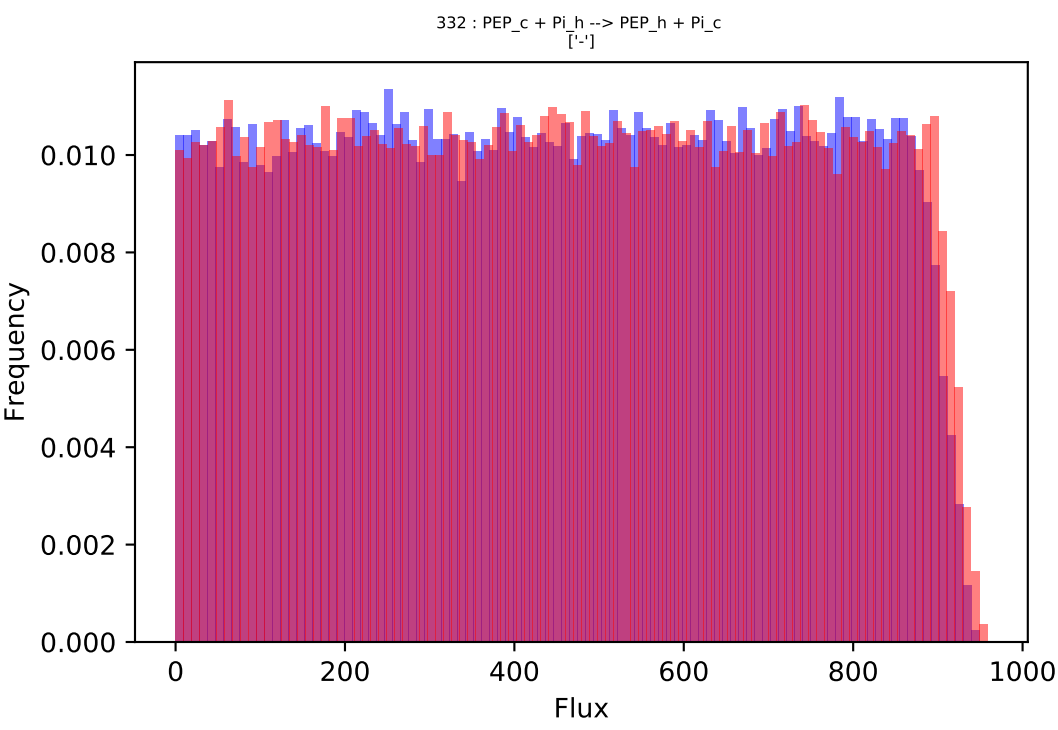

327 : AMP_h + NAD_c <=> AMP_c + NAD_h
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0
1
2
3
4
5
Flux

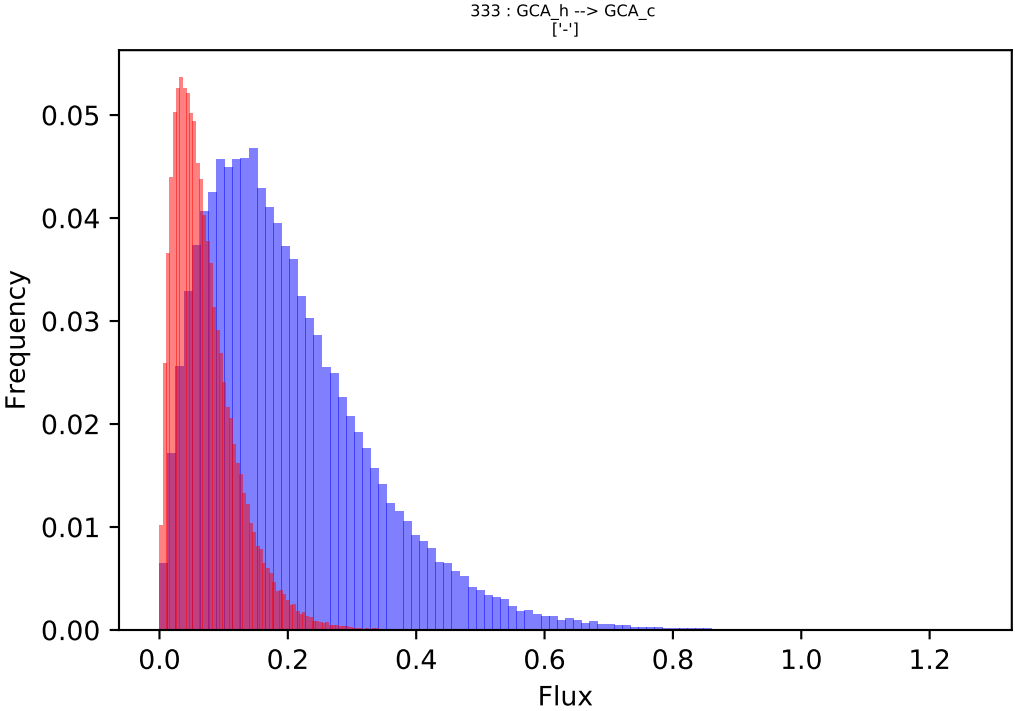

328 : ADP_h + NAD_c <=> ADP_c + NAD_h
['-']
0.08
0.06
0.04
0.02
0.00
Frequency
−5
−4
−3
−2
−1
0
Flux

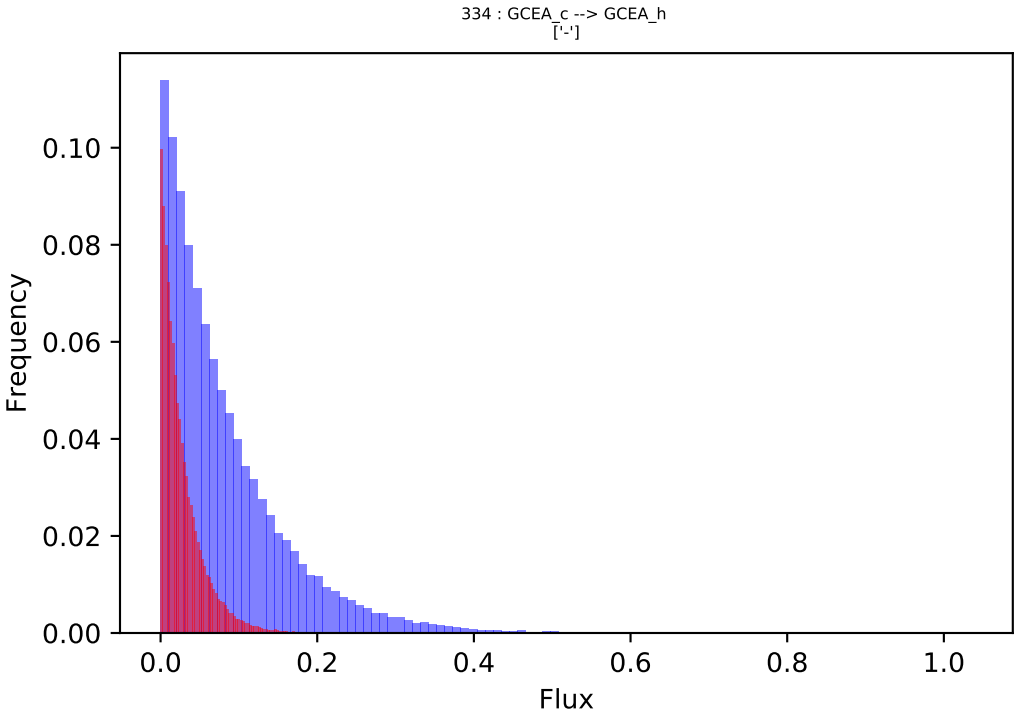

329 : PGA_h + Pi_c <=> PGA_c + Pi_h
['-']
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
0
200
400
600
800
Flux

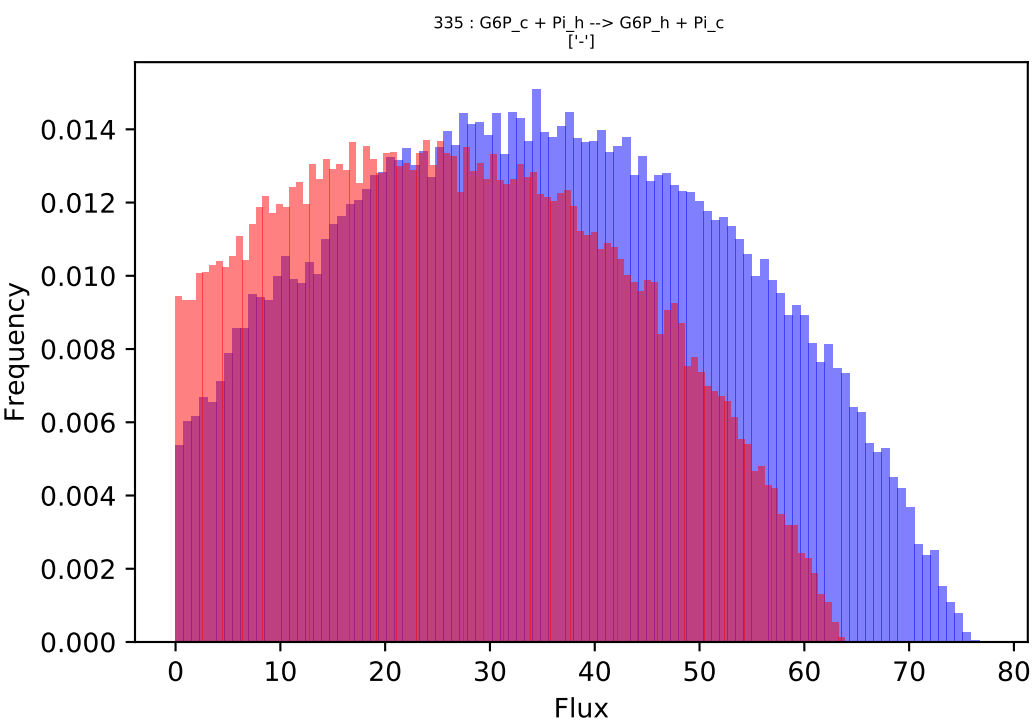

330 : GAP_h + Pi_c <=> GAP_c + Pi_h
['-']
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−750
−500
−250
0
250
500
750
1000
Flux

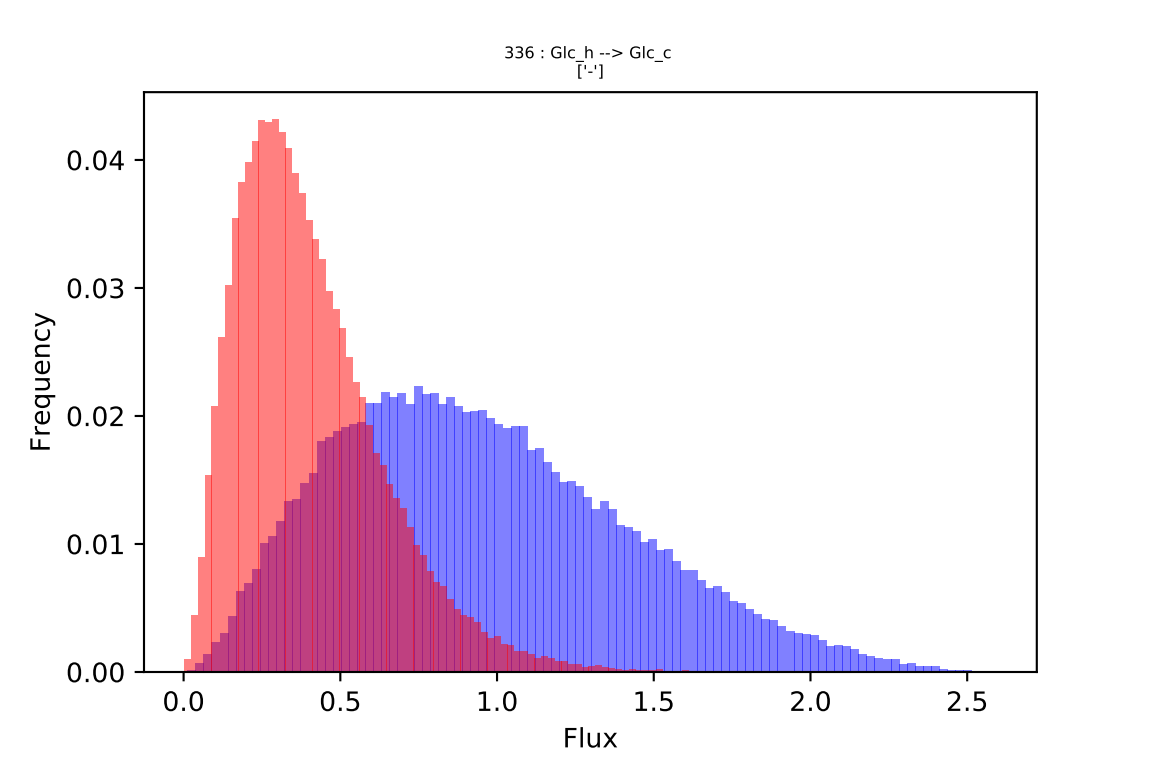

331 : DHAP_h + Pi_c <=> DHAP_c + Pi_h
['-']
Frequency
0.000
0.002
0.004
0.006
0.008
0.010
−1000
−750
−500
−250
0
250
500
750
1000
Flux

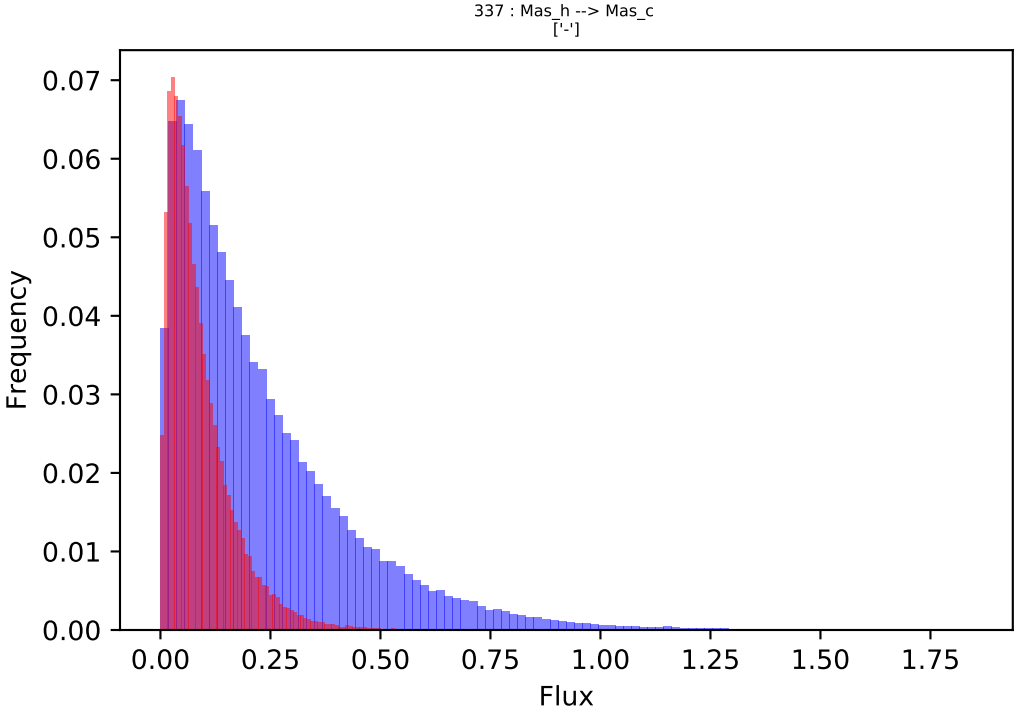

332 : PEP_c + Pi_h --> PEP_h + Pi_c
['-']
Frequency
0.000
0.002
0.004
0.006
0.008
0.010
0
200
400
600
800
1000
Flux

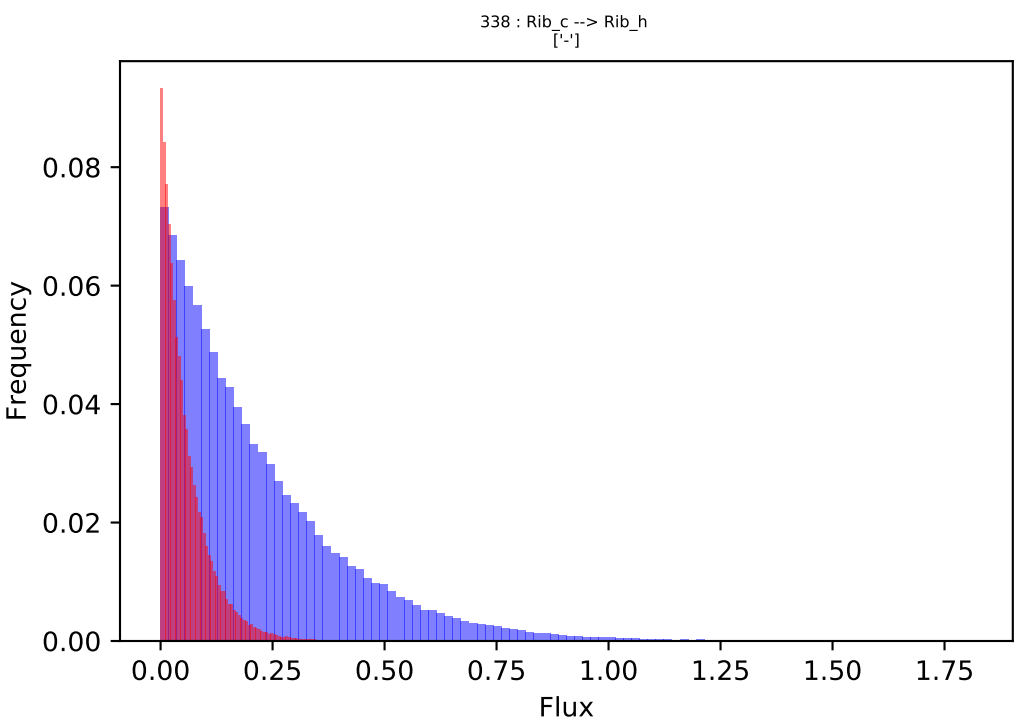

333 : GCA_h --> GCA_c
['-']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Flux

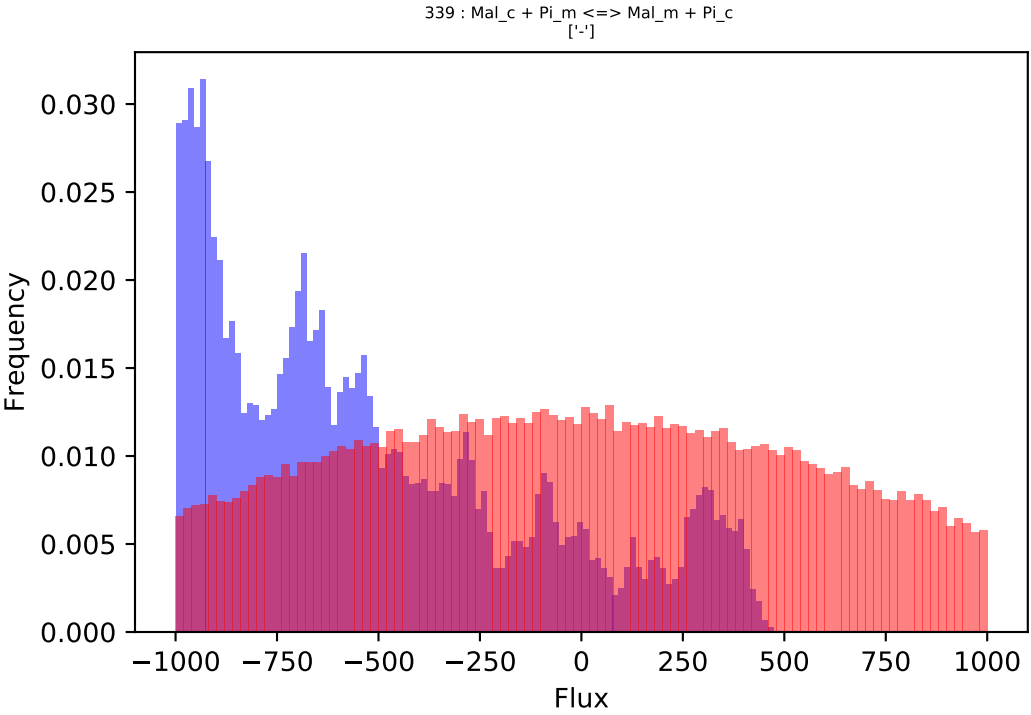

334 : GCEA_c --> GCEA_h
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.0
0.2
0.4
0.6
0.8
1.0
Flux

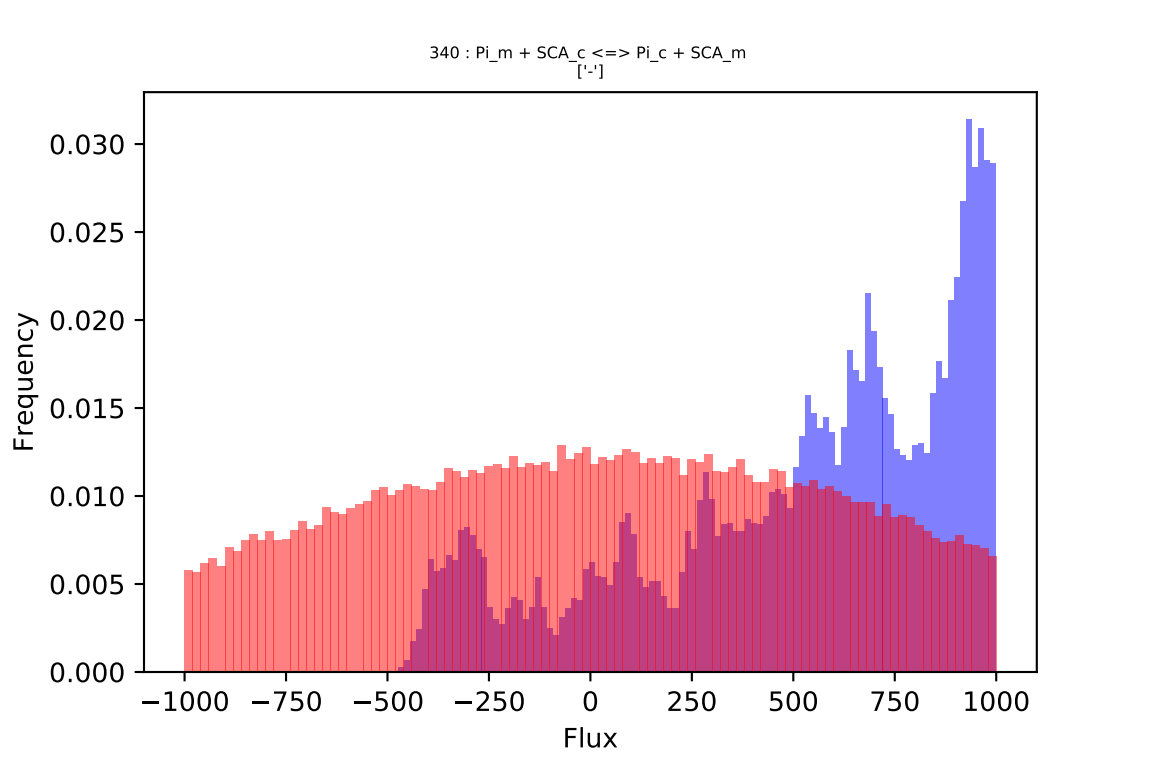

335 : G6P_c + Pi_h --> G6P_h + Pi_c
['-']
Frequency
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
0
10
20
30
40
50
60
70
80
Flux

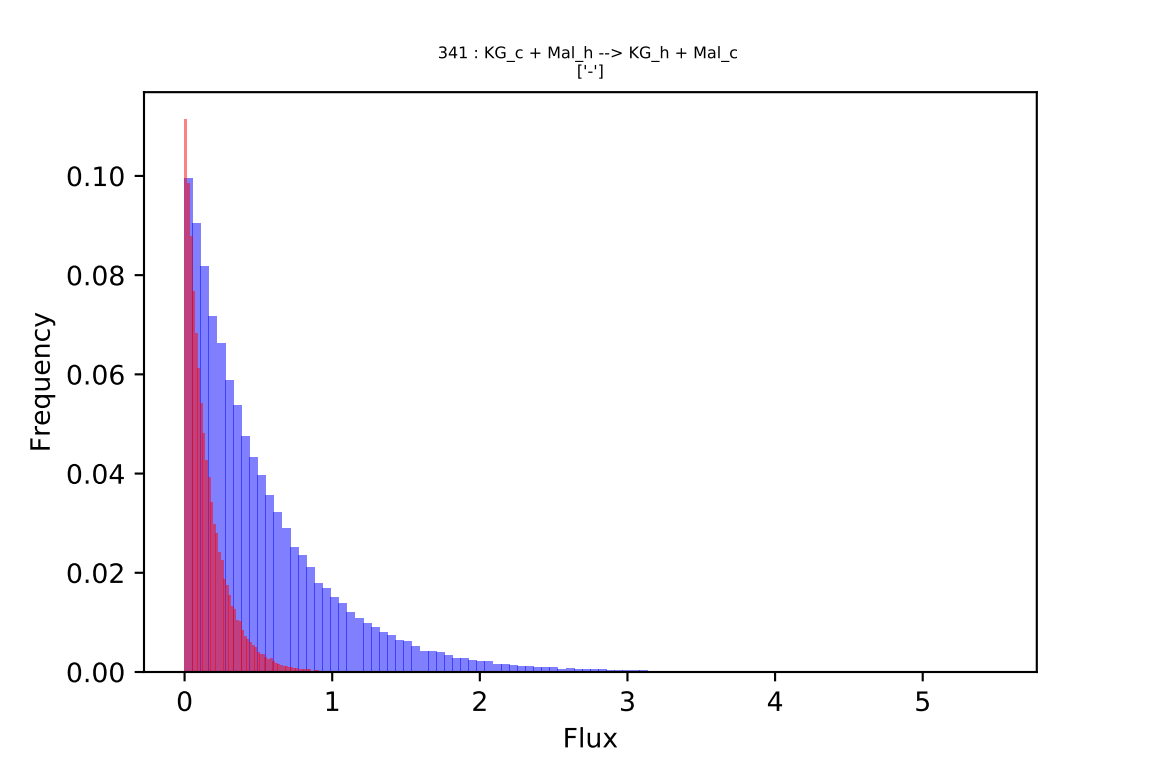

336 : Glc_h --> Glc_c
['-']
0.04
0.03
0.02
0.01
0.00
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
Flux

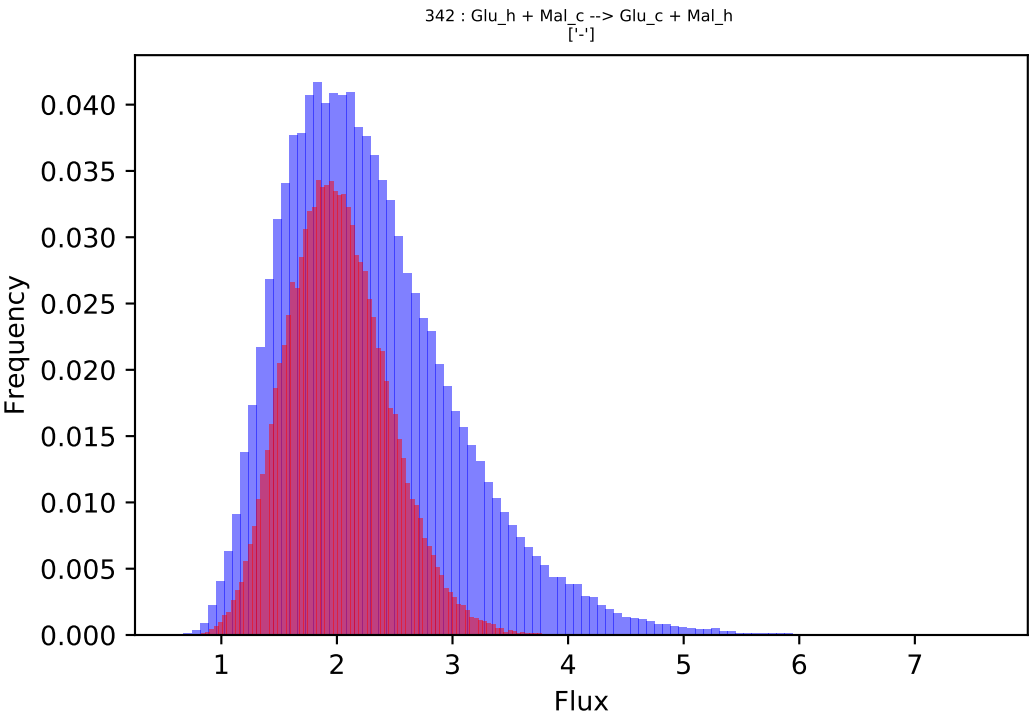

337 : Mas_h --> Mas_c
['-']
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

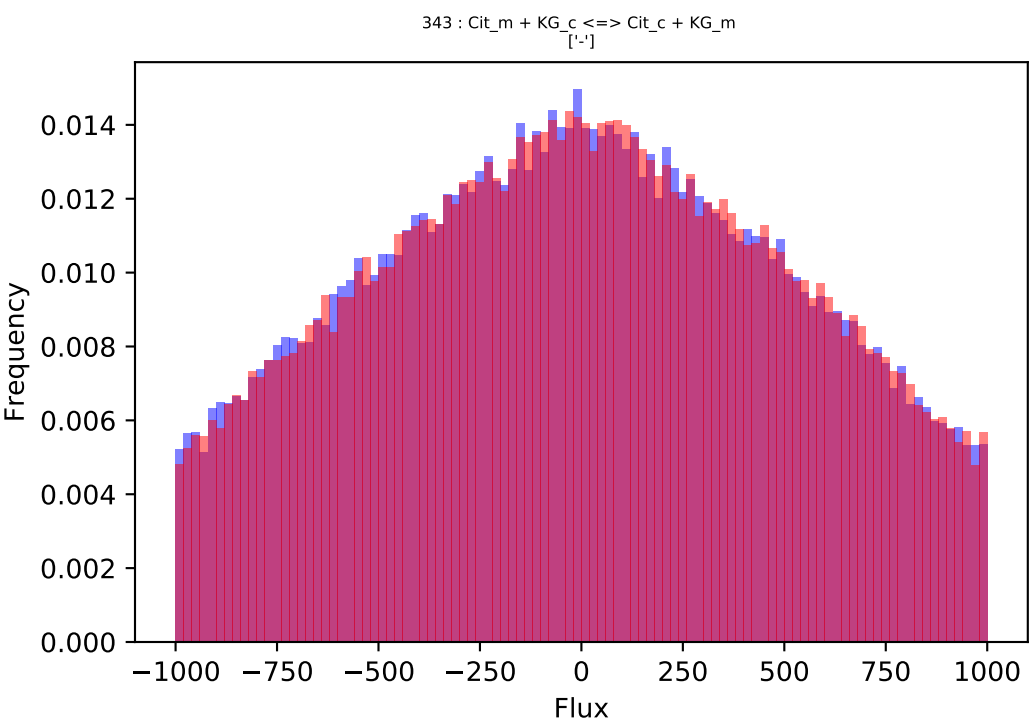

338 : Rib_c --> Rib_h
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

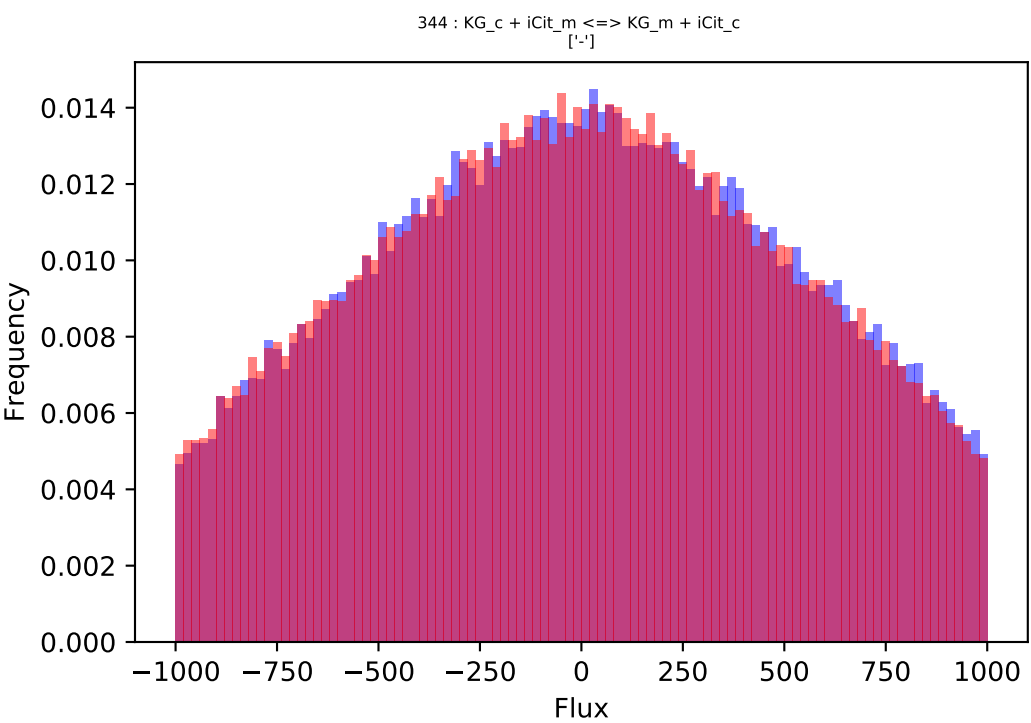

339 : Mal_c + Pi_m <=> Mal_m + Pi_c
['-']
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−1000
−750
−500
−250
0
250
500
750
1000
Flux

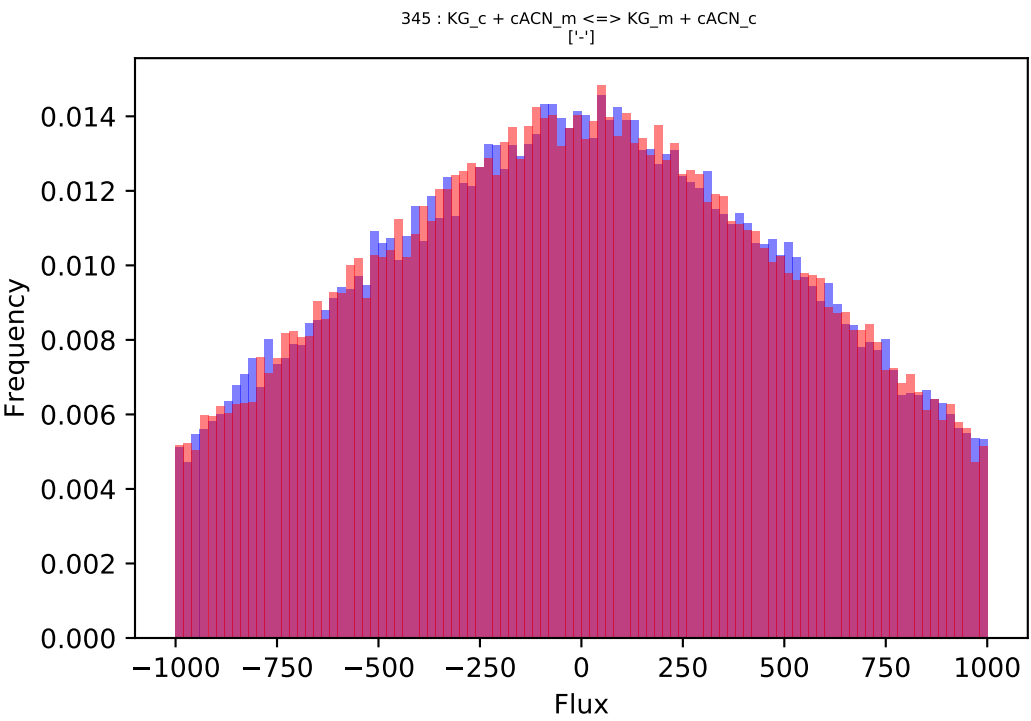

340 : Pi_m + SCA_c <=> Pi_c + SCA_m
['-']
Frequency
0.030
0.025
0.020
0.015
0.010
0.005
0.000
−1000
−750
−500
−250
0
250
500
750
1000
Flux

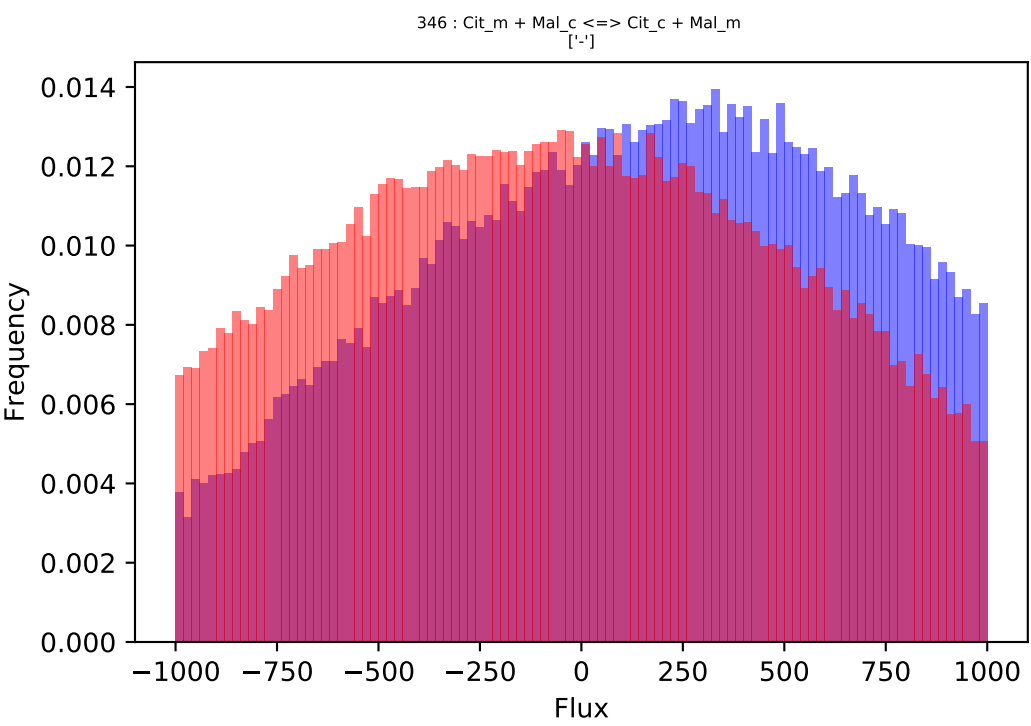

341 : KG_c + Mal_h --> KG_h + Mal_c
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0
1
2
3
4
5
Flux

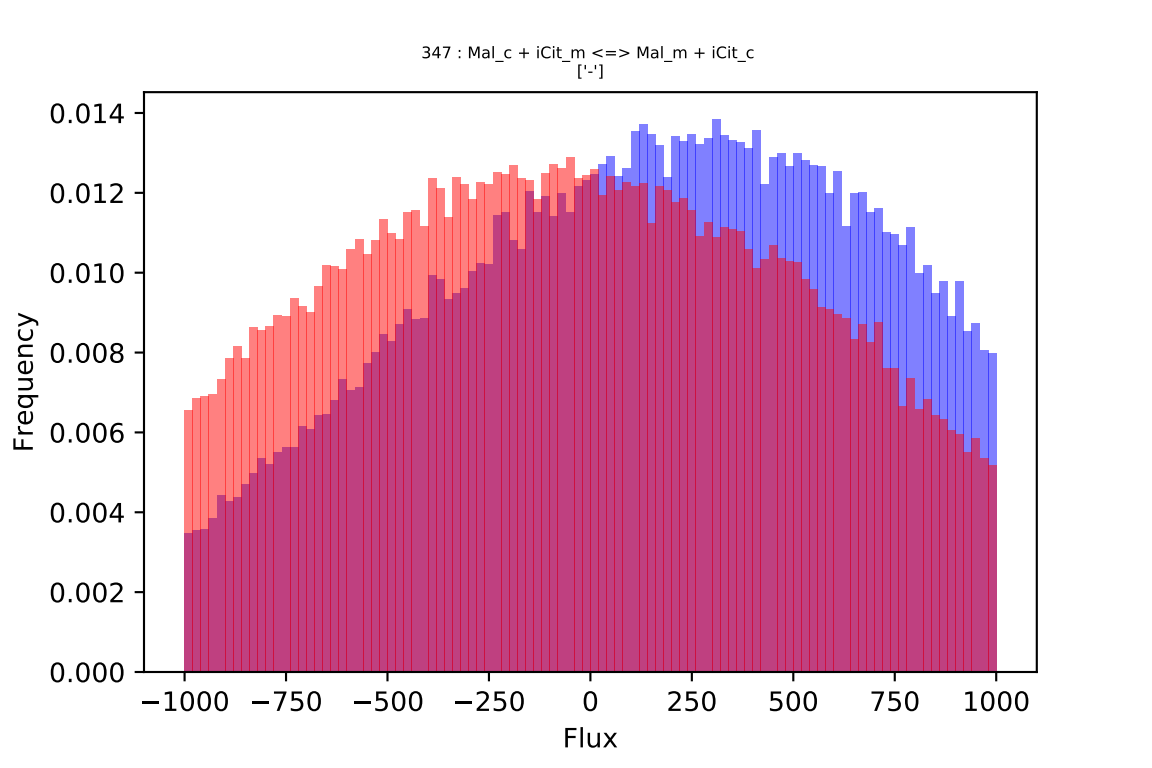

342 : Glu_h + Mal_c --> Glu_c + Mal_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
1
2
3
4
5
6
7
Flux

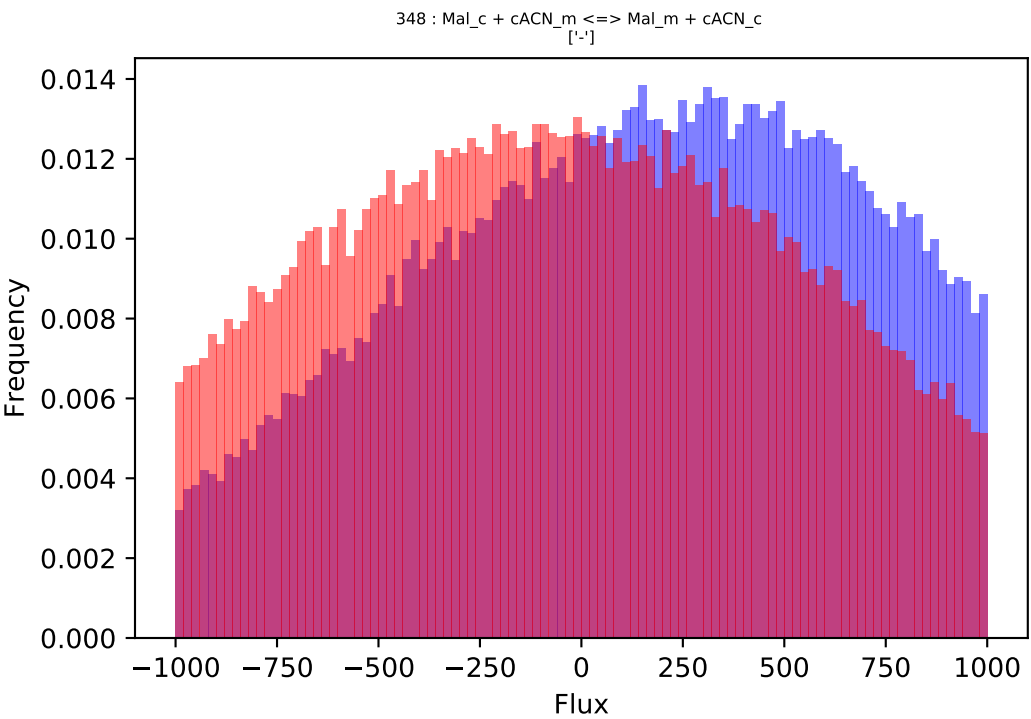

343 : Cit_m + KG_c <=> Cit_c + KG_m
['-']
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−1000
−750
−500
−250
0
250
500
750
1000
Flux

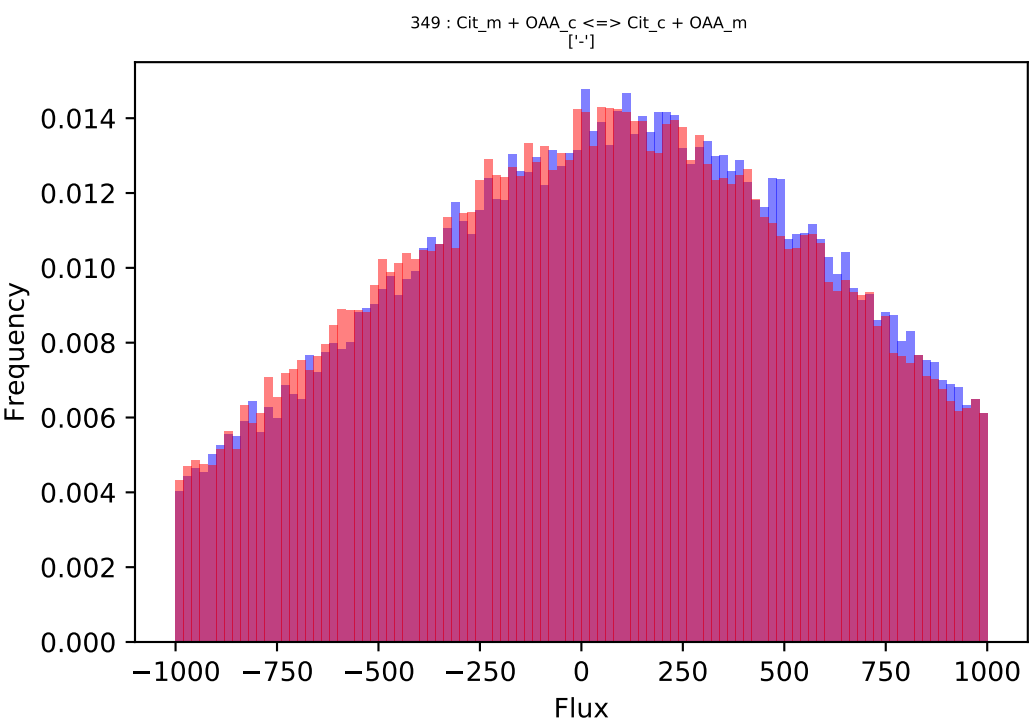

344 : KG_c + iCit_m <=> KG_m + iCit_c
['-']
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−1000
−750
−500
−250
0
250
500
750
1000
Flux

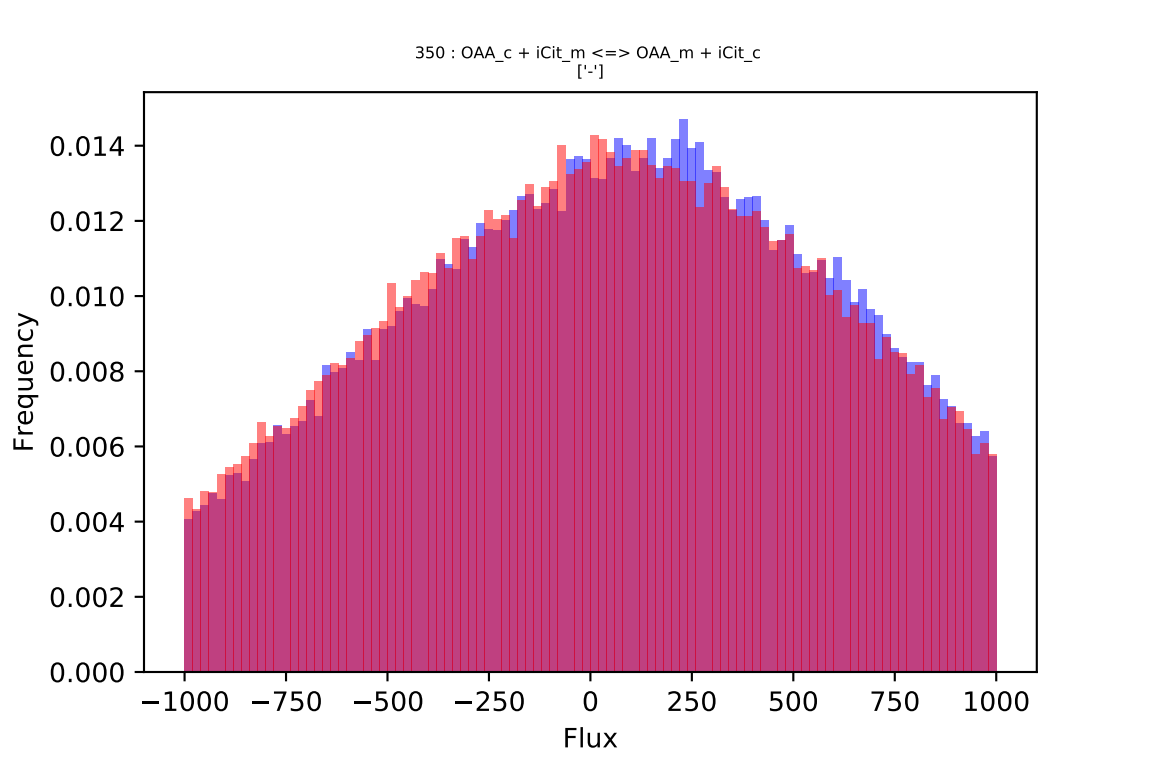

345 : KG_c + cACN_m <=> KG_m + cACN_c
['-']
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−1000
−750
−500
−250
0
250
500
750
1000
Flux

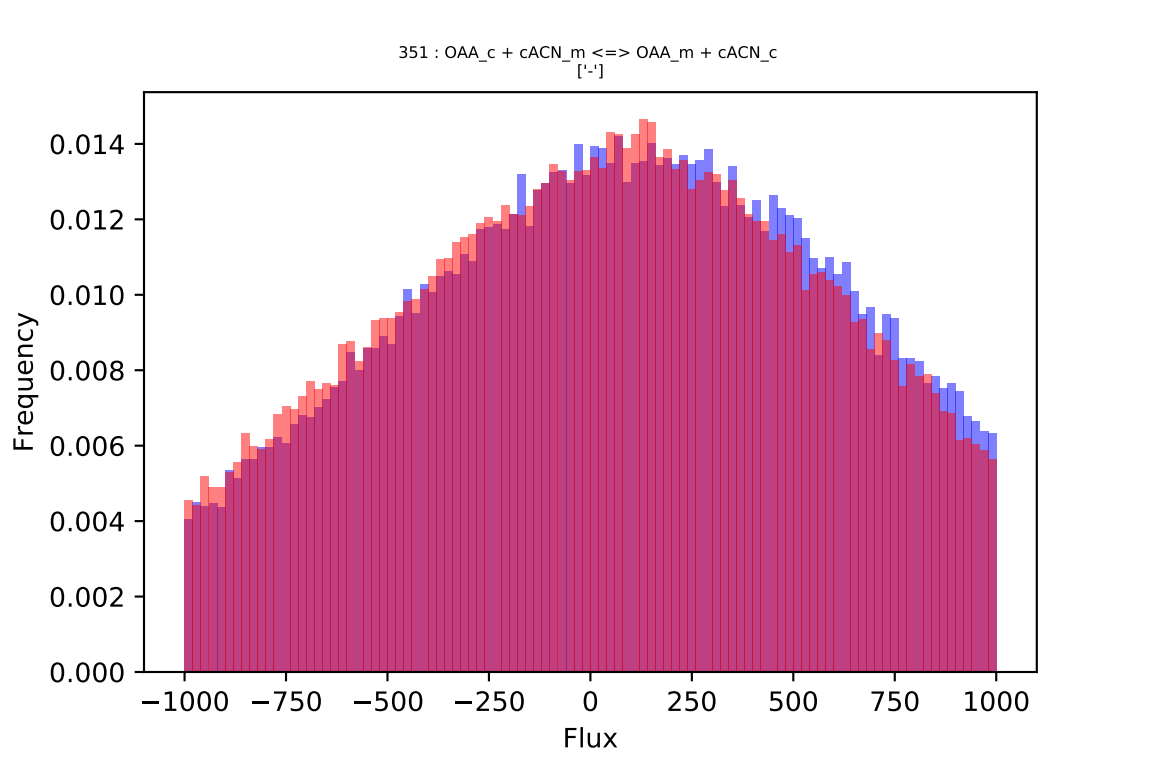

346 : Cit_m + Mal_c <=> Cit_c + Mal_m
['-']
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−1000
−750
−500
−250
0
250
500
750
1000
Flux

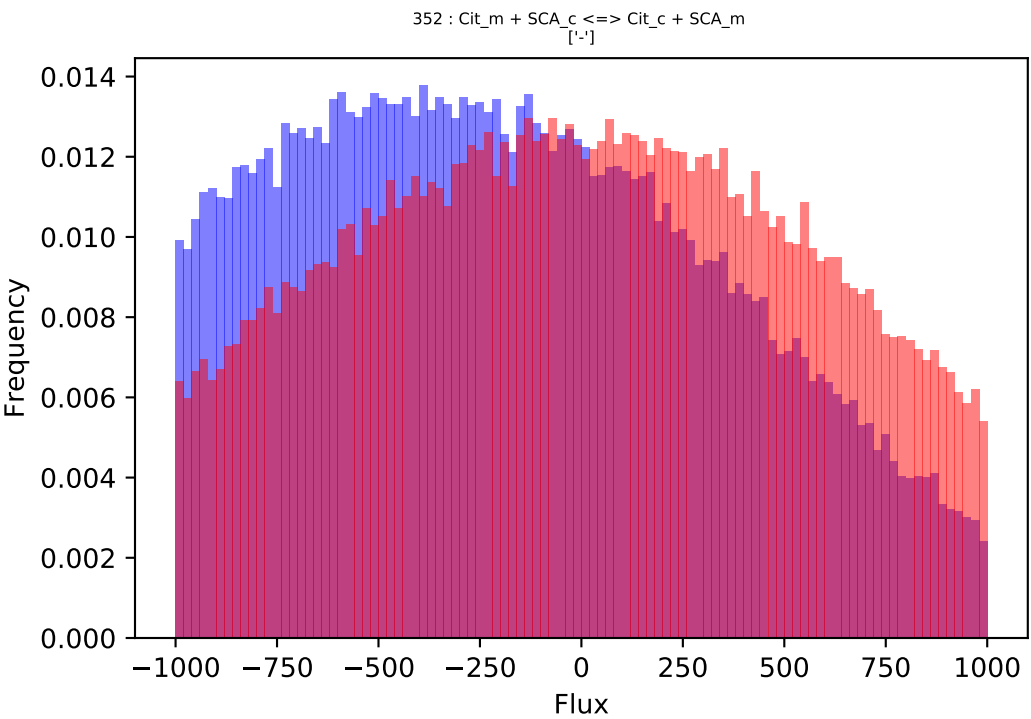

347 : Mal_c + iCit_m <=> Mal_m + iCit_c
['-']
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−1000
−750
−500
−250
0
250
500
750
1000
Flux

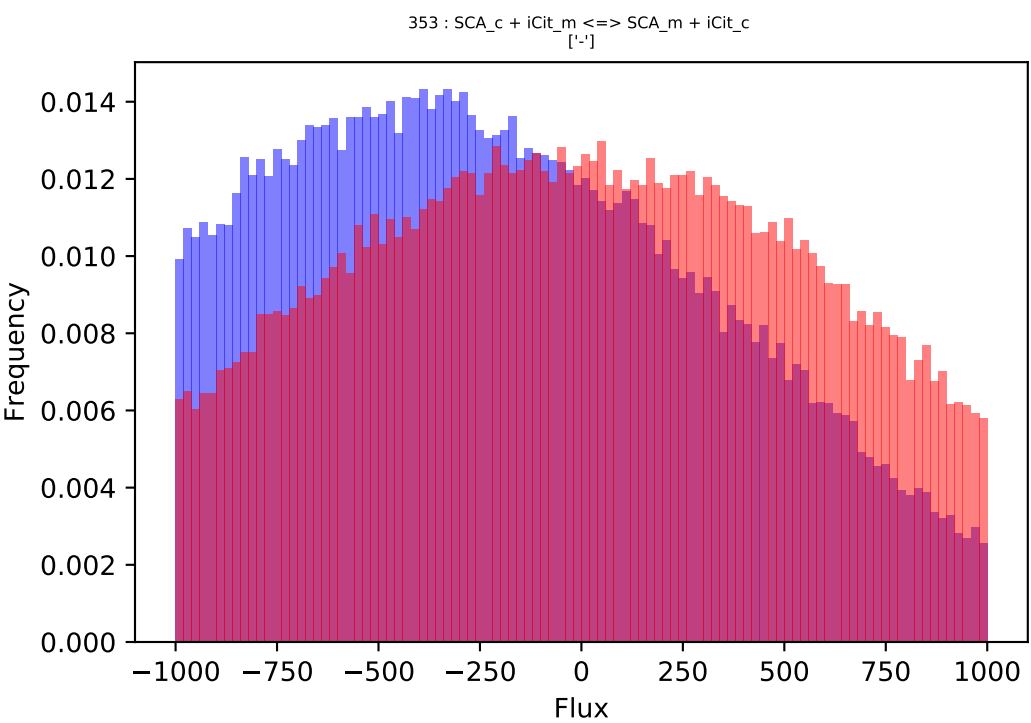

348 : Mal_c + cACN_m <=> Mal_m + cACN_c
['-']
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−1000
−750
−500
−250
0
250
500
750
1000
Flux

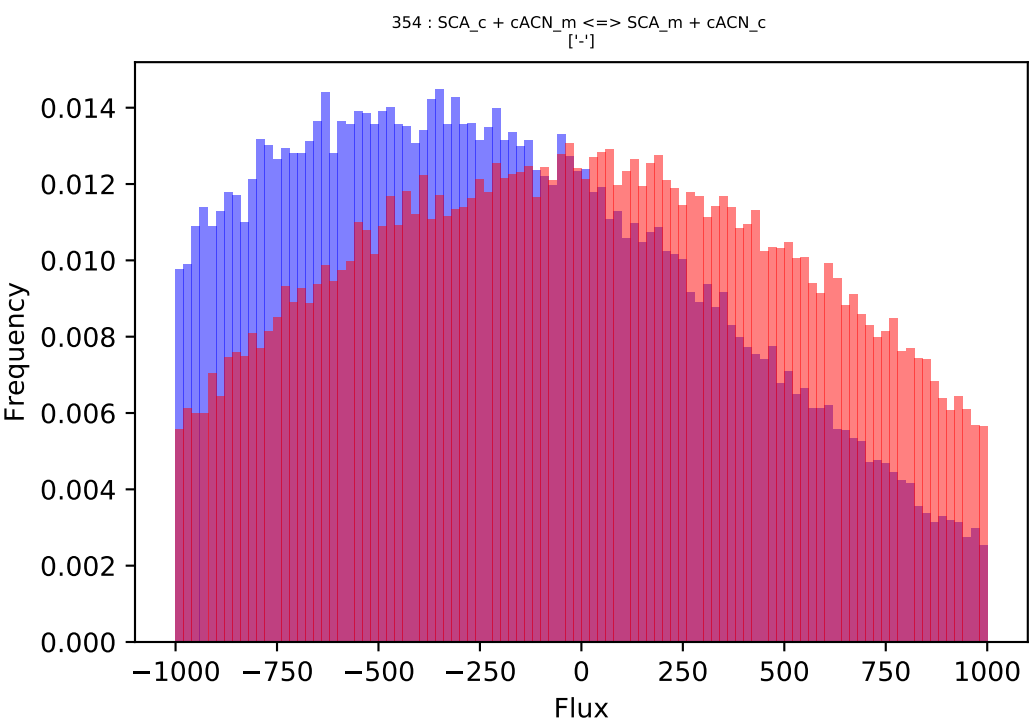

349 : Cit_m + OAA_c <=> Cit_c + OAA_m
['-']
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−1000
−750
−500
−250
0
250
500
750
1000
Flux

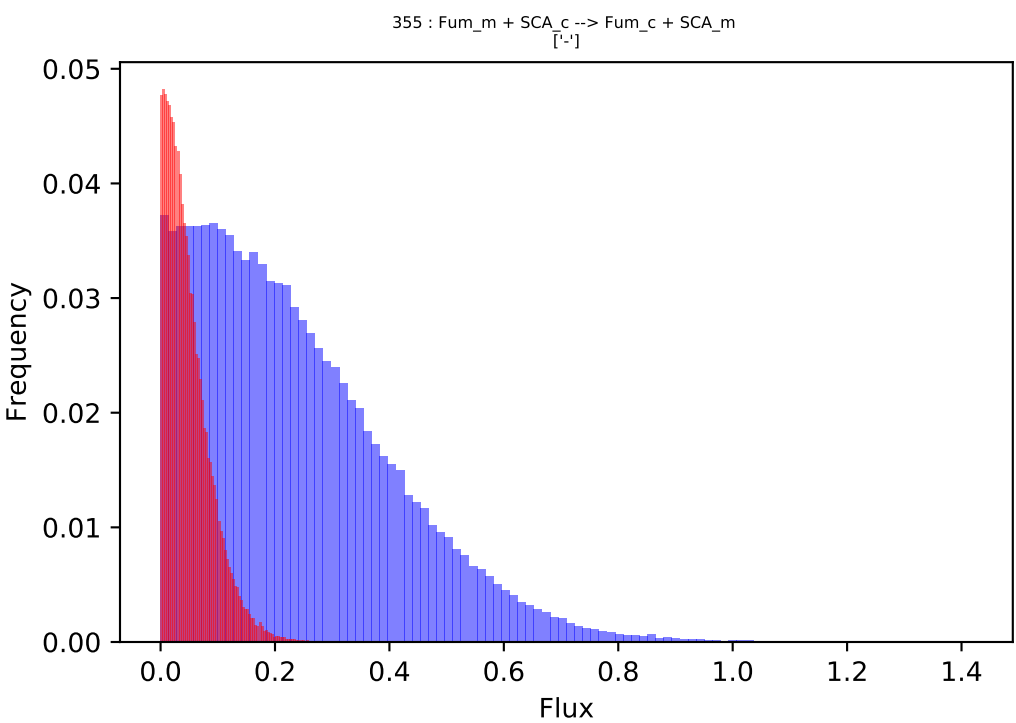

350 : OAA_c + iCit_m <=> OAA_m + iCit_c
['-']
Frequency
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
−1000
−750
−500
−250
0
250
500
750
1000
Flux

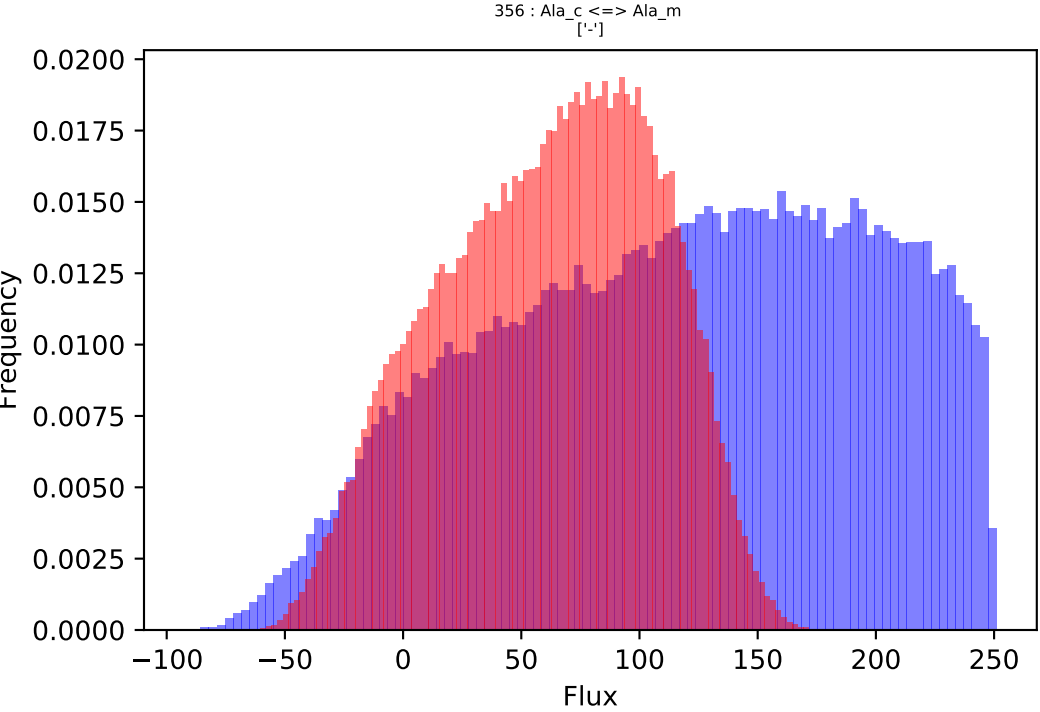

351 : OAA_c + cACN_m <=> OAA_m + cACN_c
['-']
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−1000
−750
−500
−250
0
250
500
750
1000
Flux

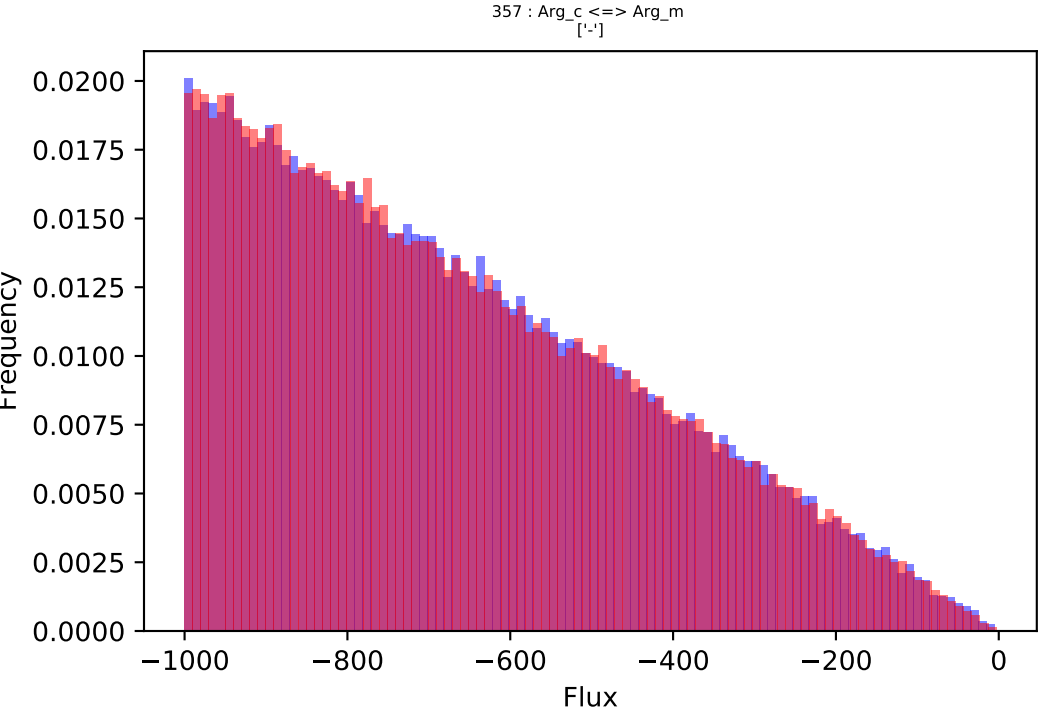

352 : Cit_m + SCA_c <=> Cit_c + SCA_m
['-']
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−1000
−750
−500
−250
0
250
500
750
1000
Flux

