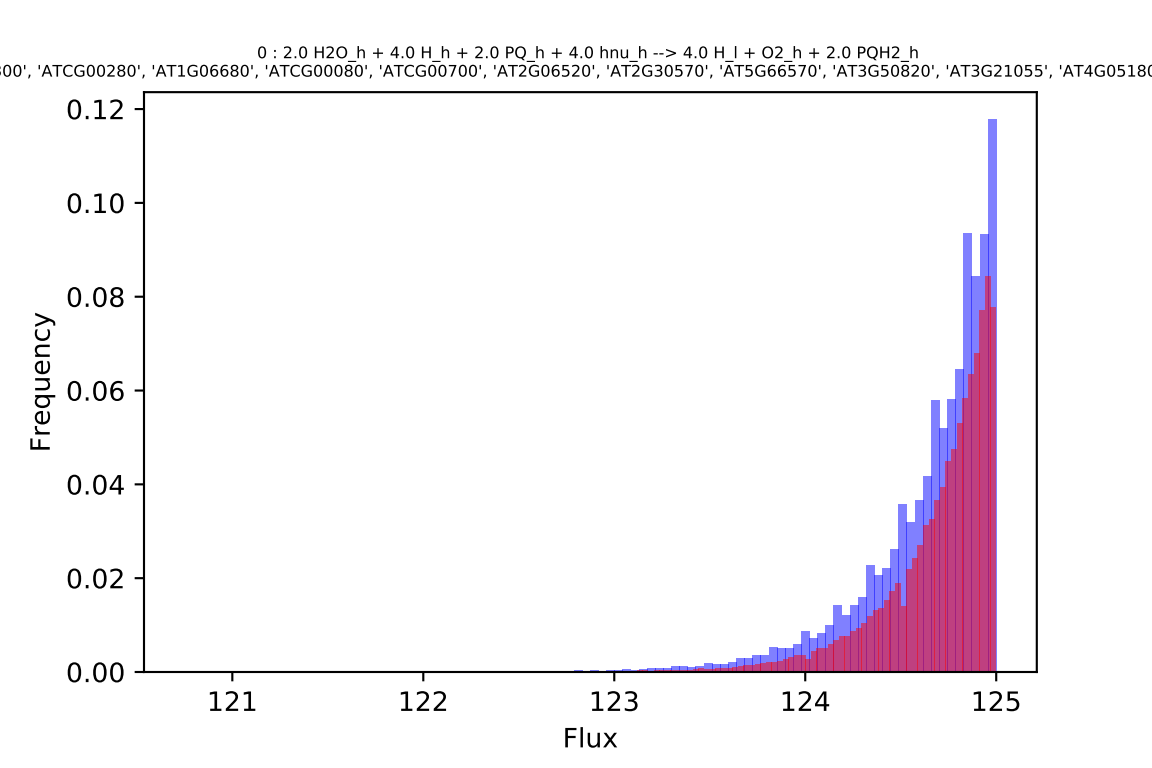
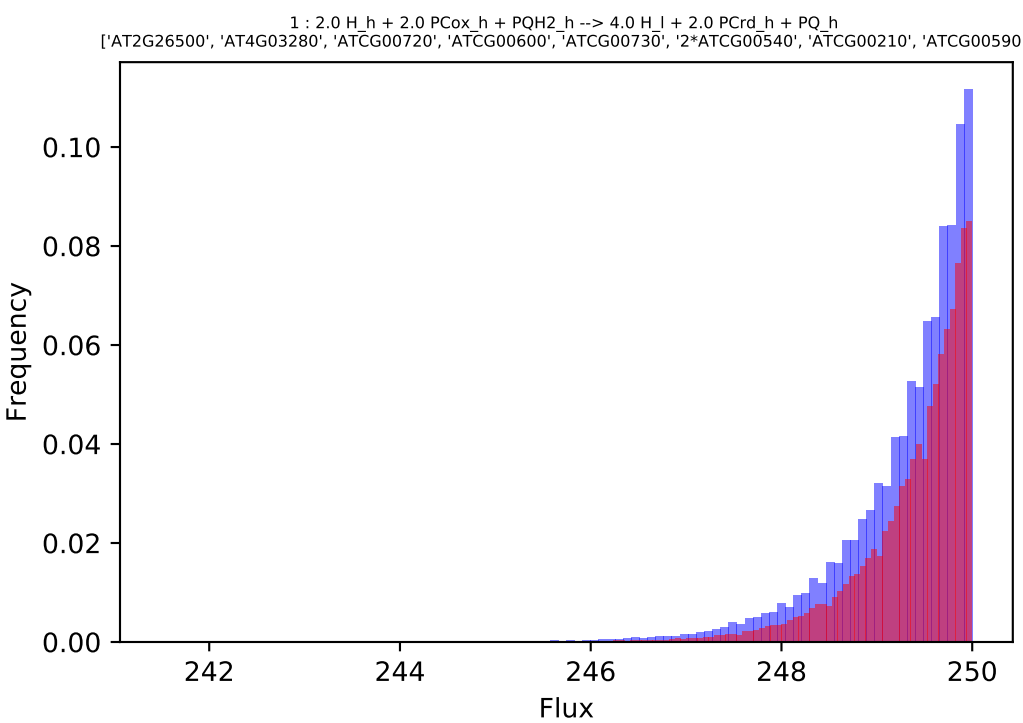
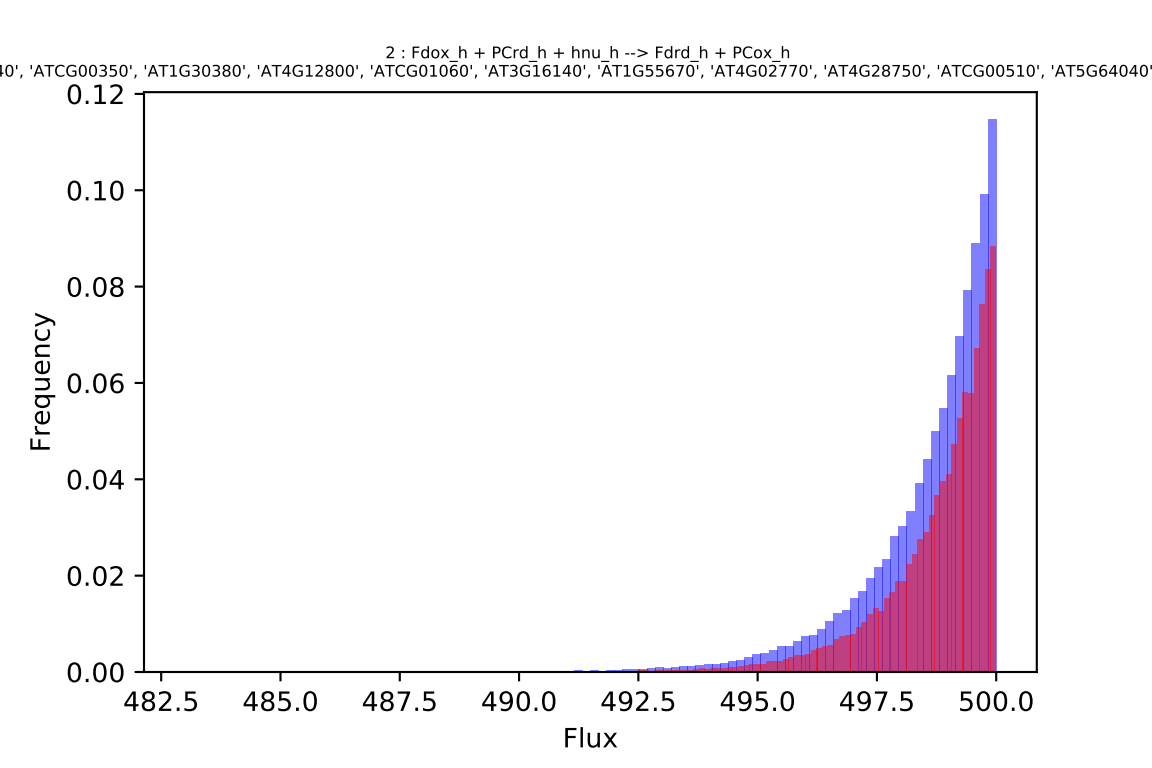
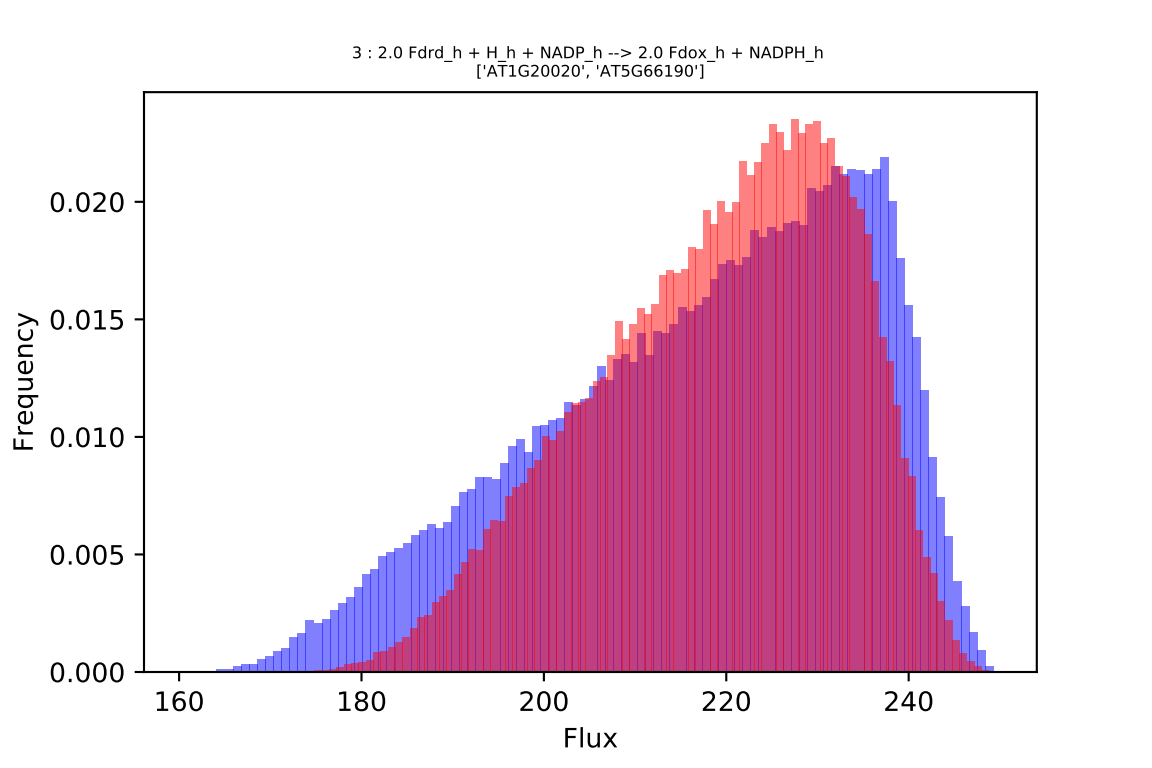
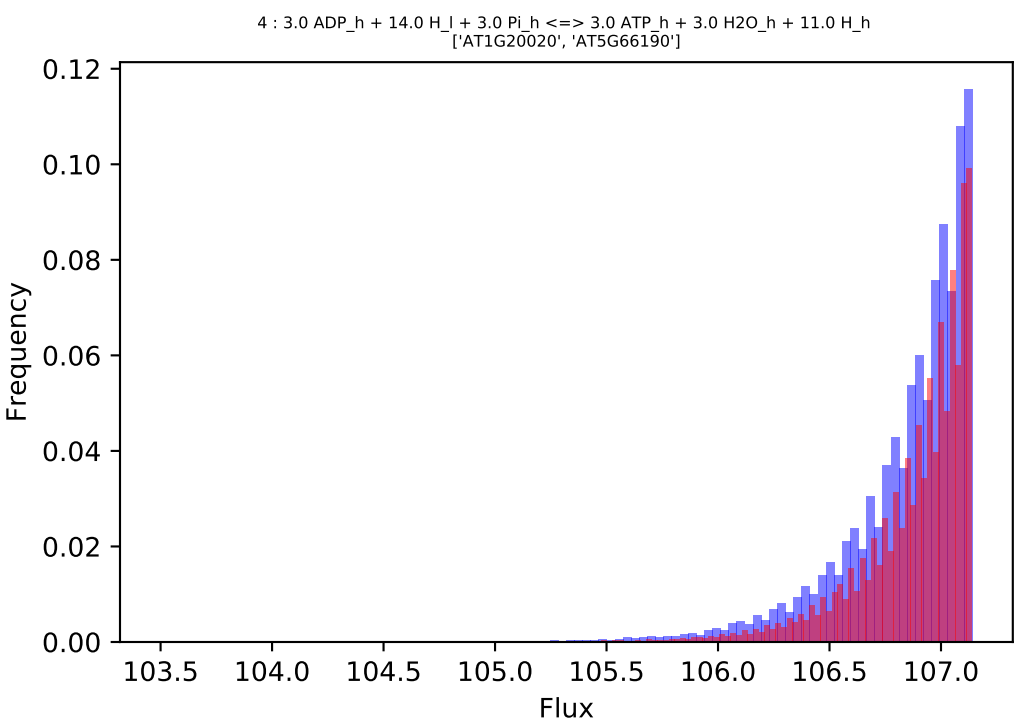
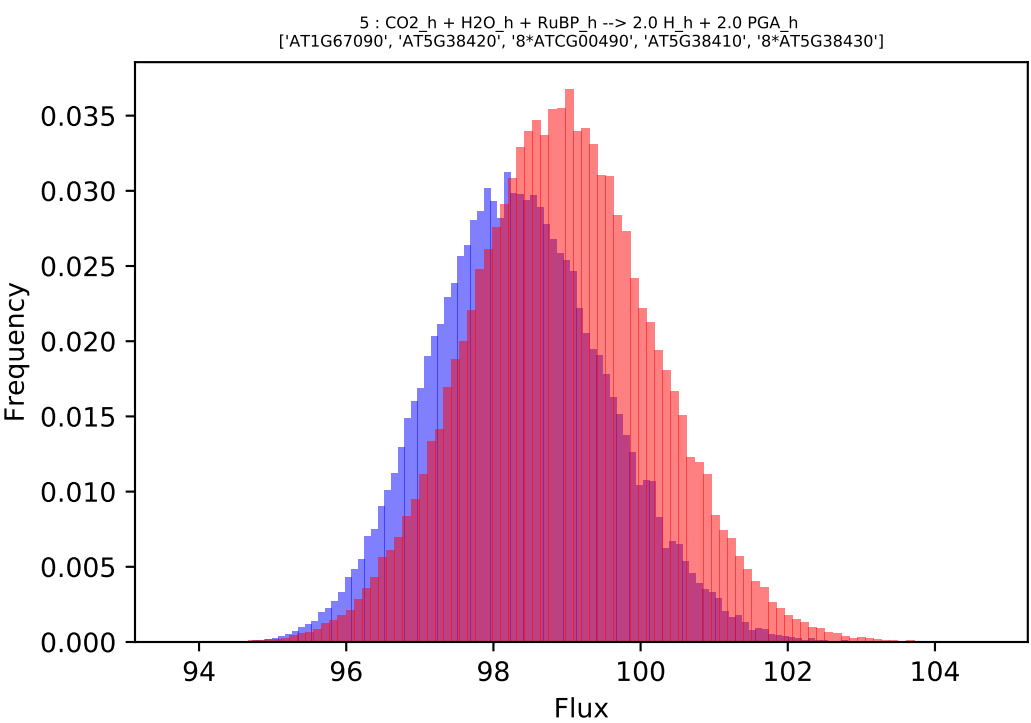

0 : 2.0 H2O_h + 4.0 H_h + 2.0 PQ_h + 4.0 hnu_h --> 4.0 H_l + O2_h + 2.0 PQH2_h
300', 'ATCG00280', 'AT1G06680', 'ATCG00080', 'ATCG00700', 'AT2G06520', 'AT2G30570', 'AT5G66570', 'AT3G50820', 'AT3G21055', 'AT4G05180
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
121
122
123
124
125
Flux

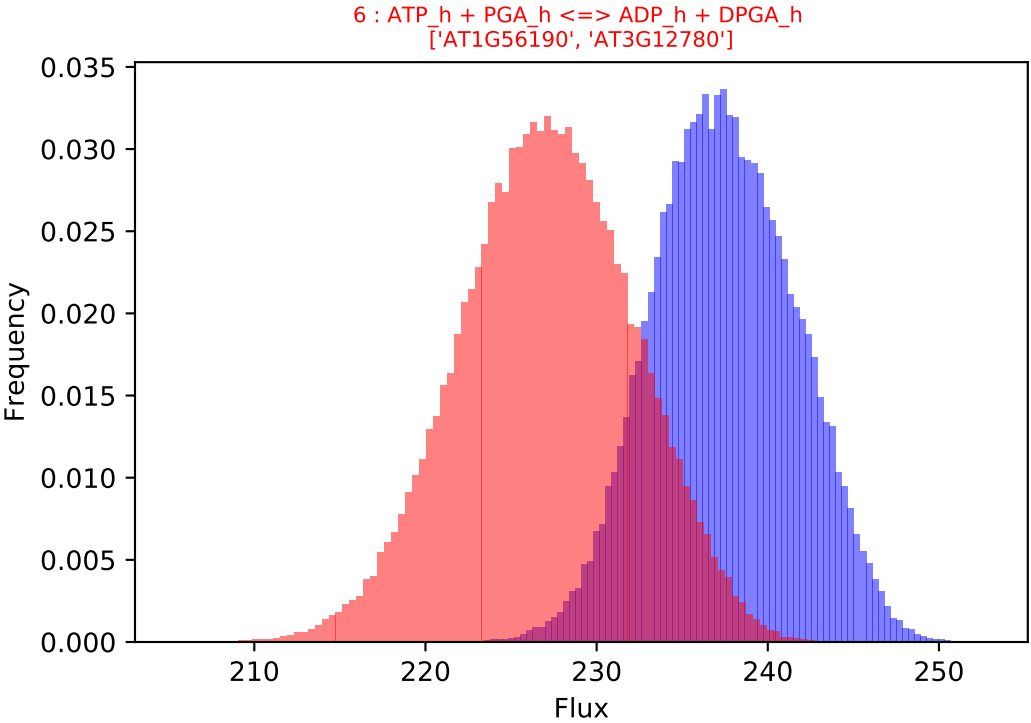

1 : 2.0 H_h + 2.0 PCox_h + PQH2_h --> 4.0 H_l + 2.0 PCrd_h + PQ_h
['AT2G26500', 'AT4G03280', 'ATCG00720', 'ATCG00600', 'ATCG00730', '2*ATCG00540', 'ATCG00210', 'ATCG00590']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
242
244
246
248
250
Flux

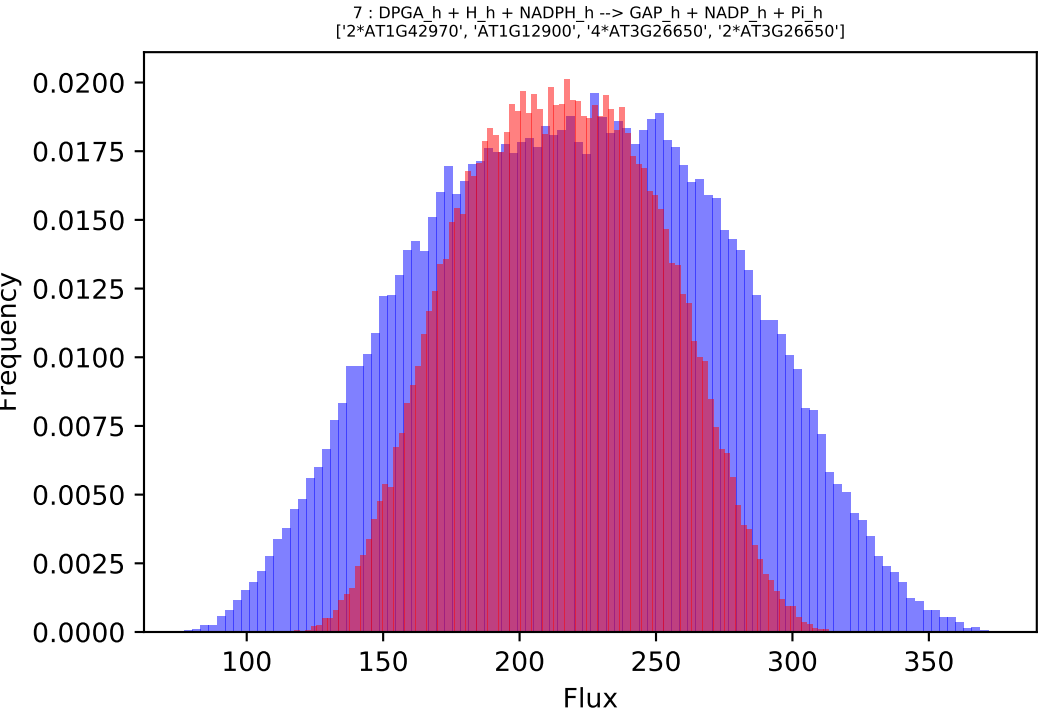

2 : Fdox_h + PCrd_h + hnu_h --> Fdrd_h + PCox_h
40', 'ATCG00350', 'AT1G30380', 'AT4G12800', 'ATCG01060', 'AT3G16140', 'AT1G55670', 'AT4G02770', 'AT4G28750', 'ATCG00510', 'AT5G64040'
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
482.5
485.0
487.5
490.0
492.5
495.0
497.5
500.0
Flux

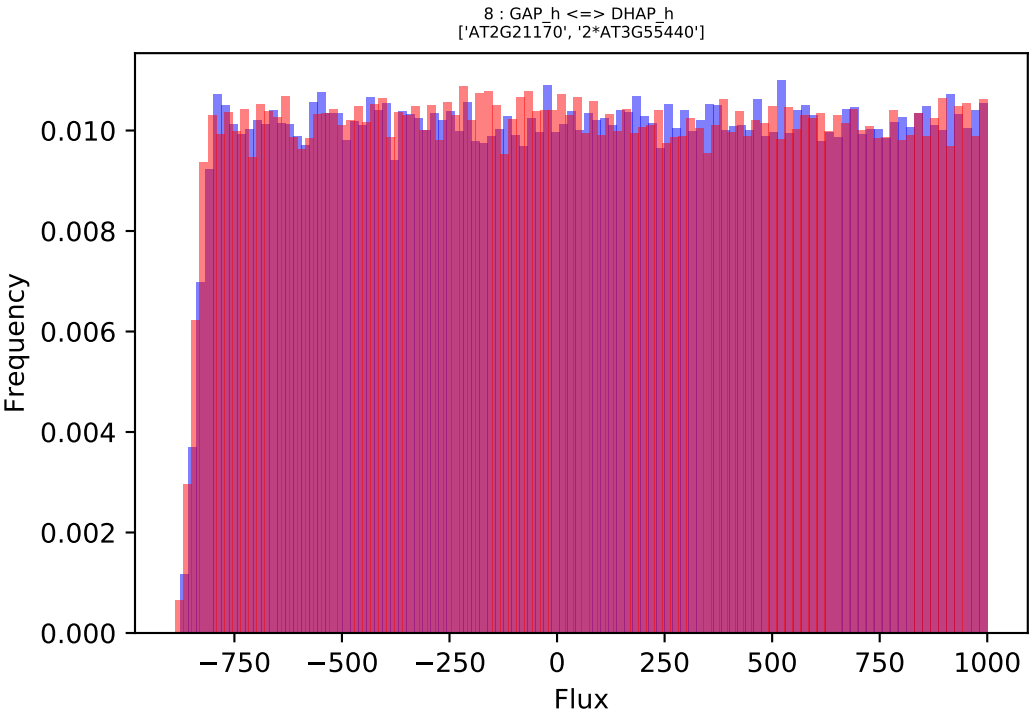

3 : 2.0 Fdrd_h + H_h + NADP_h --> 2.0 Fdox_h + NADPH_h
['AT1G20020', 'AT5G66190']
Frequency
0.020
0.015
0.010
0.005
0.000
160
180
200
220
240
Flux

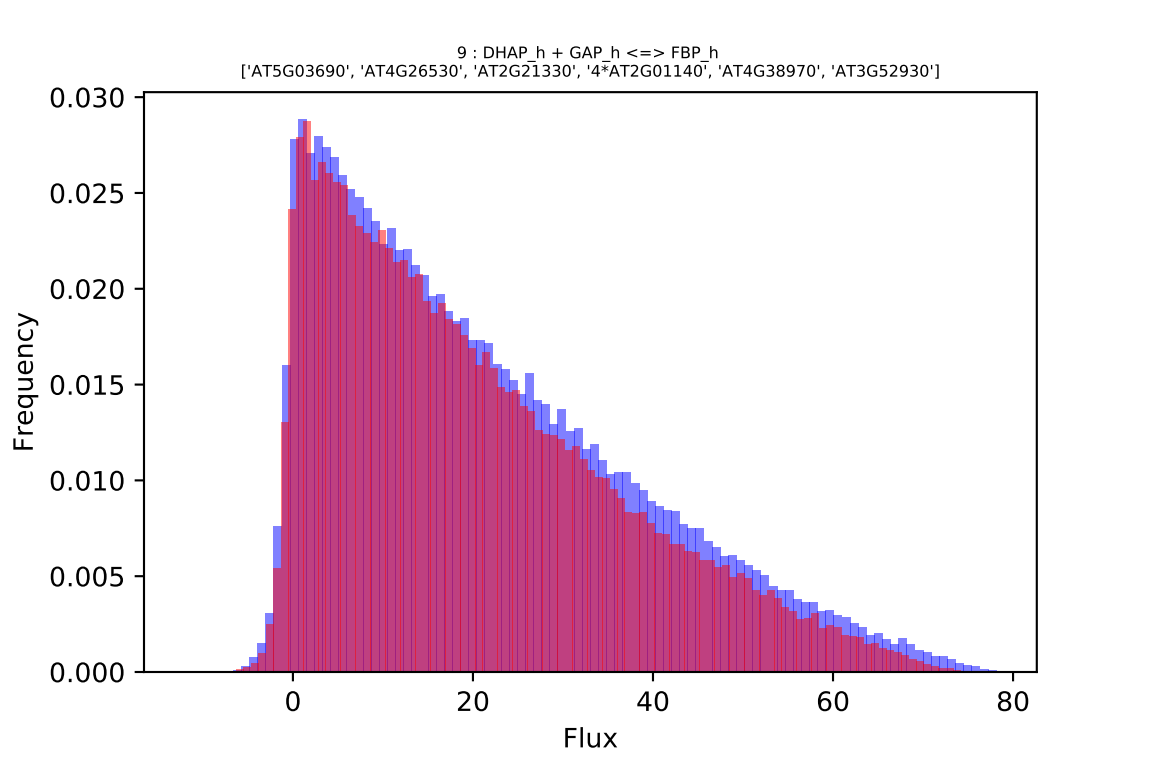

4 : 3.0 ADP_h + 14.0 H_l + 3.0 Pi_h <=> 3.0 ATP_h + 3.0 H2O_h + 11.0 H_h
['AT1G20020', 'AT5G66190']
Frequency
0.12
0.10
0.08
0.06
0.04
0.02
0.00
103.5
104.0
104.5
105.0
105.5
106.0
106.5
107.0
Flux

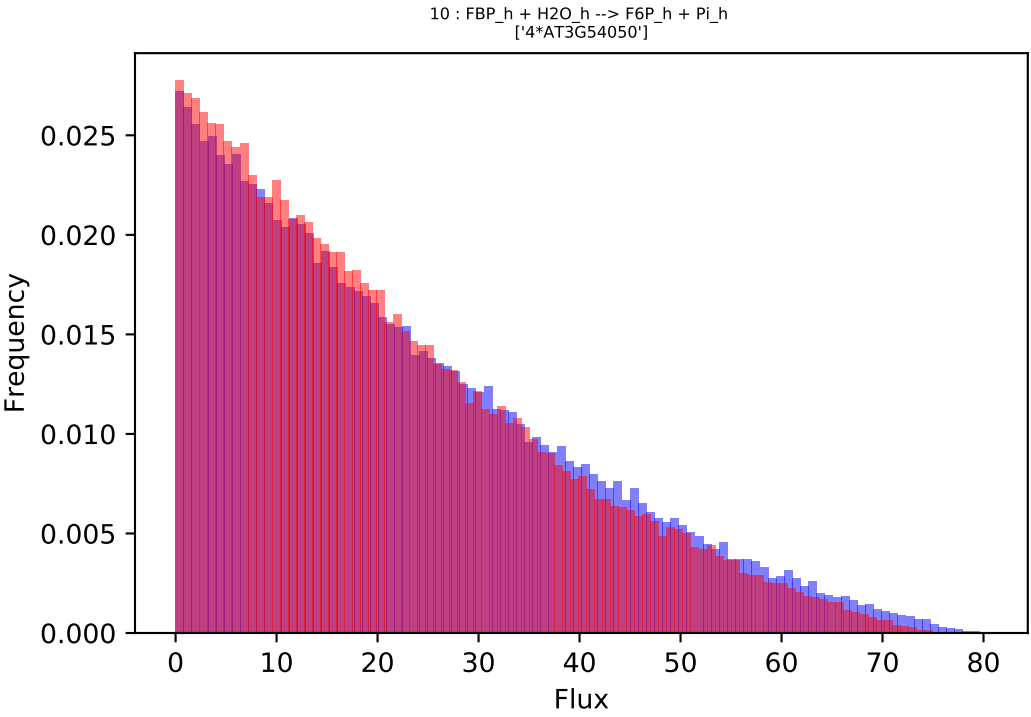

5 : CO2_h + H2O_h + RuBP_h --> 2.0 H_h + 2.0 PGA_h
['AT1G67090', 'AT5G38420', '8*ATCG00490', 'AT5G38410', '8*AT5G38430']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
94
96
98
100
102
104
Flux

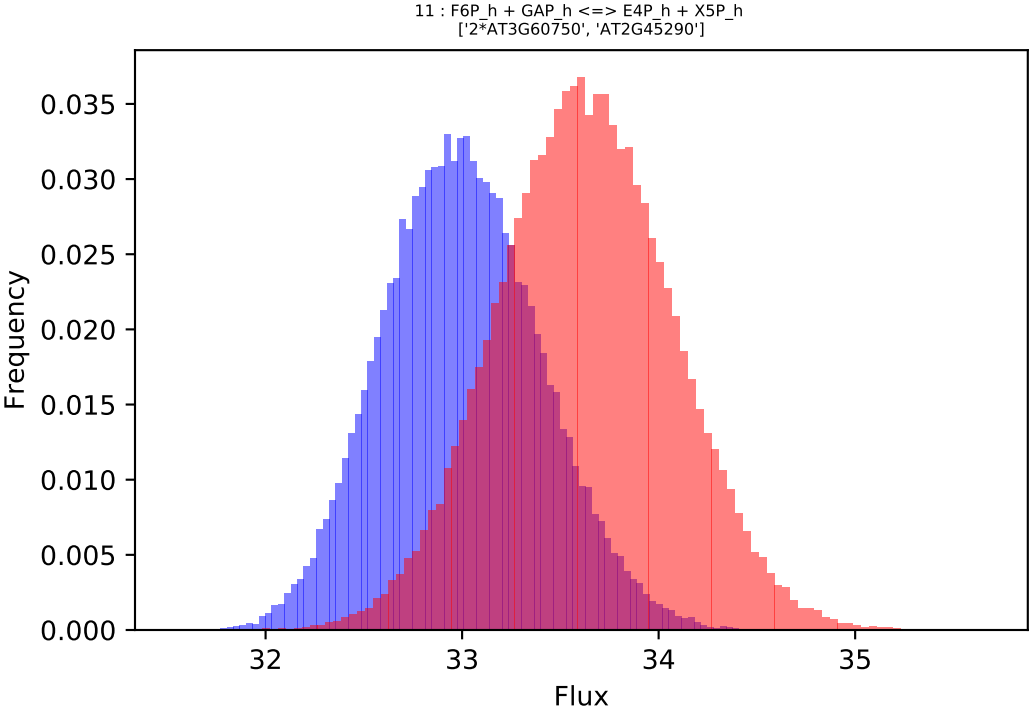

6 : ATP_h + PGA_h <=> ADP_h + DPGA_h
['AT1G56190', 'AT3G12780']
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
210
220
230
240
250
Flux

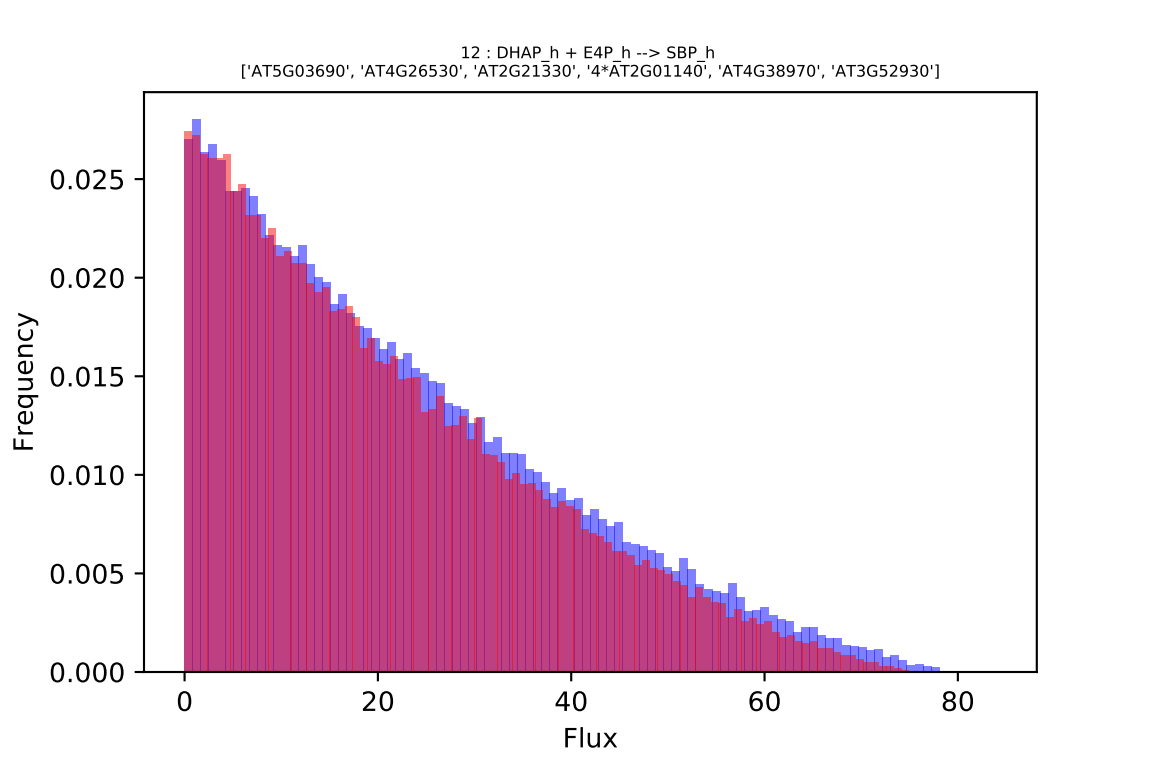

7 : DPGA_h + H_h + NADPH_h --> GAP_h + NADP_h + Pi_h
['2*AT1G42970', 'AT1G12900', '4*AT3G26650', '2*AT3G26650']
Frequency
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
100
150
200
250
300
350
Flux

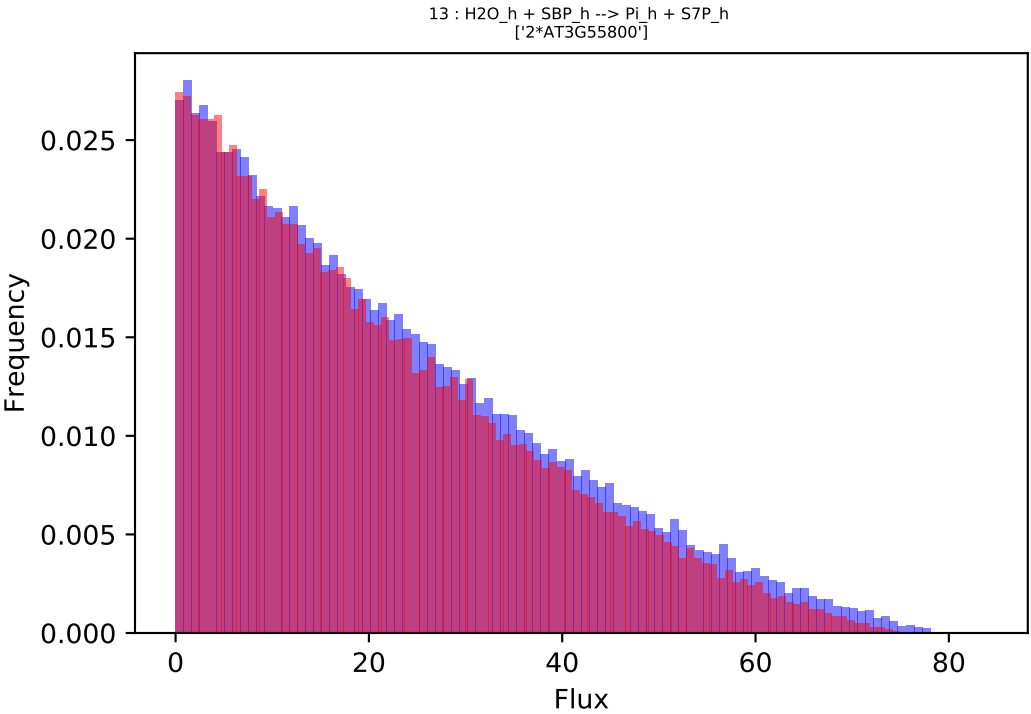

8 : GAP_h <=> DHAP_h
['AT2G21170', '2*AT3G55440']
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−750
−500
−250
0
250
500
750
1000
Flux

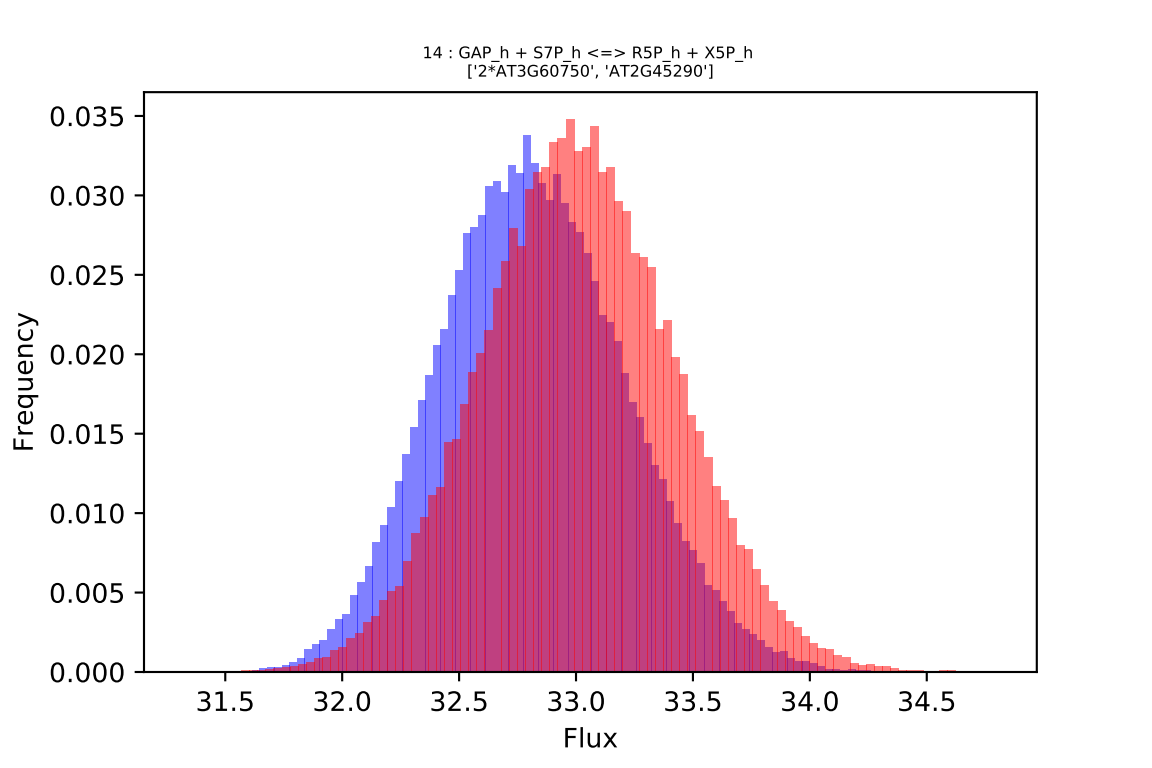

9 : DHAP_h + GAP_h <=> FBP_h
['AT5G03690', 'AT4G26530', 'AT2G21330', '4*AT2G01140', 'AT4G38970', 'AT3G52930']
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
20
40
60
80
Flux

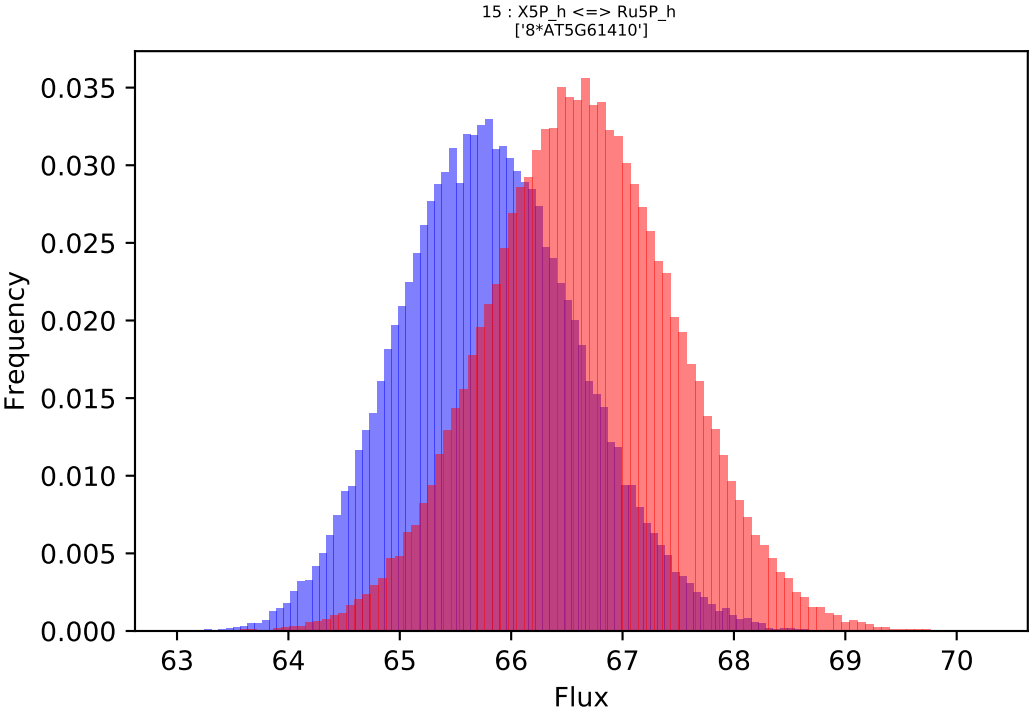

10 : FBP_h + H2O_h --> F6P_h + Pi_h
['4*AT3G54050']
Frequency
0.025
0.020
0.015
0.010
0.005
0.000
0
10
20
30
40
50
60
70
80
Flux

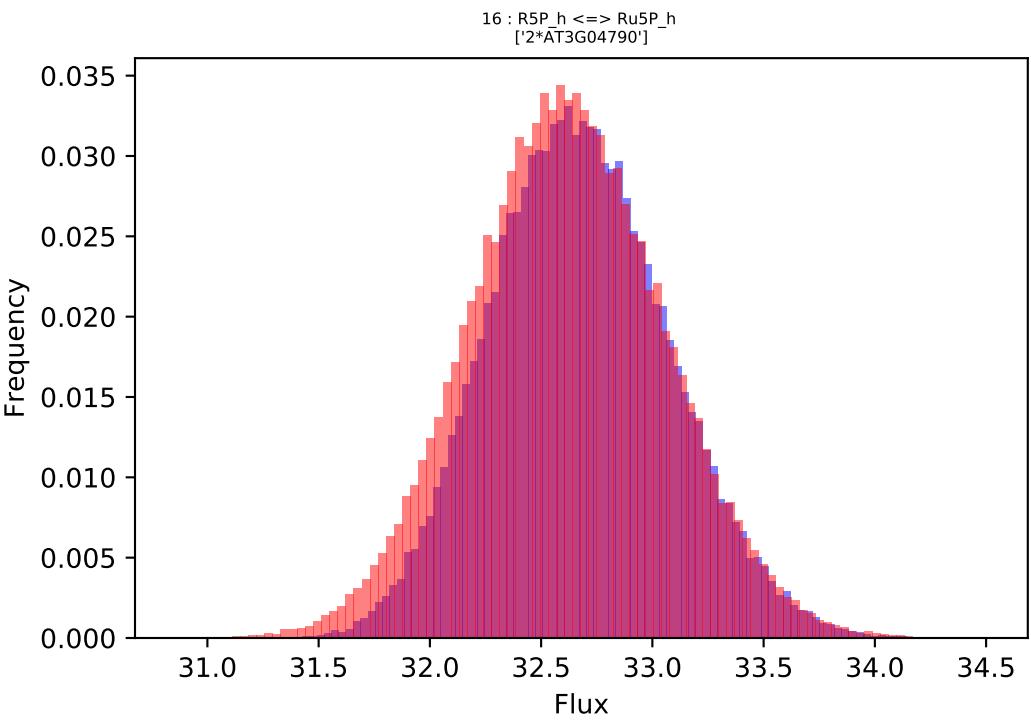

11 : F6P_h + GAP_h <=> E4P_h + X5P_h
['2*AT3G60750', 'AT2G45290']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
32
33
34
35
Flux