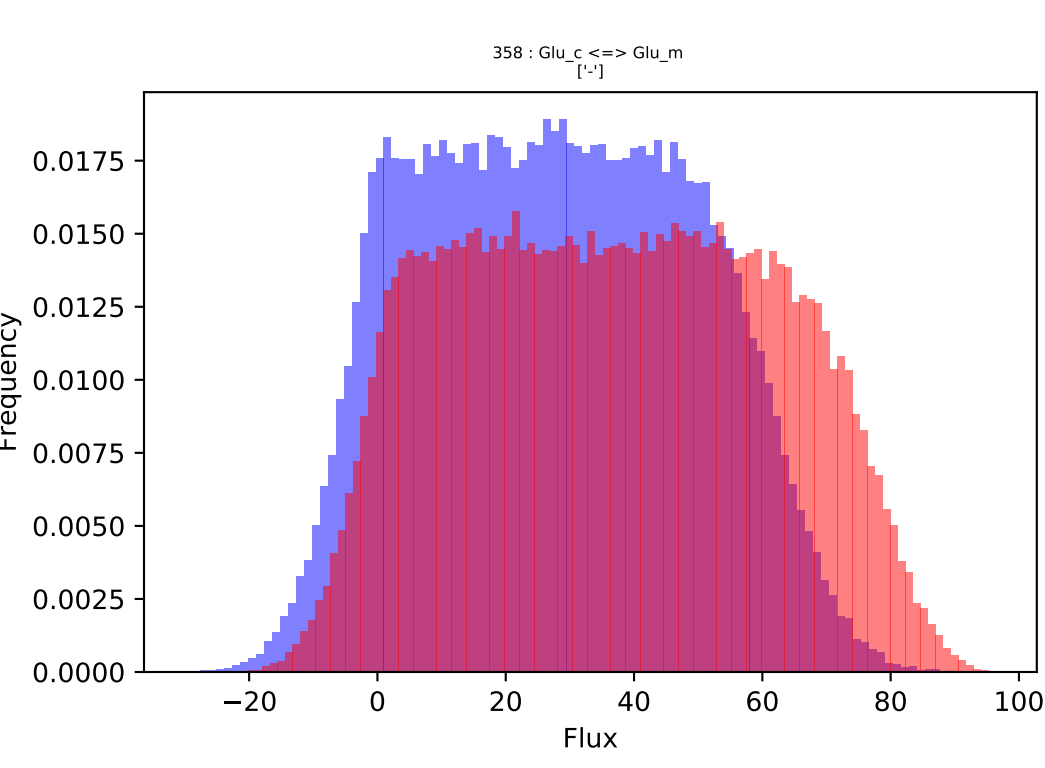

353 : SCA_c + iCit_m <=> SCA_m + iCit_c
['-']
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−1000
−750
−500
−250
0
250
500
750
1000
Flux

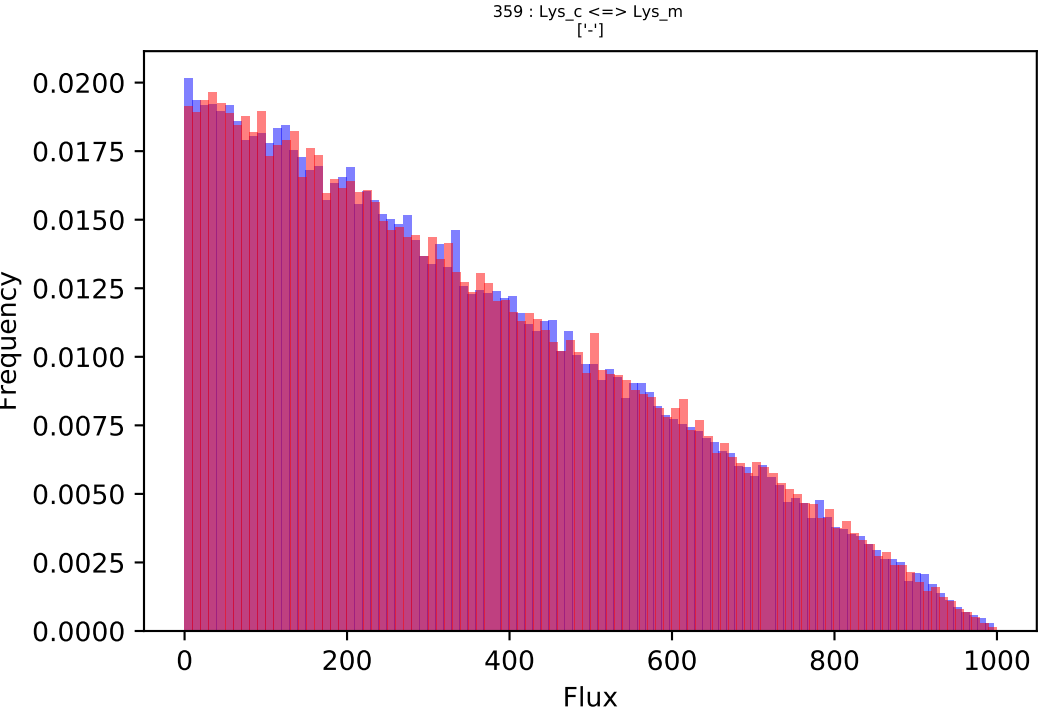

354 : SCA_c + cACN_m <=> SCA_m + cACN_c
['-']
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−1000
−750
−500
−250
0
250
500
750
1000
Flux

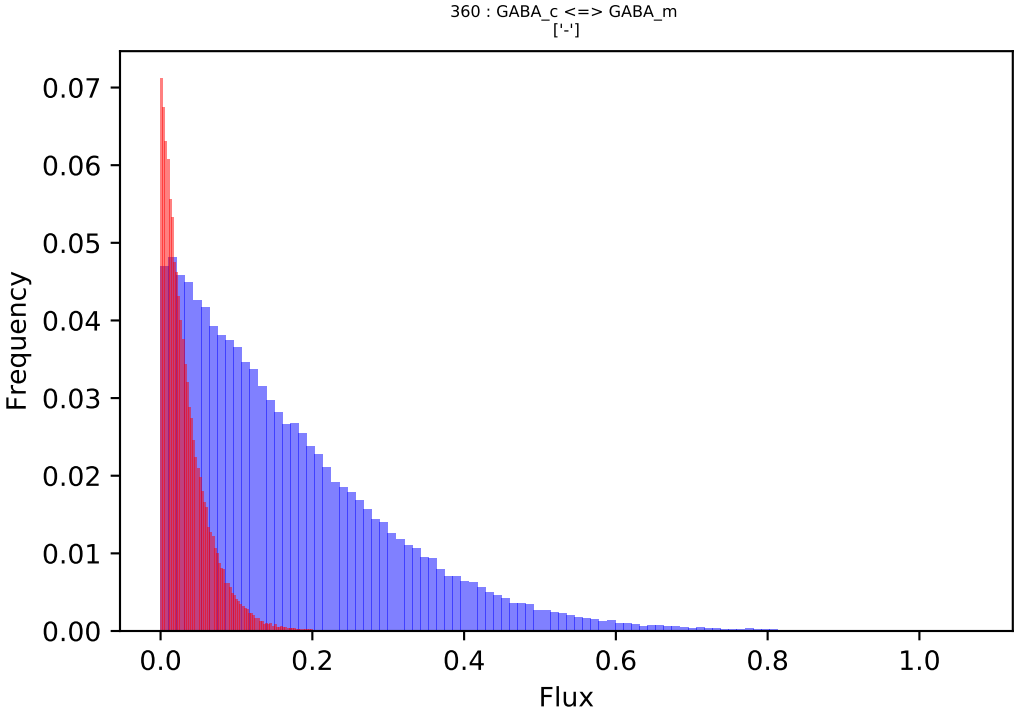

355 : Fum_m + SCA_c --> Fum_c + SCA_m
['-']
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

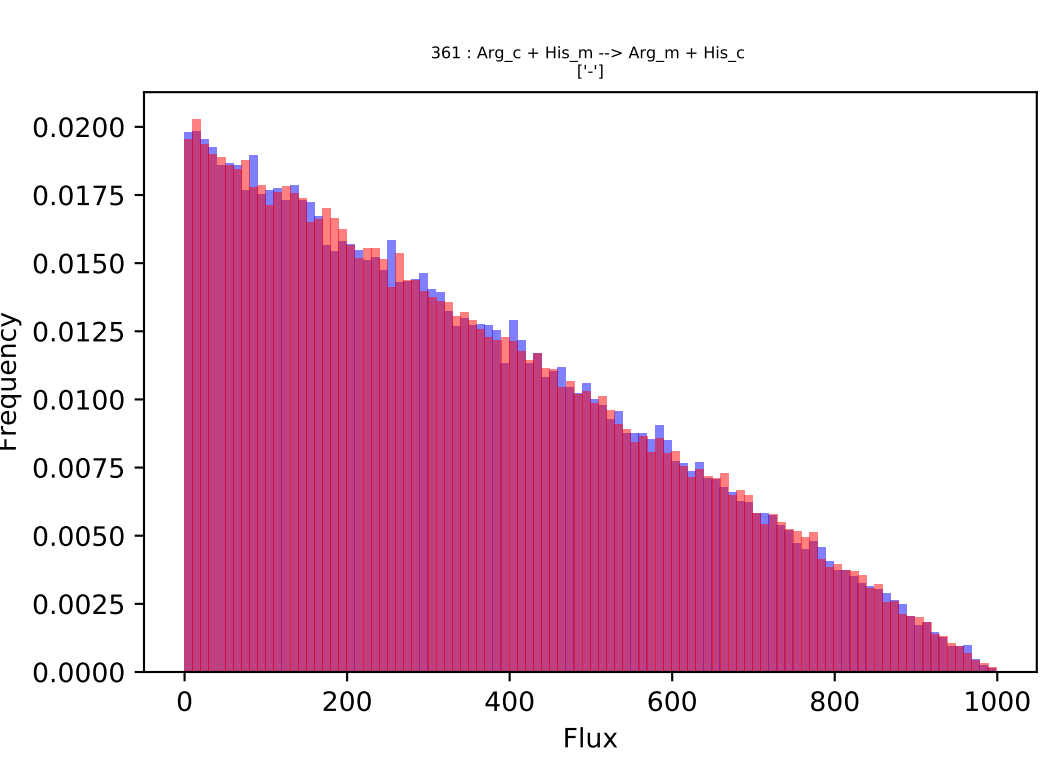

356 : Ala_c <=> Ala_m
['-']
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
Frequency
−100
−50
0
50
100
150
200
250
Flux

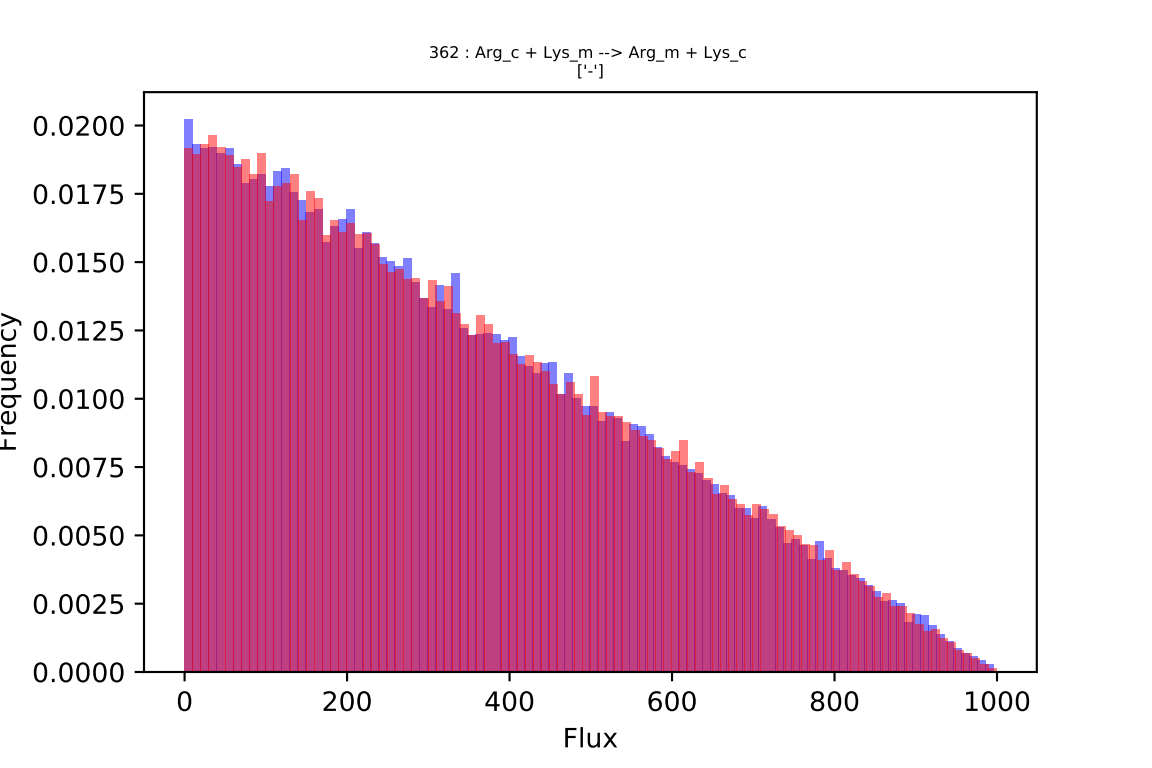

357 : Arg_c <=> Arg_m
['-']
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
Frequency
−1000
−800
−600
−400
−200
0
Flux

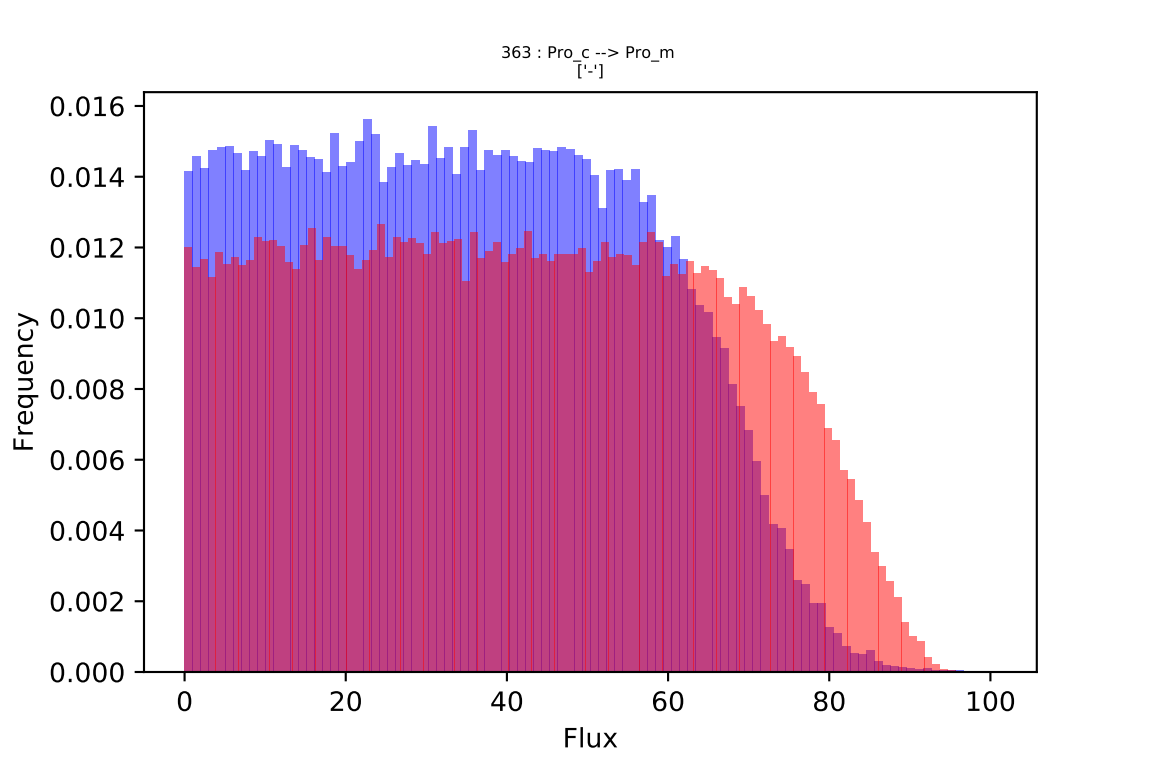

358 : Glu_c <=> Glu_m
['-']
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
Frequency
−20
0
20
40
60
80
100
Flux

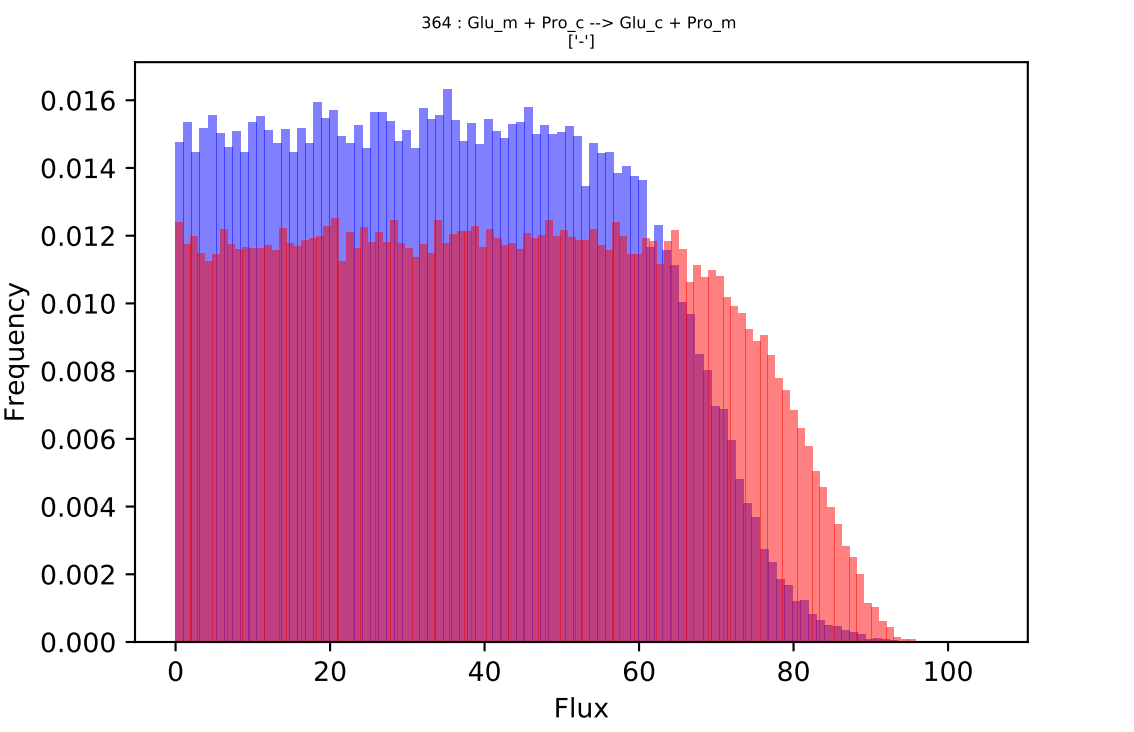

359 : Lys_c <=> Lys_m
['-']
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
Frequency
0
200
400
600
800
1000
Flux

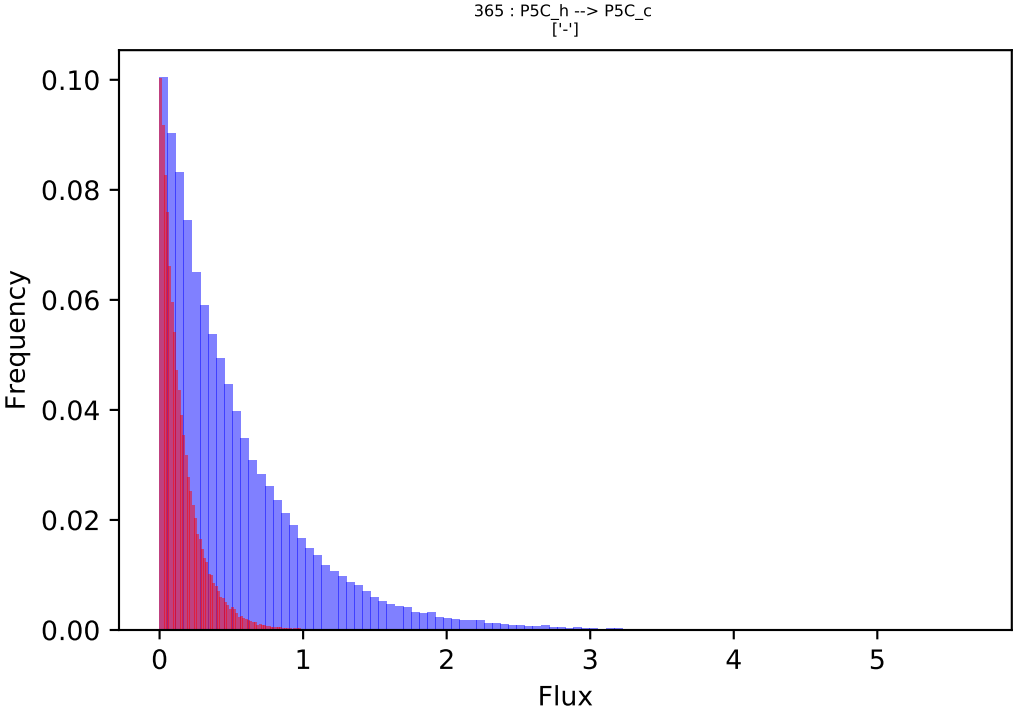

360 : GABA_c <=> GABA_m
['-']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.0
0.2
0.4
0.6
0.8
1.0

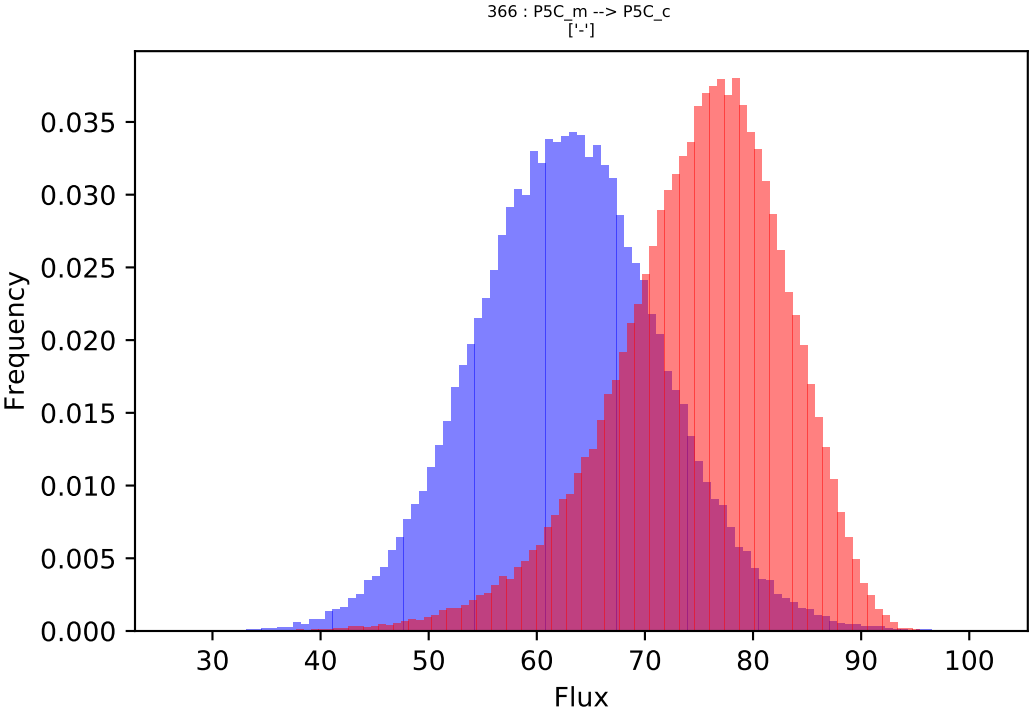

361 : Arg_c + His_m --> Arg_m + His_c
['-']
Frequency
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
0
200
400
600
800
1000
Flux

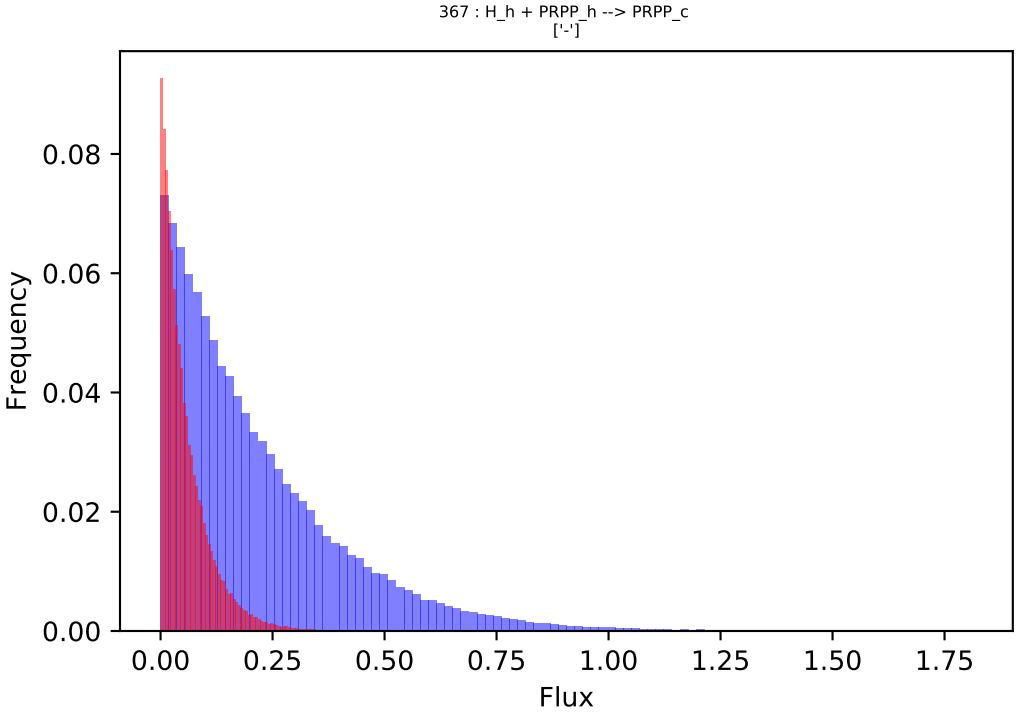

362 : Arg_c + Lys_m --> Arg_m + Lys_c
['-']
Frequency
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
0
200
400
600
800
1000
Flux

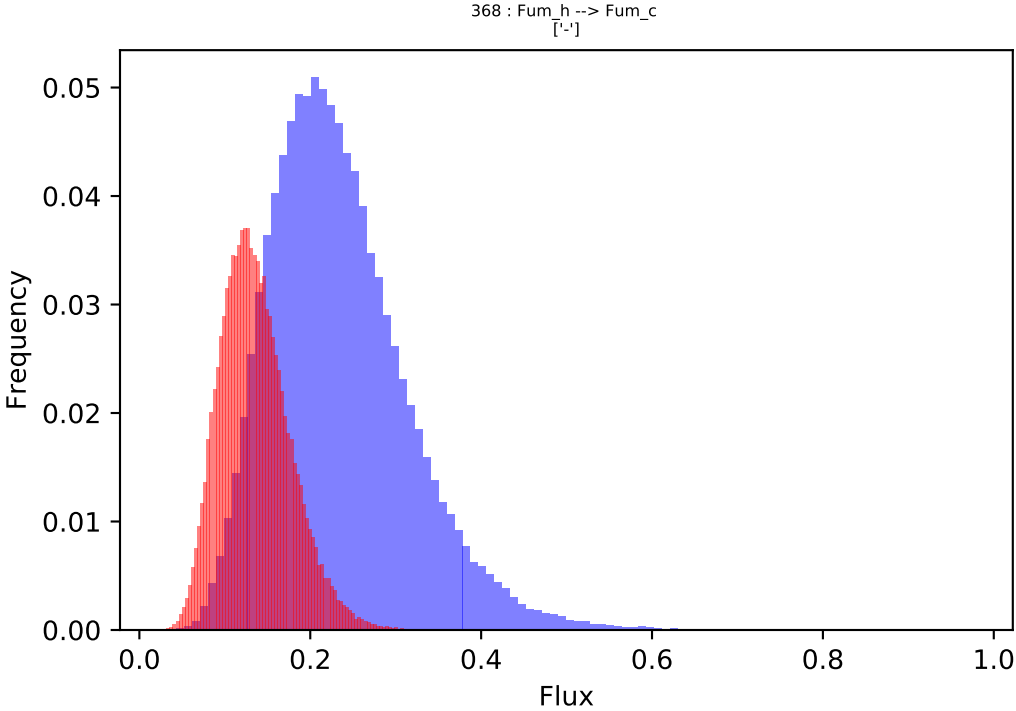

363 : Pro_c --> Pro_m
['-']
0.016
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
0
20
40
60
80
100
Flux

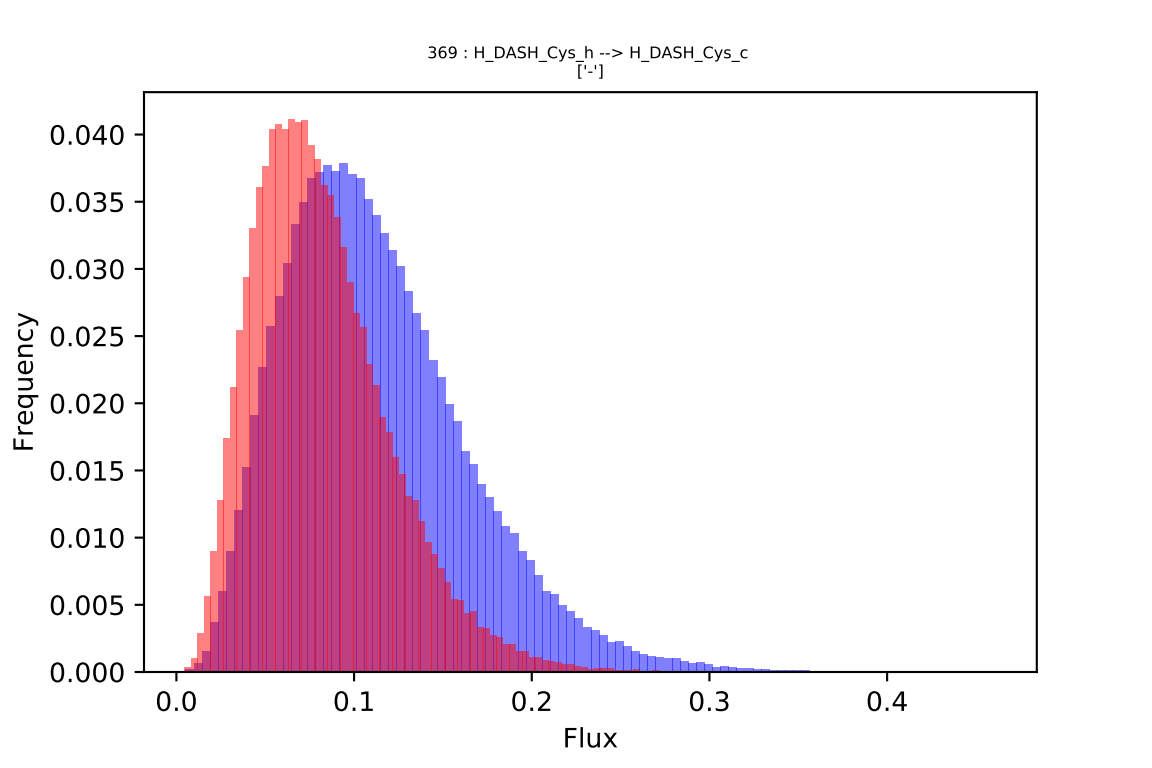

364 : Glu_m + Pro_c --> Glu_c + Pro_m
['-']
0.016
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
0
20
40
60
80
100
Flux

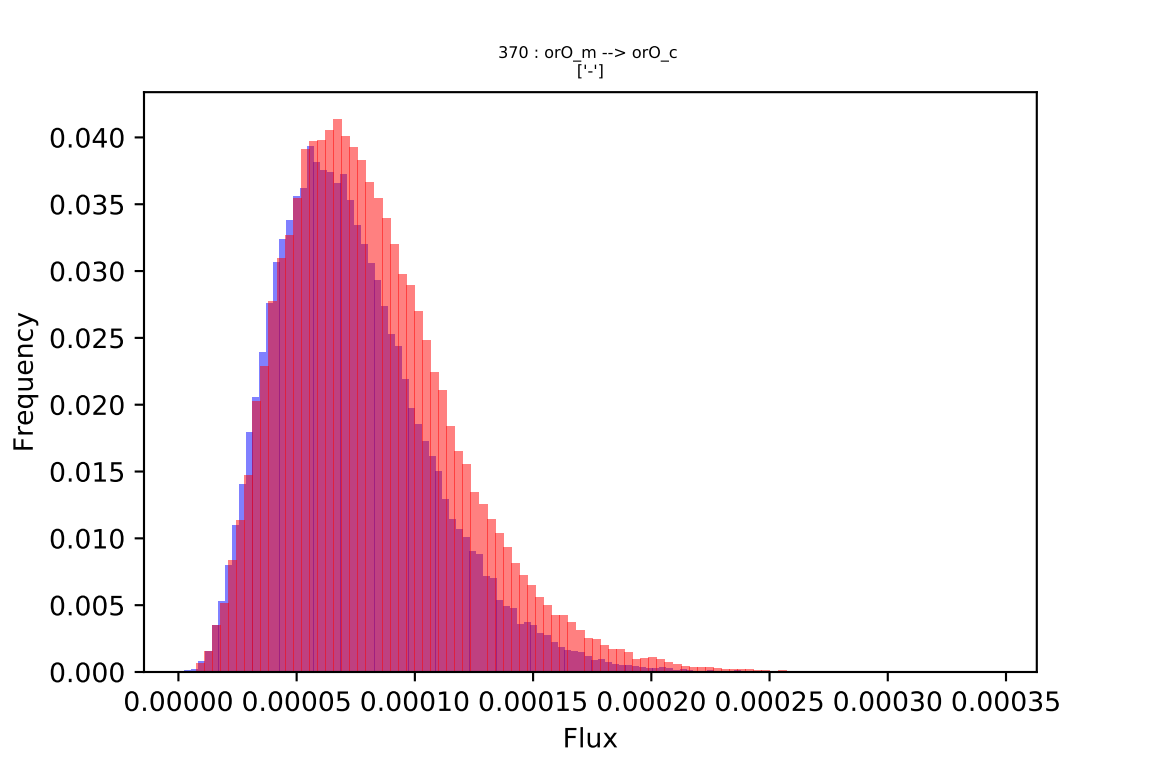

365 : P5C_h --> P5C_c
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0
1
2
3
4
5
Flux

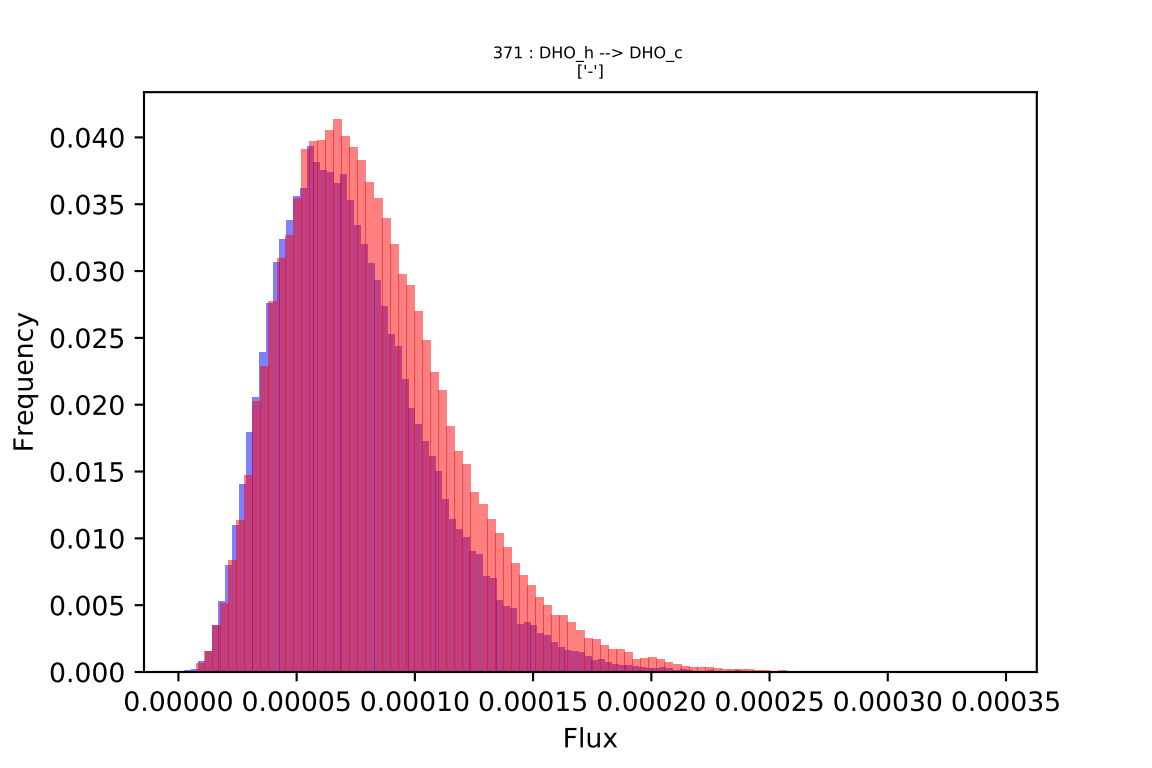

366 : P5C_m --> P5C_c
['-']
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
30
40
50
60
70
80
90
100
Flux

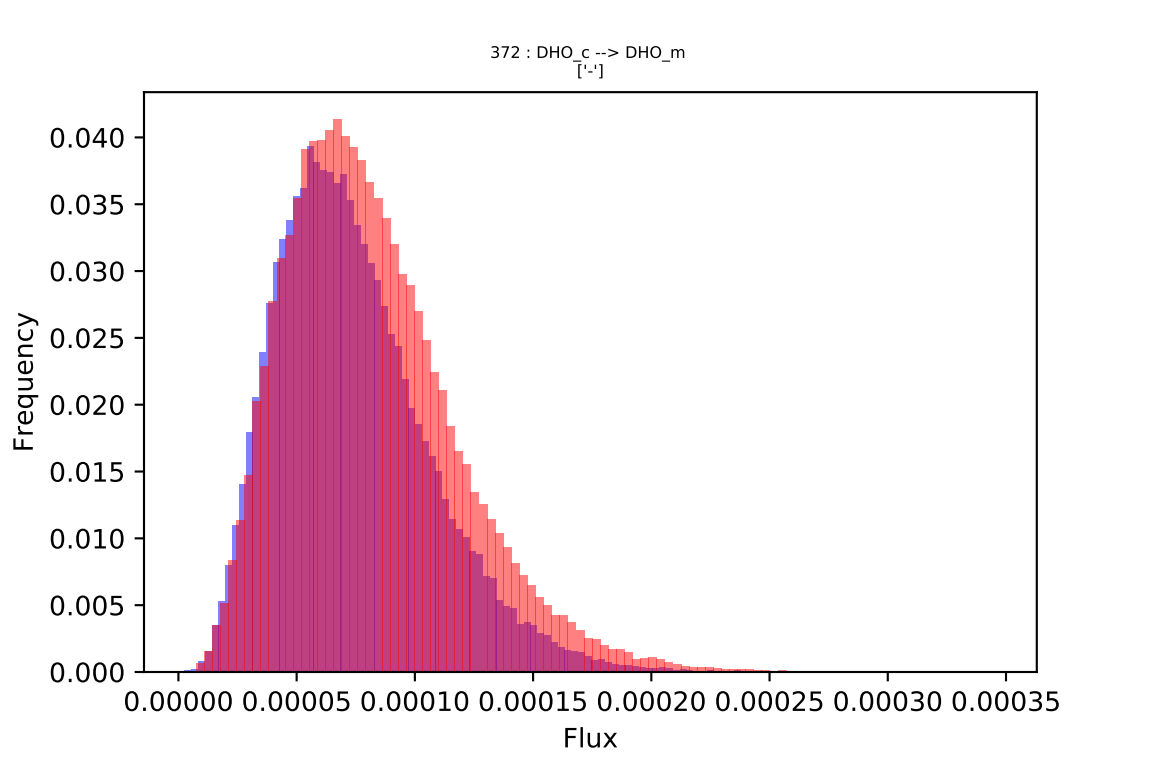

367 : H_h + PRPP_h --> PRPP_c
['-']
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

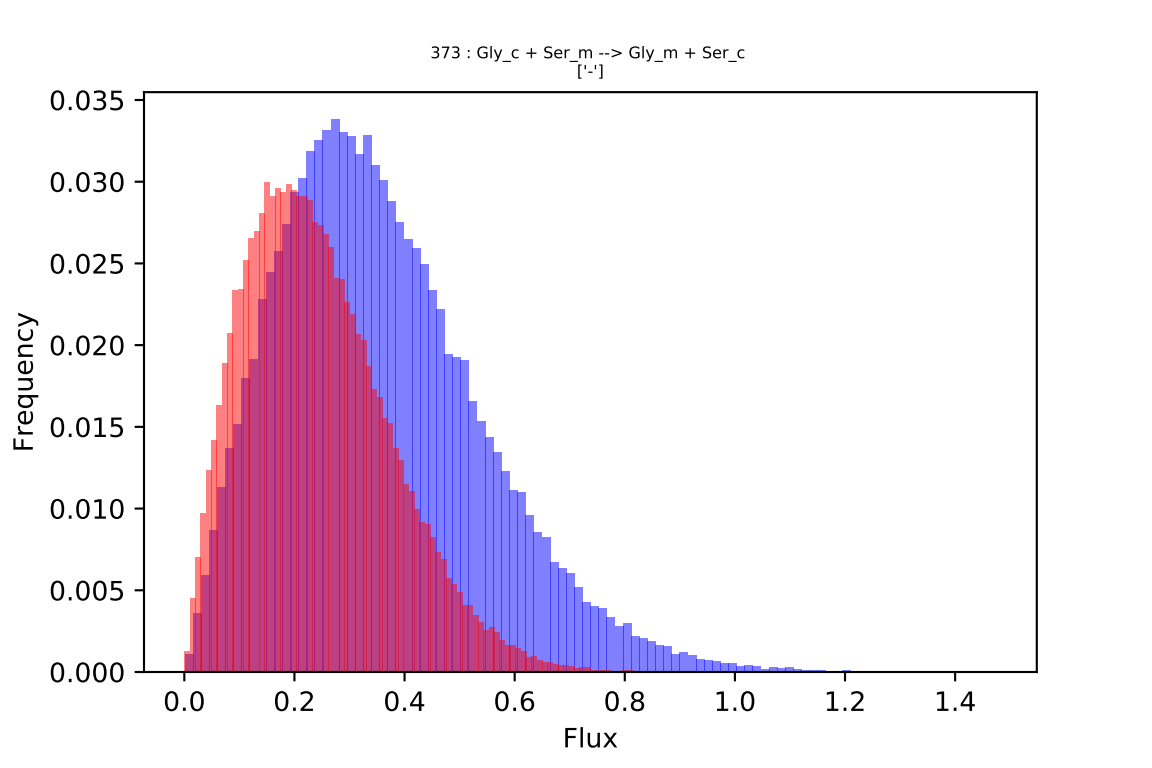

368 : Fum_h --> Fum_c
['-']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0.0
0.2
0.4
0.6
0.8
1.0

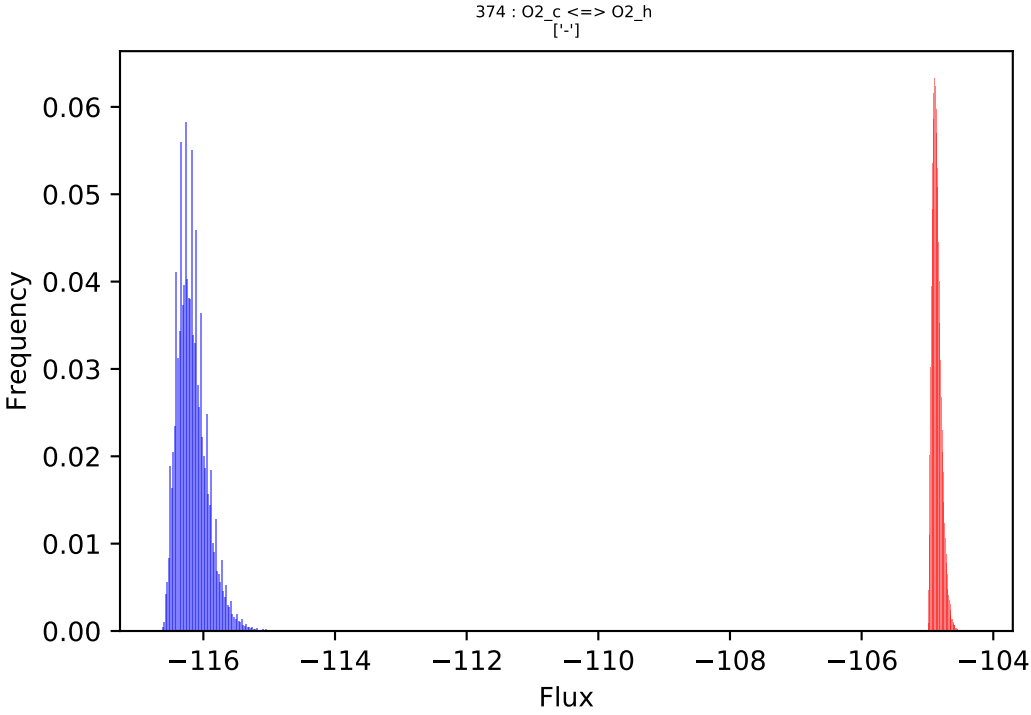

369 : H_DASH_Cys_h --> H_DASH_Cys_c
['-']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.1
0.2
0.3
0.4
Flux

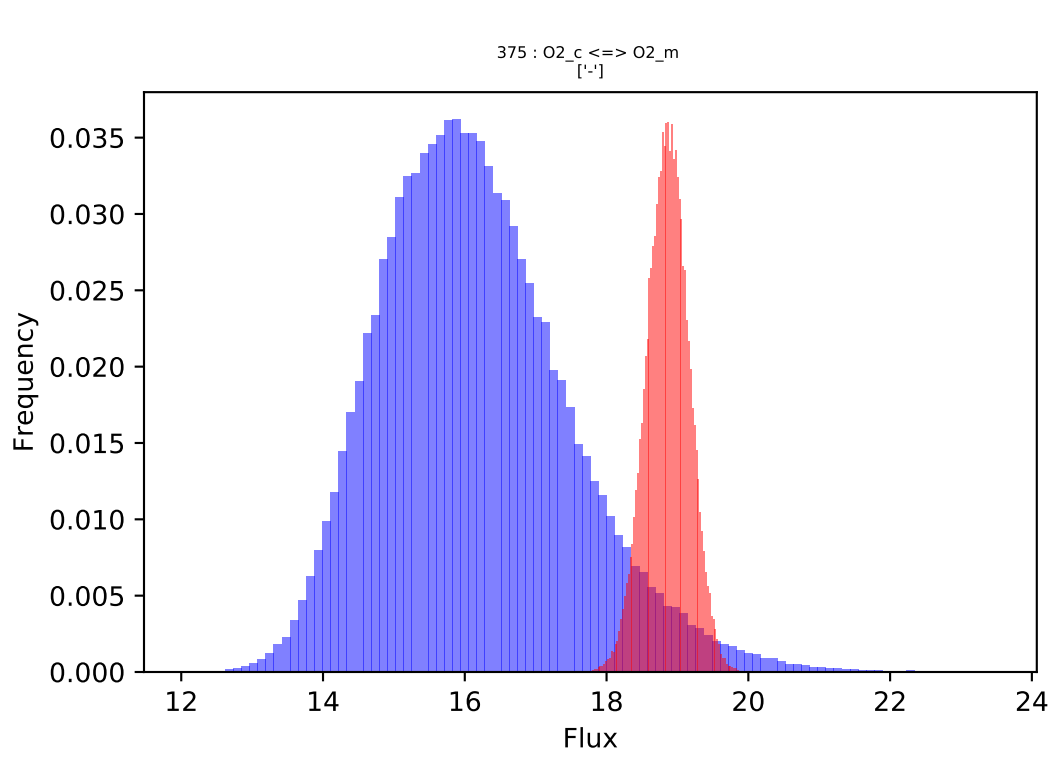

370 : orO_m --> orO_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.00000 0.00005 0.00010 0.00015 0.00020 0.00025 0.00030 0.00035
Flux

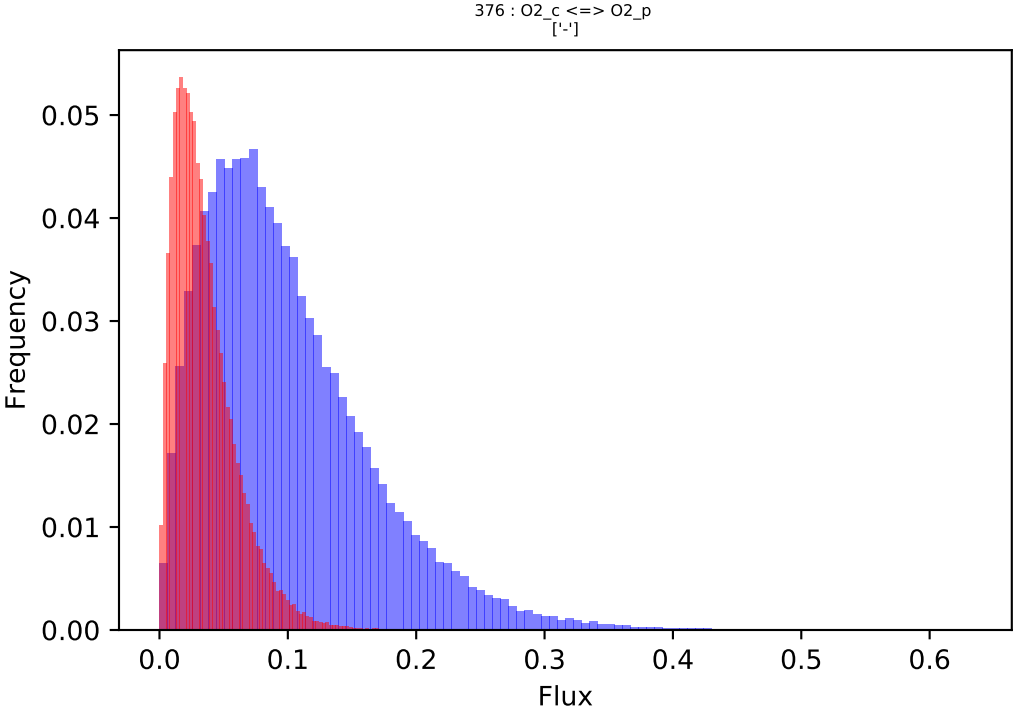

371 : DHO_h --> DHO_c
['-']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000 0.00005 0.00010 0.00015 0.00020 0.00025 0.00030 0.00035
Flux

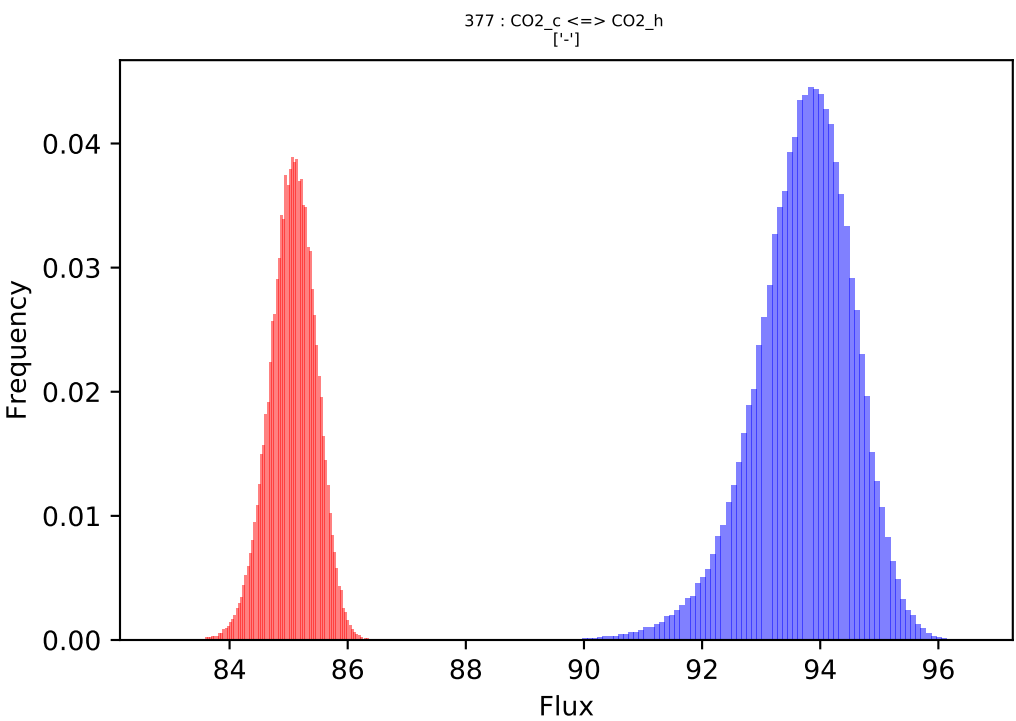

372 : DHO_c --> DHO_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.00000 0.00005 0.00010 0.00015 0.00020 0.00025 0.00030 0.00035
Flux

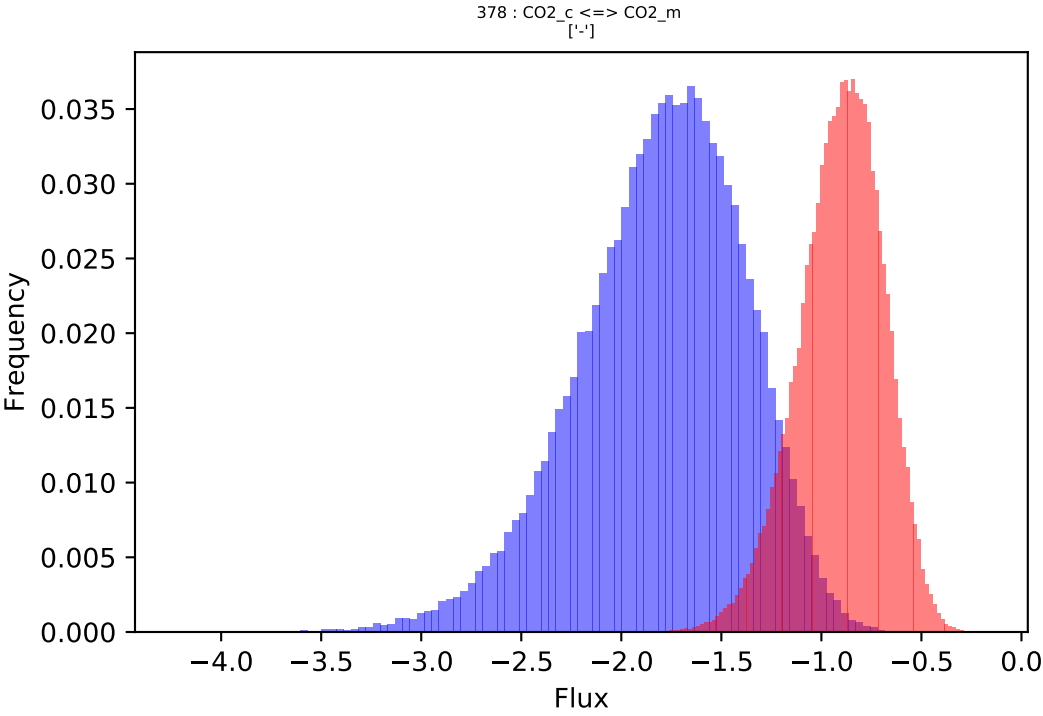

373 : Gly_c + Ser_m --> Gly_m + Ser_c
['-']
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

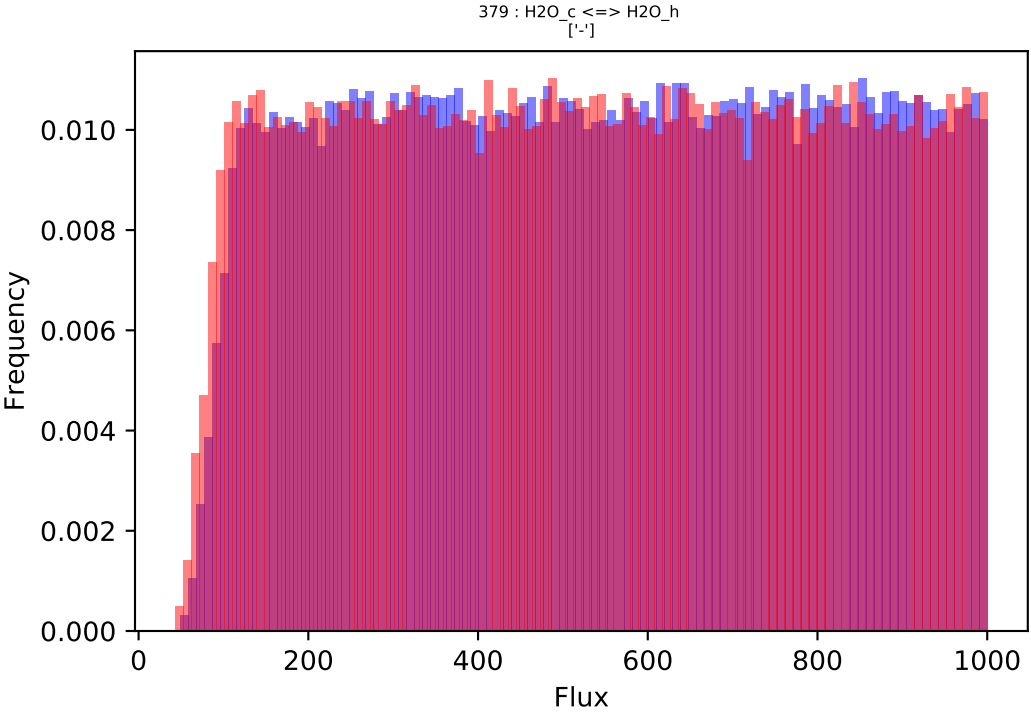

374 : O2_c <=> O2_h
['-']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
−116
−114
−112
−110
−108
−106
−104
Flux

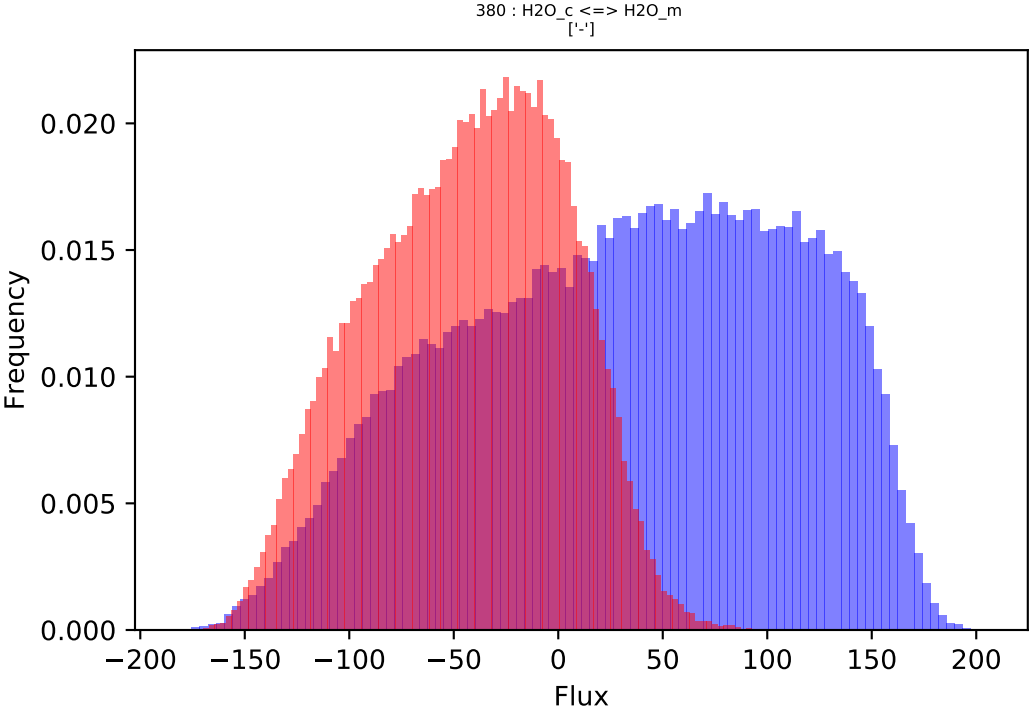

375 : O2_c <=> O2_m
['-']
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
12
14
16
18
20
22
24
Flux

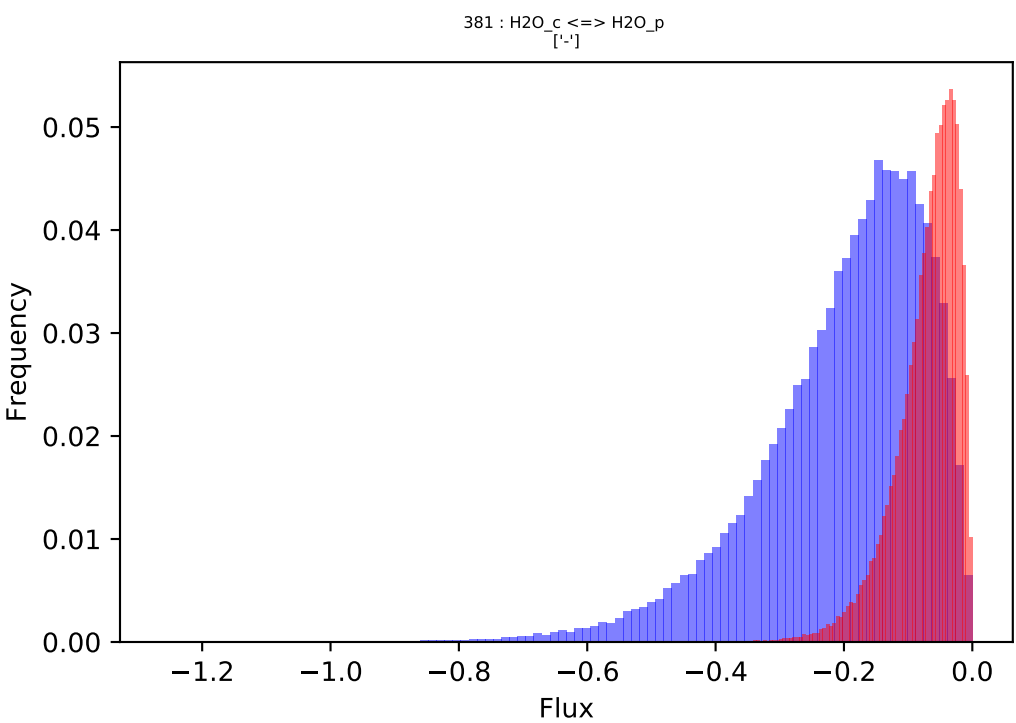

376 : O2_c <=> O2_p
['-']
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Flux

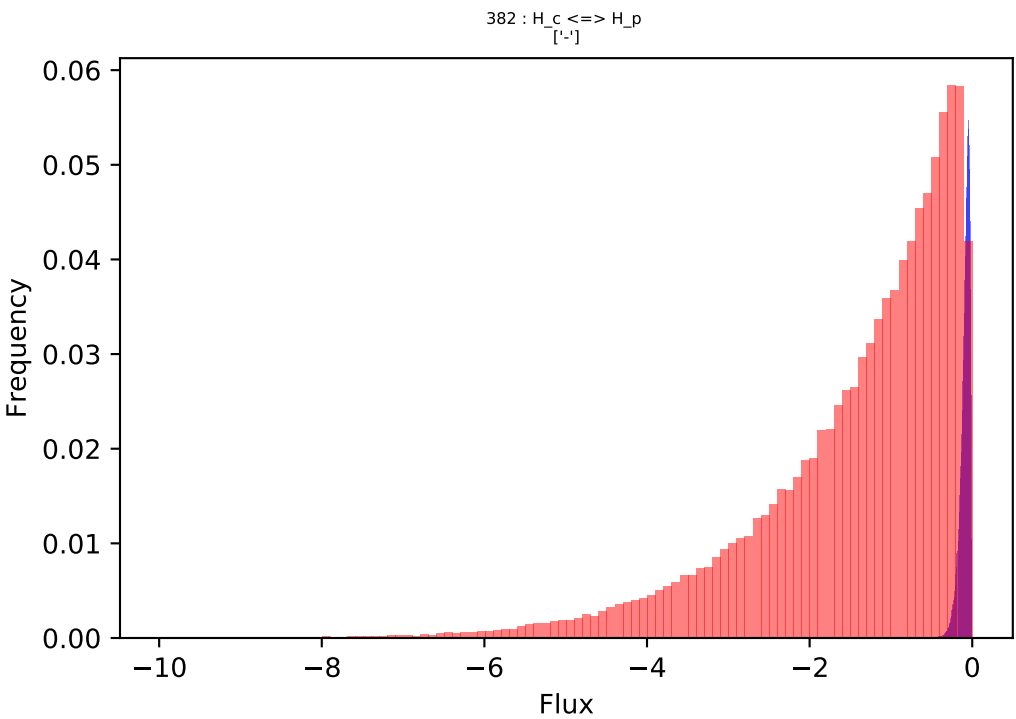

377 : CO2_c <=> CO2_h
['-']
Frequency
0.00
0.01
0.02
0.03
0.04
84
86
88
90
92
94
96
Flux

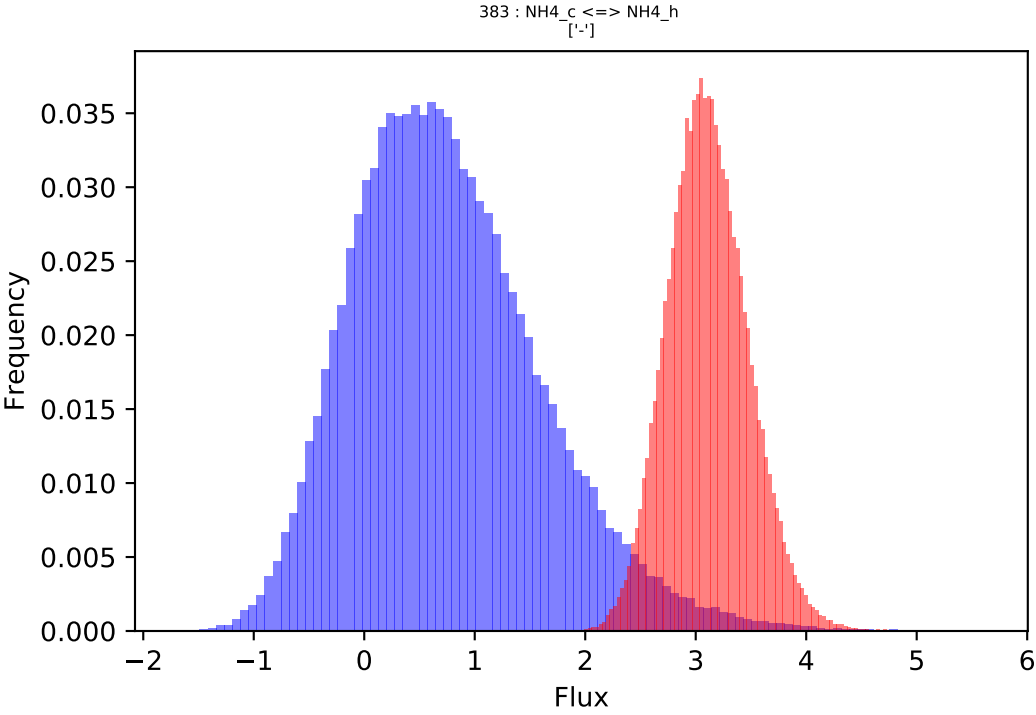

378 : CO2_c <=> CO2_m
['-']
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−4.0
−3.5
−3.0
−2.5
−2.0
−1.5
−1.0
−0.5
0.0
Flux

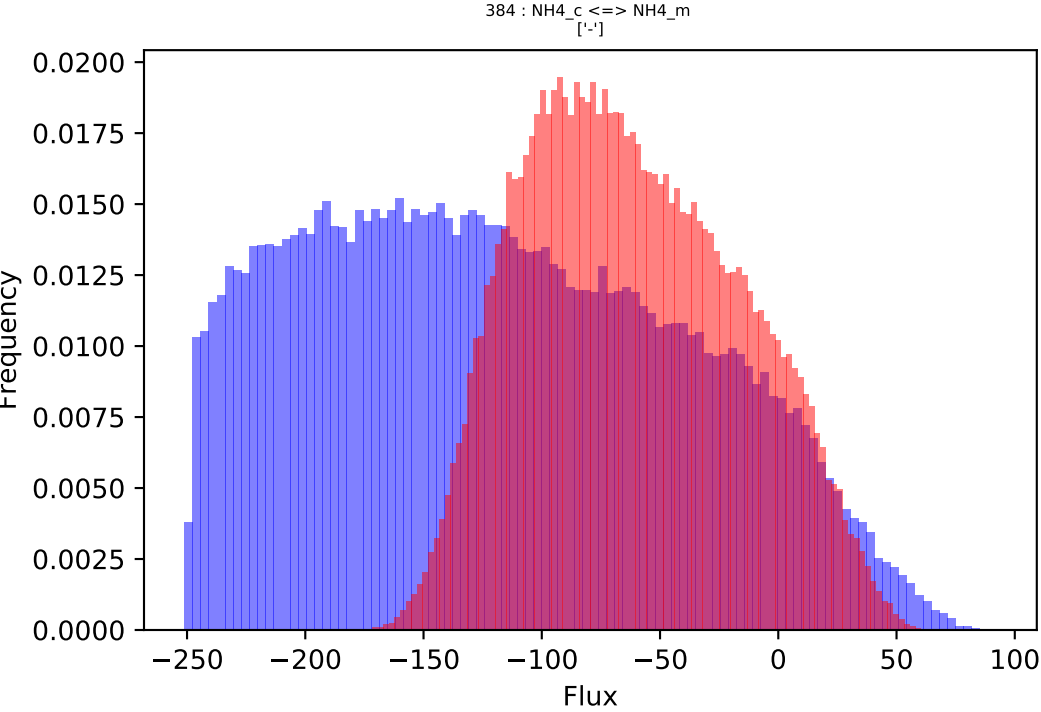

379 : H2O_c <=> H2O_h
['-']
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
0
200
400
600
800
1000
Flux

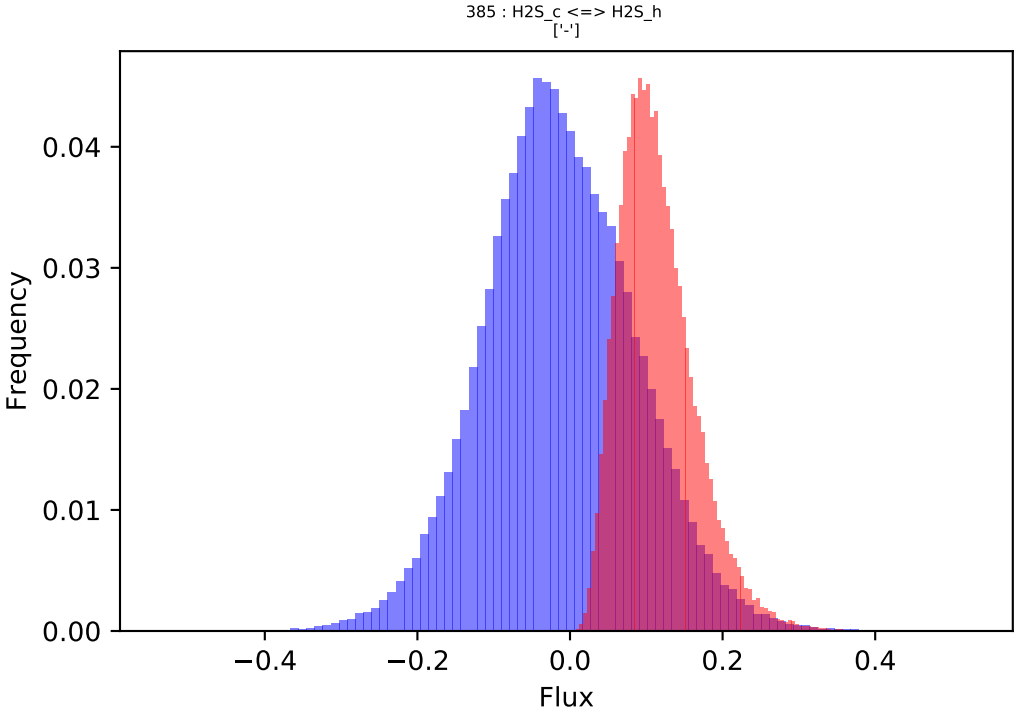

380 : H2O_c <=> H2O_m
['-']
0.020
0.015
0.010
0.005
0.000
Frequency
−200
−150
−100
−50
0
50
100
150
200
Flux

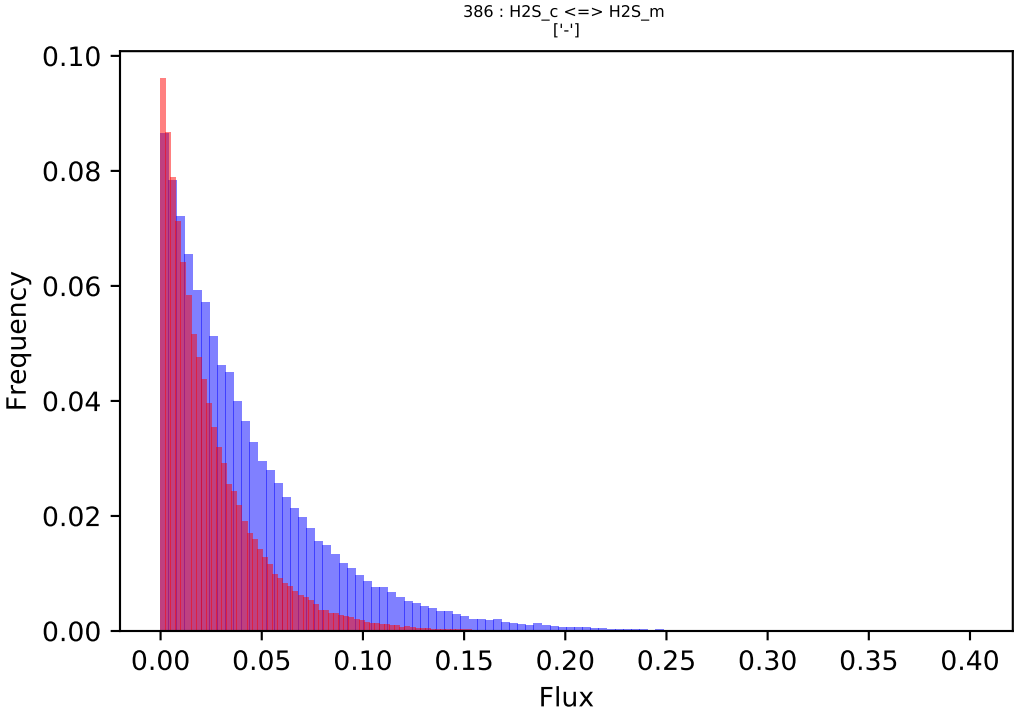

381 : H2O_c <=> H2O_p
['-']
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
−1.2
−1.0
−0.8
−0.6
−0.4
−0.2
0.0
Flux

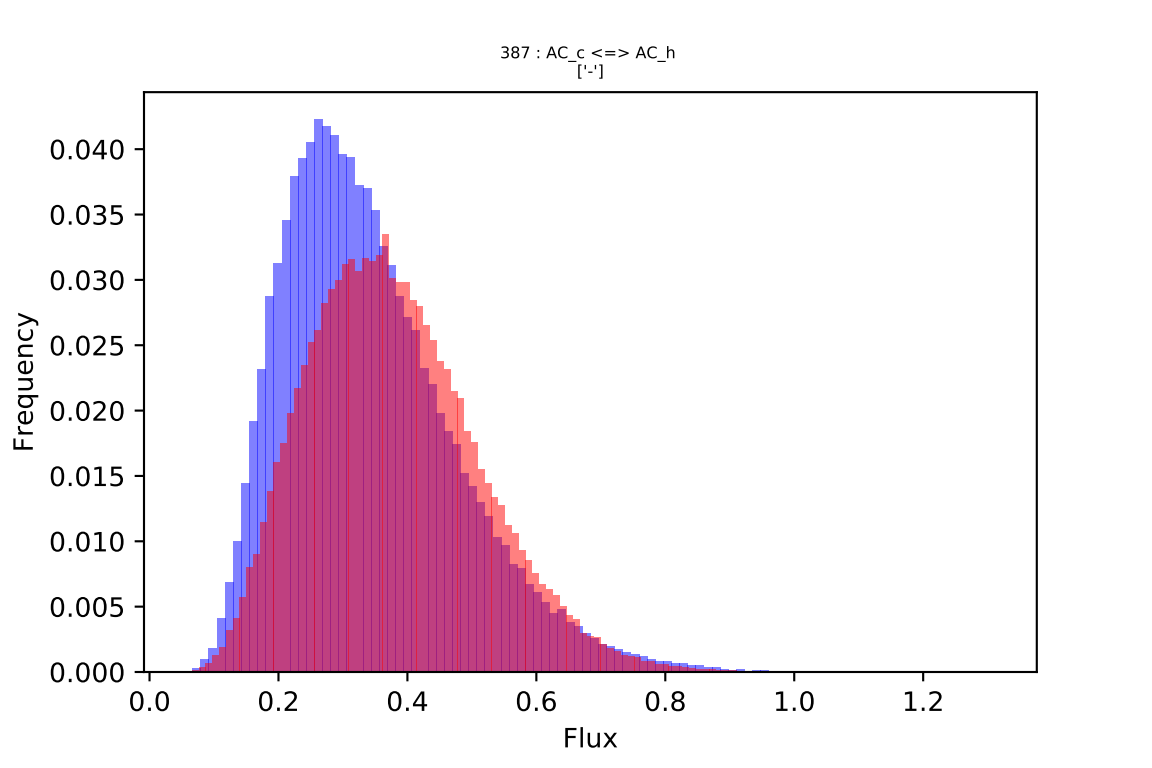

382 : H_c <=> H_p
['-']
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
−10
−8
−6
−4
−2
0
Flux

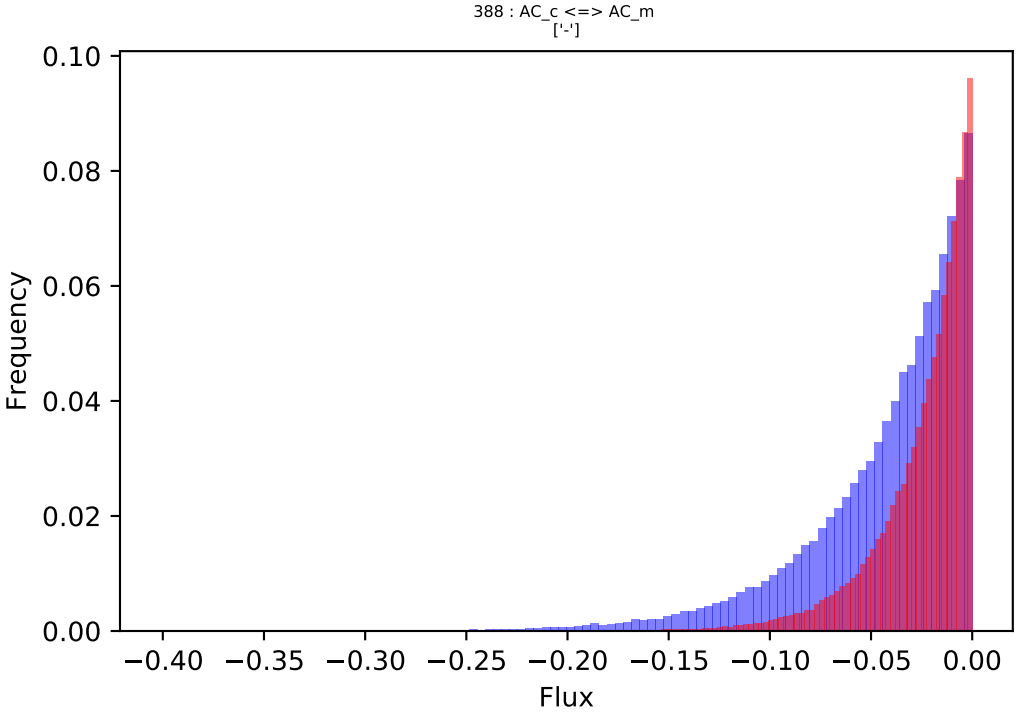

383 : NH4_c <=> NH4_h
['-']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
−2
−1
0
1
2
3
4
5
6
Flux

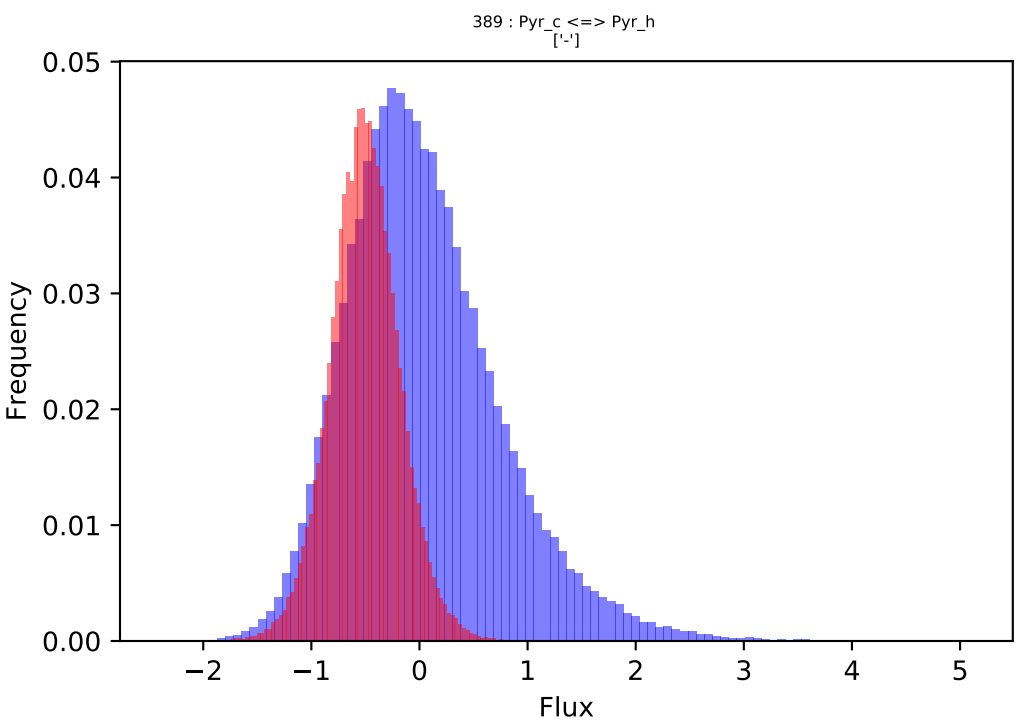

384 : NH4_c <=> NH4_m
['-']
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
Frequency
−250
−200
−150
−100
−50
0
50
100
Flux

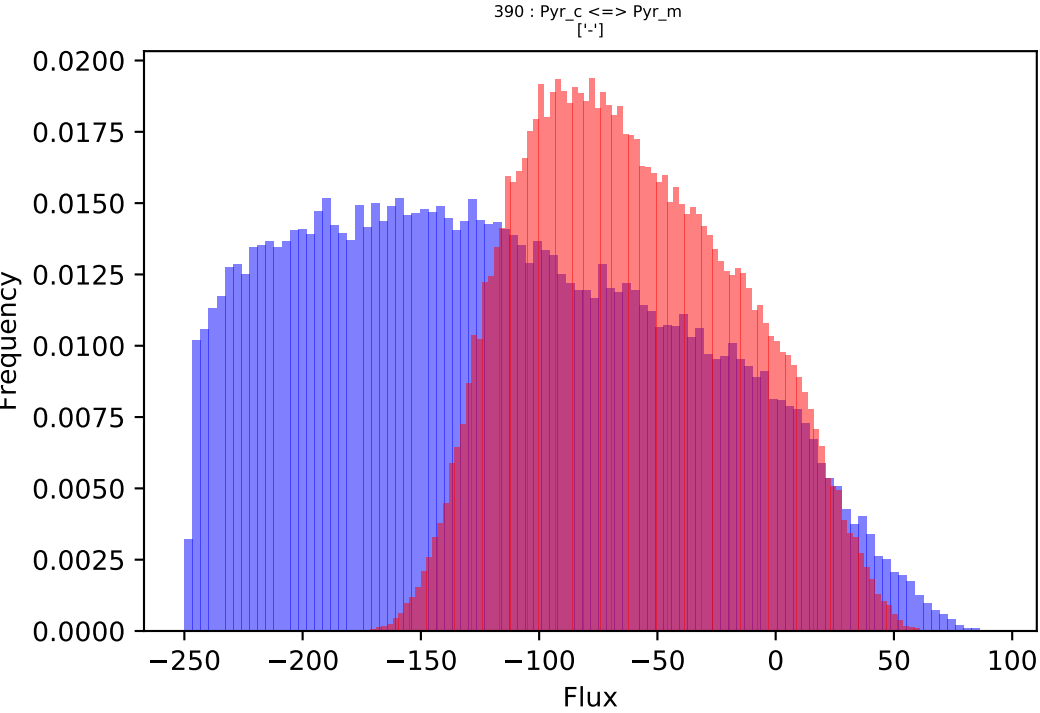

385 : H2S_c <=> H2S_h
['-']
0.04
0.03
0.02
0.01
0.00
Frequency
−0.4
−0.2
0.0
0.2
0.4
Flux

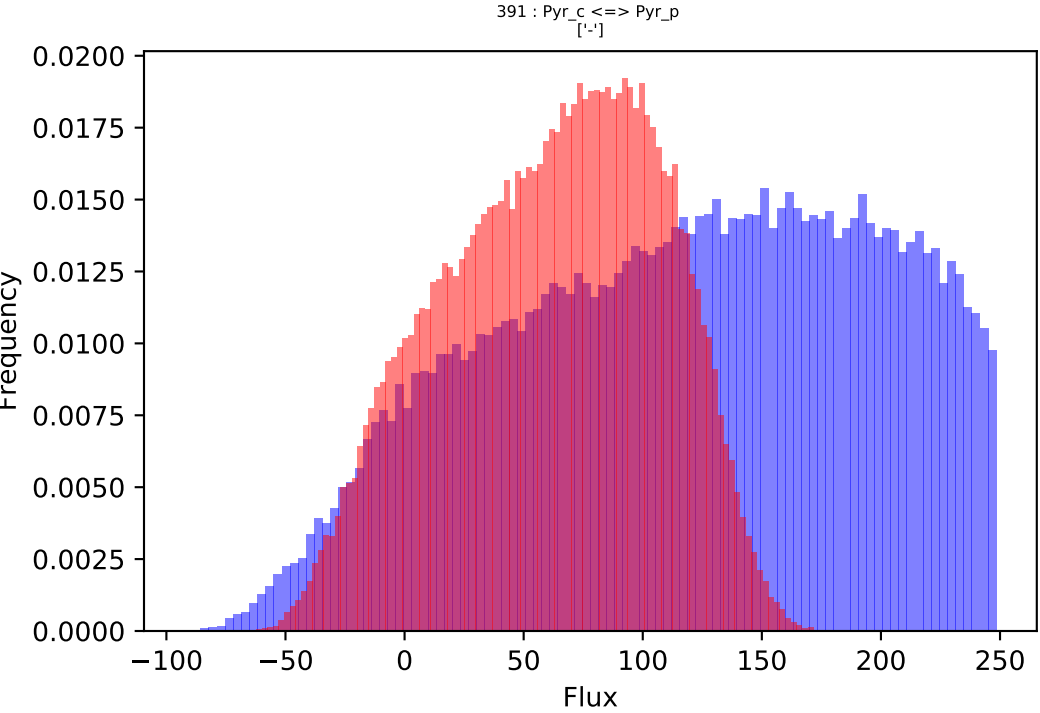

386 : H2S_c <=> H2S_m
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
Flux

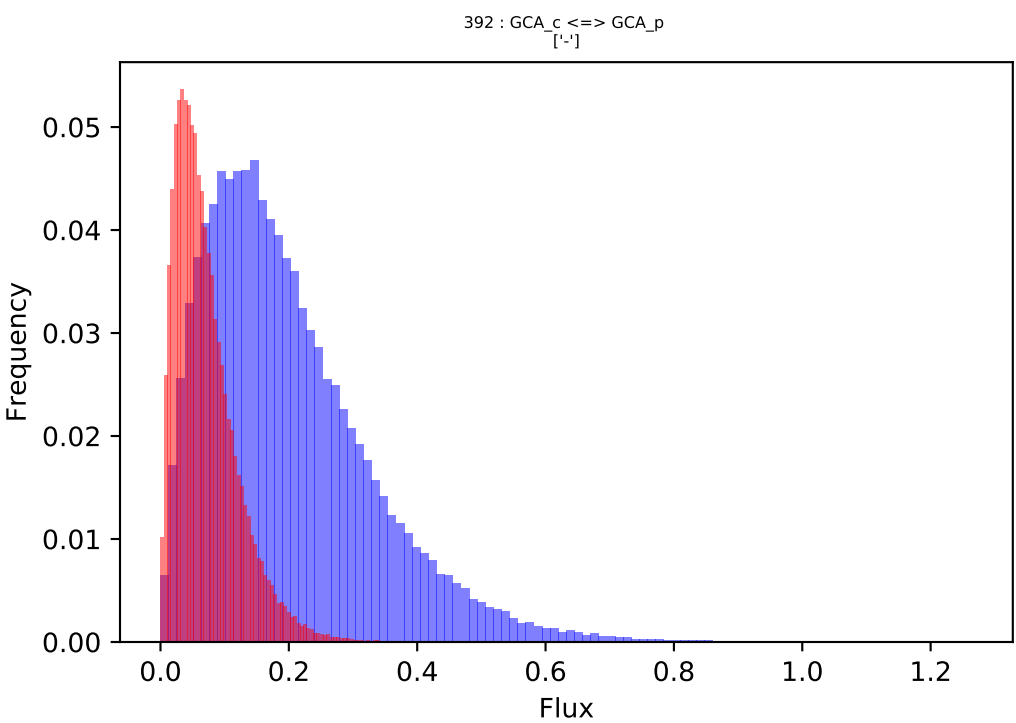

387 : AC_c <=> AC_h
['-']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Flux

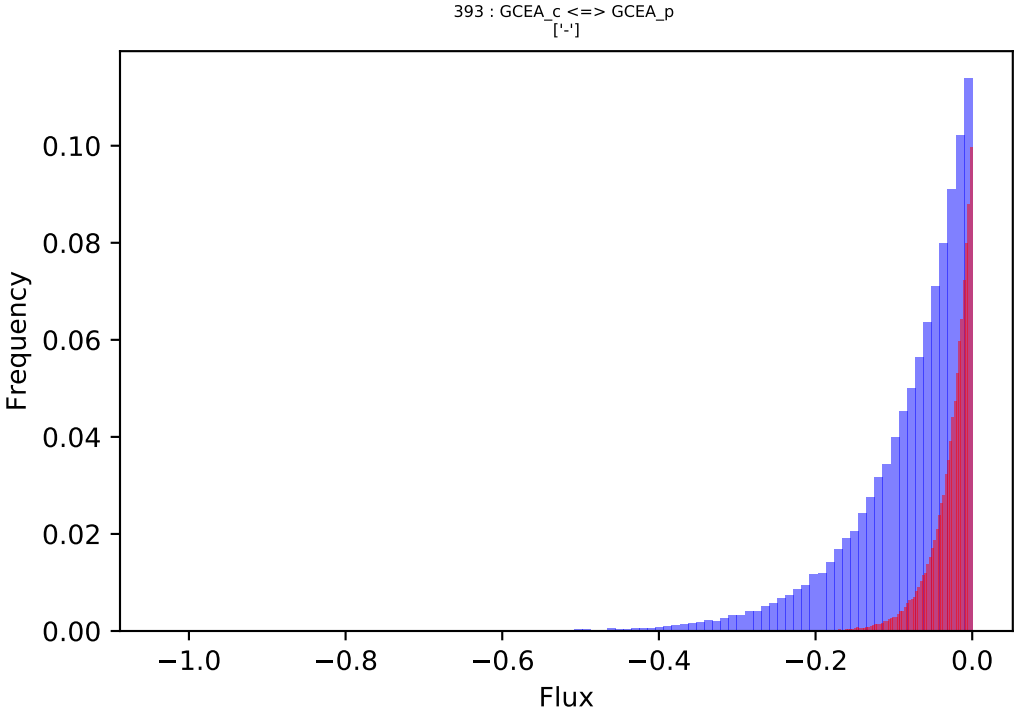

388 : AC_c <=> AC_m
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
−0.40
−0.35
−0.30
−0.25
−0.20
−0.15
−0.10
−0.05
0.00
Flux

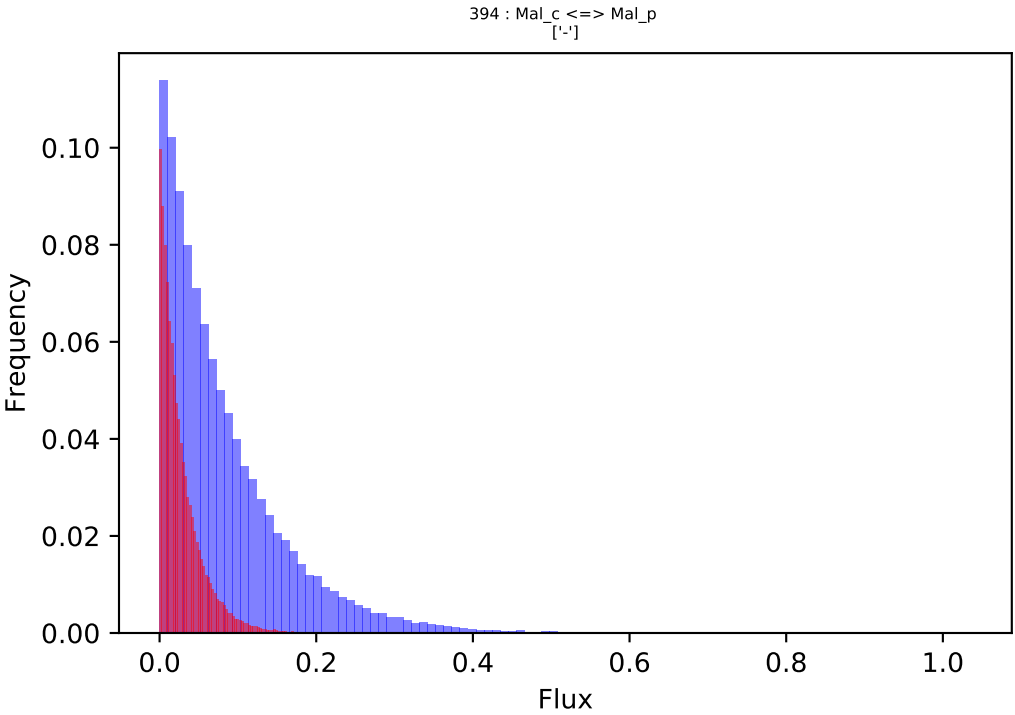

389 : Pyr_c <=> Pyr_h
['-']
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
−2
−1
0
1
2
3
4
5
Flux

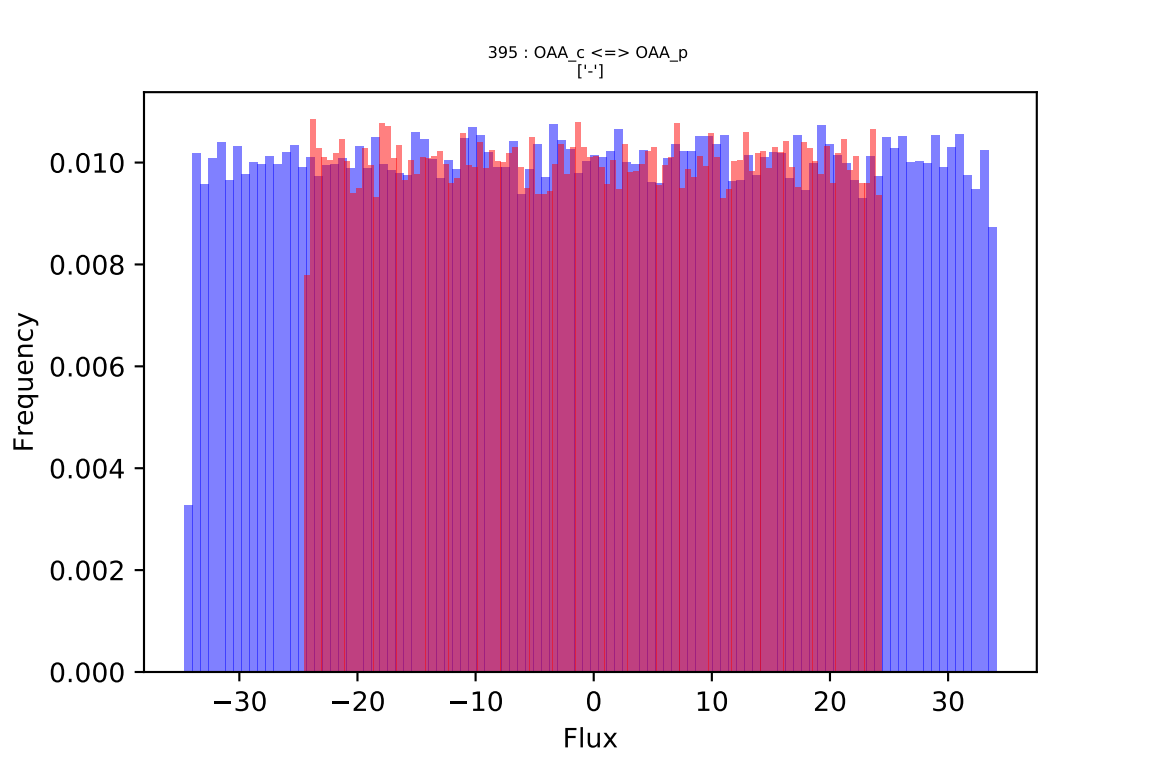

390 : Pyr_c <=> Pyr_m
['-']
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
Frequency
−250
−200
−150
−100
−50
0
50
100
Flux

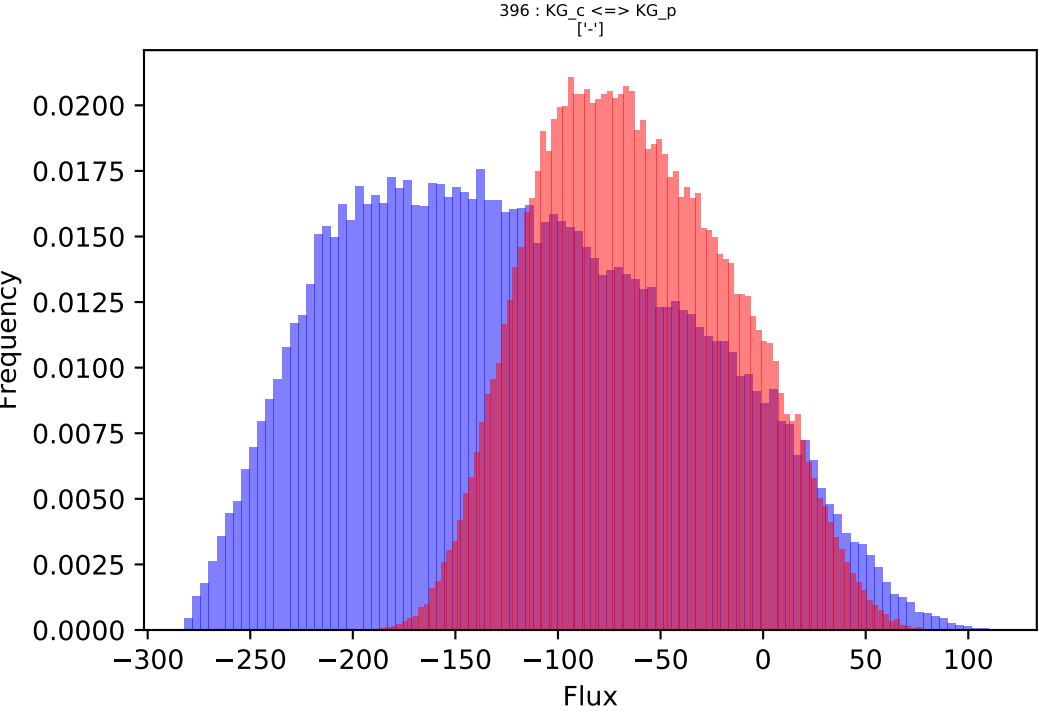

391 : Pyr_c <=> Pyr_p
['-']
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
Frequency
−100
−50
0
50
100
150
200
250
Flux

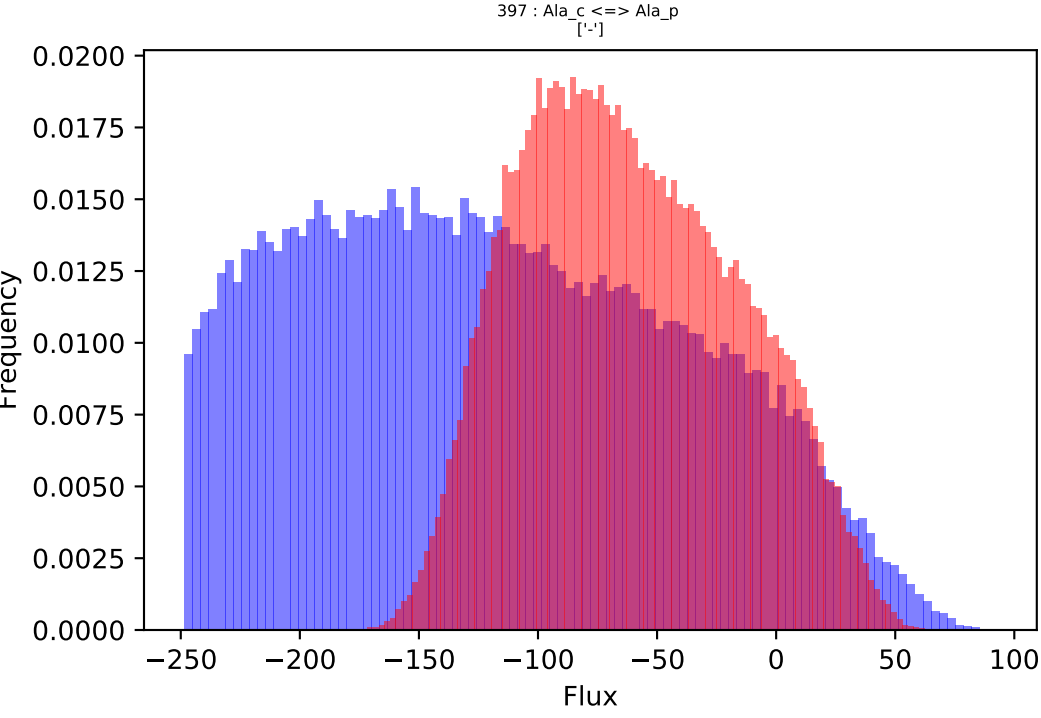

392 : GCA_c <=> GCA_p
['-']
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Flux

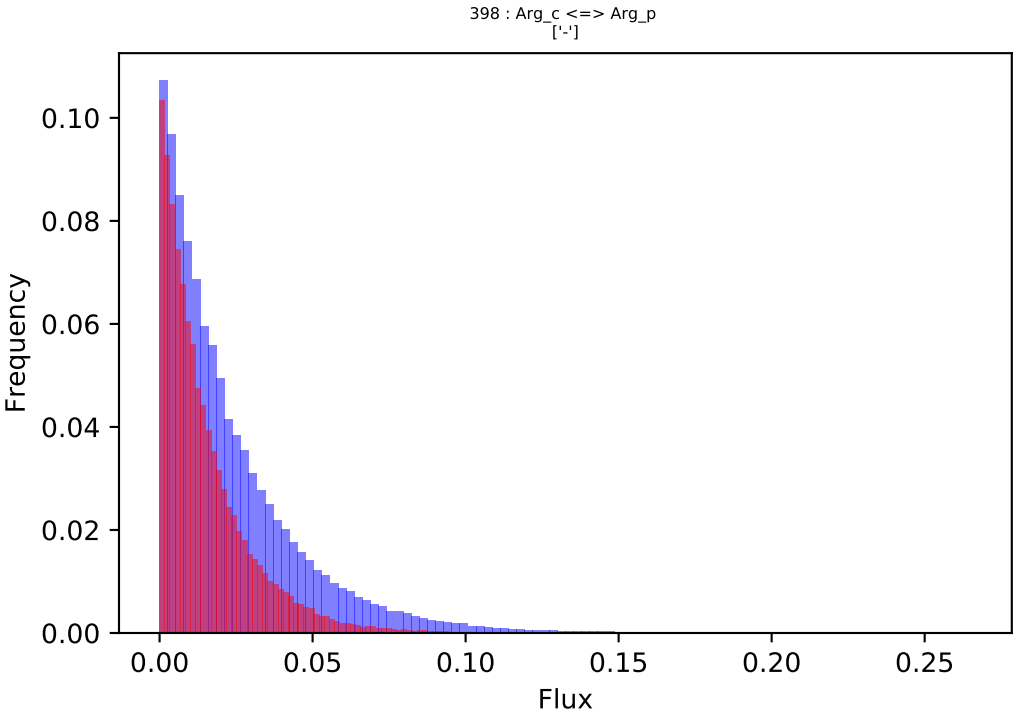

393 : GCEA_c <=> GCEA_p
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
−1.0
−0.8
−0.6
−0.4
−0.2
0.0
Flux

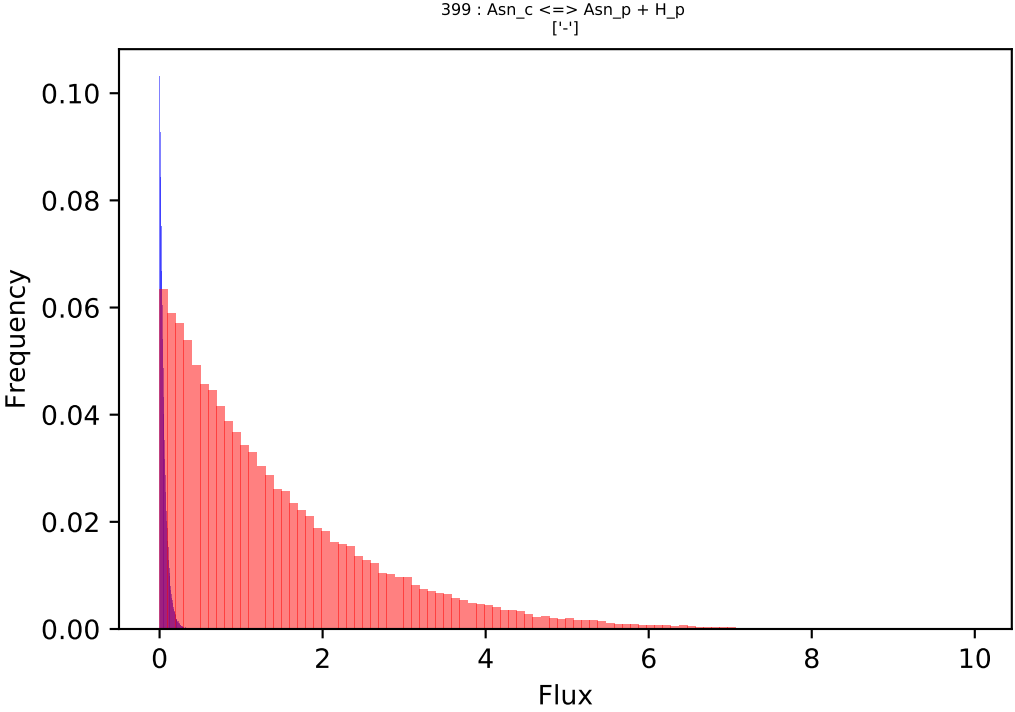

394 : Mal_c <=> Mal_p
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.0
0.2
0.4
0.6
0.8
1.0
Flux

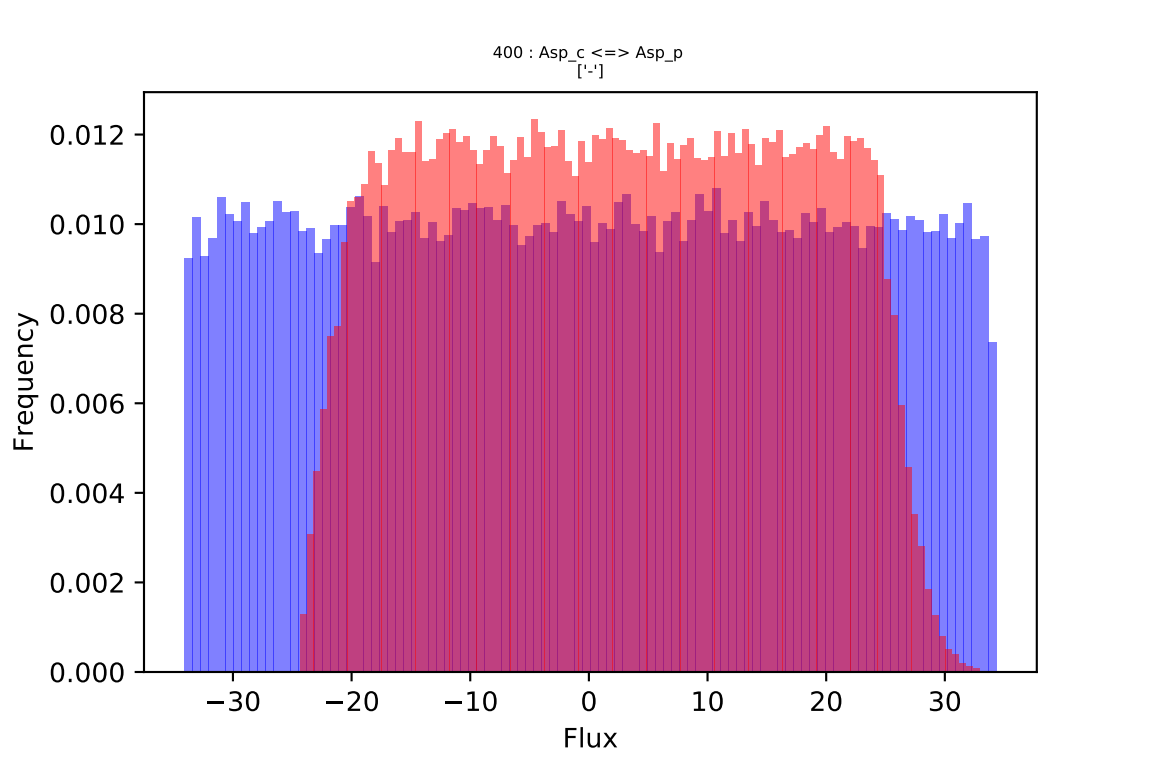

395 : OAA_c <=> OAA_p
['-']
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−30
−20
−10
0
10
20
30
Flux

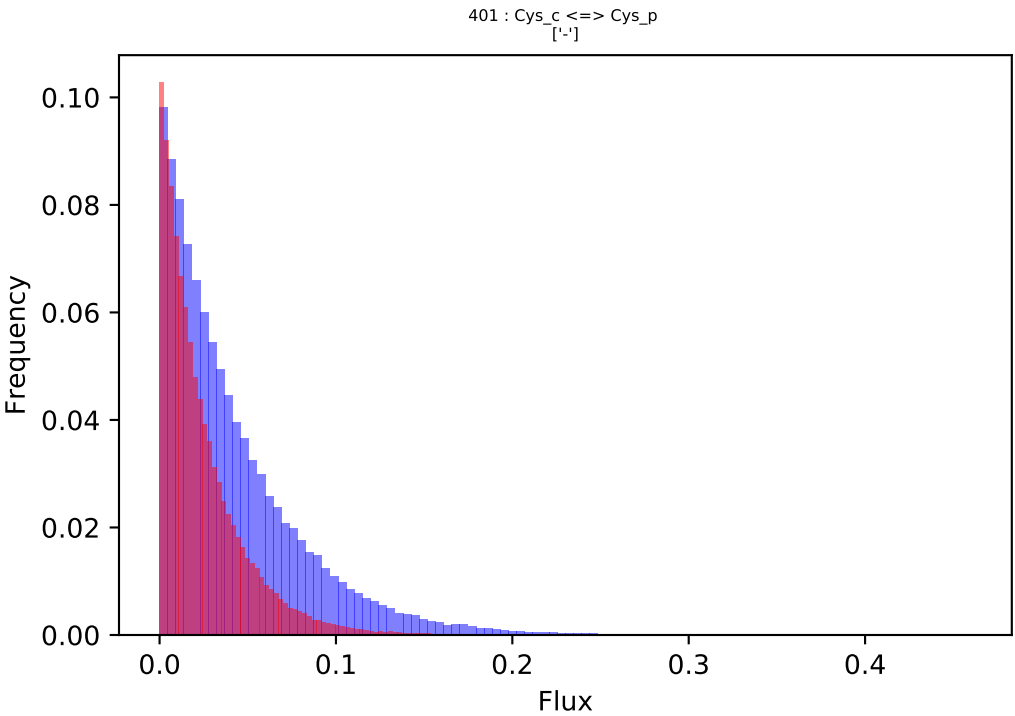

396 : KG_c <=> KG_p
['-']
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
Frequency
−300
−250
−200
−150
−100
−50
0
50
100
Flux

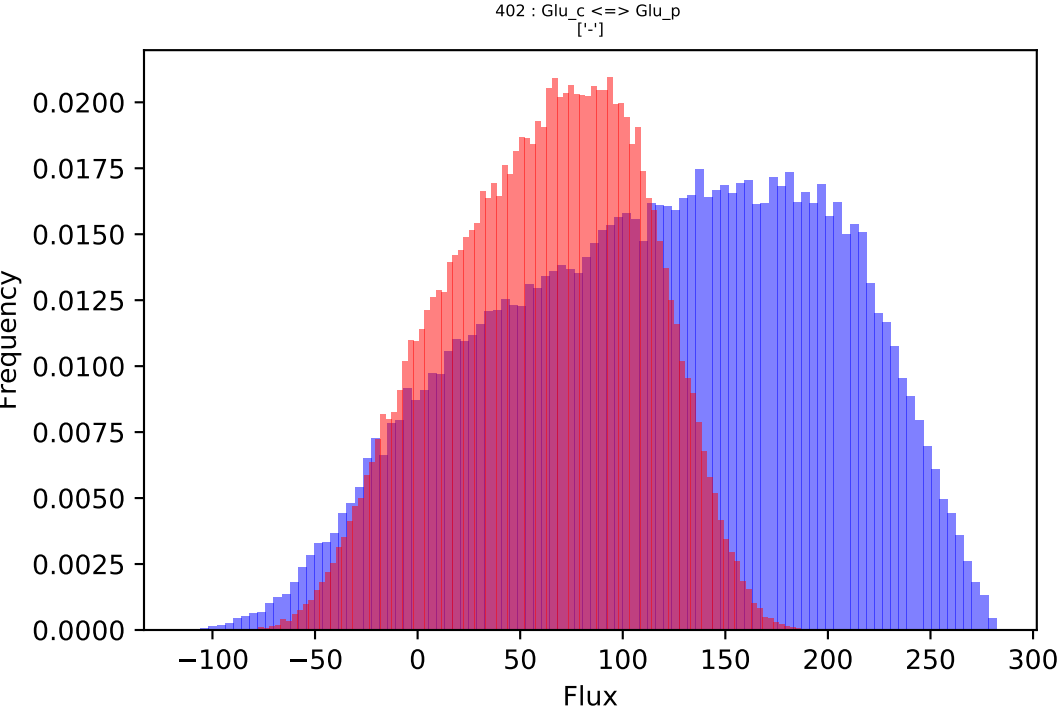

397 : Ala_c <=> Ala_p
['-']
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
Frequency
−250
−200
−150
−100
−50
0
50
100
Flux

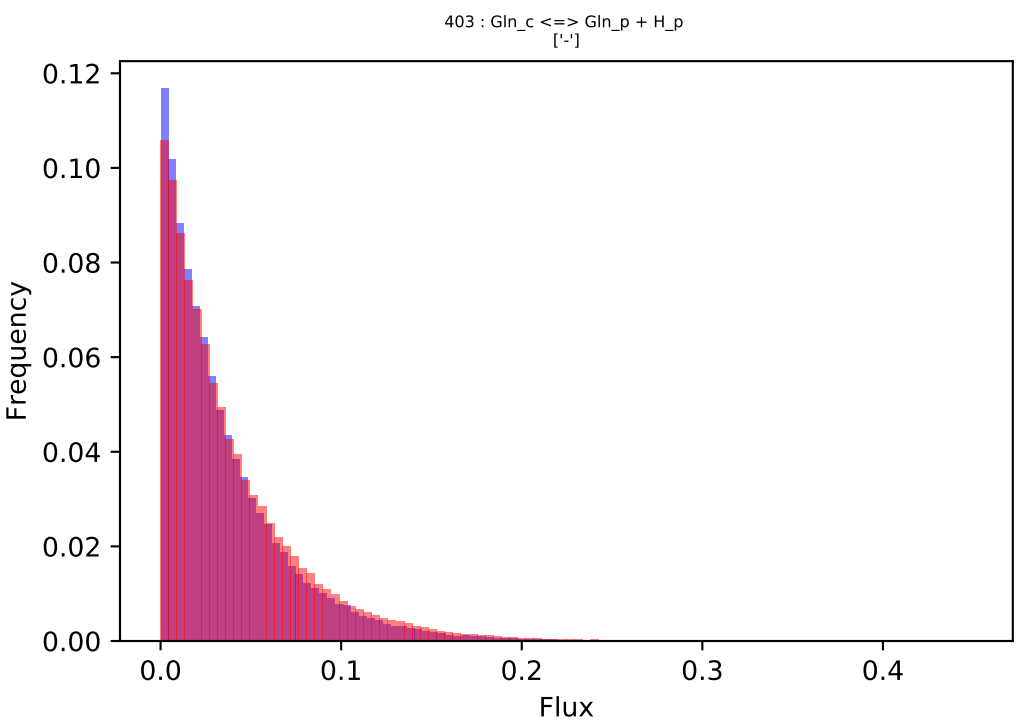

398 : Arg_c <=> Arg_p
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.05
0.10
0.15
0.20
0.25
Flux

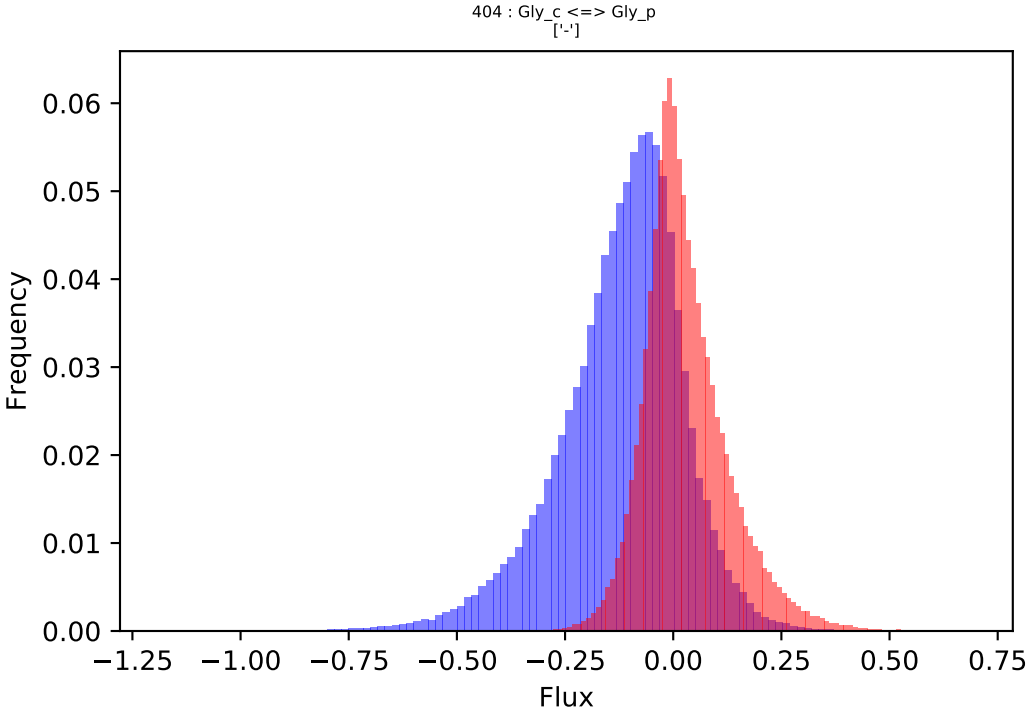

399 : Asn_c <=> Asn_p + H_p
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0
2
4
6
8
10
Flux

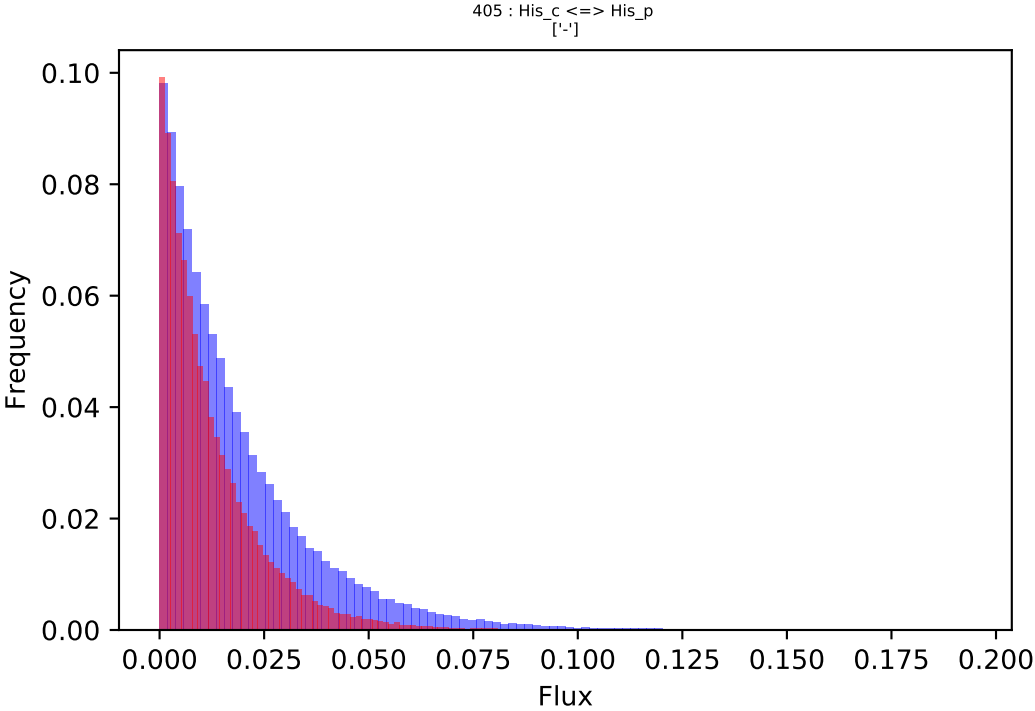

400 : Asp_c <=> Asp_p
['-']
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−30
−20
−10
0
10
20
30
Flux

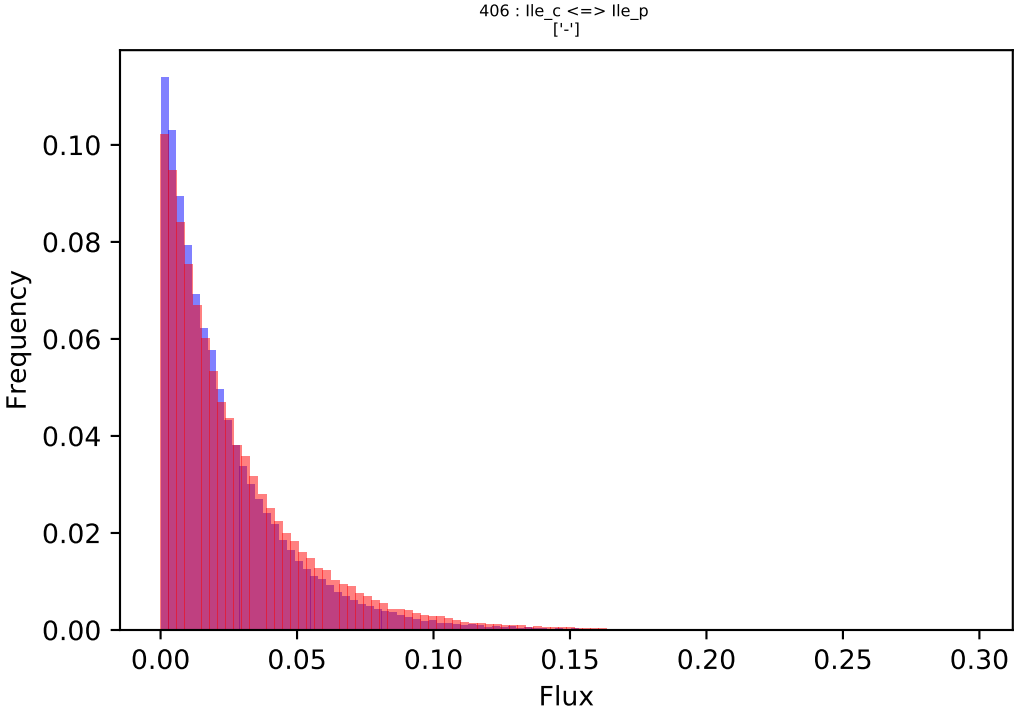

401 : Cys_c <=> Cys_p
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
Flux

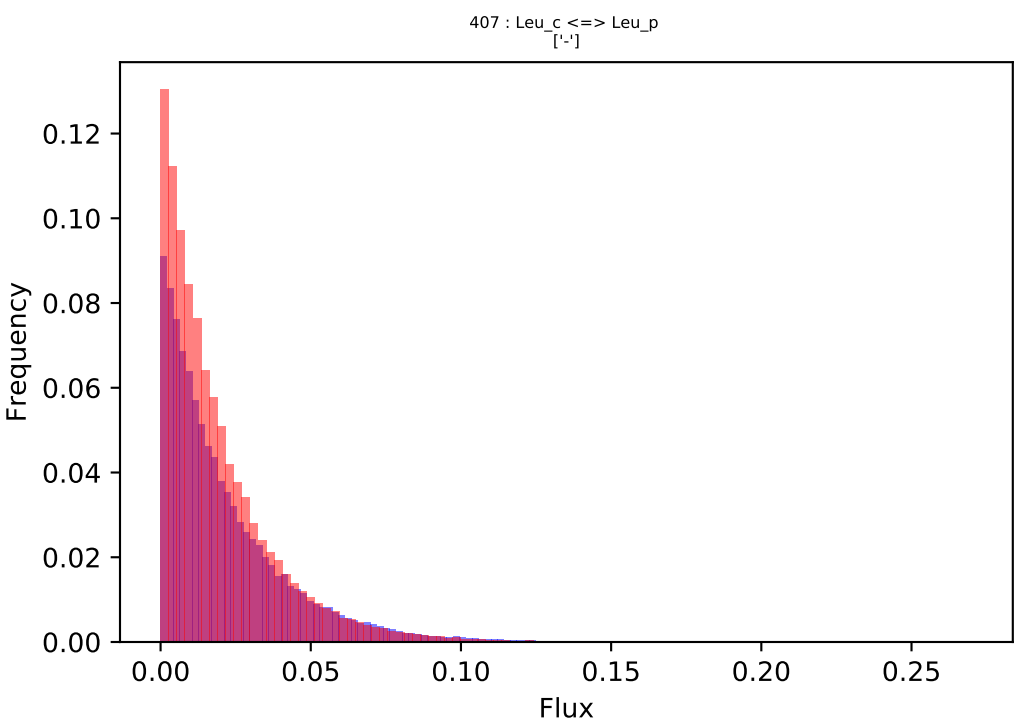

402 : Glu_c <=> Glu_p
['-']
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
Frequency
−100
−50
0
50
100
150
200
250
300
Flux

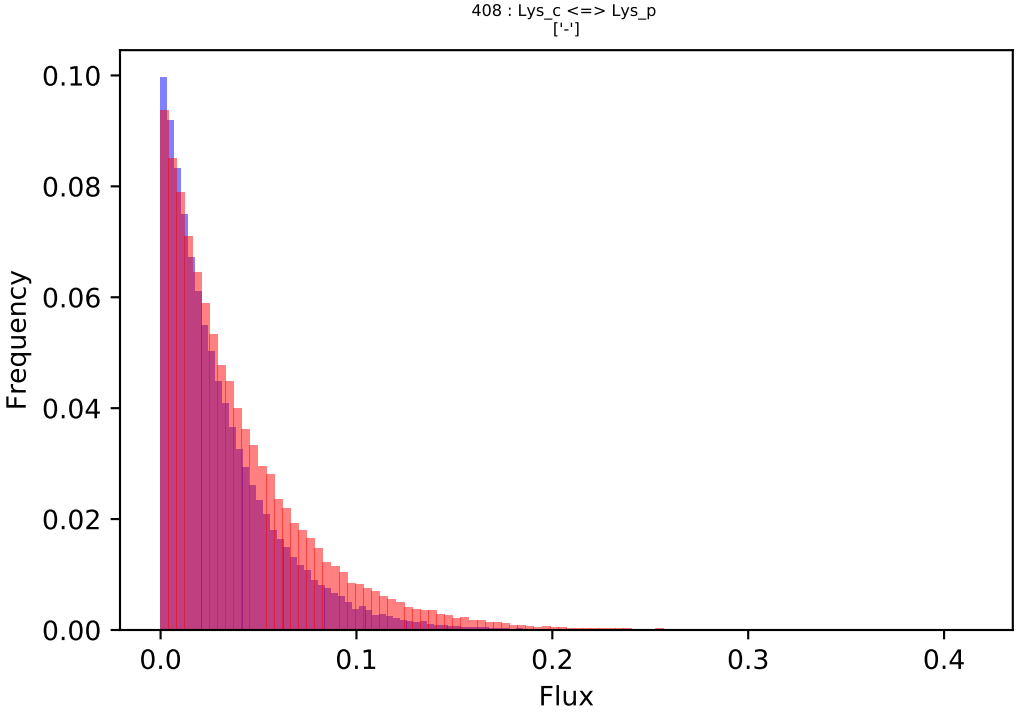

403 : Gln_c <=> Gln_p + H_p
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
Flux

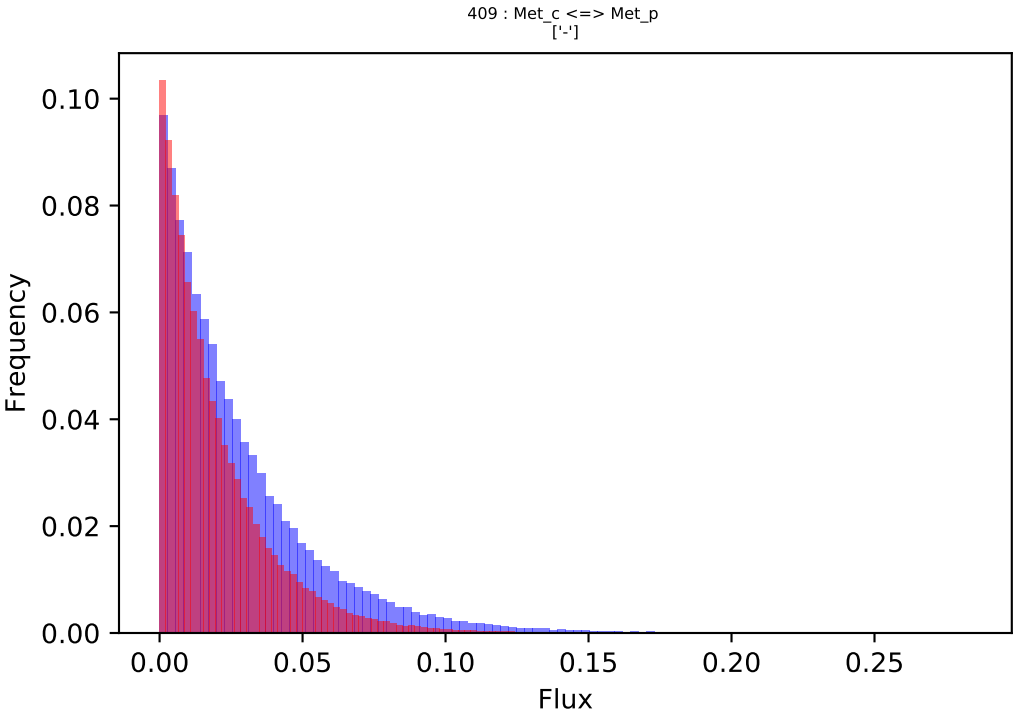

404 : Gly_c <=> Gly_p
['-']
Frequency
0.06
0.05
0.04
0.03
0.02
0.01
0.00
−1.25
−1.00
−0.75
−0.50
−0.25
0.00
0.25
0.50
0.75
Flux

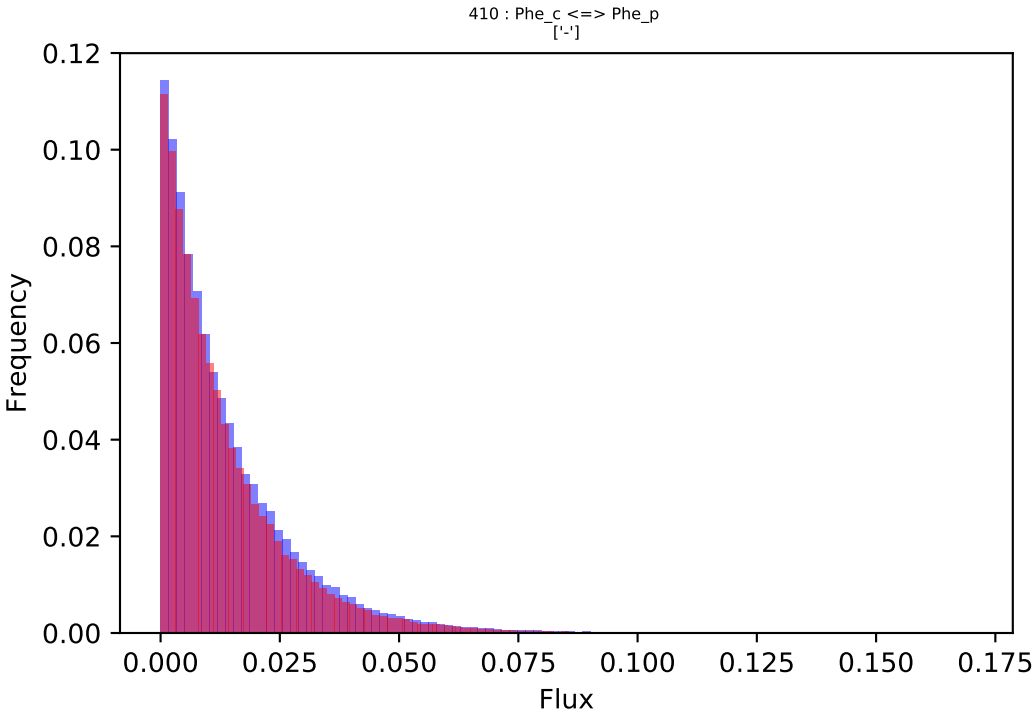

405 : His_c <=> His_p
['-']
Frequency
0.10
0.08
0.06
0.04
0.02
0.00
0.000
0.025
0.050
0.075
0.100
0.125
0.150
0.175
0.200
Flux

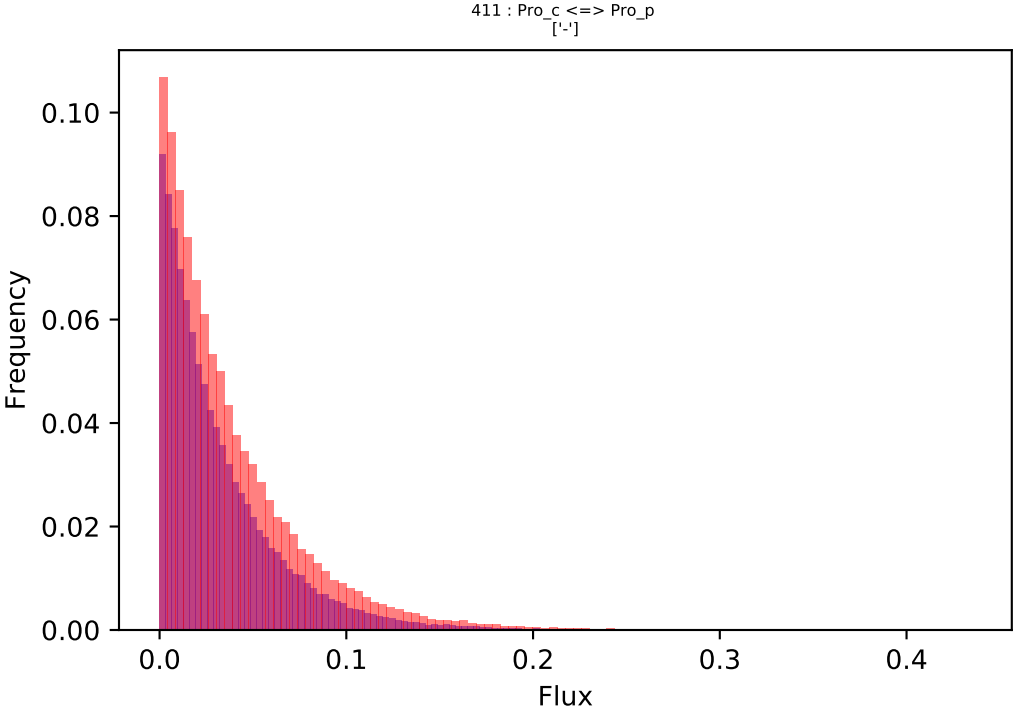

406 : Ile_c <=> Ile_p
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.00
0.05
0.10
0.15
0.20
0.25
0.30
Flux