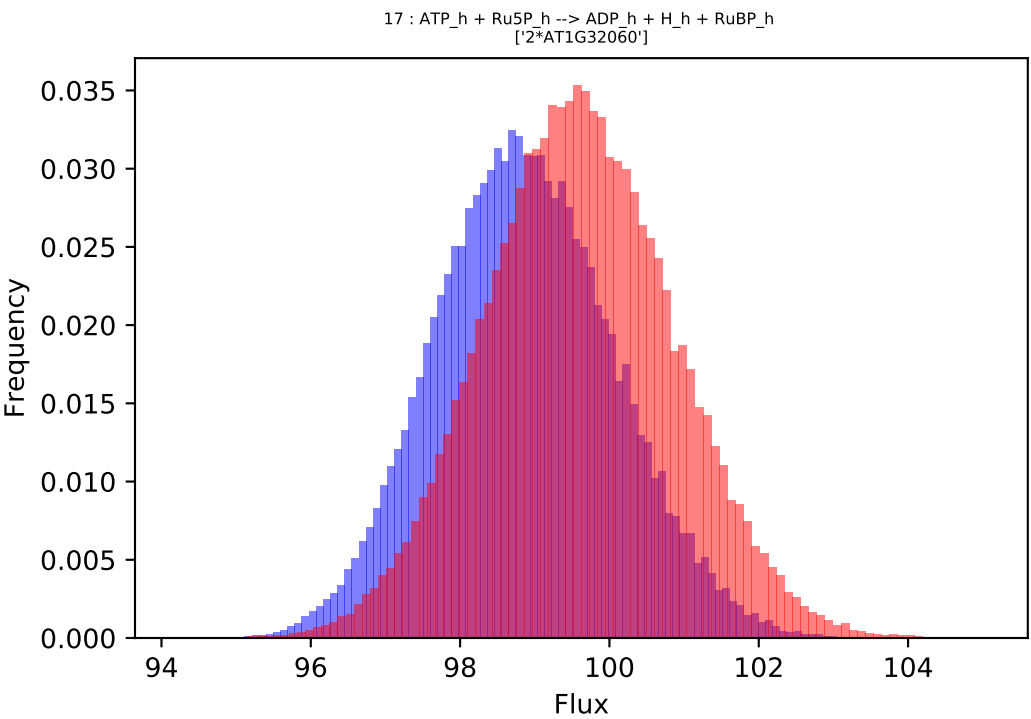

12 : DHAP_h + E4P_h --> SBP_h
['AT5G03690', 'AT4G26530', 'AT2G21330', '4*AT2G01140', 'AT4G38970', 'AT3G52930']
Frequency
0.025
0.020
0.015
0.010
0.005
0.000
0
20
40
60
80
Flux

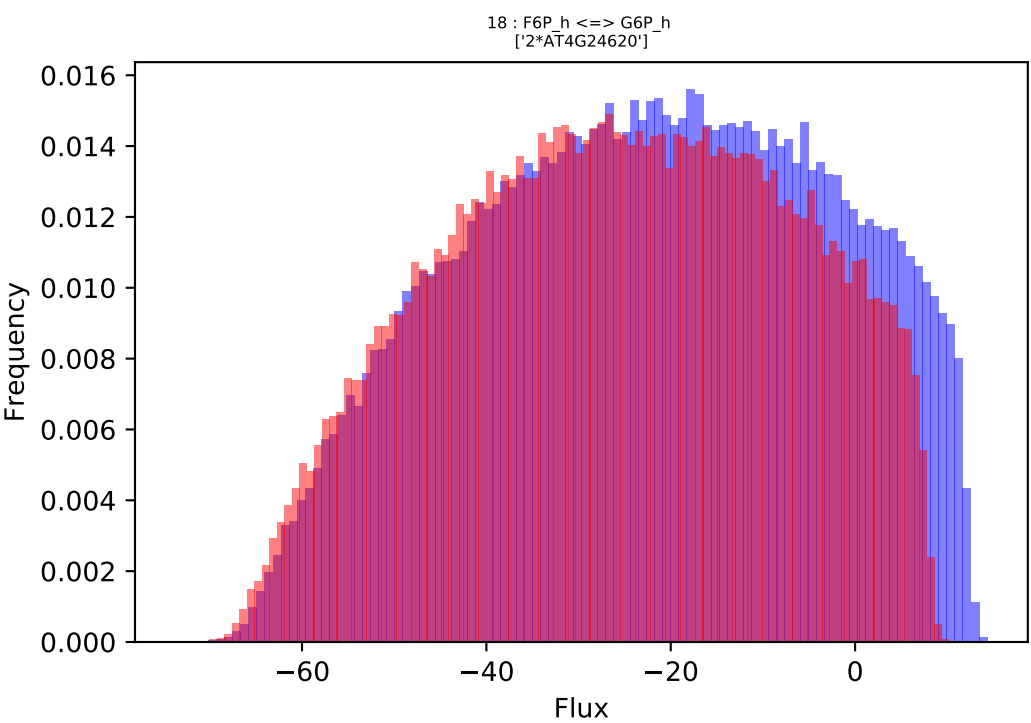

13 : H2O_h + SBP_h --> Pi_h + S7P_h
['2*AT3G55800']
Frequency
0.025
0.020
0.015
0.010
0.005
0.000
0
20
40
60
80
Flux

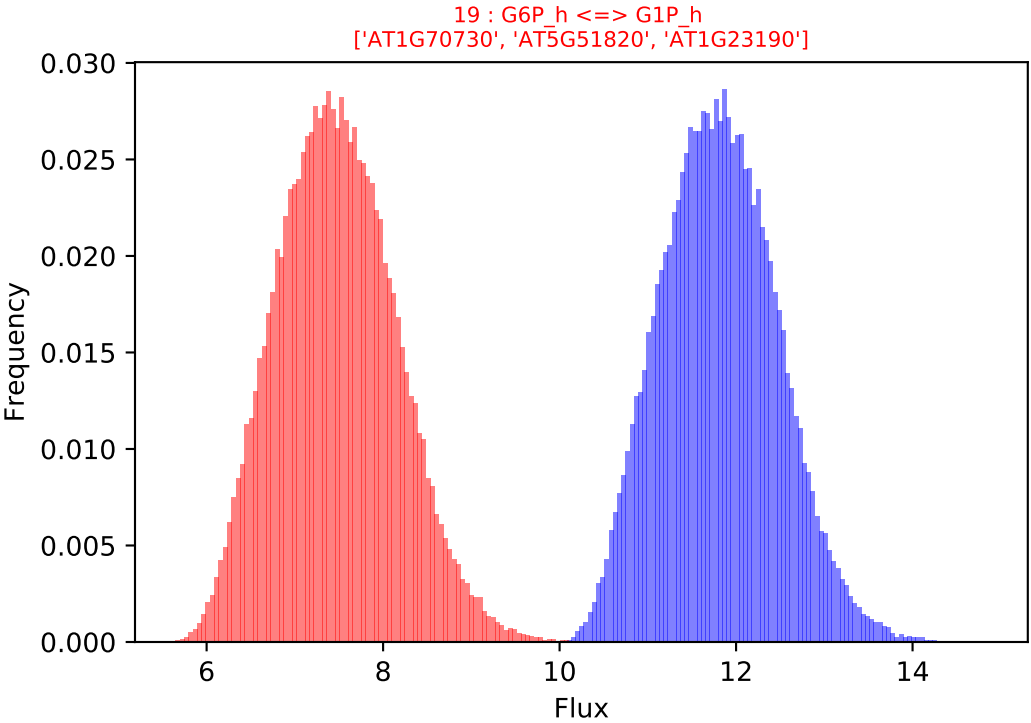

14 : GAP_h + S7P_h <=> R5P_h + X5P_h
['2*AT3G60750', 'AT2G45290']
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
31.5
32.0
32.5
33.0
33.5
34.0
34.5
Flux

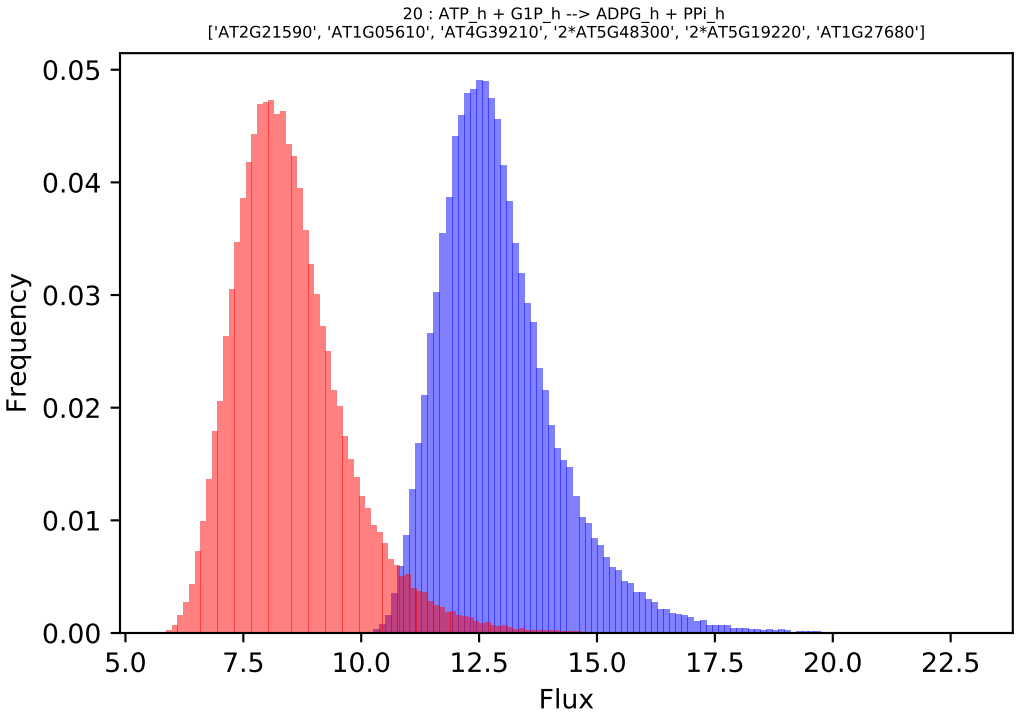

15 : X5P_h <=> Ru5P_h
['8*AT5G61410']
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
63
64
65
66
67
68
69
70
Flux

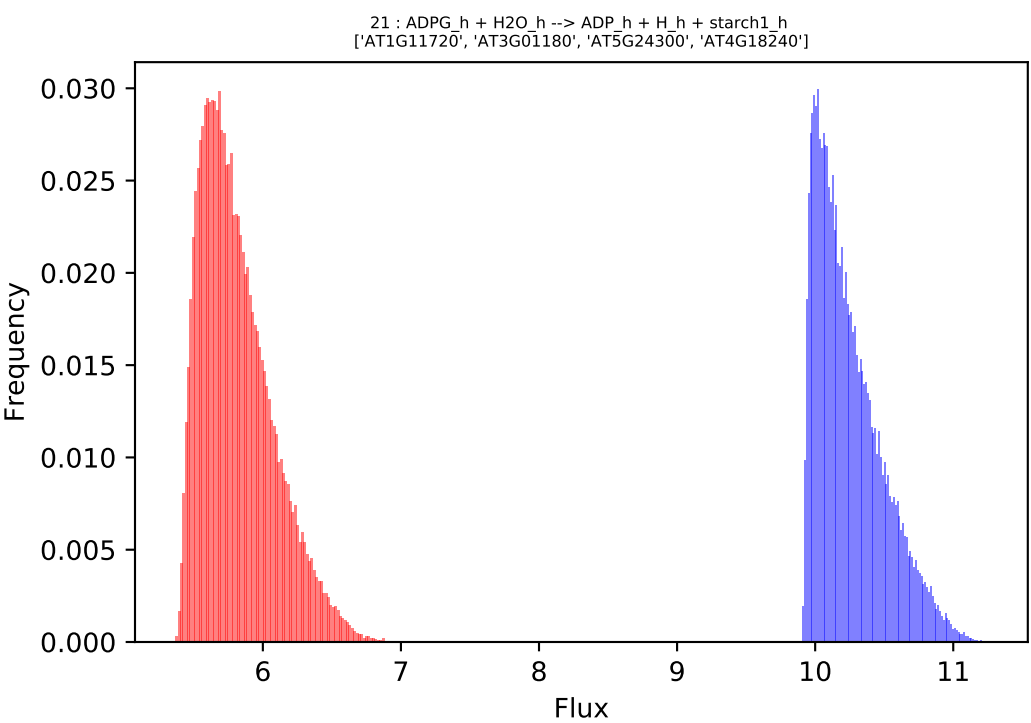

16 : R5P_h <=> Ru5P_h
['2*AT3G04790']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
31.0
31.5
32.0
32.5
33.0
33.5
34.0
34.5
Flux

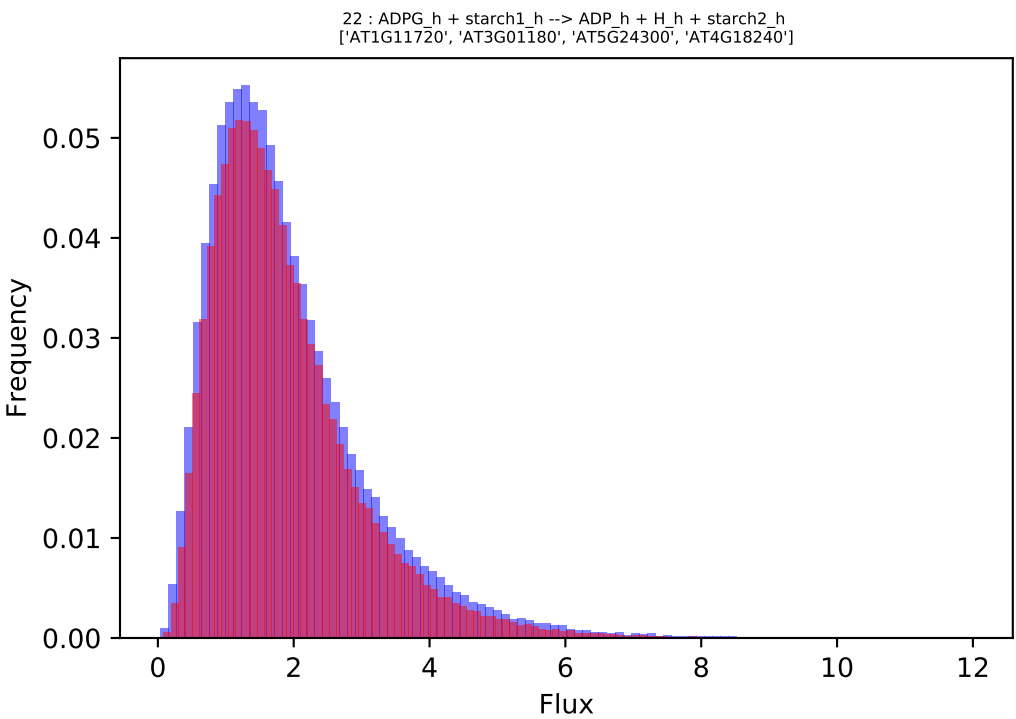

17 : ATP_h + Ru5P_h --> ADP_h + H_h + RuBP_h
['2*AT1G32060']
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
94
96
98
100
102
104
Flux

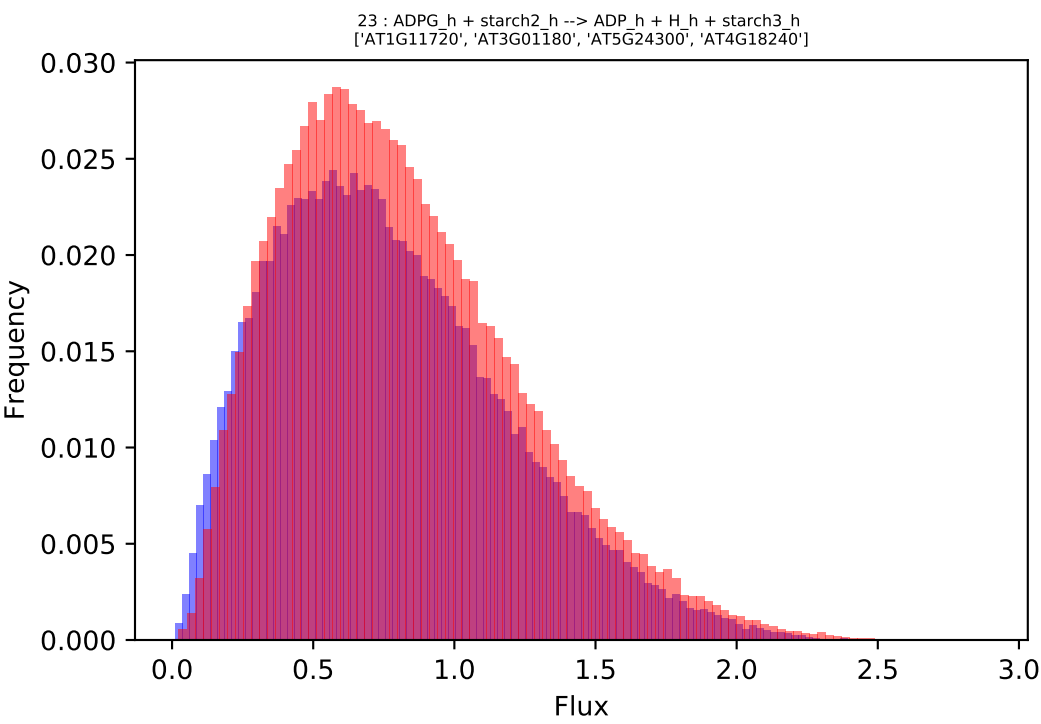

18 : F6P_h <=> G6P_h
['2*AT4G24620']
0.016
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−60
−40
−20
0
Flux

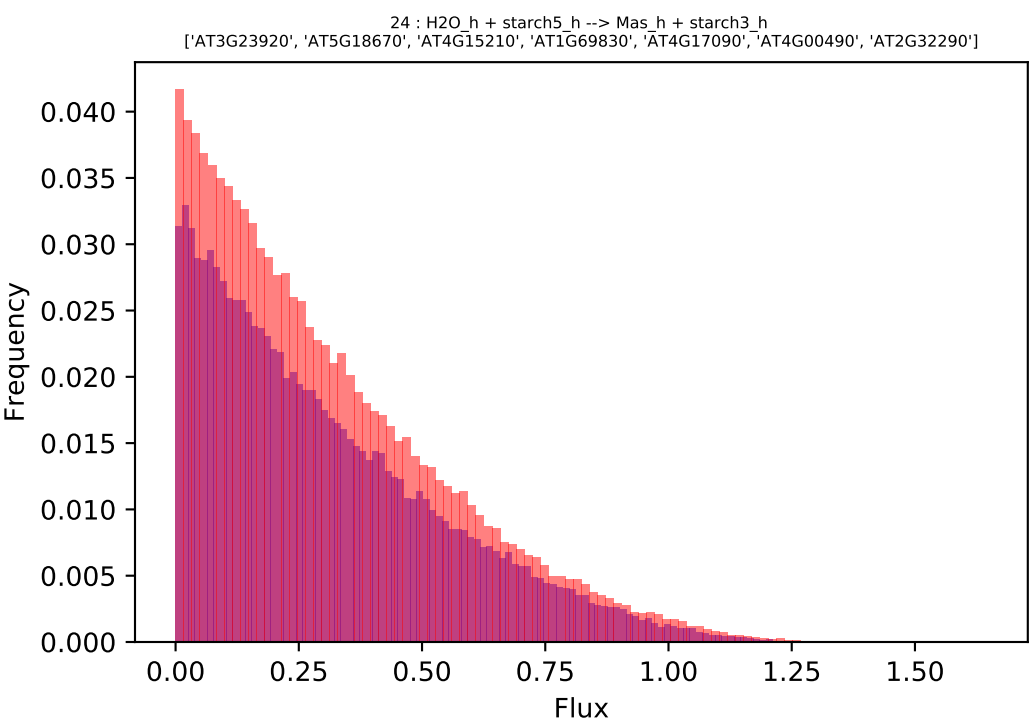

19 : G6P_h <=> G1P_h
['AT1G70730', 'AT5G51820', 'AT1G23190']
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
6
8
10
12
14
Flux

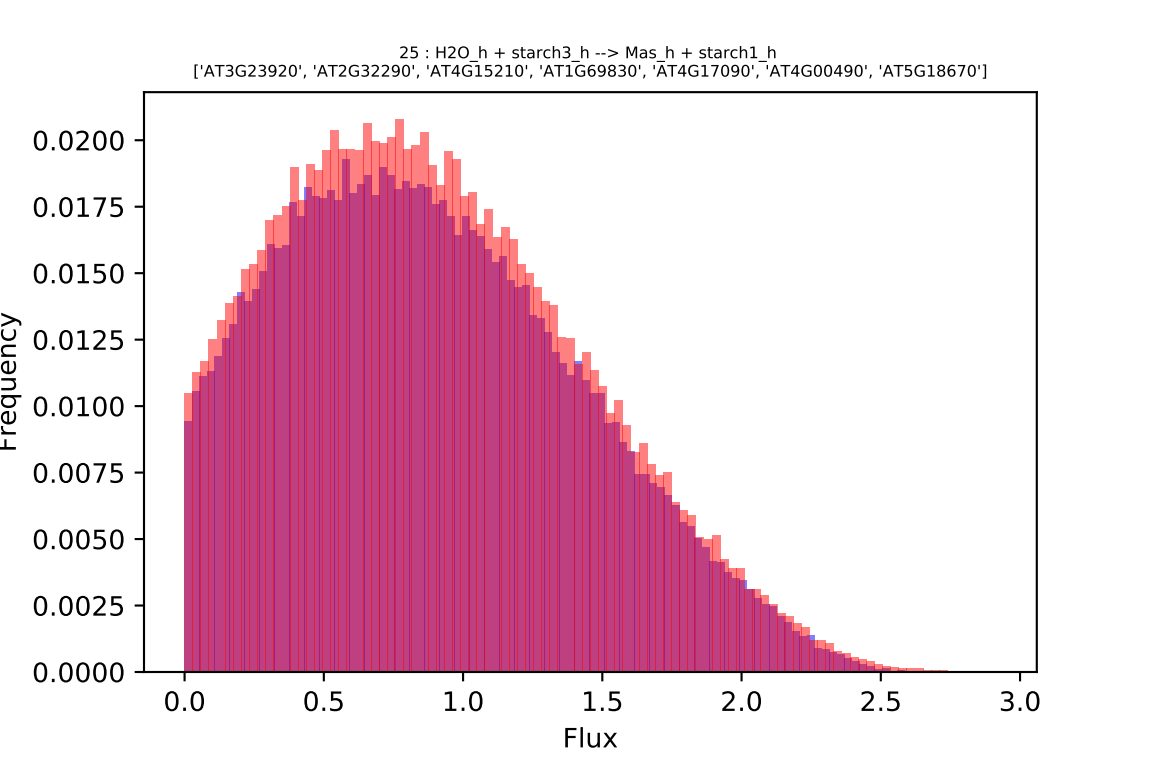

20 : ATP_h + G1P_h --> ADPG_h + PPi_h
['AT2G21590', 'AT1G05610', 'AT4G39210', '2*AT5G48300', '2*AT5G19220', 'AT1G27680']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
5.0
7.5
10.0
12.5
15.0
17.5
20.0
22.5
Flux

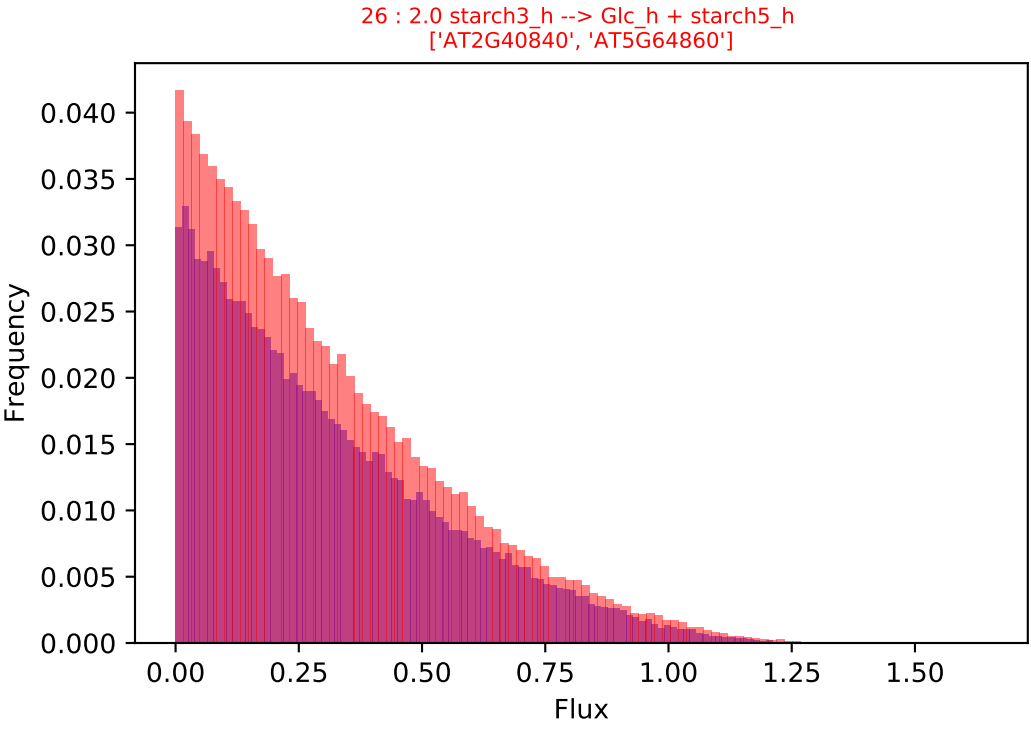

21 : ADPG_h + H2O_h --> ADP_h + H_h + starch1_h
['AT1G11720', 'AT3G01180', 'AT5G24300', 'AT4G18240']
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
6
7
8
9
10
11
Flux

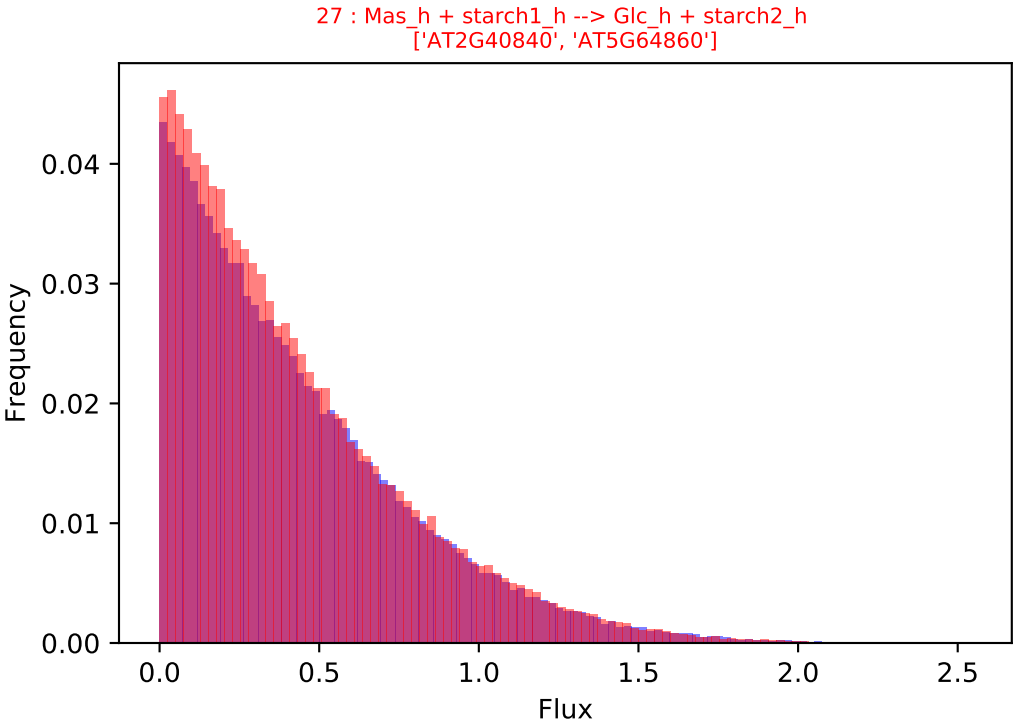

22 : ADPG_h + starch1_h --> ADP_h + H_h + starch2_h
['AT1G11720', 'AT3G01180', 'AT5G24300', 'AT4G18240']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0
2
4
6
8
10
12
Flux

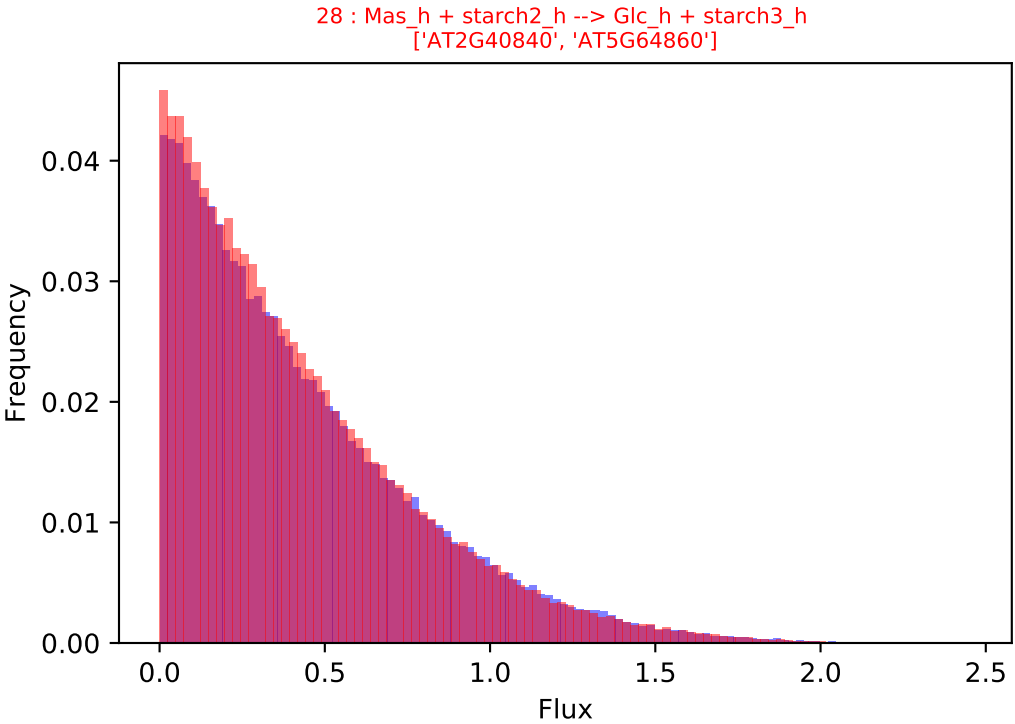

23 : ADPG_h + starch2_h --> ADP_h + H_h + starch3_h
['AT1G11720', 'AT3G01180', 'AT5G24300', 'AT4G18240']
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Flux

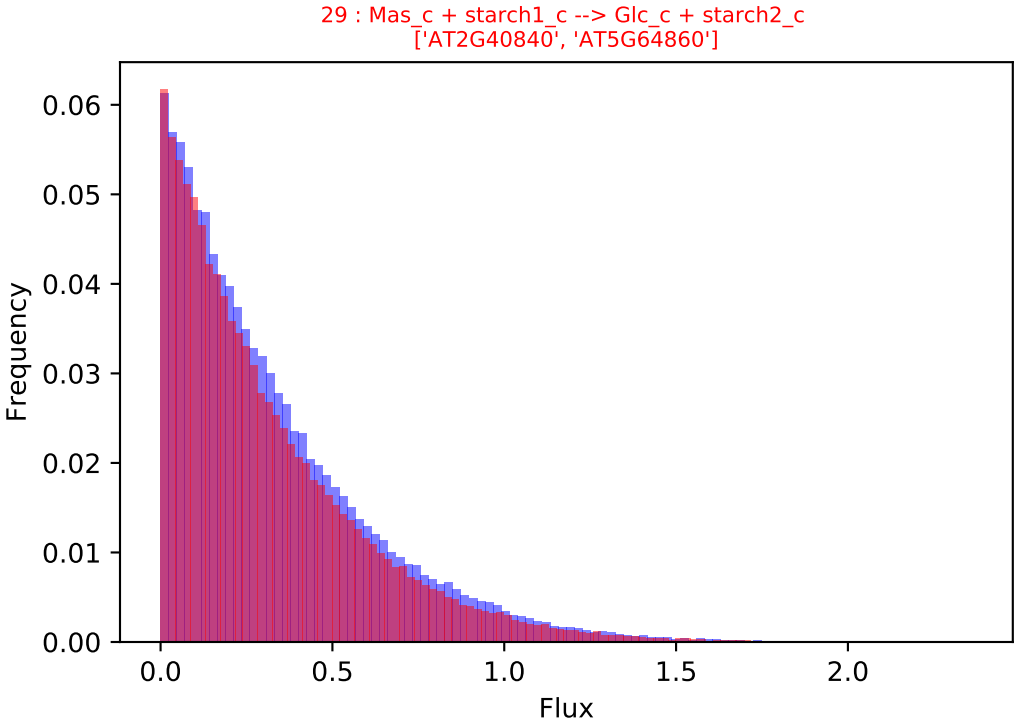

24 : H2O_h + starch5_h --> Mas_h + starch3_h
['AT3G23920', 'AT5G18670', 'AT4G15210', 'AT1G69830', 'AT4G17090', 'AT4G00490', 'AT2G32290']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00
0.25
0.50
0.75
1.00
1.25
1.50
Flux

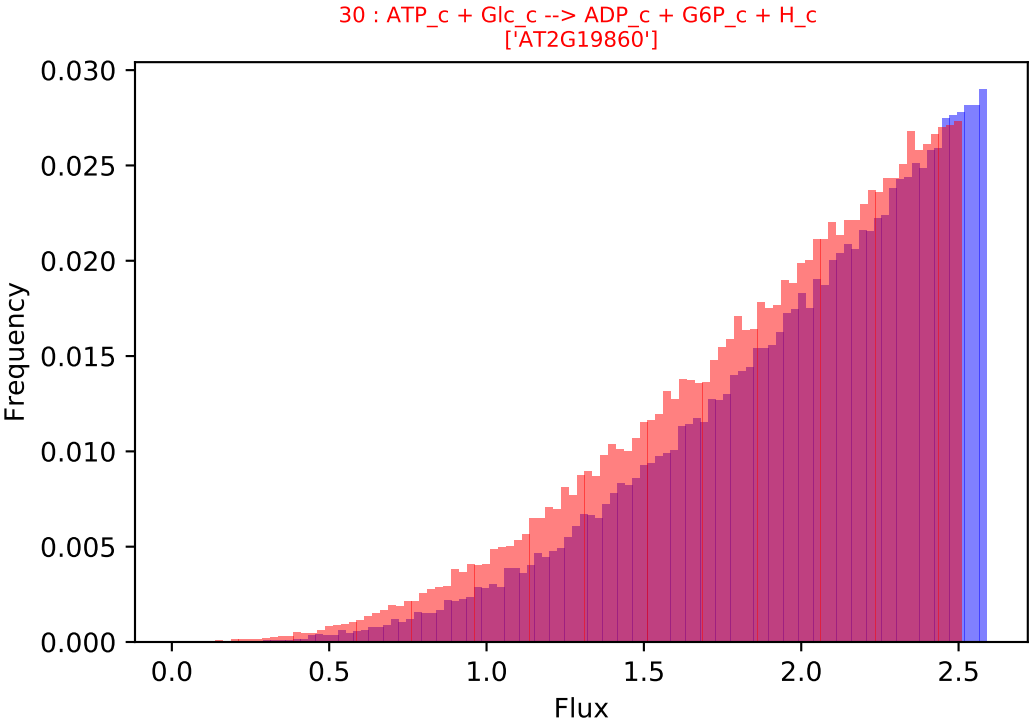

25 : H2O_h + starch3_h --> Mas_h + starch1_h
['AT3G23920', 'AT2G32290', 'AT4G15210', 'AT1G69830', 'AT4G17090', 'AT4G00490', 'AT5G18670']
Frequency
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Flux

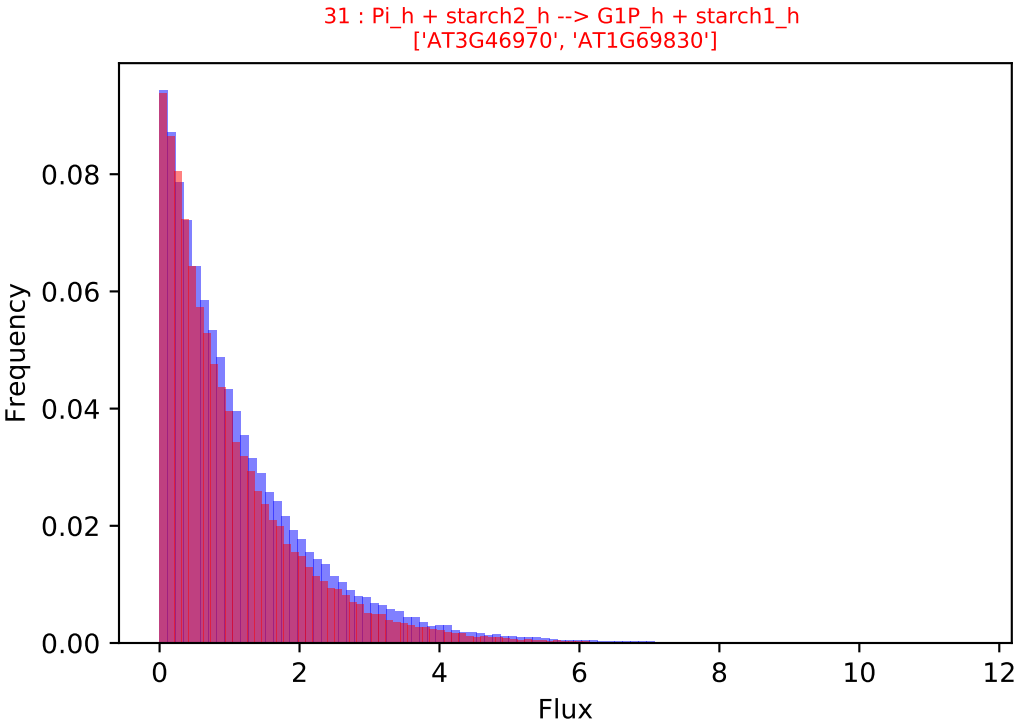

26 : 2.0 starch3_h --> Glc_h + starch5_h
['AT2G40840', 'AT5G64860']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00
0.25
0.50
0.75
1.00
1.25
1.50
Flux

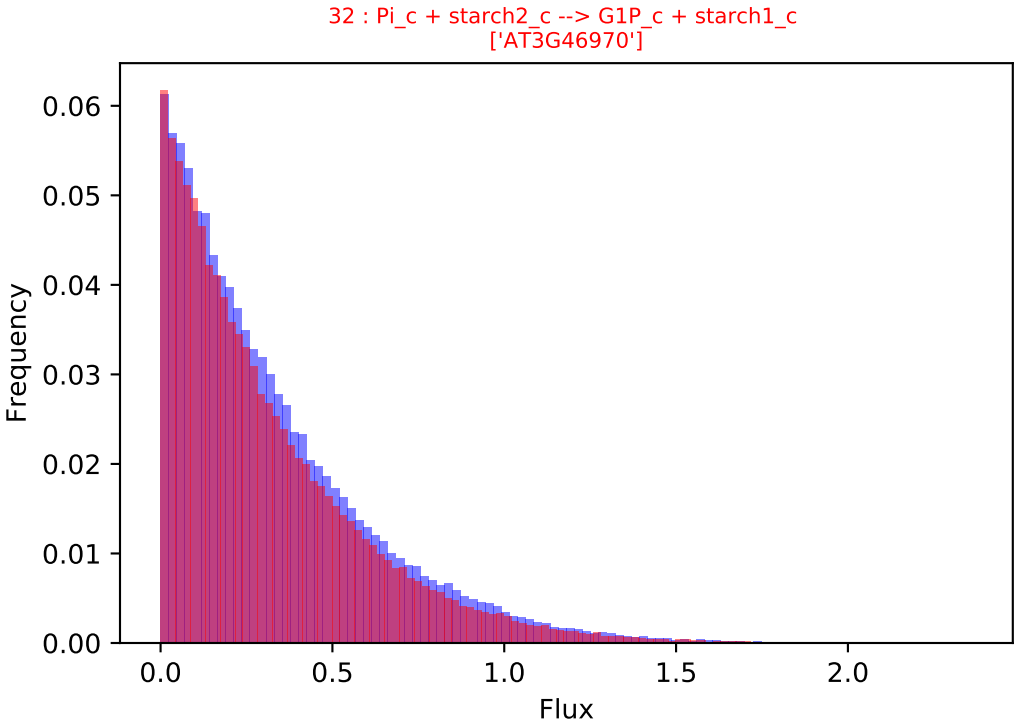

27 : Mas_h + starch1_h --> Glc_h + starch2_h
['AT2G40840', 'AT5G64860']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.5
1.0
1.5
2.0
2.5
Flux

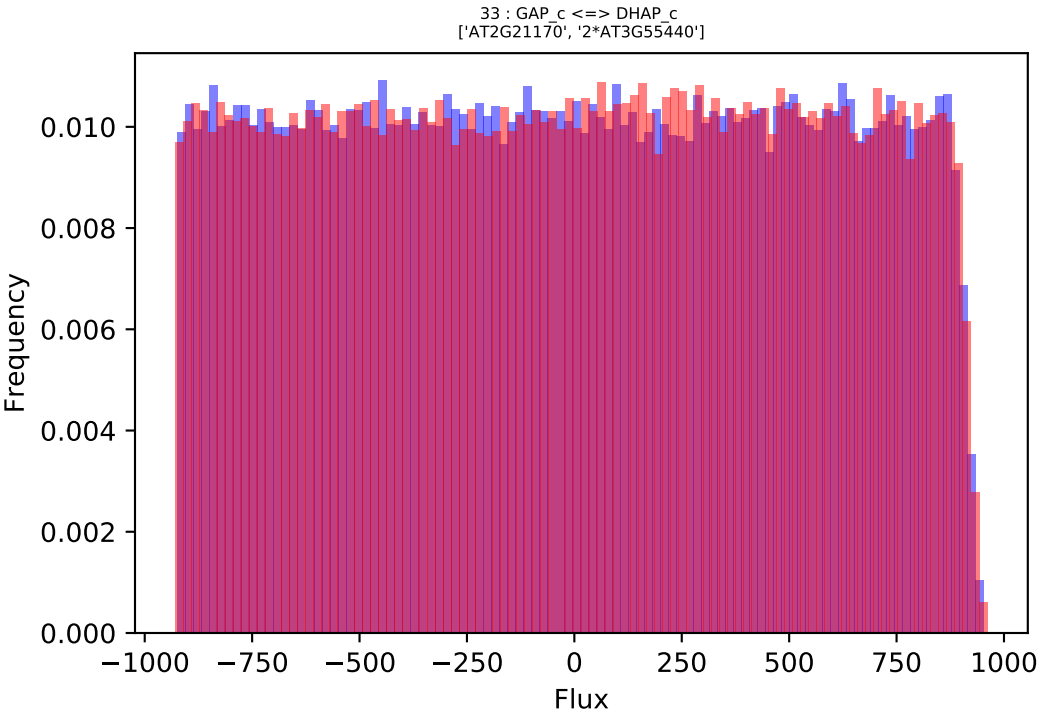

28 : Mas_h + starch2_h --> Glc_h + starch3_h
['AT2G40840', 'AT5G64860']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.5
1.0
1.5
2.0
2.5
Flux

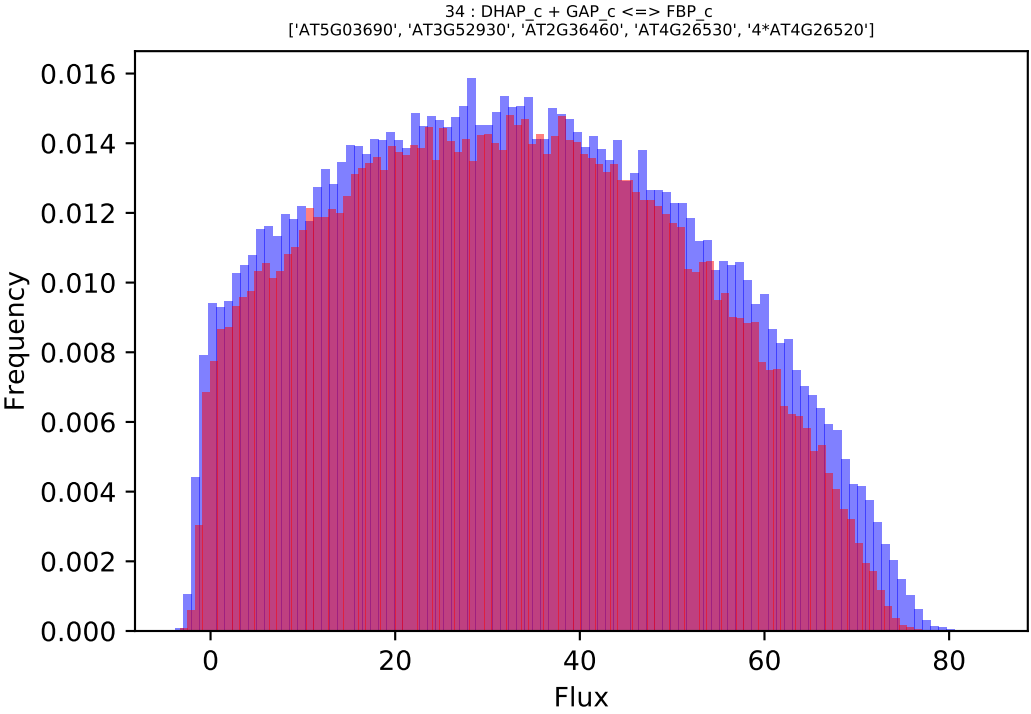

29 : Mas_c + starch1_c --> Glc_c + starch2_c
['AT2G40840', 'AT5G64860']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.5
1.0
1.5
2.0
Flux