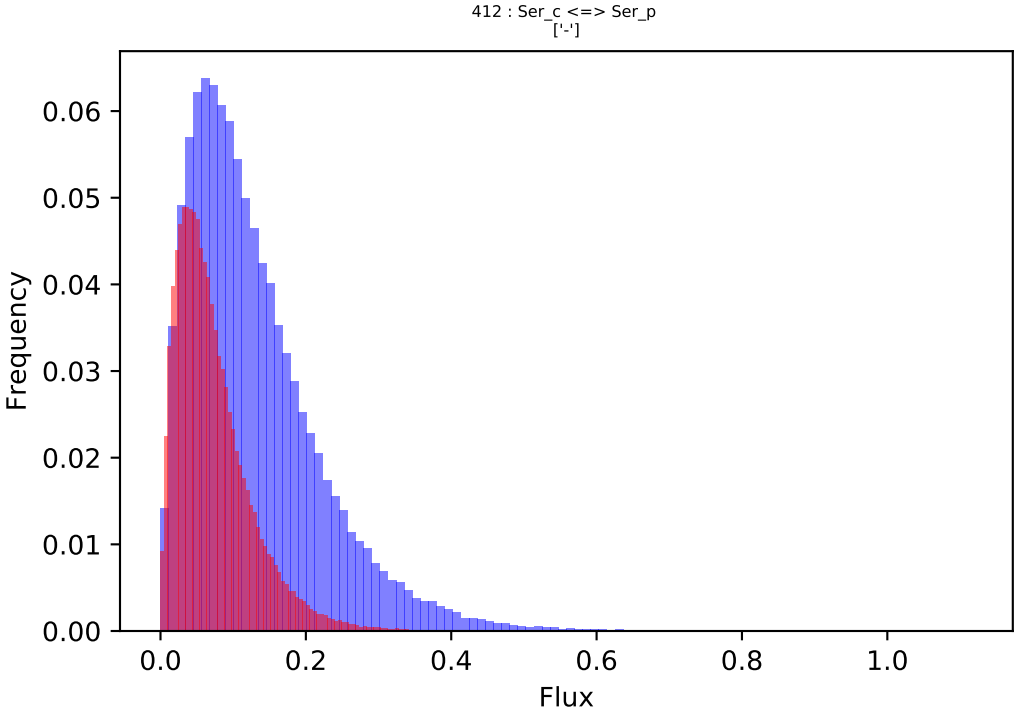

407 : Leu_c <=> Leu_p
['-']
Frequency
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0.00
0.05
0.10
0.15
0.20
0.25
Flux

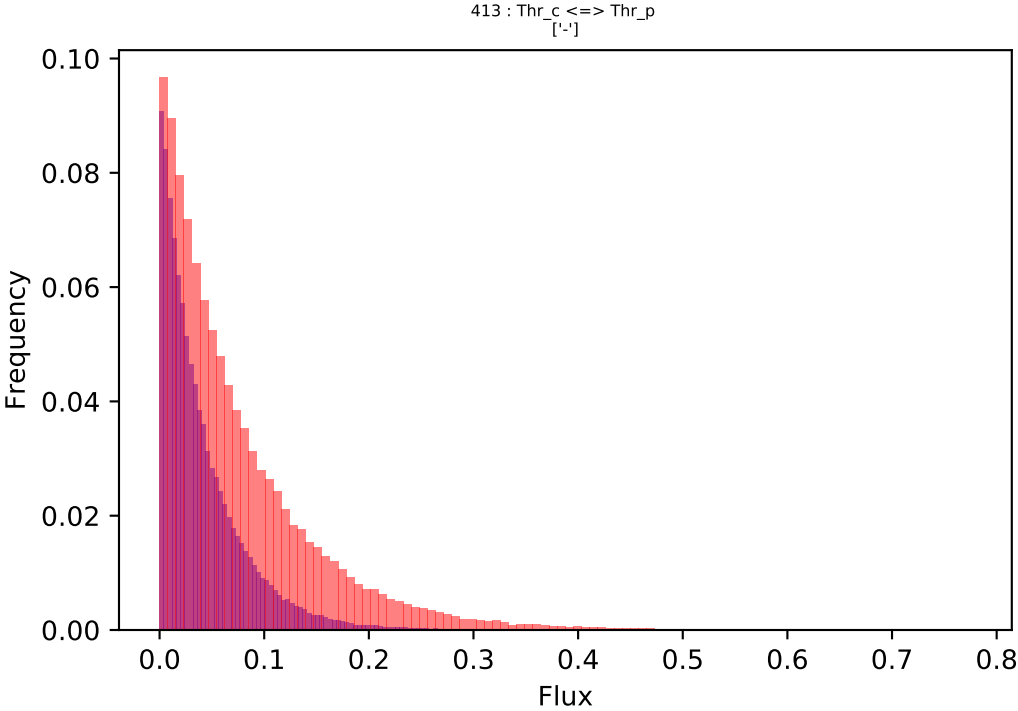

408 : Lys_c <=> Lys_p
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
Flux

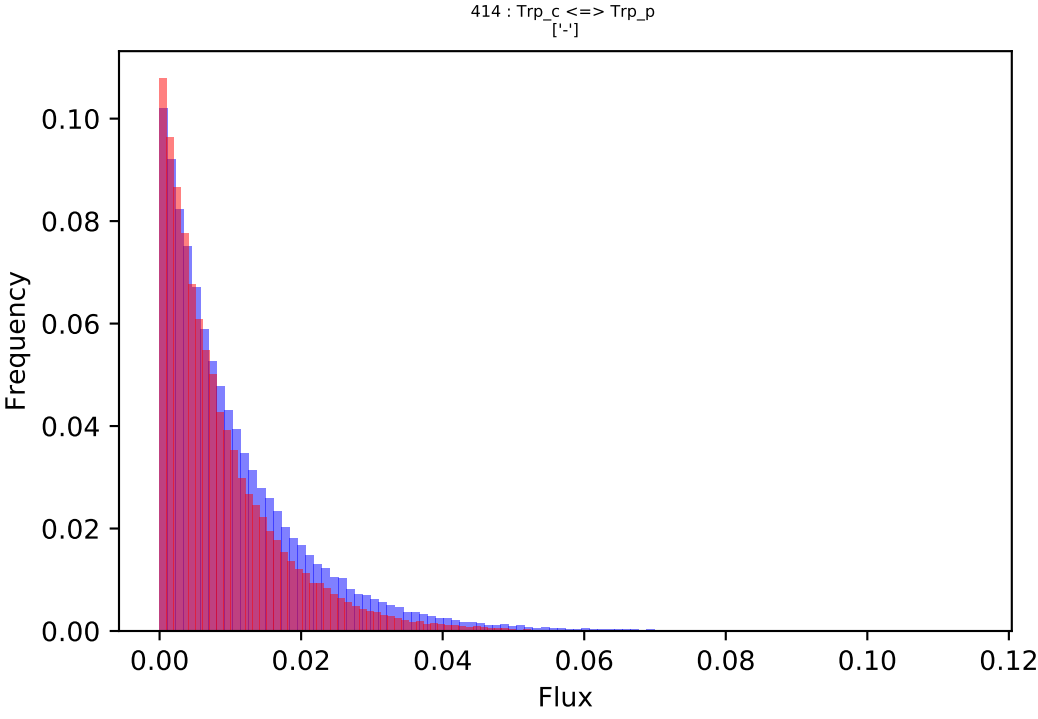

409 : Met_c <=> Met_p
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.05
0.10
0.15
0.20
0.25
Flux

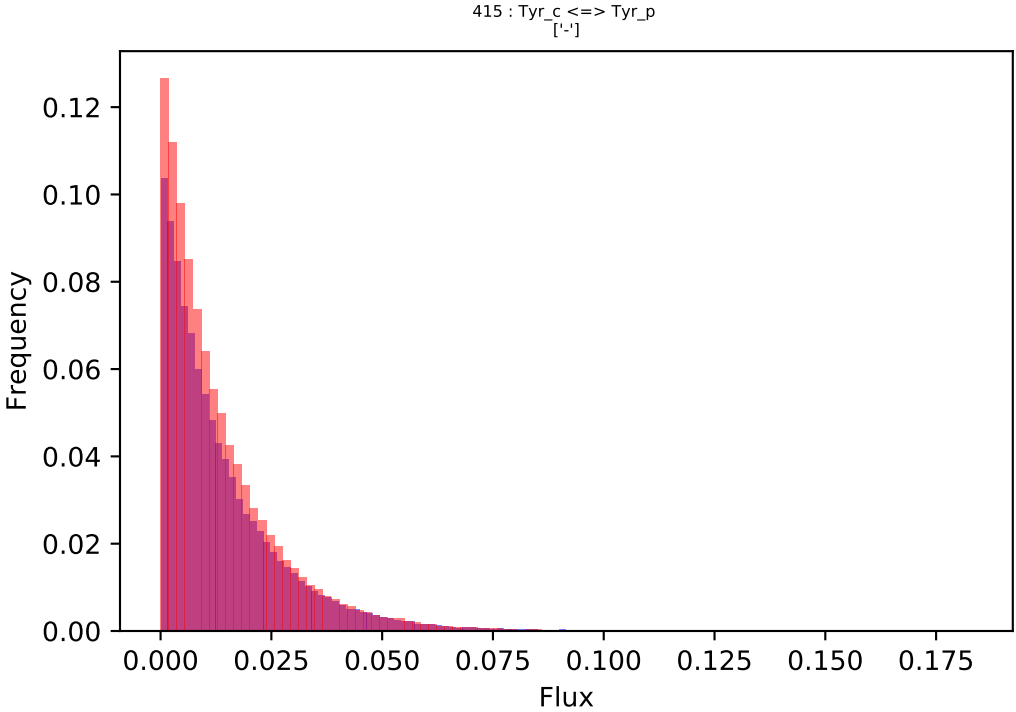

410 : Phe_c <=> Phe_p
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.000
0.025
0.050
0.075
0.100
0.125
0.150
0.175
Flux

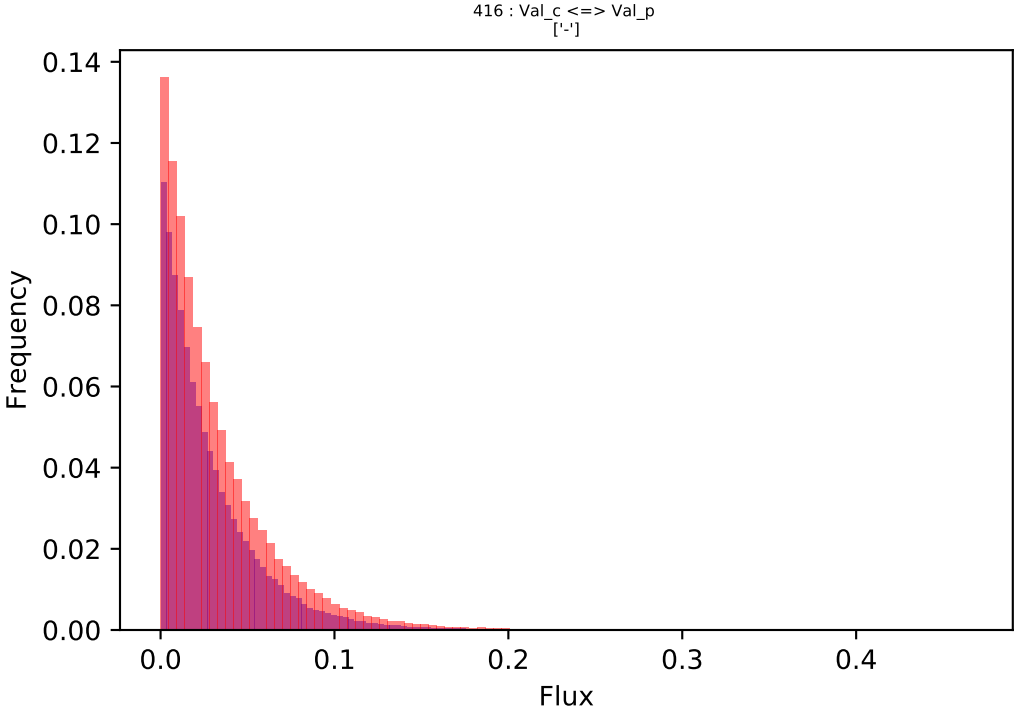

411 : Pro_c <=> Pro_p
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
Flux

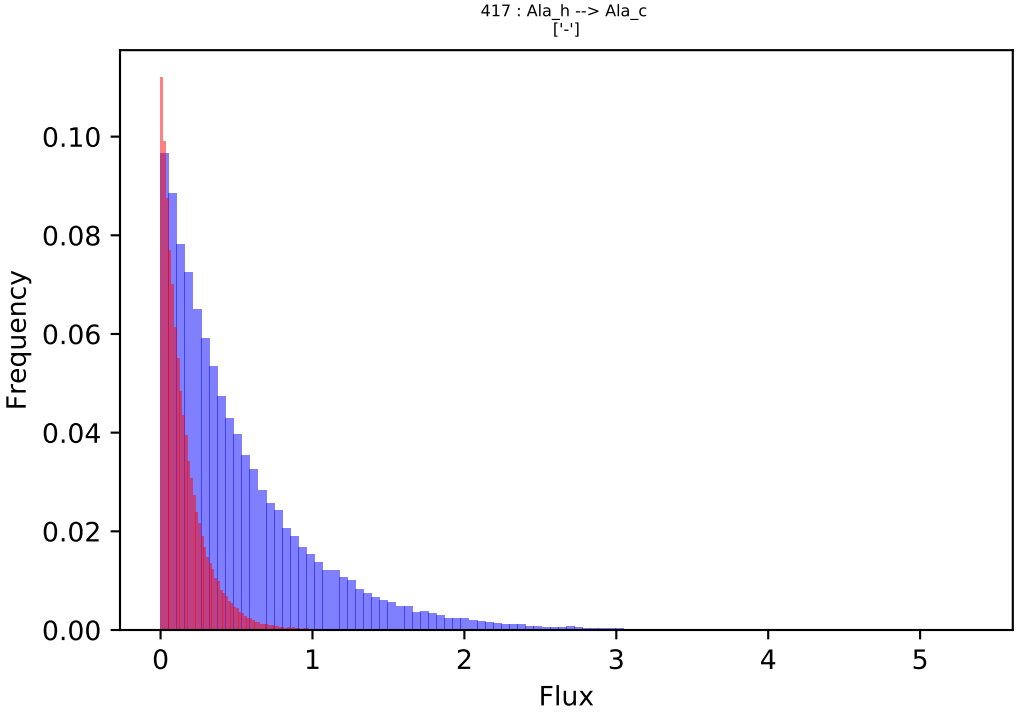

412 : Ser_c <=> Ser_p
['-']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.2
0.4
0.6
0.8
1.0
Flux

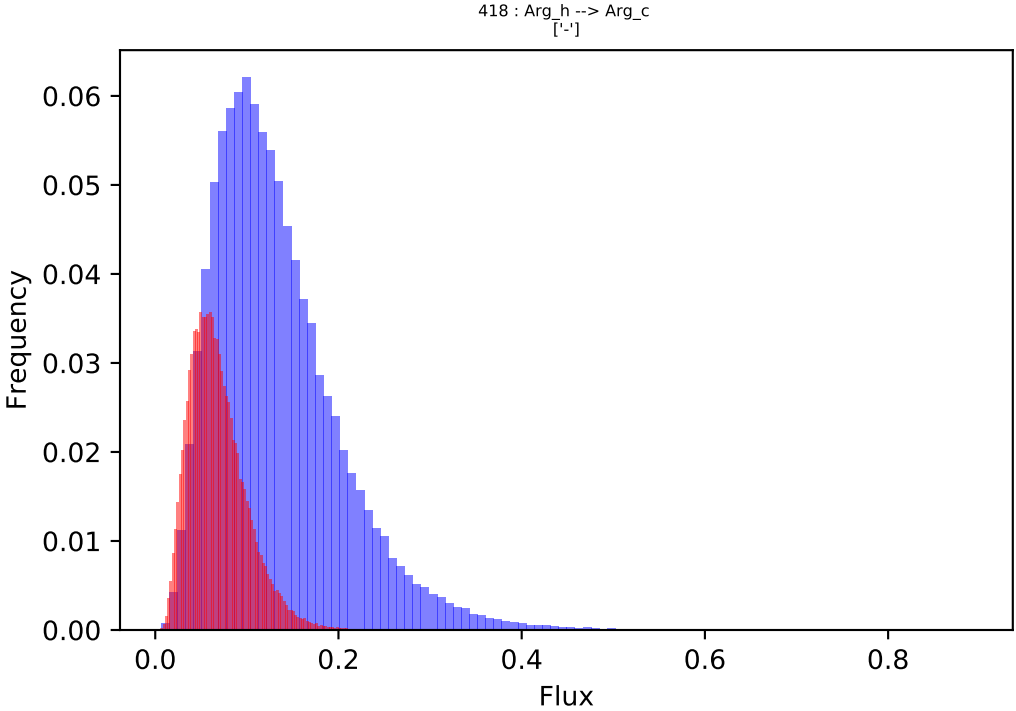

413 : Thr_c <=> Thr_p
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
Flux

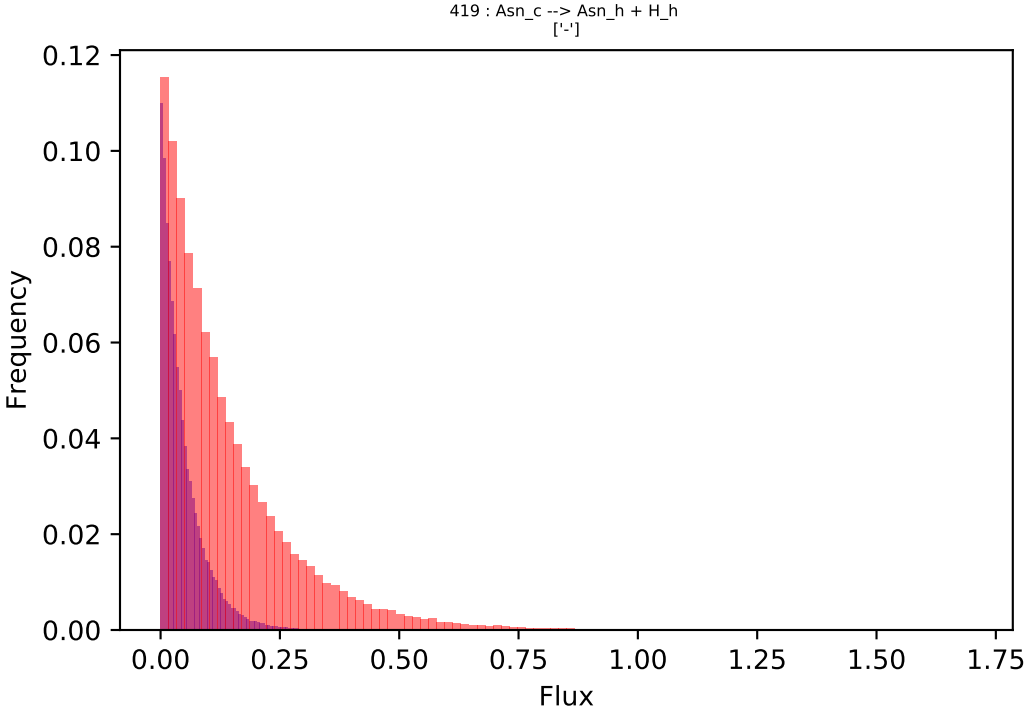

414 : Trp_c <=> Trp_p
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
Flux
0.00
0.02
0.04
0.06
0.08
0.10
0.12

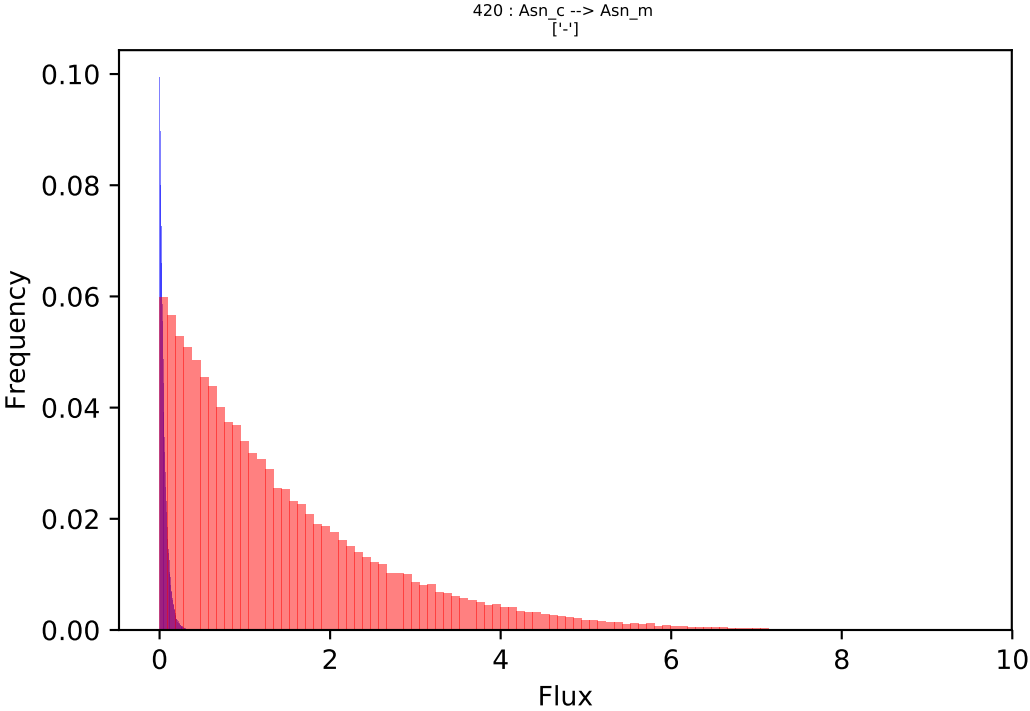

415 : Tyr_c <=> Tyr_p
['-']
Frequency
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0.000
0.025
0.050
0.075
0.100
0.125
0.150
0.175
Flux

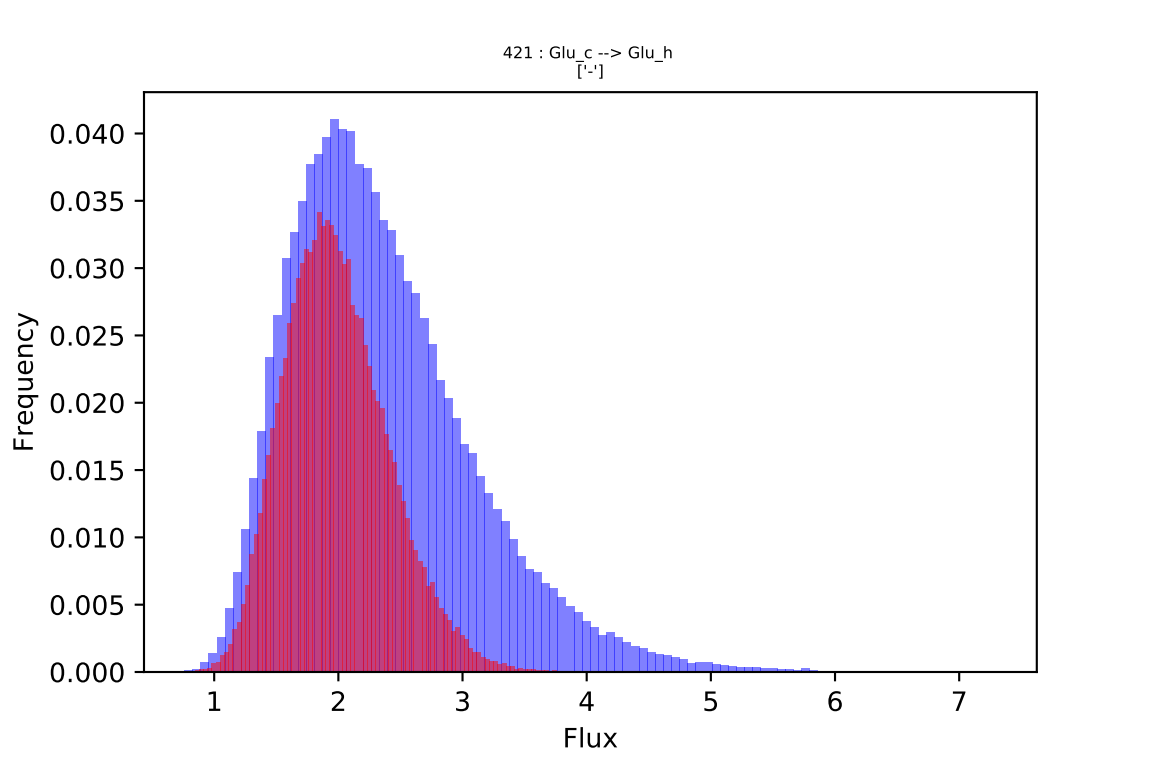

416 : Val_c <=> Val_p
['-']
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
Flux

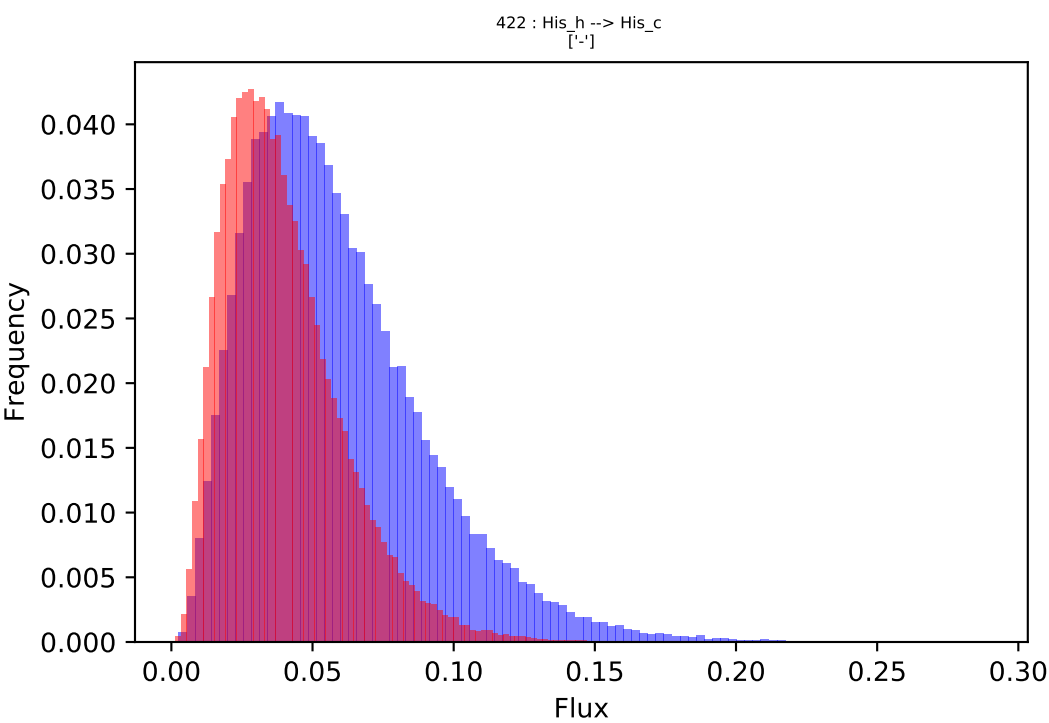

417 : Ala_h --> Ala_c
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0
1
2
3
4
5
Flux

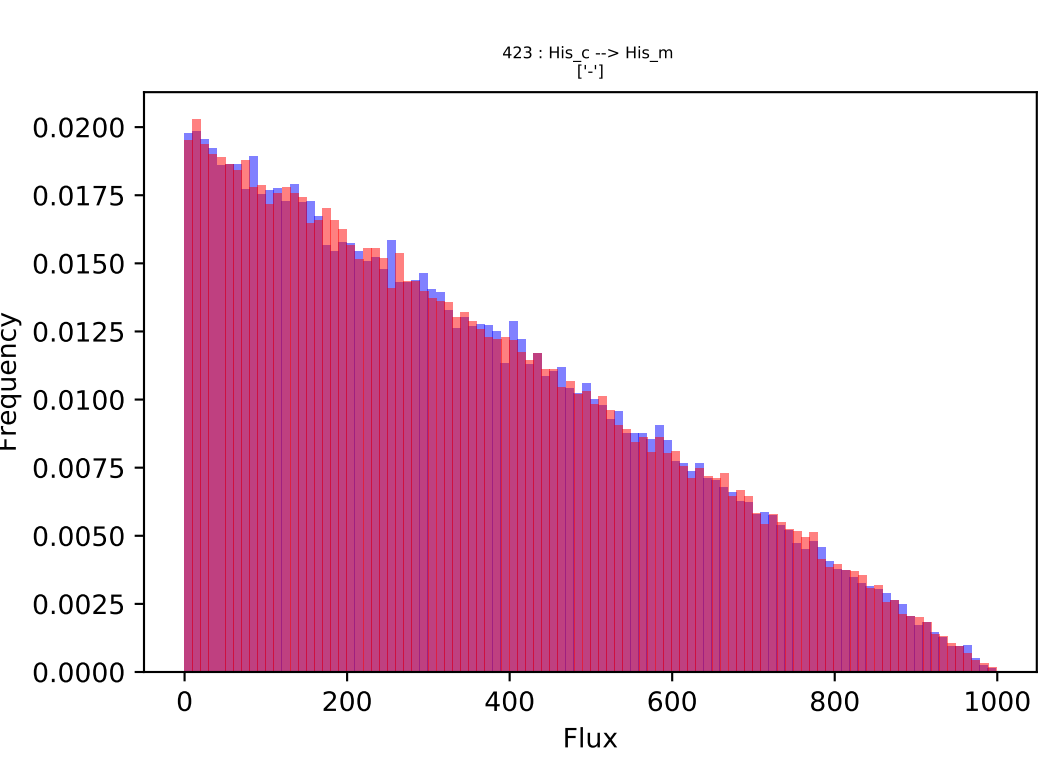

418 : Arg_h --> Arg_c
['-']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.2
0.4
0.6
0.8
Flux

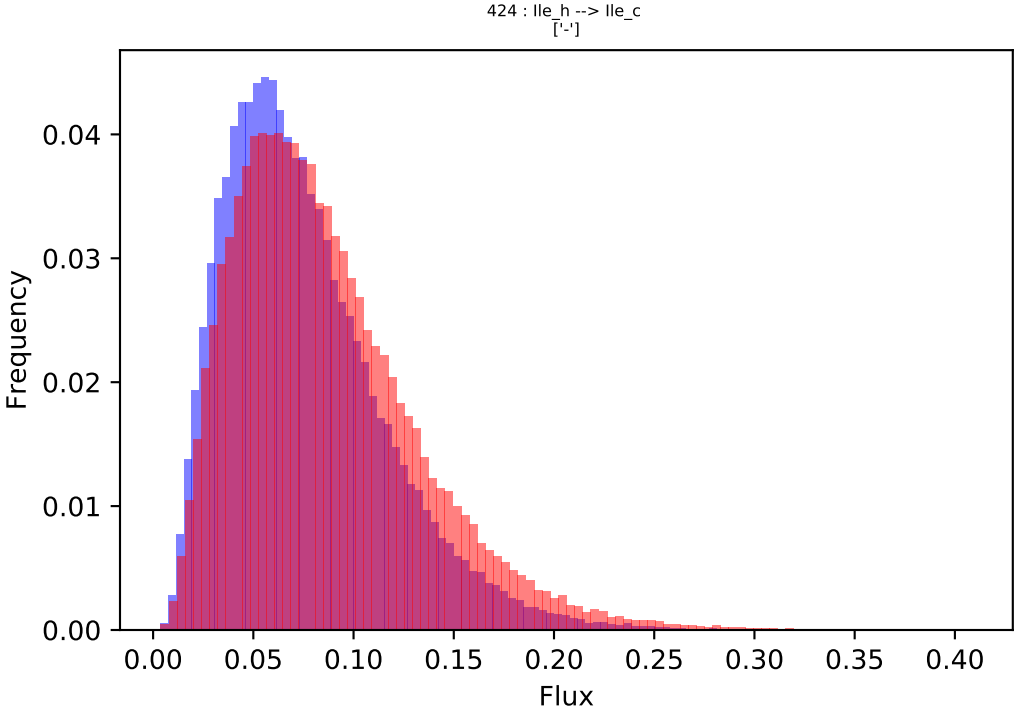

419 : Asn_c --> Asn_h + H_h
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

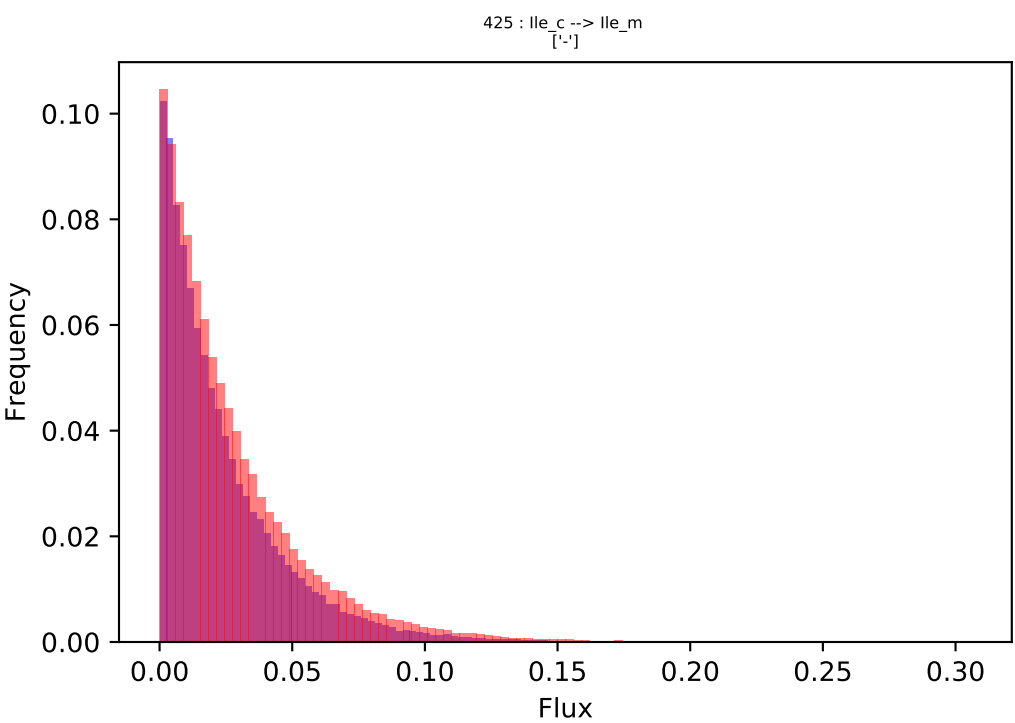

420 : Asn_c --> Asn_m
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0
2
4
6
8
10
Flux

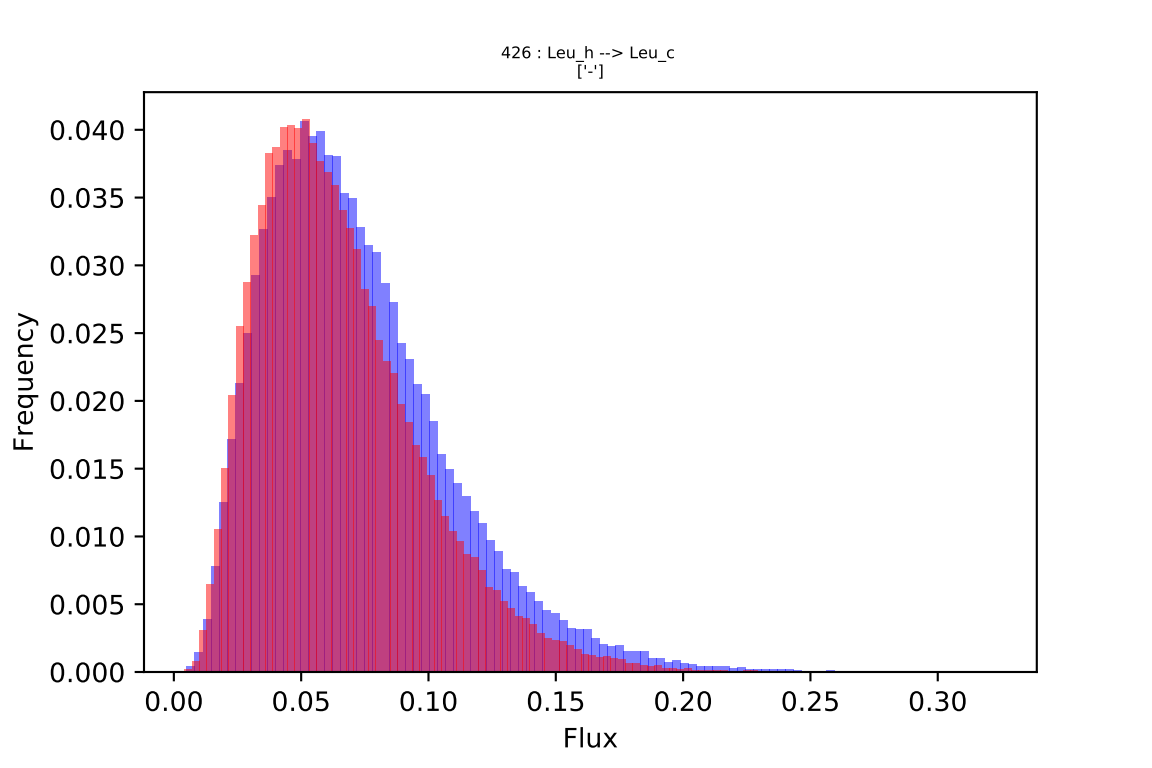

421 : Glu_c --> Glu_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
1
2
3
4
5
6
7
Flux

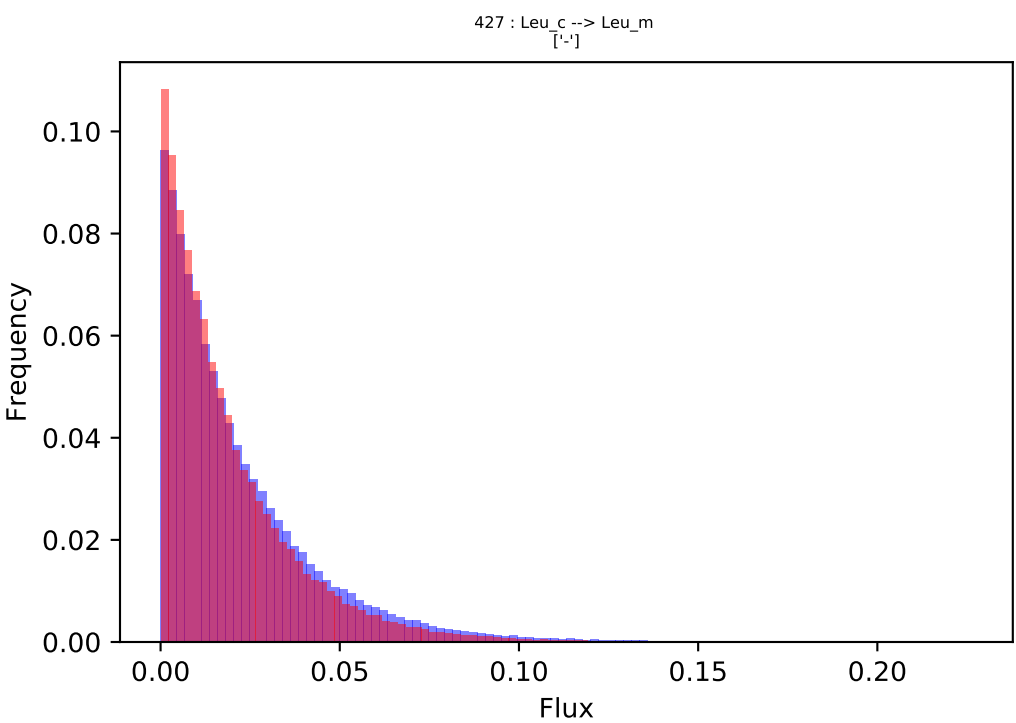

422 : His_h --> His_c
['-']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00
0.05
0.10
0.15
0.20
0.25
0.30
Flux

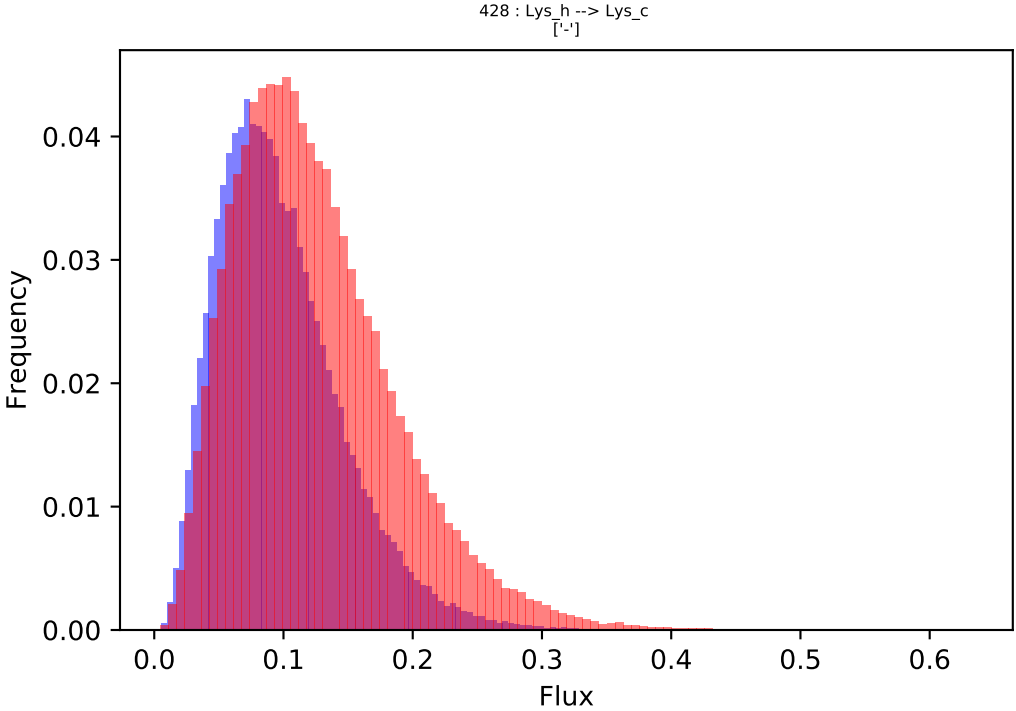

423 : His_c --> His_m
['-']
Frequency
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
0
200
400
600
800
1000
Flux

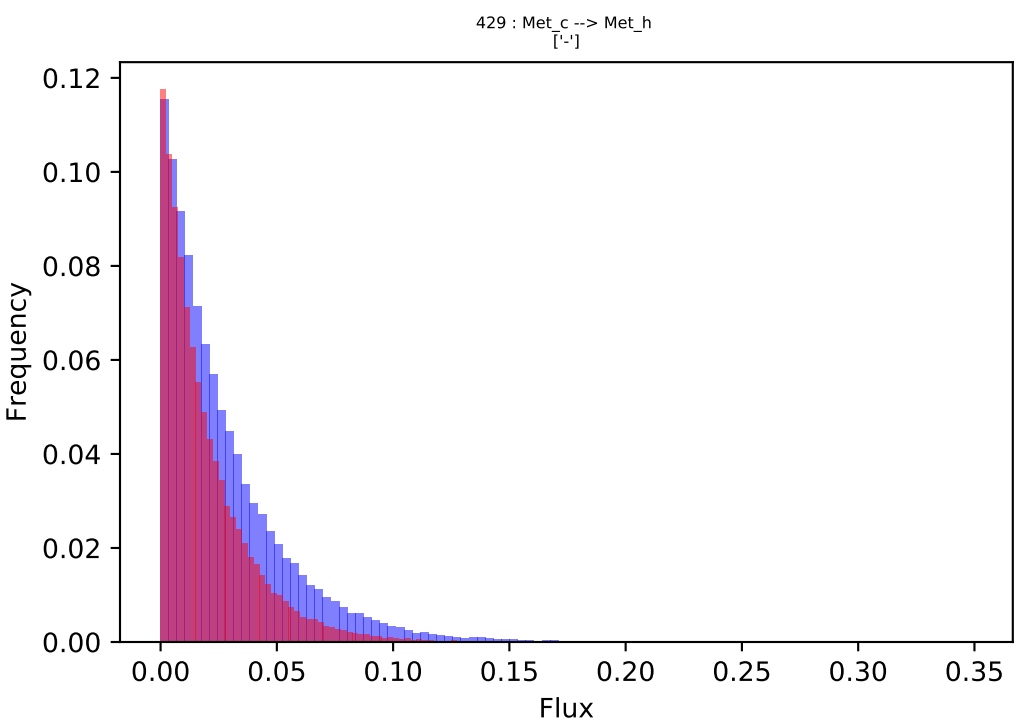

424 : Ile_h --> Ile_c
['-']
0.04
0.03
0.02
0.01
0.00
Frequency
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
Flux

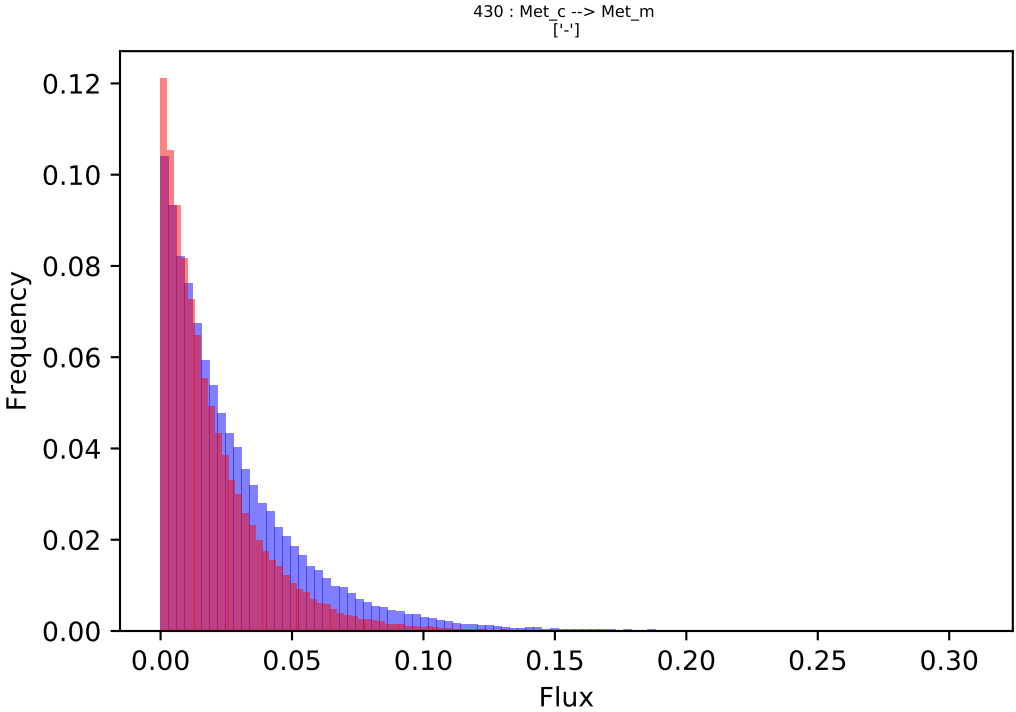

425 : Ile_c --> Ile_m
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.05
0.10
0.15
0.20
0.25
0.30
Flux

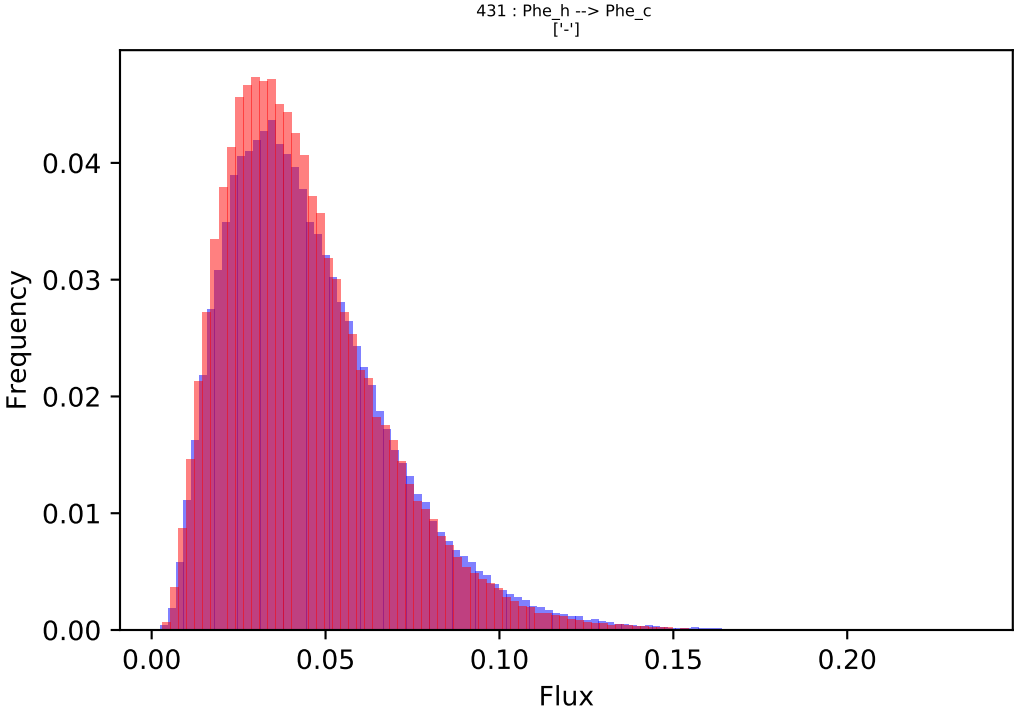

426 : Leu_h --> Leu_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.00
0.05
0.10
0.15
0.20
0.25
0.30
Flux

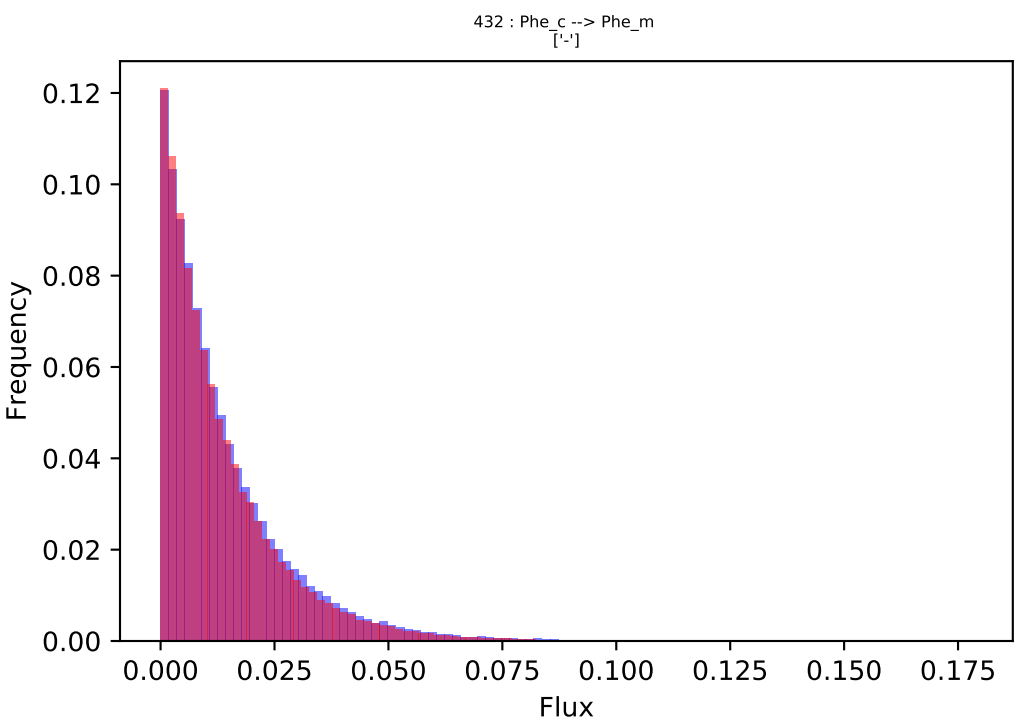

427 : Leu_c --> Leu_m
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.05
0.10
0.15
0.20
Flux

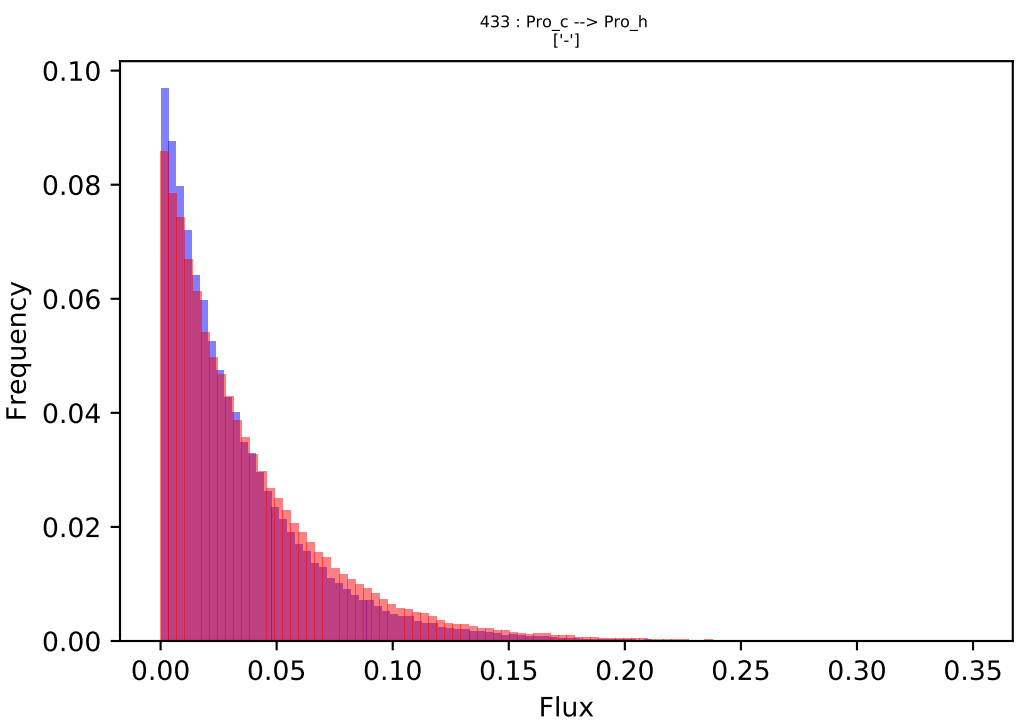

428 : Lys_h --> Lys_c
['-']
0.04
0.03
0.02
0.01
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Flux

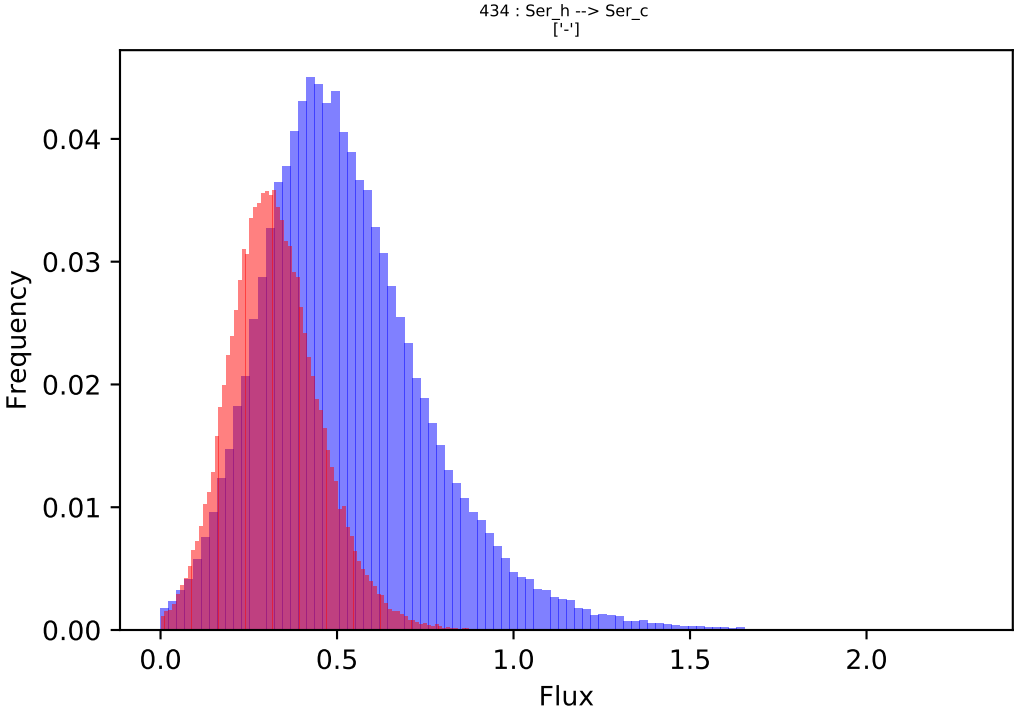

429 : Met_c --> Met_h
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Flux

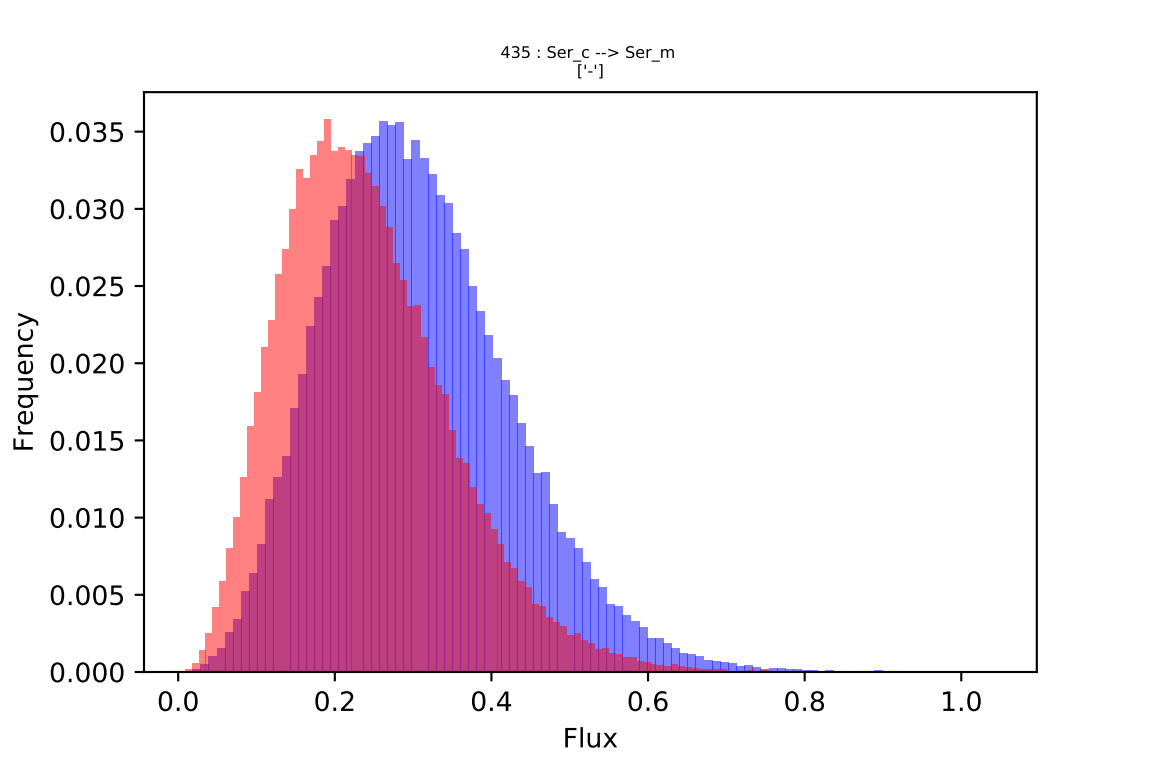

430 : Met_c --> Met_m
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.05
0.10
0.15
0.20
0.25
0.30
Flux

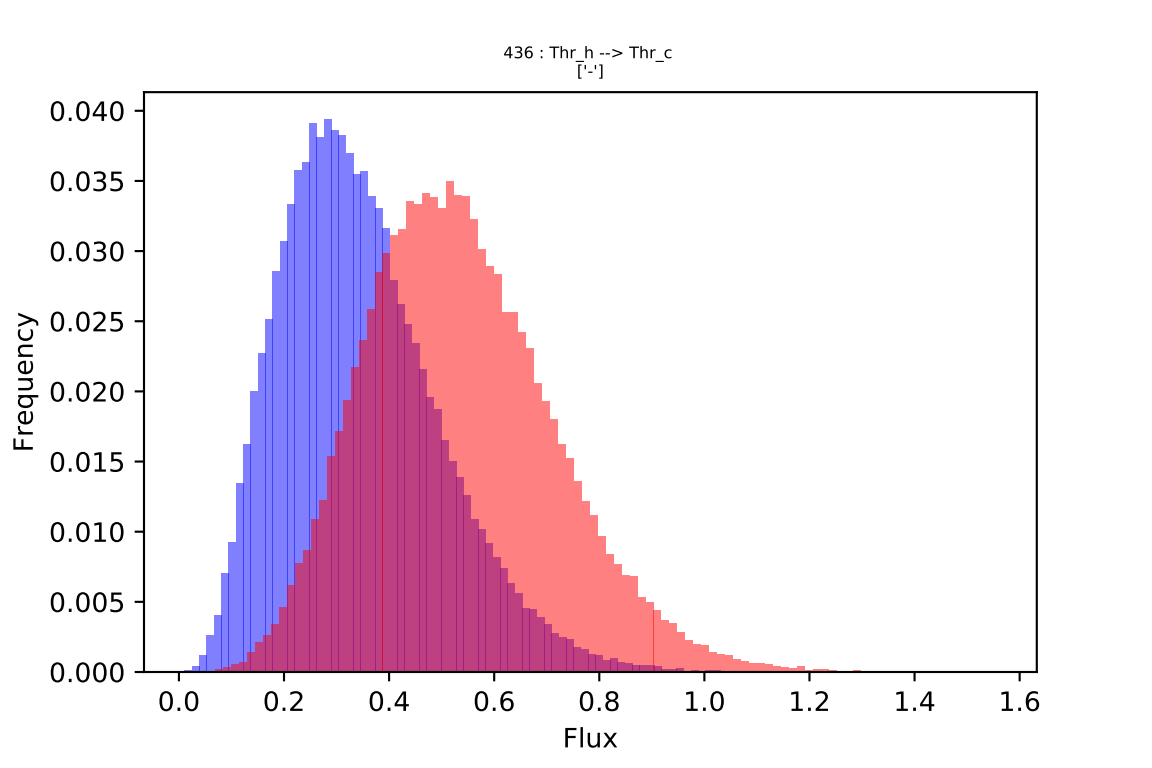

431 : Phe_h --> Phe_c
['-']
Frequency
0.00
0.01
0.02
0.03
0.04
0.00
0.05
0.10
0.15
0.20
Flux

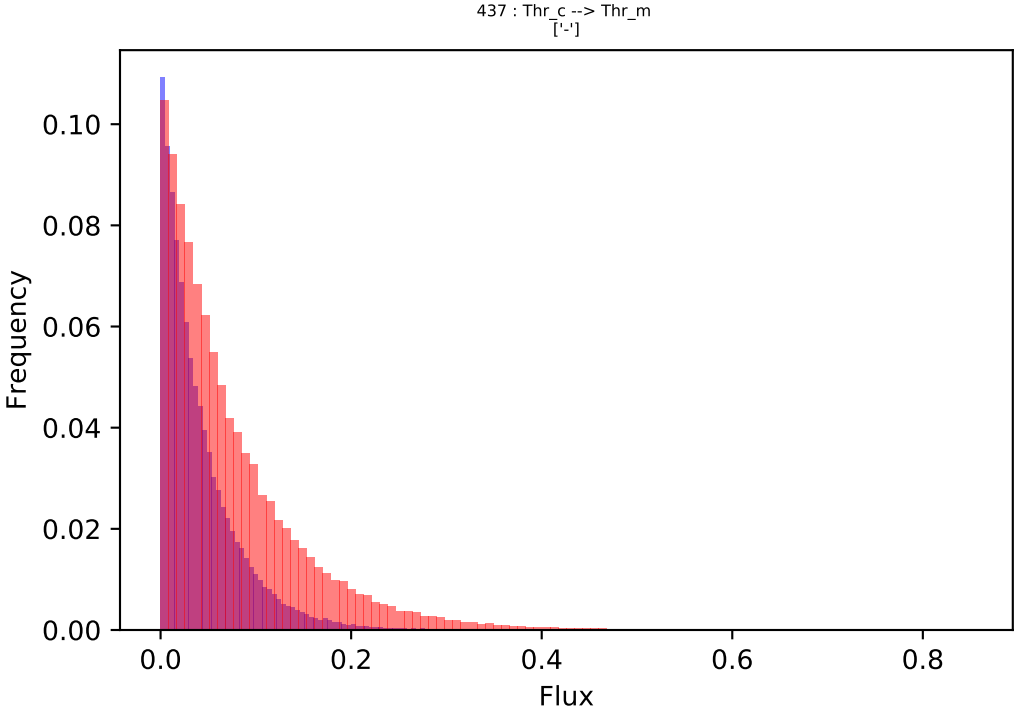

432 : Phe_c --> Phe_m
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.000
0.025
0.050
0.075
0.100
0.125
0.150
0.175
Flux

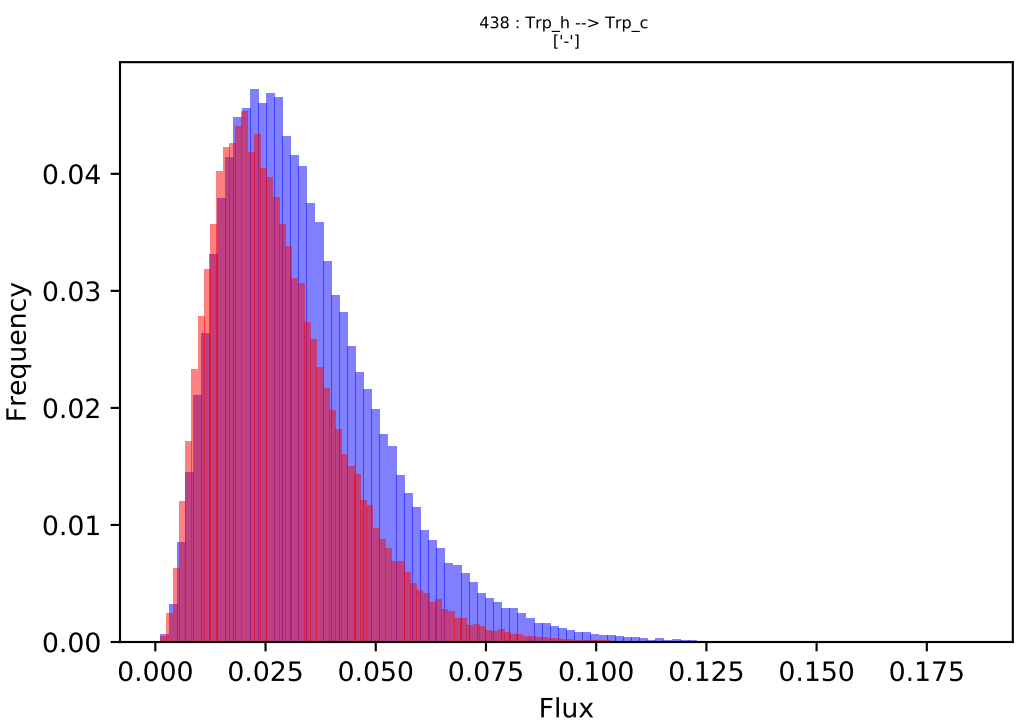

433 : Pro_c --> Pro_h
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Flux

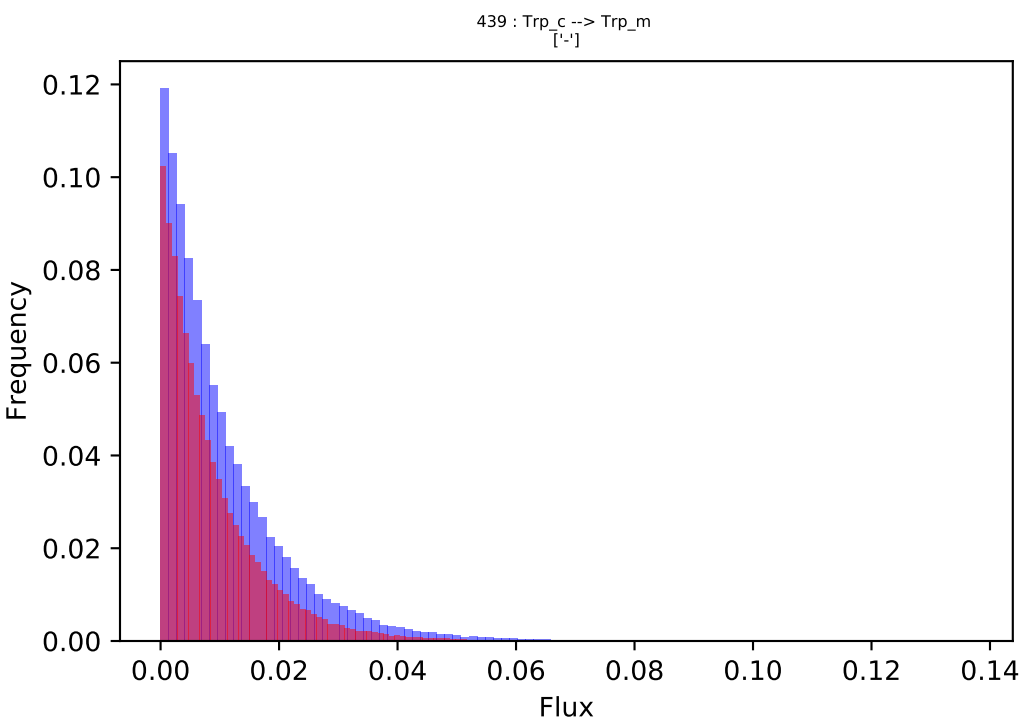

434 : Ser_h --> Ser_c
['-']
0.04
0.03
0.02
0.01
0.00
Frequency
0.0
0.5
1.0
1.5
2.0
Flux

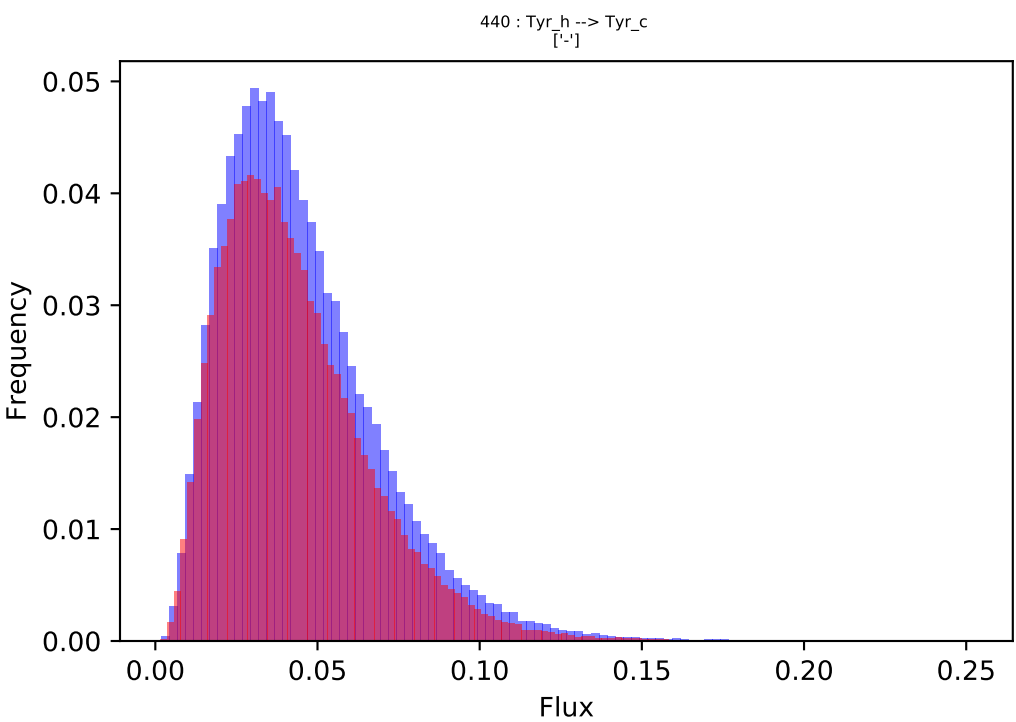

435 : Ser_c --> Ser_m
['-']
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
Flux

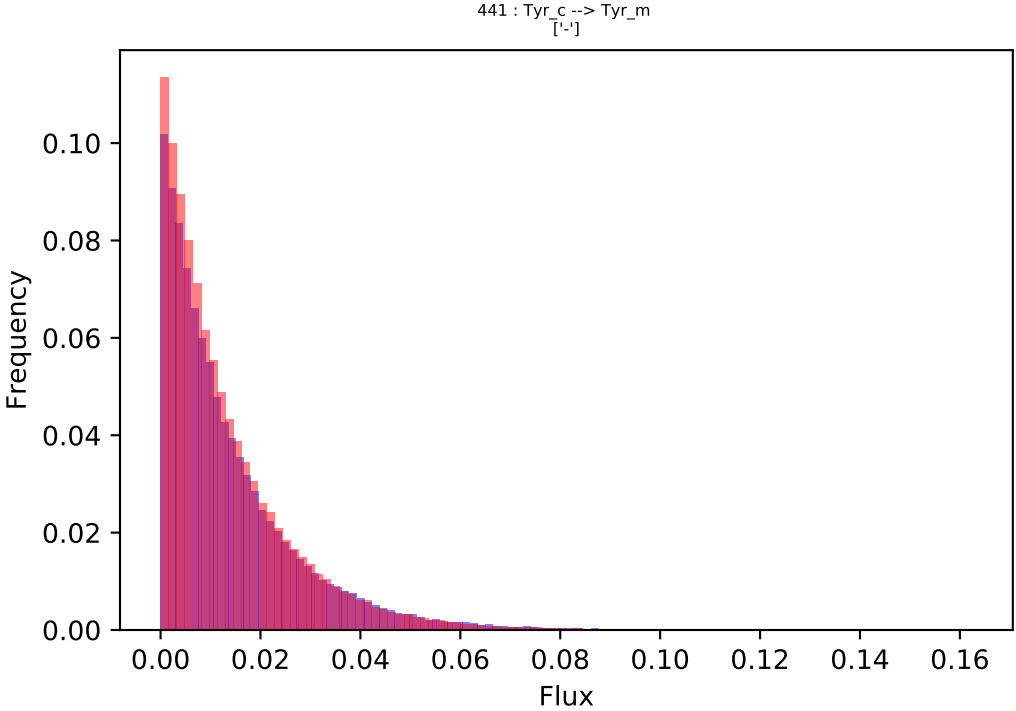

436 : Thr_h --> Thr_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Flux

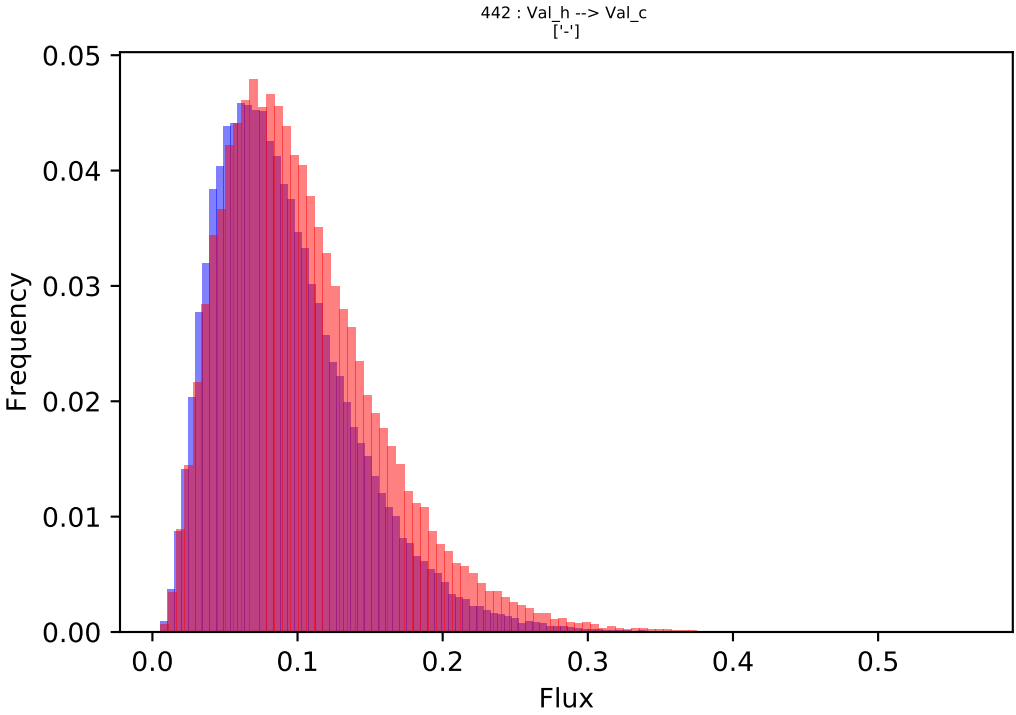

437 : Thr_c --> Thr_m
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
Flux

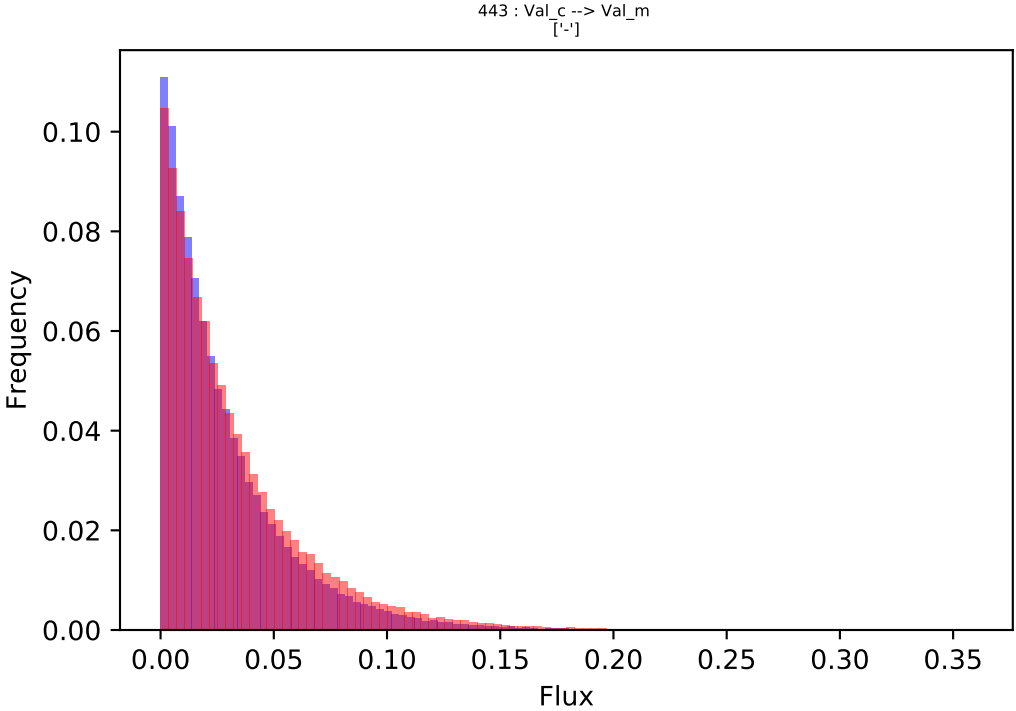

438 : Trp_h --> Trp_c
['-']
Frequency
0.00
0.01
0.02
0.03
0.04
0.000
0.025
0.050
0.075
0.100
0.125
0.150
0.175
Flux

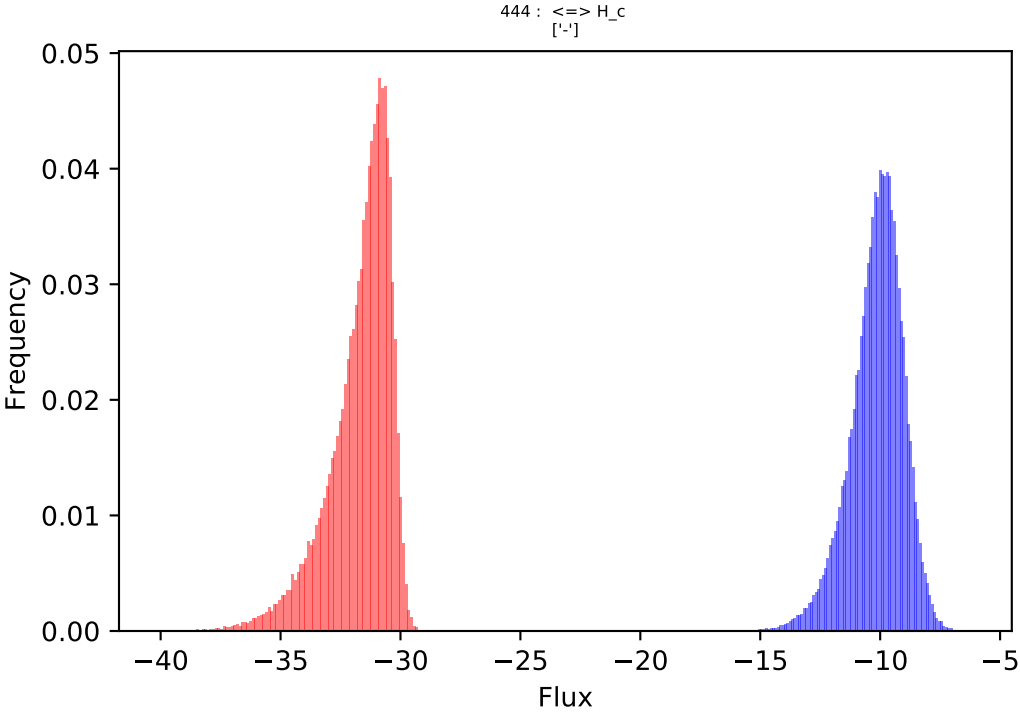

439 : Trp_c --> Trp_m
['-']
Frequency
Flux
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14

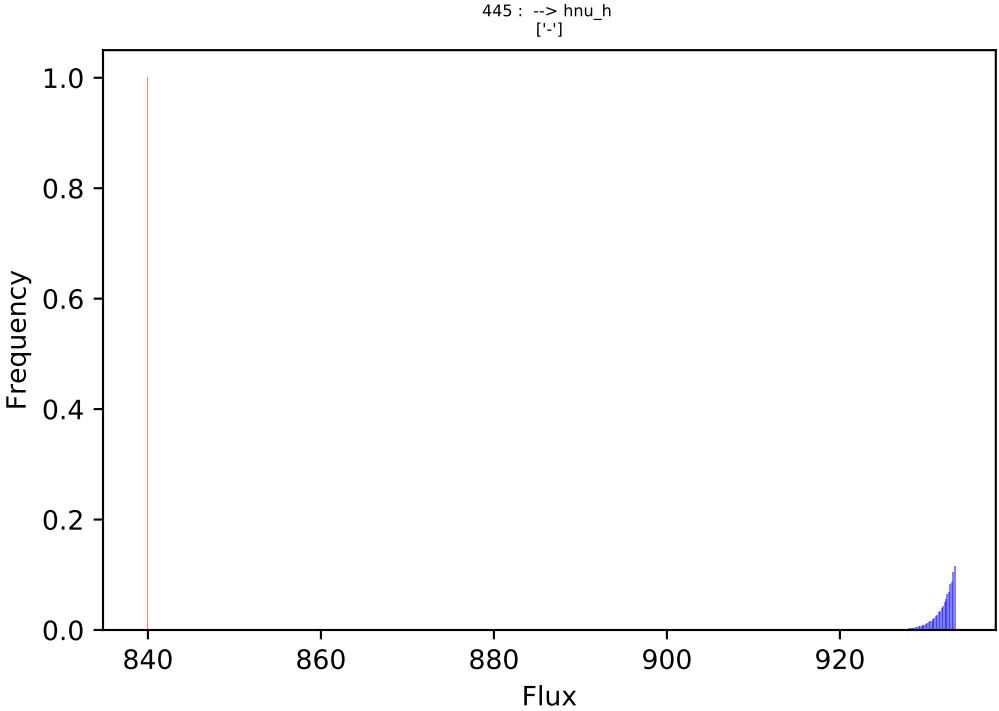

440 : Tyr_h --> Tyr_c
['-']
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
0.00
0.05
0.10
0.15
0.20
0.25
Flux

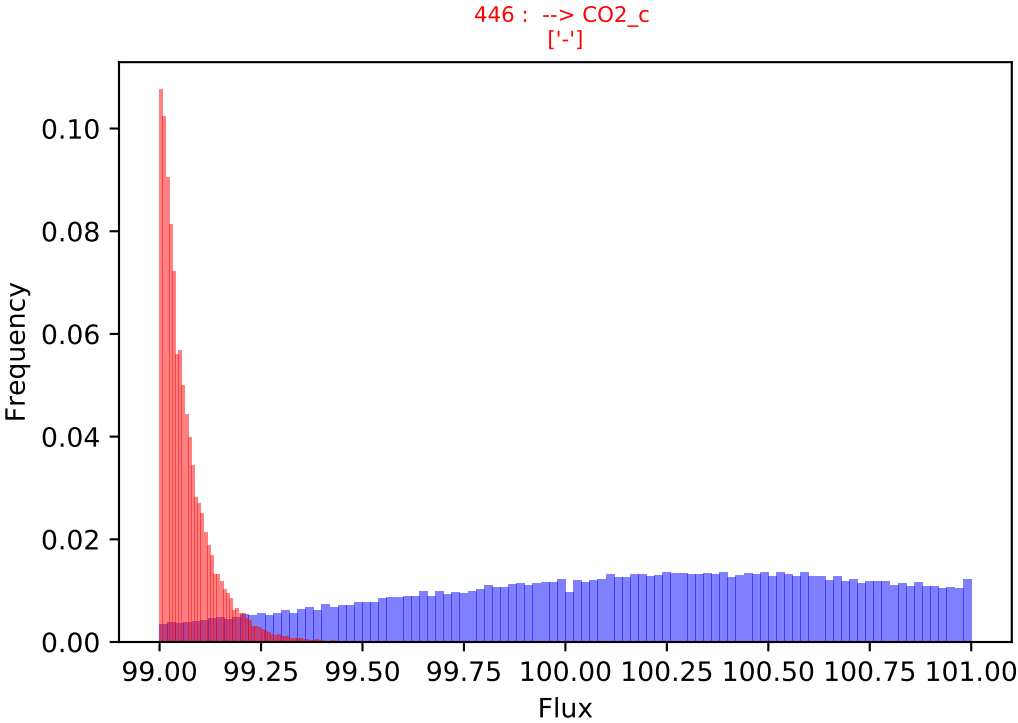

441 : Tyr_c --> Tyr_m
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
Flux
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16

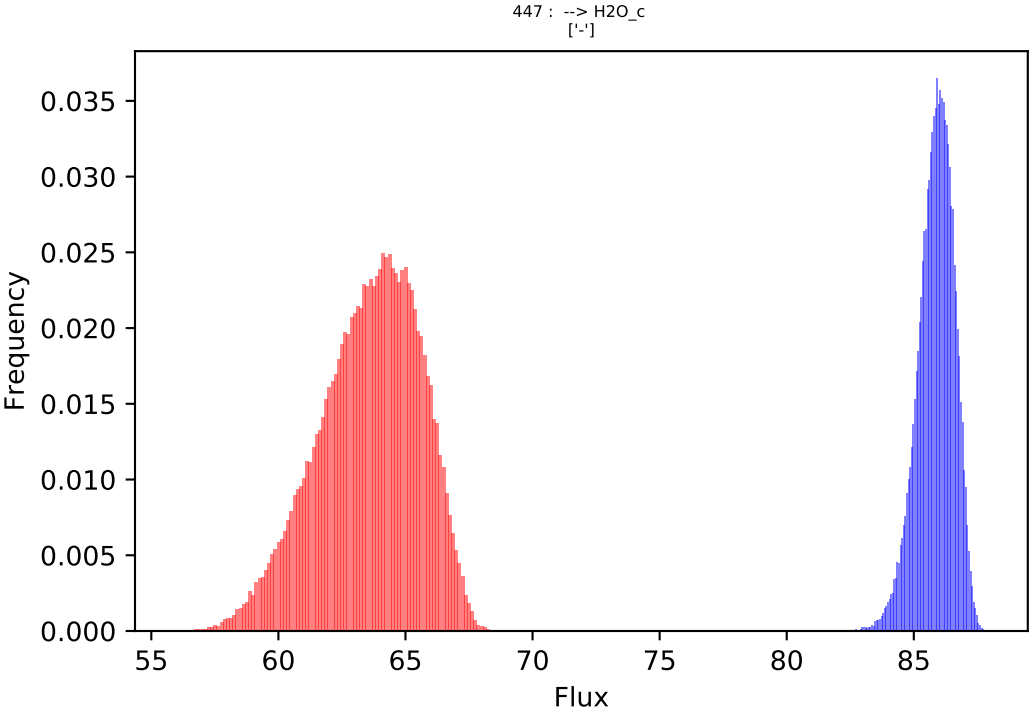

442 : Val_h --> Val_c
['-']
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
Flux

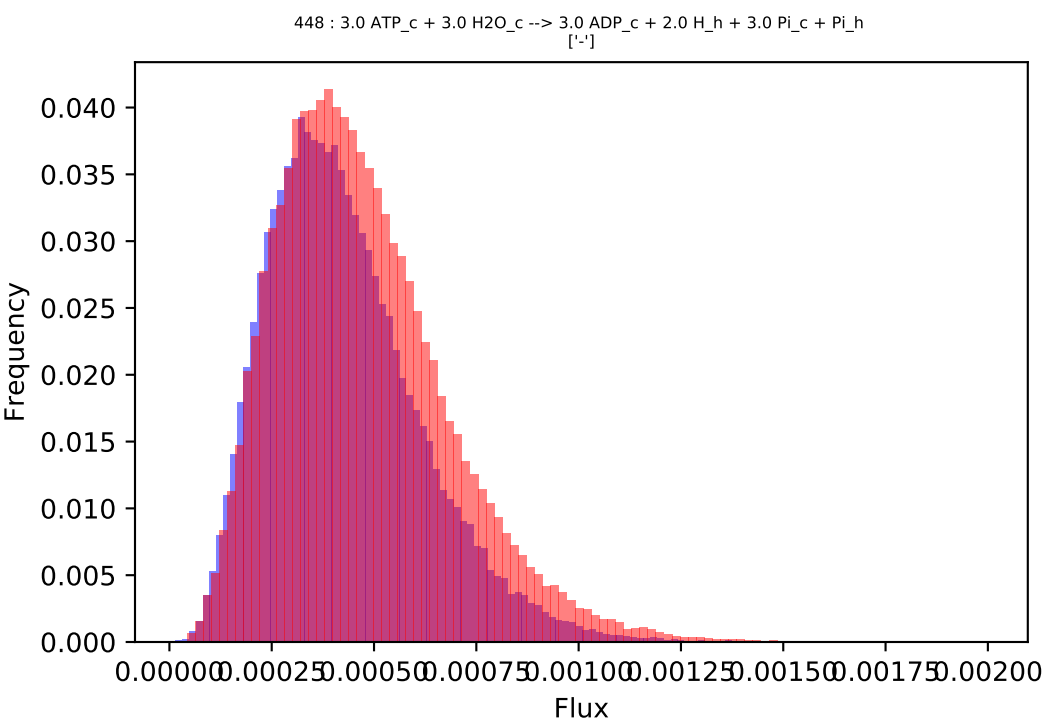

443 : Val_c --> Val_m
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Flux

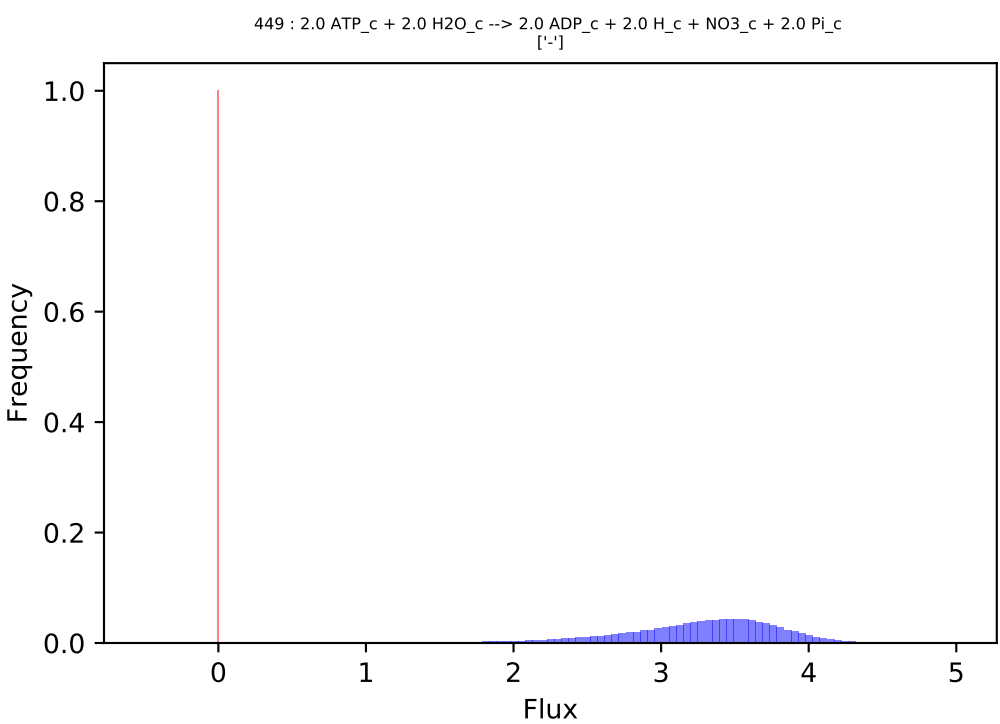

444 : <=> H_c
['-']
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
−40
−35
−30
−25
−20
−15
−10
−5
Flux

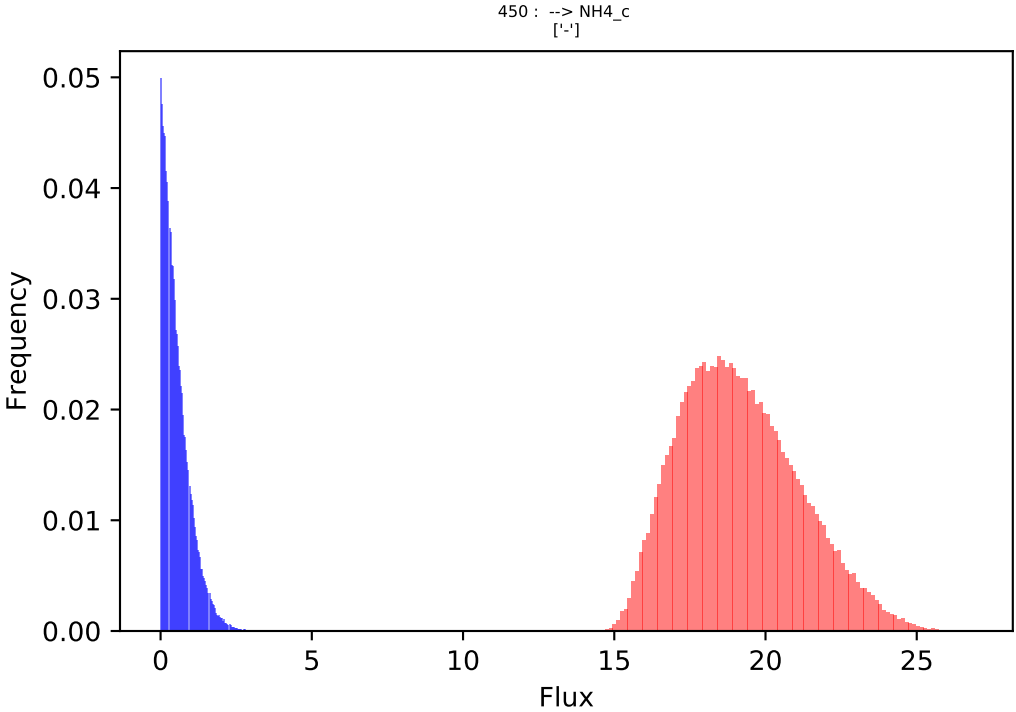

445 : --> hnu_h
['-']
1.0
0.8
0.6
0.4
0.2
0.0
Frequency
840
860
880
900
920
Flux

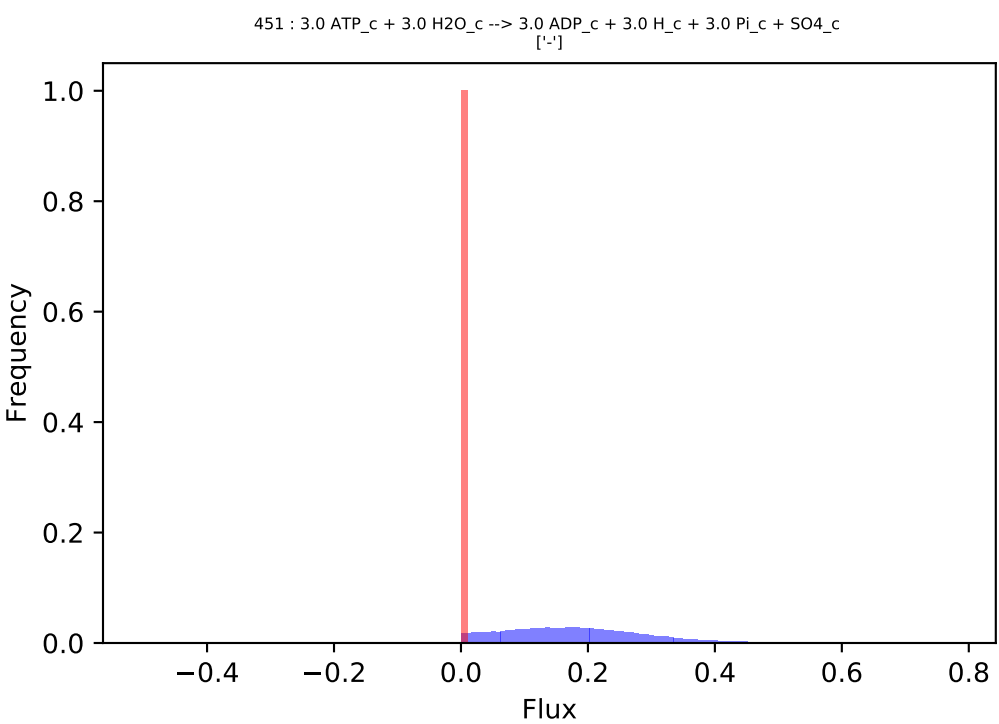

446 : --> CO2_c
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
99.00
99.25
99.50
99.75
100.00
100.25
100.50
100.75
101.00
Flux

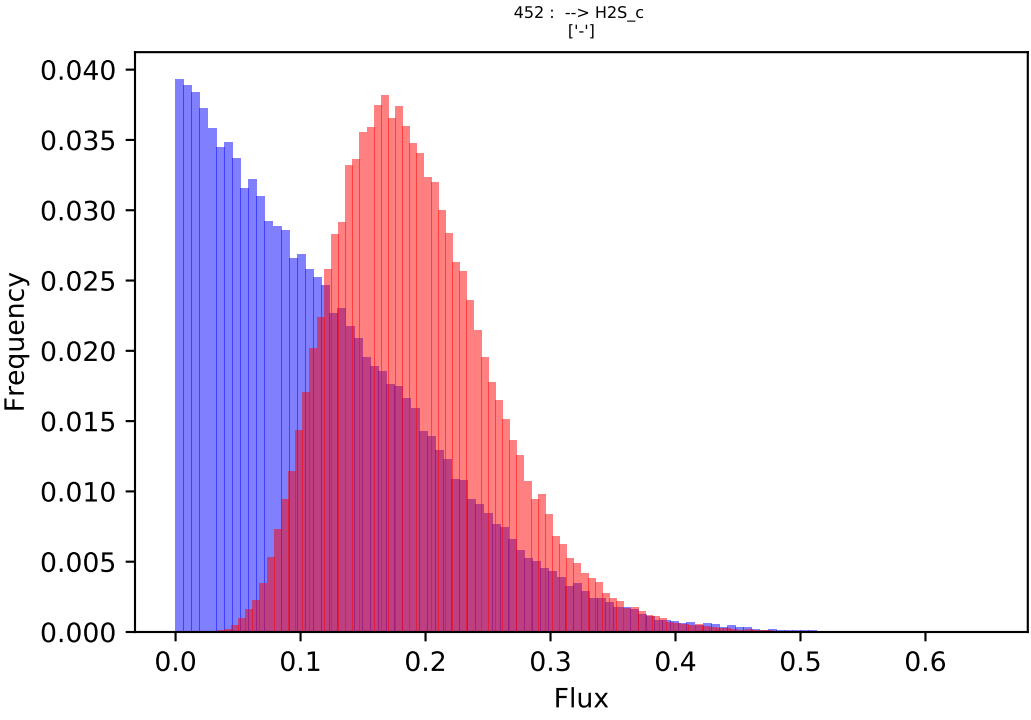

447 : --> H2O_c
['-']
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
55
60
65
70
75
80
85
Flux

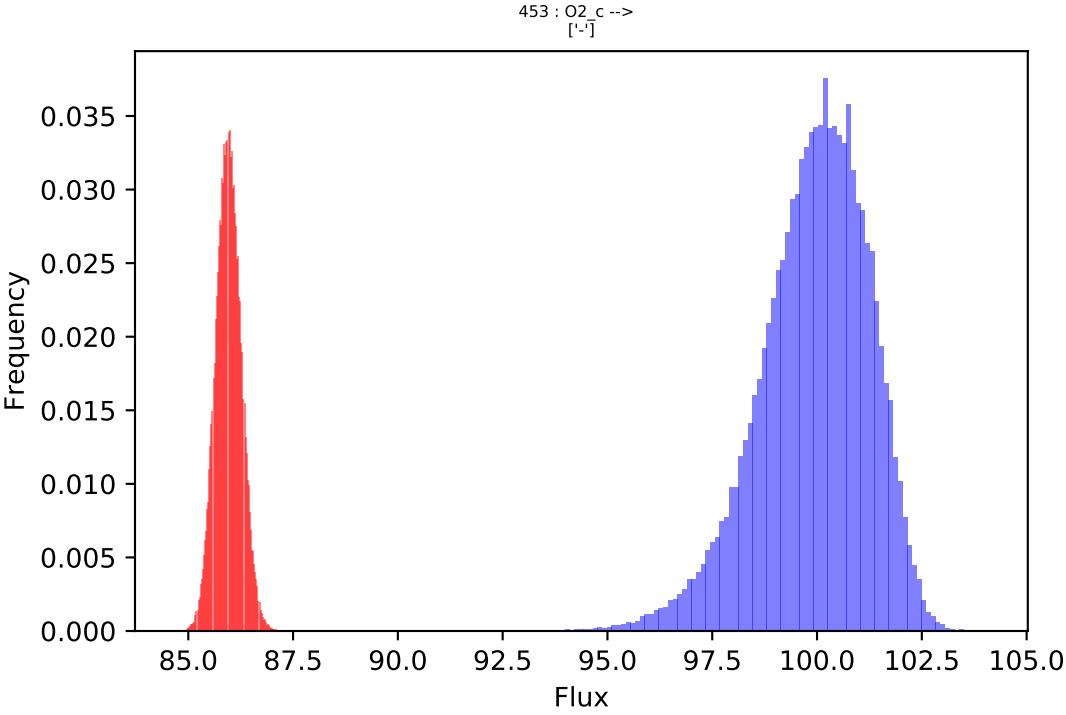

448 : 3.0 ATP_c + 3.0 H2O_c --> 3.0 ADP_c + 2.0 H_h + 3.0 Pi_c + Pi_h
['-']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00025
0.00050
0.00075
0.00100
0.00125
0.00150
0.00175
0.00200
Flux

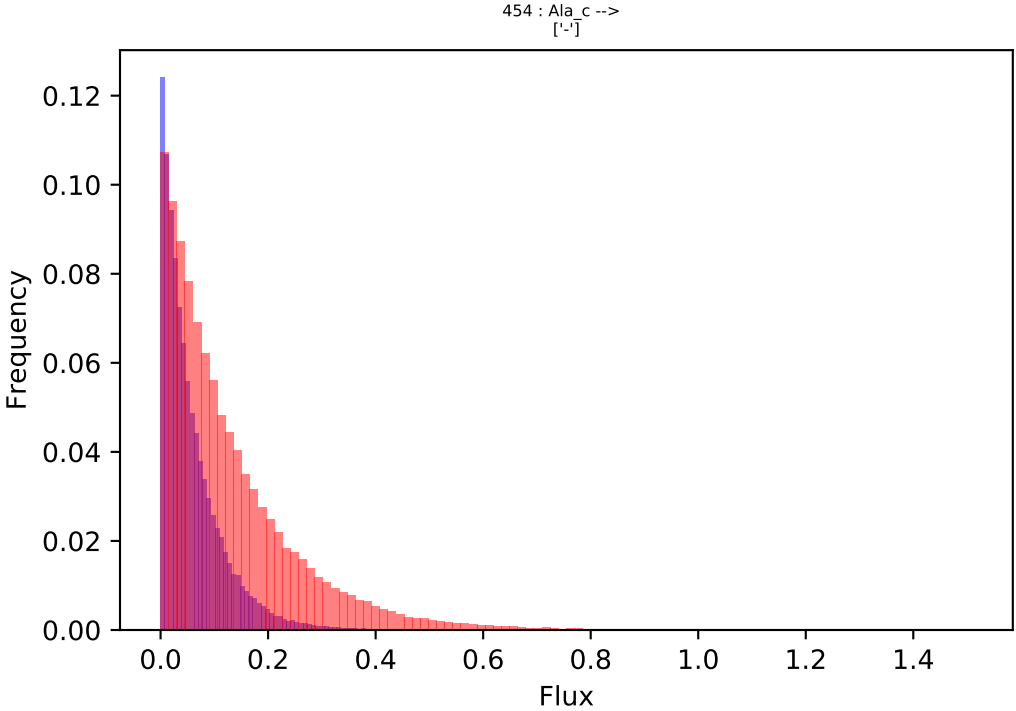

449 : 2.0 ATP_c + 2.0 H2O_c --> 2.0 ADP_c + 2.0 H_c + NO3_c + 2.0 Pi_c
['-']
Frequency
1.0
0.8
0.6
0.4
0.2
0.0
0
1
2
3
4
5
Flux

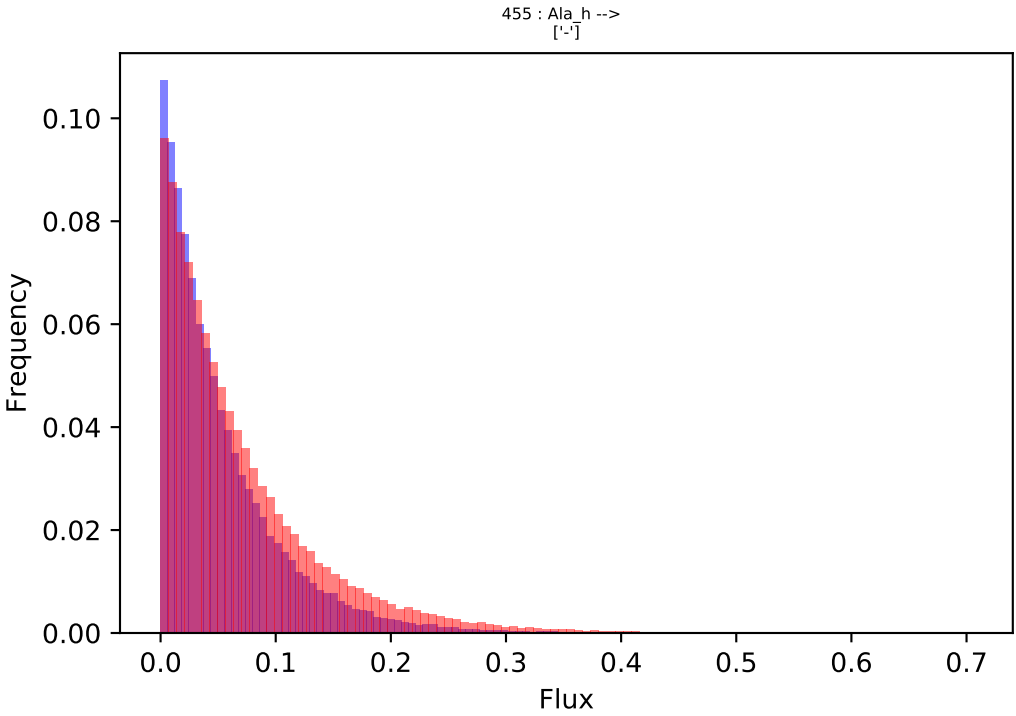

450 : --> NH4_c
['-']
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
0
5
10
15
20
25
Flux

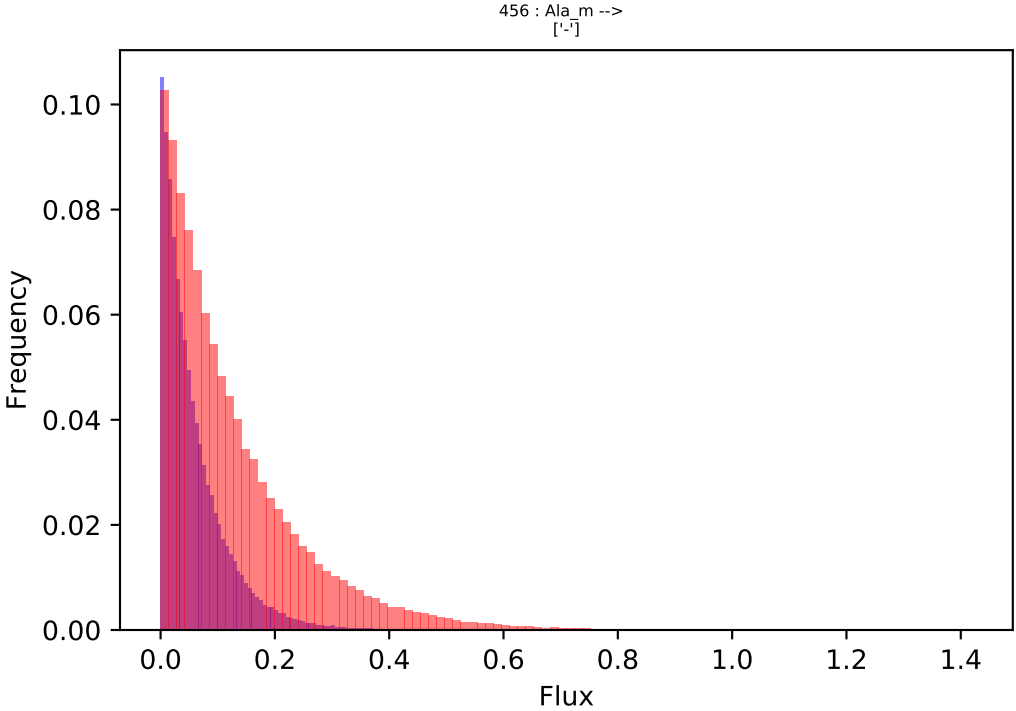

451 : 3.0 ATP_c + 3.0 H2O_c --> 3.0 ADP_c + 3.0 H_c + 3.0 Pi_c + SO4_c
['-']
Frequency
1.0
0.8
0.6
0.4
0.2
0.0
−0.4
−0.2
0.0
0.2
0.4
0.6
0.8
Flux

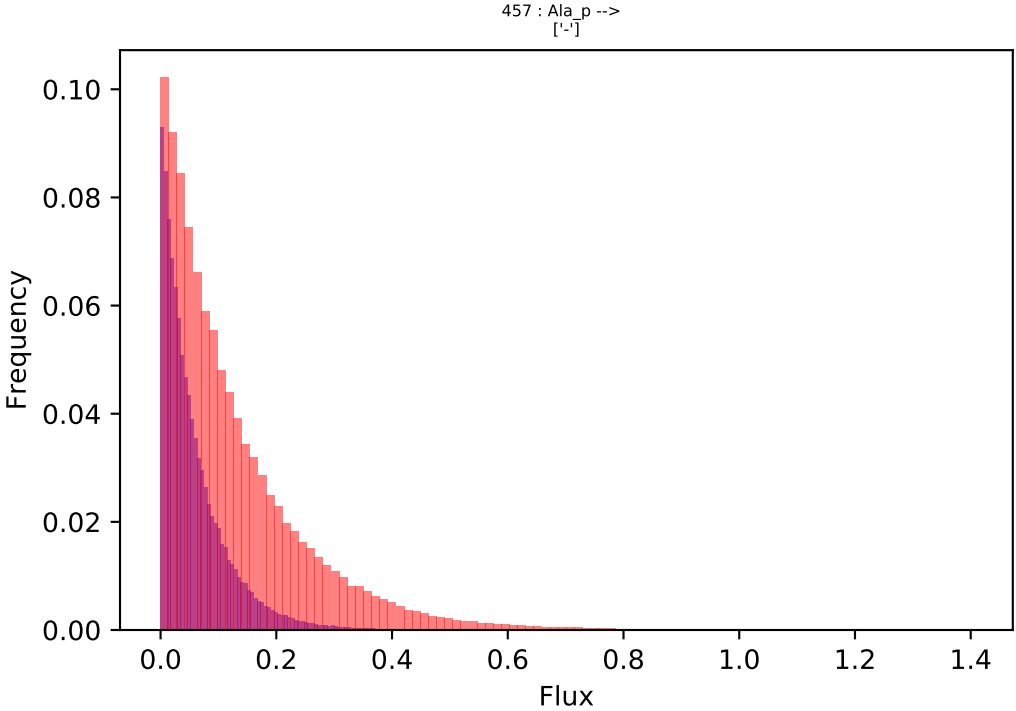

452 : --> H2S_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Flux

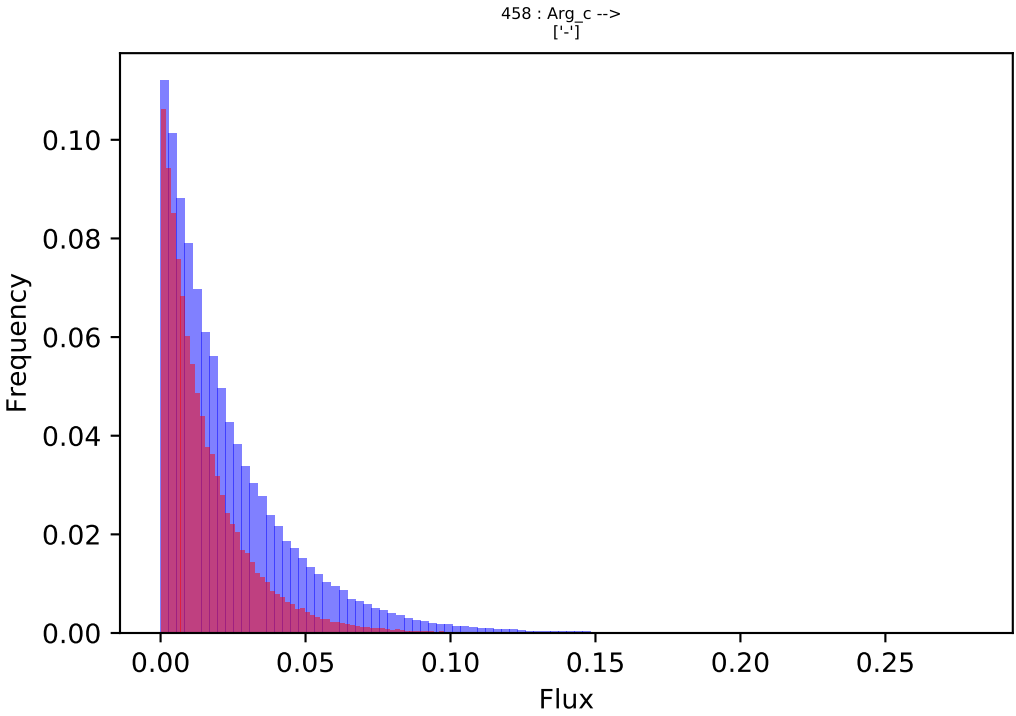

453 : O2_c -->
['-']
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
85.0
87.5
90.0
92.5
95.0
97.5
100.0
102.5
105.0
Flux

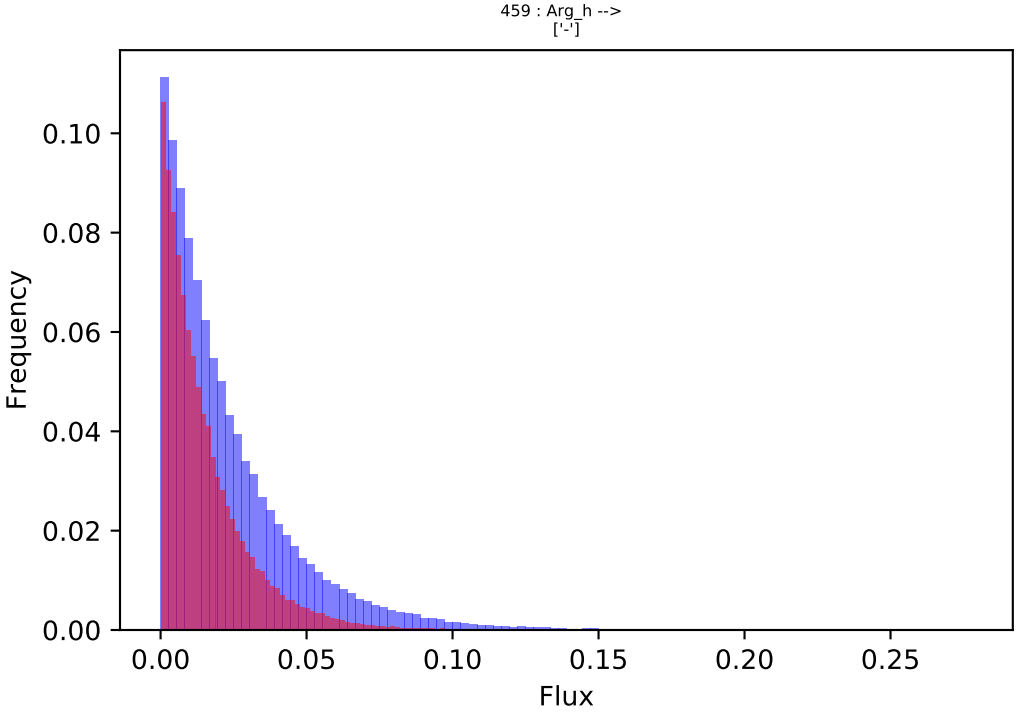

454 : Ala_c -->
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

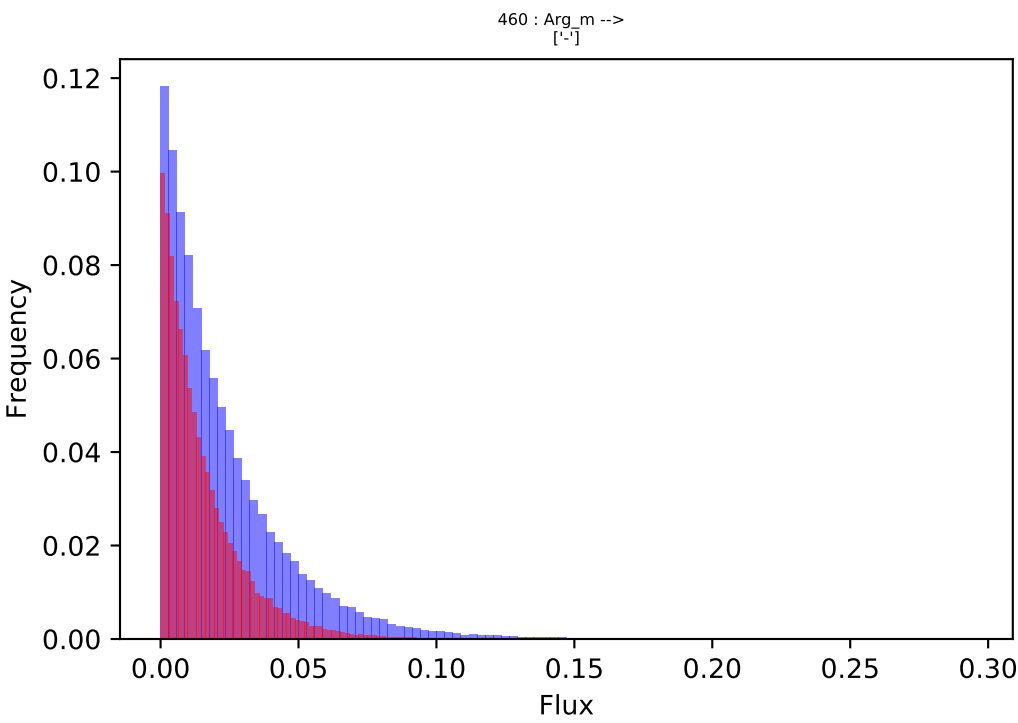

455 : Ala_h -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Flux

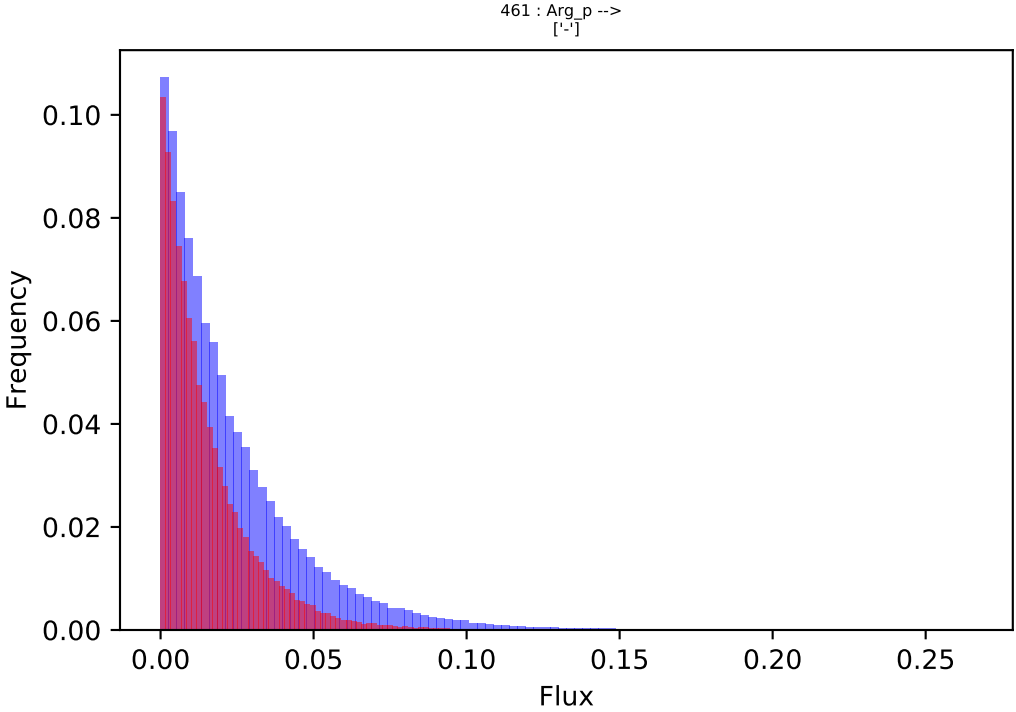

456 : Ala_m -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

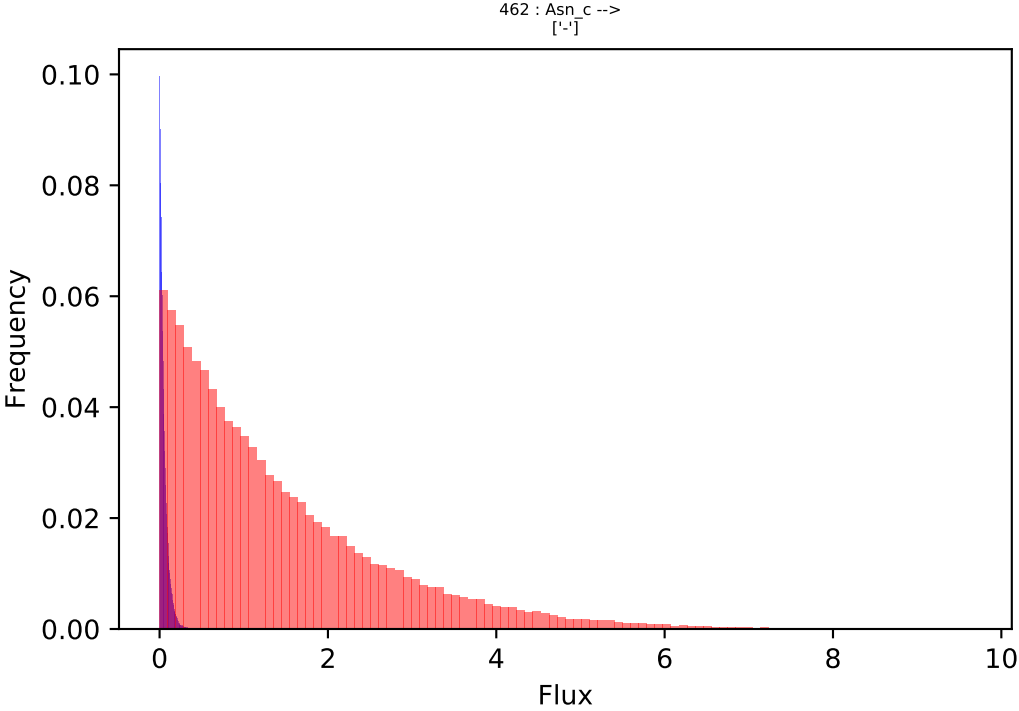

457 : Ala_p -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

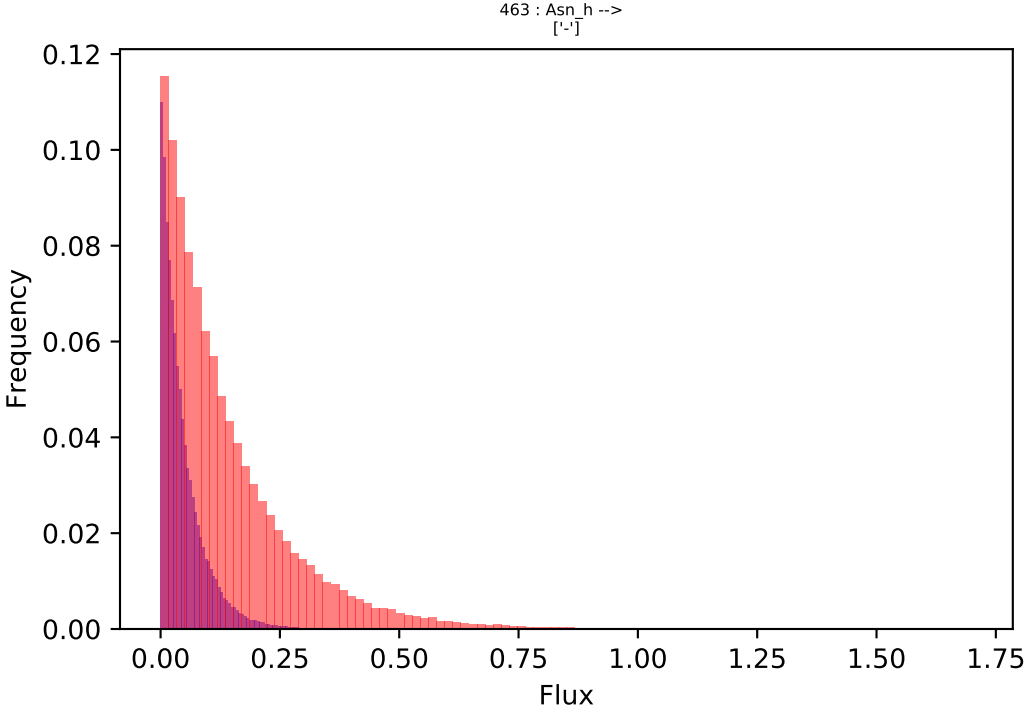

458 : Arg_c -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.05
0.10
0.15
0.20
0.25
Flux

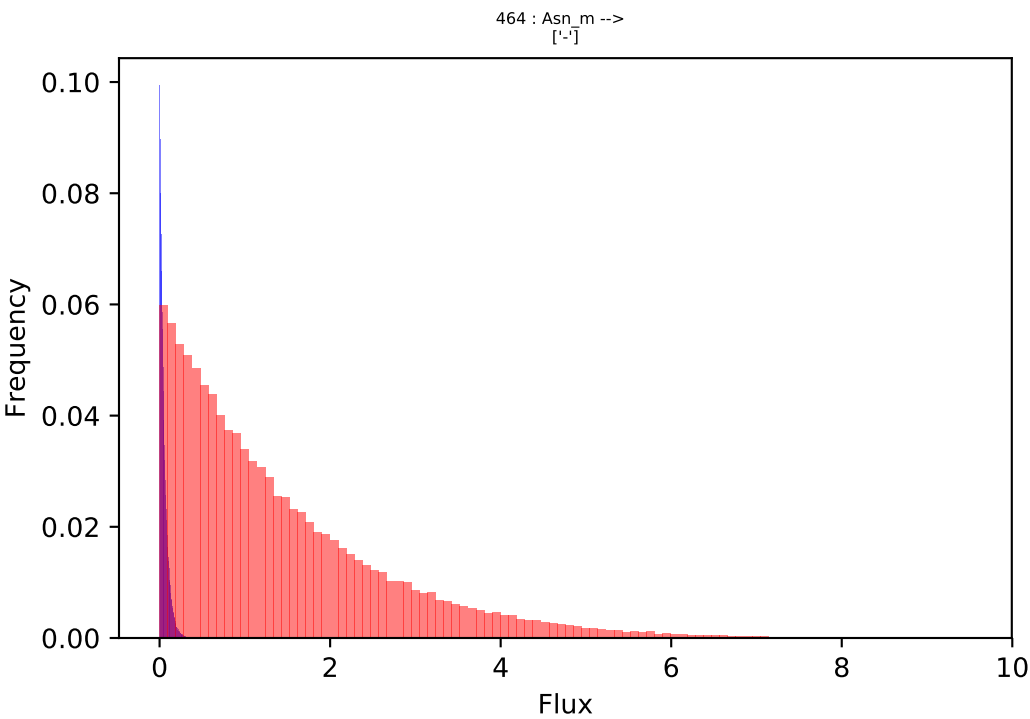

459 : Arg_h -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.05
0.10
0.15
0.20
0.25
Flux

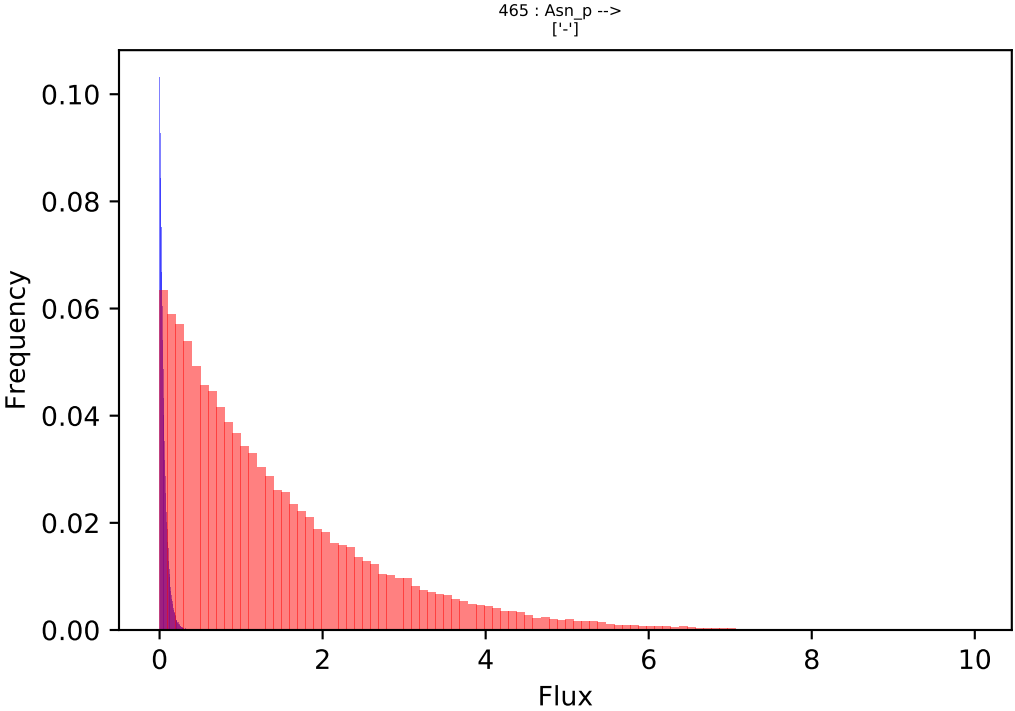

460 : Arg_m -->
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.05
0.10
0.15
0.20
0.25
0.30
Flux

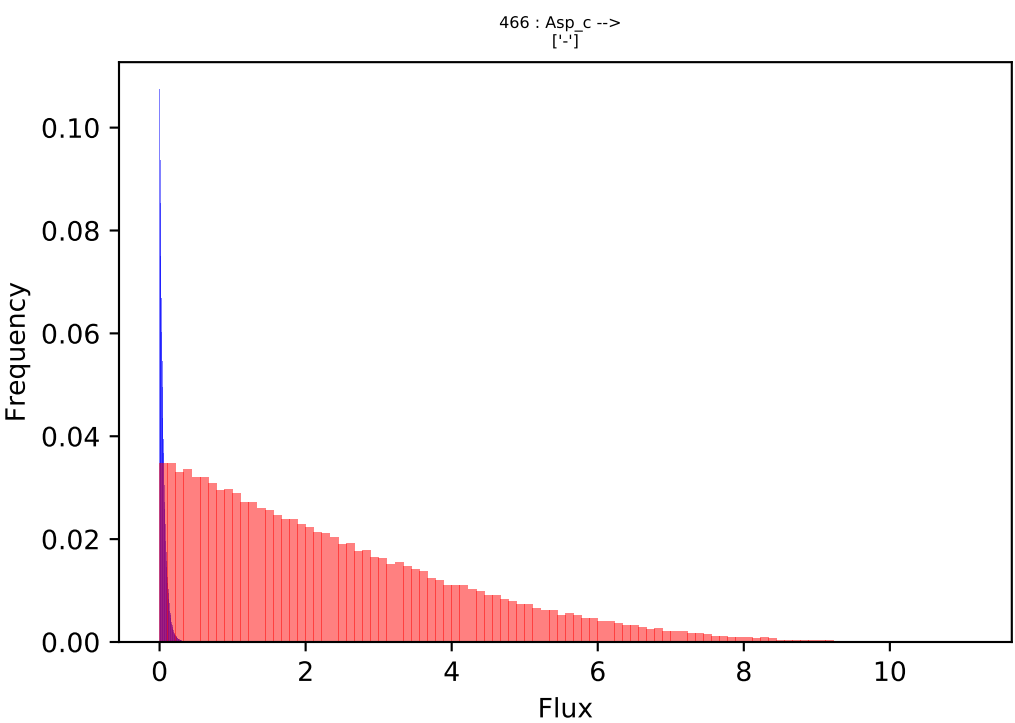

461 : Arg_p -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.05
0.10
0.15
0.20
0.25
Flux