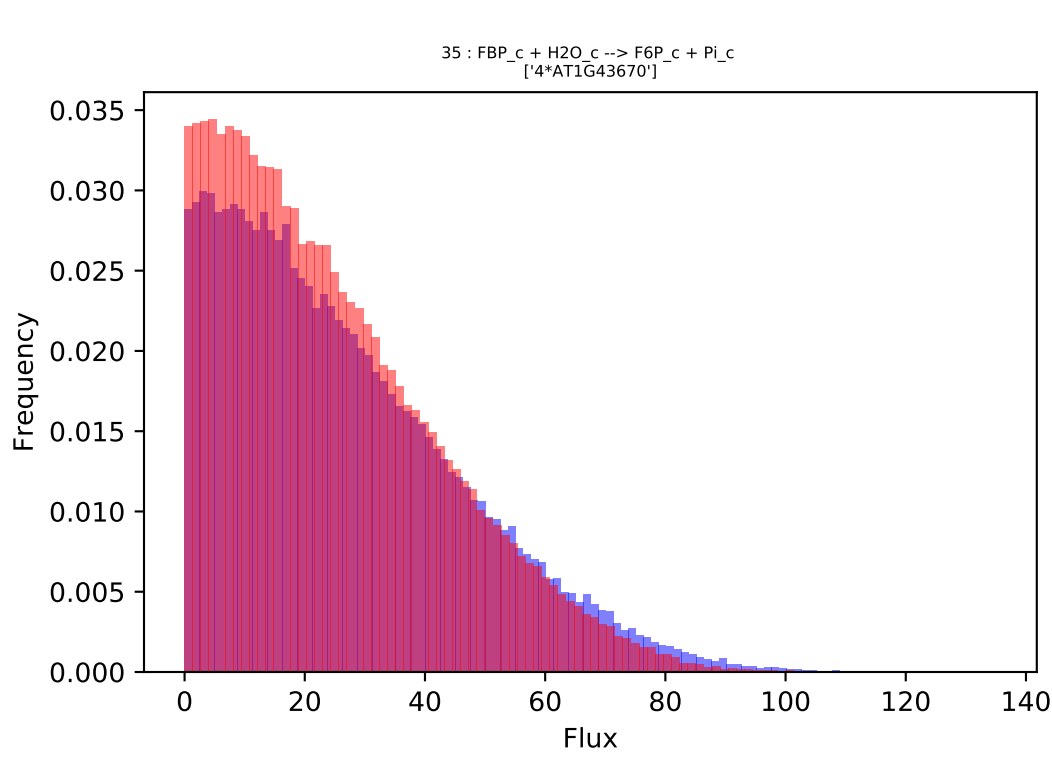

30 : ATP_c + Glc_c --> ADP_c + G6P_c + H_c
['AT2G19860']
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
Flux

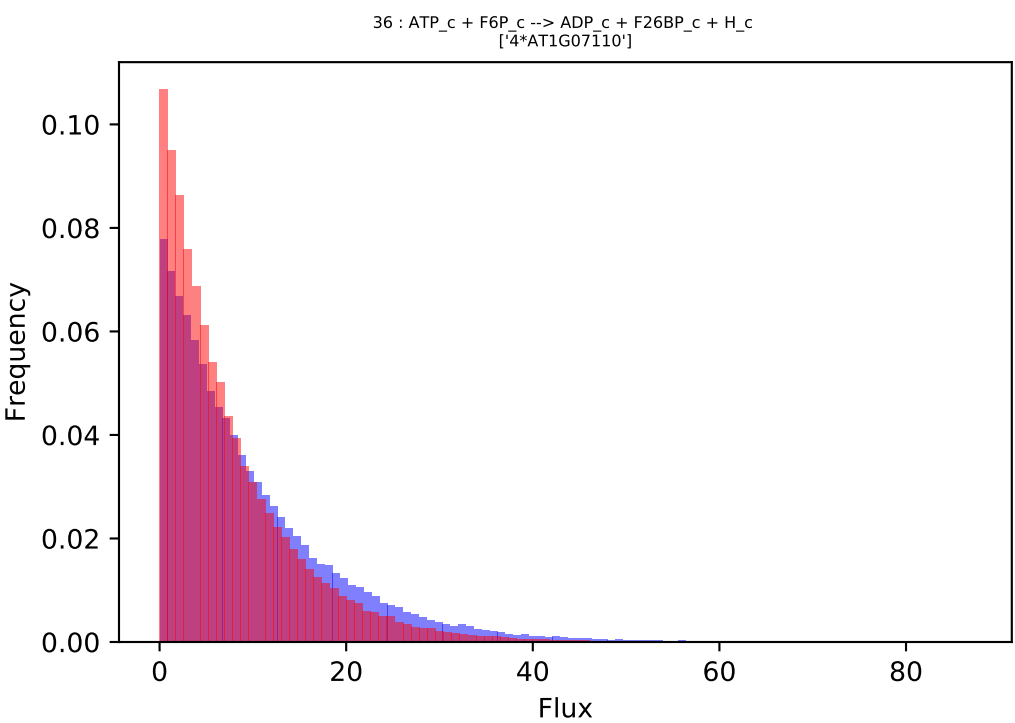

31 : Pi_h + starch2_h --> G1P_h + starch1_h
['AT3G46970', 'AT1G69830']
Frequency
0.00
0.02
0.04
0.06
0.08
0
2
4
6
8
10
12
Flux

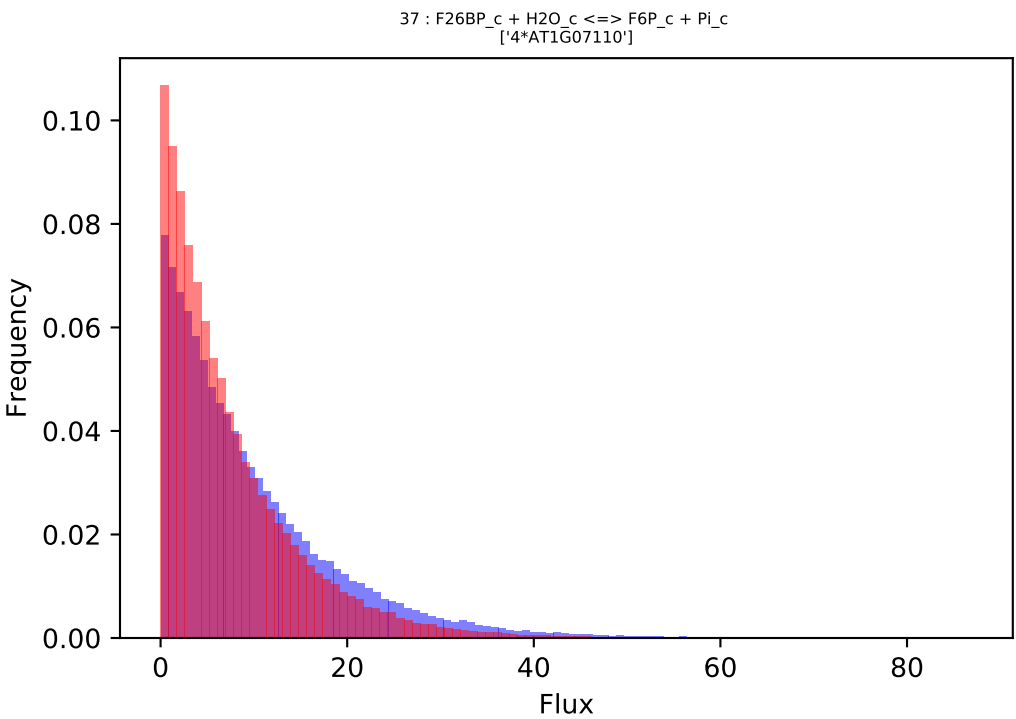

32 : Pi_c + starch2_c --> G1P_c + starch1_c
['AT3G46970']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.5
1.0
1.5
2.0
Flux

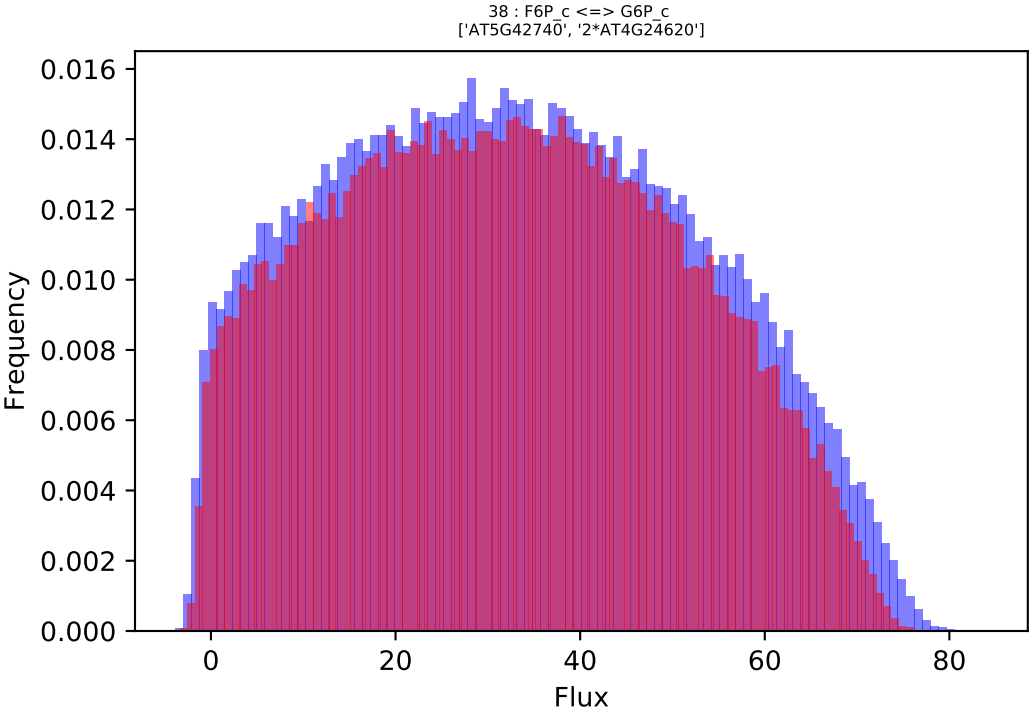

33 : GAP_c <=> DHAP_c
['AT2G21170', '2*AT3G55440']
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−1000
−750
−500
−250
0
250
500
750
1000
Flux

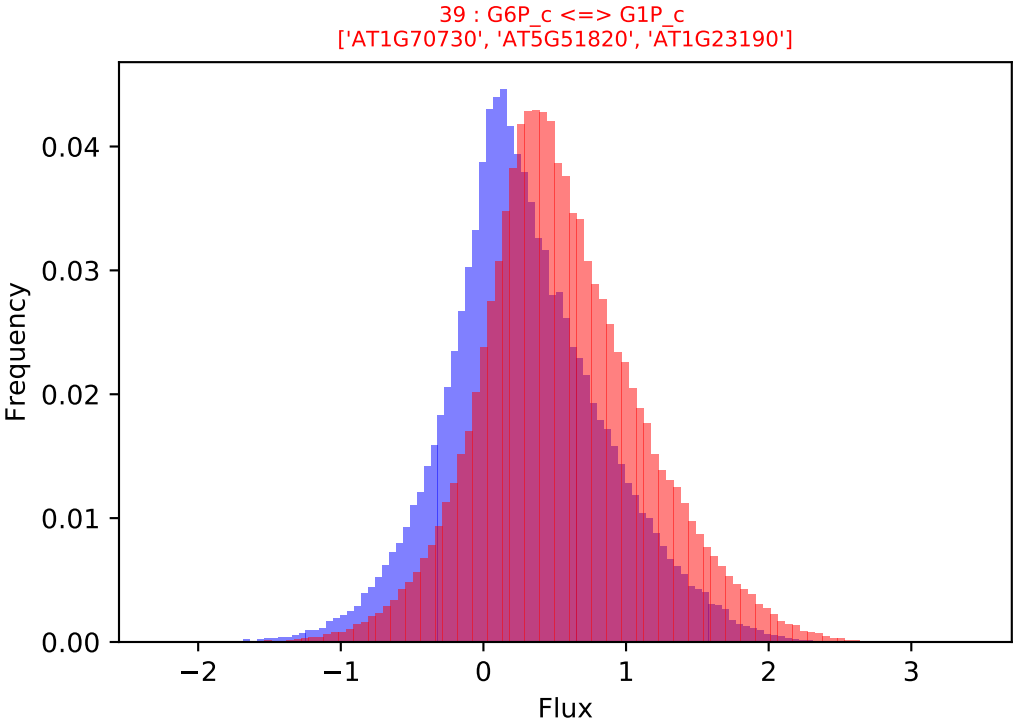

34 : DHAP_c + GAP_c <=> FBP_c
['AT5G03690', 'AT3G52930', 'AT2G36460', 'AT4G26530', '4*AT4G26520']
0.016
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
0
20
40
60
80
Flux

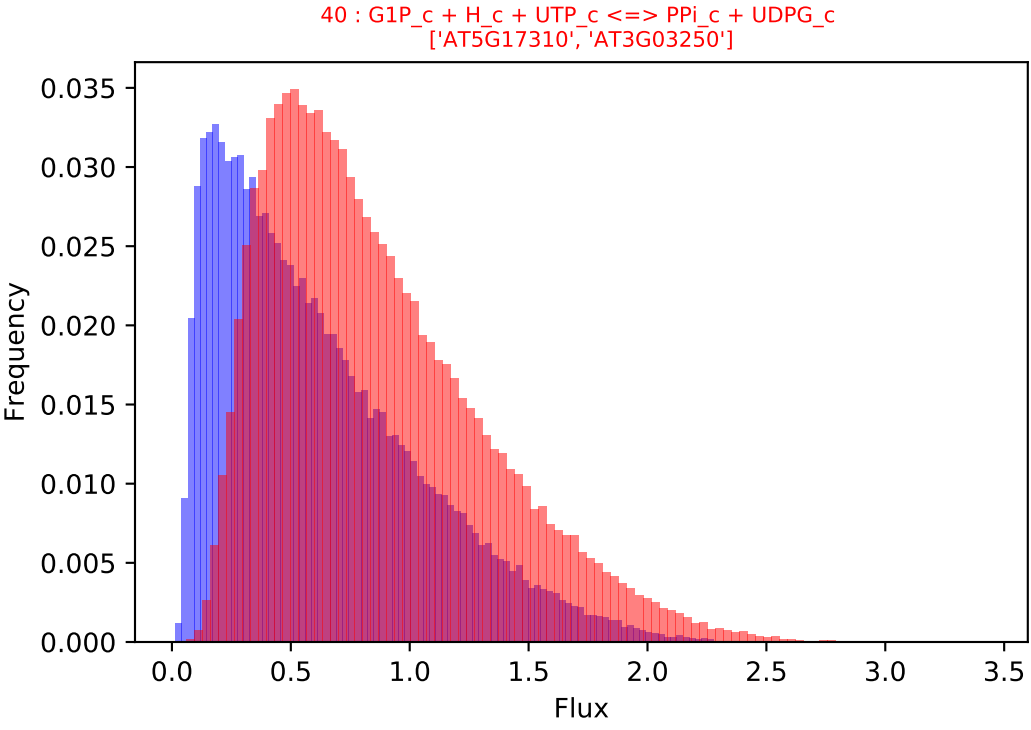

35 : FBP_c + H2O_c --> F6P_c + Pi_c
['4*AT1G43670']
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
20
40
60
80
100
120
140
Flux

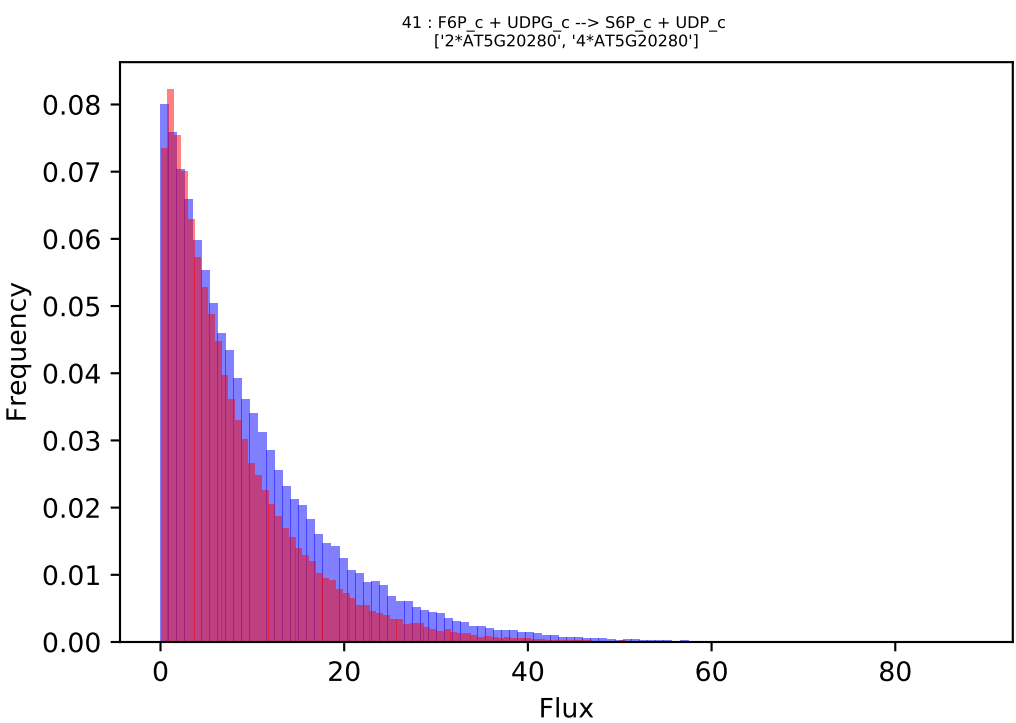

36 : ATP_c + F6P_c --> ADP_c + F26BP_c + H_c
['4*AT1G07110']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0
20
40
60
80
Flux

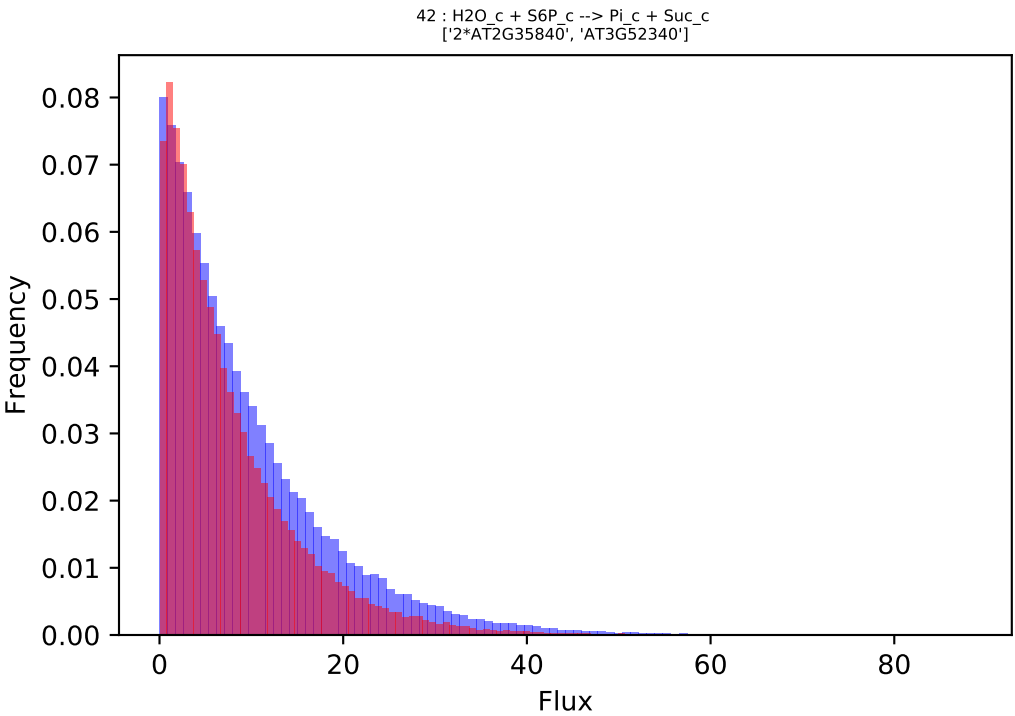

37 : F26BP_c + H2O_c <=> F6P_c + Pi_c
['4*AT1G07110']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0
20
40
60
80
Flux

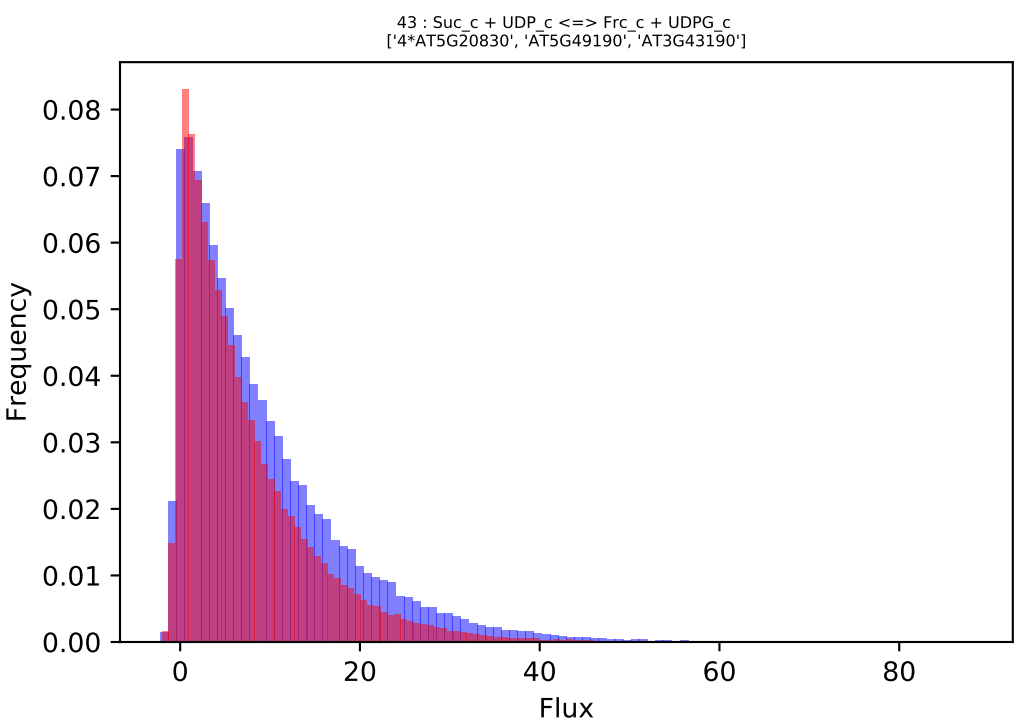

38 : F6P_c <=> G6P_c
['AT5G42740', '2*AT4G24620']
0.016
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
0
20
40
60
80
Flux

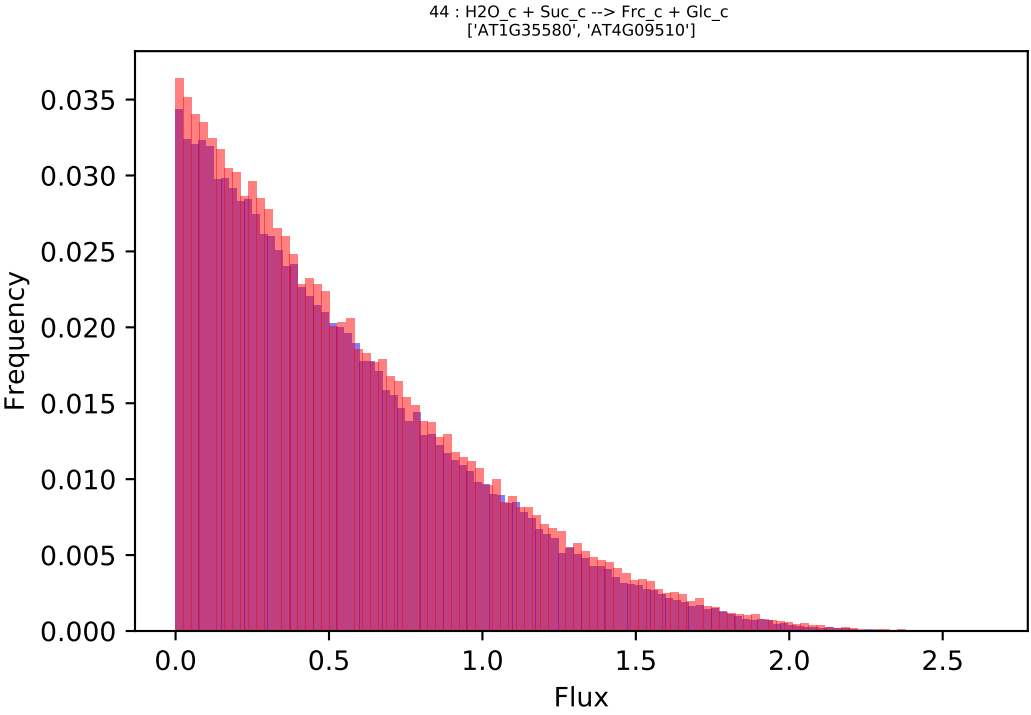

39 : G6P_c <=> G1P_c
['AT1G70730', 'AT5G51820', 'AT1G23190']
0.04
0.03
0.02
0.01
0.00
Frequency
−2
−1
0
1
2
3
Flux

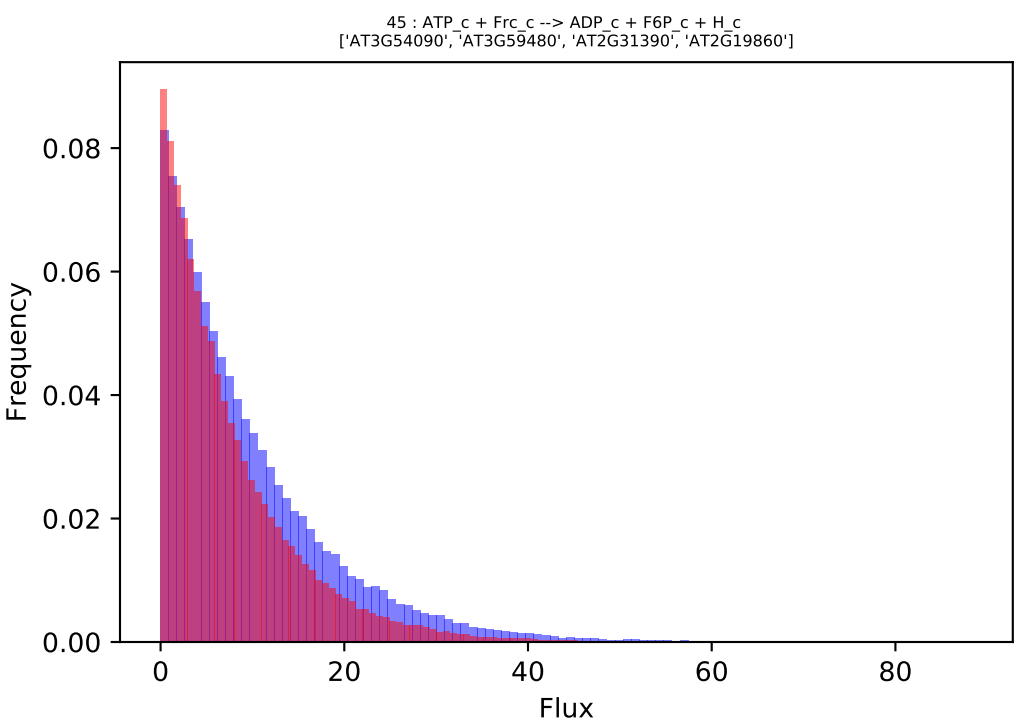

40 : G1P_c + H_c + UTP_c <=> PPi_c + UDPG_c
['AT5G17310', 'AT3G03250']
Frequency
Flux
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5

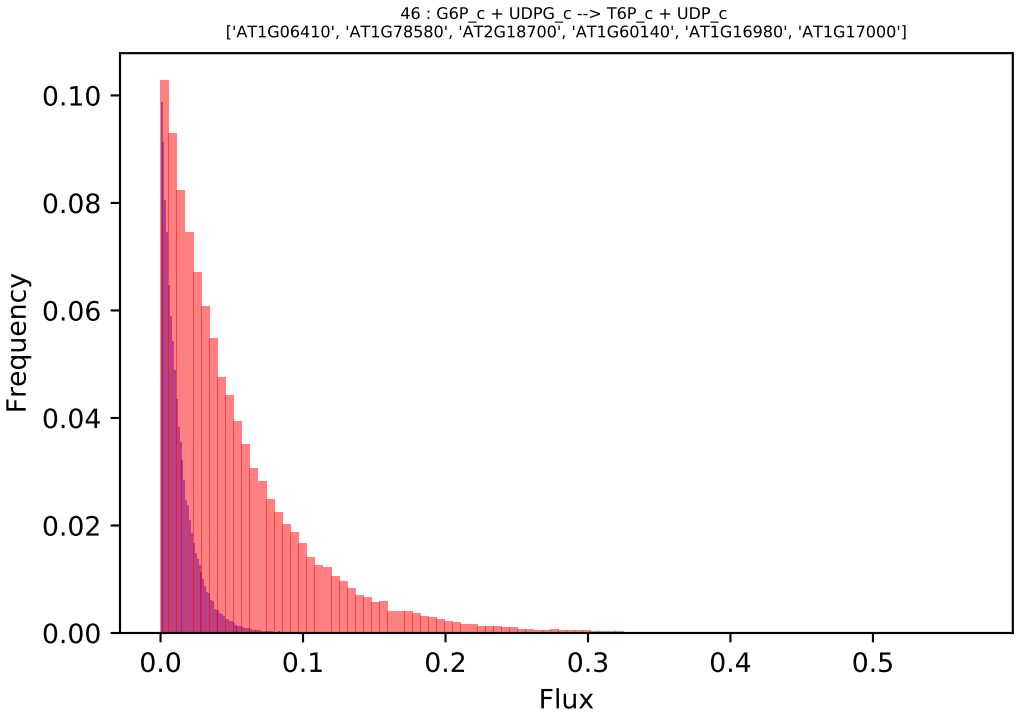

41 : F6P_c + UDPG_c --> S6P_c + UDP_c
['2*AT5G20280', '4*AT5G20280']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0
20
40
60
80
Flux

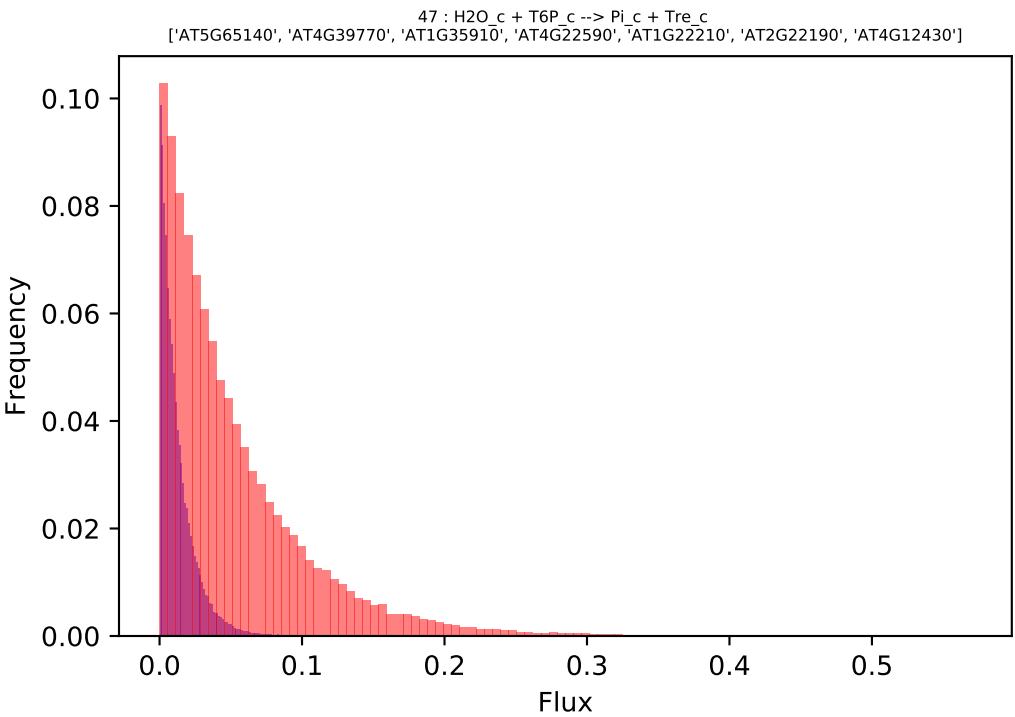

42 : H2O_c + S6P_c --> Pi_c + Suc_c
['2*AT2G35840', 'AT3G52340']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0
20
40
60
80
Flux

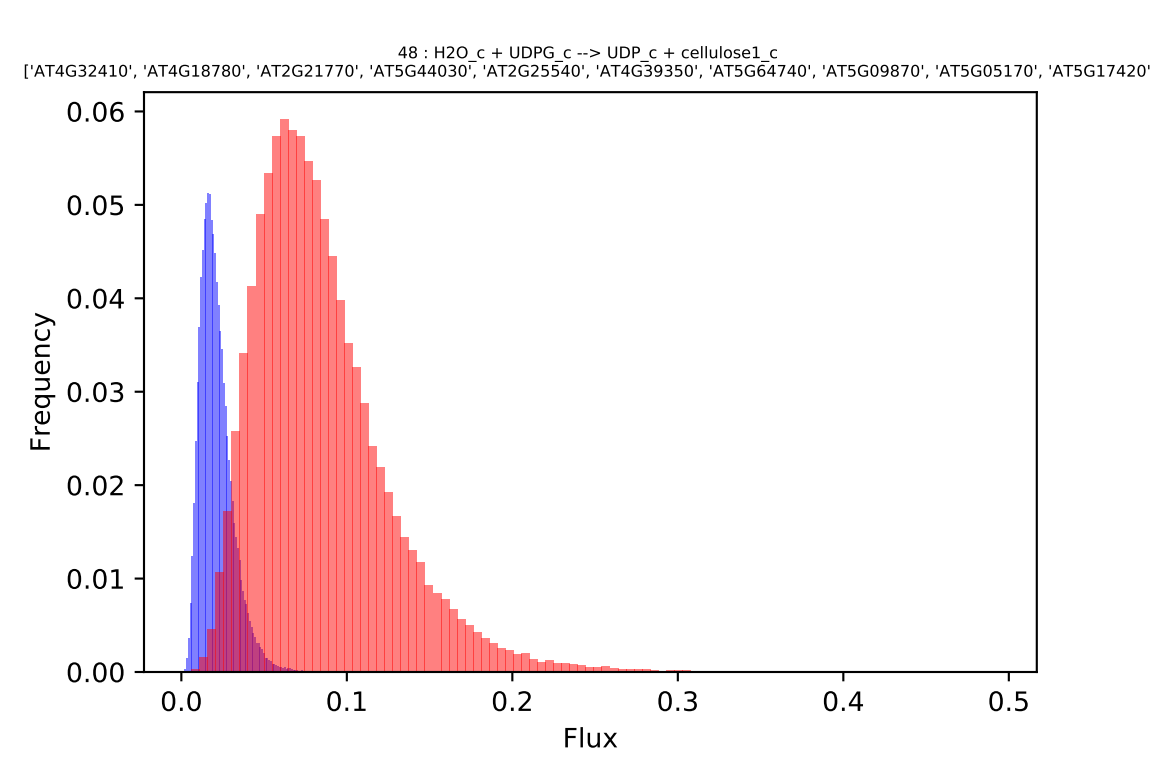

43 : Suc_c + UDP_c <=> Frc_c + UDPG_c
['4*AT5G20830', 'AT5G49190', 'AT3G43190']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0
20
40
60
80
Flux

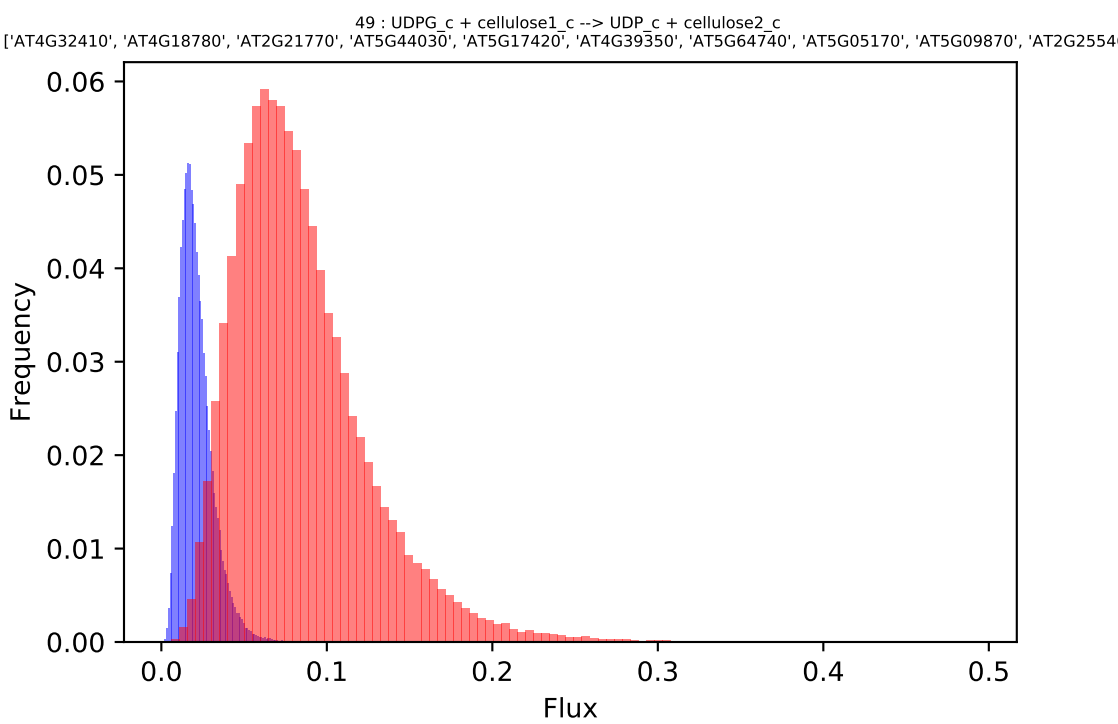

44 : H2O_c + Suc_c --> Frc_c + Glc_c
['AT1G35580', 'AT4G09510']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.5
1.0
1.5
2.0
2.5
Flux

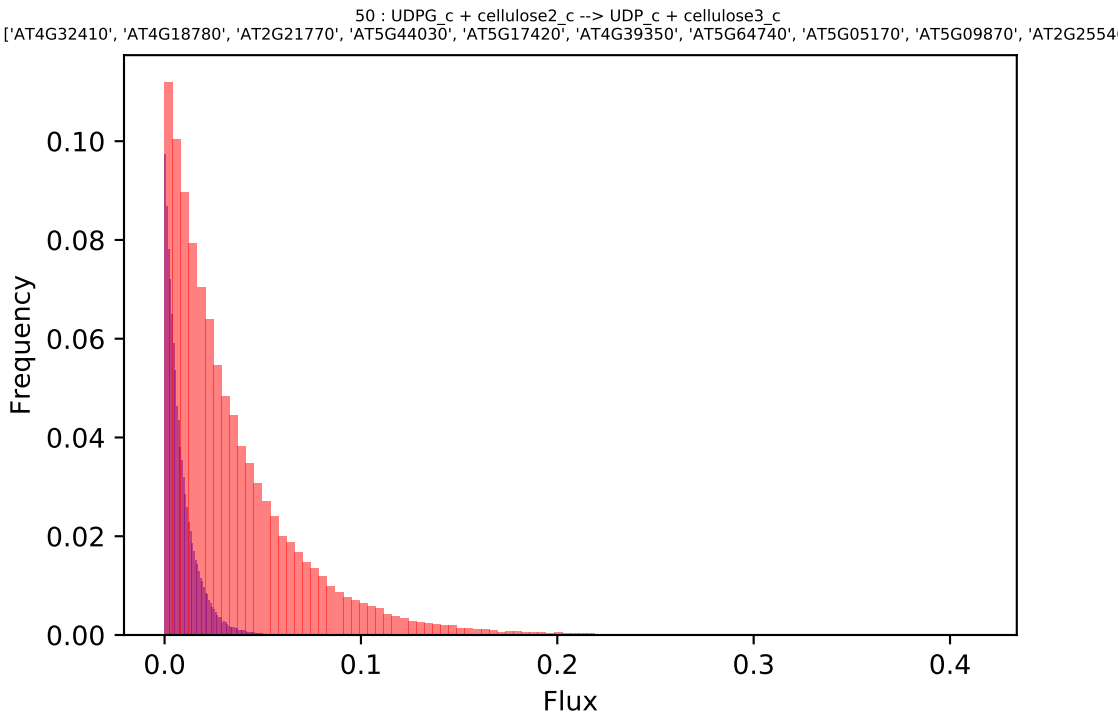

45 : ATP_c + Frc_c --> ADP_c + F6P_c + H_c
['AT3G54090', 'AT3G59480', 'AT2G31390', 'AT2G19860']
Frequency
0.00
0.02
0.04
0.06
0.08
0
20
40
60
80
Flux

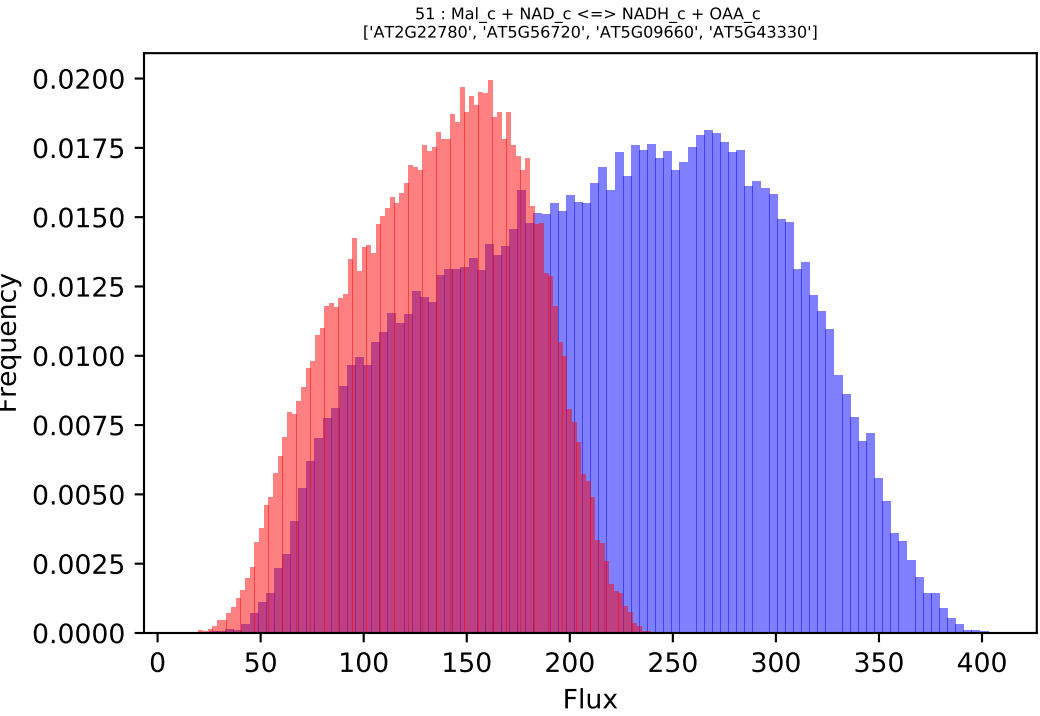

46 : G6P_c + UDPG_c --> T6P_c + UDP_c
['AT1G06410', 'AT1G78580', 'AT2G18700', 'AT1G60140', 'AT1G16980', 'AT1G17000']
Frequency
0.10
0.08
0.06
0.04
0.02
0.00
0.0
0.1
0.2
0.3
0.4
0.5
Flux

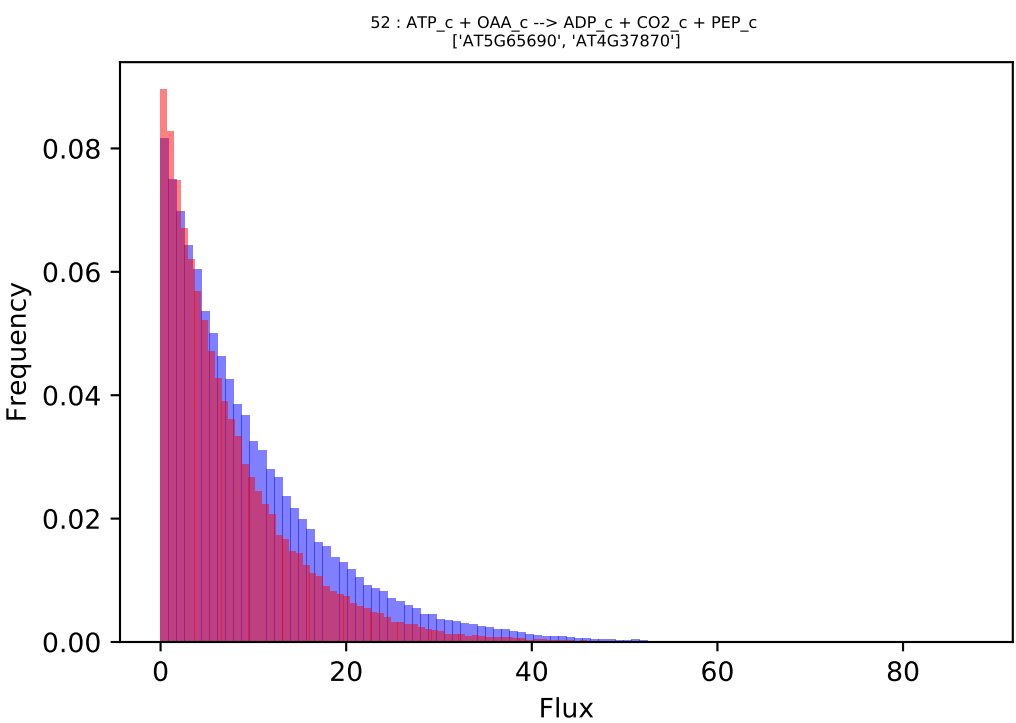

47 : H2O_c + T6P_c --> Pi_c + Tre_c
['AT5G65140', 'AT4G39770', 'AT1G35910', 'AT4G22590', 'AT1G22210', 'AT2G22190', 'AT4G12430']
Frequency
0.10
0.08
0.06
0.04
0.02
0.00
0.0
0.1
0.2
0.3
0.4
0.5
Flux

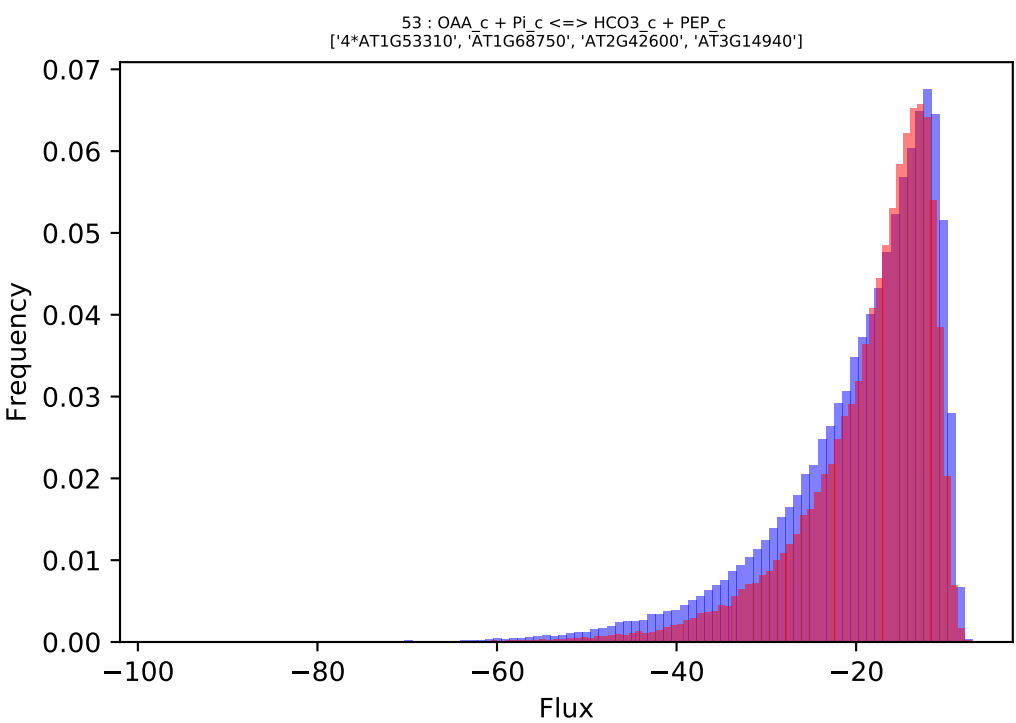

48 : H2O_c + UDPG_c --> UDP_c + cellulose1_c
['AT4G32410', 'AT4G18780', 'AT2G21770', 'AT5G44030', 'AT2G25540', 'AT4G39350', 'AT5G64740', 'AT5G09870', 'AT5G05170', 'AT5G17420'
Frequency
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0.0
0.1
0.2
0.3
0.4
0.5
Flux