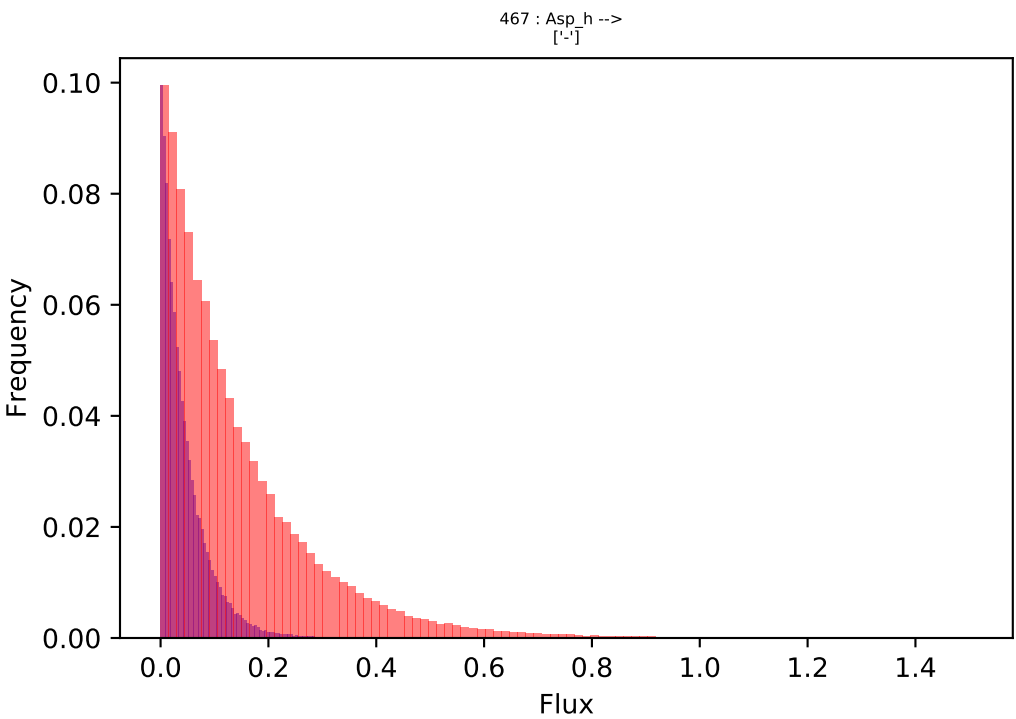

462 : Asn_c -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0
2
4
6
8
10
Flux

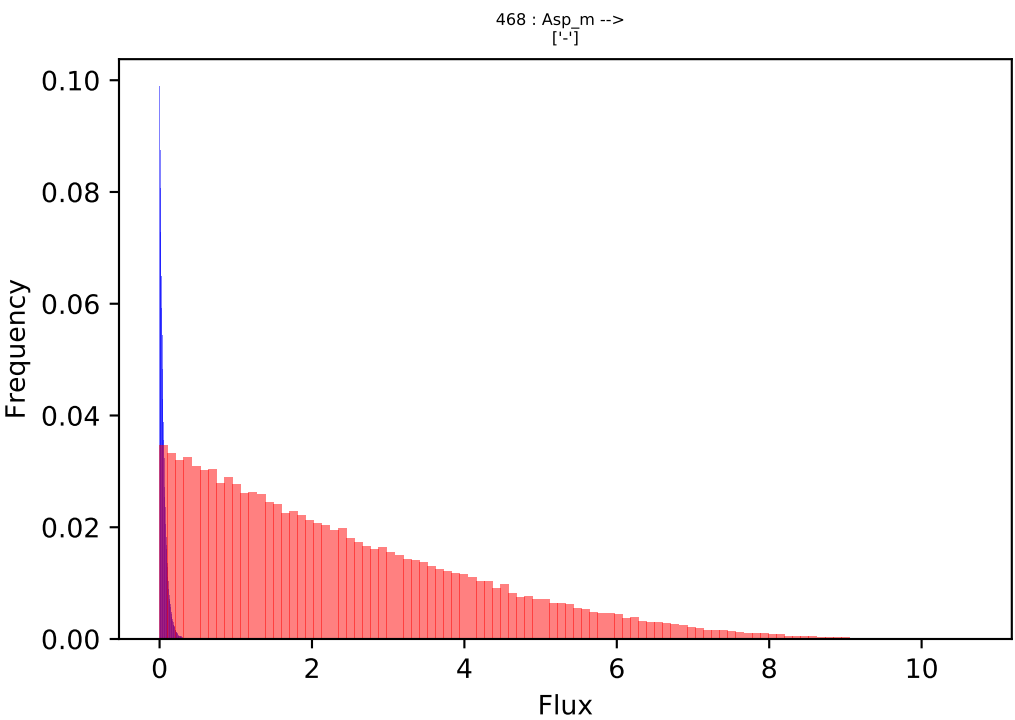

463 : Asn_h -->
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

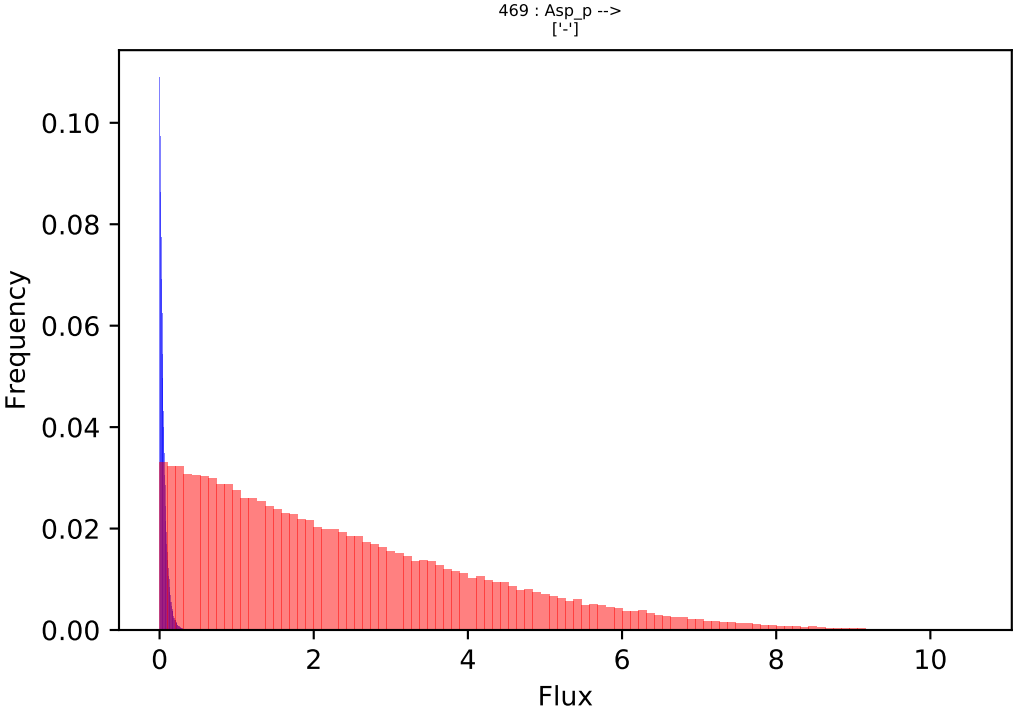

464 : Asn_m -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0
2
4
6
8
10
Flux

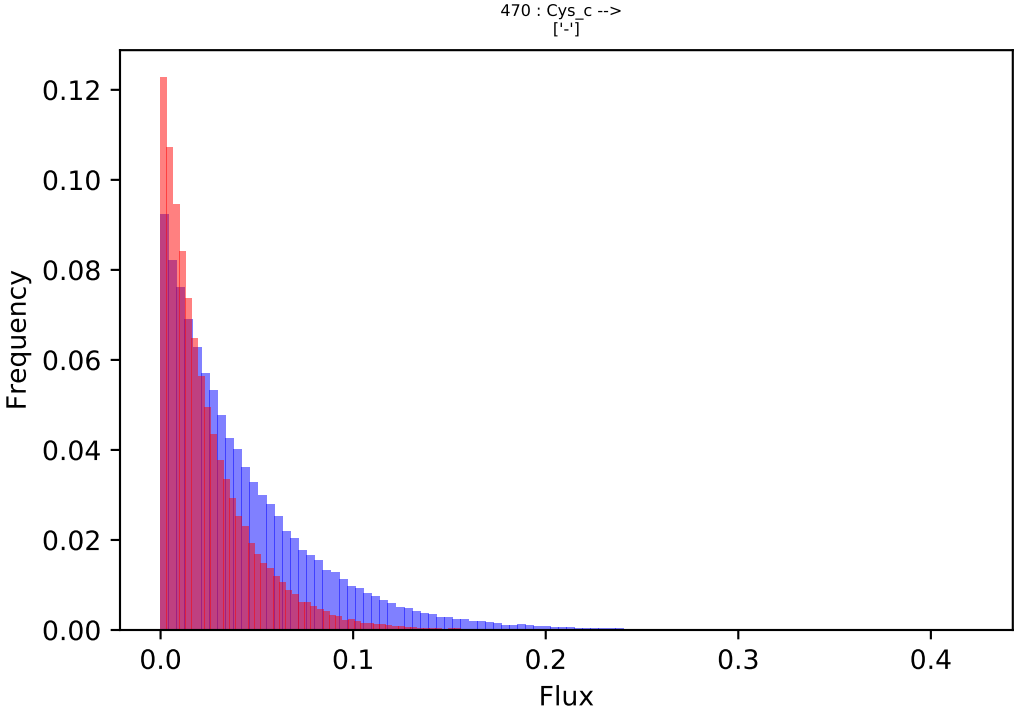

465 : Asn_p -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0
2
4
6
8
10
Flux

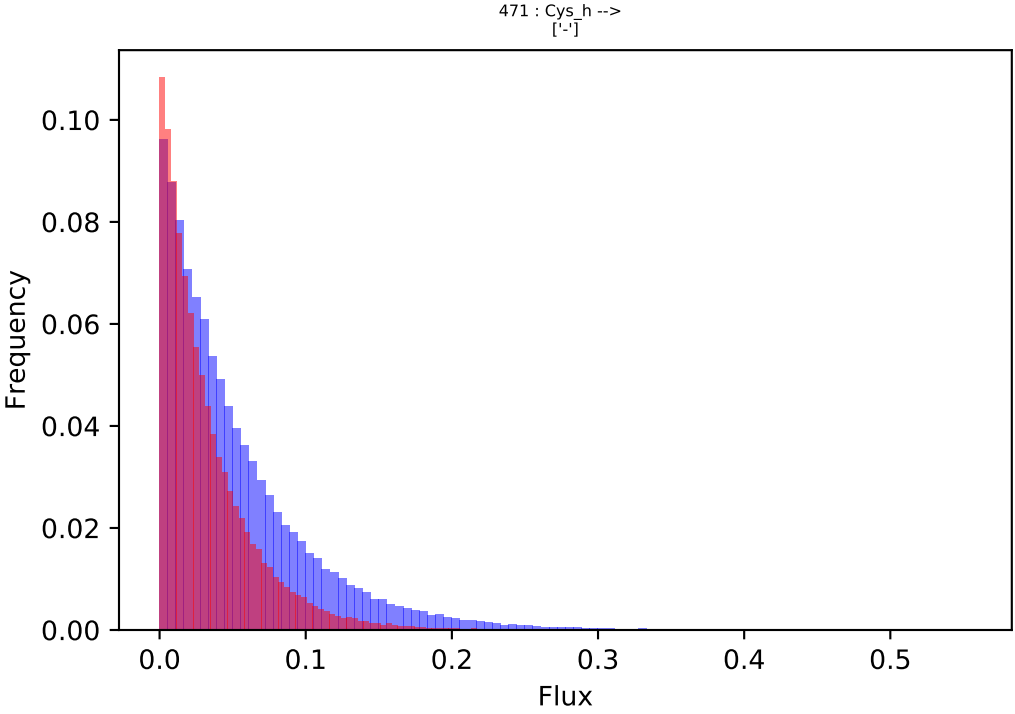

466 : Asp_c -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0
2
4
6
8
10
Flux

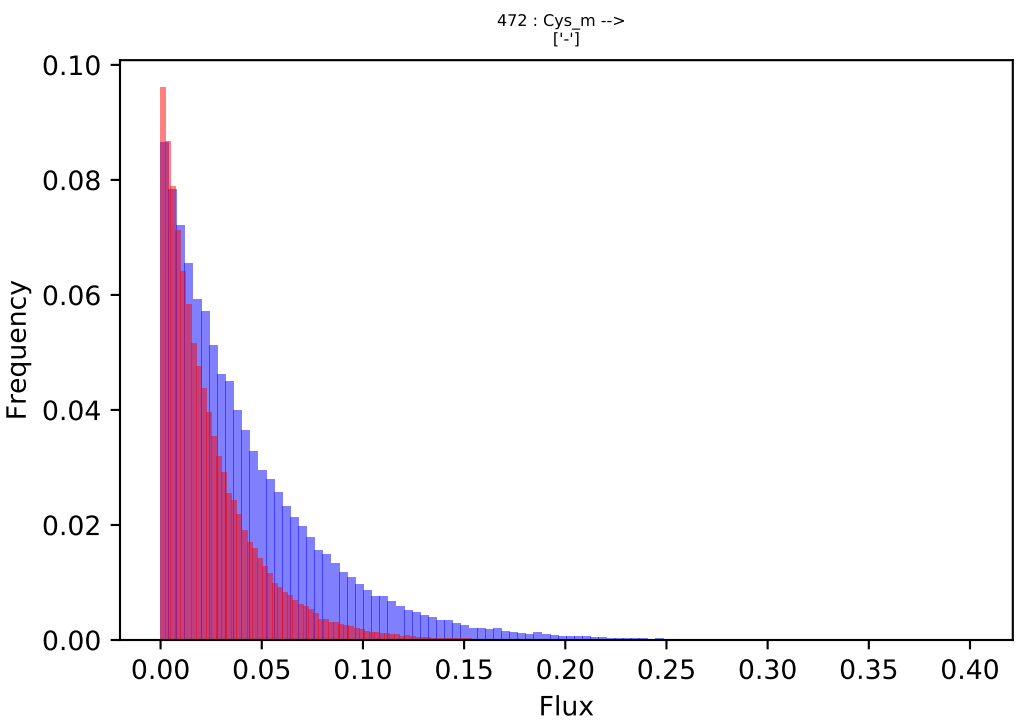

467 : Asp_h -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

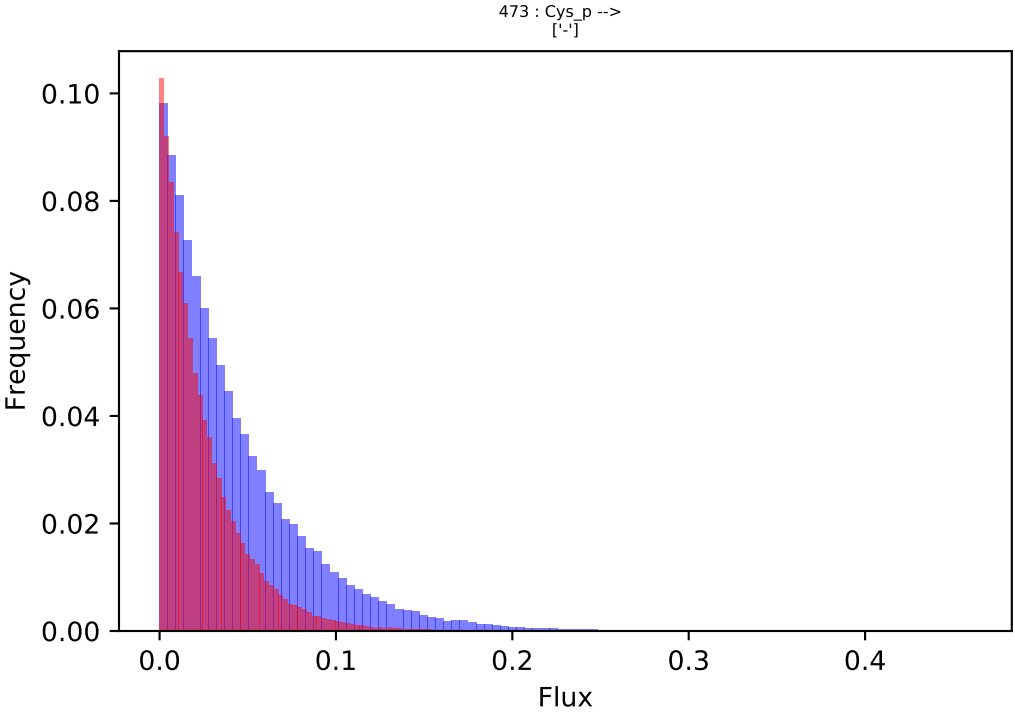

468 : Asp_m -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0
2
4
6
8
10
Flux

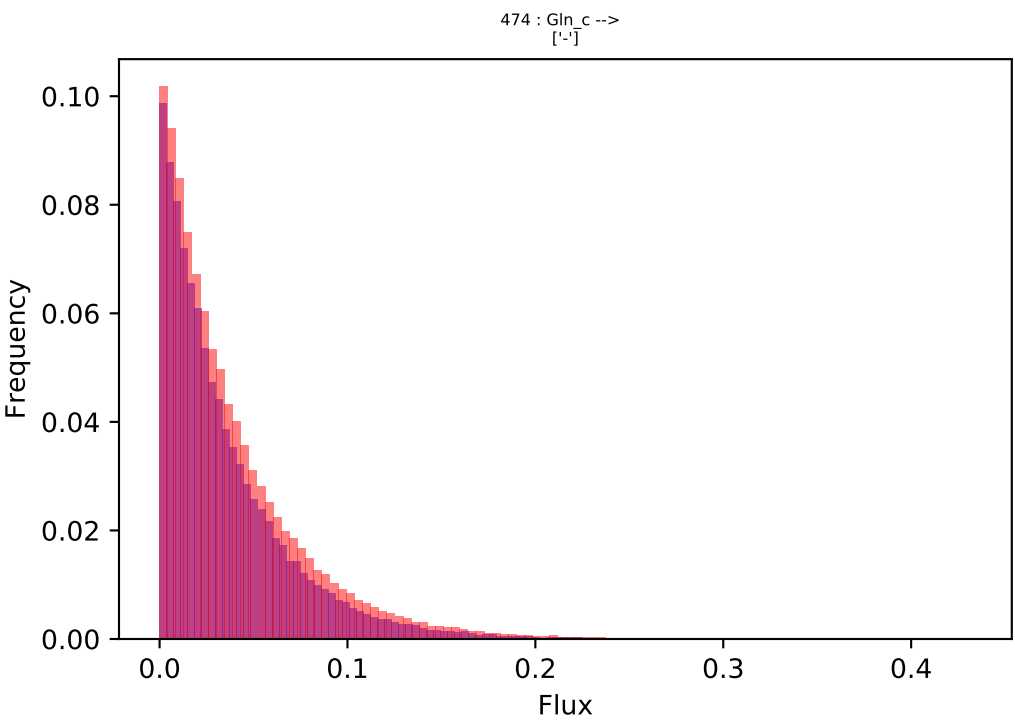

469 : Asp_p -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0
2
4
6
8
10
Flux

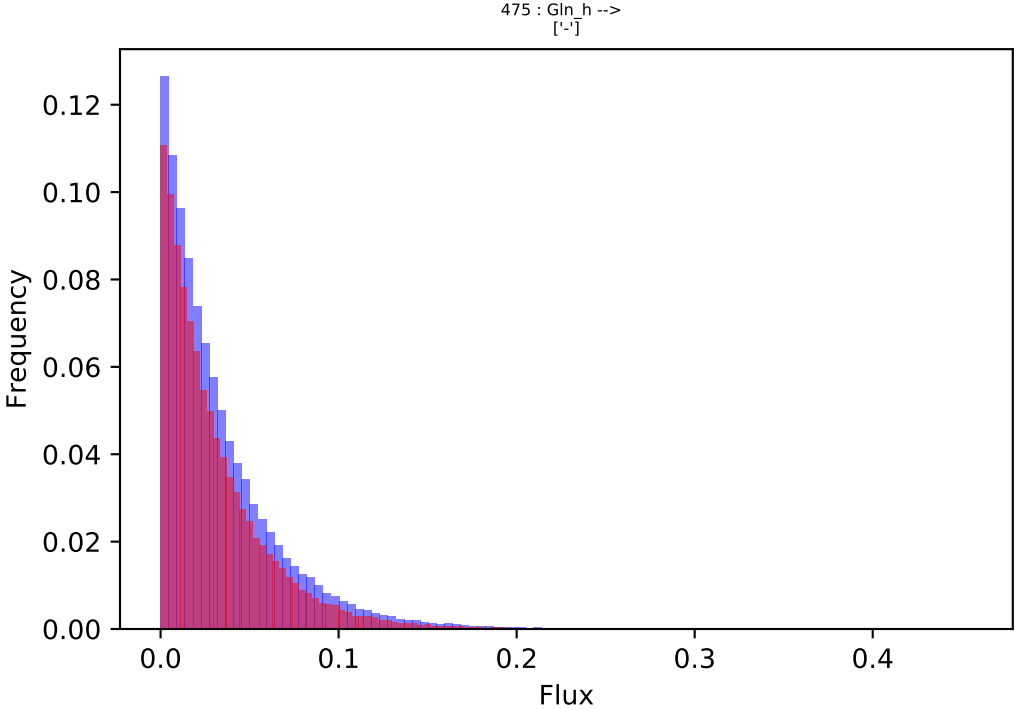

470 : Cys_c -->
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
Flux

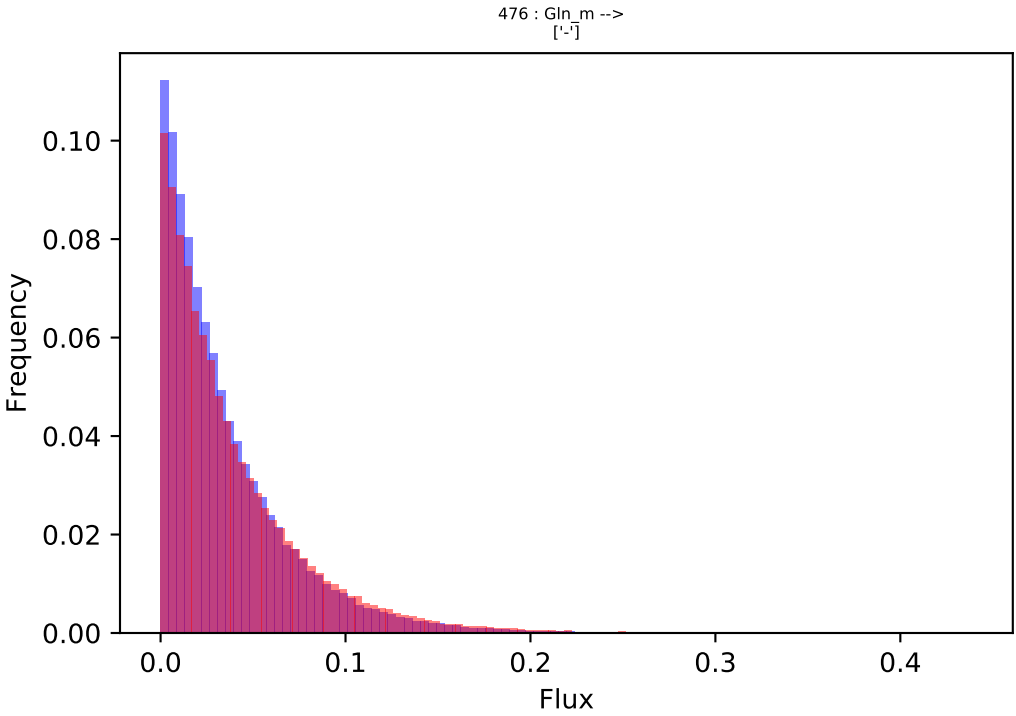

471 : Cys_h -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
Flux

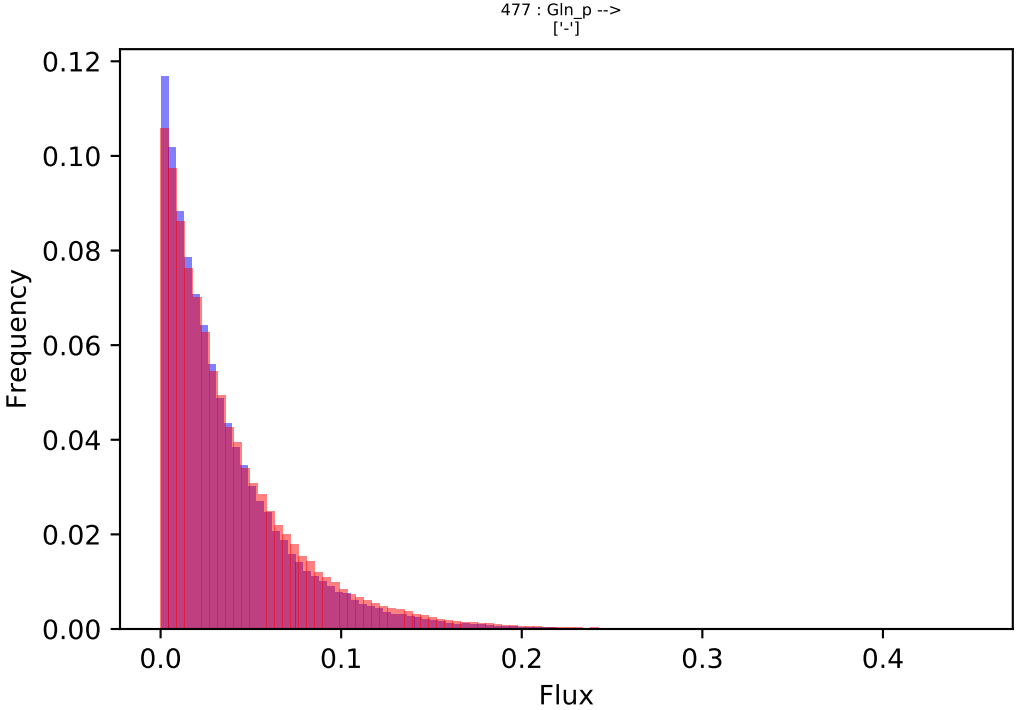

472 : Cys_m -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
Flux

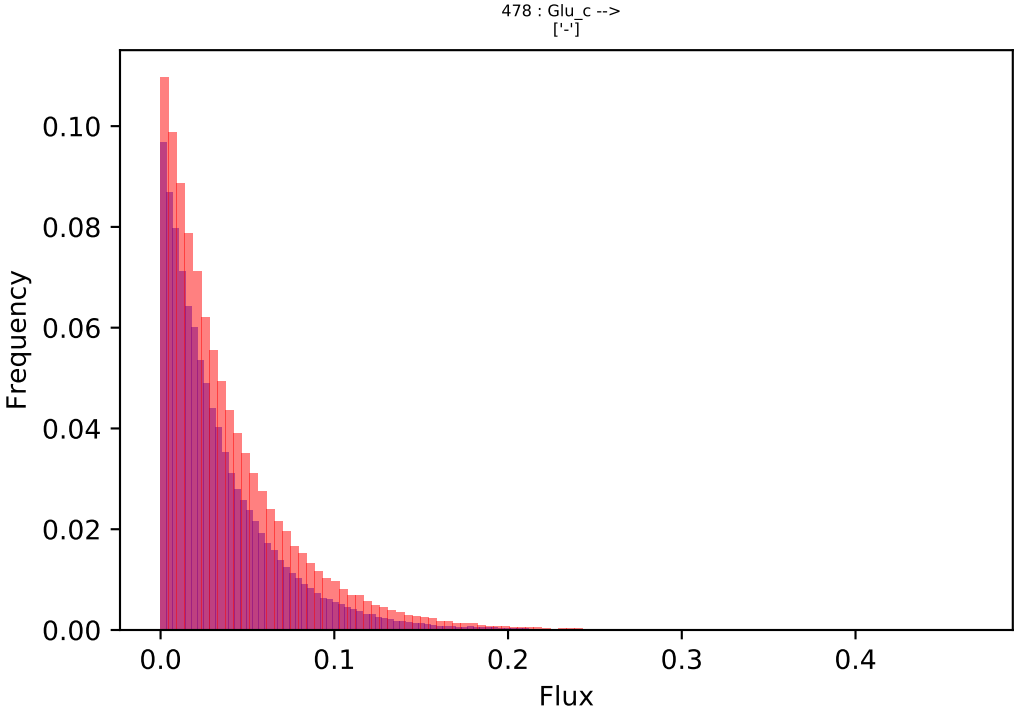

473 : Cys_p -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
Flux

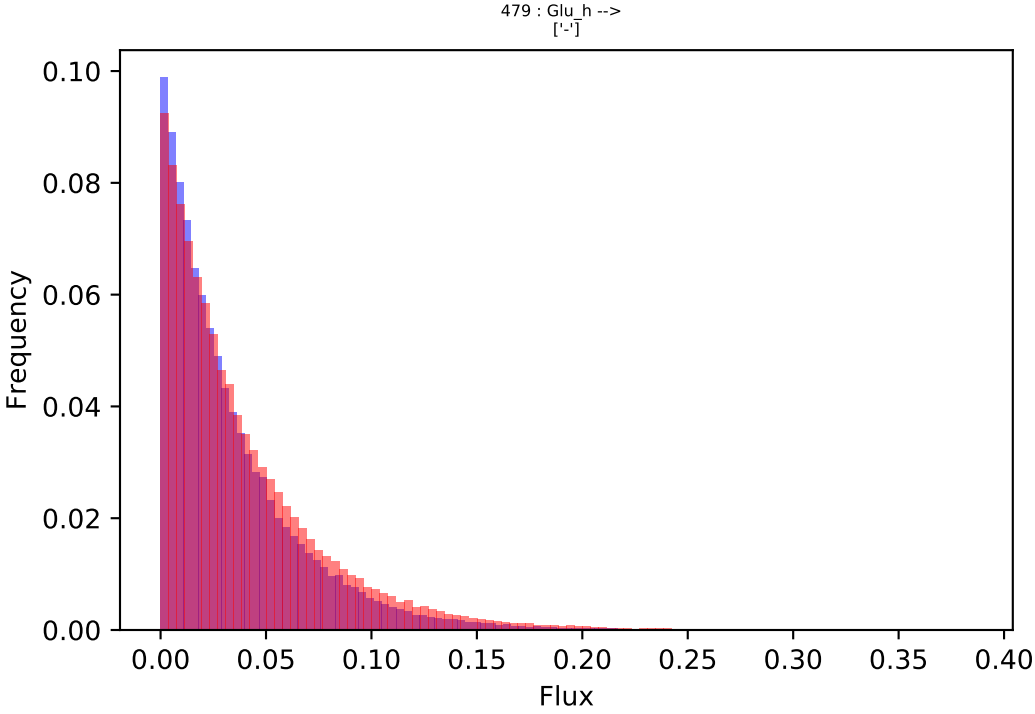

474 : Gln_c -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
Flux

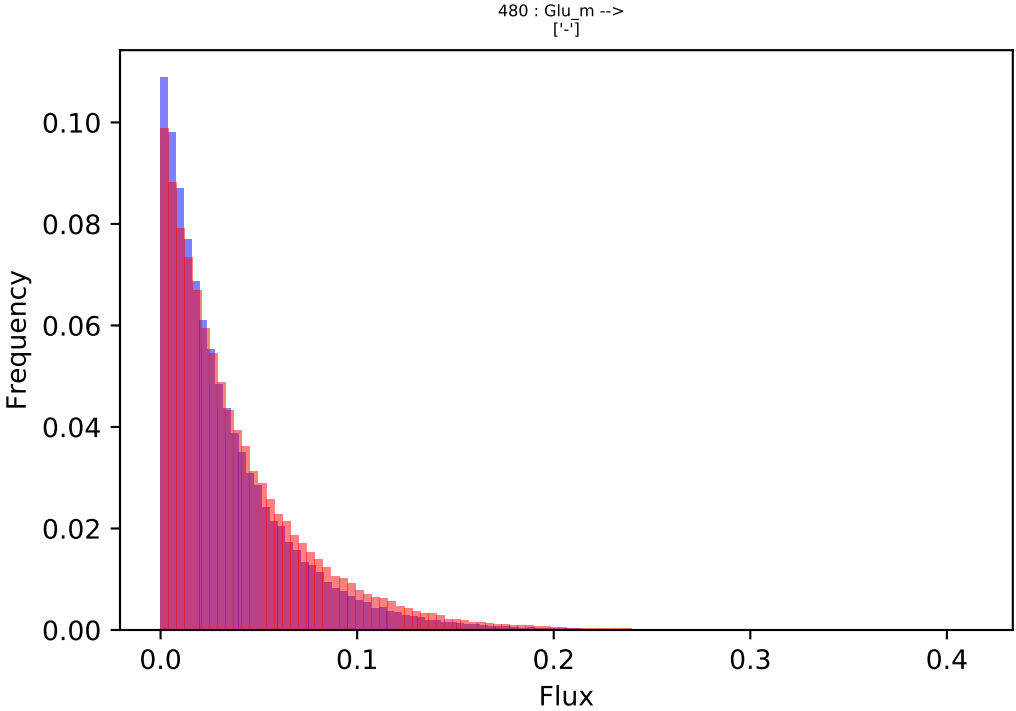

475 : Gln_h -->
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
Flux


476 : Gln_m -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
Flux


477 : Gln_p -->
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
Flux


478 : Glu_c -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
Flux


479 : Glu_h -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
Flux


480 : Glu_m -->
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Frequency
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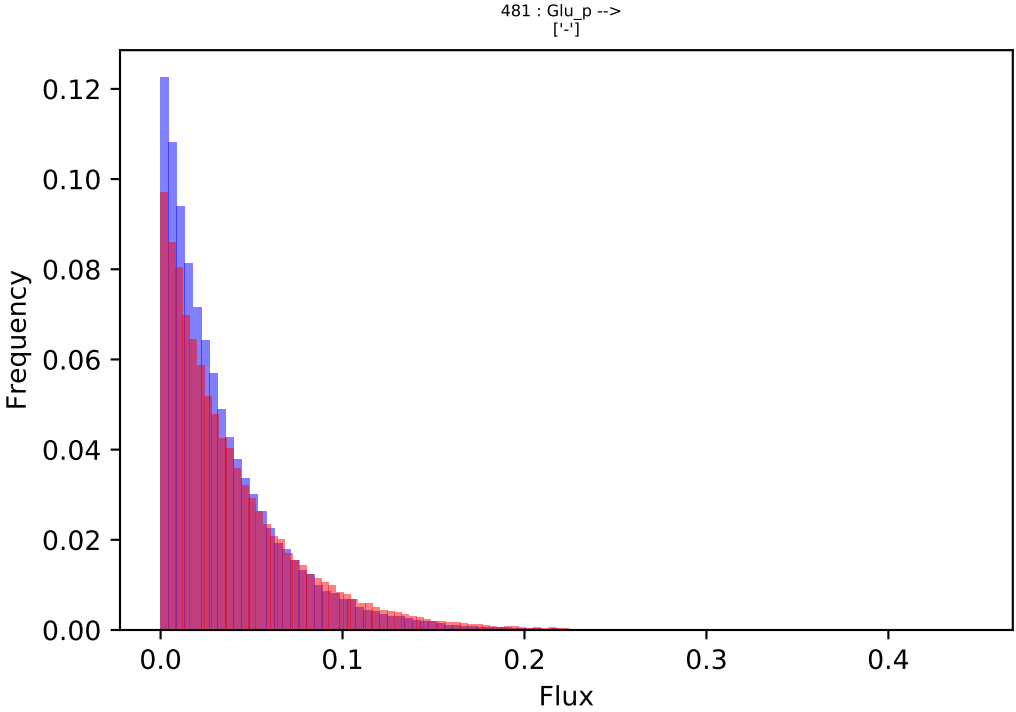
Flux


481 : Glu_p -->
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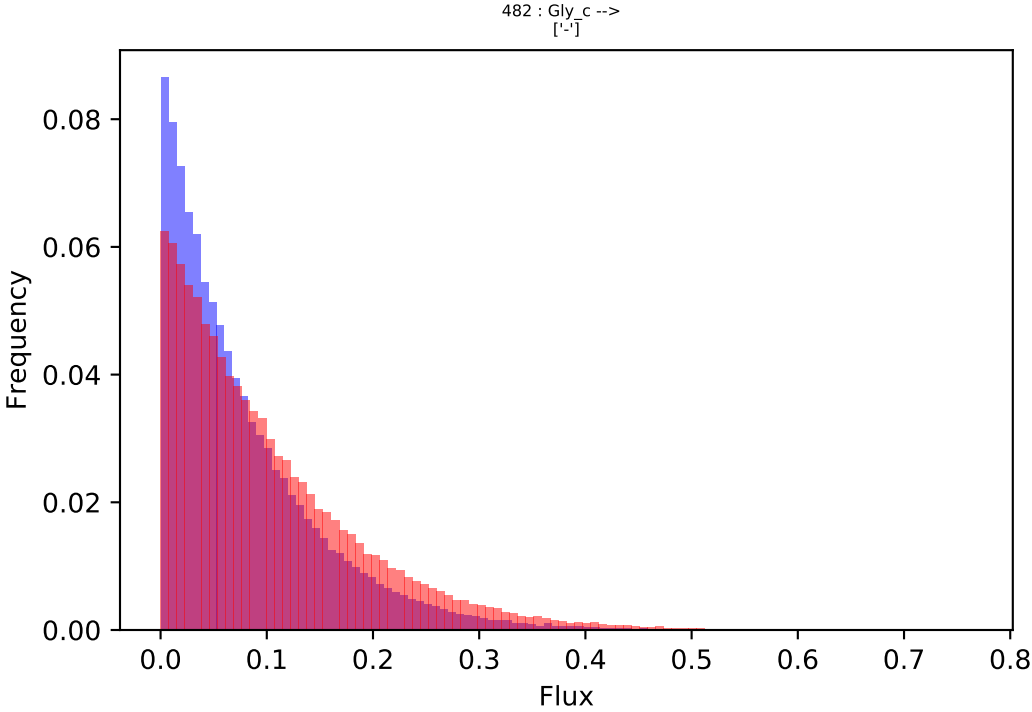
Flux


482 : Gly_c -->
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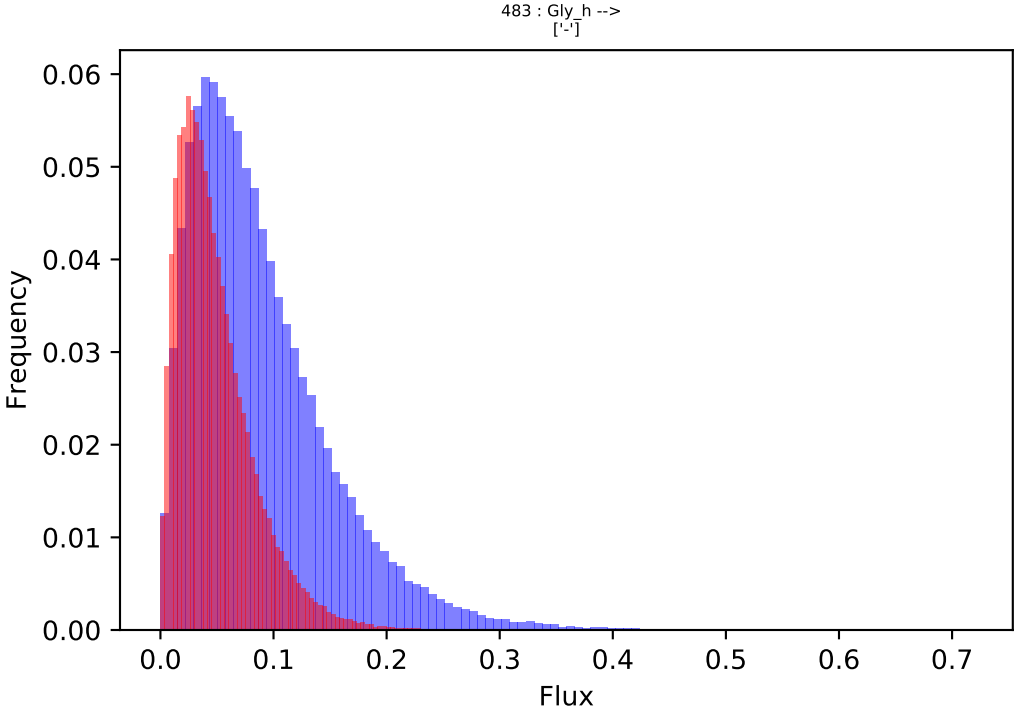
Flux


483 : Gly_h -->
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0.03
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Frequency
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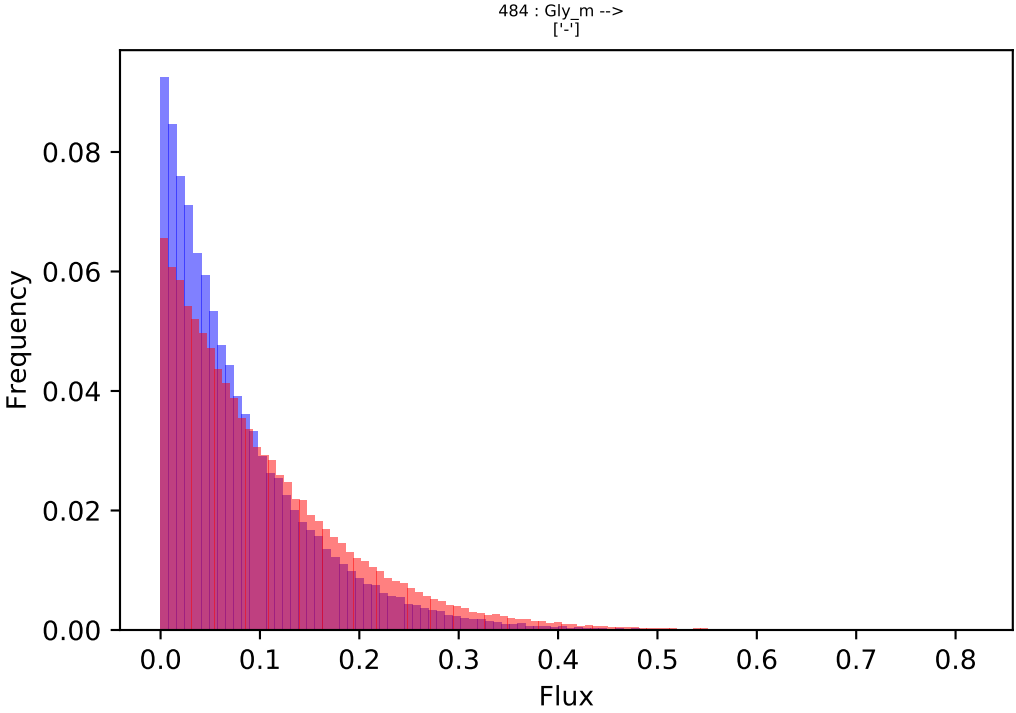
Flux


484 : Gly_m -->
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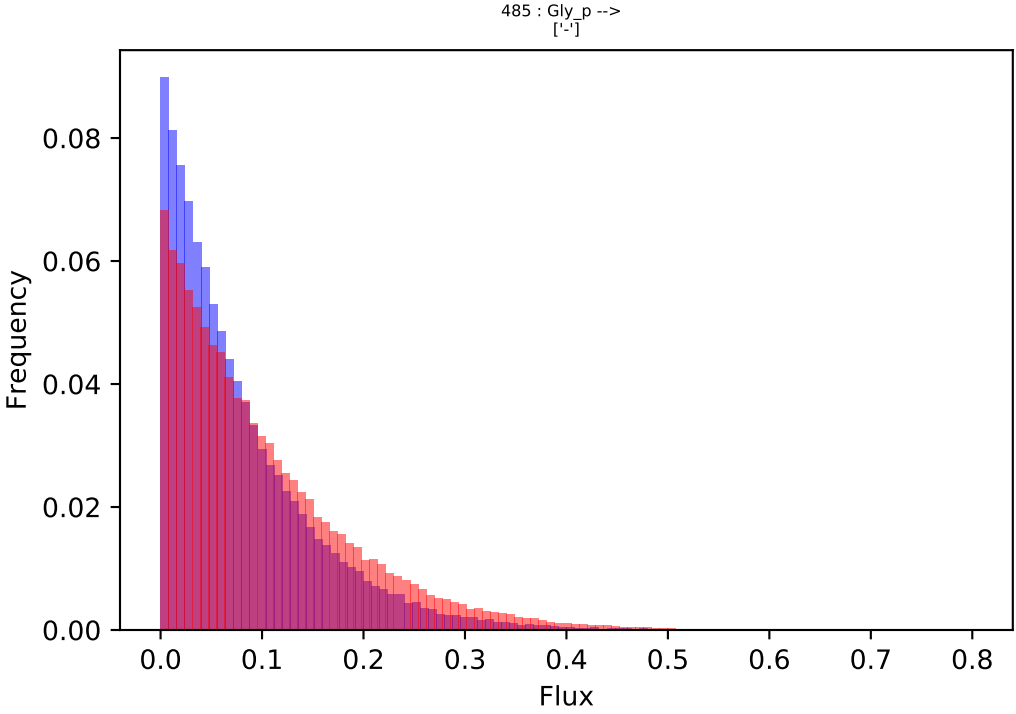
Flux


485 : Gly_p -->
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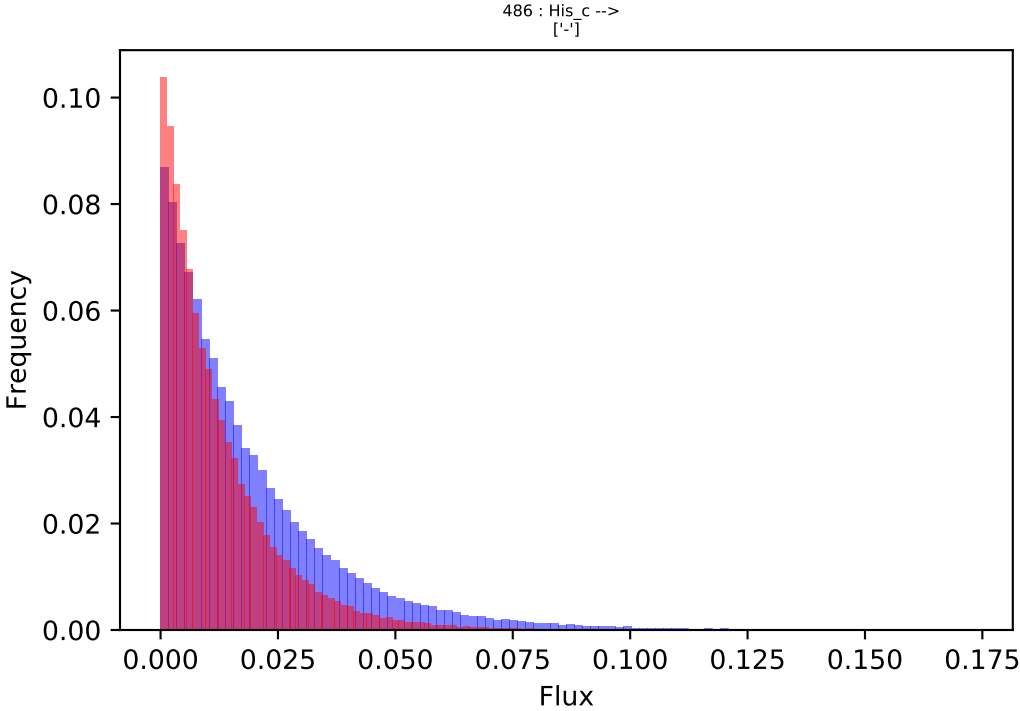
Flux


486 : His_c -->
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Frequency
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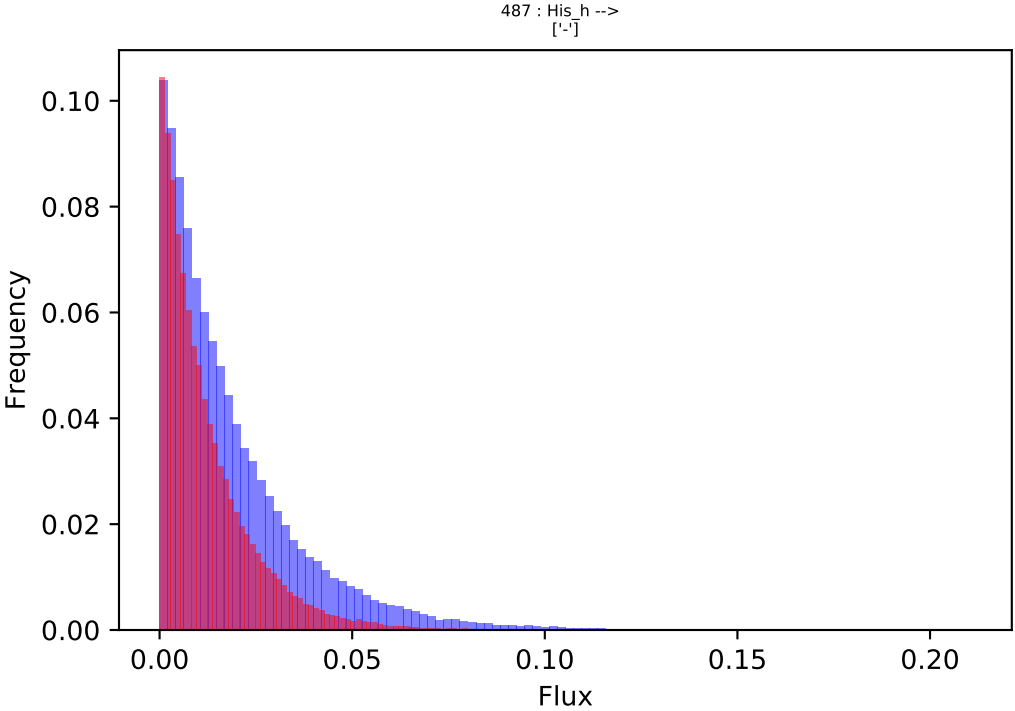
0.150
0.175
Flux


487 : His_h -->
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Frequency
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0.15
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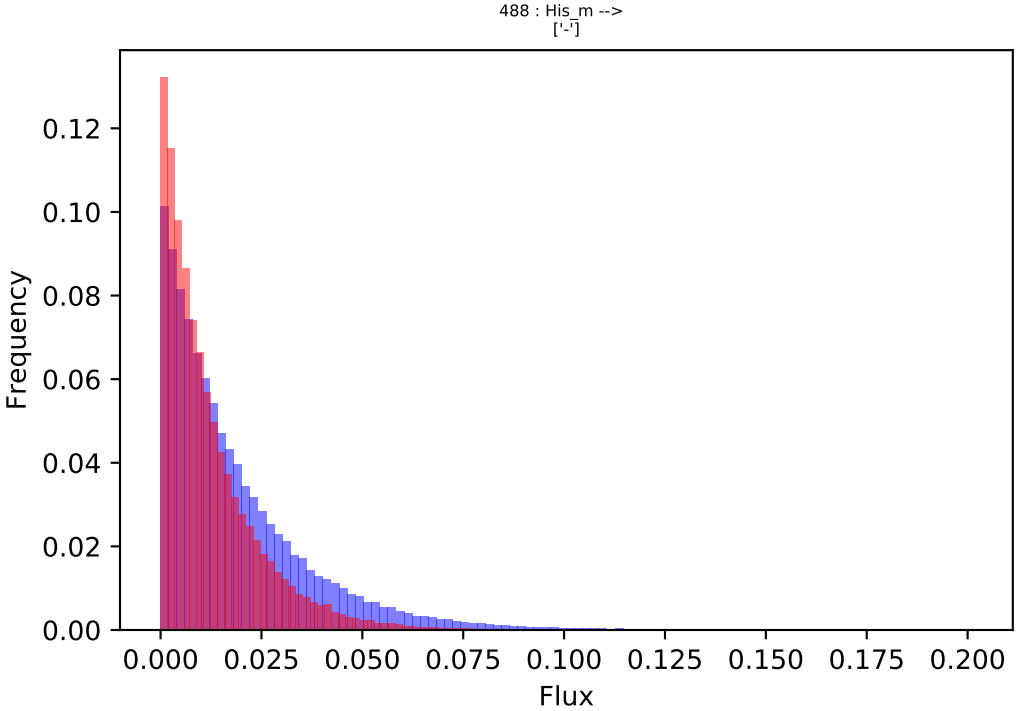
Flux


488 : His_m -->
['-']
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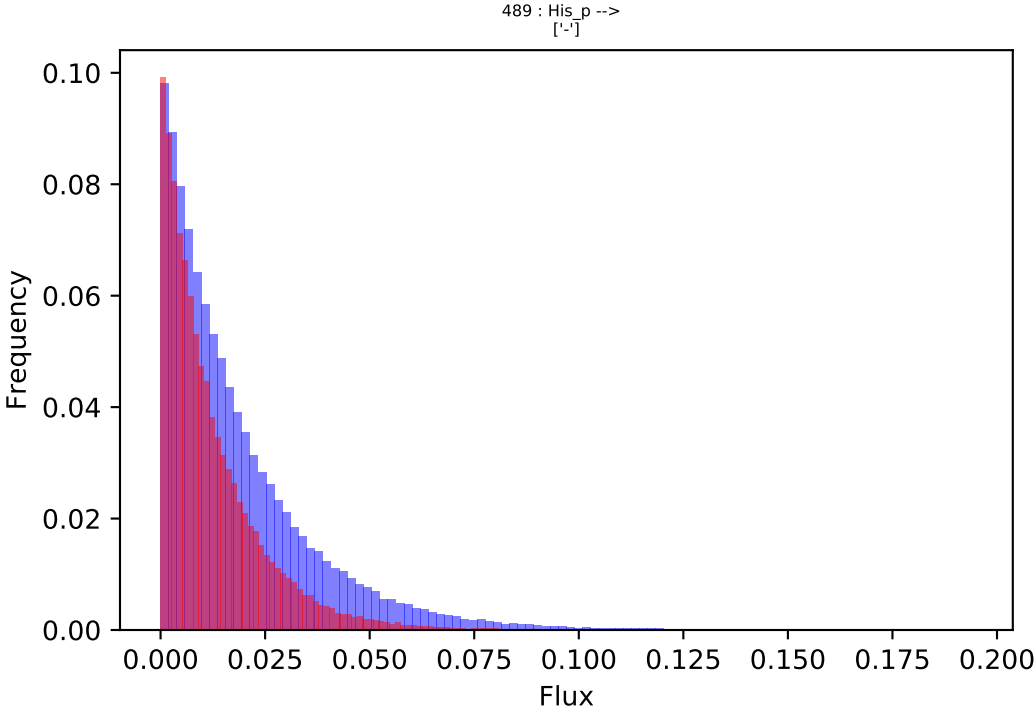
0.200
Flux


489 : His_p -->
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0.075
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0.125
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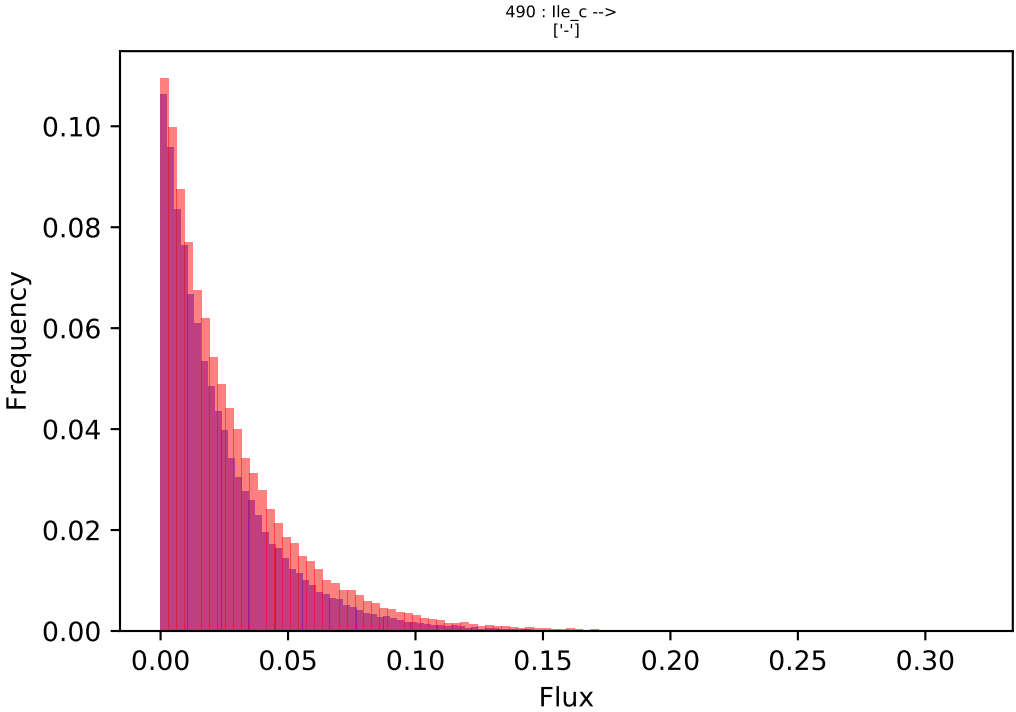
0.175
0.200
Flux


490 : Ile_c -->
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Frequency
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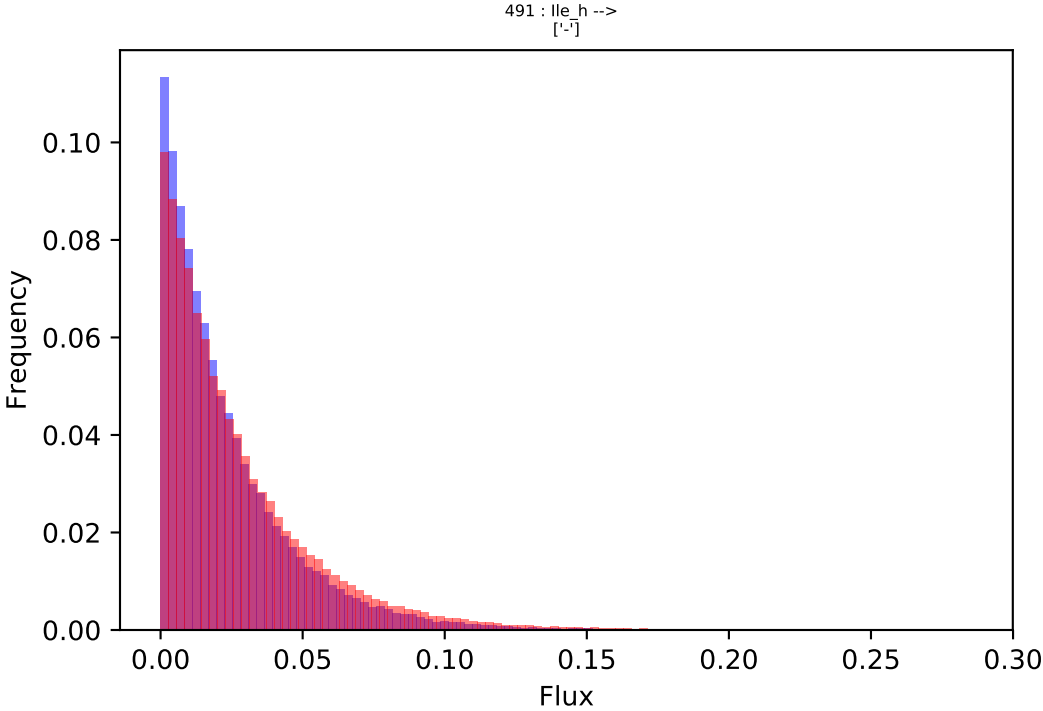
0.25
0.30
Flux


491 : Ile_h -->
['-']
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Frequency
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0.15
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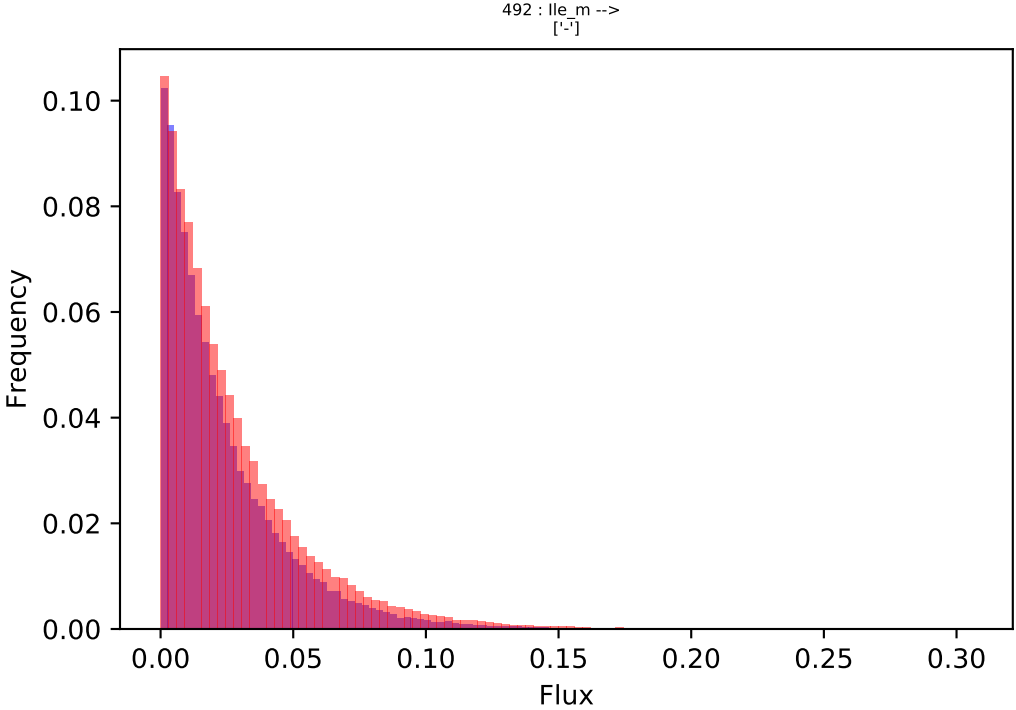
0.25
0.30
Flux


492 : Ile_m -->
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Frequency
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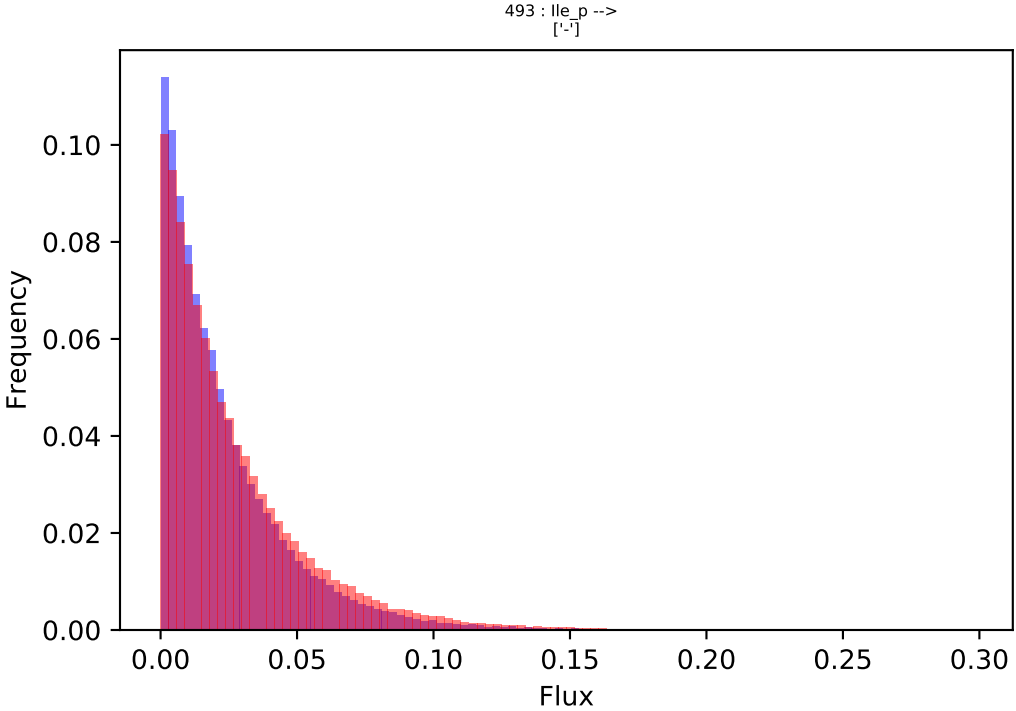
Flux


493 : Ile_p -->
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Frequency
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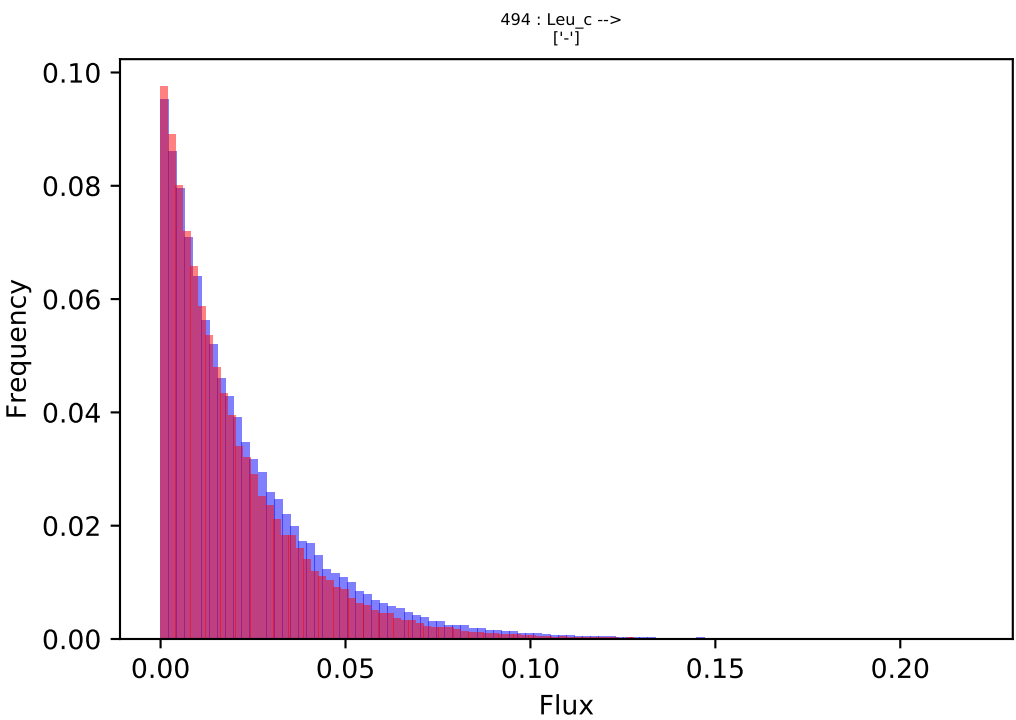
Flux


494 : Leu_c -->
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Frequency
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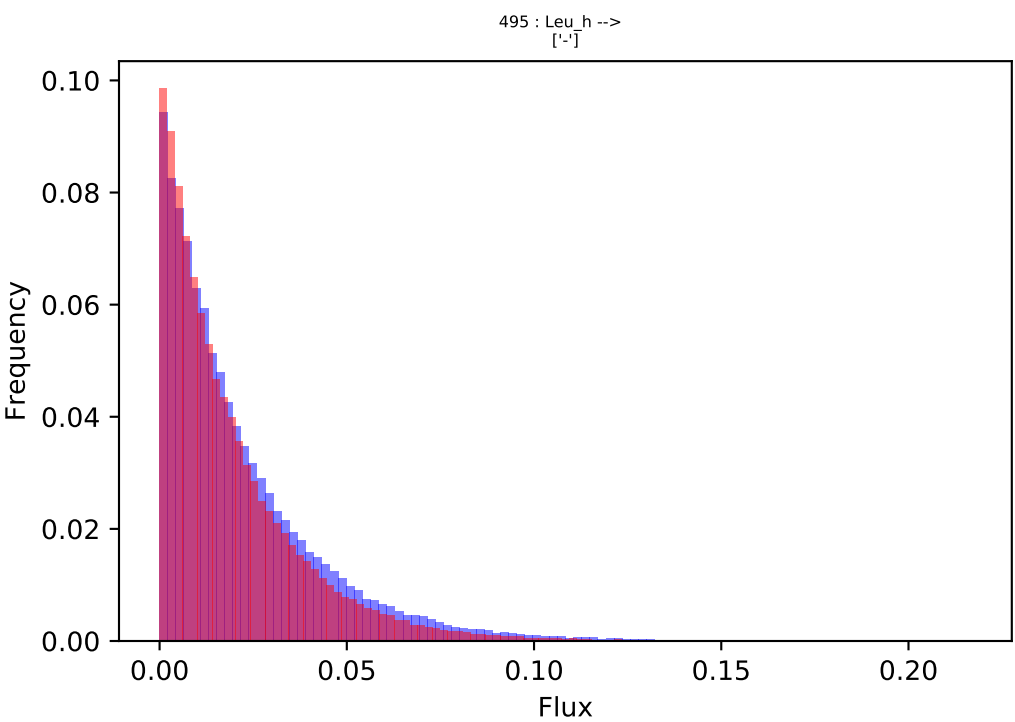
Flux