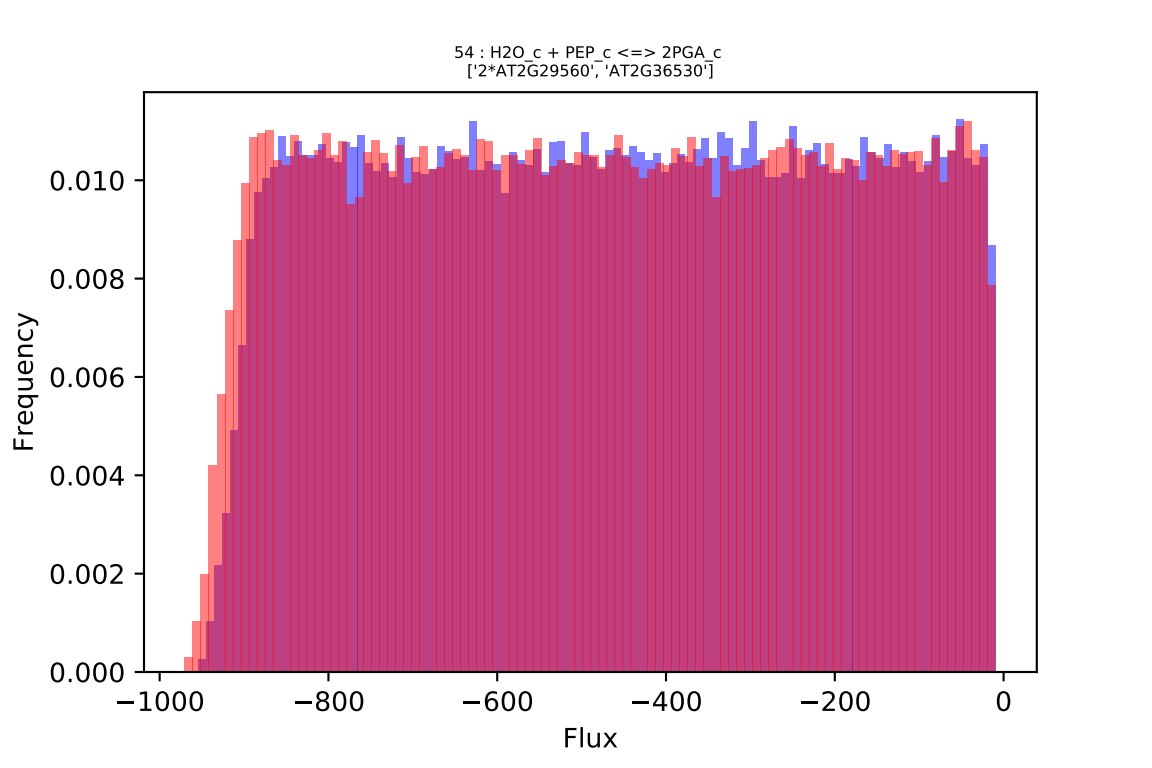

49 : UDPG_c + cellulose1_c --> UDP_c + cellulose2_c
['AT4G32410', 'AT4G18780', 'AT2G21770', 'AT5G44030', 'AT5G17420', 'AT4G39350', 'AT5G64740', 'AT5G05170', 'AT5G09870', 'AT2G25540'
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
Flux

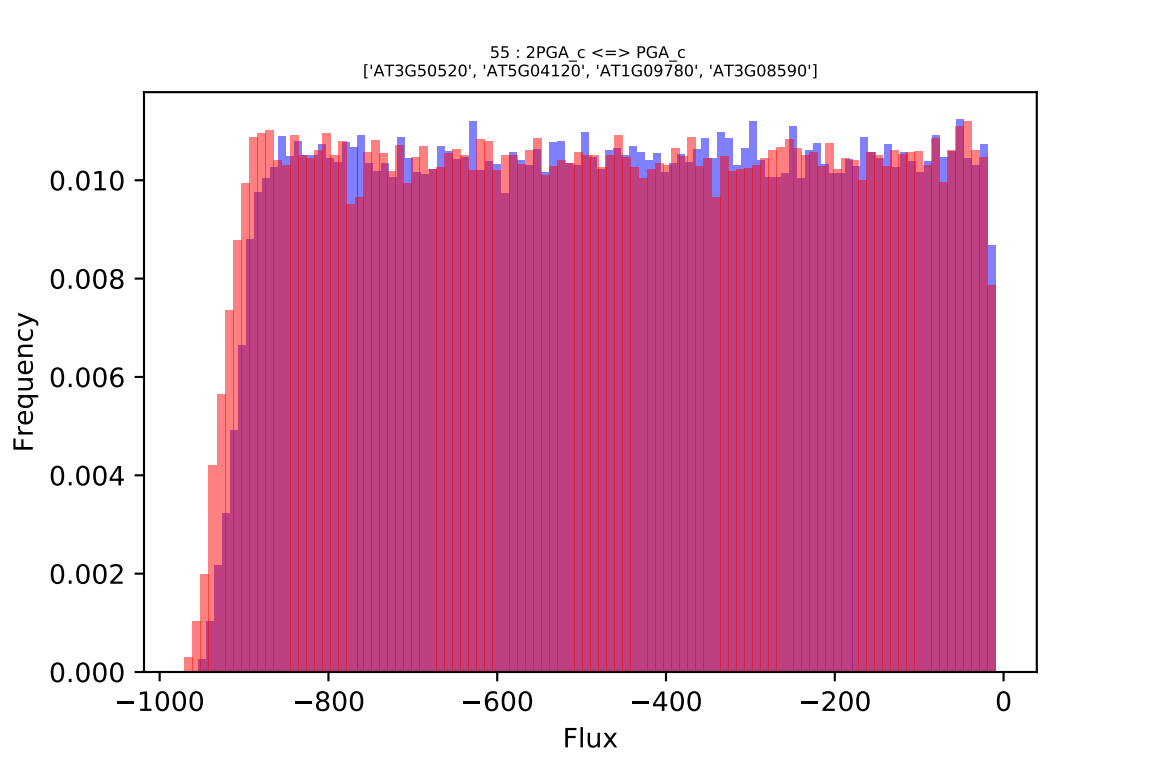

50 : UDPG_c + cellulose2_c --> UDP_c + cellulose3_c
['AT4G32410', 'AT4G18780', 'AT2G21770', 'AT5G44030', 'AT5G17420', 'AT4G39350', 'AT5G64740', 'AT5G05170', 'AT5G09870', 'AT2G25540'
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.0
0.1
0.2
0.3
0.4
Flux

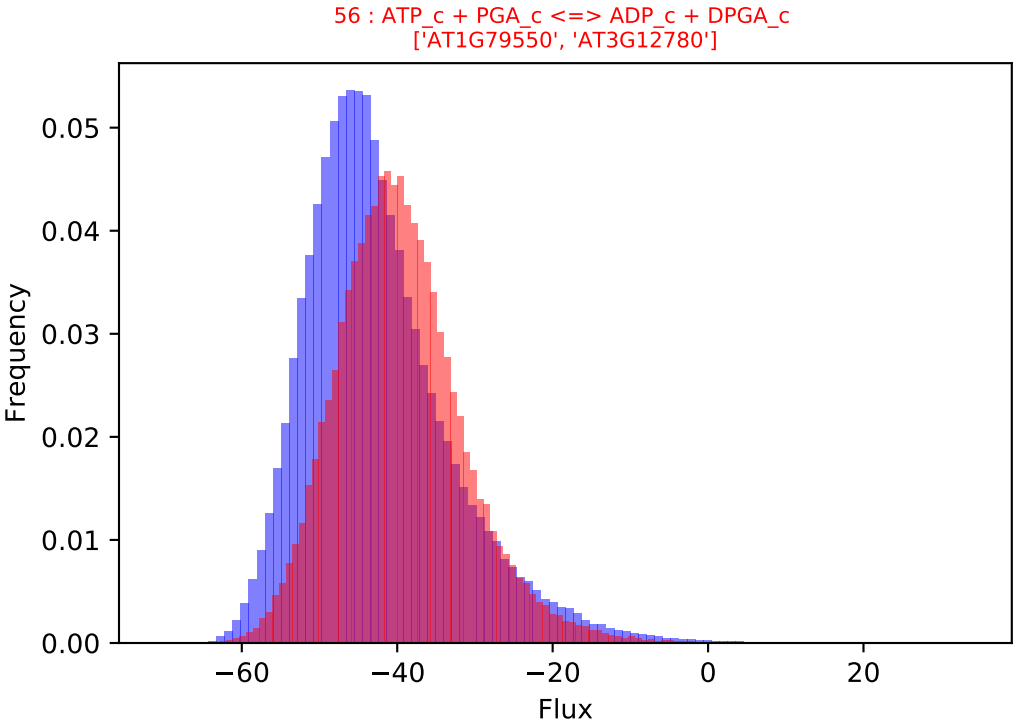

51 : Mal_c + NAD_c <=> NADH_c + OAA_c
['AT2G22780', 'AT5G56720', 'AT5G09660', 'AT5G43330']
Frequency
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
0
50
100
150
200
250
300
350
400
Flux

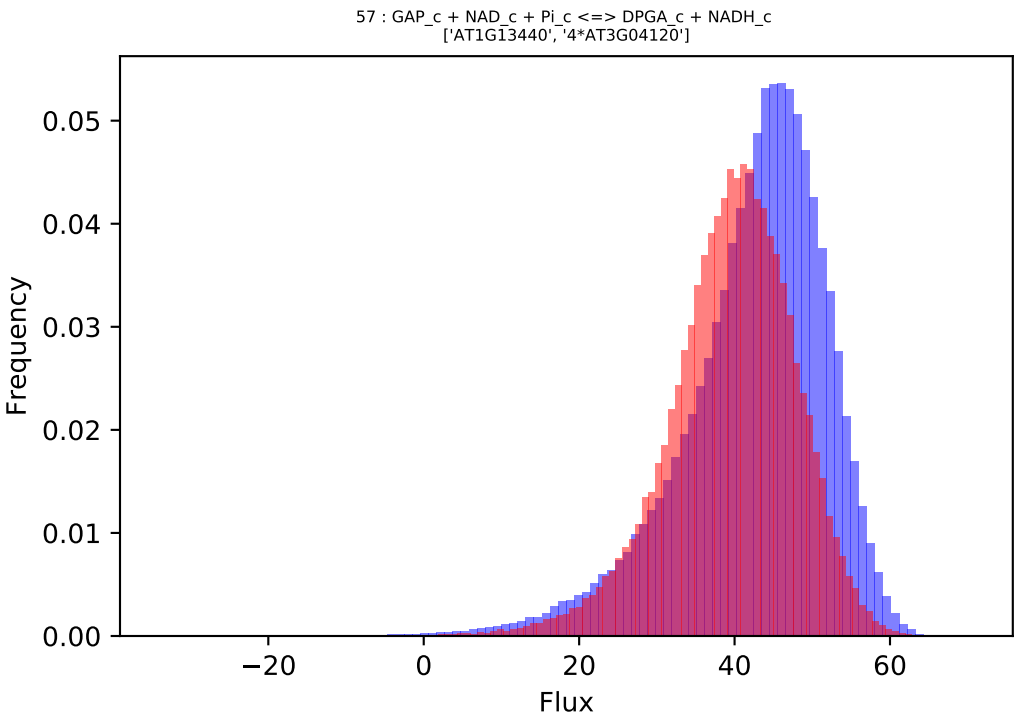

52 : ATP_c + OAA_c --> ADP_c + CO2_c + PEP_c
['AT5G65690', 'AT4G37870']
Frequency
0.00
0.02
0.04
0.06
0.08
0
20
40
60
80
Flux

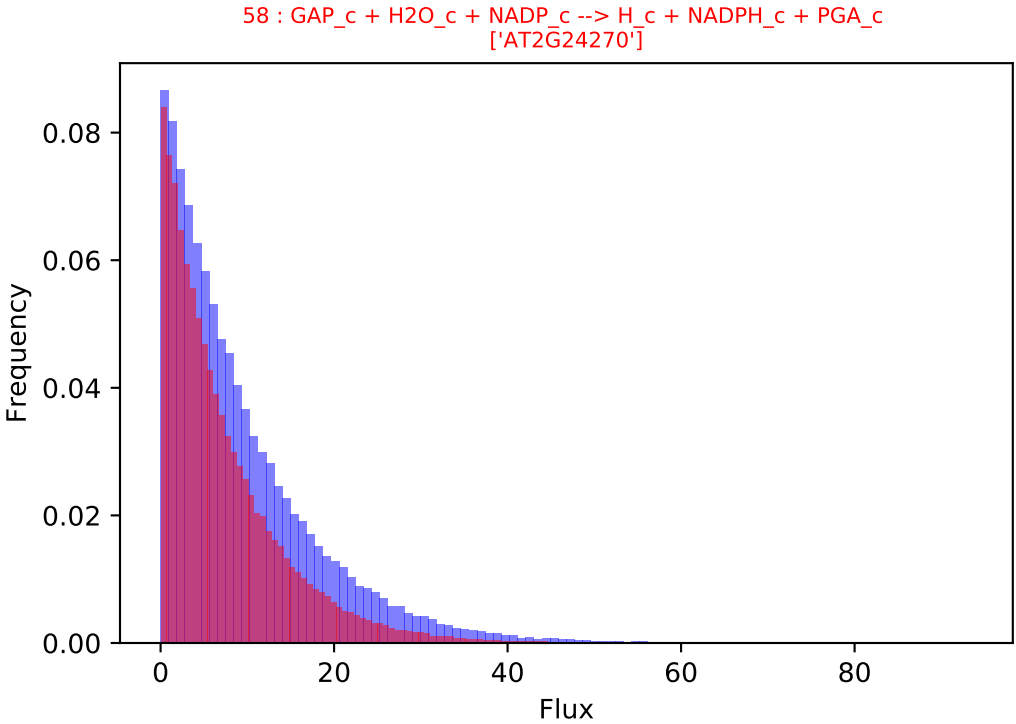

53 : OAA_c + Pi_c <=> HCO3_c + PEP_c
['4*AT1G53310', 'AT1G68750', 'AT2G42600', 'AT3G14940']
Frequency
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
−100
−80
−60
−40
−20
Flux

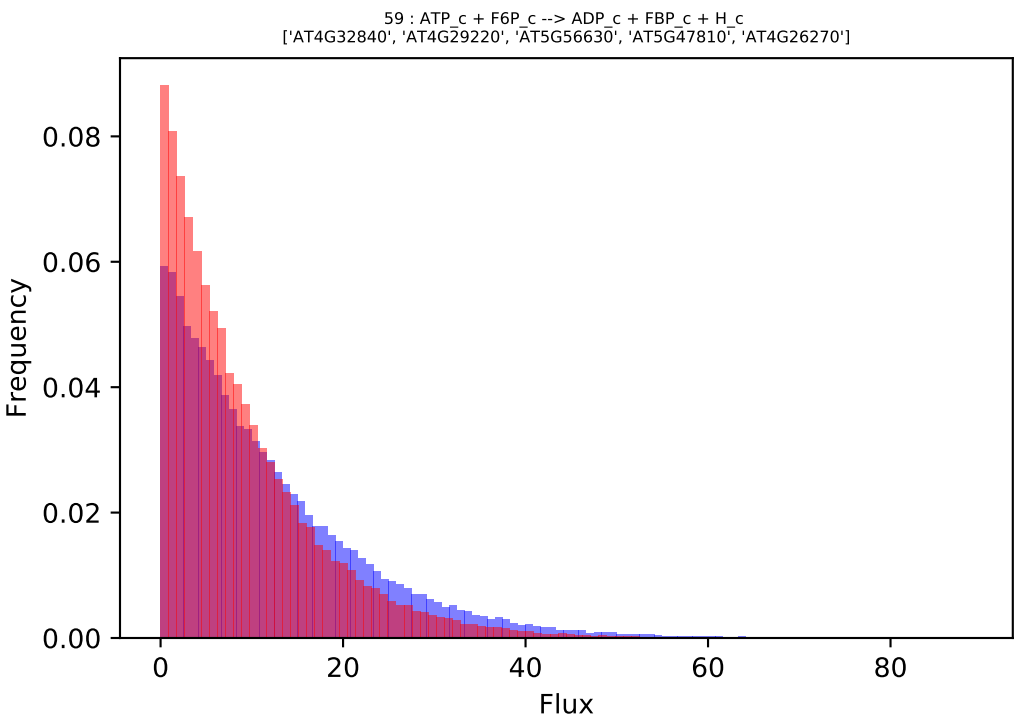

54 : H2O_c + PEP_c <=> 2PGA_c
['2*AT2G29560', 'AT2G36530']
Frequency
0.010
0.008
0.006
0.004
0.002
0.000
−1000
−800
−600
−400
−200
0
Flux

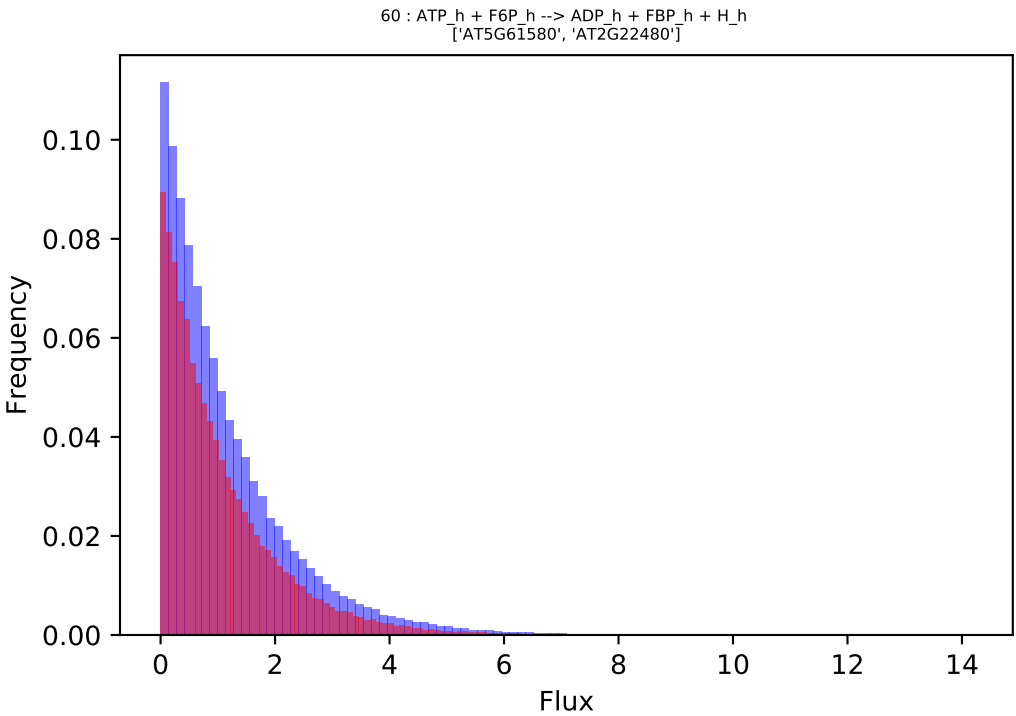

55 : 2PGA_c <=> PGA_c
['AT3G50520', 'AT5G04120', 'AT1G09780', 'AT3G08590']
Frequency
0.000
0.002
0.004
0.006
0.008
0.010
−1000
−800
−600
−400
−200
0
Flux

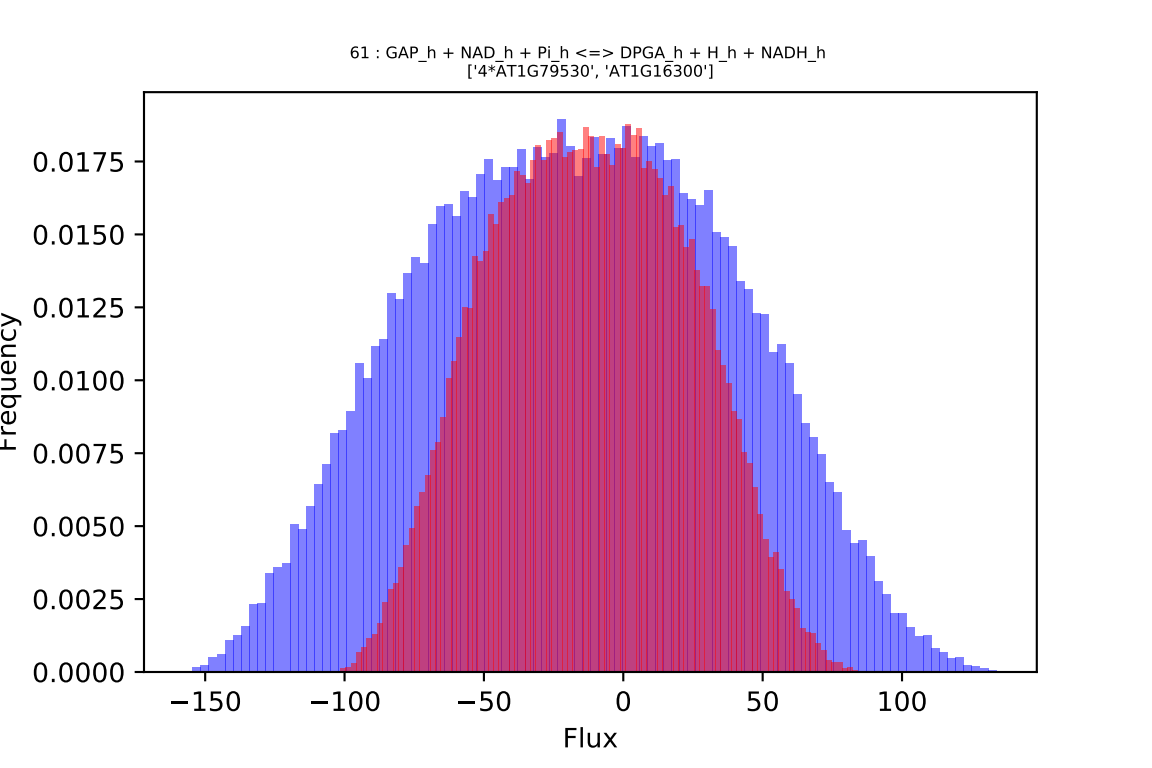

56 : ATP_c + PGA_c <=> ADP_c + DPGA_c
['AT1G79550', 'AT3G12780']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
−60
−40
−20
0
20
Flux

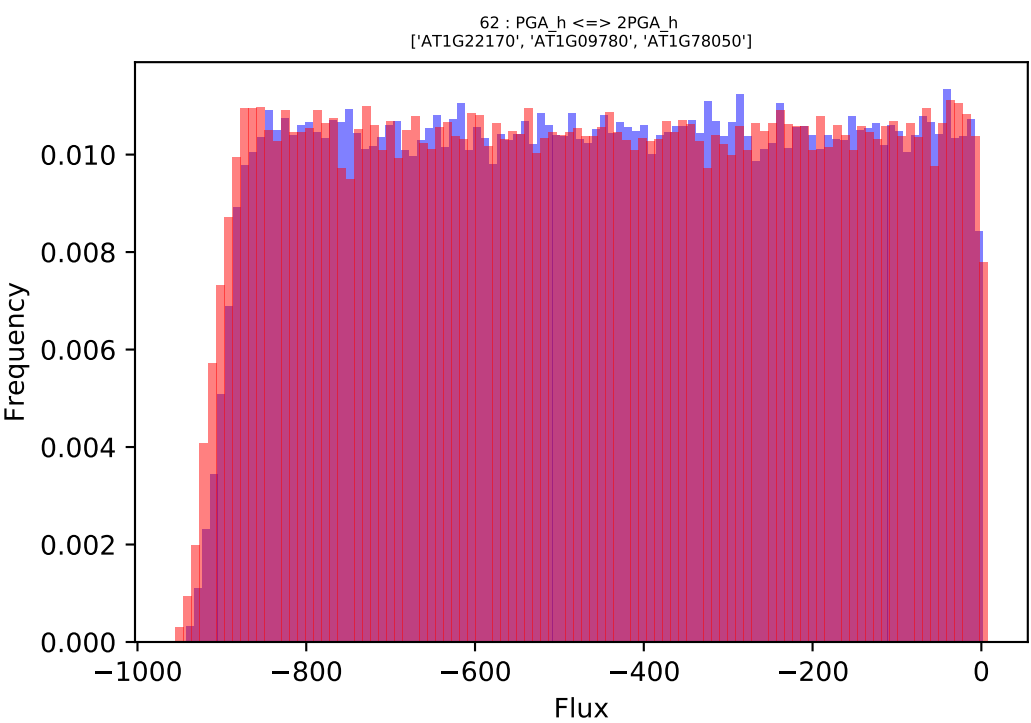

57 : GAP_c + NAD_c + Pi_c <=> DPGA_c + NADH_c
['AT1G13440', '4*AT3G04120']
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
−20
0
20
40
60
Flux

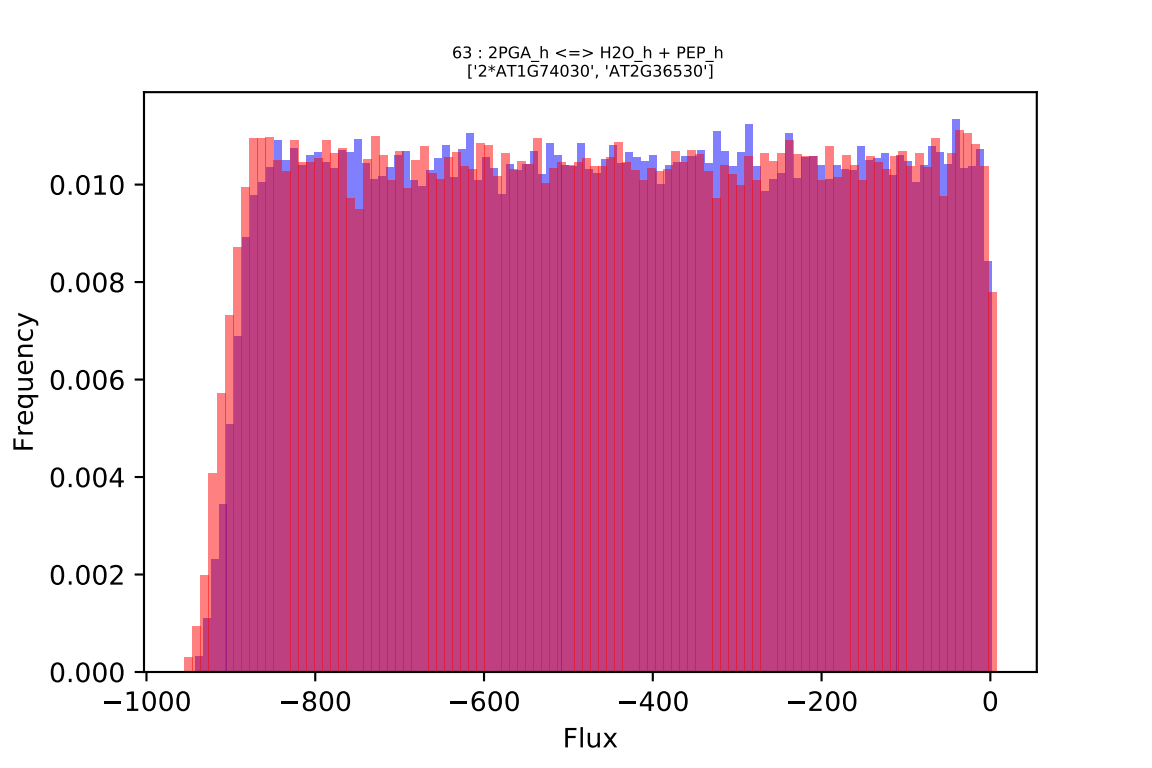

58 : GAP_c + H2O_c + NADP_c --> H_c + NADPH_c + PGA_c
['AT2G24270']
0.08
0.06
0.04
0.02
0.00
Frequency
0
20
40
60
80
Flux

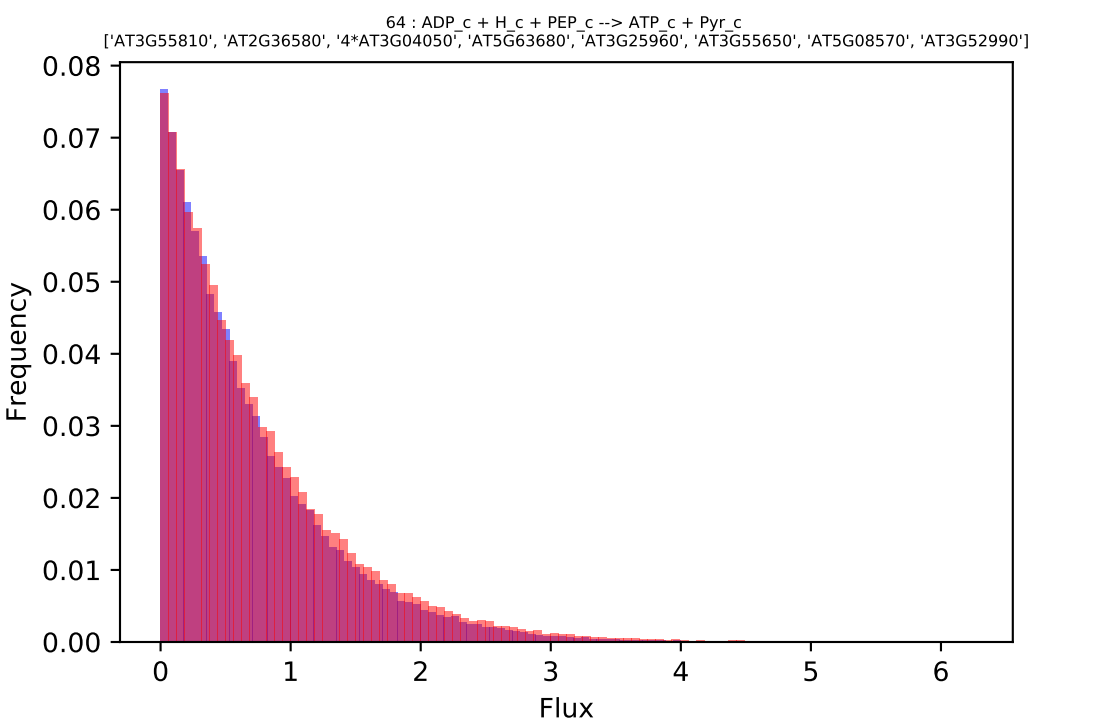

59 : ATP_c + F6P_c --> ADP_c + FBP_c + H_c
['AT4G32840', 'AT4G29220', 'AT5G56630', 'AT5G47810', 'AT4G26270']
Frequency
0.00
0.02
0.04
0.06
0.08
0
20
40
60
80
Flux

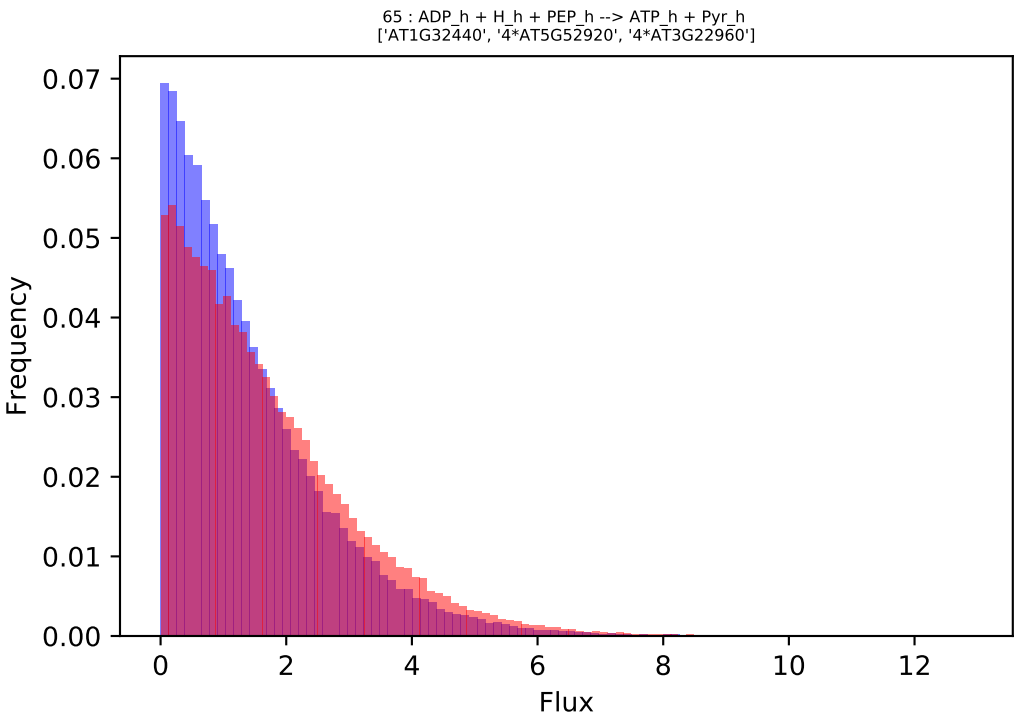

60 : ATP_h + F6P_h --> ADP_h + FBP_h + H_h
['AT5G61580', 'AT2G22480']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0
2
4
6
8
10
12
14
Flux

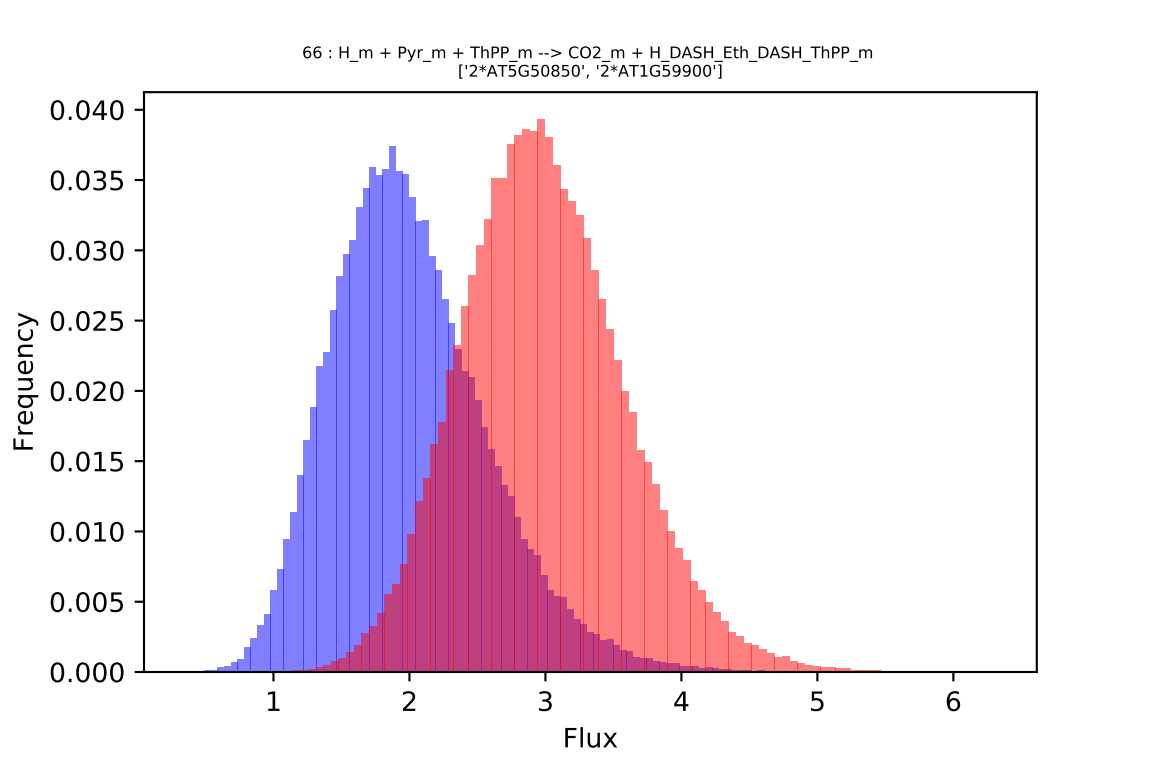

61 : GAP_h + NAD_h + Pi_h <=> DPGA_h + H_h + NADH_h
['4*AT1G79530', 'AT1G16300']
Frequency
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
−150
−100
−50
0
50
100
Flux

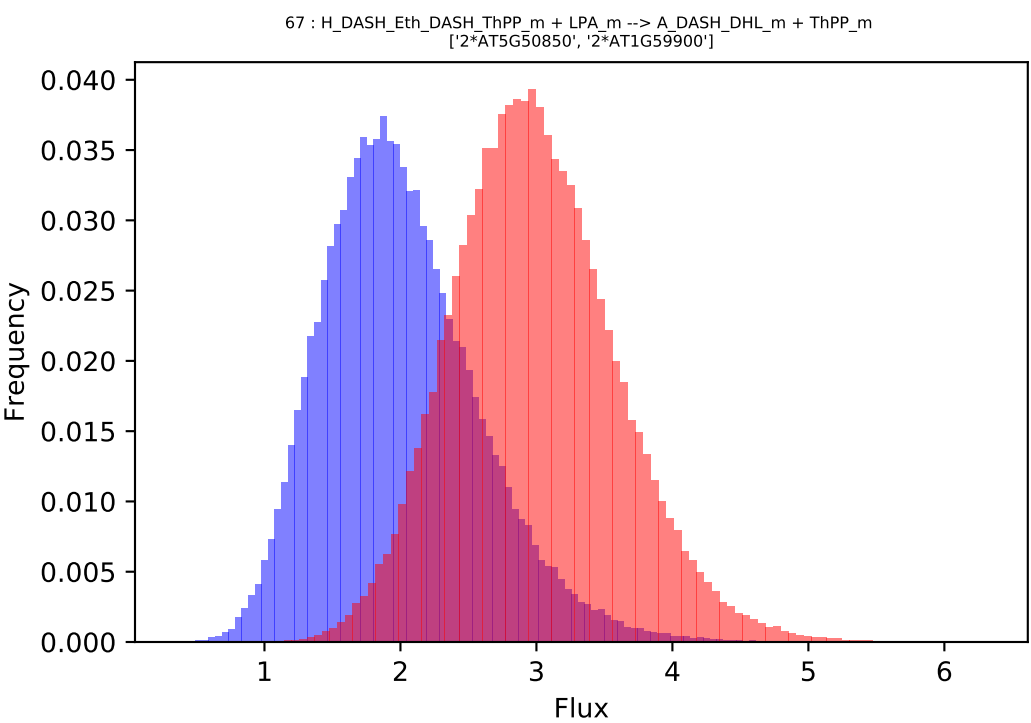

62 : PGA_h <=> 2PGA_h
['AT1G22170', 'AT1G09780', 'AT1G78050']
Frequency
0.010
0.008
0.006
0.004
0.002
0.000
−1000
−800
−600
−400
−200
0
Flux

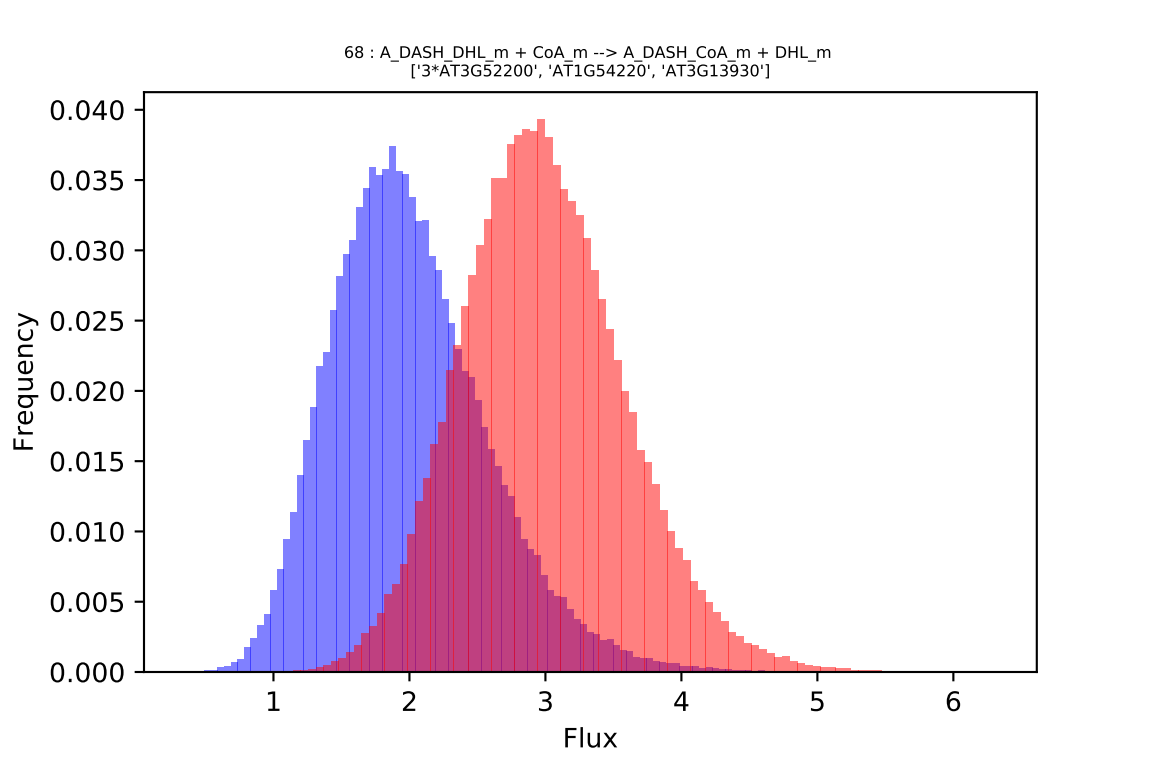

63 : 2PGA_h <=> H2O_h + PEP_h
['2*AT1G74030', 'AT2G36530']
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−1000
−800
−600
−400
−200
0
Flux

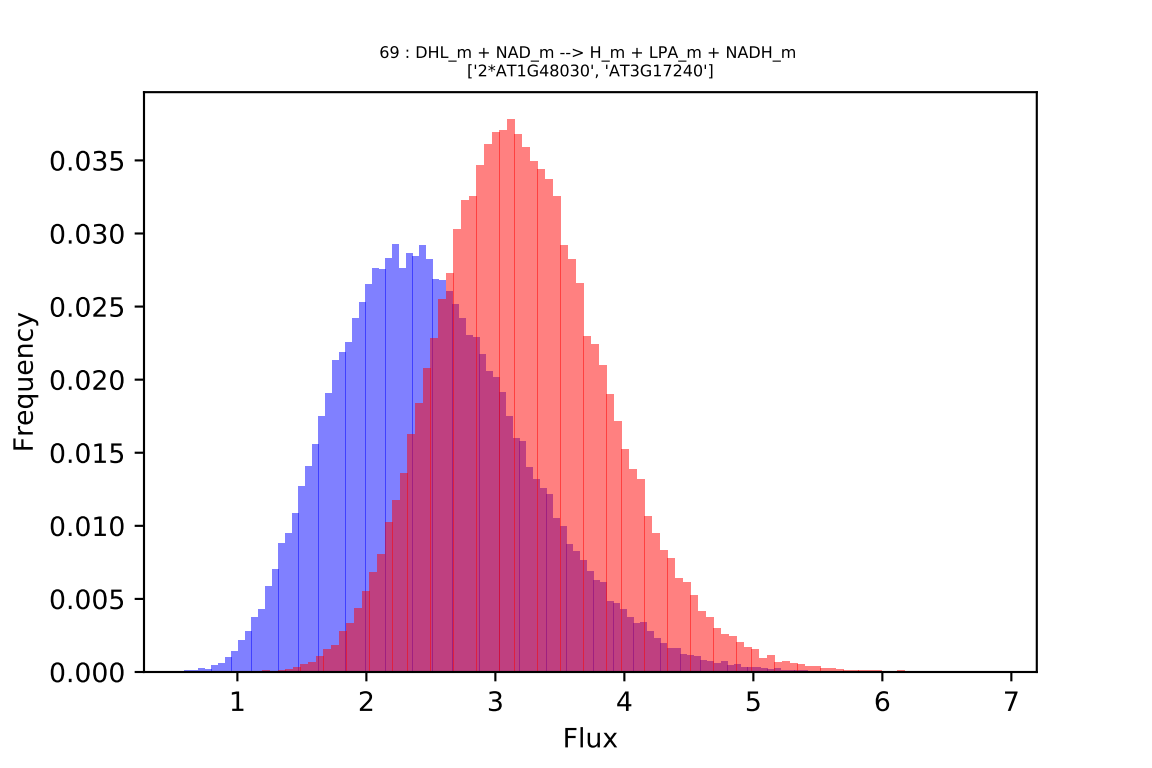

64 : ADP_c + H_c + PEP_c --> ATP_c + Pyr_c
['AT3G55810', 'AT2G36580', '4*AT3G04050', 'AT5G63680', 'AT3G25960', 'AT3G55650', 'AT5G08570', 'AT3G52990']
Frequency
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0
1
2
3
4
5
6
Flux

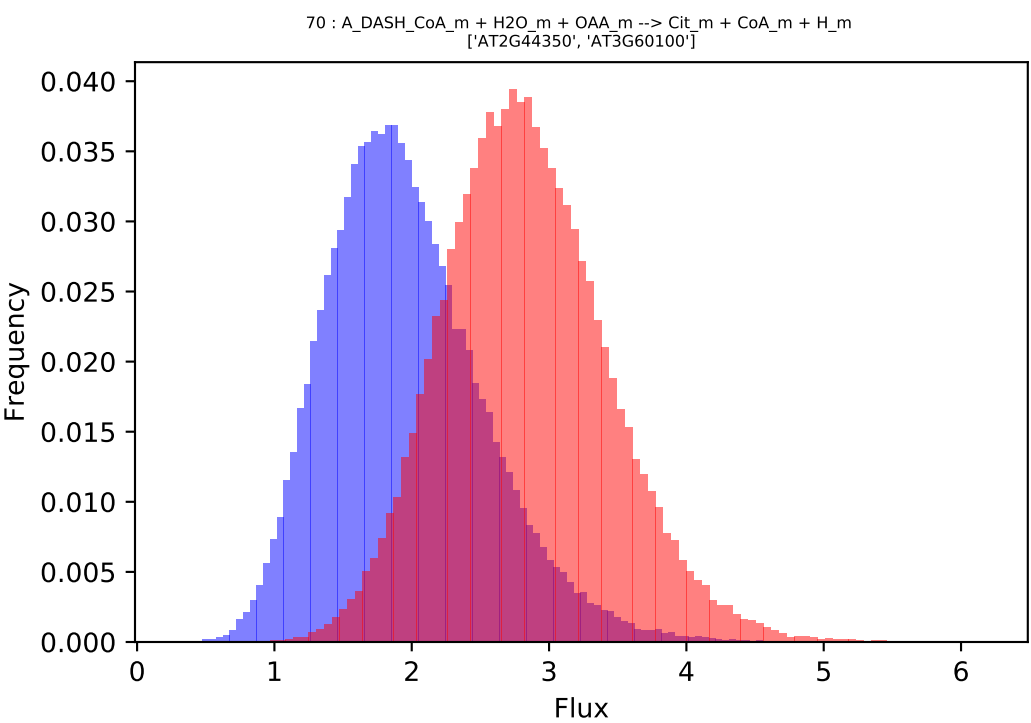

65 : ADP_h + H_h + PEP_h --> ATP_h + Pyr_h
['AT1G32440', '4*AT5G52920', '4*AT3G22960']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0
2
4
6
8
10
12
Flux

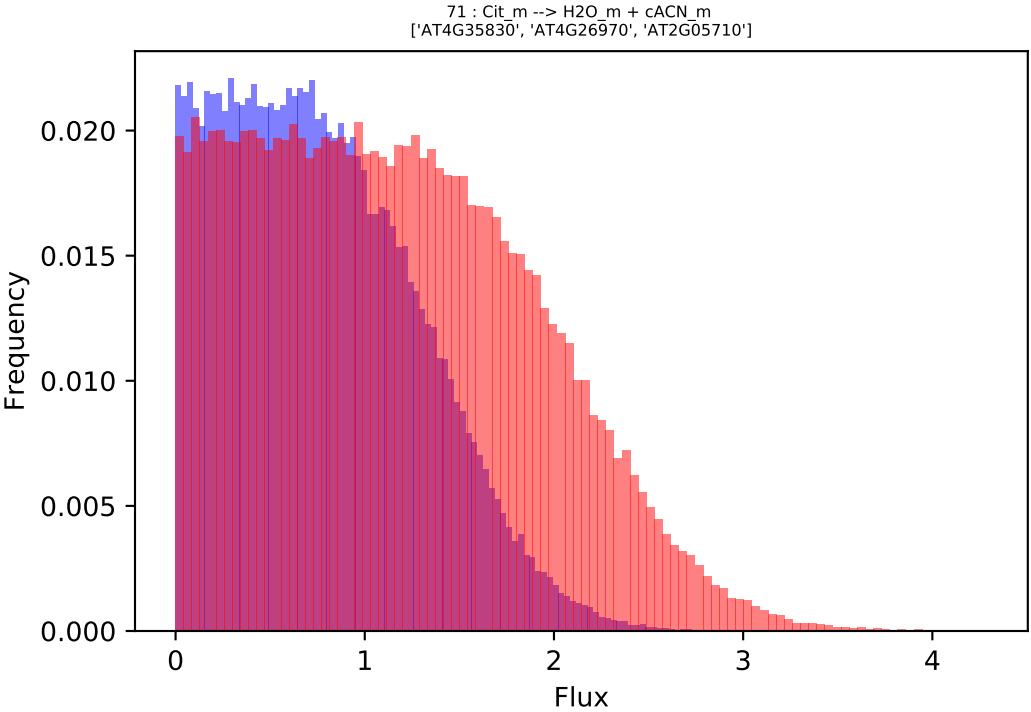

66 : H_m + Pyr_m + ThPP_m --> CO2_m + H_DASH_Eth_DASH_ThPP_m
['2*AT5G50850', '2*AT1G59900']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
1
2
3
4
5
6
Flux

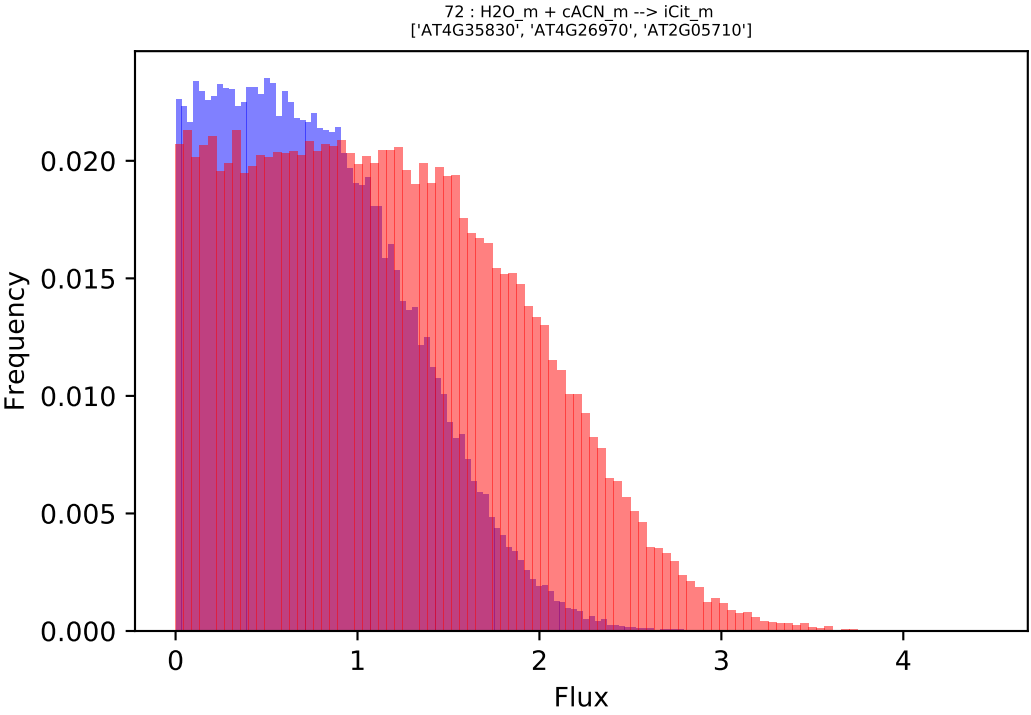

67 : H_DASH_Eth_DASH_ThPP_m + LPA_m --> A_DASH_DHL_m + ThPP_m
['2*AT5G50850', '2*AT1G59900']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
1
2
3
4
5
6
Flux

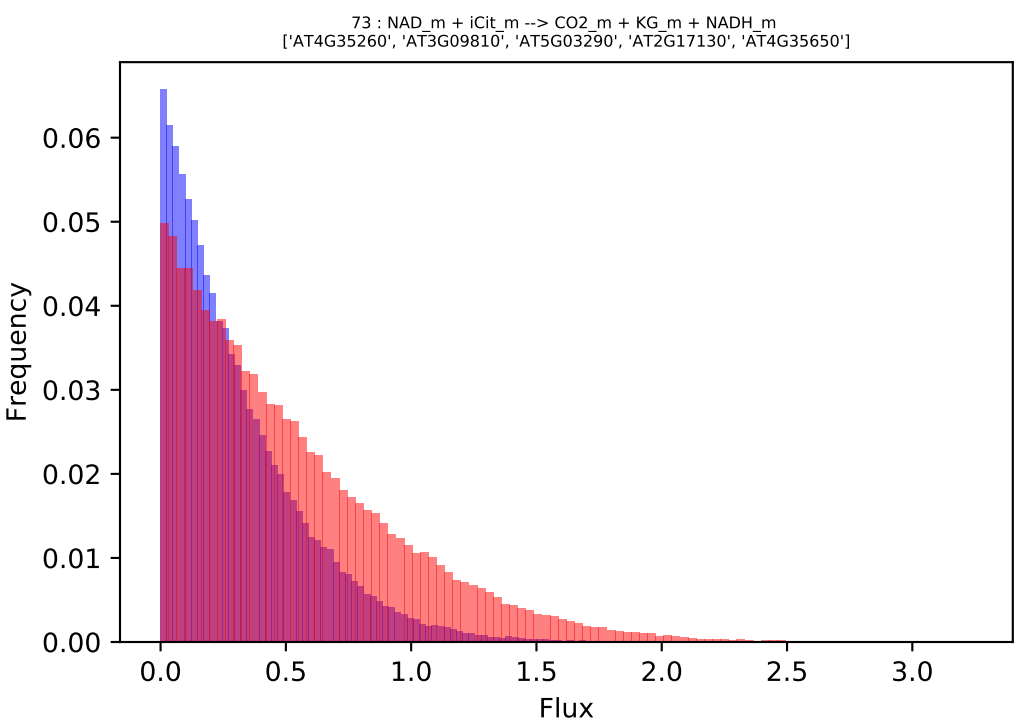

68 : A_DASH_DHL_m + CoA_m --> A_DASH_CoA_m + DHL_m
['3*AT3G52200', 'AT1G54220', 'AT3G13930']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
1
2
3
4
5
6
Flux

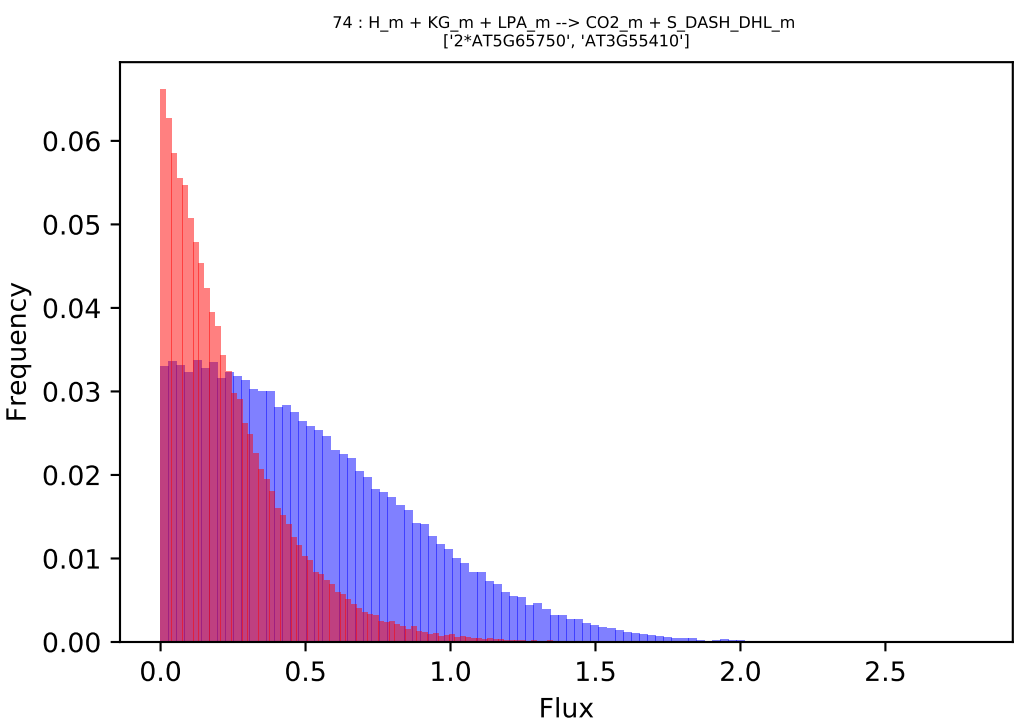

69 : DHL_m + NAD_m --> H_m + LPA_m + NADH_m
['2*AT1G48030', 'AT3G17240']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
1
2
3
4
5
6
7
Flux

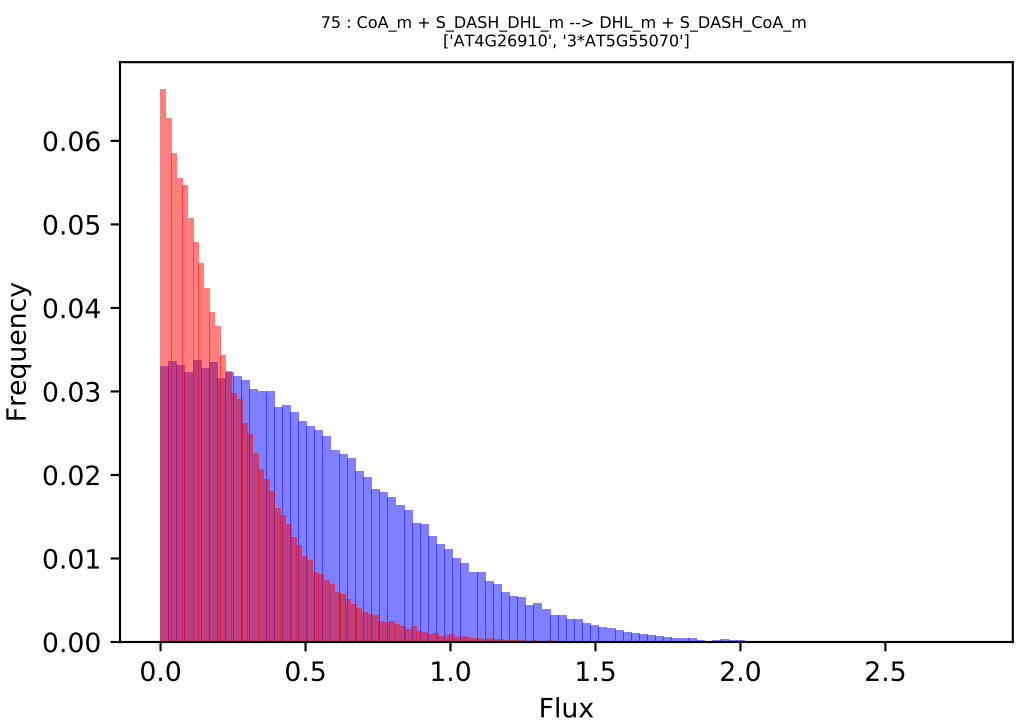

70 : A_DASH_CoA_m + H2O_m + OAA_m --> Cit_m + CoA_m + H_m
['AT2G44350', 'AT3G60100']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0
1
2
3
4
5
6
Flux

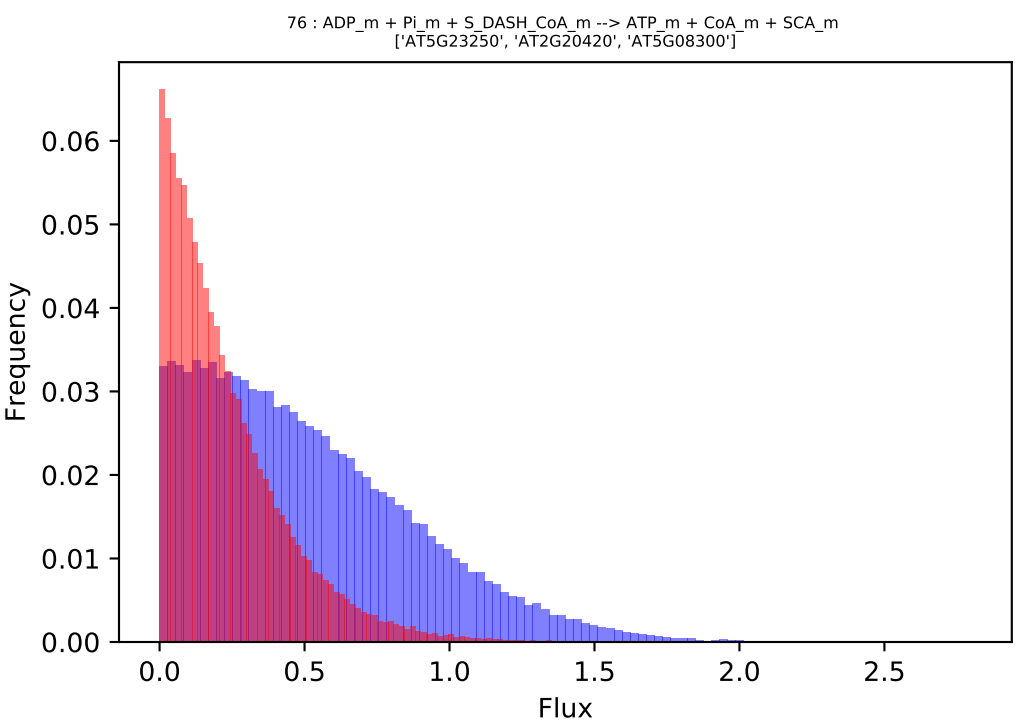

71 : Cit_m --> H2O_m + cACN_m
['AT4G35830', 'AT4G26970', 'AT2G05710']
Frequency
0.020
0.015
0.010
0.005
0.000
0
1
2
3
4
Flux

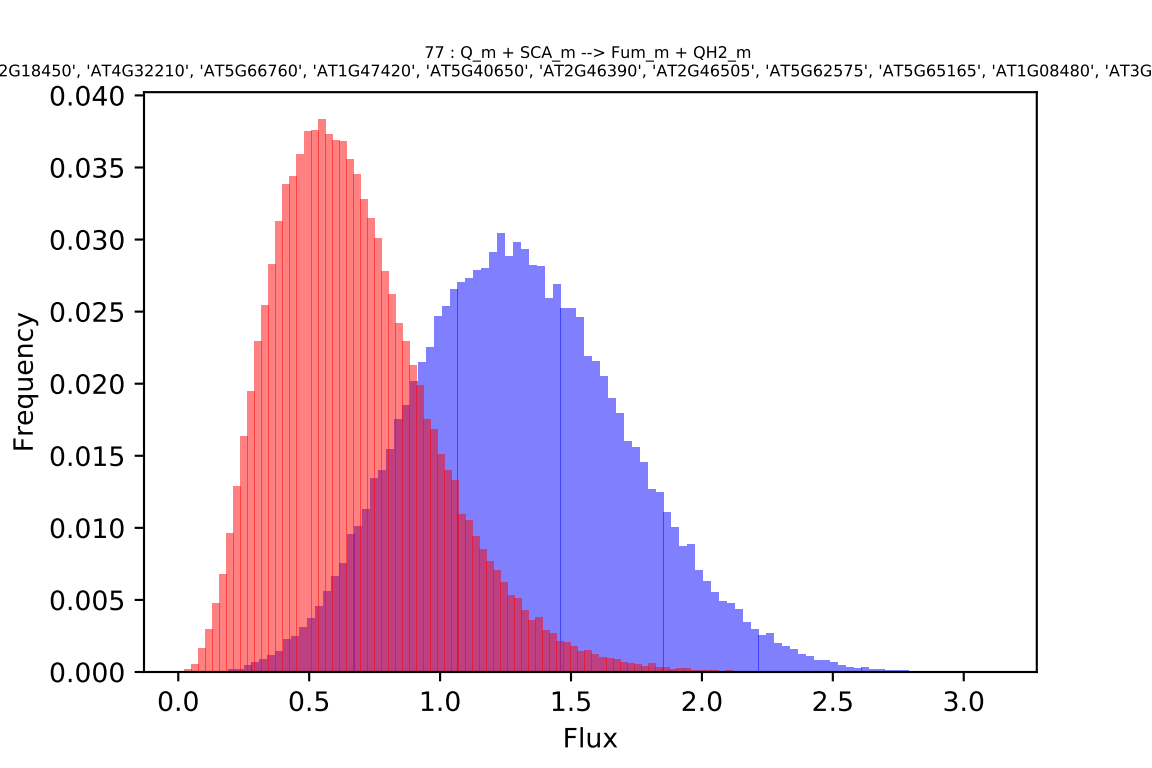

72 : H2O_m + cACN_m --> iCit_m
['AT4G35830', 'AT4G26970', 'AT2G05710']
Frequency
0.020
0.015
0.010
0.005
0.000
0
1
2
3
4
Flux

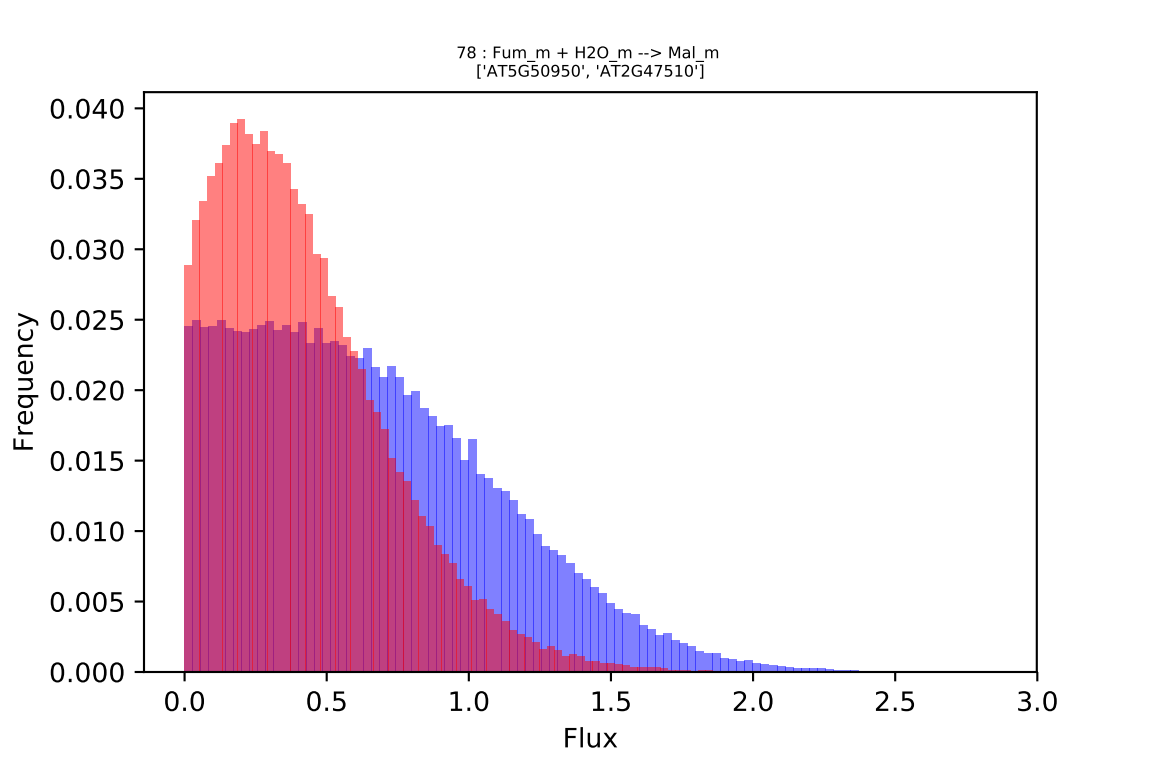

73 : NAD_m + iCit_m --> CO2_m + KG_m + NADH_m
['AT4G35260', 'AT3G09810', 'AT5G03290', 'AT2G17130', 'AT4G35650']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Flux

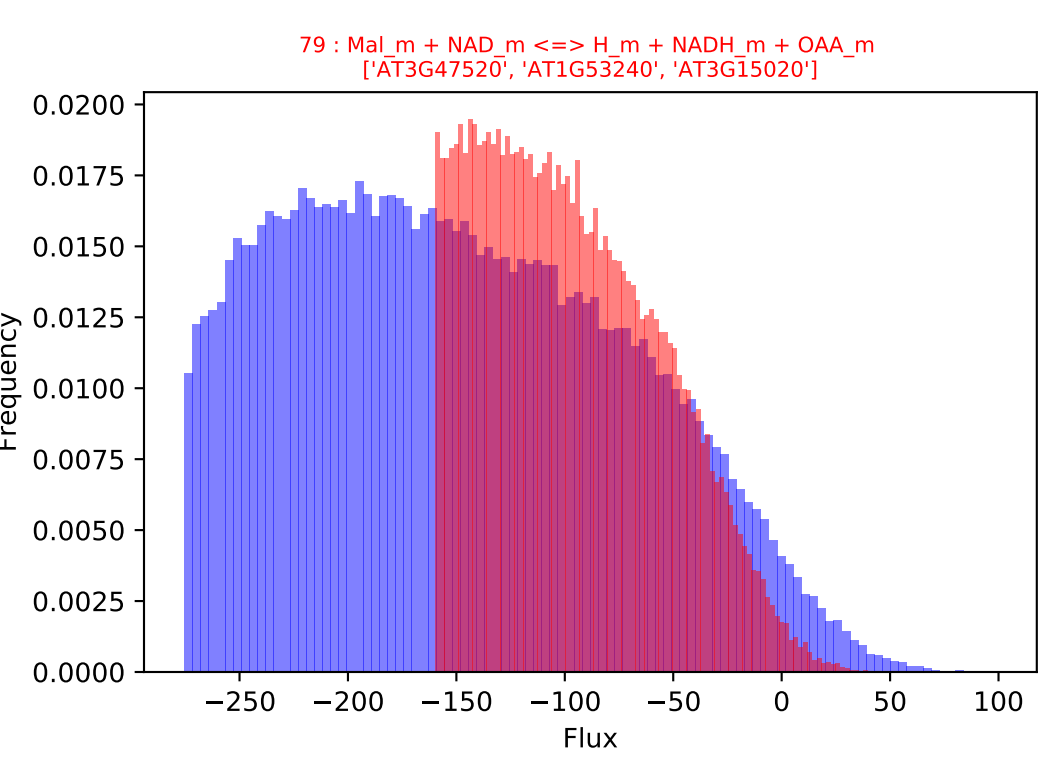

74 : H_m + KG_m + LPA_m --> CO2_m + S_DASH_DHL_m
['2*AT5G65750', 'AT3G55410']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.5
1.0
1.5
2.0
2.5
Flux

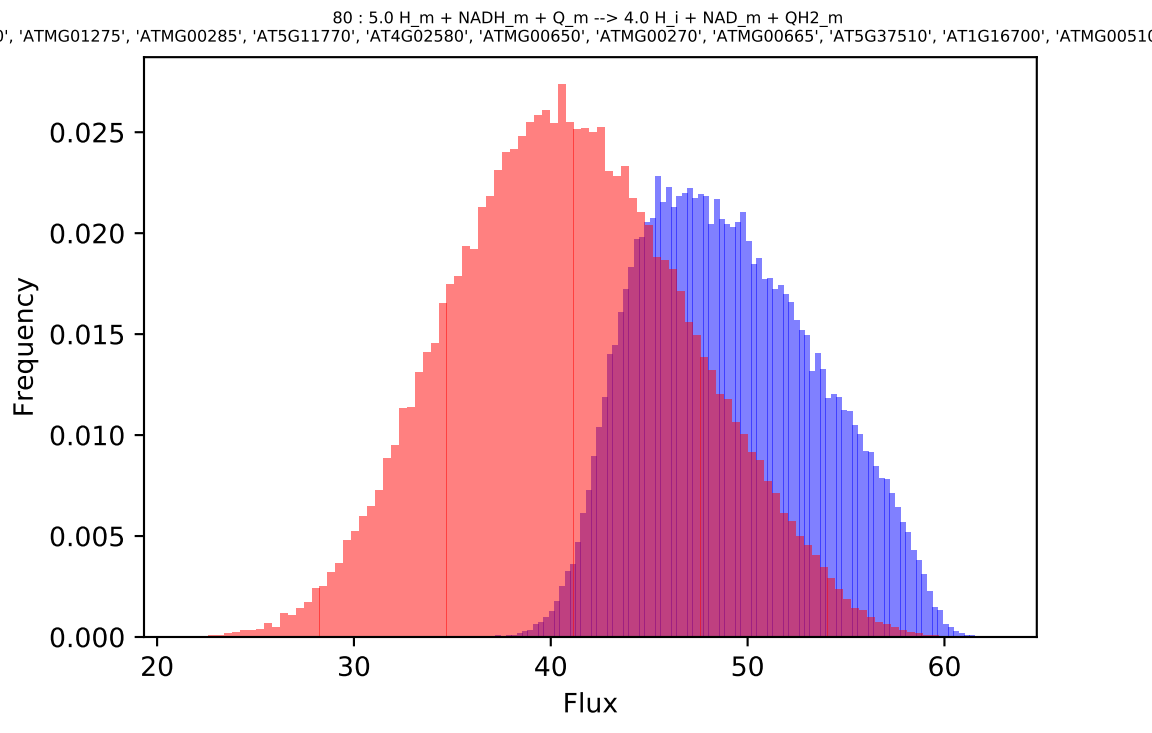

75 : CoA_m + S_DASH_DHL_m --> DHL_m + S_DASH_CoA_m
['AT4G26910', '3*AT5G55070']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.5
1.0
1.5
2.0
2.5
Flux

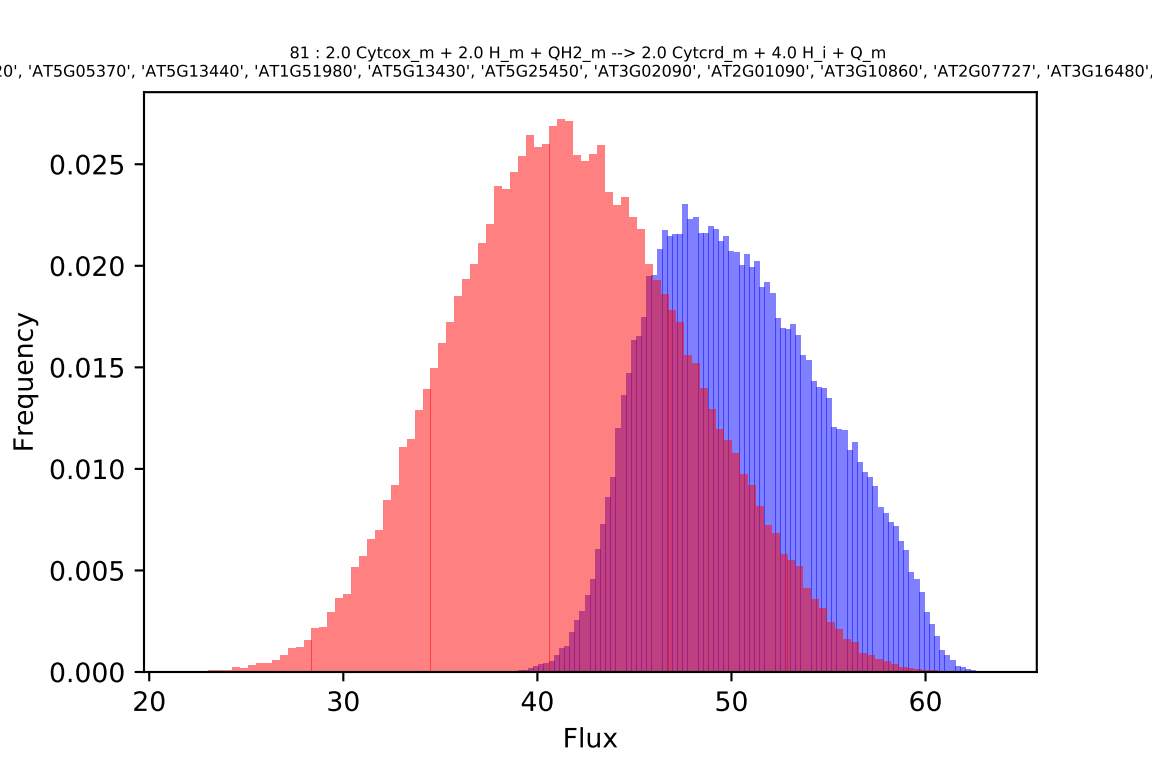

76 : ADP_m + Pi_m + S_DASH_CoA_m --> ATP_m + CoA_m + SCA_m
['AT5G23250', 'AT2G20420', 'AT5G08300']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.5
1.0
1.5
2.0
2.5
Flux

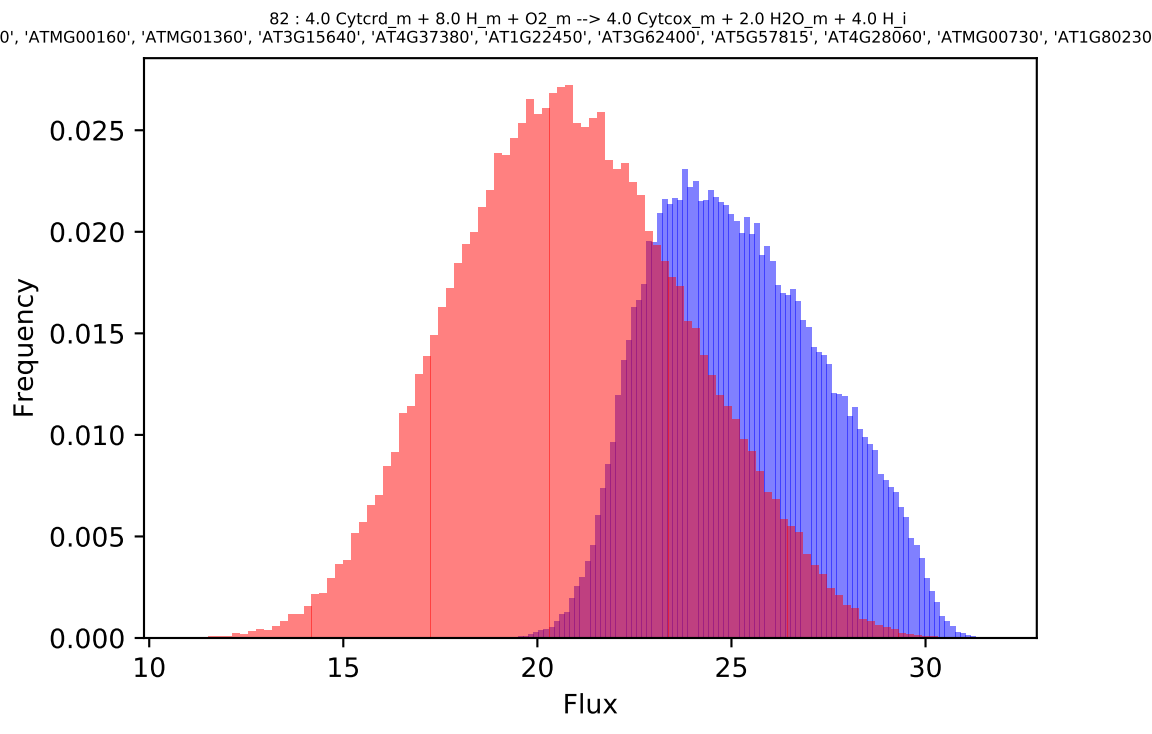

77 : Q_m + SCA_m --> Fum_m + QH2_m
2G18450', 'AT4G32210', 'AT5G66760', 'AT1G47420', 'AT5G40650', 'AT2G46390', 'AT2G46505', 'AT5G62575', 'AT5G65165', 'AT1G08480', 'AT3G
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Flux

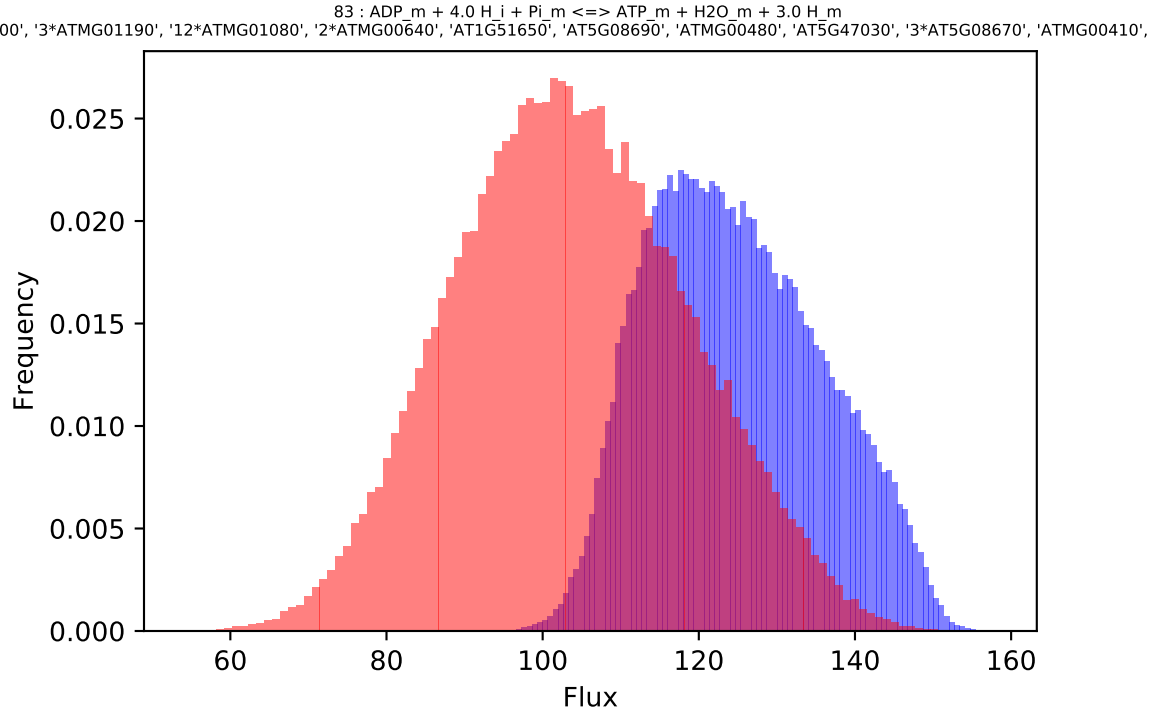

78 : Fum_m + H2O_m --> Mal_m
['AT5G50950', 'AT2G47510']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Flux

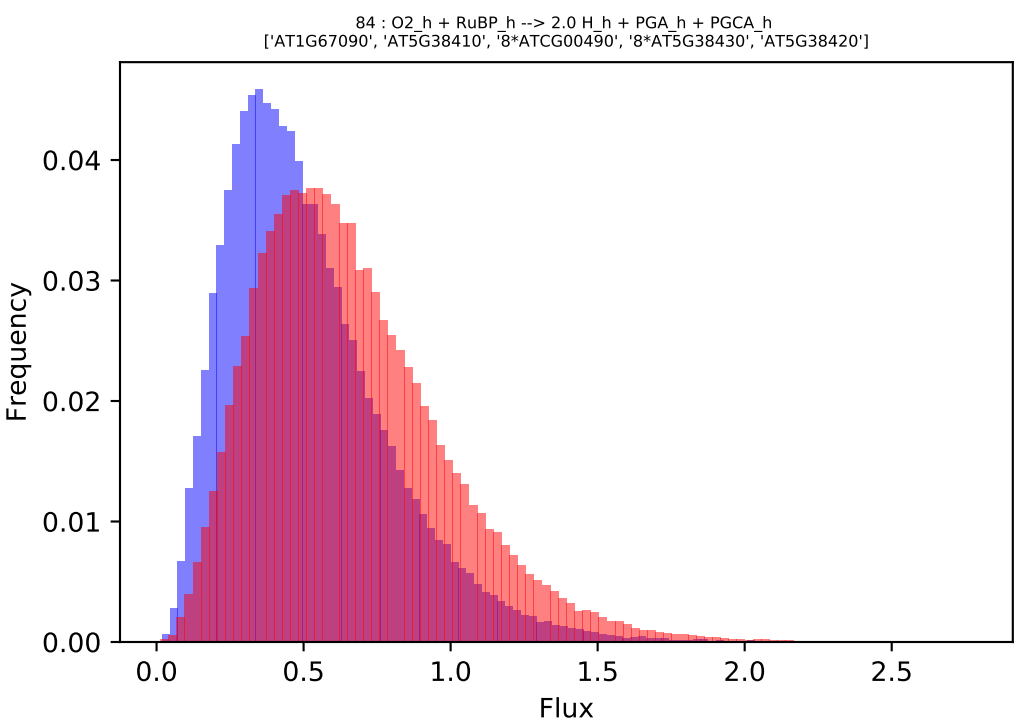

79 : Mal_m + NAD_m <=> H_m + NADH_m + OAA_m
['AT3G47520', 'AT1G53240', 'AT3G15020']
Frequency
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
−250
−200
−150
−100
−50
0
50
100
Flux

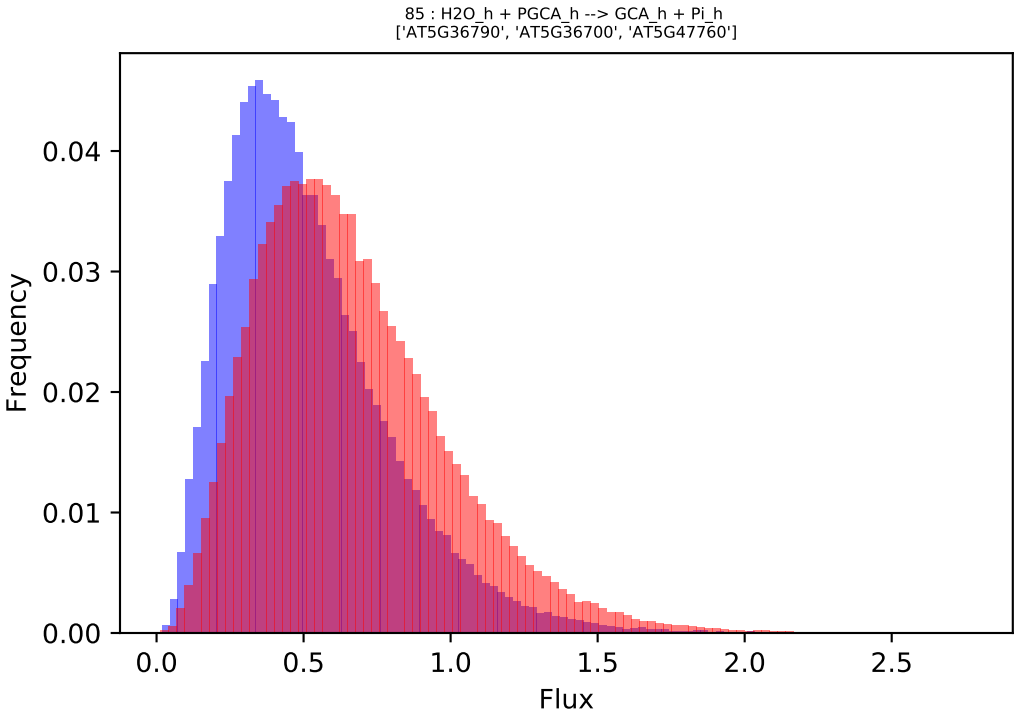

80 : 5.0 H_m + NADH_m + Q_m --> 4.0 H_i + NAD_m + QH2_m
', 'ATMG01275', 'ATMG00285', 'AT5G11770', 'AT4G02580', 'ATMG00650', 'ATMG00270', 'ATMG00665', 'AT5G37510', 'AT1G16700', 'ATMG00510
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
20
30
40
50
60
Flux

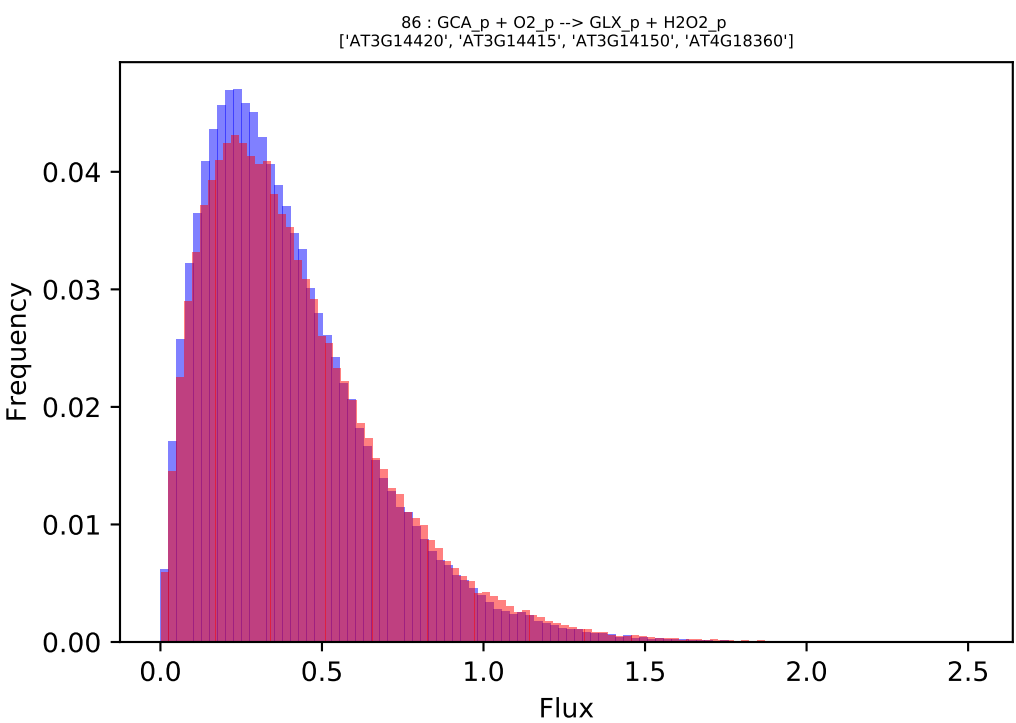

81 : 2.0 Cytcox_m + 2.0 H_m + QH2_m --> 2.0 Cytcrd_m + 4.0 H_i + Q_m
20', 'AT5G05370', 'AT5G13440', 'AT1G51980', 'AT5G13430', 'AT5G25450', 'AT3G02090', 'AT2G01090', 'AT3G10860', 'AT2G07727', 'AT3G16480',
Frequency
0.025
0.020
0.015
0.010
0.005
0.000
20
30
40
50
60
Flux