495 : Leu_h -->
['-']
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Frequency
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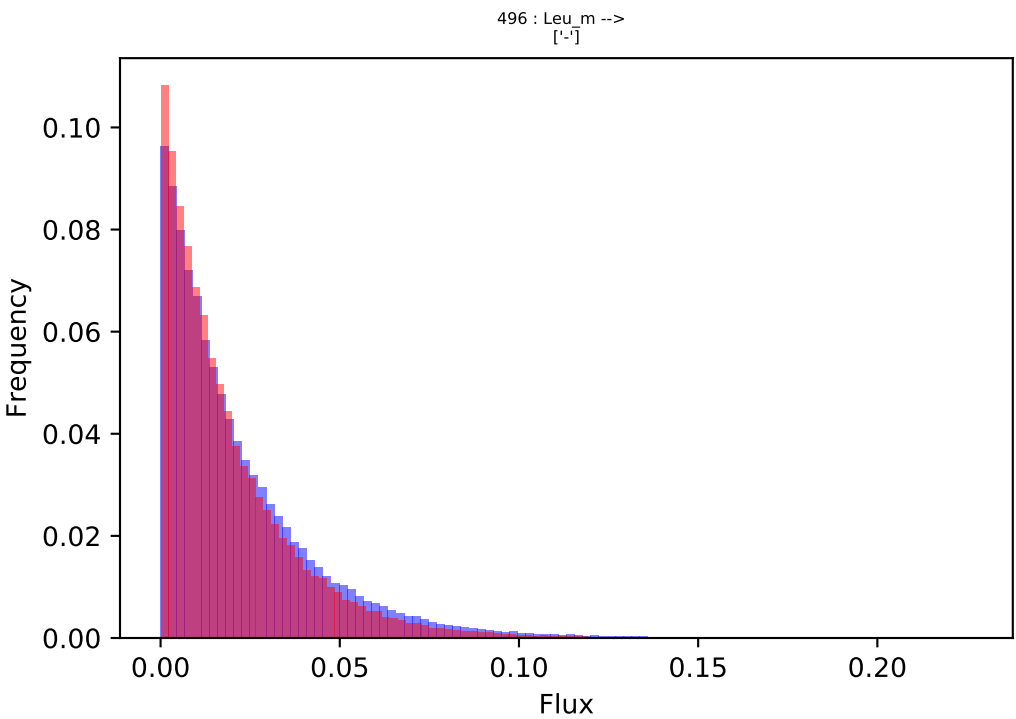
Flux


496 : Leu_m -->
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Frequency
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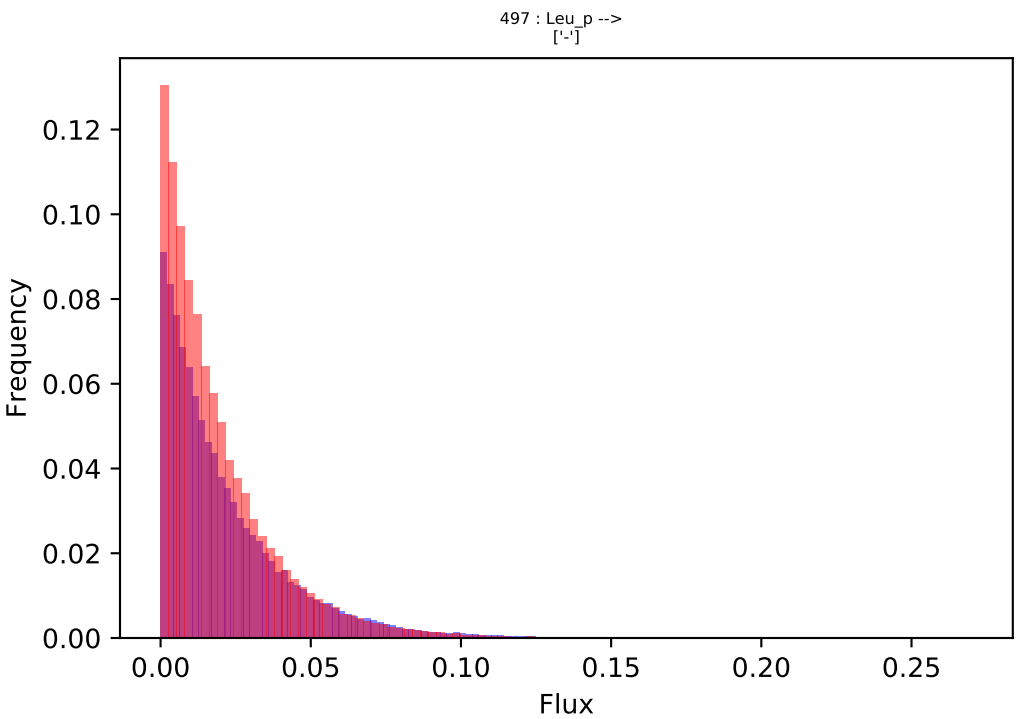
Flux


497 : Leu_p -->
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Frequency
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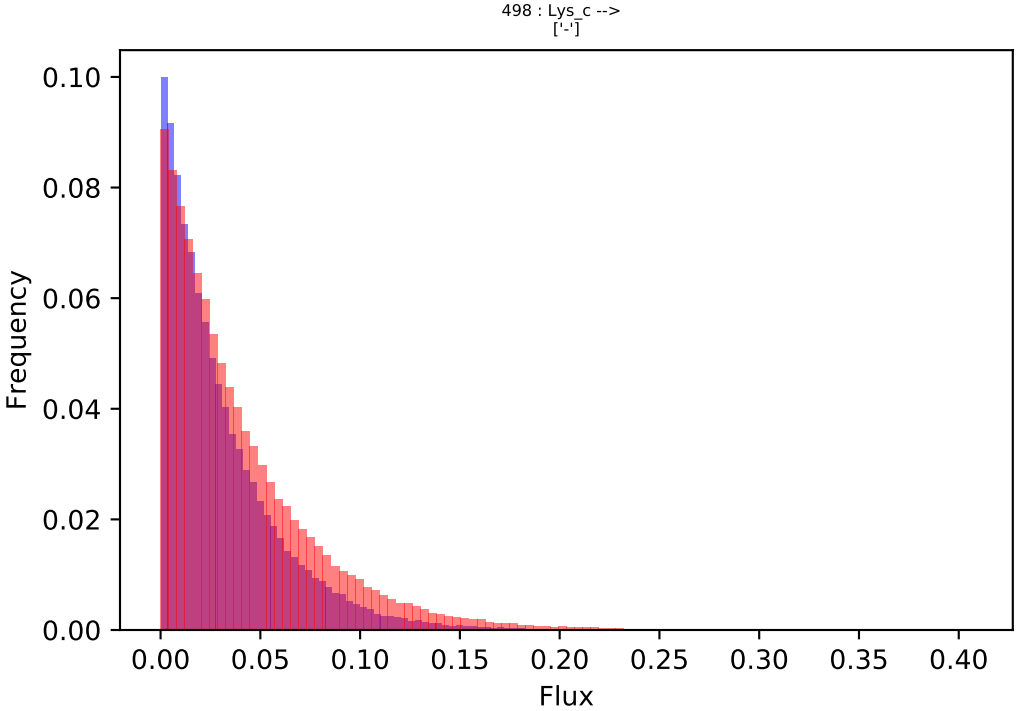
Flux


498 : Lys_c -->
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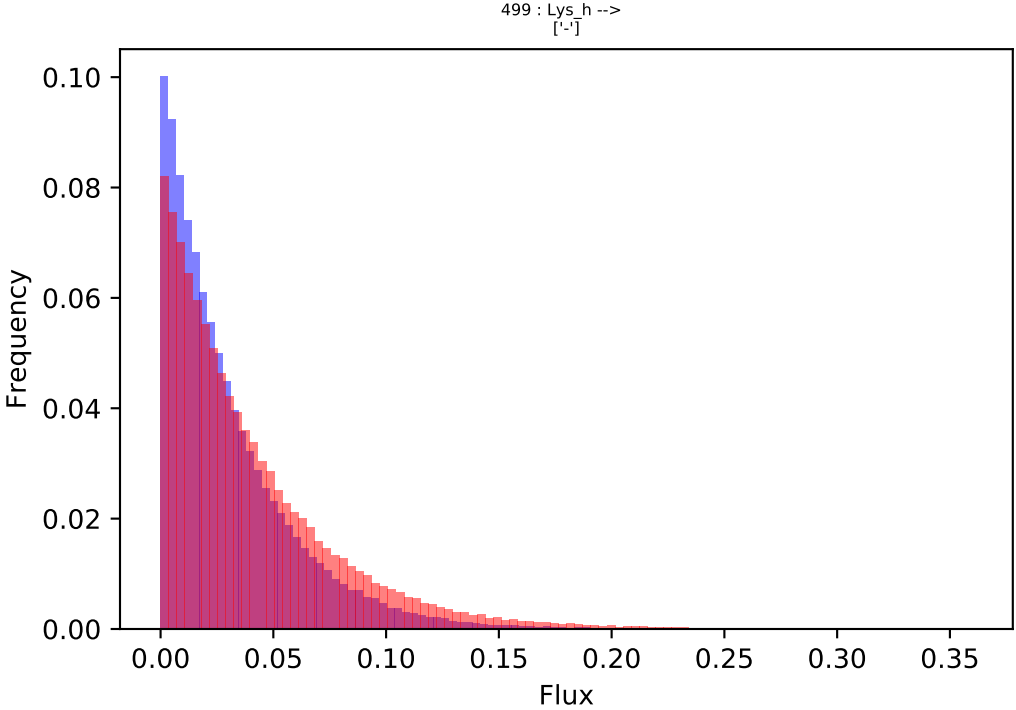
Flux


499 : Lys_h -->
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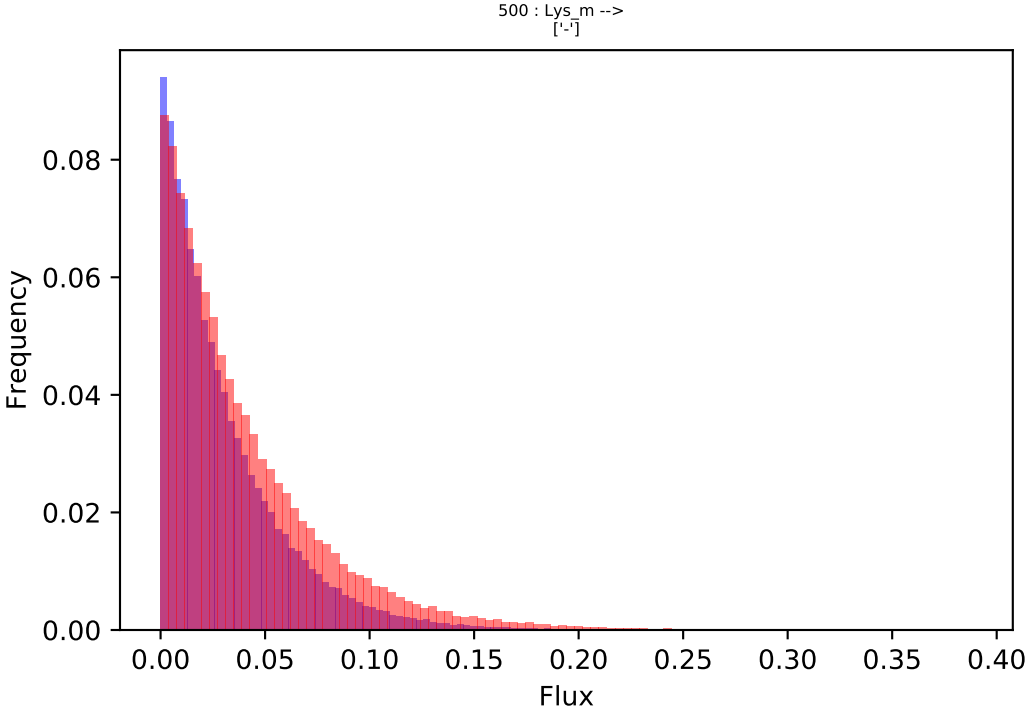
Flux


500 : Lys_m -->
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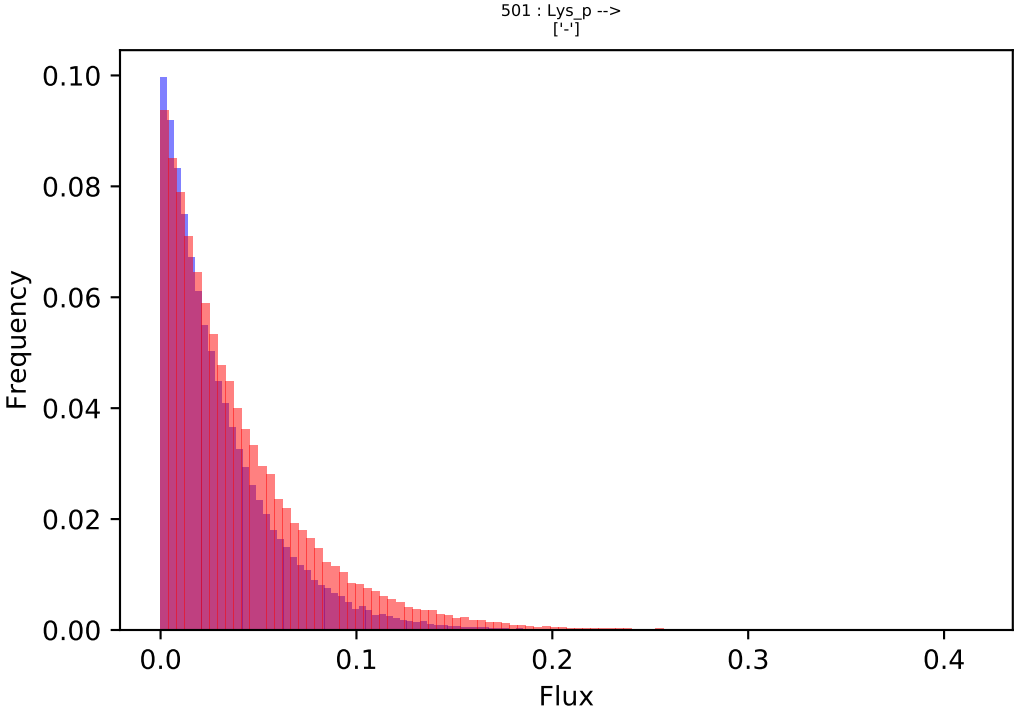
Flux


501 : Lys_p -->
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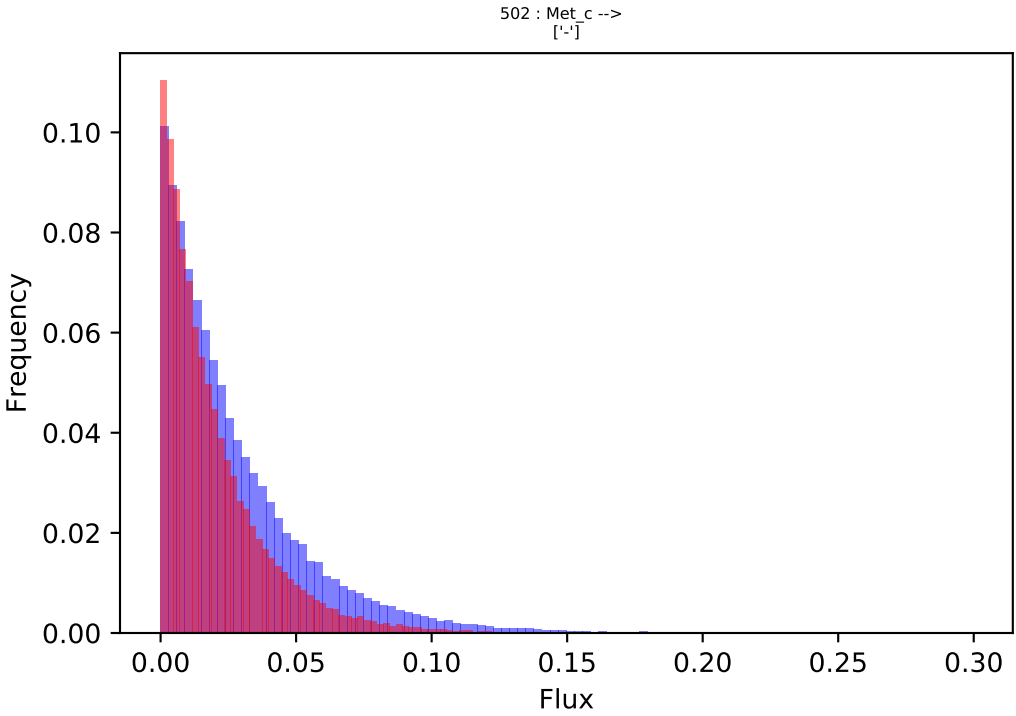
Flux


502 : Met_c -->
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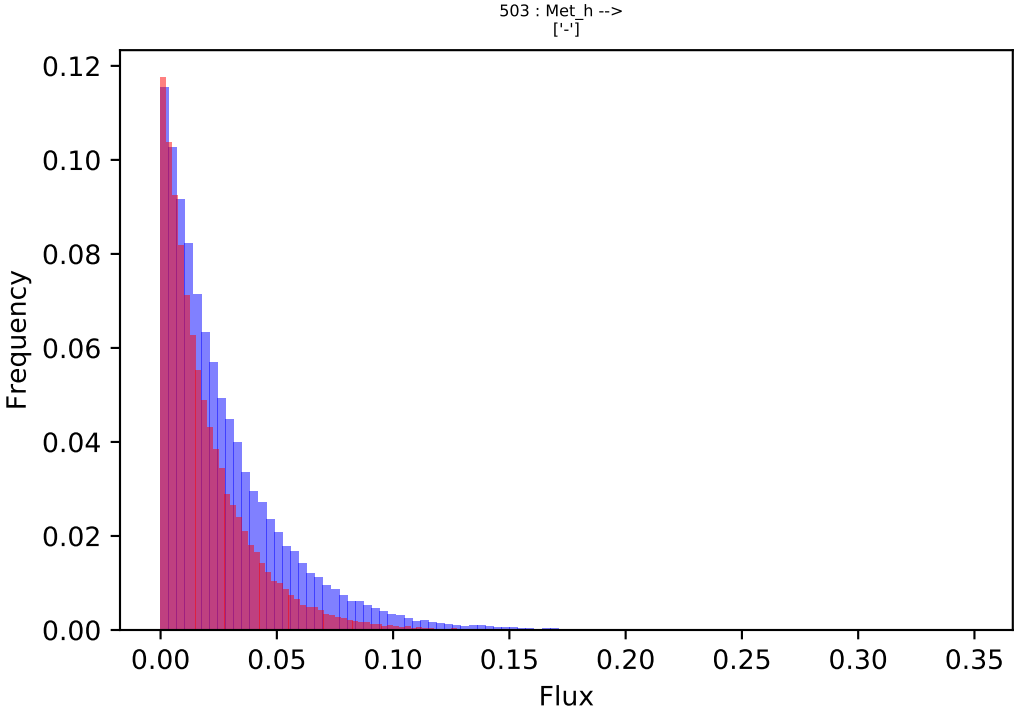
Flux


503 : Met_h -->
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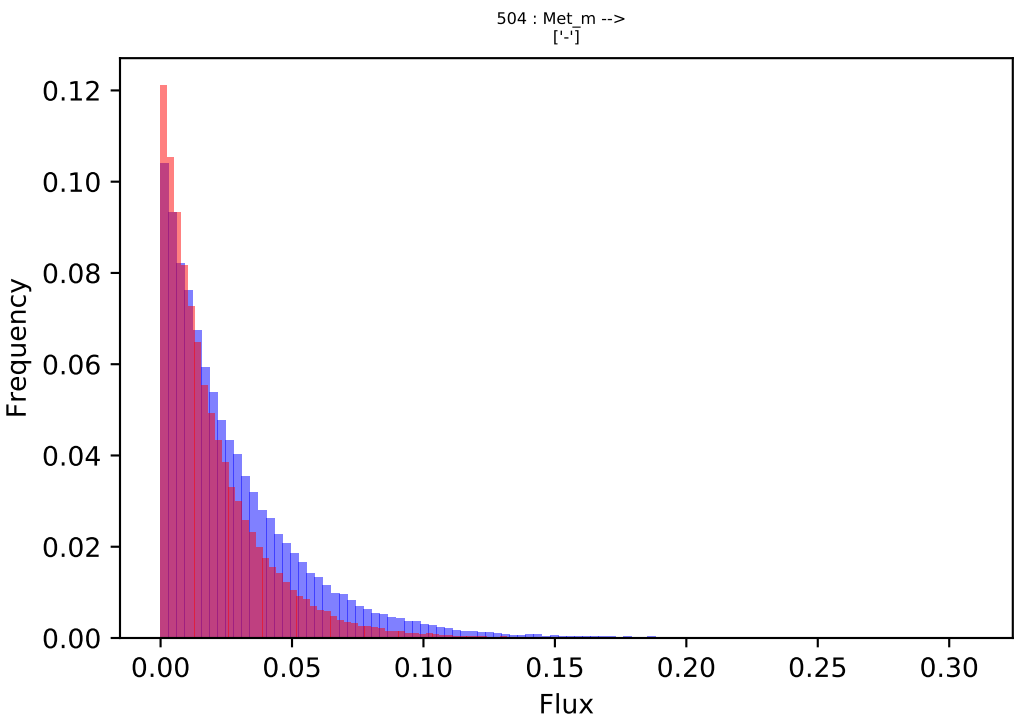
Flux


504 : Met_m -->
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Frequency
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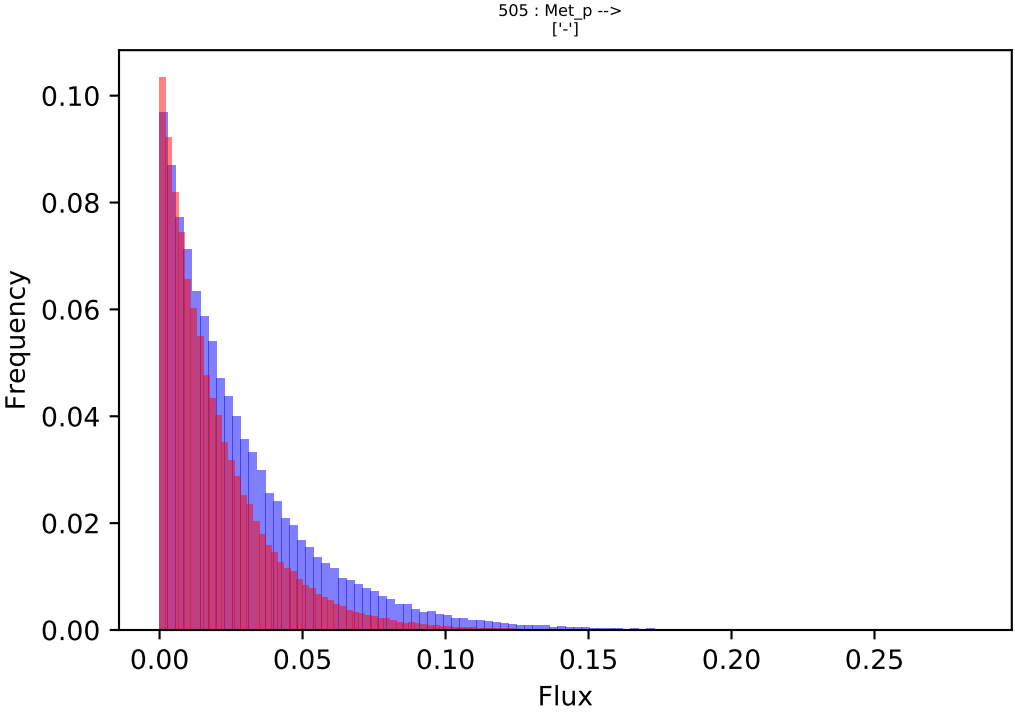
Flux


505 : Met_p -->
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Frequency
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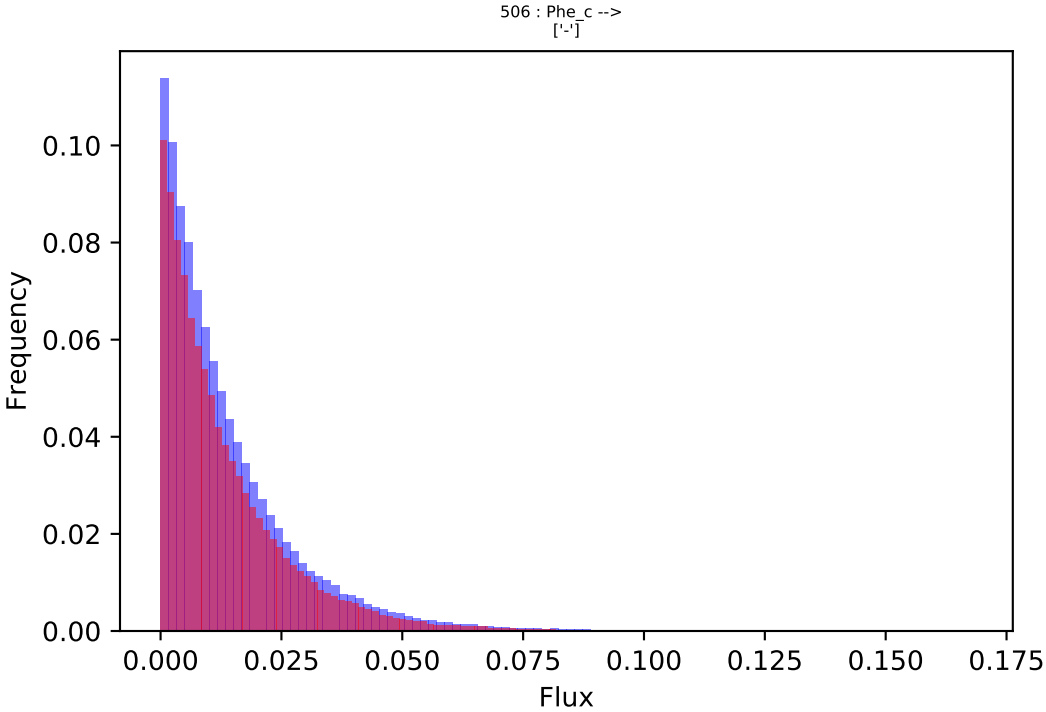
Flux


506 : Phe_c -->
['-']
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Frequency
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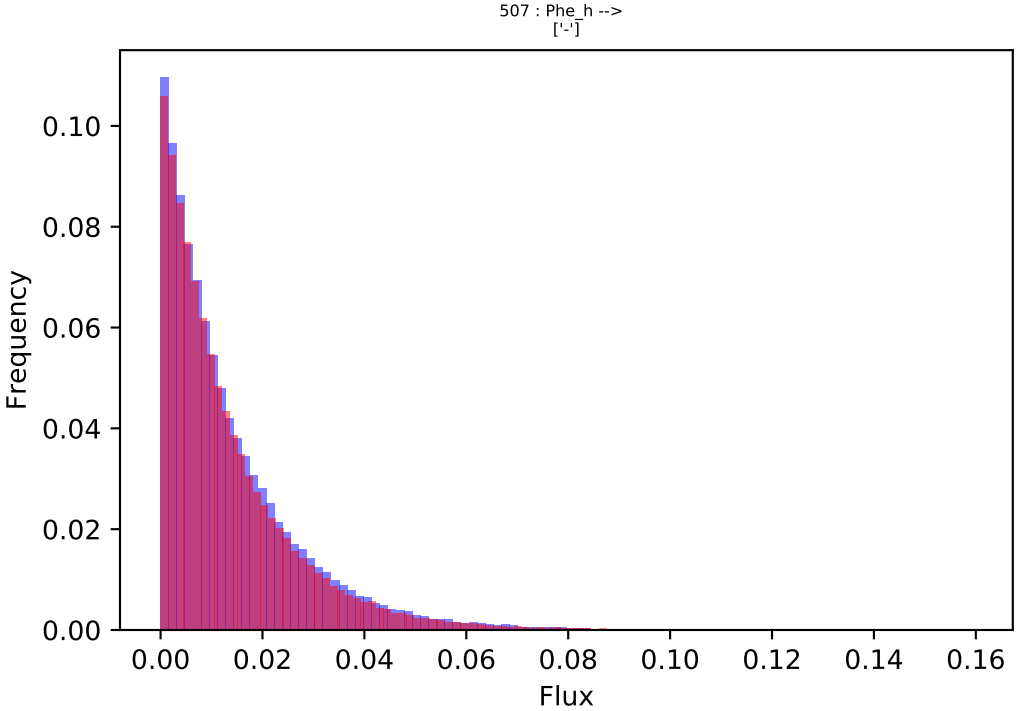
0.175
Flux


507 : Phe_h -->
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Flux
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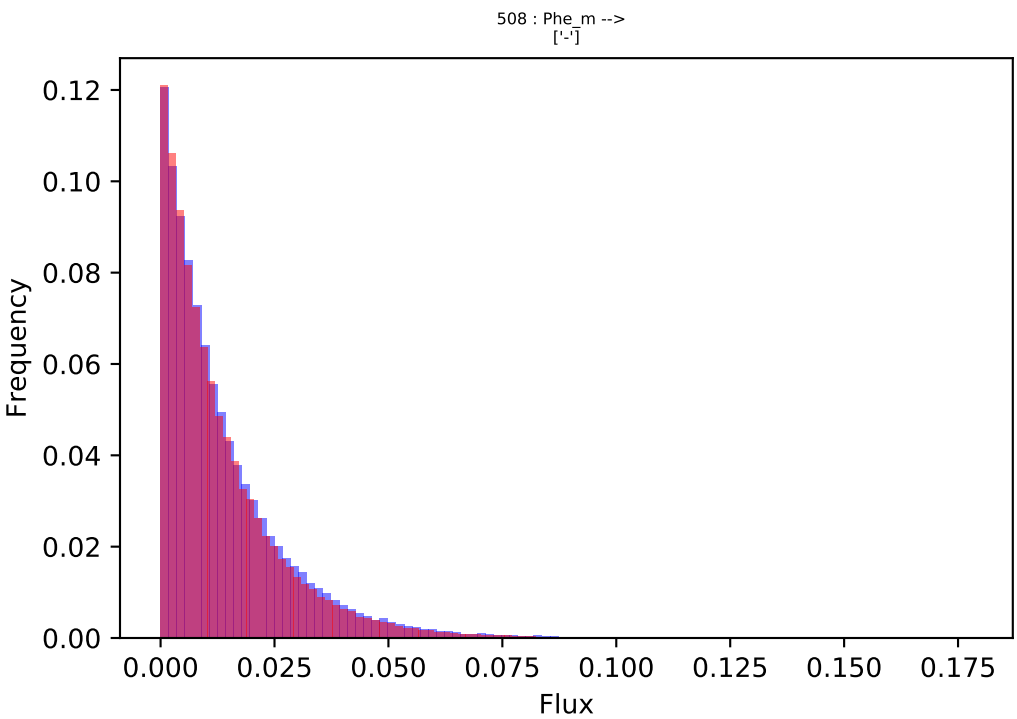
0.16


508 : Phe_m -->
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Frequency
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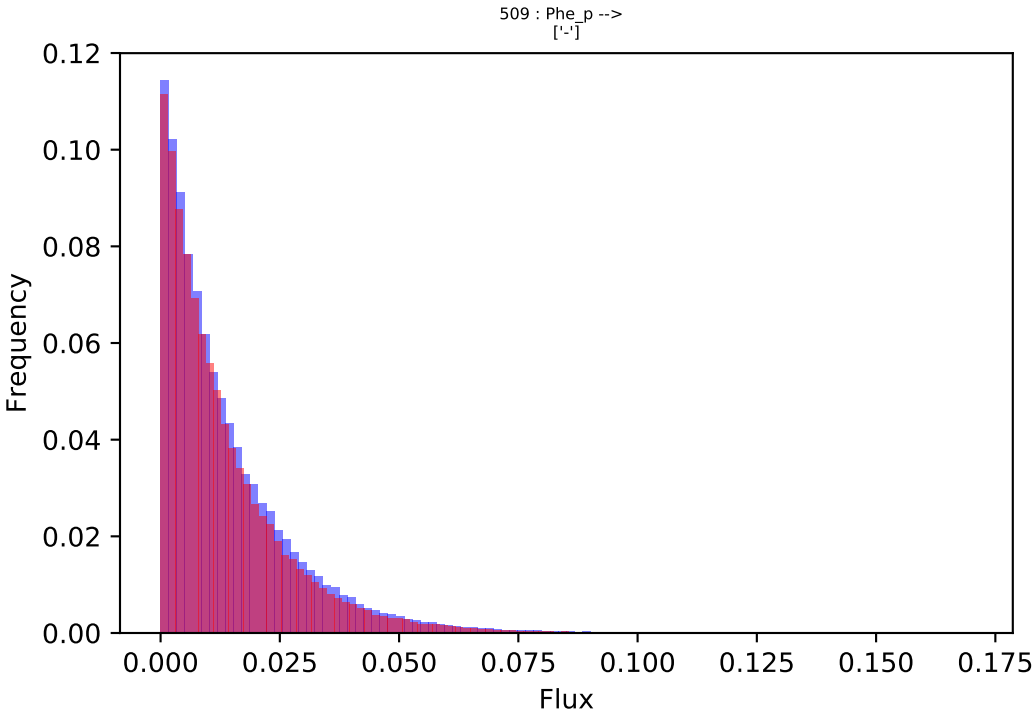
Flux


509 : Phe_p -->
['-']
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Frequency
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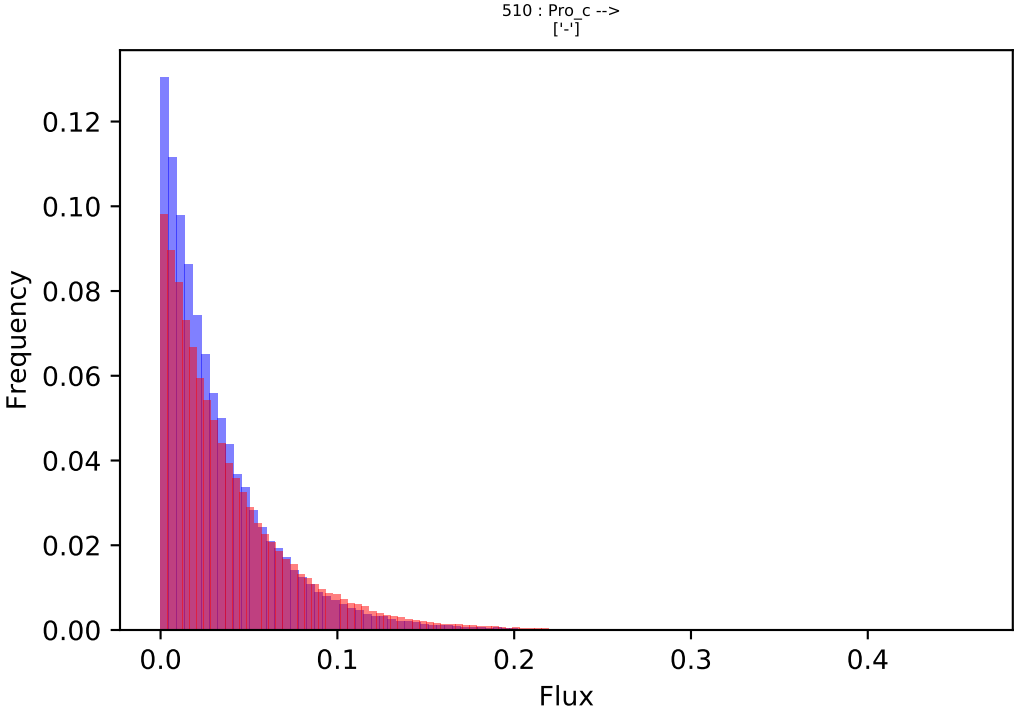
Flux


510 : Pro_c -->
['-']
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0.02
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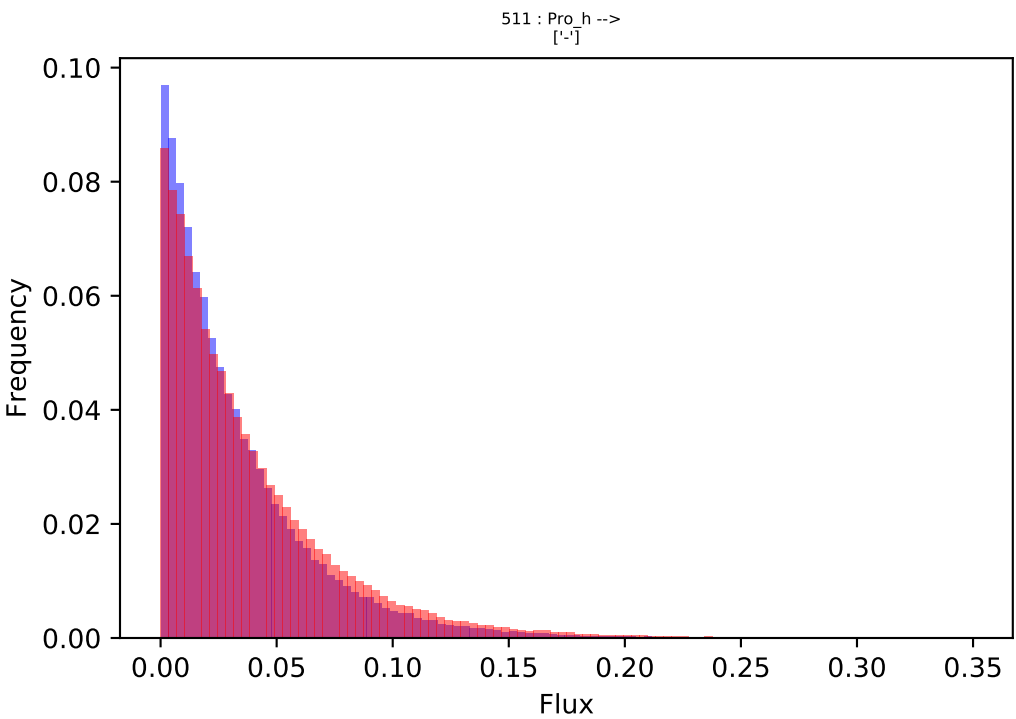
Flux


511 : Pro_h -->
['-']
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Frequency
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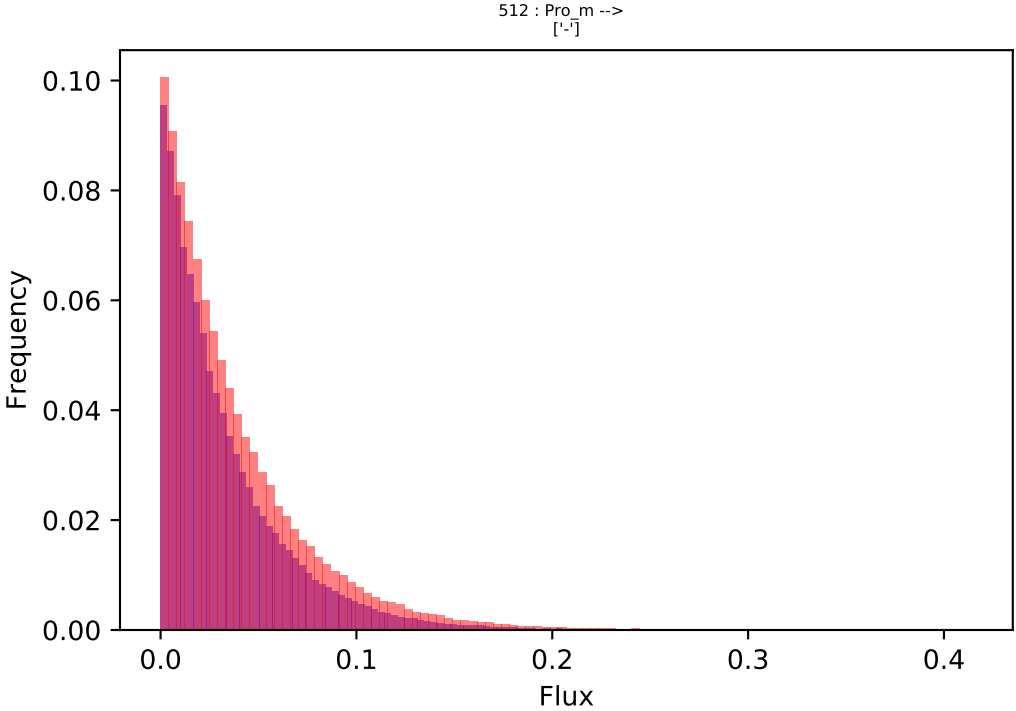
Flux


512 : Pro_m -->
['-']
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Frequency
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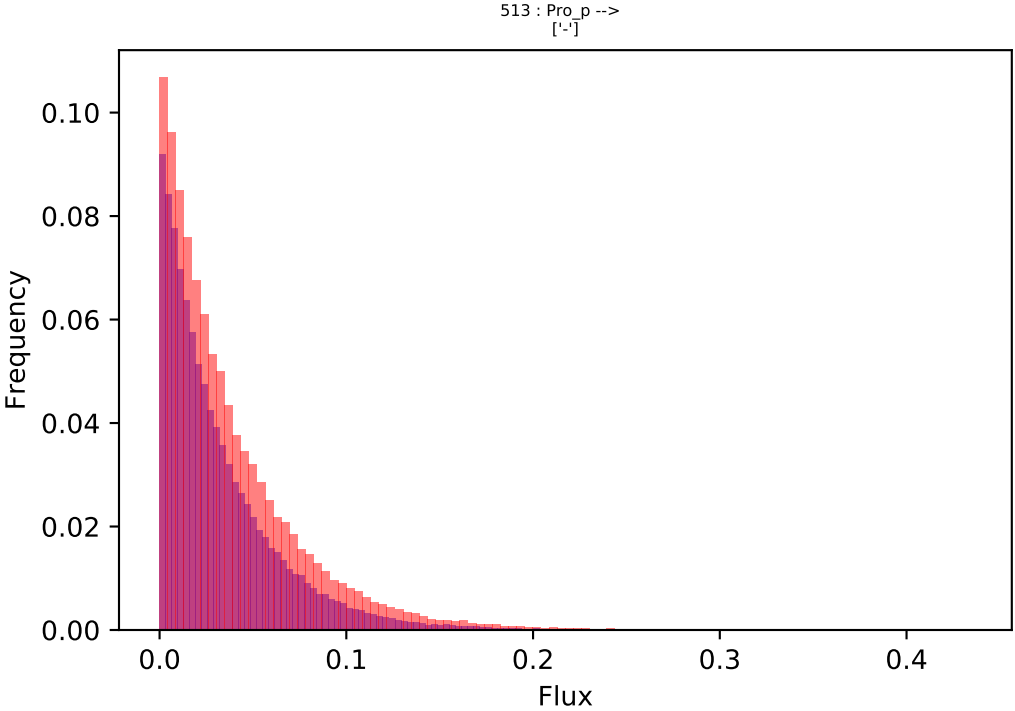
Flux


513 : Pro_p -->
['-']
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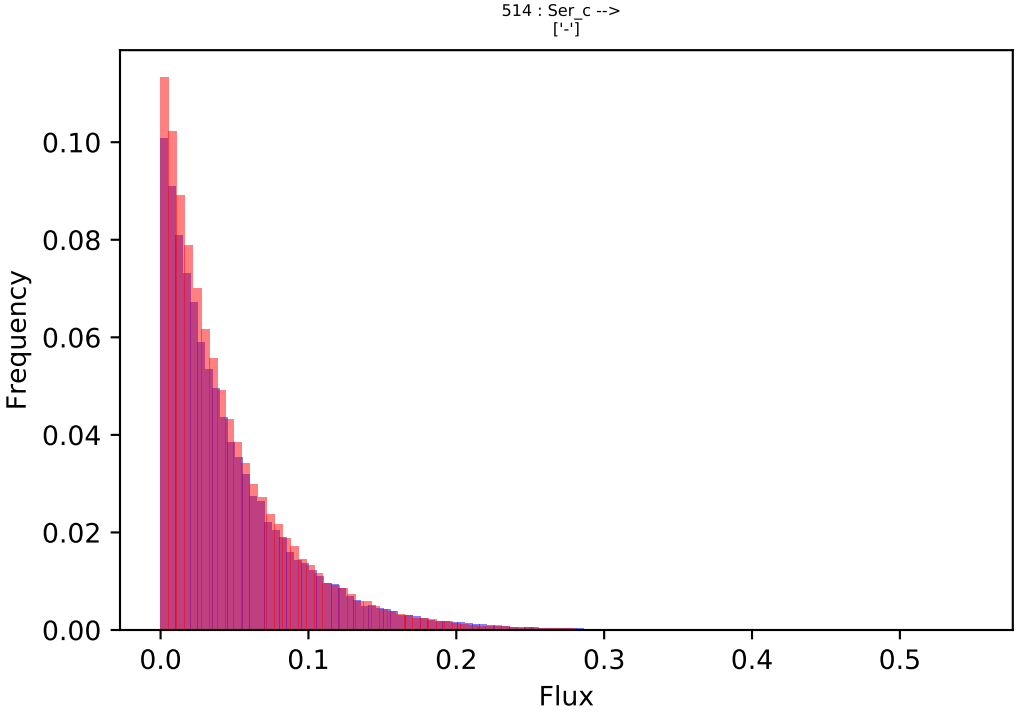
Flux


514 : Ser_c -->
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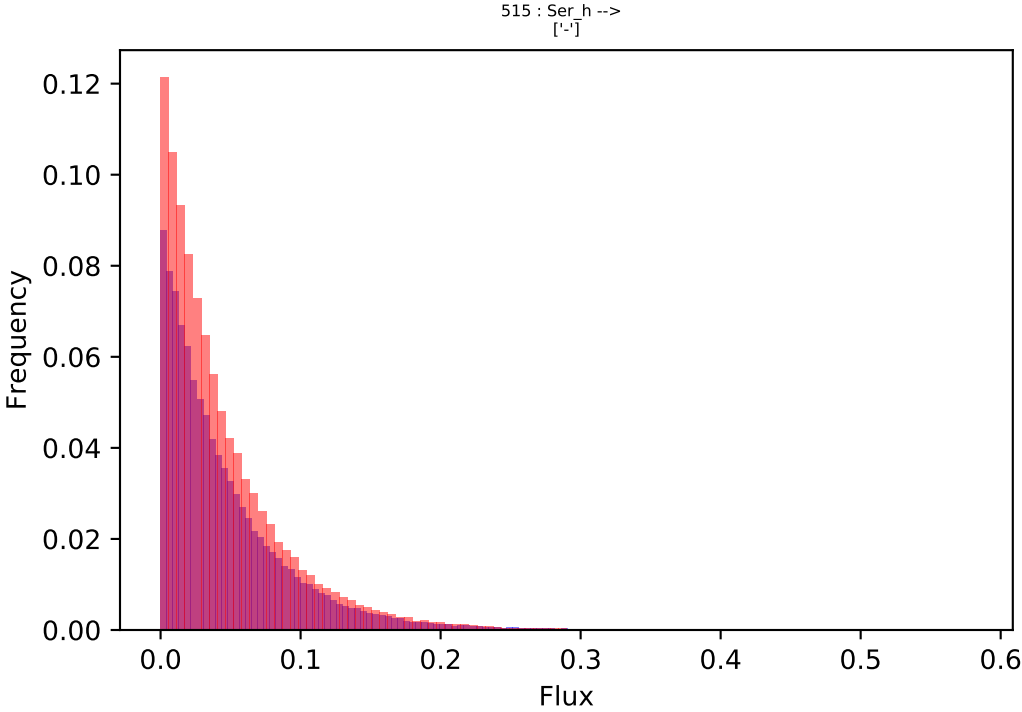
515 : Ser_h -->
['-']
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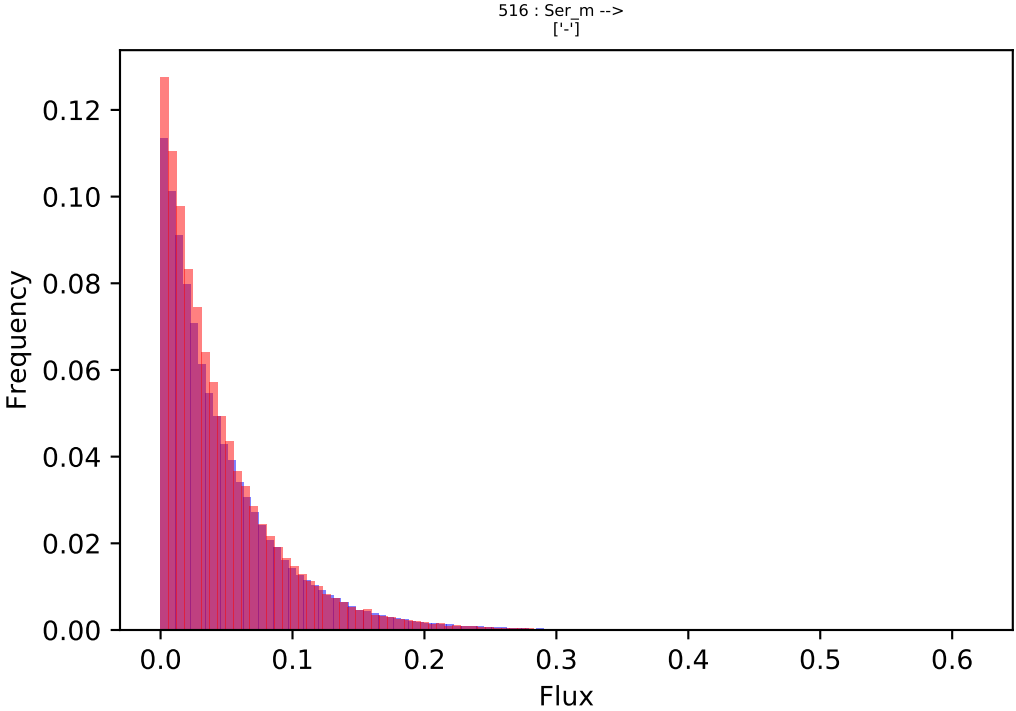
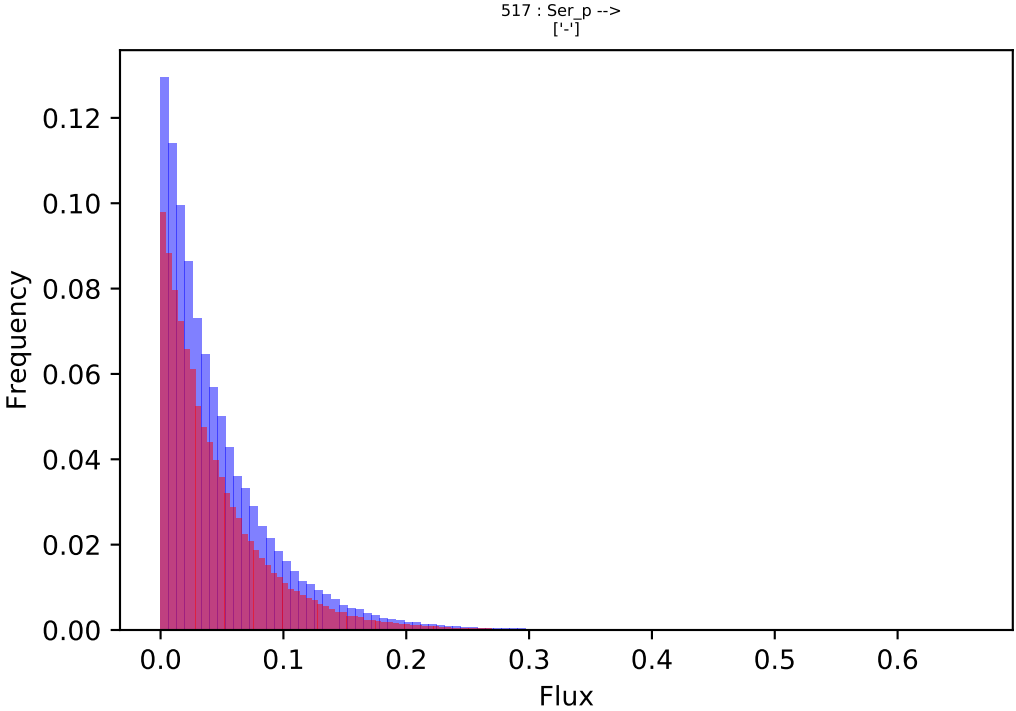
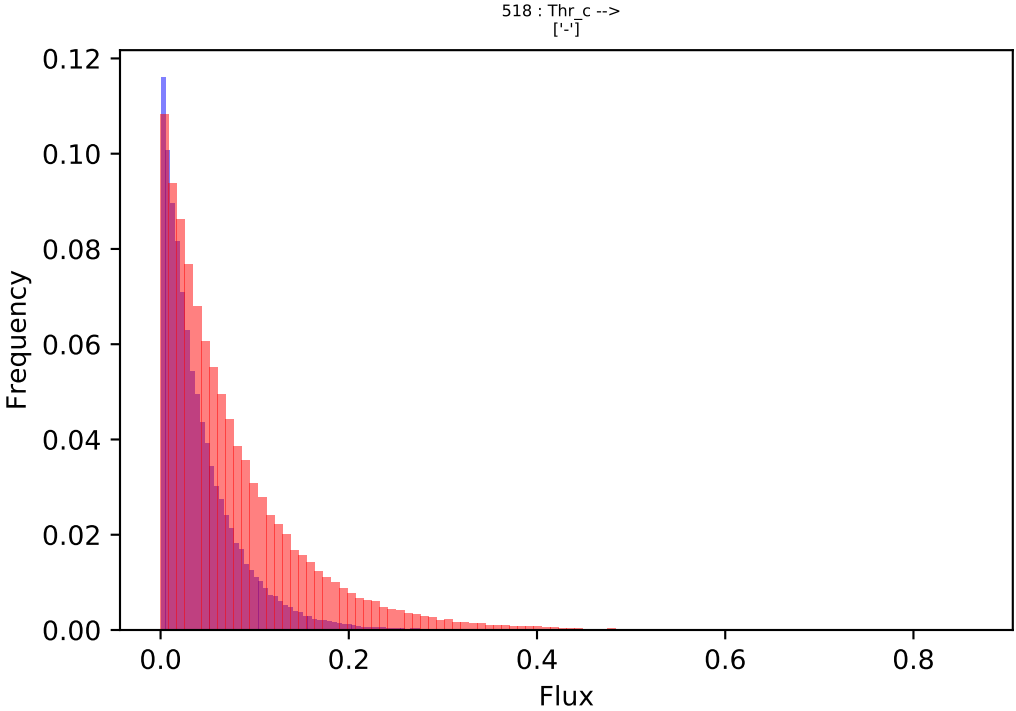
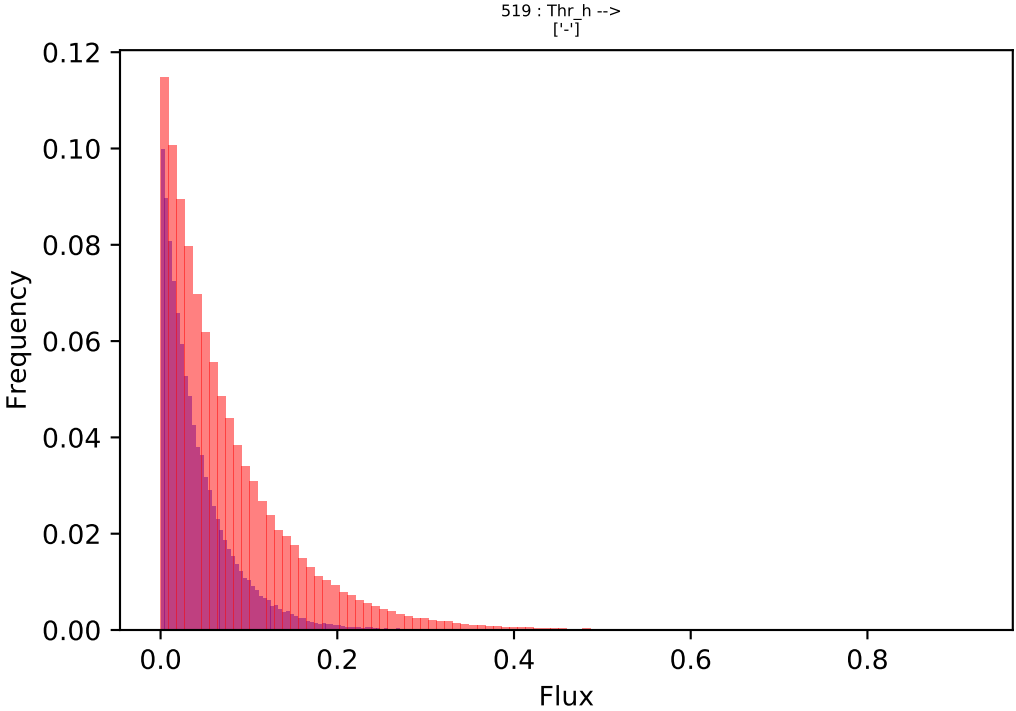
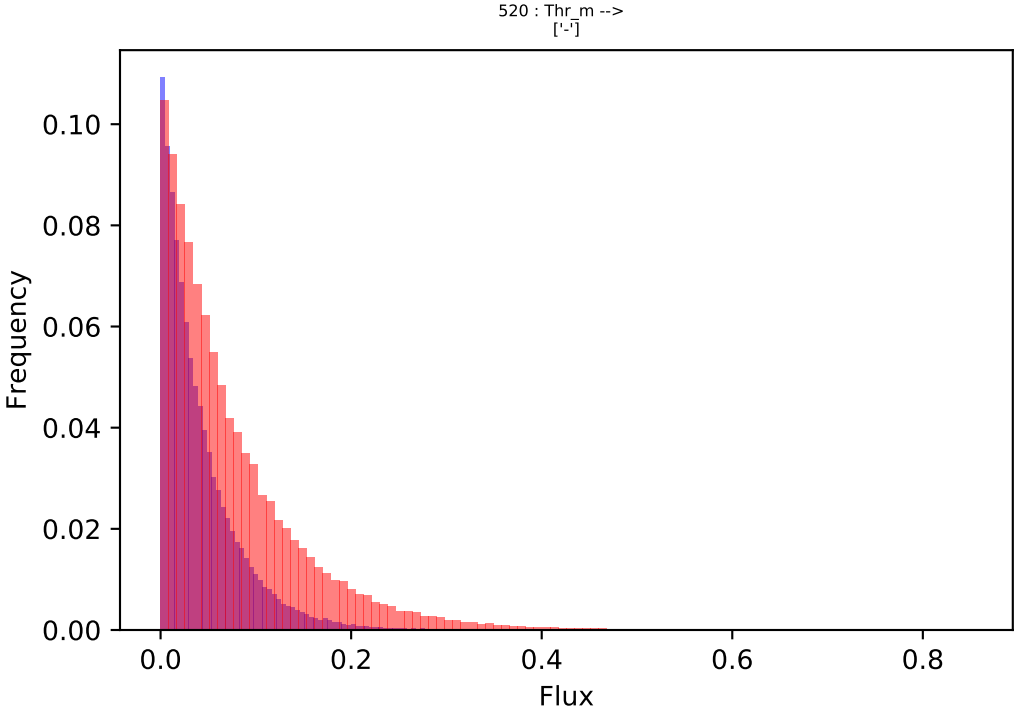
0.6
Flux