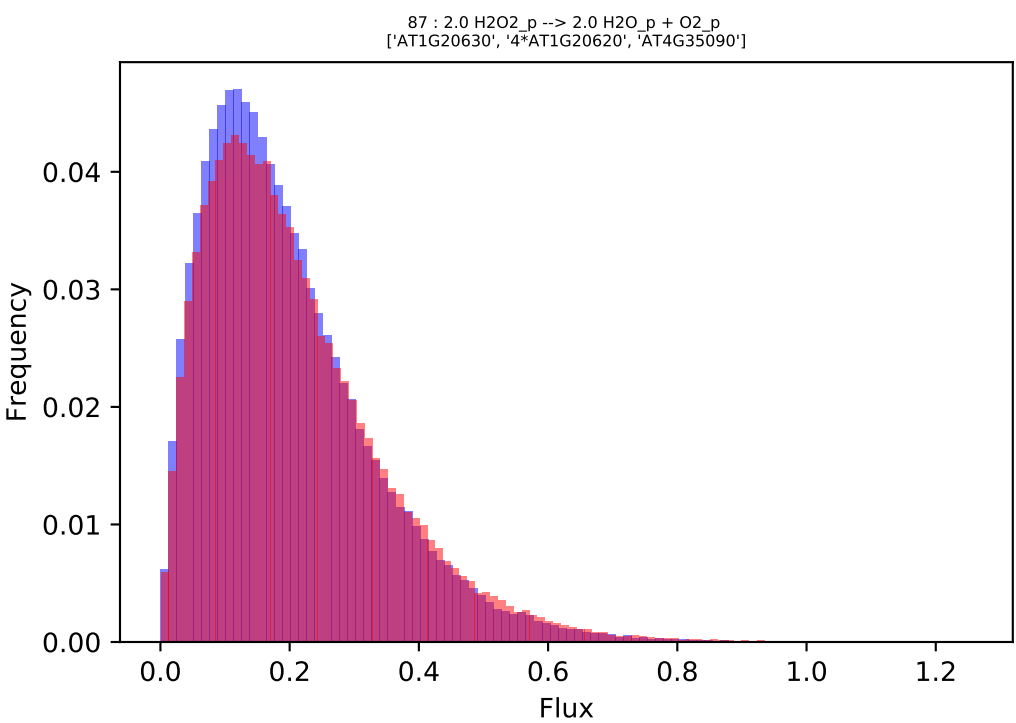

82 : 4.0 Cytcrd_m + 8.0 H_m + O2_m --> 4.0 Cytcox_m + 2.0 H2O_m + 4.0 H_i
0', 'ATMG00160', 'ATMG01360', 'AT3G15640', 'AT4G37380', 'AT1G22450', 'AT3G62400', 'AT5G57815', 'AT4G28060', 'ATMG00730', 'AT1G80230
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
10
15
20
25
30
Flux

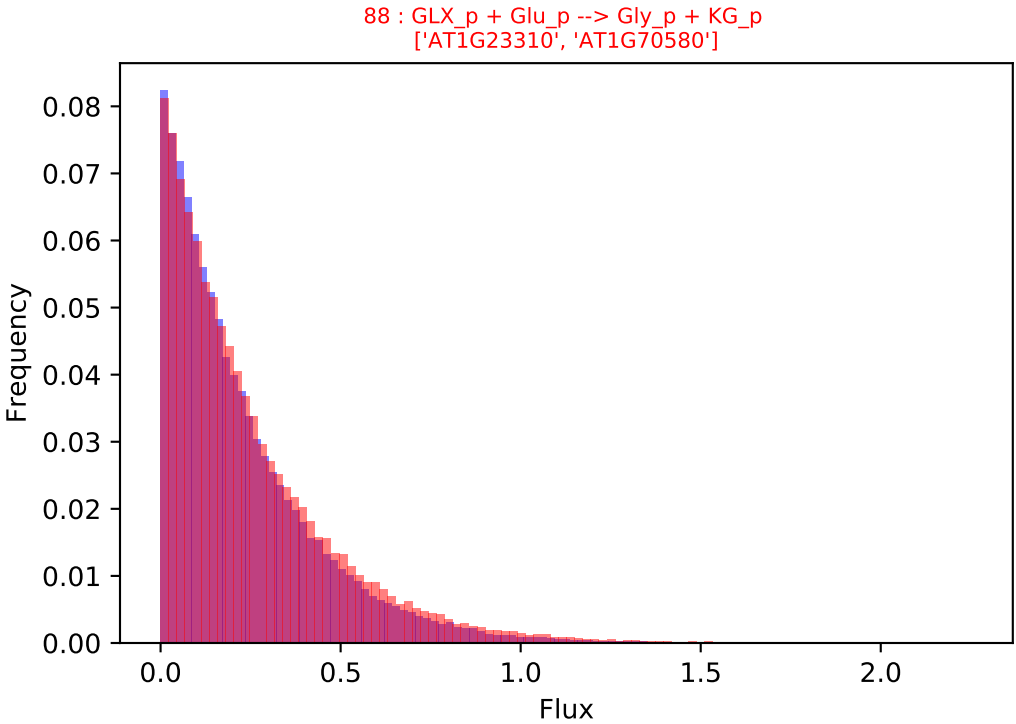

83 : ADP_m + 4.0 H_i + Pi_m <=> ATP_m + H2O_m + 3.0 H_m
00', '3*ATMG01190', '12*ATMG01080', '2*ATMG00640', 'AT1G51650', 'AT5G08690', 'ATMG00480', 'AT5G47030', '3*AT5G08670', 'ATMG00410',
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
60
80
100
120
140
160
Flux

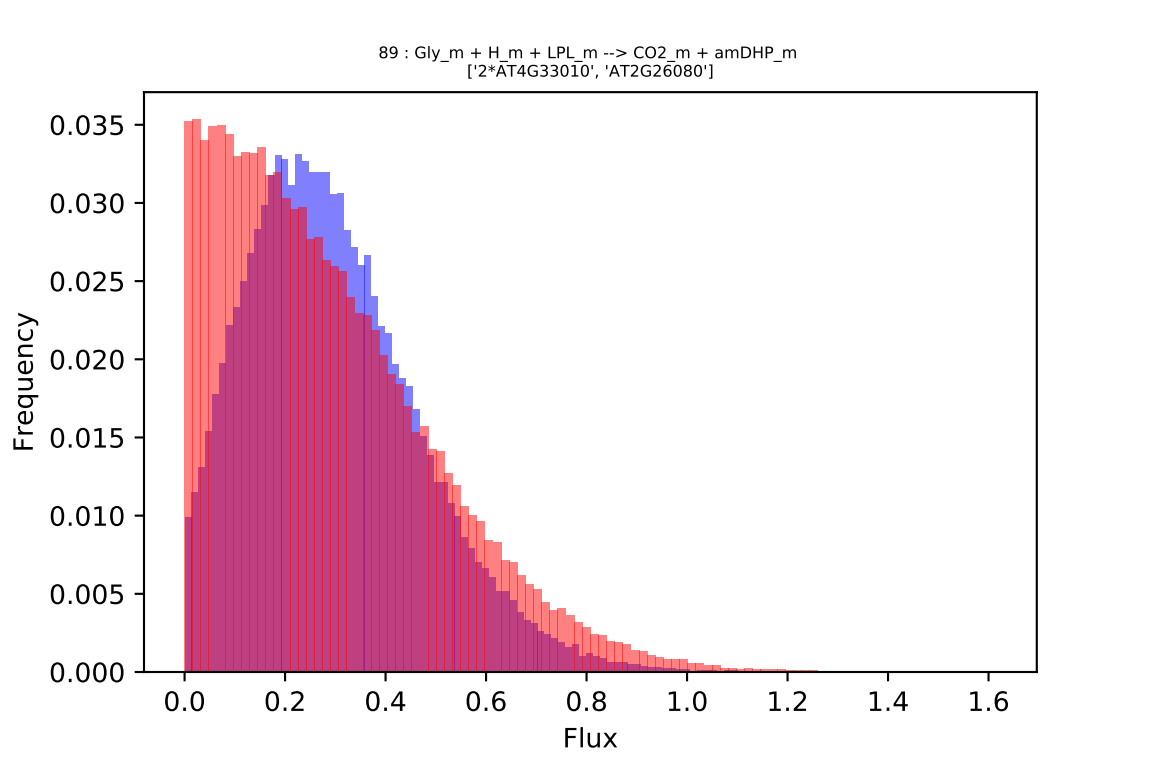

84 : O2_h + RuBP_h --> 2.0 H_h + PGA_h + PGCA_h
['AT1G67090', 'AT5G38410', '8*ATCG00490', '8*AT5G38430', 'AT5G38420']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.5
1.0
1.5
2.0
2.5
Flux

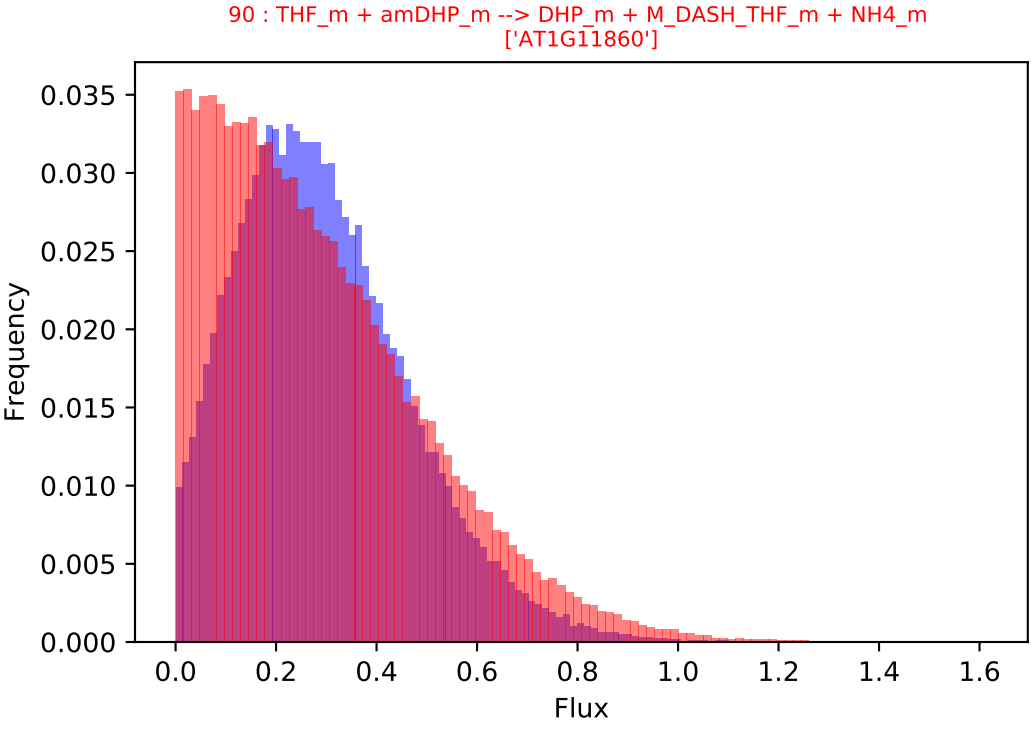

85 : H2O_h + PGCA_h --> GCA_h + Pi_h
['AT5G36790', 'AT5G36700', 'AT5G47760']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.5
1.0
1.5
2.0
2.5
Flux

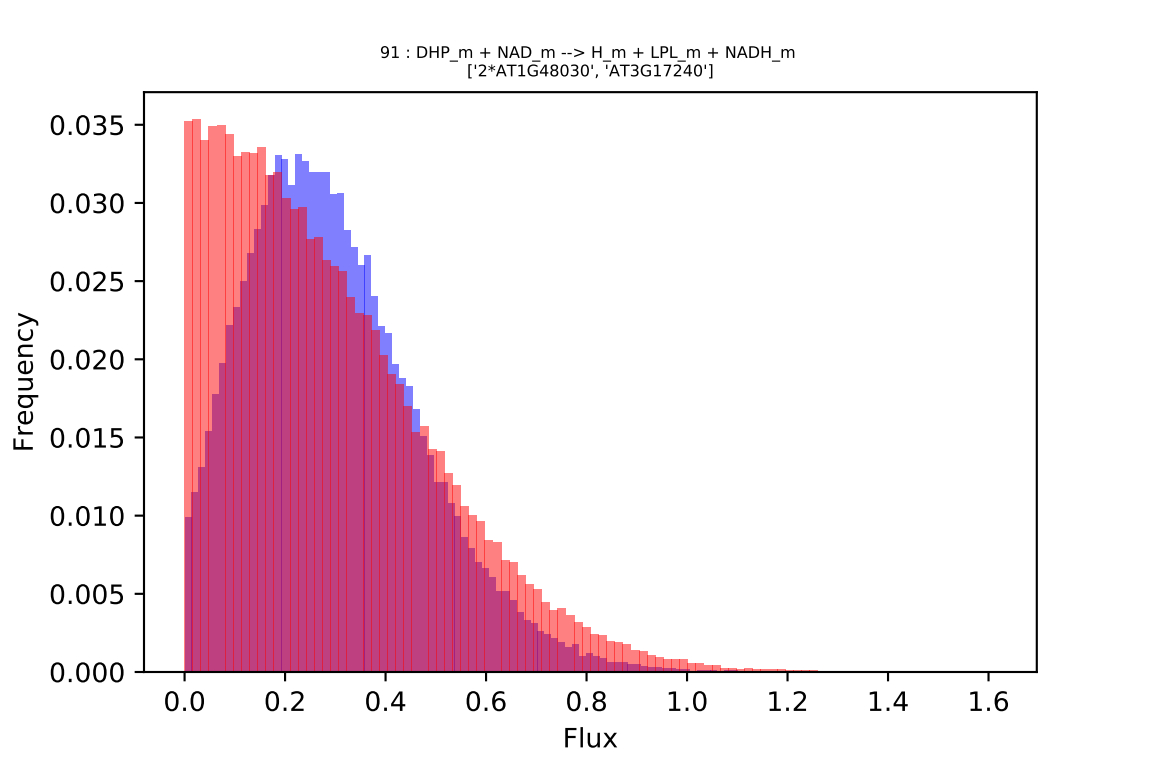

86 : GCA_p + O2_p --> GLX_p + H2O2_p
['AT3G14420', 'AT3G14415', 'AT3G14150', 'AT4G18360']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.5
1.0
1.5
2.0
2.5
Flux

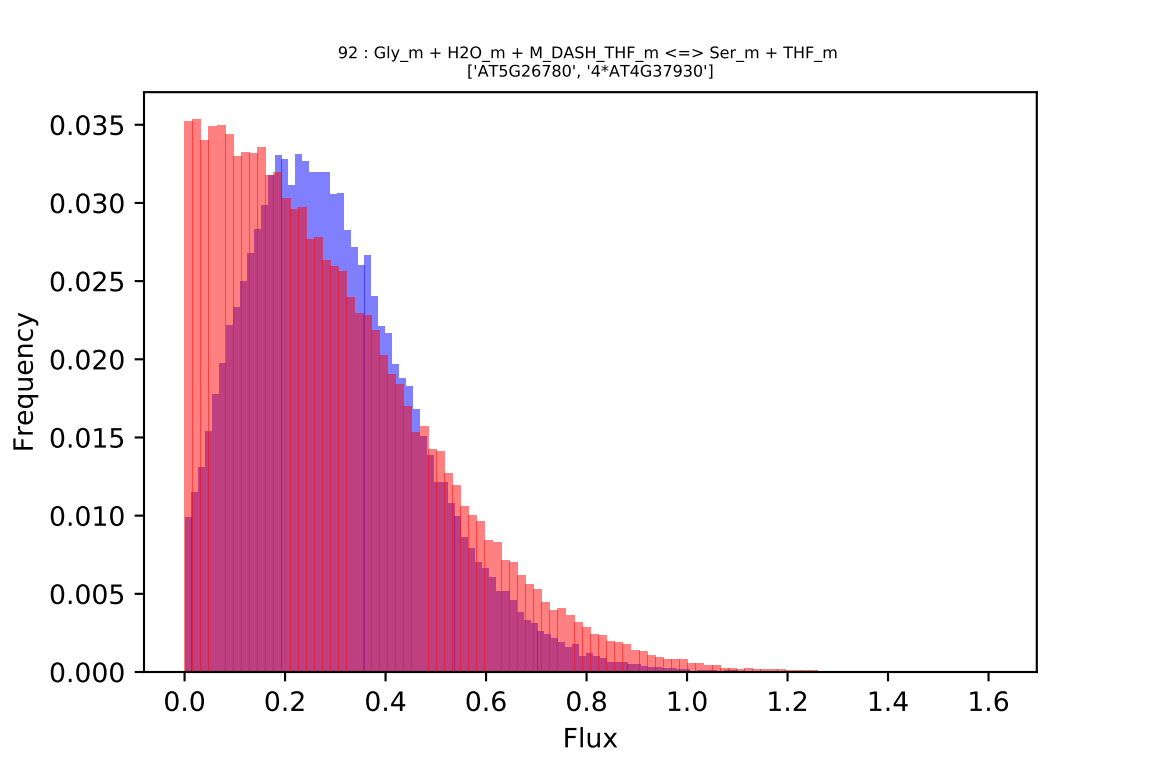

87 : 2.0 H2O2_p --> 2.0 H2O_p + O2_p
['AT1G20630', '4*AT1G20620', 'AT4G35090']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Flux

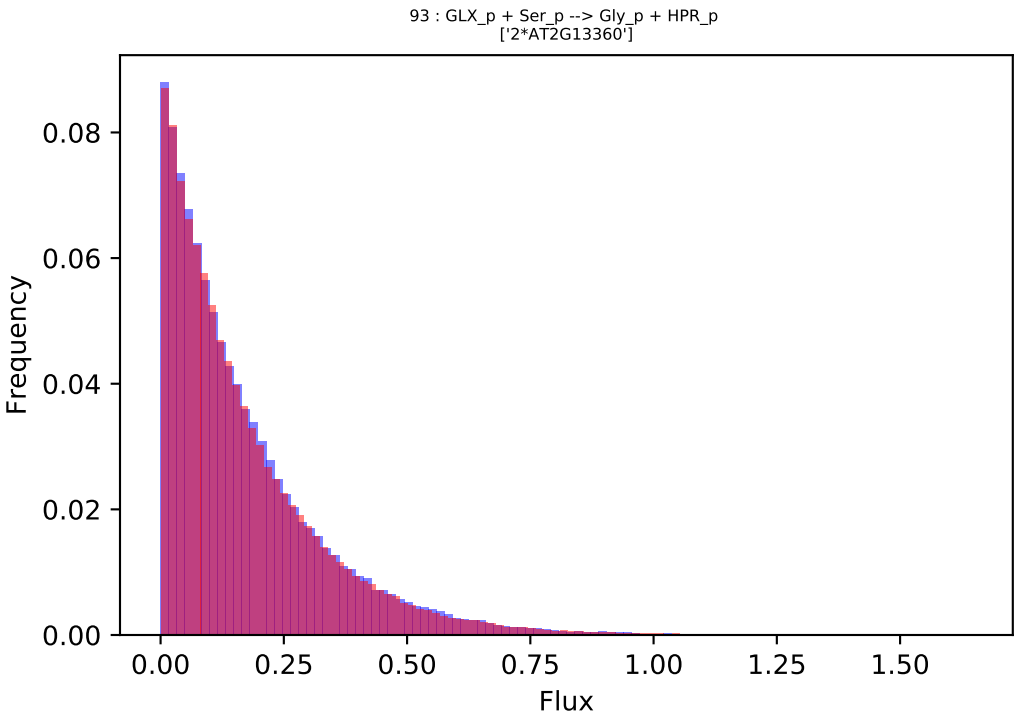

88 : GLX_p + Glu_p --> Gly_p + KG_p
['AT1G23310', 'AT1G70580']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.0
0.5
1.0
1.5
2.0
Flux

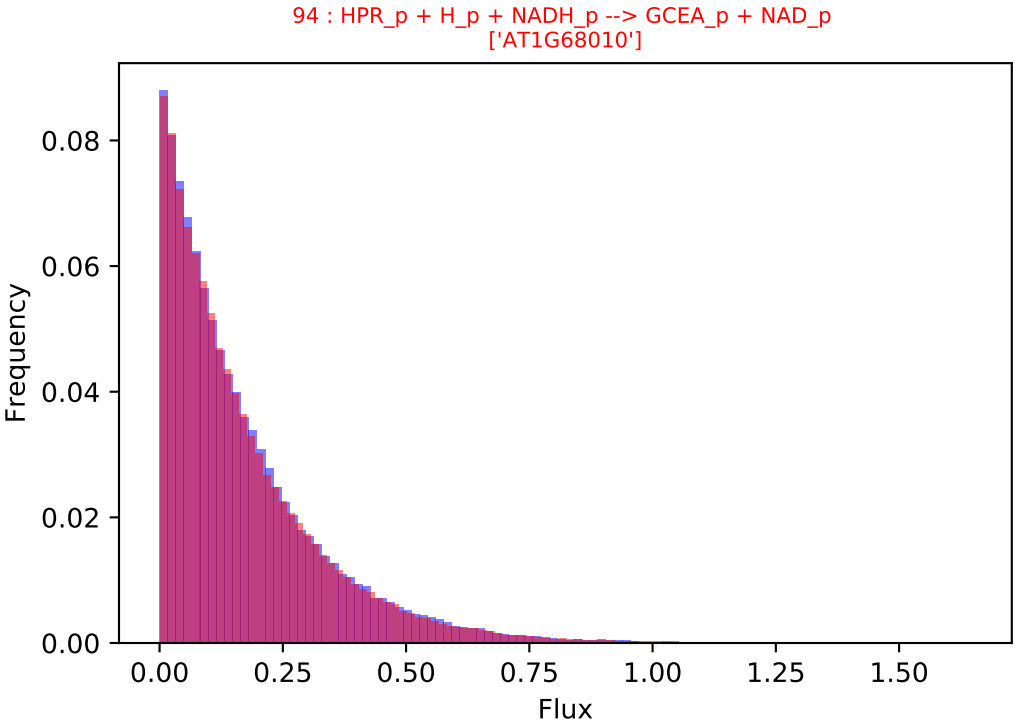

89 : Gly_m + H_m + LPL_m --> CO2_m + amDHP_m
['2*AT4G33010', 'AT2G26080']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Flux

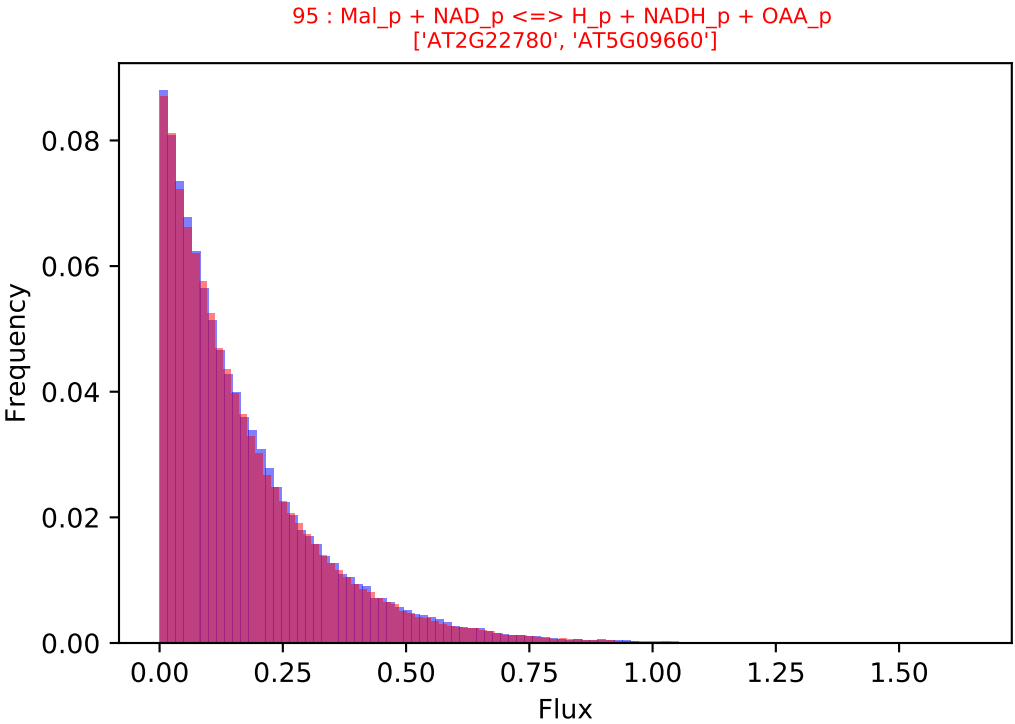

90 : THF_m + amDHP_m --> DHP_m + M_DASH_THF_m + NH4_m
['AT1G11860']
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Flux

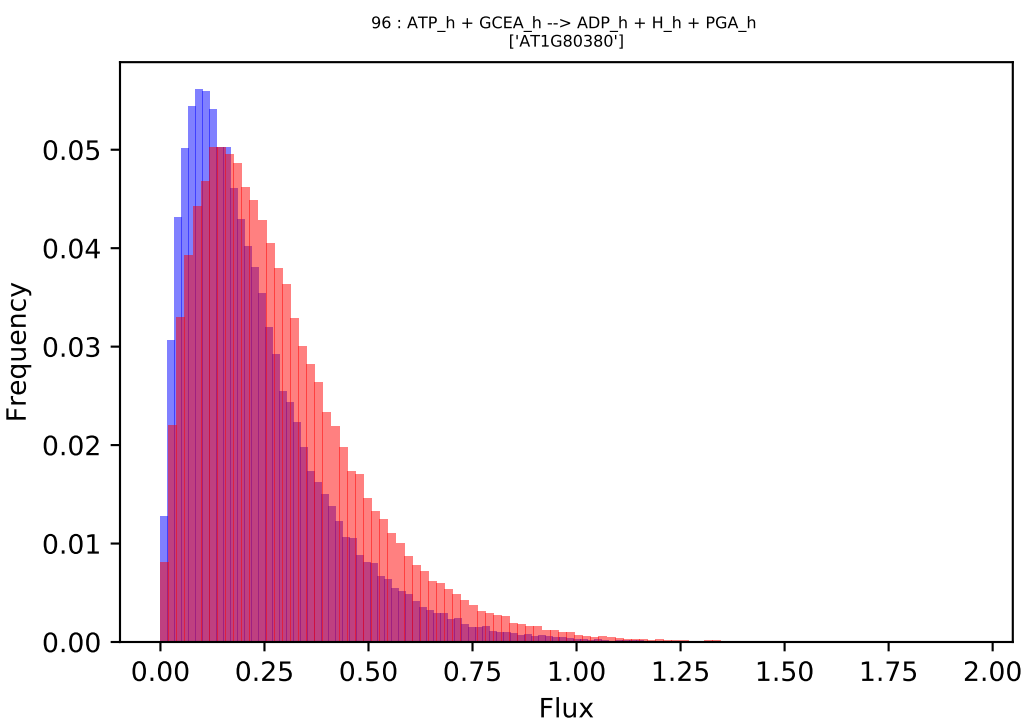

91 : DHP_m + NAD_m --> H_m + LPL_m + NADH_m
['2*AT1G48030', 'AT3G17240']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Flux

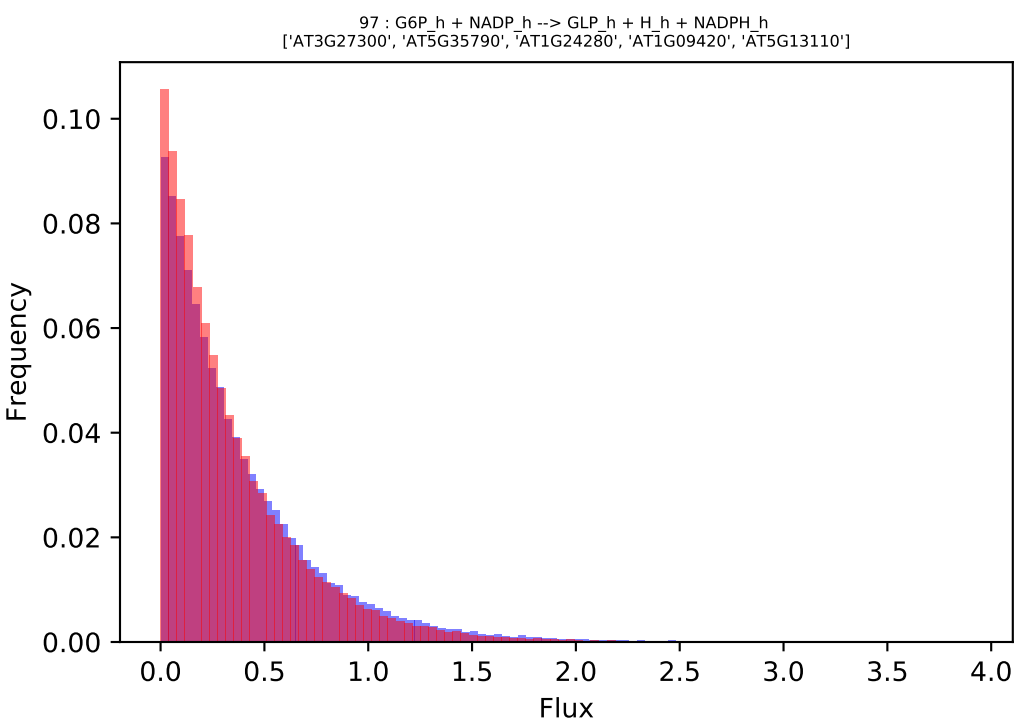

92 : Gly_m + H2O_m + M_DASH_THF_m <=> Ser_m + THF_m
['AT5G26780', '4*AT4G37930']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Flux

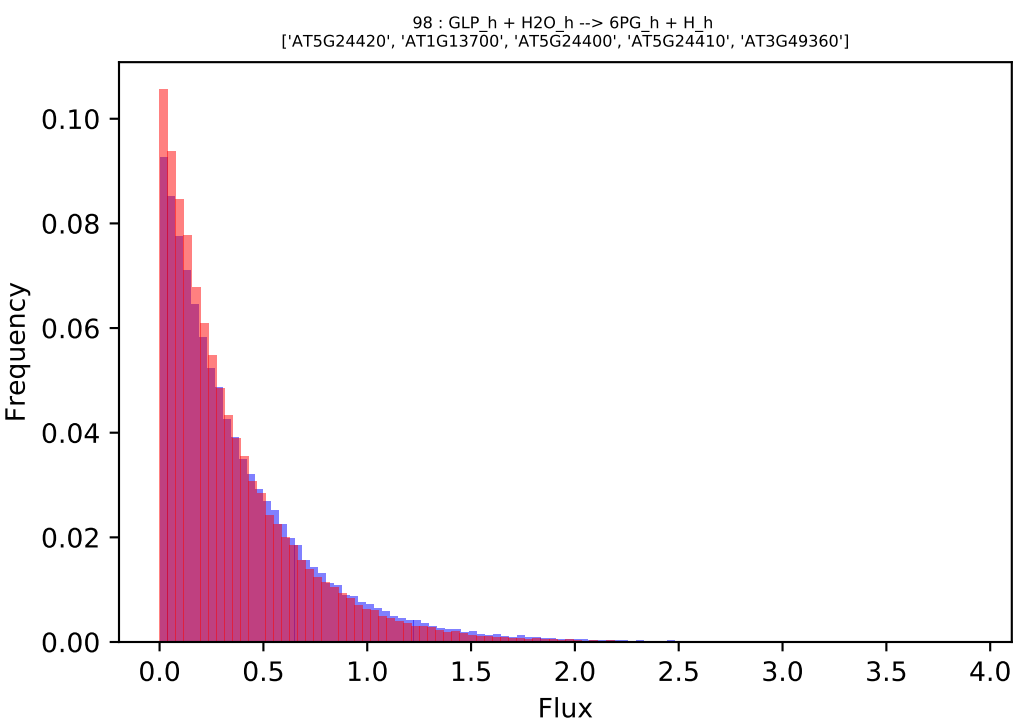

93 : GLX_p + Ser_p --> Gly_p + HPR_p
['2*AT2G13360']
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.25
0.50
0.75
1.00
1.25
1.50
Flux

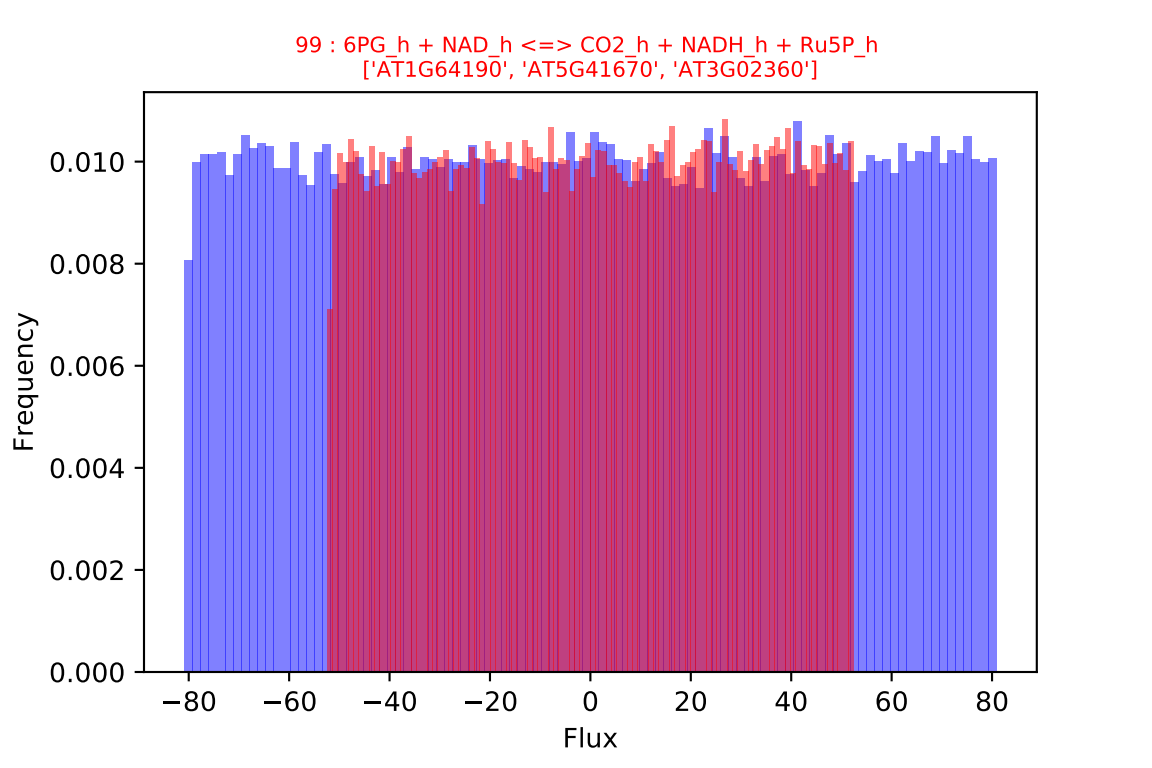

94 : HPR_p + H_p + NADH_p --> GCEA_p + NAD_p
['AT1G68010']
Frequency
0.00
0.02
0.04
0.06
0.08
0.00
0.25
0.50
0.75
1.00
1.25
1.50
Flux

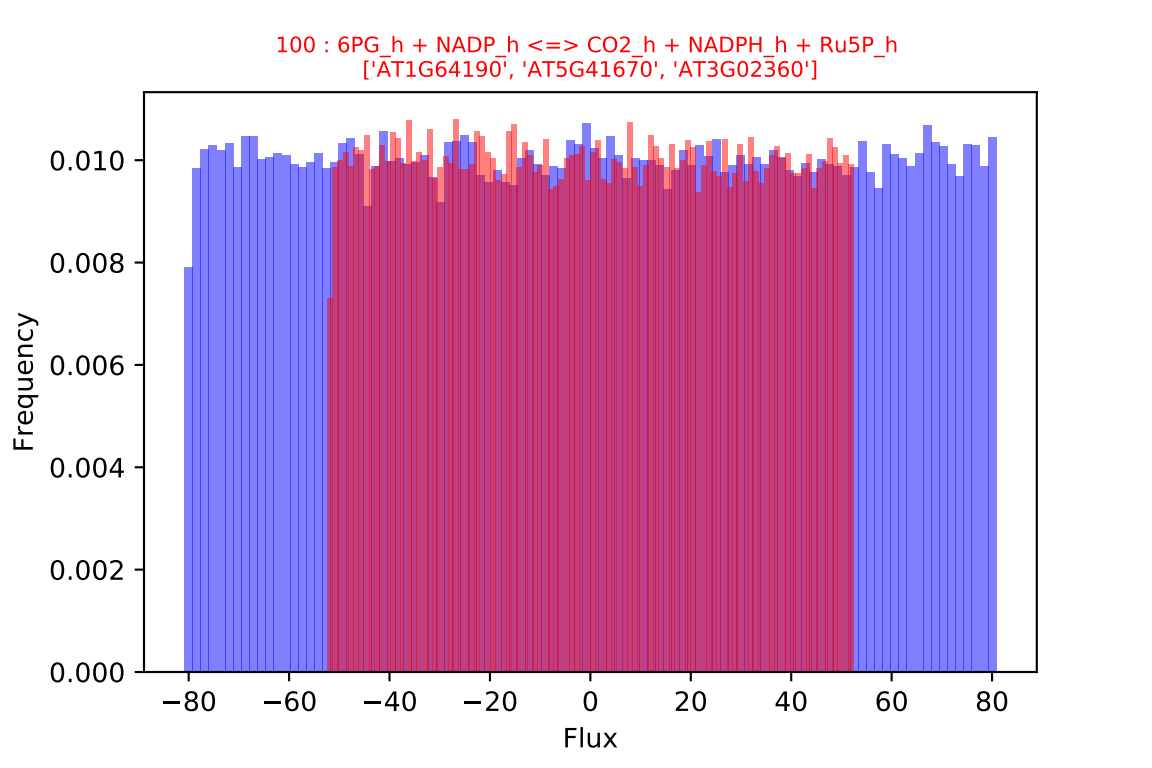

95 : Mal_p + NAD_p <=> H_p + NADH_p + OAA_p
['AT2G22780', 'AT5G09660']
Frequency
0.00
0.02
0.04
0.06
0.08
0.00
0.25
0.50
0.75
1.00
1.25
1.50
Flux

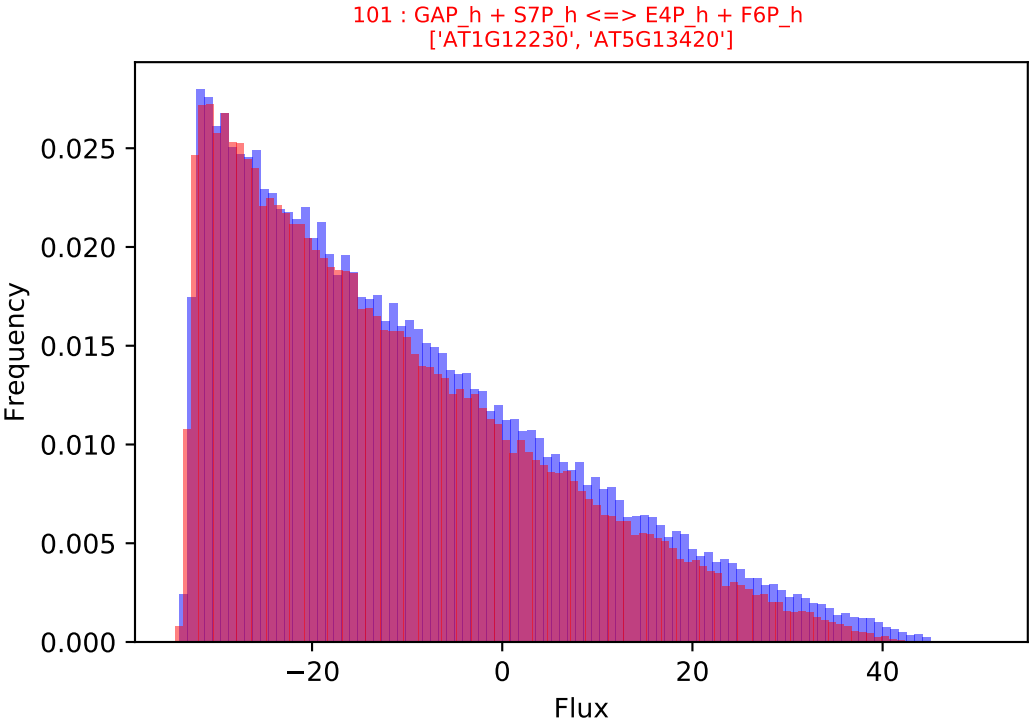

96 : ATP_h + GCEA_h --> ADP_h + H_h + PGA_h
['AT1G80380']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
2.00
Flux

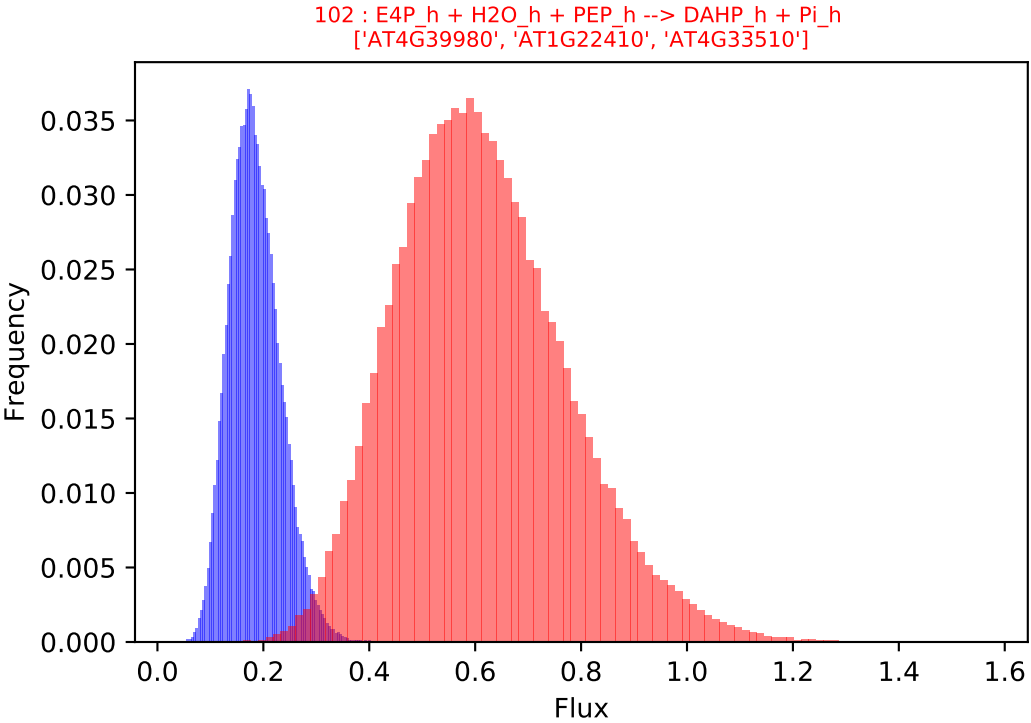

97 : G6P_h + NADP_h --> GLP_h + H_h + NADPH_h
['AT3G27300', 'AT5G35790', 'AT1G24280', 'AT1G09420', 'AT5G13110']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Flux

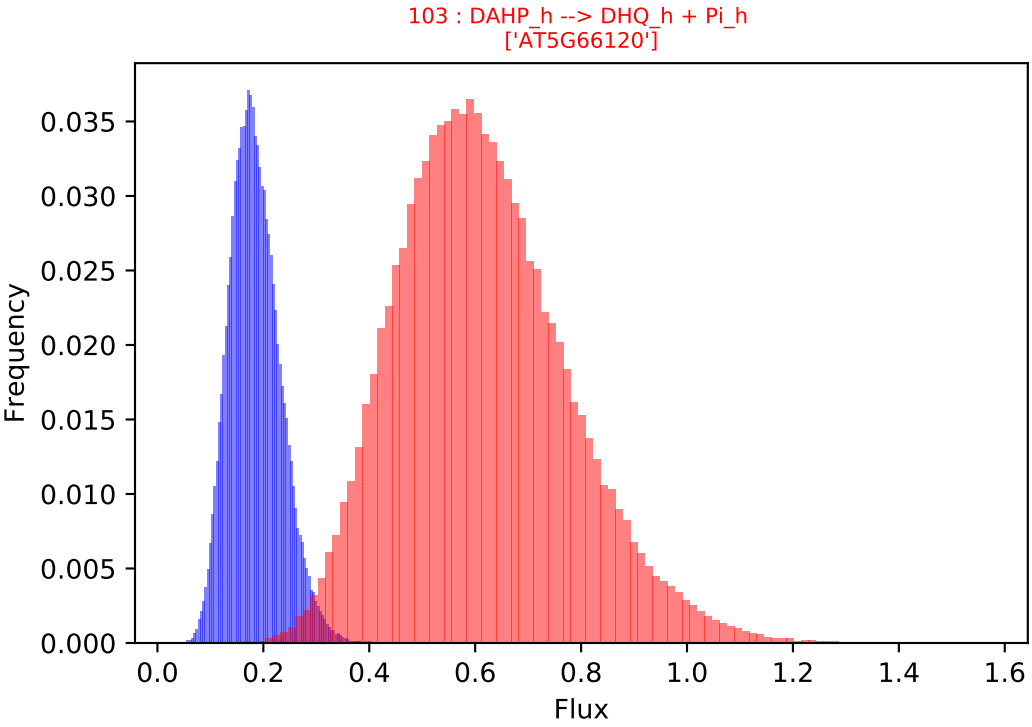

98 : GLP_h + H2O_h --> 6PG_h + H_h
['AT5G24420', 'AT1G13700', 'AT5G24400', 'AT5G24410', 'AT3G49360']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Flux

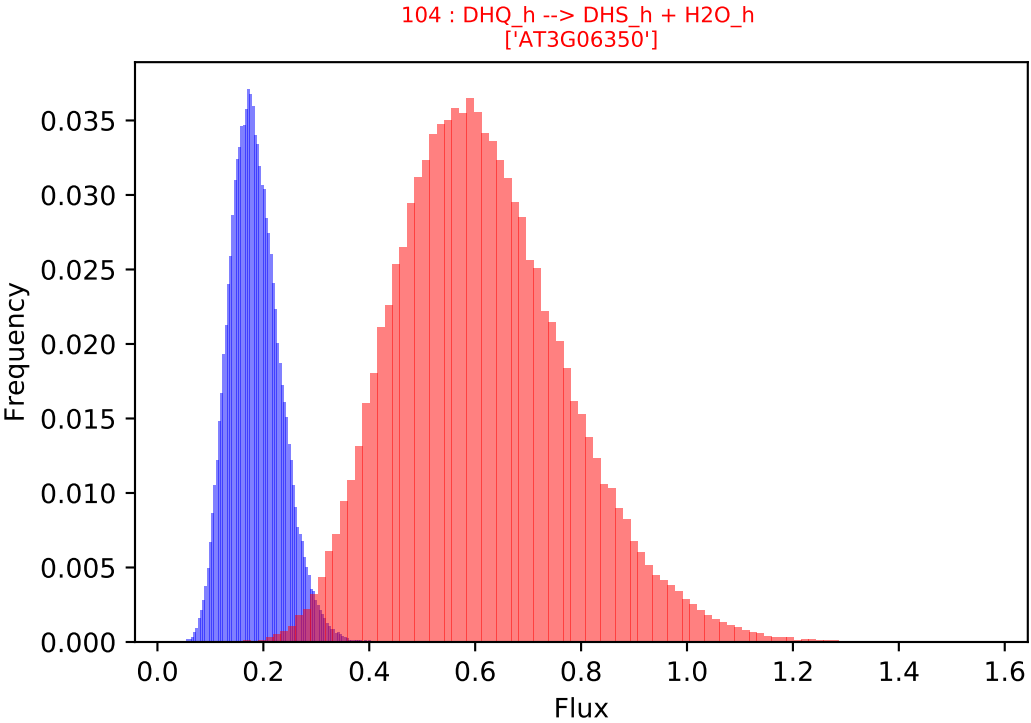

99 : 6PG_h + NAD_h <=> CO2_h + NADH_h + Ru5P_h
['AT1G64190', 'AT5G41670', 'AT3G02360']
Frequency
0.010
0.008
0.006
0.004
0.002
0.000
−80
−60
−40
−20
0
20
40
60
80
Flux