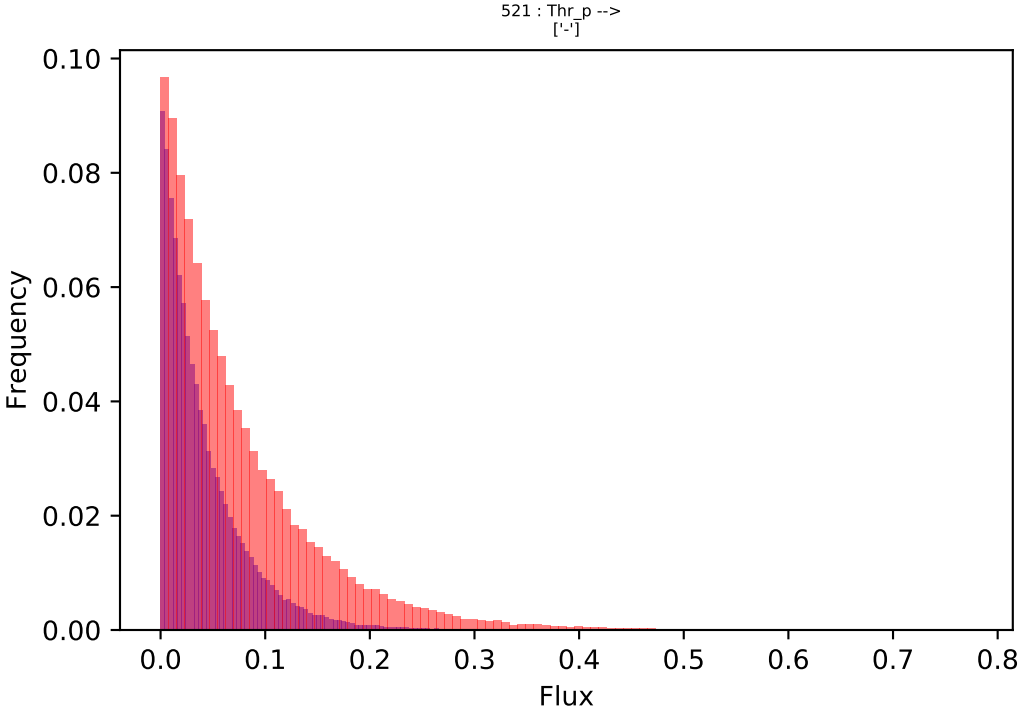

516 : Ser_m -->
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Flux

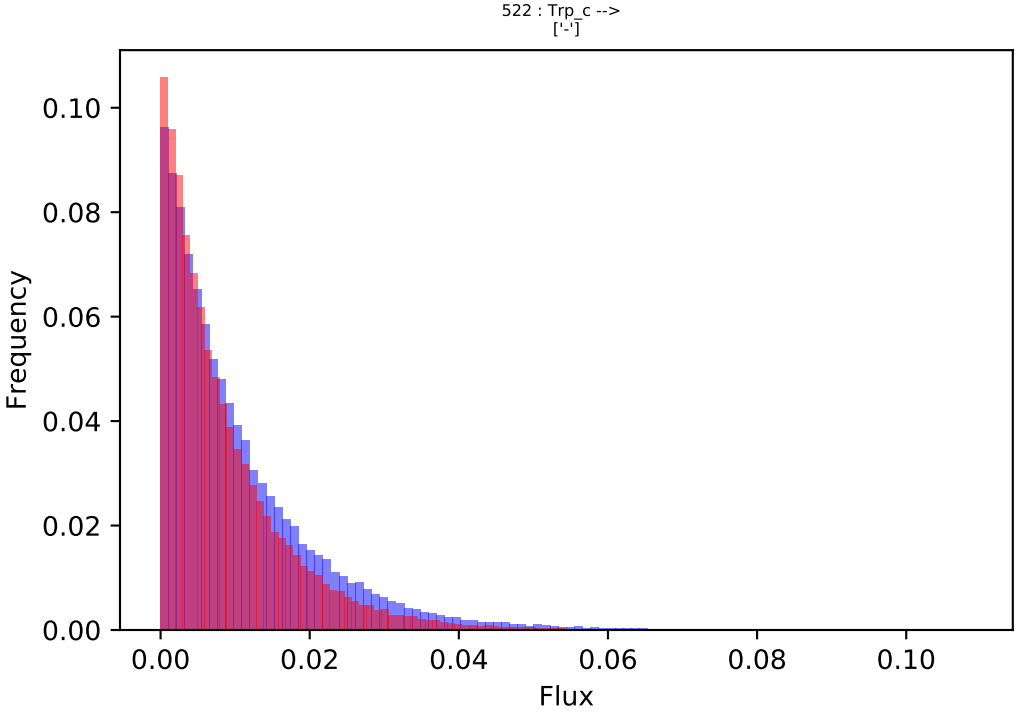

517 : Ser_p -->
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Flux

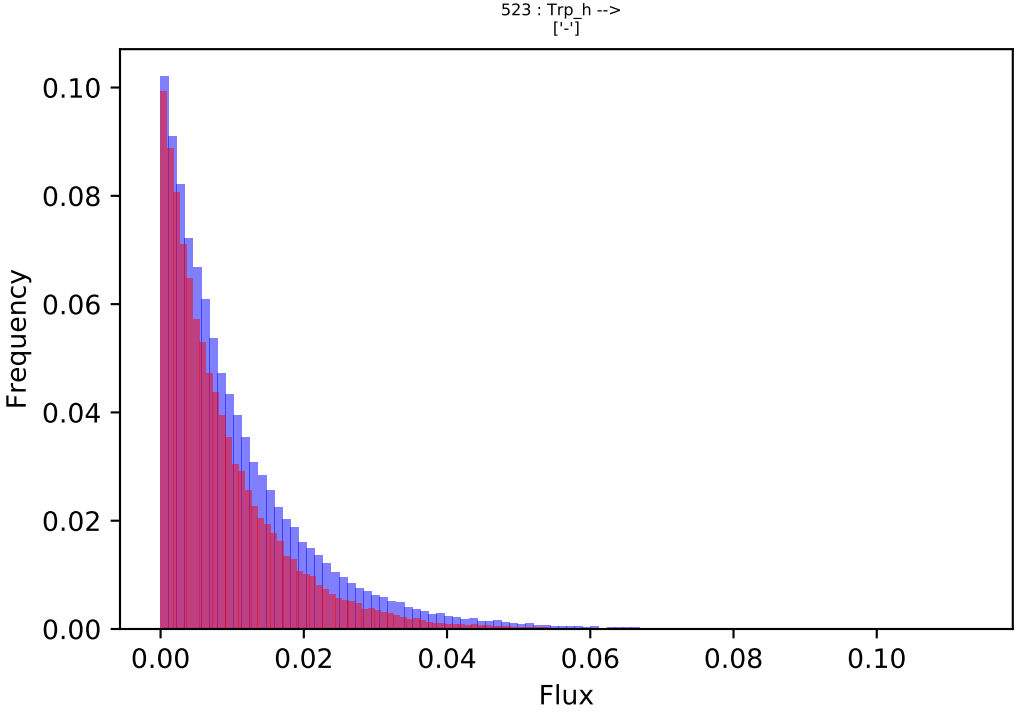

518 : Thr_c -->
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
Flux

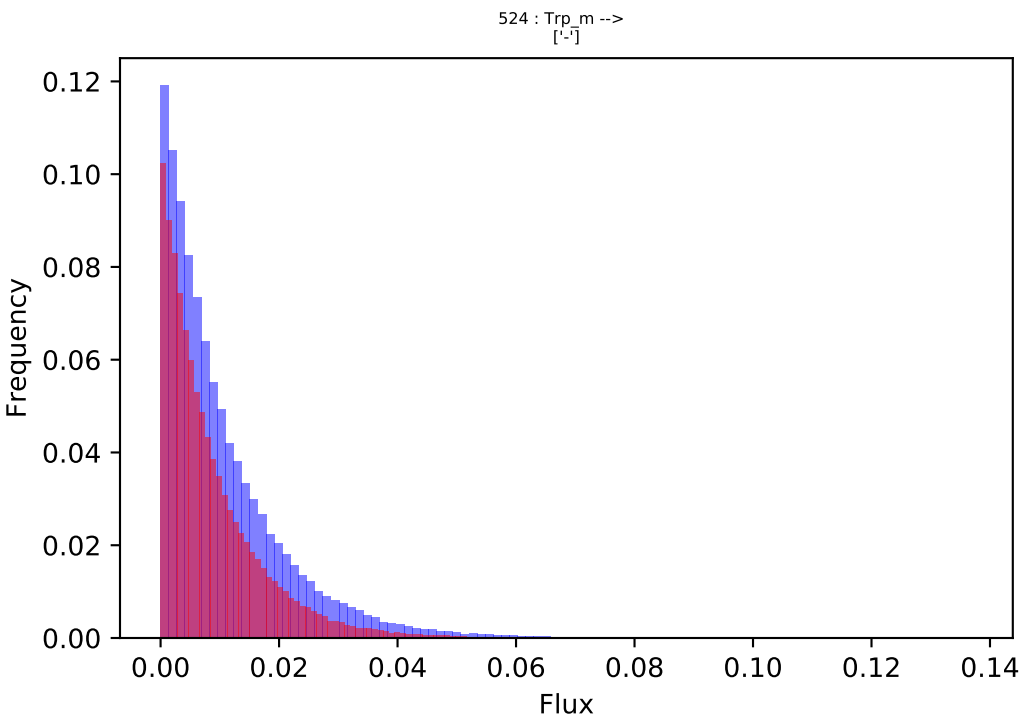

519 : Thr_h -->
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
Flux

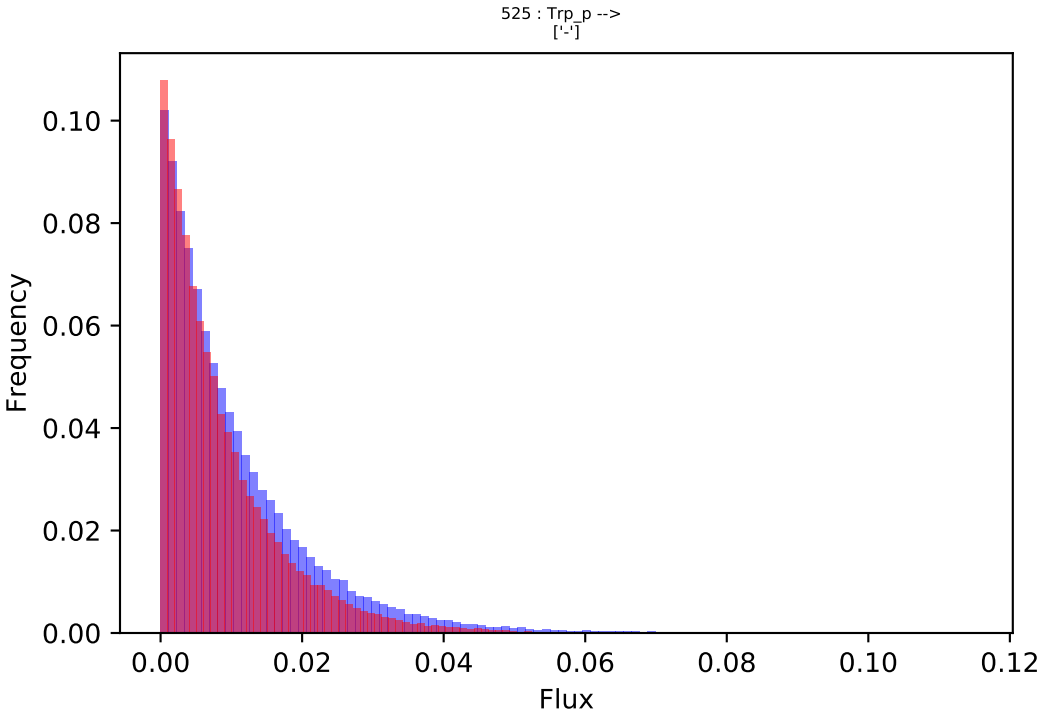

520 : Thr_m -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
Flux

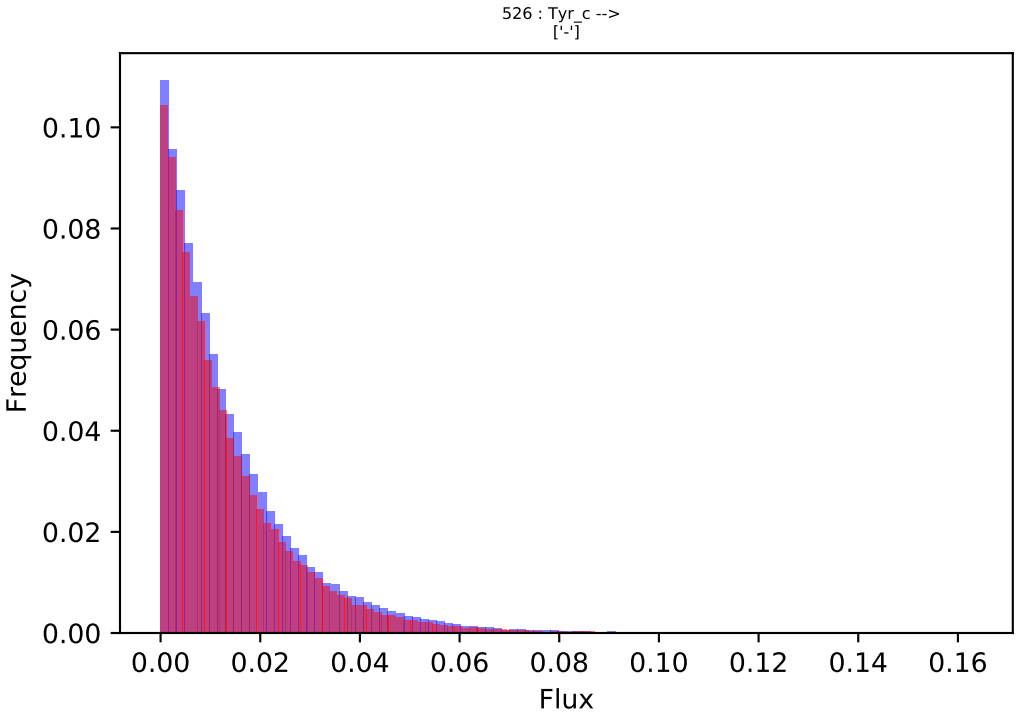

521 : Thr_p -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
Flux

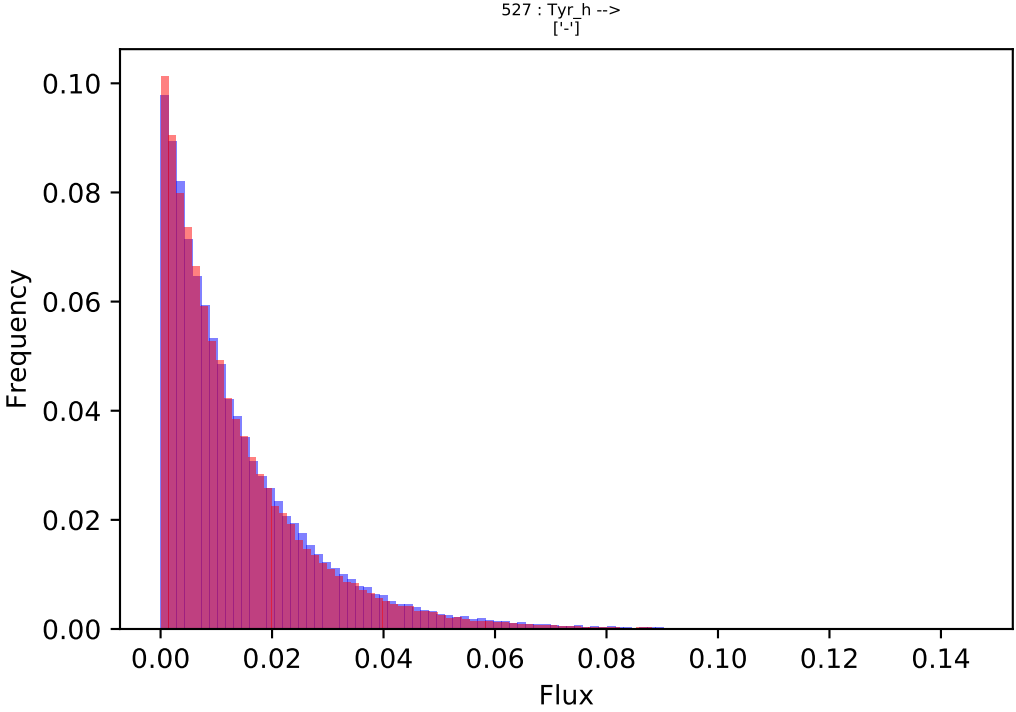

522 : Trp_c -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
Flux

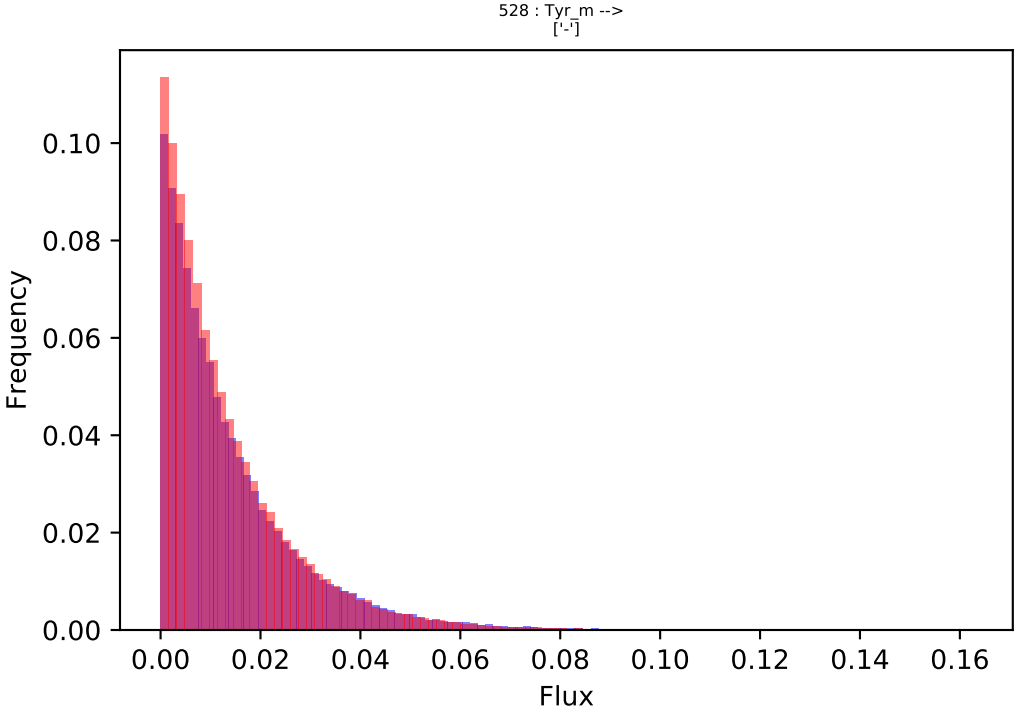

523 : Trp_h -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
Flux

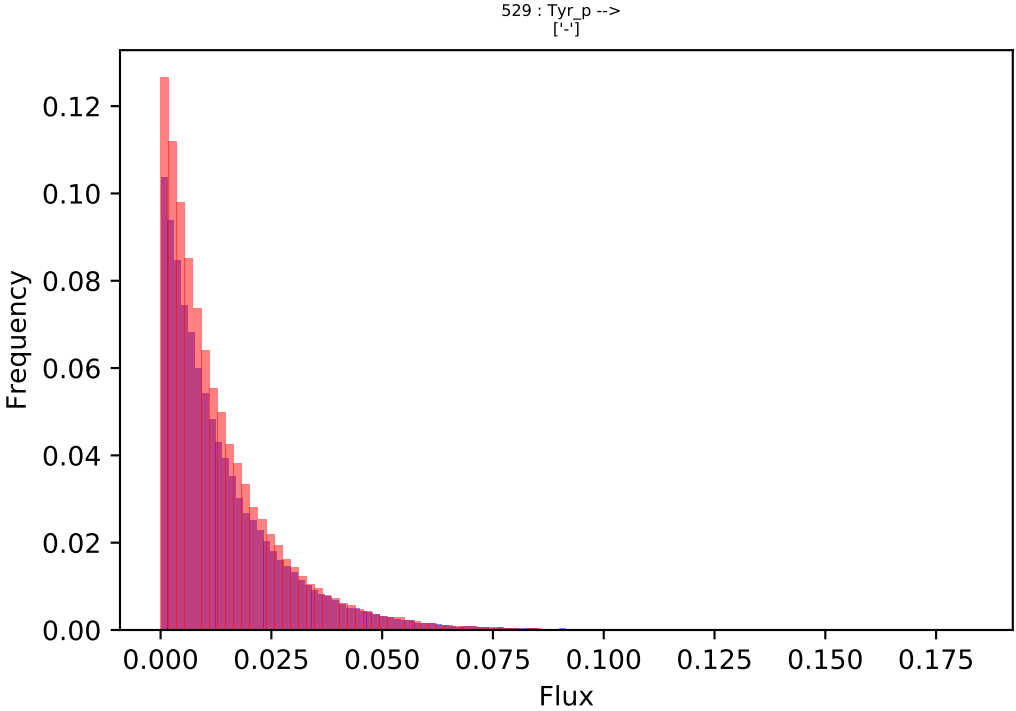

524 : Trp_m -->
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
Flux

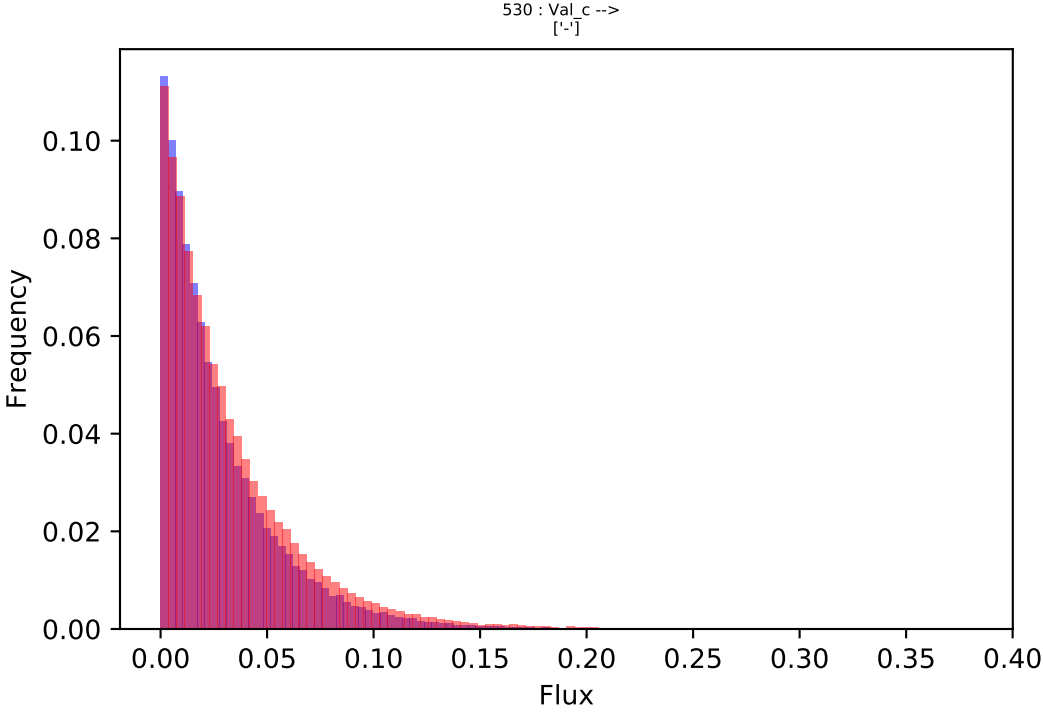

525 : Trp_p -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.12
Flux

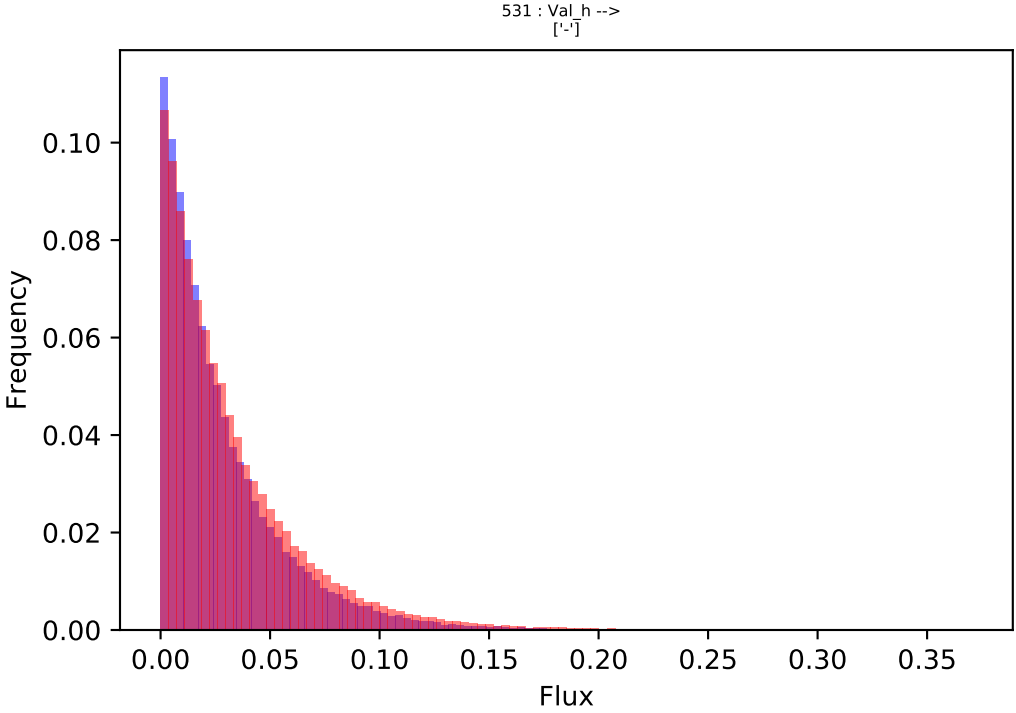

526 : Tyr_c -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
Flux

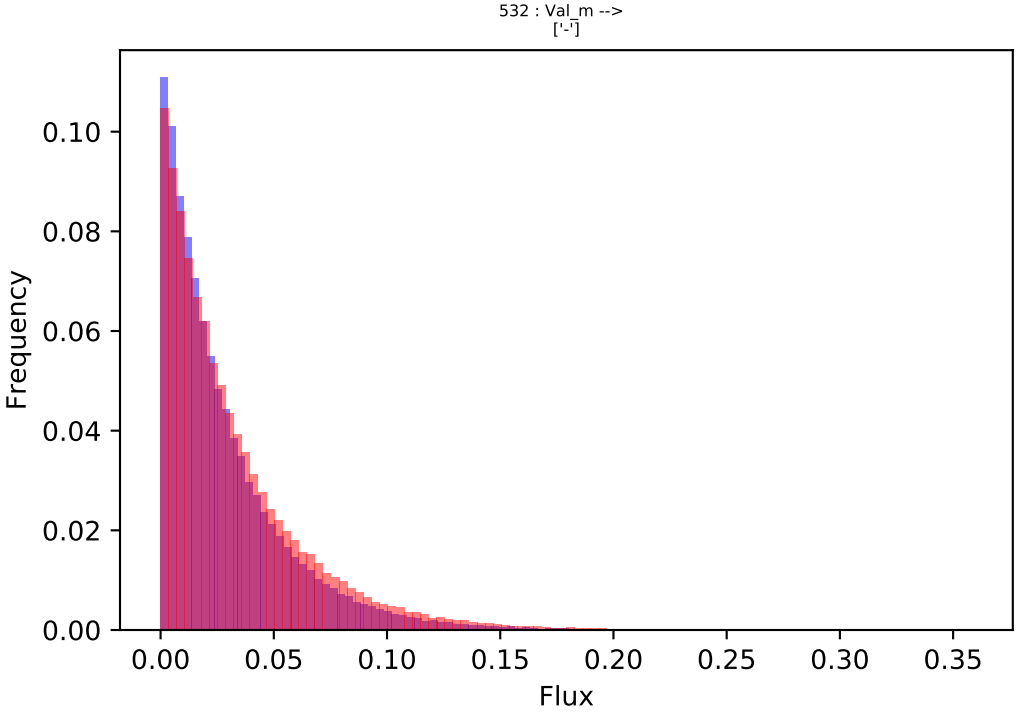

527 : Tyr_h -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
Flux

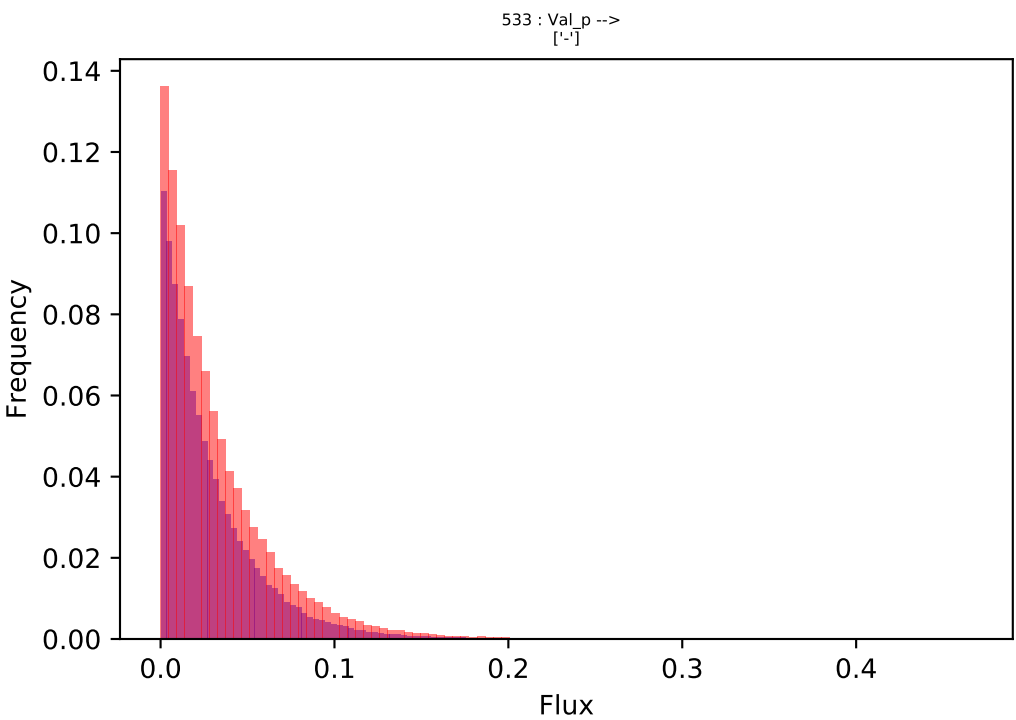

528 : Tyr_m -->
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
Flux
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16

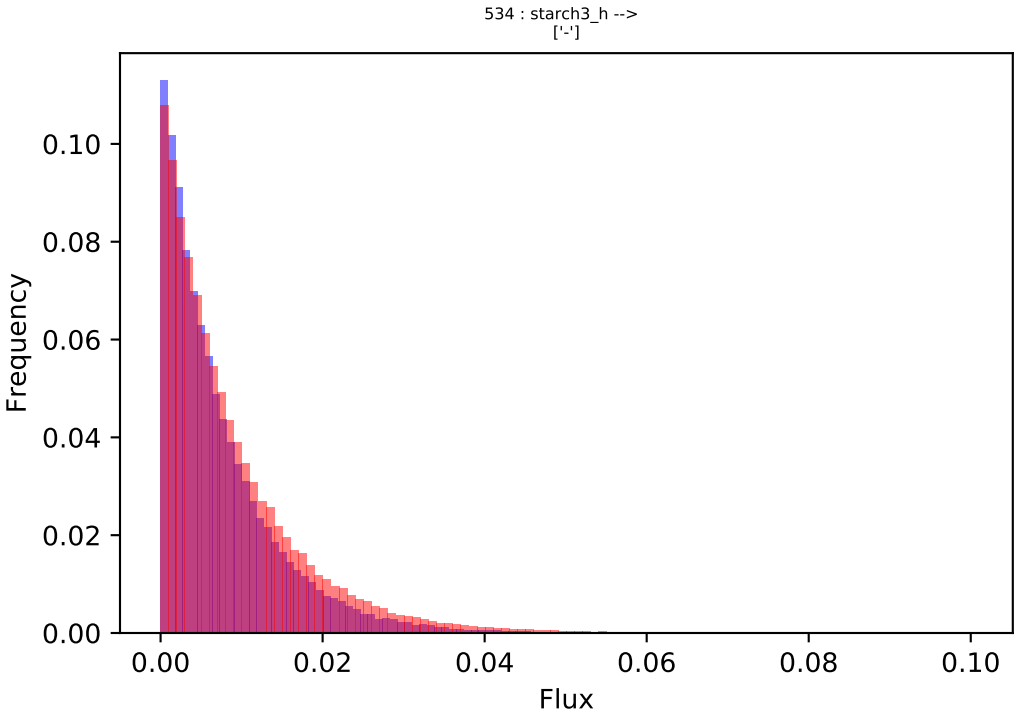

529 : Tyr_p -->
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.000
0.025
0.050
0.075
0.100
0.125
0.150
0.175
Flux

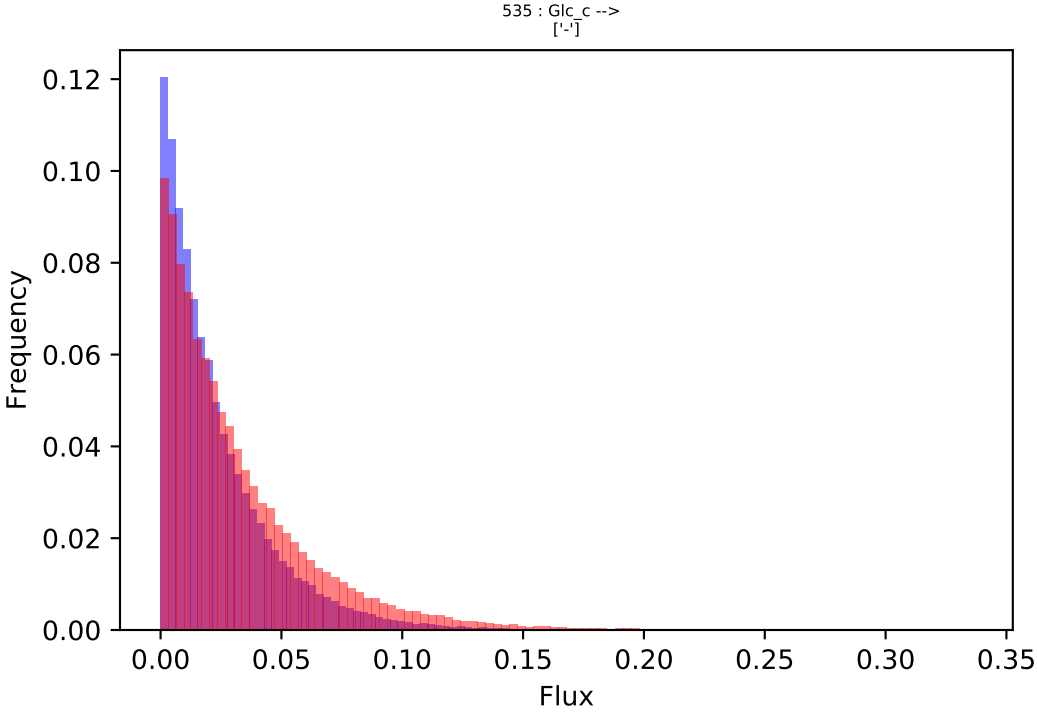

530 : Val_c -->
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
Flux

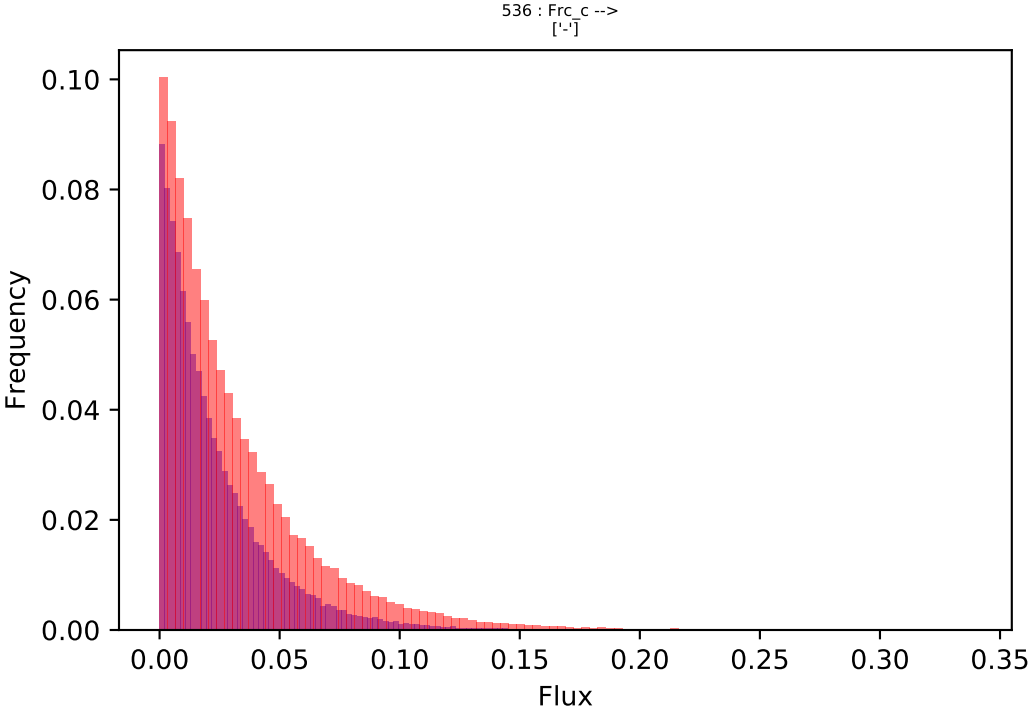

531 : Val_h -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Flux

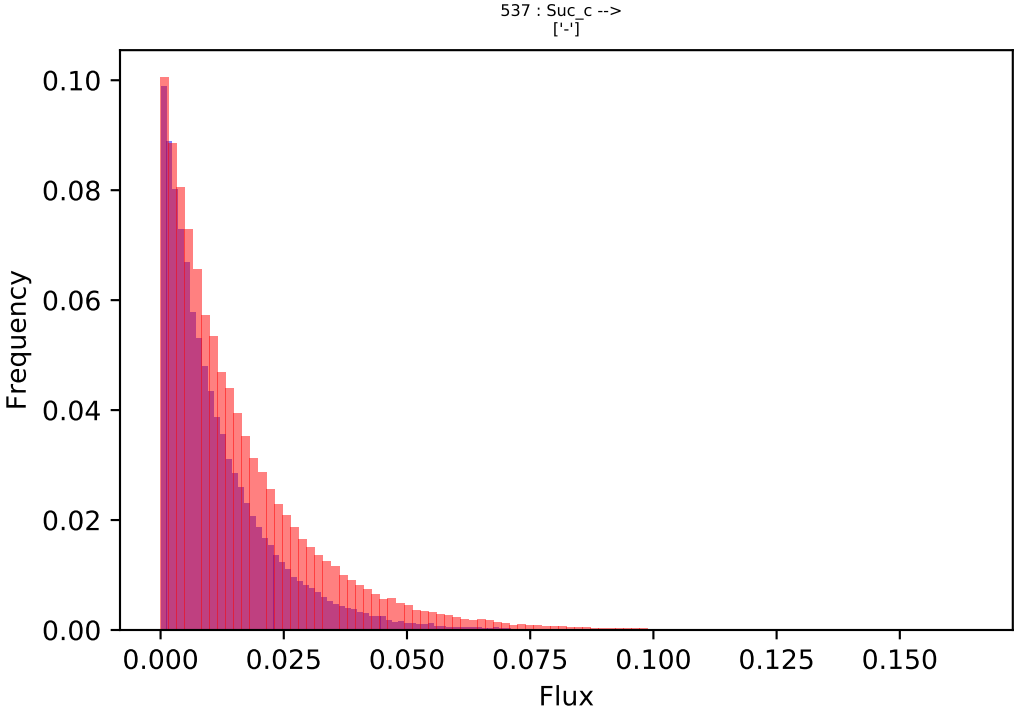

532 : Val_m -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Flux

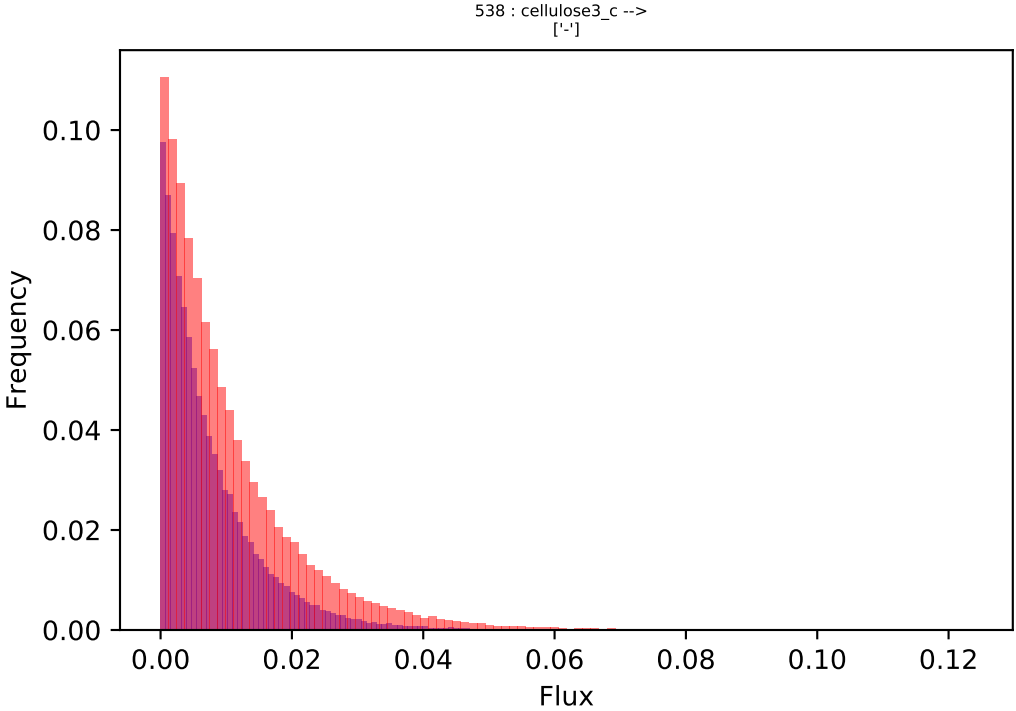

533 : Val_p -->
['-']
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
Flux

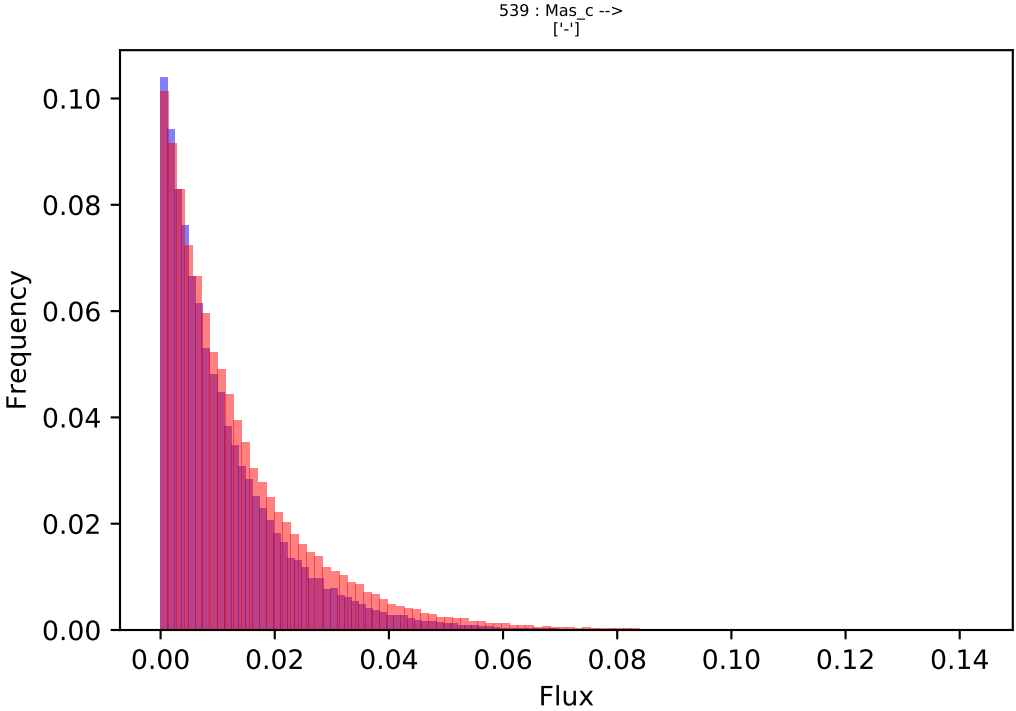

534 : starch3_h -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
Flux

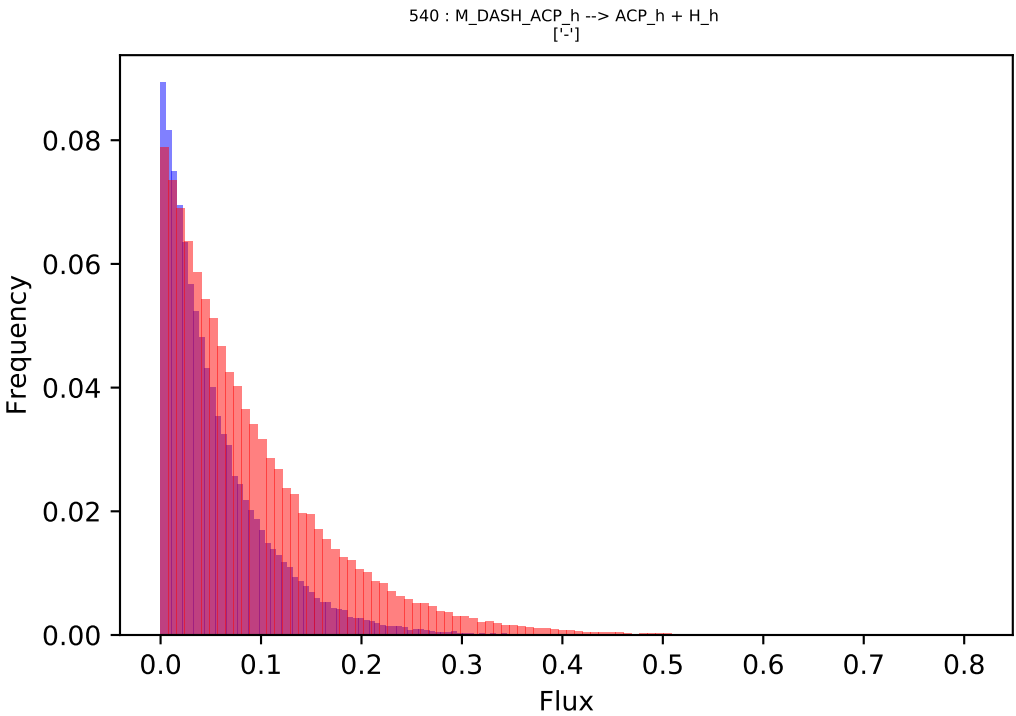

535 : Glc_c -->
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Flux

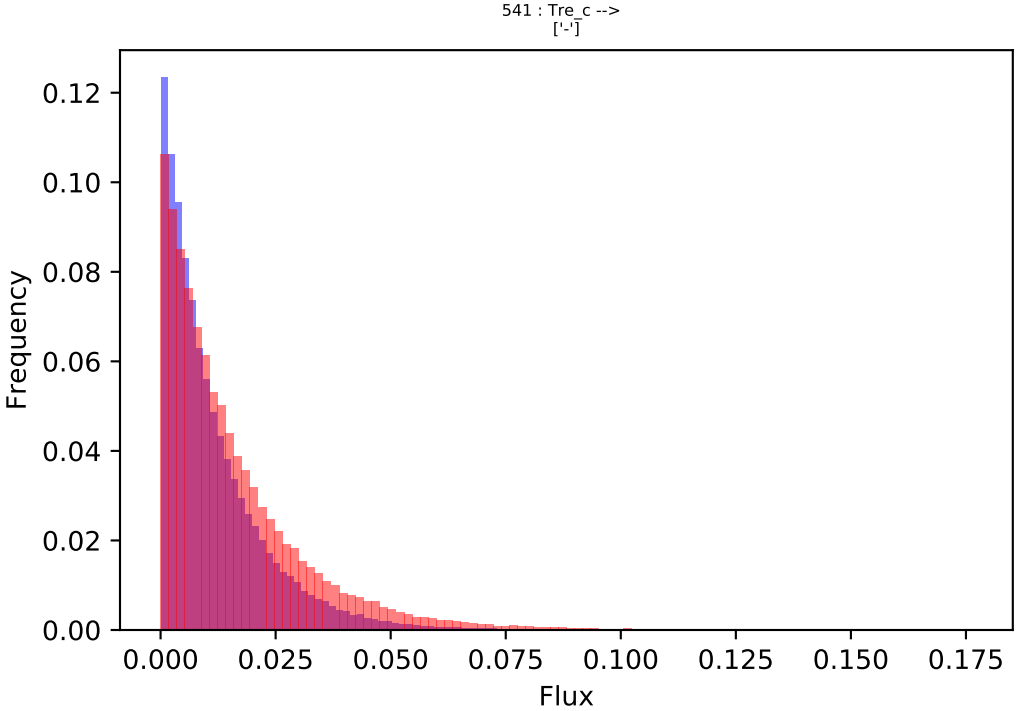

536 : Frc_c -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
Flux

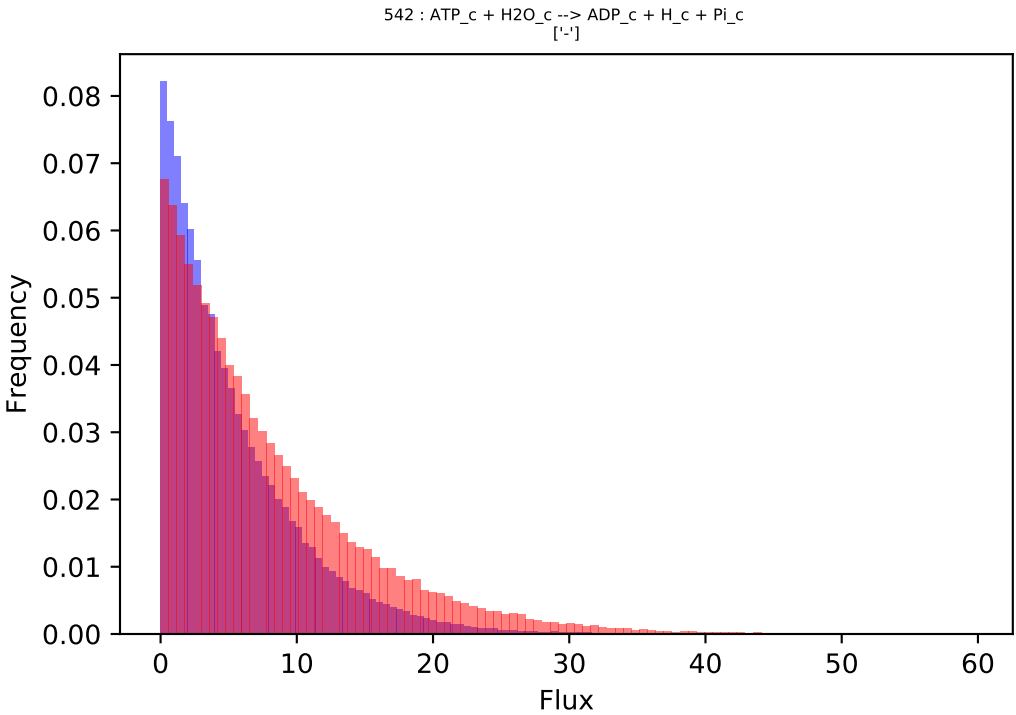

537 : Suc_c -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.000
0.025
0.050
0.075
0.100
0.125
0.150
Flux

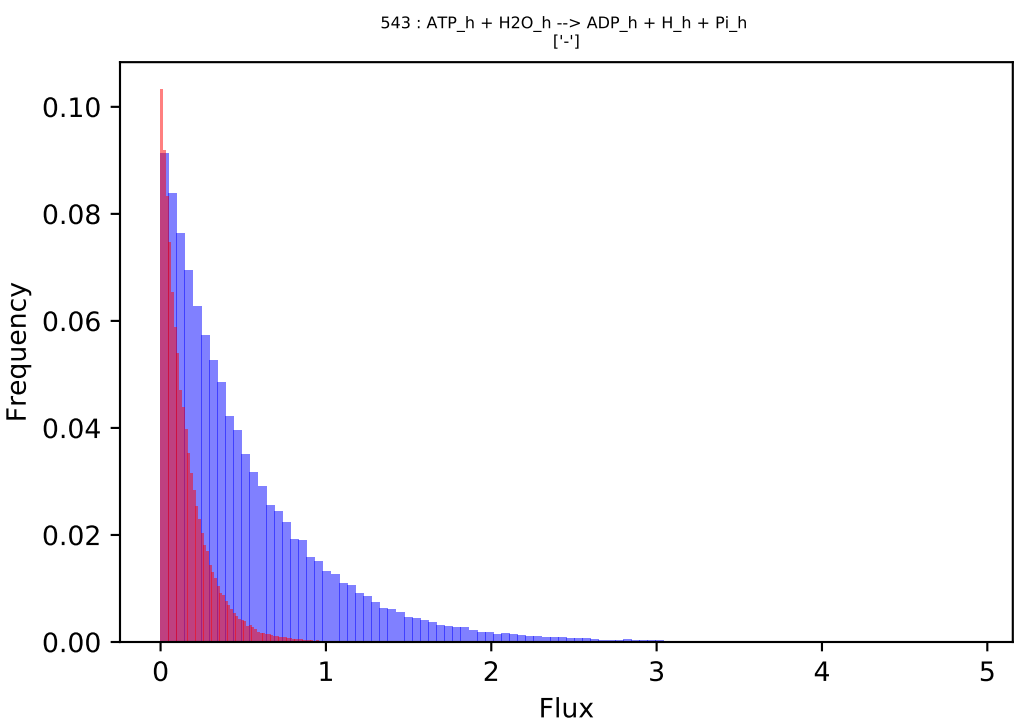

538 : cellulose3_c -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.12
Flux

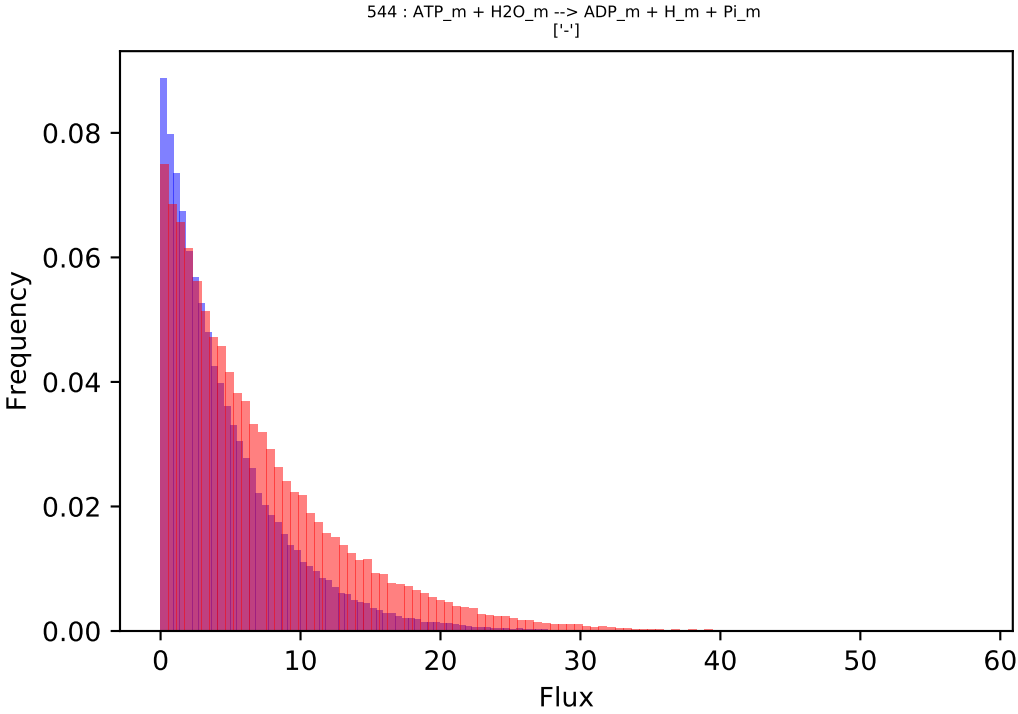

539 : Mas_c -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
Flux

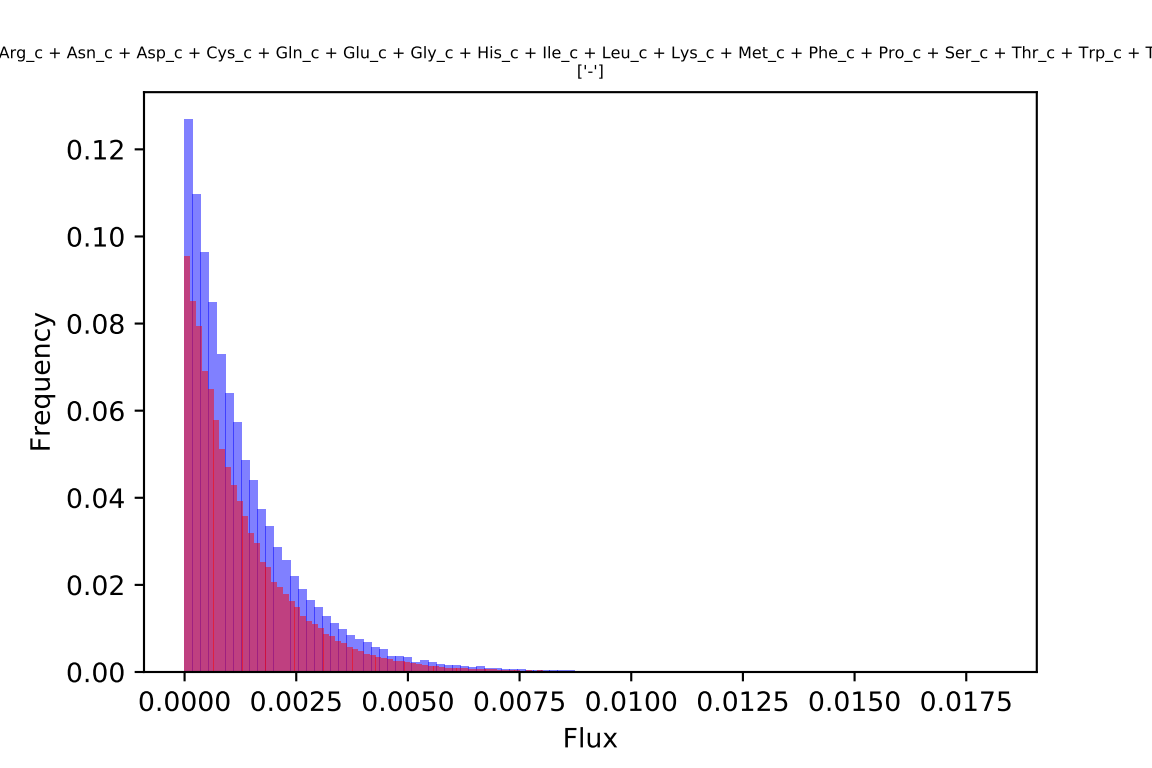

540 : M_DASH_ACP_h --> ACP_h + H_h
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
Flux

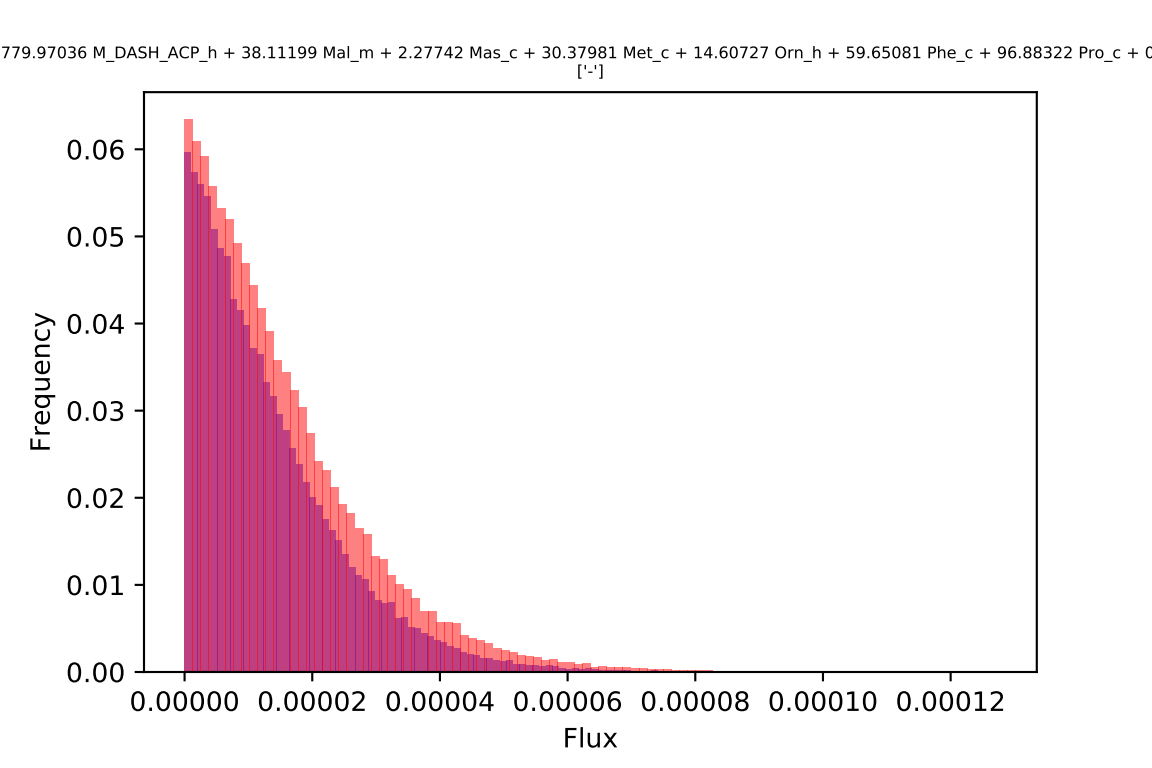

541 : Tre_c -->
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.000
0.025
0.050
0.075
0.100
0.125
0.150
0.175
Flux


542 : ATP_c + H2O_c --> ADP_c + H_c + Pi_c
['-']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0
10
20
30
40
50
60
Flux

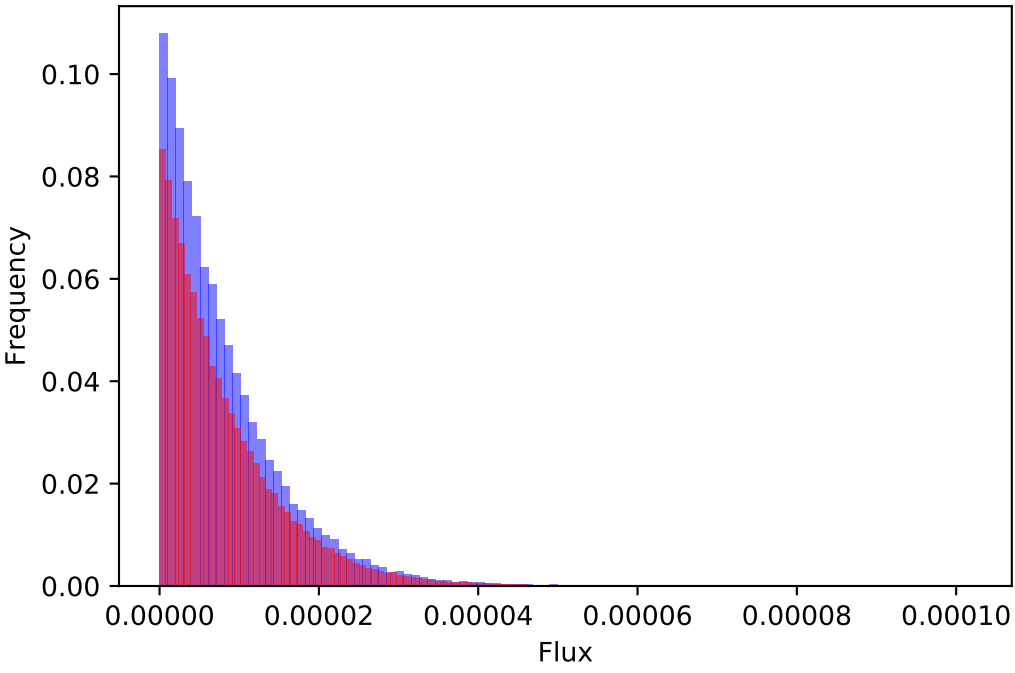

543 : ATP_h + H2O_h --> ADP_h + H_h + Pi_h
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0
1
2
3
4
5
Flux

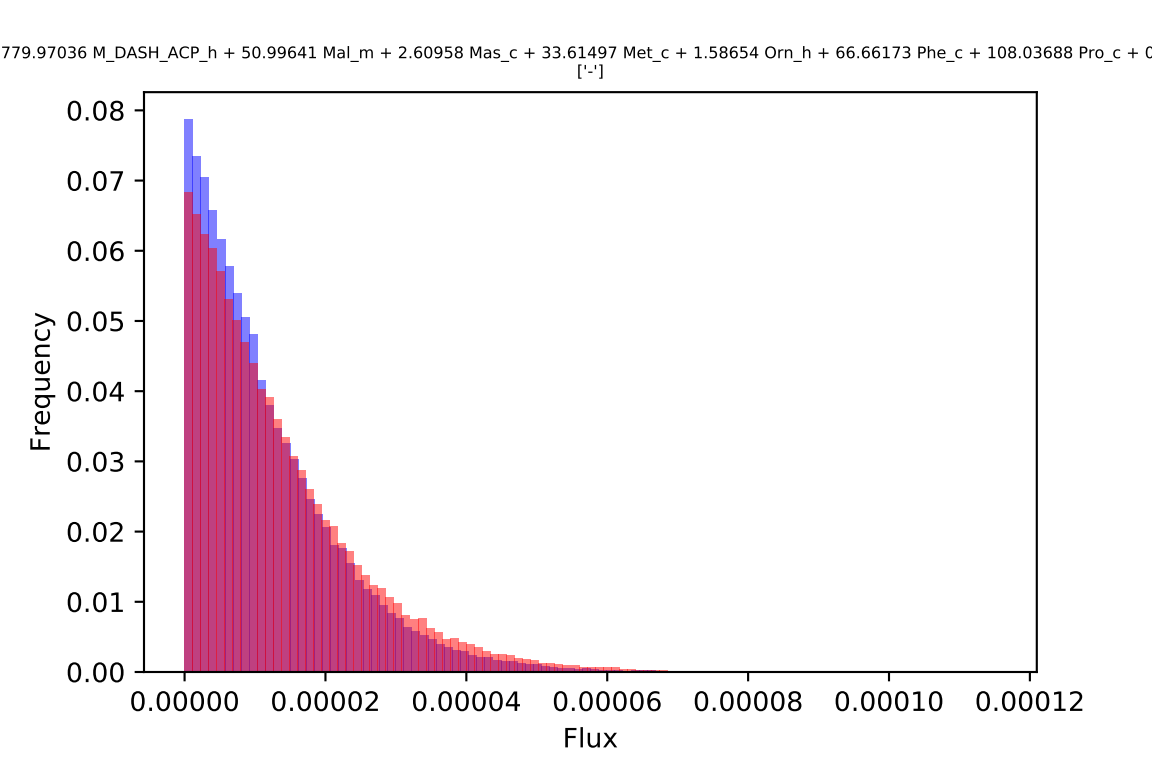

544 : ATP_m + H2O_m --> ADP_m + H_m + Pi_m
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0
10
20
30
40
50
60
Flux

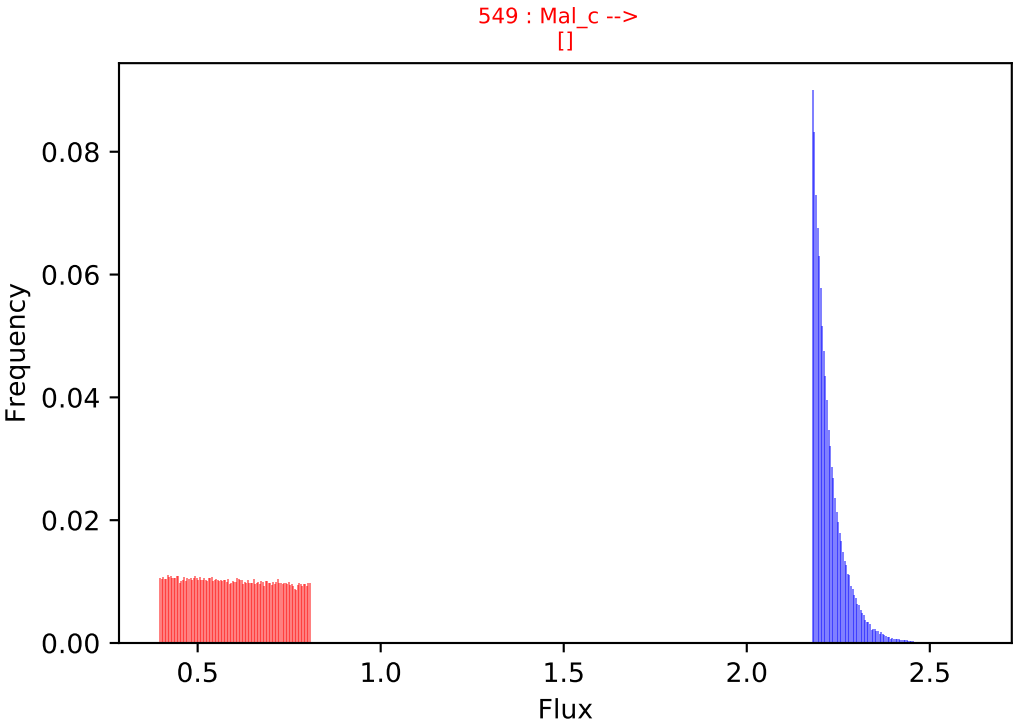

Arg_c + Asn_c + Asp_c + Cys_c + Gln_c + Glu_c + Gly_c + His_c + Ile_c + Leu_c + Lys_c + Met_c + Phe_c + Pro_c + Ser_c + Thr_c + Trp_c + T
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0000
0.0025
0.0050
0.0075
0.0100
0.0125
0.0150
0.0175
Flux

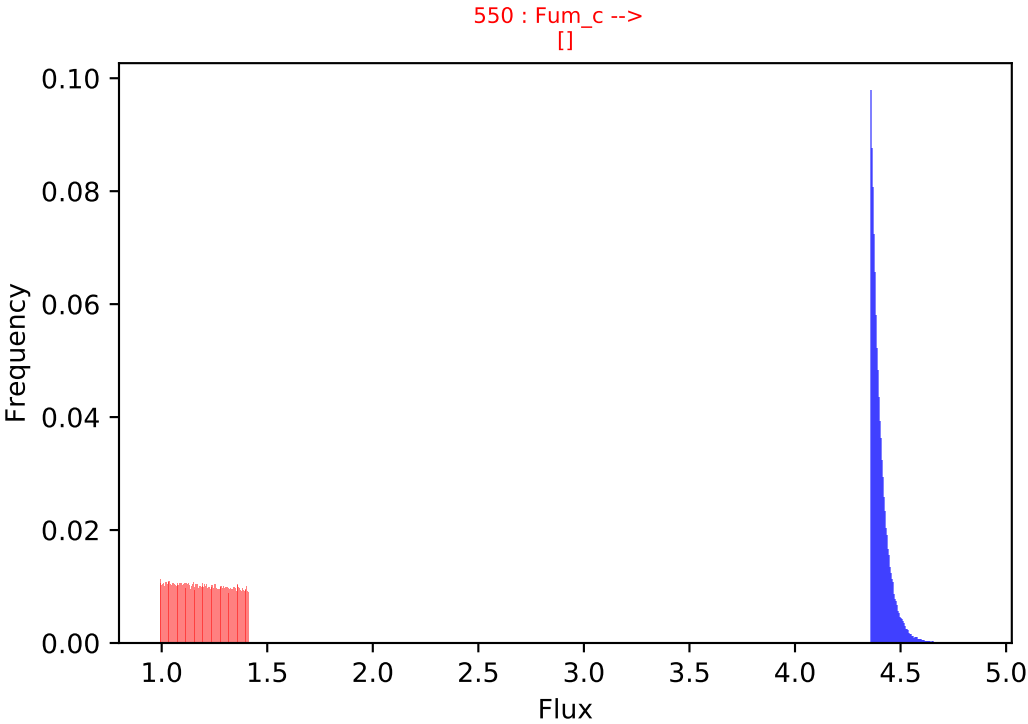

779.97036 M_DASH_ACP_h + 38.11199 Mal_m + 2.27742 Mas_c + 30.37981 Met_c + 14.60727 Orn_h + 59.65081 Phe_c + 96.88322 Pro_c + 0
['-']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.00000
0.00002
0.00004
0.00006
0.00008
0.00010
0.00012
Flux

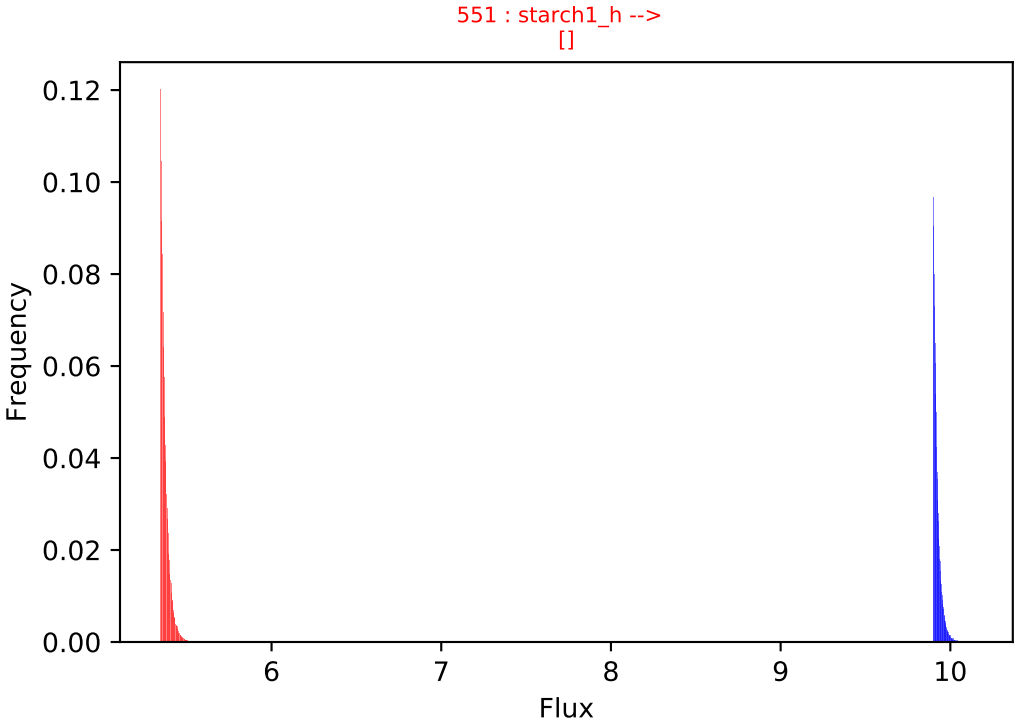
_c + 826.95653 M_DASH_ACP_h + 10.89856 Mal_m + 5.37965 Mas_c + 51.81818 Met_c + 9.64682 Orn_h + 101.65645 Phe_c + 164.00331 Pro_
['-']




779.97036 M_DASH_ACP_h + 50.99641 Mal_m + 2.60958 Mas_c + 33.61497 Met_c + 1.58654 Orn_h + 66.66173 Phe_c + 108.03688 Pro_c + 0
['-']
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
0.00000
0.00002
0.00004
0.00006
0.00008
0.00010
0.00012
Flux


549 : Mal_c -->
[]
0.08
0.06
0.04
0.02
0.00
Frequency
0.5
1.0
1.5
2.0
2.5
Flux


550 : Fum_c -->
[]
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
Flux


551 : starch1_h -->
[]
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
6
7
8
9
10
Flux