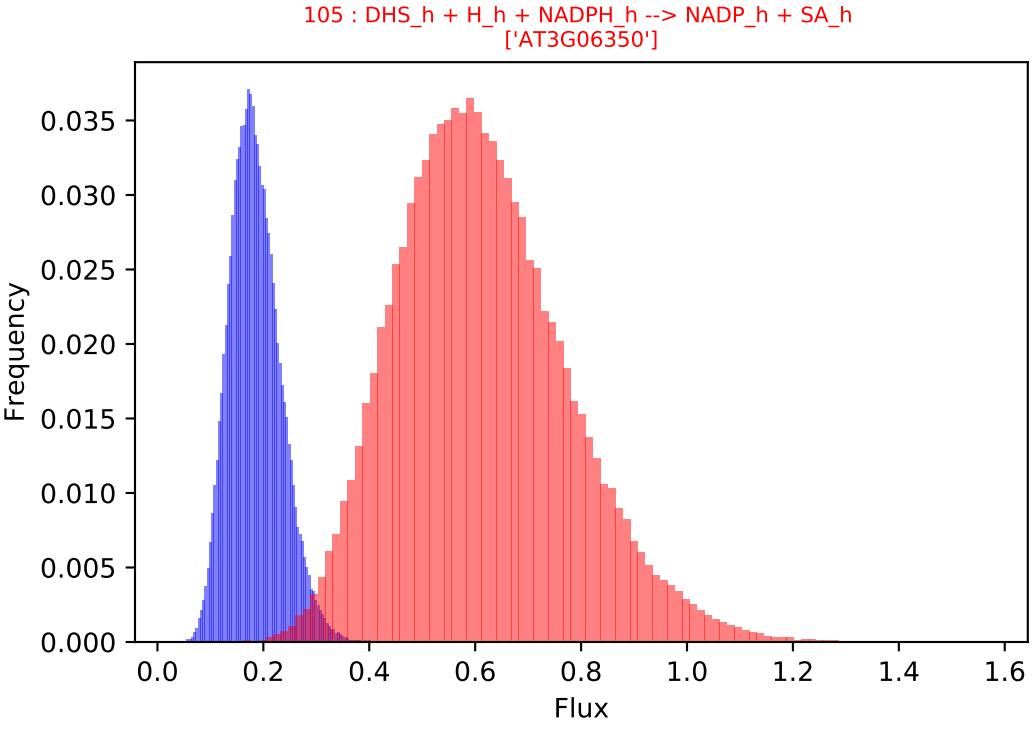

100 : 6PG_h + NADP_h <=> CO2_h + NADPH_h + Ru5P_h
['AT1G64190', 'AT5G41670', 'AT3G02360']
Frequency
0.010
0.008
0.006
0.004
0.002
0.000
−80
−60
−40
−20
0
20
40
60
80
Flux

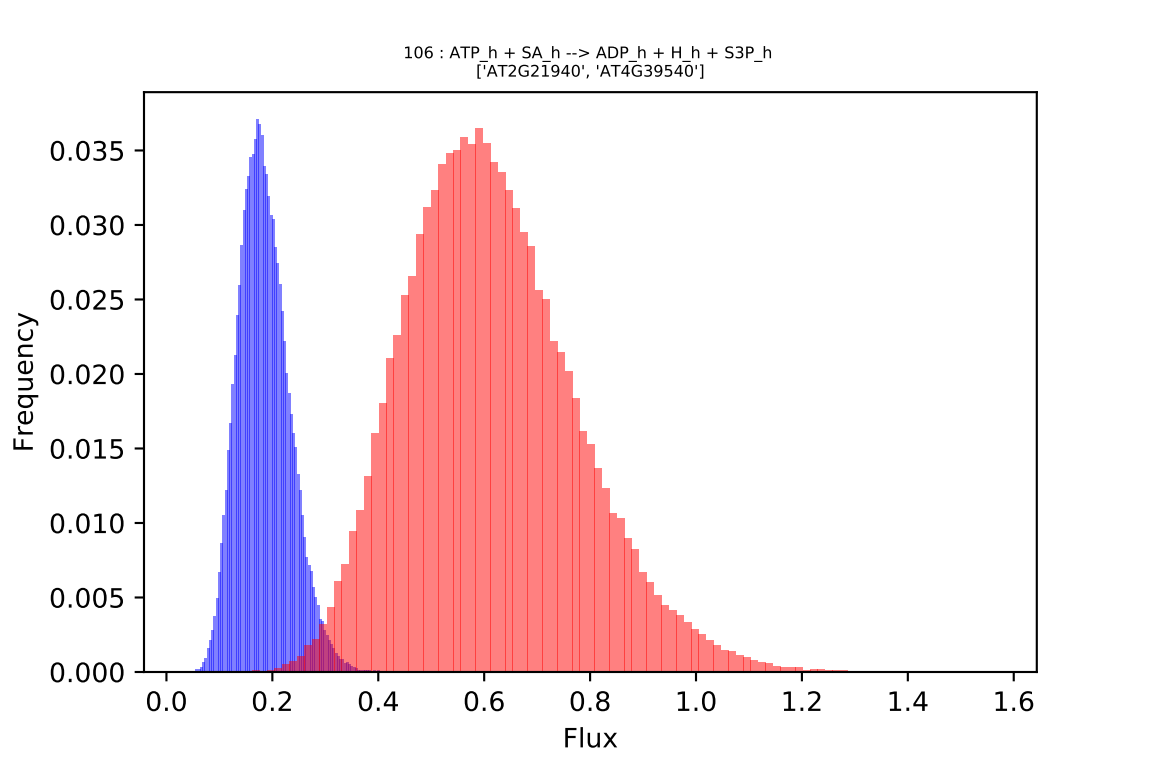

101 : GAP_h + S7P_h <=> E4P_h + F6P_h
['AT1G12230', 'AT5G13420']
Frequency
0.025
0.020
0.015
0.010
0.005
0.000
−20
0
20
40
Flux

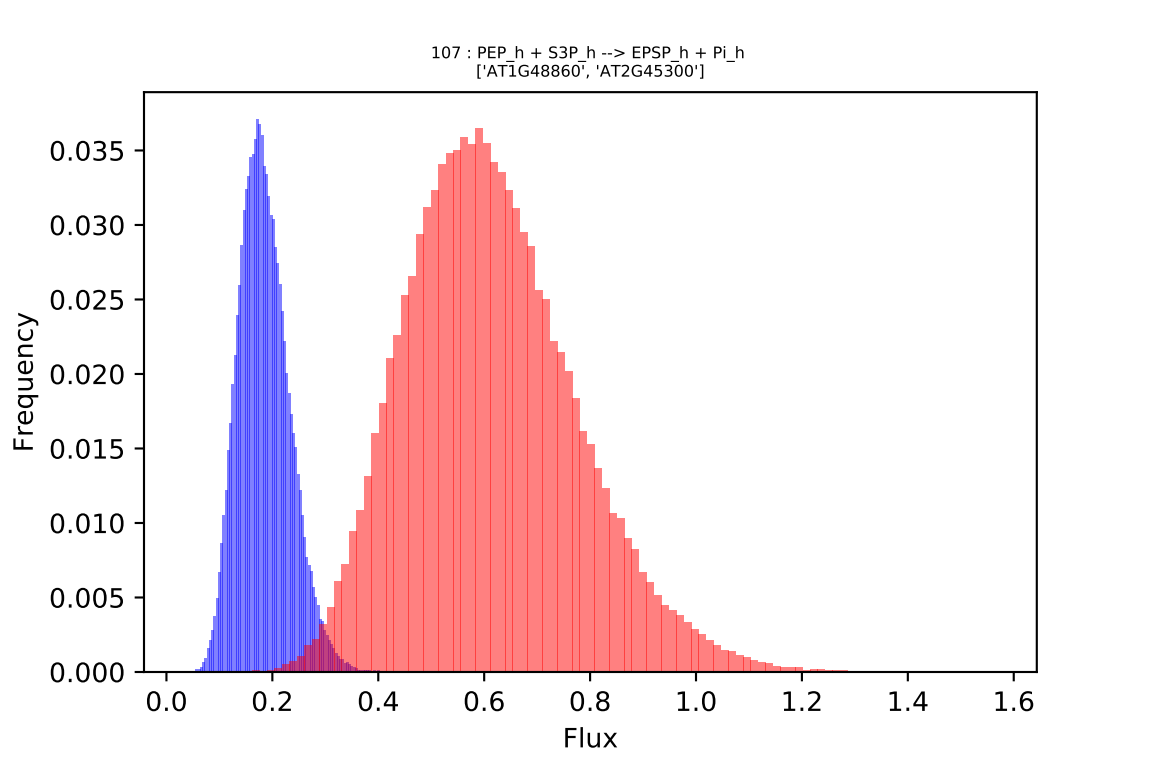

102 : E4P_h + H2O_h + PEP_h --> DAHP_h + Pi_h
['AT4G39980', 'AT1G22410', 'AT4G33510']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Flux

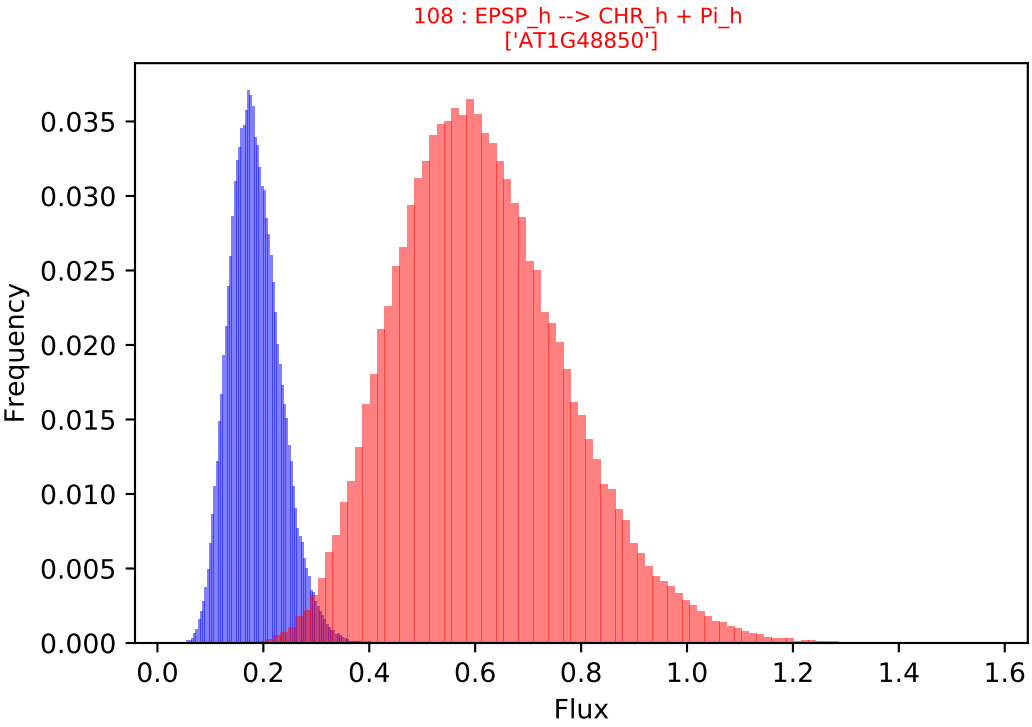

103 : DAHP_h --> DHQ_h + Pi_h
['AT5G66120']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Flux

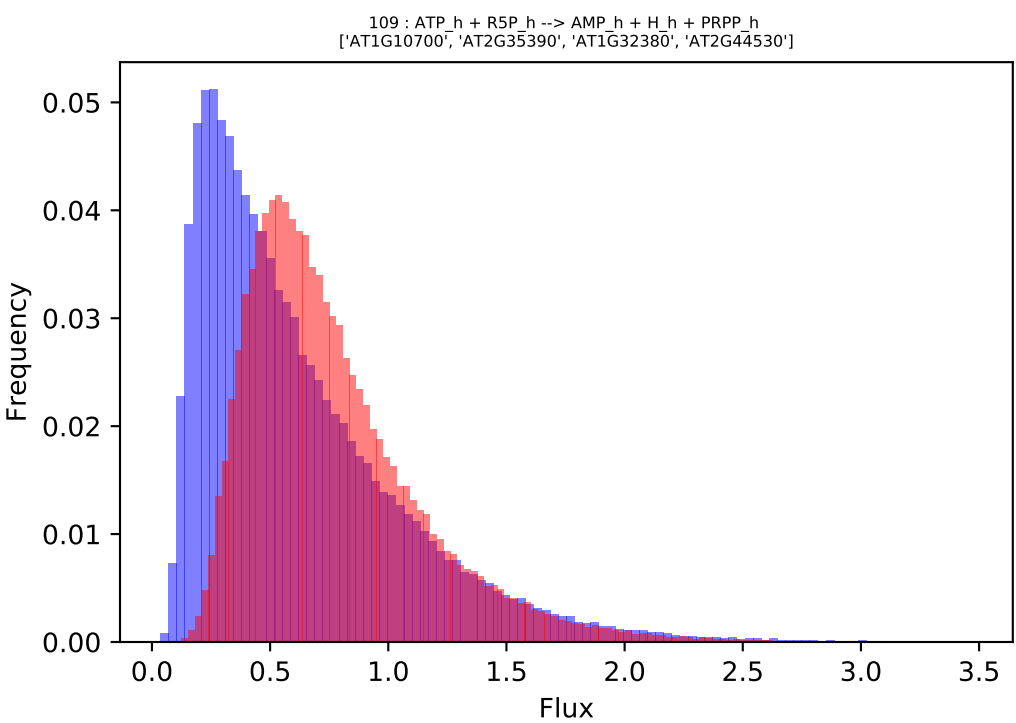

104 : DHQ_h --> DHS_h + H2O_h
['AT3G06350']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Flux

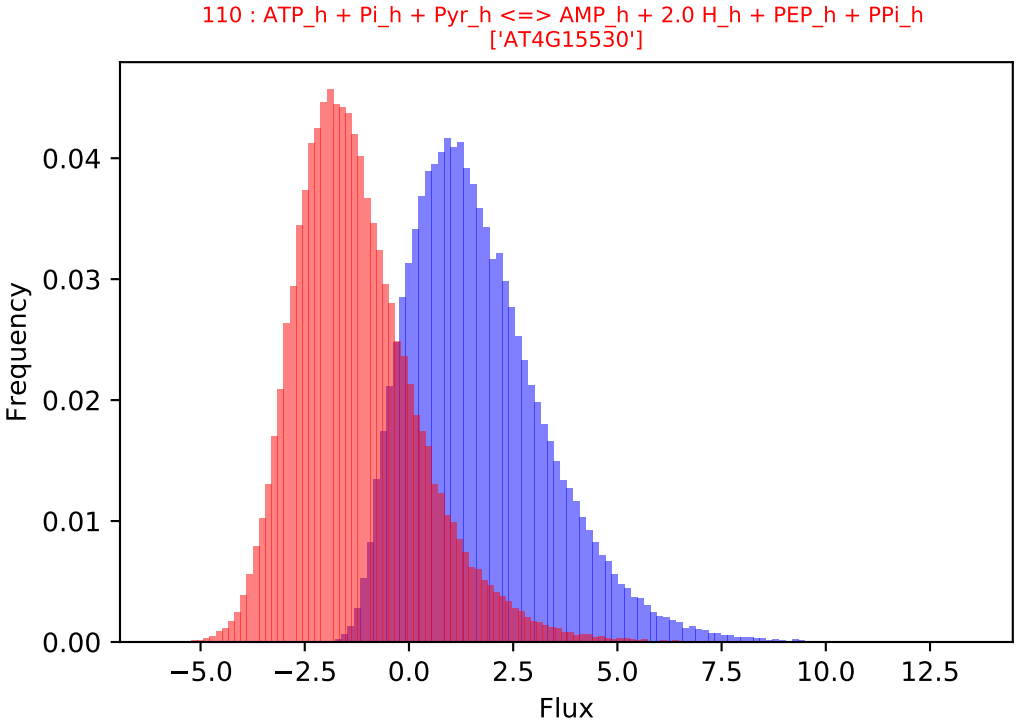

105 : DHS_h + H_h + NADPH_h --> NADP_h + SA_h
['AT3G06350']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Flux

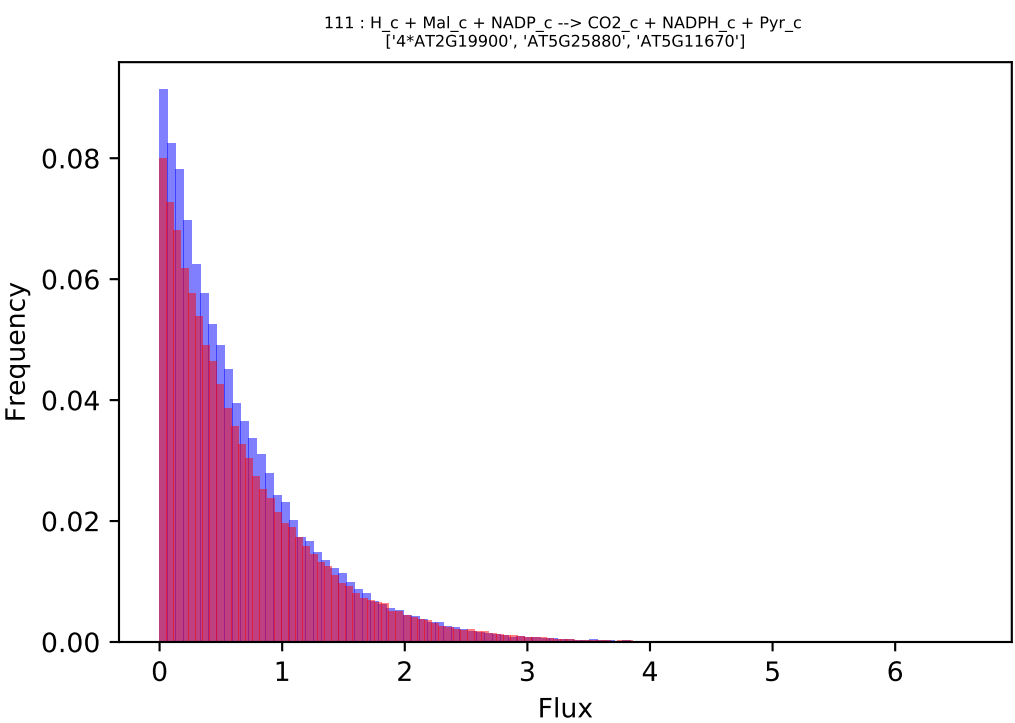

106 : ATP_h + SA_h --> ADP_h + H_h + S3P_h
['AT2G21940', 'AT4G39540']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Flux

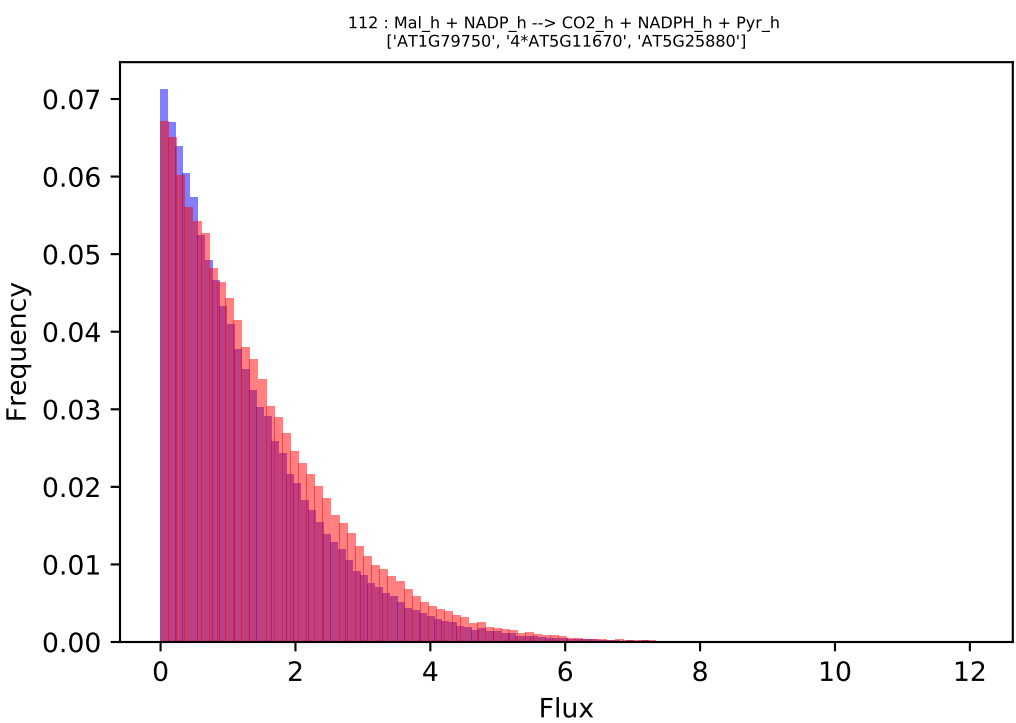

107 : PEP_h + S3P_h --> EPSP_h + Pi_h
['AT1G48860', 'AT2G45300']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Flux

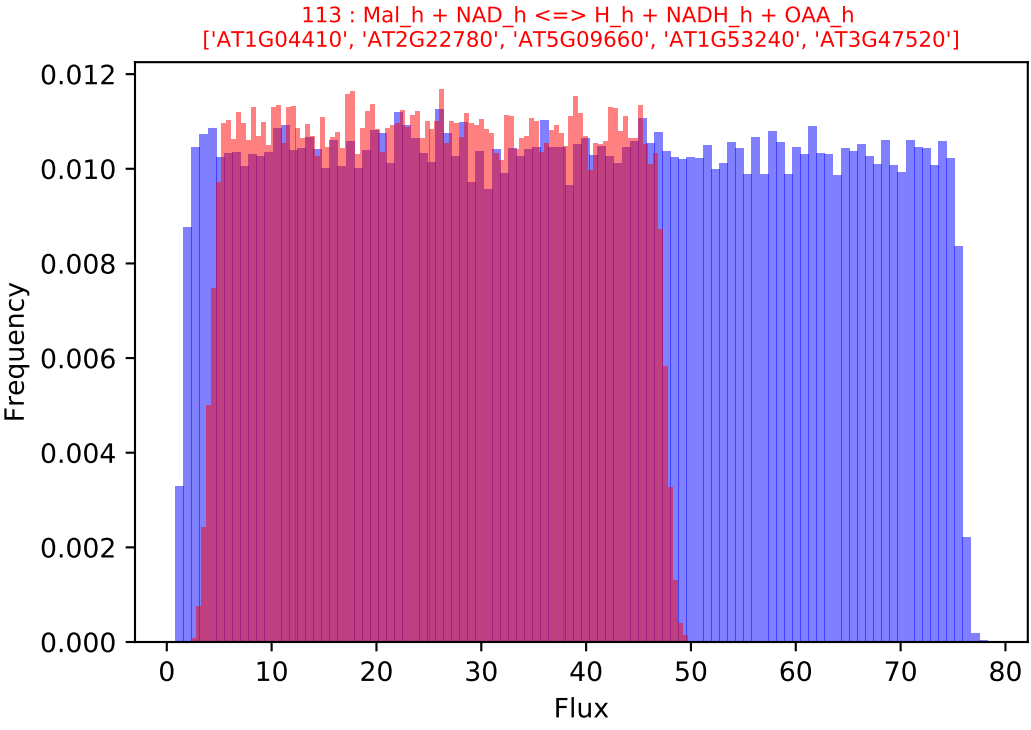

108 : EPSP_h --> CHR_h + Pi_h
['AT1G48850']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Flux

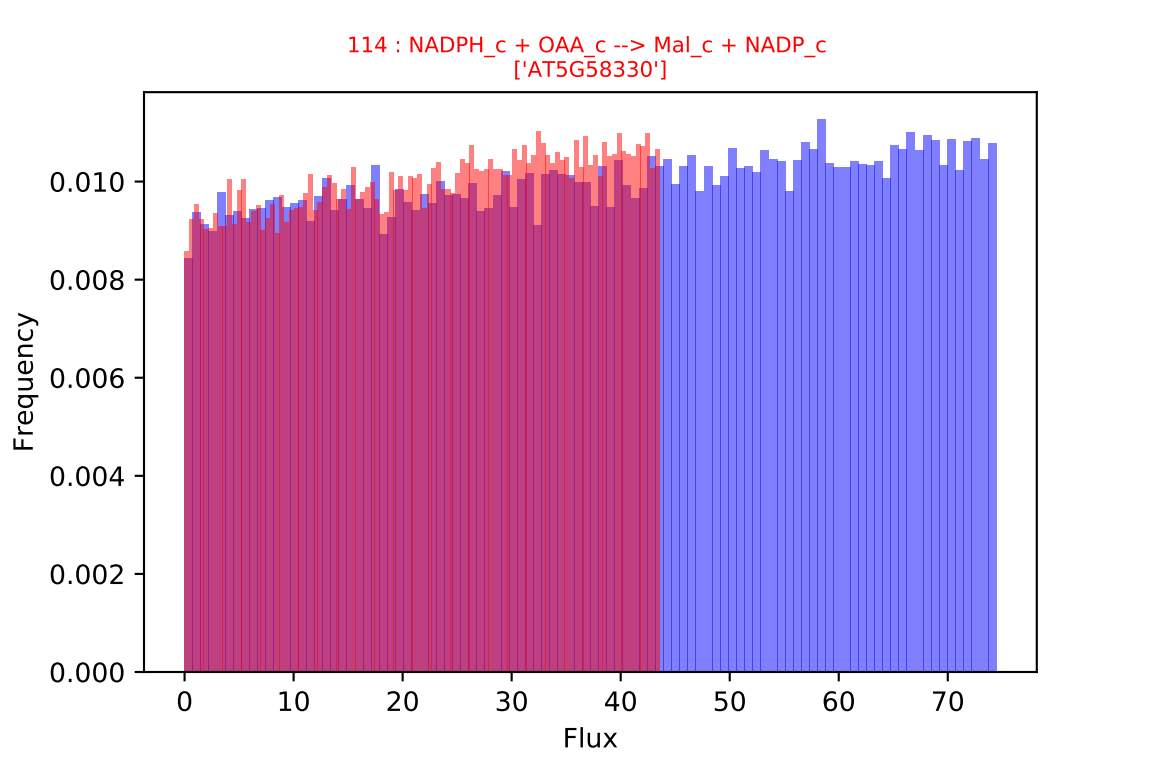

109 : ATP_h + R5P_h --> AMP_h + H_h + PRPP_h
['AT1G10700', 'AT2G35390', 'AT1G32380', 'AT2G44530']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
Flux

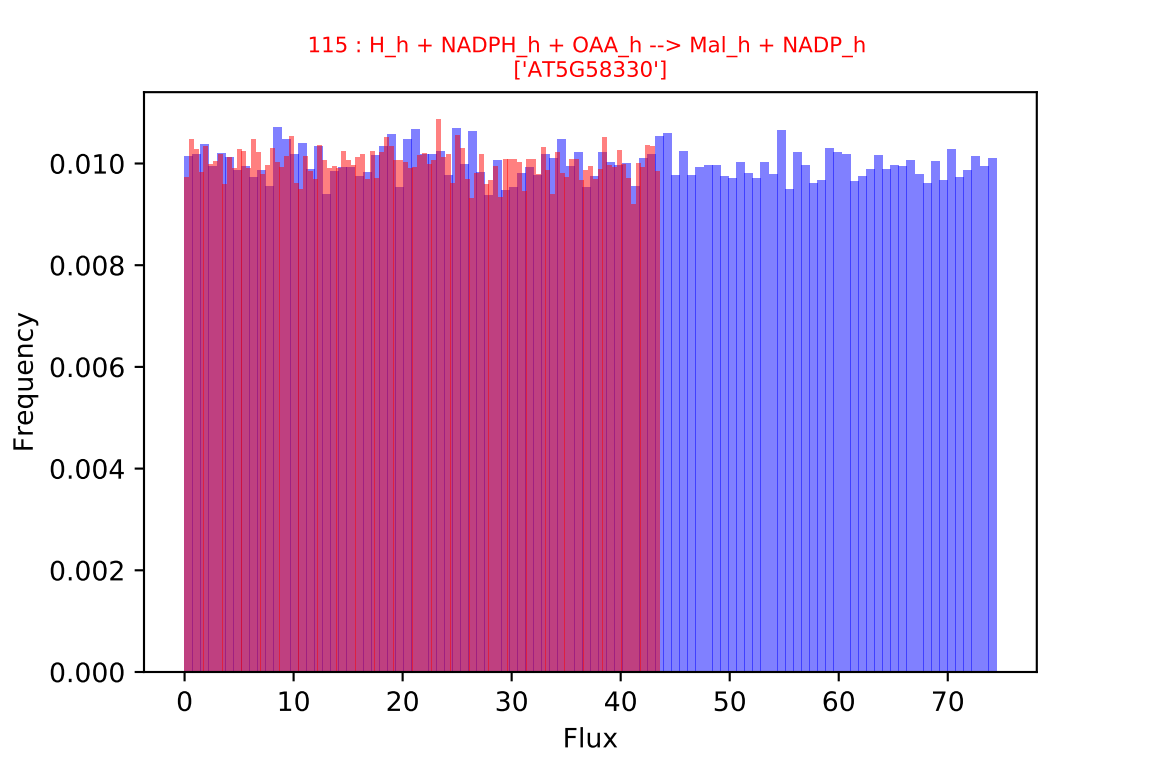

110 : ATP_h + Pi_h + Pyr_h <=> AMP_h + 2.0 H_h + PEP_h + PPi_h
['AT4G15530']
Frequency
0.00
0.01
0.02
0.03
0.04
−5.0
−2.5
0.0
2.5
5.0
7.5
10.0
12.5
Flux

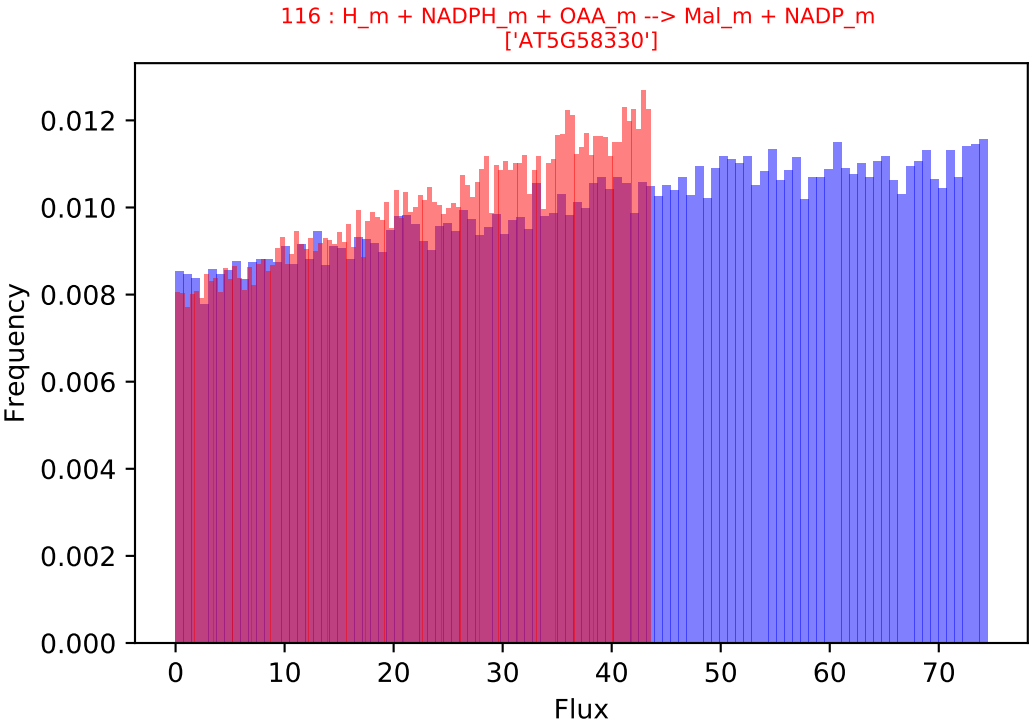

111 : H_c + Mal_c + NADP_c --> CO2_c + NADPH_c + Pyr_c
['4*AT2G19900', 'AT5G25880', 'AT5G11670']
Frequency
0.00
0.02
0.04
0.06
0.08
0
1
2
3
4
5
6
Flux

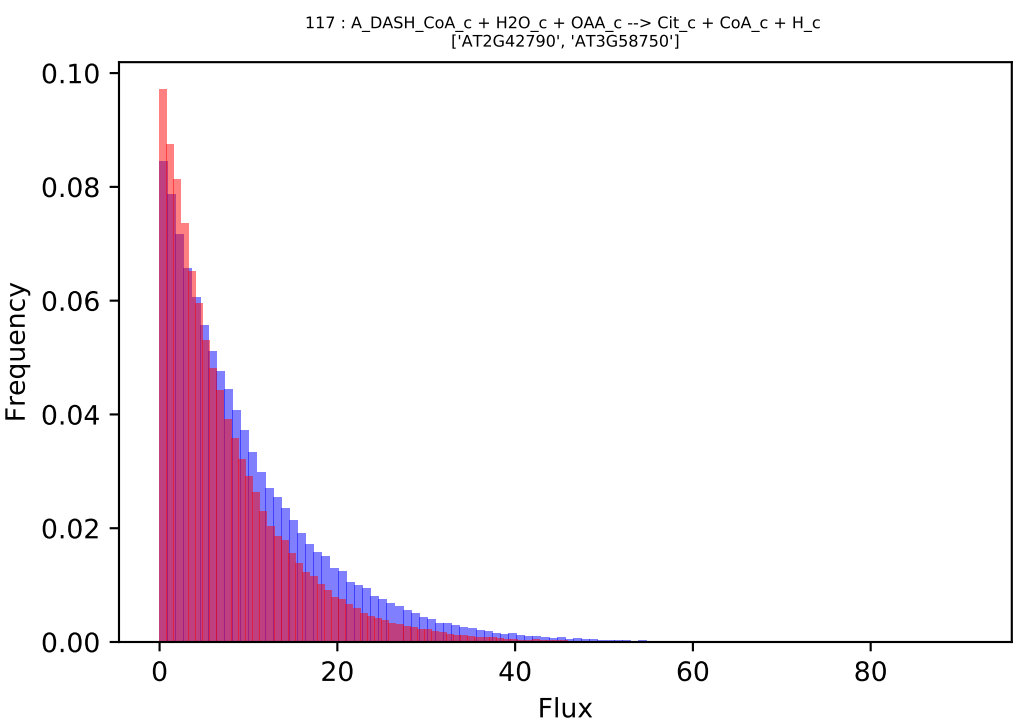

112 : Mal_h + NADP_h --> CO2_h + NADPH_h + Pyr_h
['AT1G79750', '4*AT5G11670', 'AT5G25880']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0
2
4
6
8
10
12
Flux

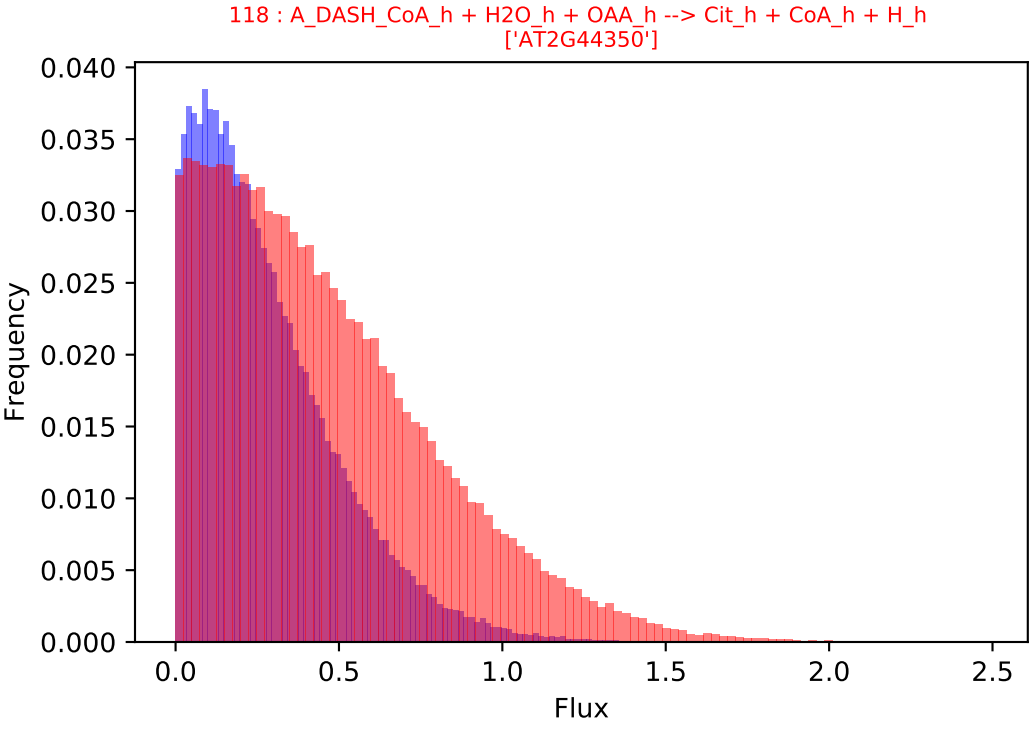

113 : Mal_h + NAD_h <=> H_h + NADH_h + OAA_h
['AT1G04410', 'AT2G22780', 'AT5G09660', 'AT1G53240', 'AT3G47520']
Frequency
0.012
0.010
0.008
0.006
0.004
0.002
0.000
0
10
20
30
40
50
60
70
80
Flux

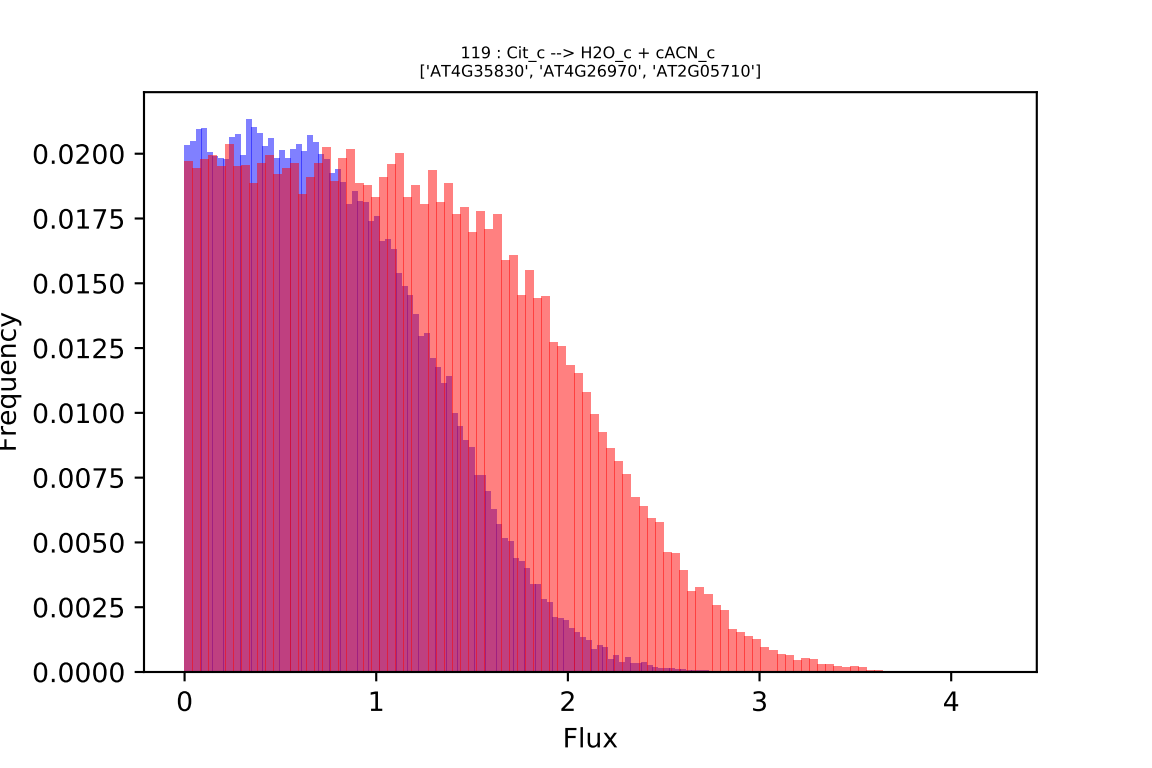

114 : NADPH_c + OAA_c --> Mal_c + NADP_c
['AT5G58330']
Frequency
0.000
0.002
0.004
0.006
0.008
0.010
0
10
20
30
40
50
60
70
Flux

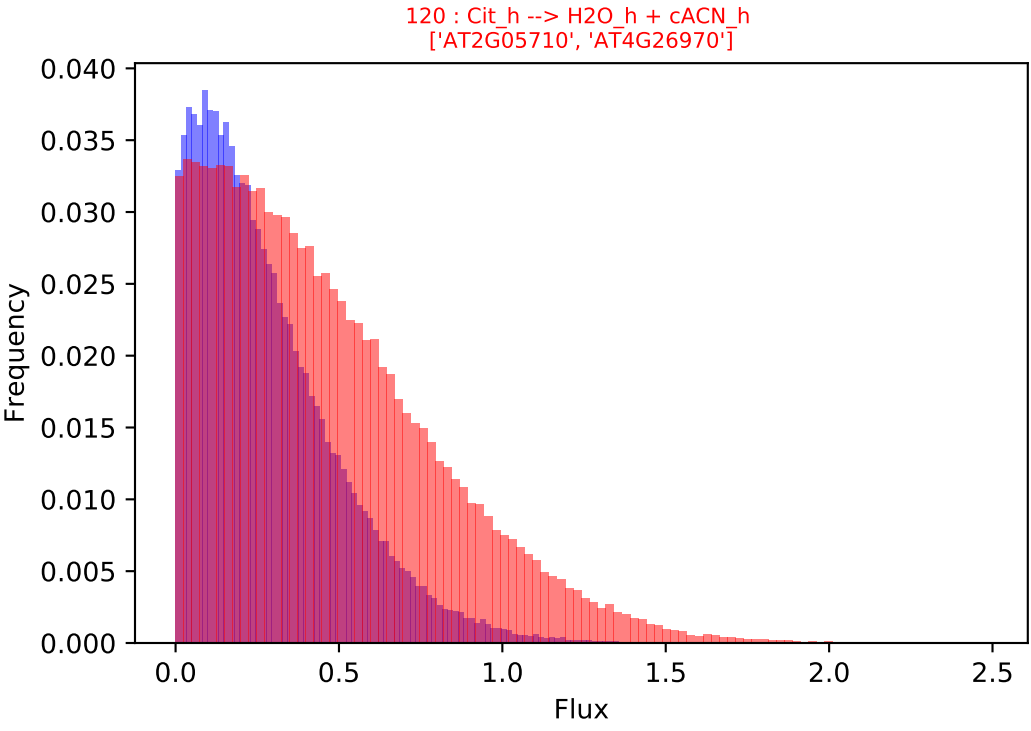

115 : H_h + NADPH_h + OAA_h --> Mal_h + NADP_h
['AT5G58330']
Frequency
0.000
0.002
0.004
0.006
0.008
0.010
0
10
20
30
40
50
60
70
Flux

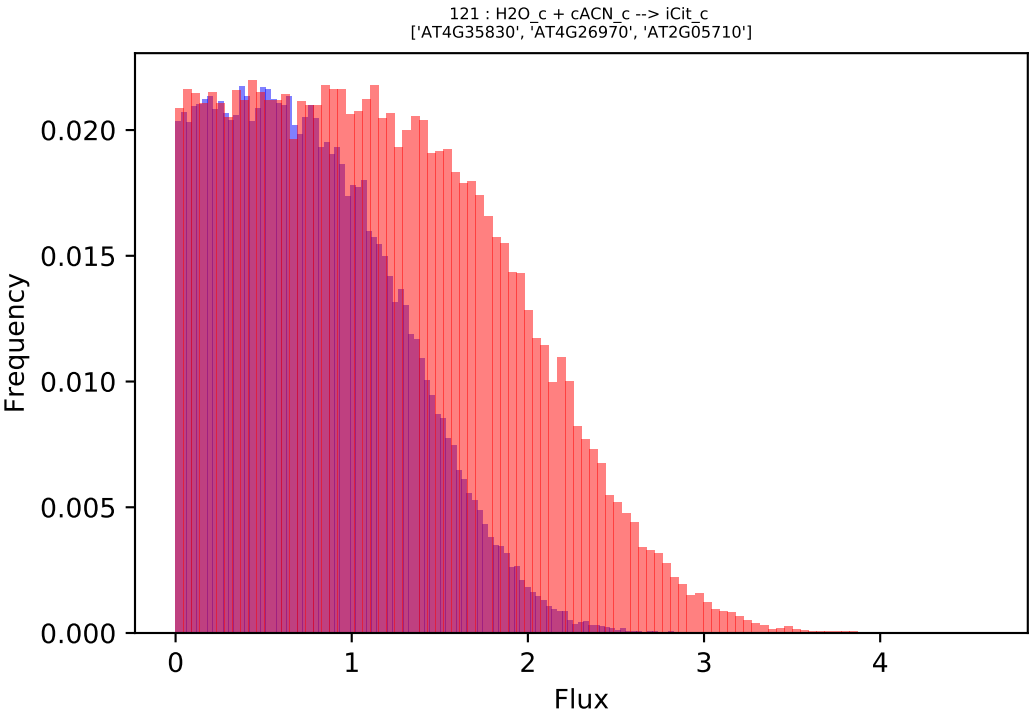

116 : H_m + NADPH_m + OAA_m --> Mal_m + NADP_m
['AT5G58330']
Frequency
0.000
0.002
0.004
0.006
0.008
0.010
0.012
0
10
20
30
40
50
60
70
Flux

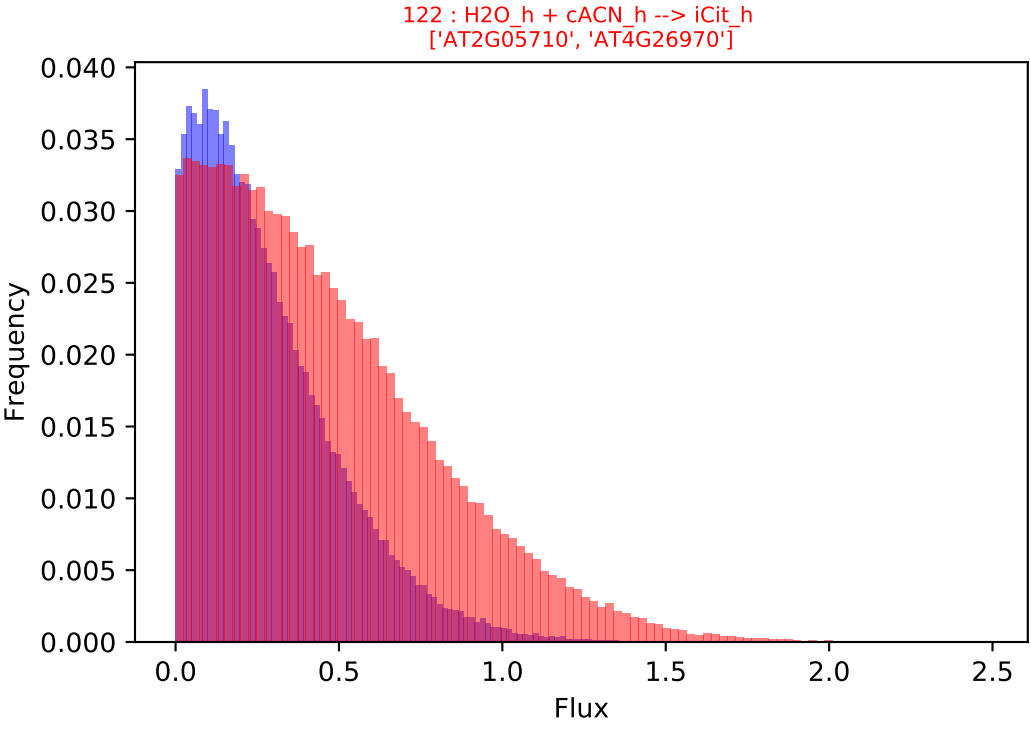

117 : A_DASH_CoA_c + H2O_c + OAA_c --> Cit_c + CoA_c + H_c
['AT2G42790', 'AT3G58750']
Frequency
0.10
0.08
0.06
0.04
0.02
0.00
0
20
40
60
80
Flux

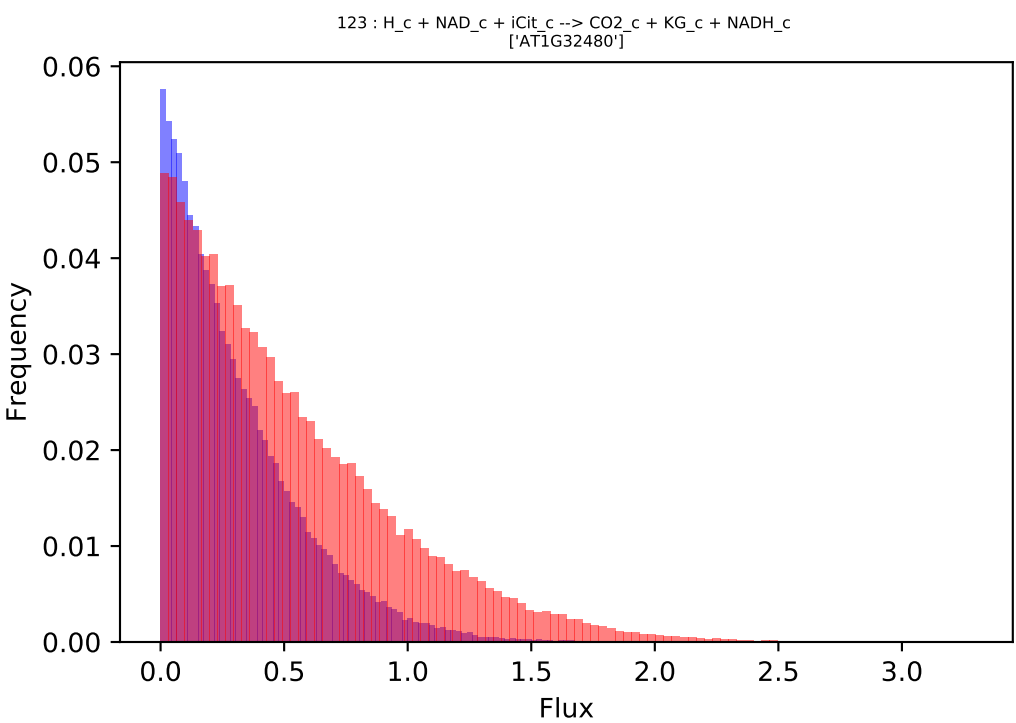

118 : A_DASH_CoA_h + H2O_h + OAA_h --> Cit_h + CoA_h + H_h
['AT2G44350']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
Flux

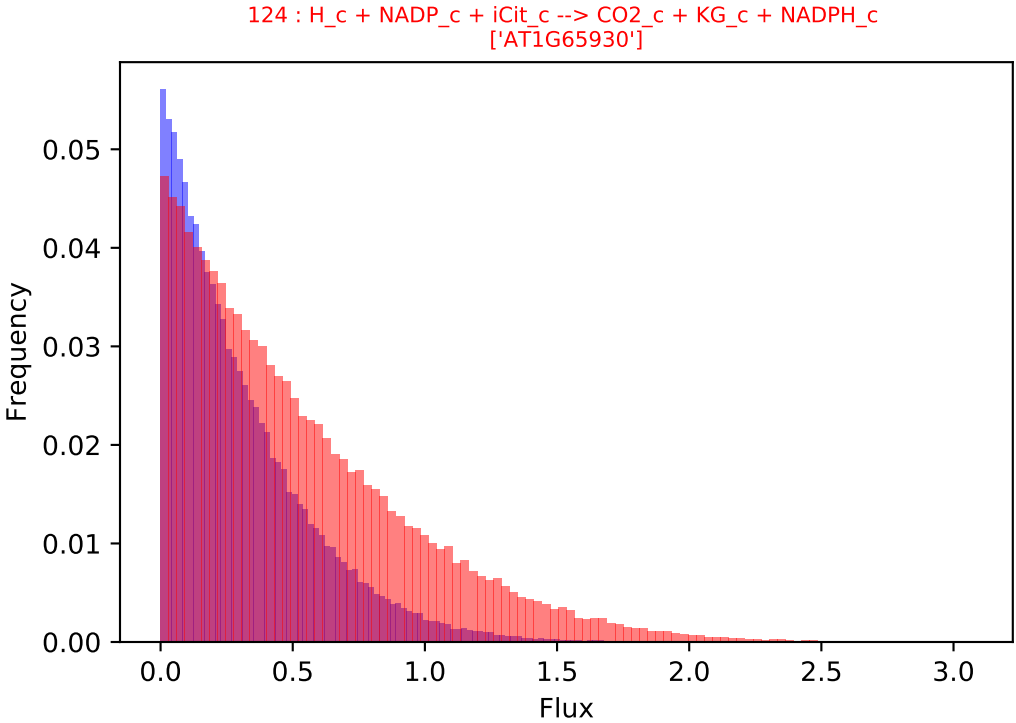

119 : Cit_c --> H2O_c + cACN_c
['AT4G35830', 'AT4G26970', 'AT2G05710']
Frequency
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
0
1
2
3
4
Flux

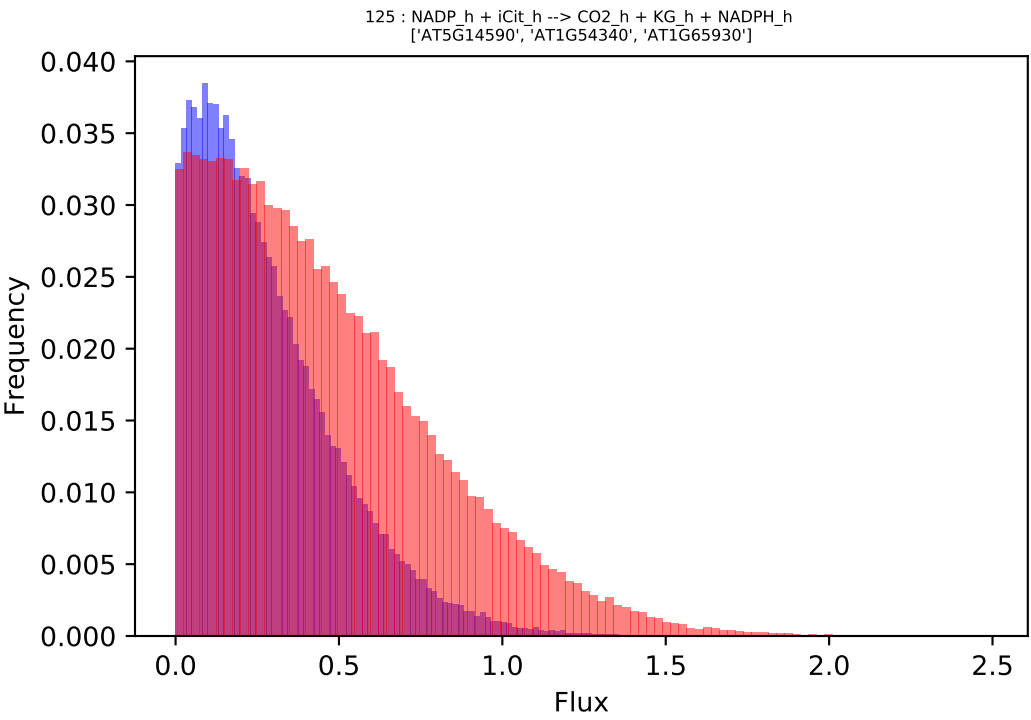

120 : Cit_h --> H2O_h + cACN_h
['AT2G05710', 'AT4G26970']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
Flux

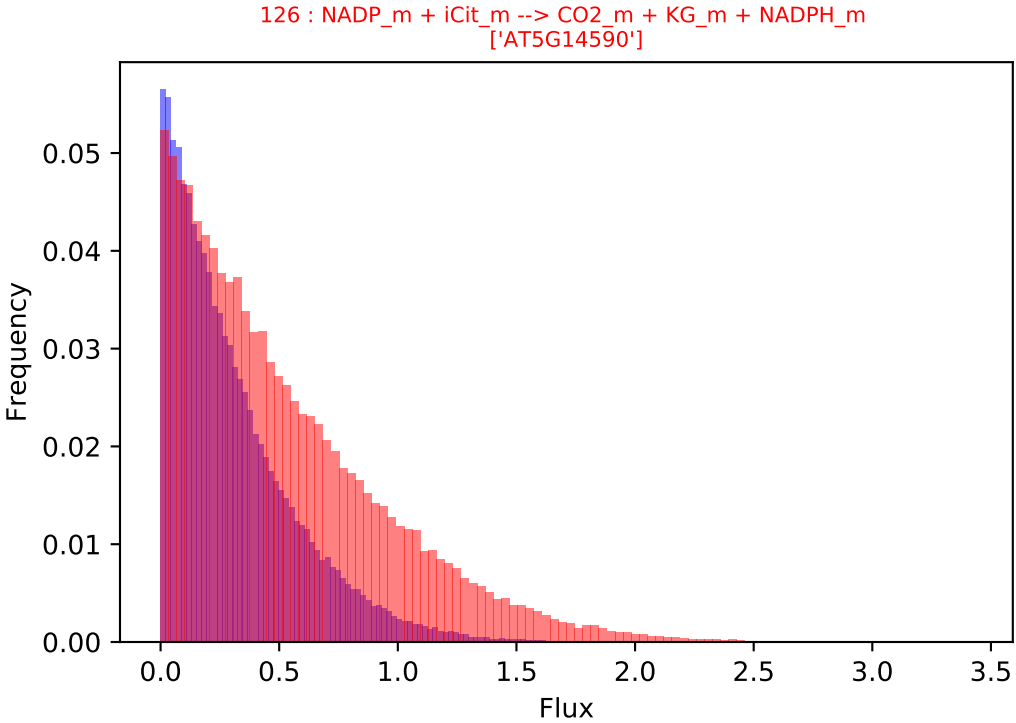

121 : H2O_c + cACN_c --> iCit_c
['AT4G35830', 'AT4G26970', 'AT2G05710']
Frequency
0.020
0.015
0.010
0.005
0.000
0
1
2
3
4
Flux

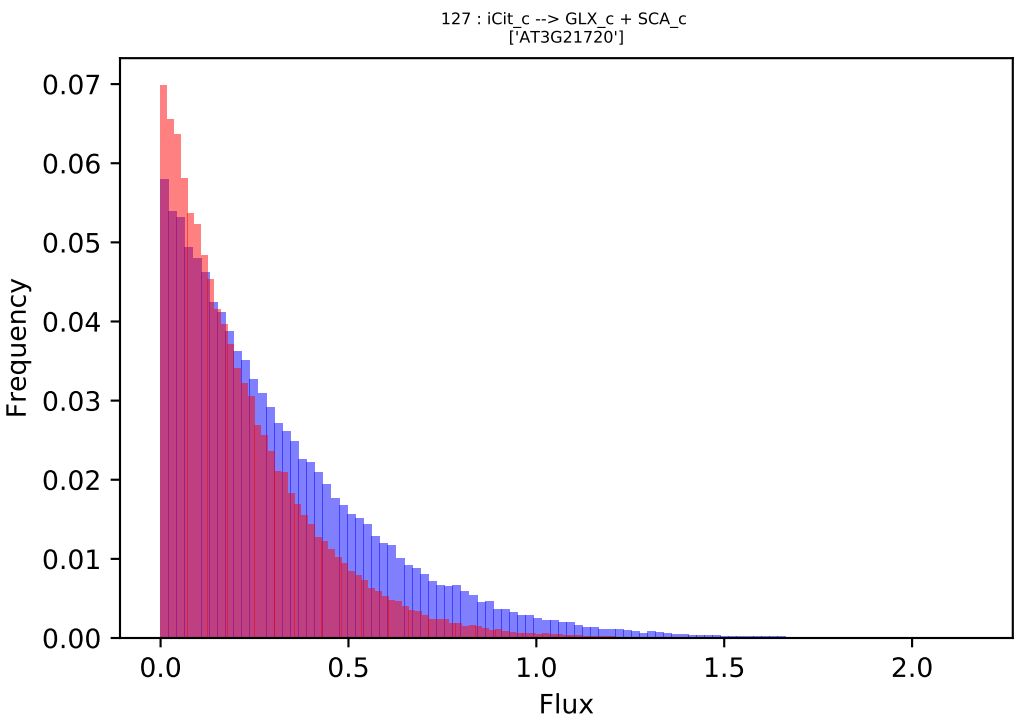

122 : H2O_h + cACN_h --> iCit_h
['AT2G05710', 'AT4G26970']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
Flux

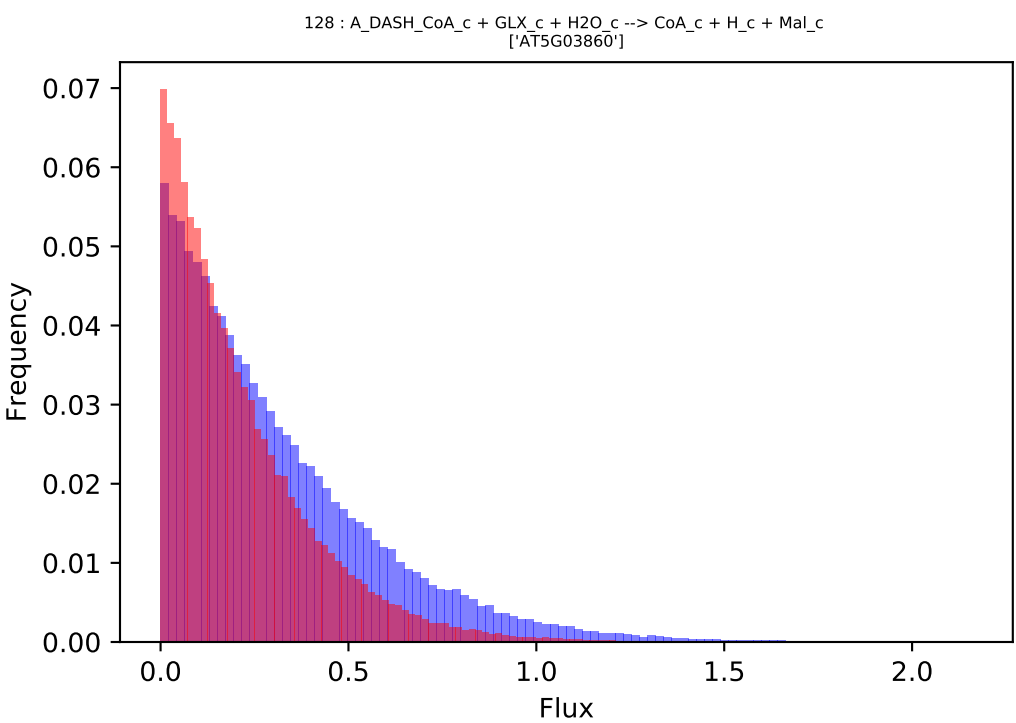

123 : H_c + NAD_c + iCit_c --> CO2_c + KG_c + NADH_c
['AT1G32480']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.5
1.0
1.5
2.0
2.5
3.0

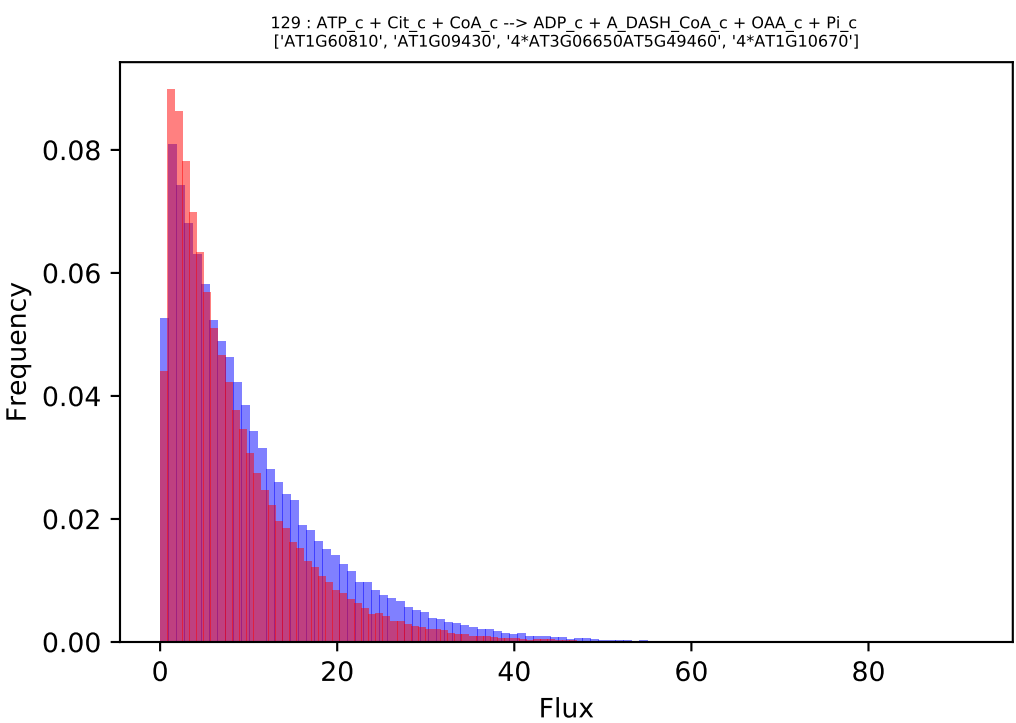

124 : H_c + NADP_c + iCit_c --> CO2_c + KG_c + NADPH_c
['AT1G65930']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Flux

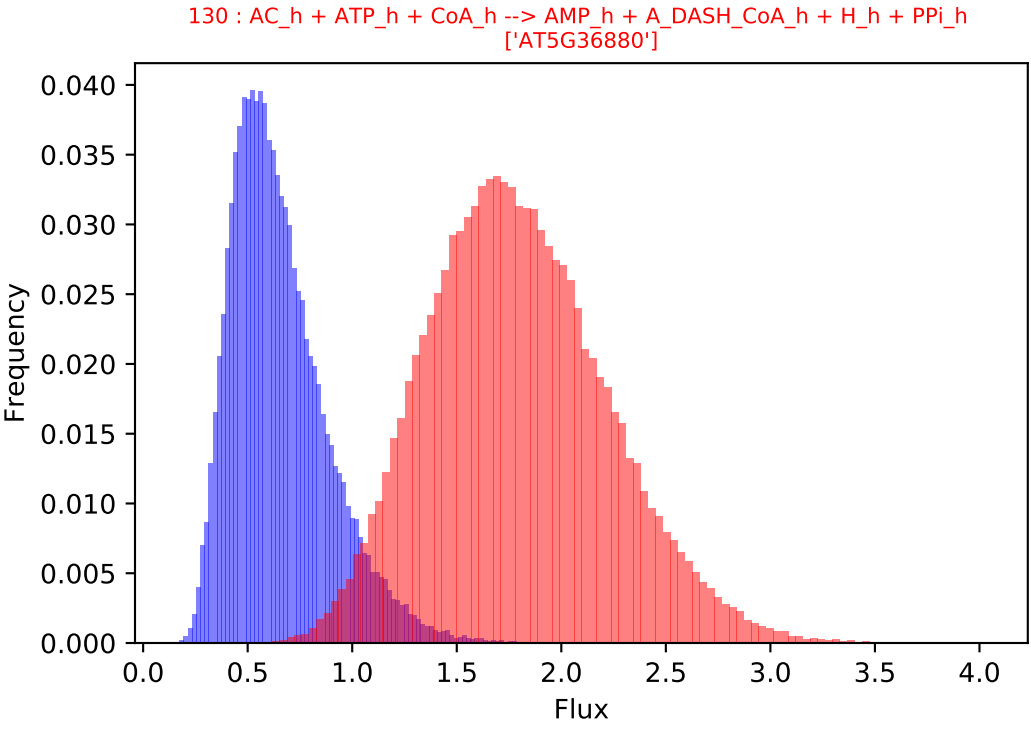

125 : NADP_h + iCit_h --> CO2_h + KG_h + NADPH_h
['AT5G14590', 'AT1G54340', 'AT1G65930']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
Flux

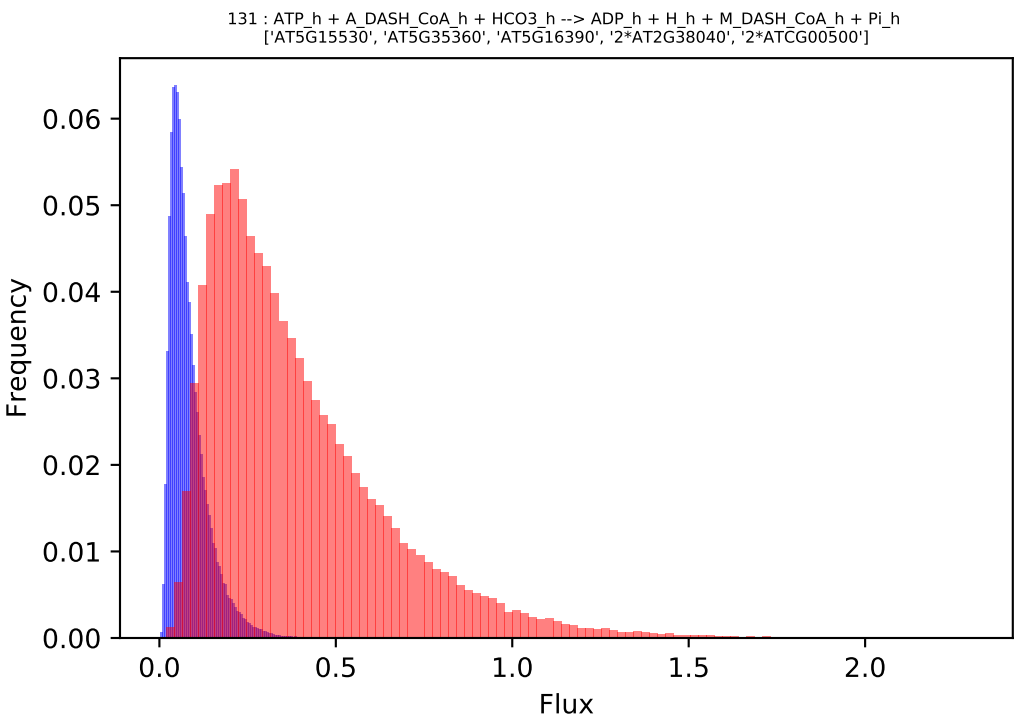

126 : NADP_m + iCit_m --> CO2_m + KG_m + NADPH_m
['AT5G14590']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
Flux

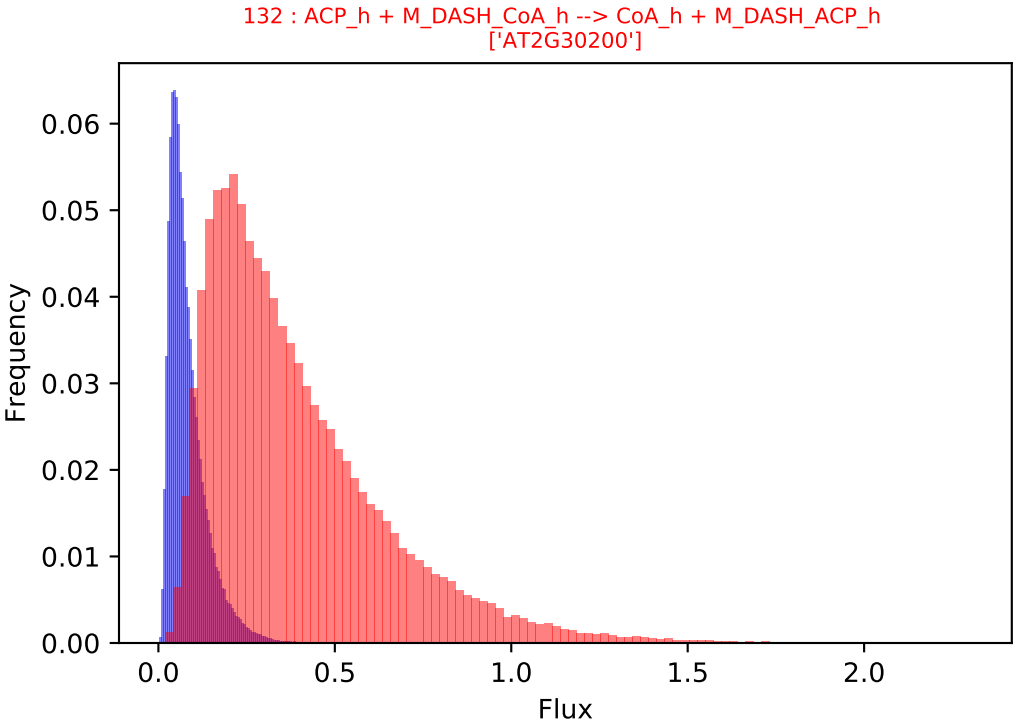

127 : iCit_c --> GLX_c + SCA_c
['AT3G21720']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.0
0.5
1.0
1.5
2.0
Flux

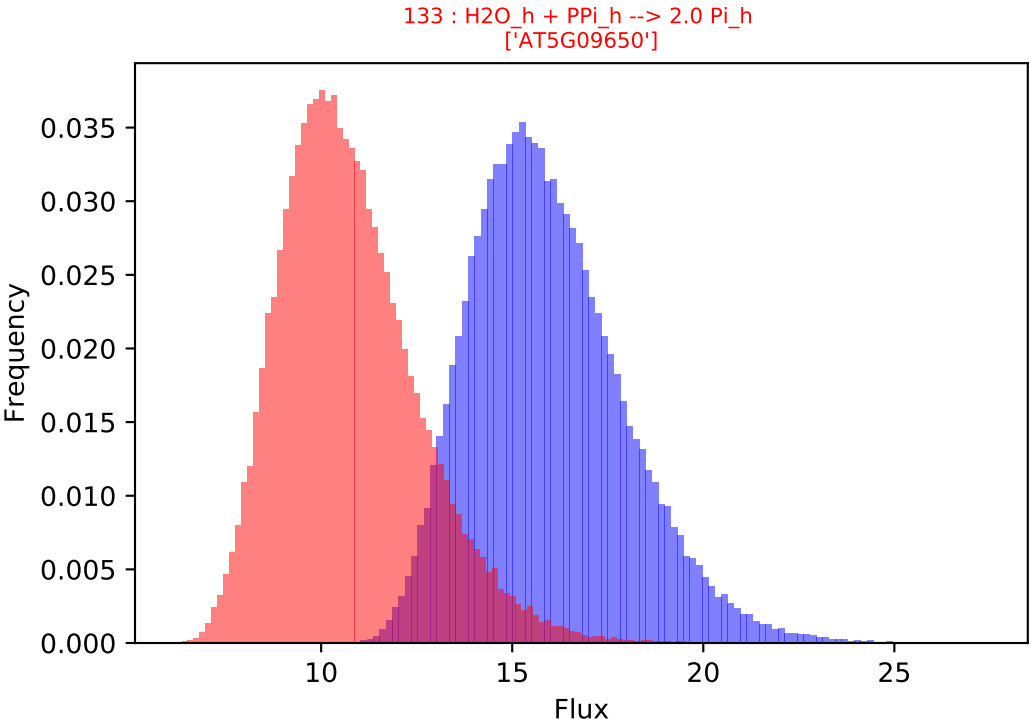

128 : A_DASH_CoA_c + GLX_c + H2O_c --> CoA_c + H_c + Mal_c
['AT5G03860']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.0
0.5
1.0
1.5
2.0
Flux

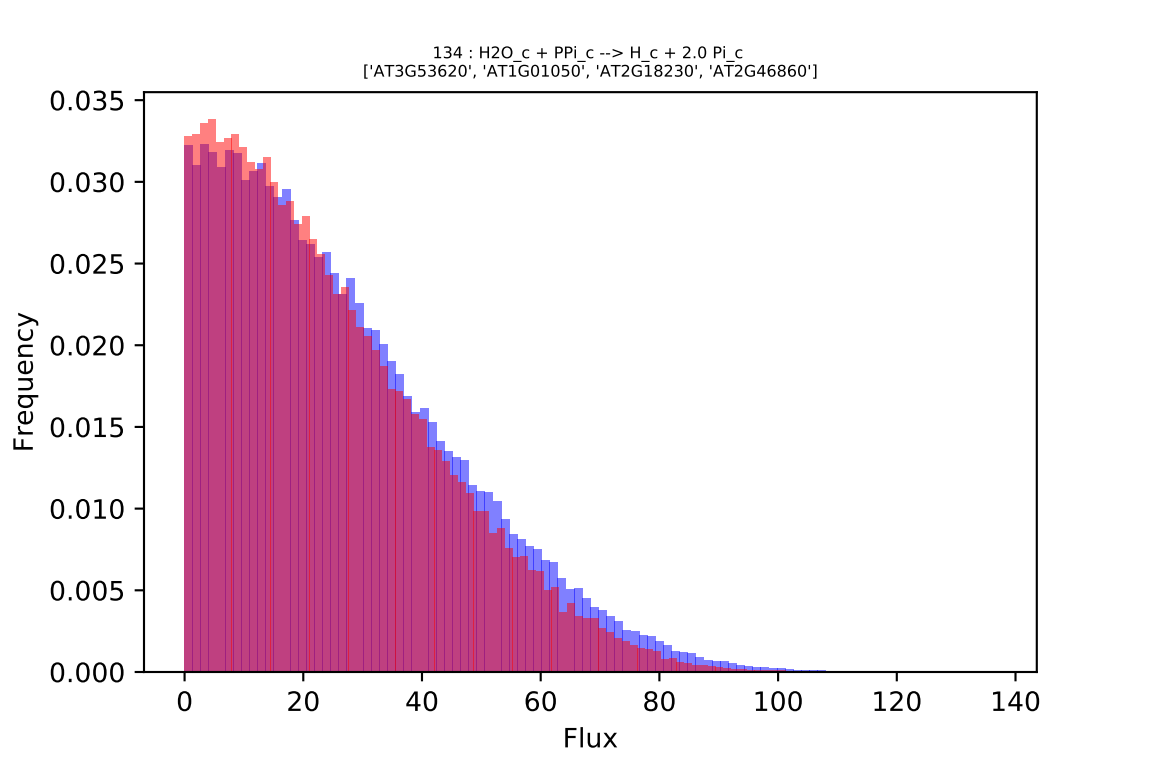

129 : ATP_c + Cit_c + CoA_c --> ADP_c + A_DASH_CoA_c + OAA_c + Pi_c
['AT1G60810', 'AT1G09430', '4*AT3G06650AT5G49460', '4*AT1G10670']
Frequency
0.00
0.02
0.04
0.06
0.08
0
20
40
60
80
Flux

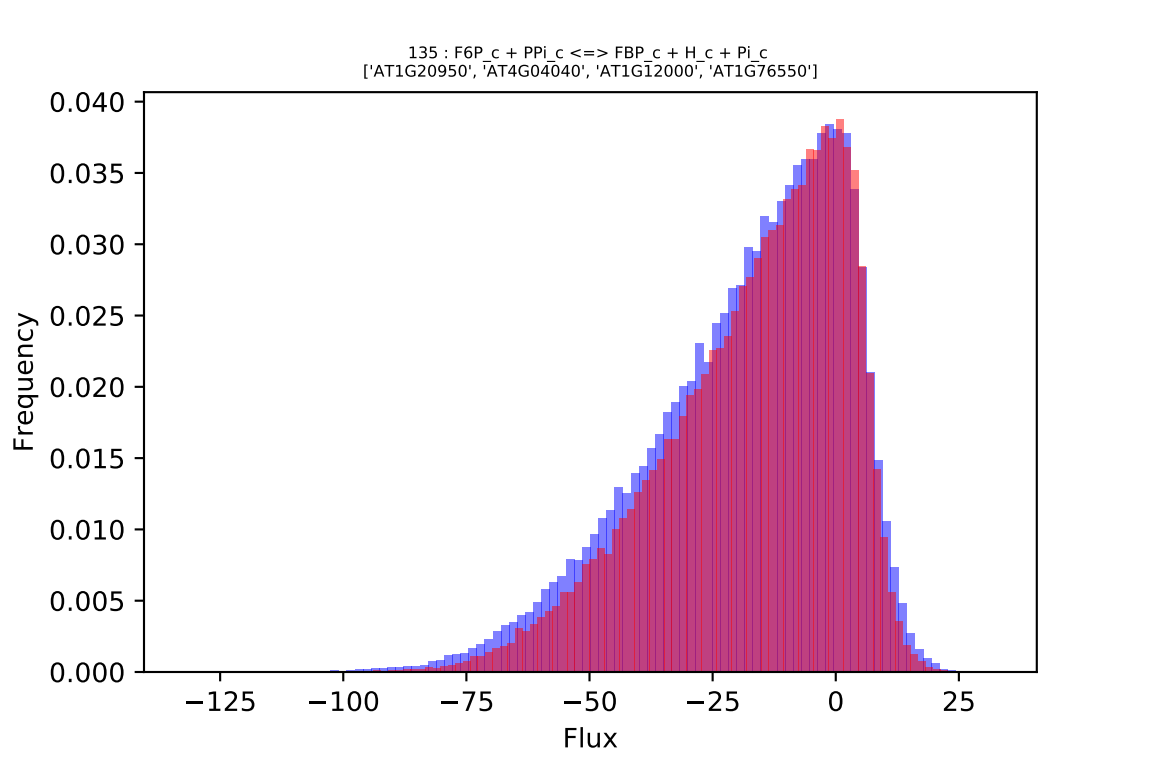

130 : AC_h + ATP_h + CoA_h --> AMP_h + A_DASH_CoA_h + H_h + PPi_h
['AT5G36880']
Frequency
Flux
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
0.040
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0

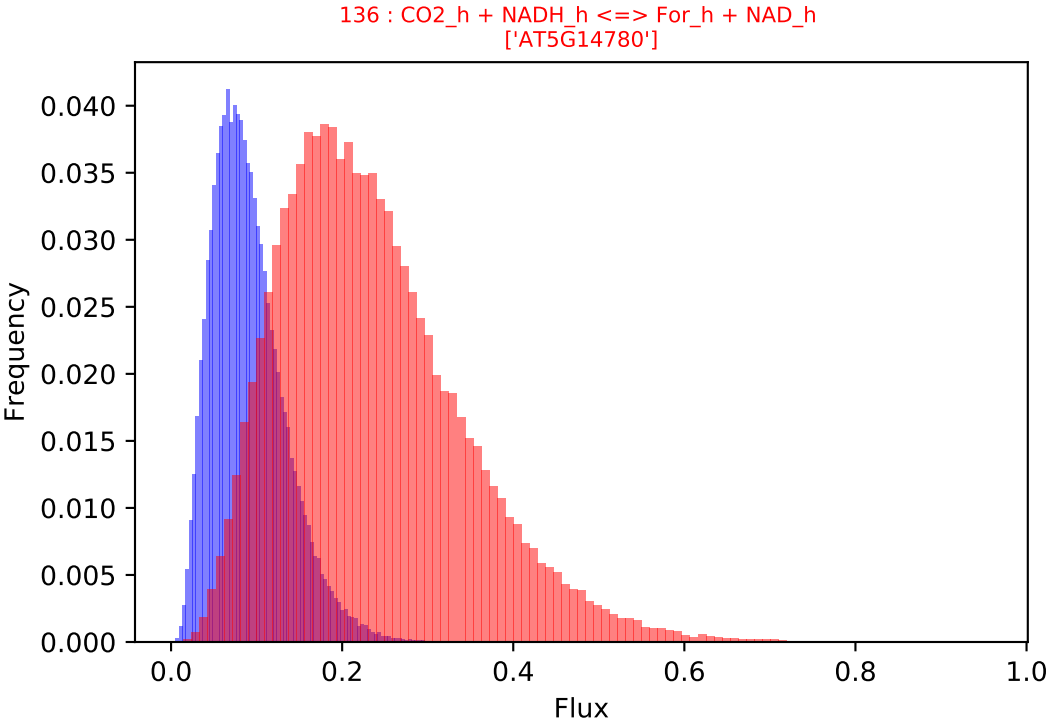

131 : ATP_h + A_DASH_CoA_h + HCO3_h --> ADP_h + H_h + M_DASH_CoA_h + Pi_h
['AT5G15530', 'AT5G35360', 'AT5G16390', '2*AT2G38040', '2*ATCG00500']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.5
1.0
1.5
2.0
Flux

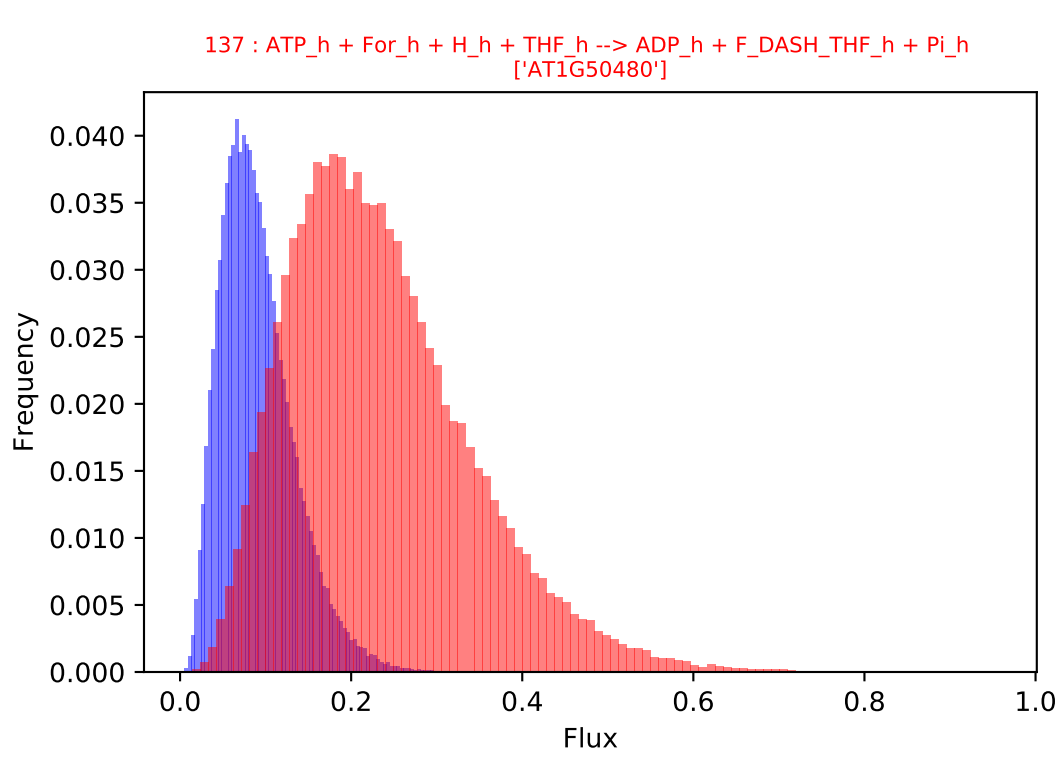

132 : ACP_h + M_DASH_CoA_h --> CoA_h + M_DASH_ACP_h
['AT2G30200']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.5
1.0
1.5
2.0
Flux

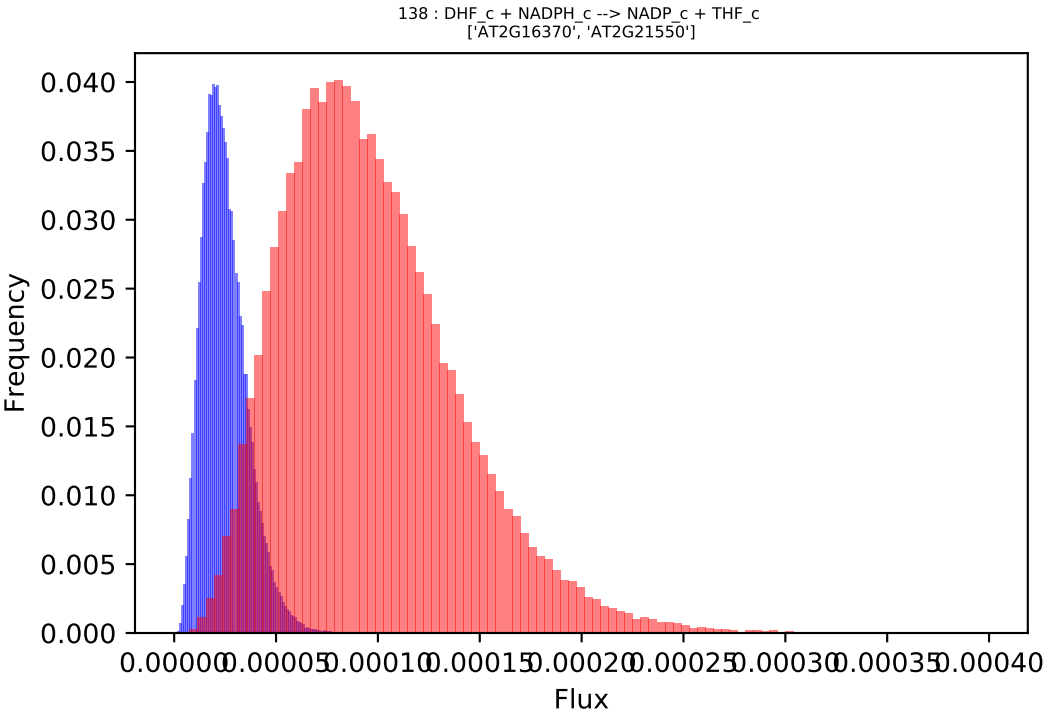

133 : H2O_h + PPi_h --> 2.0 Pi_h
['AT5G09650']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
10
15
20
25
Flux

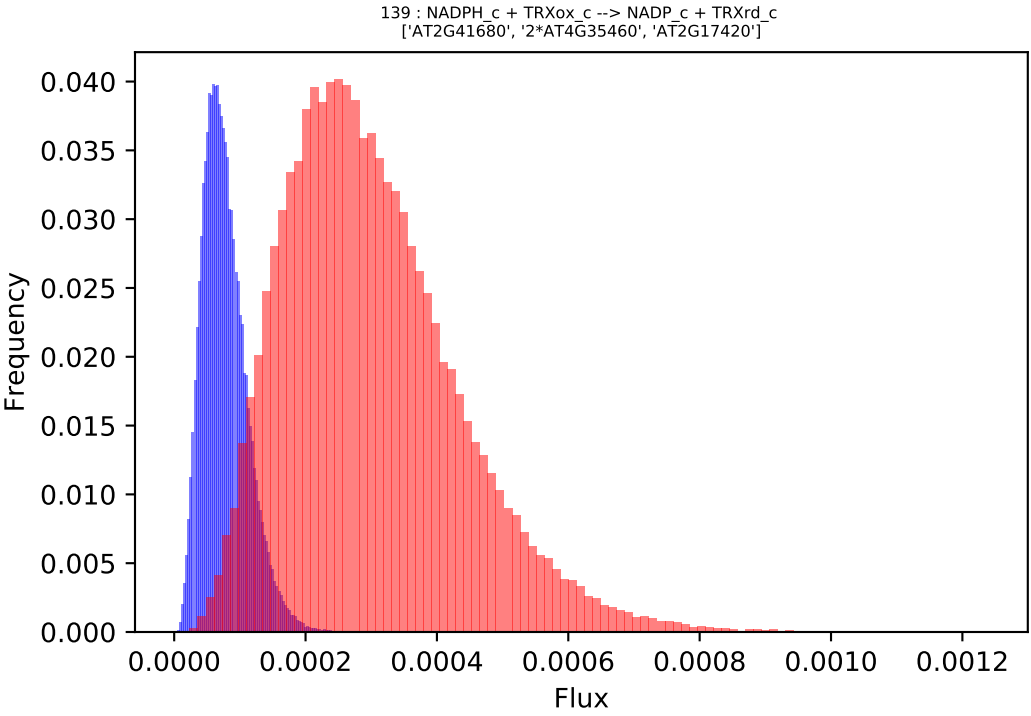

134 : H2O_c + PPi_c --> H_c + 2.0 Pi_c
['AT3G53620', 'AT1G01050', 'AT2G18230', 'AT2G46860']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0
20
40
60
80
100
120
140
Flux

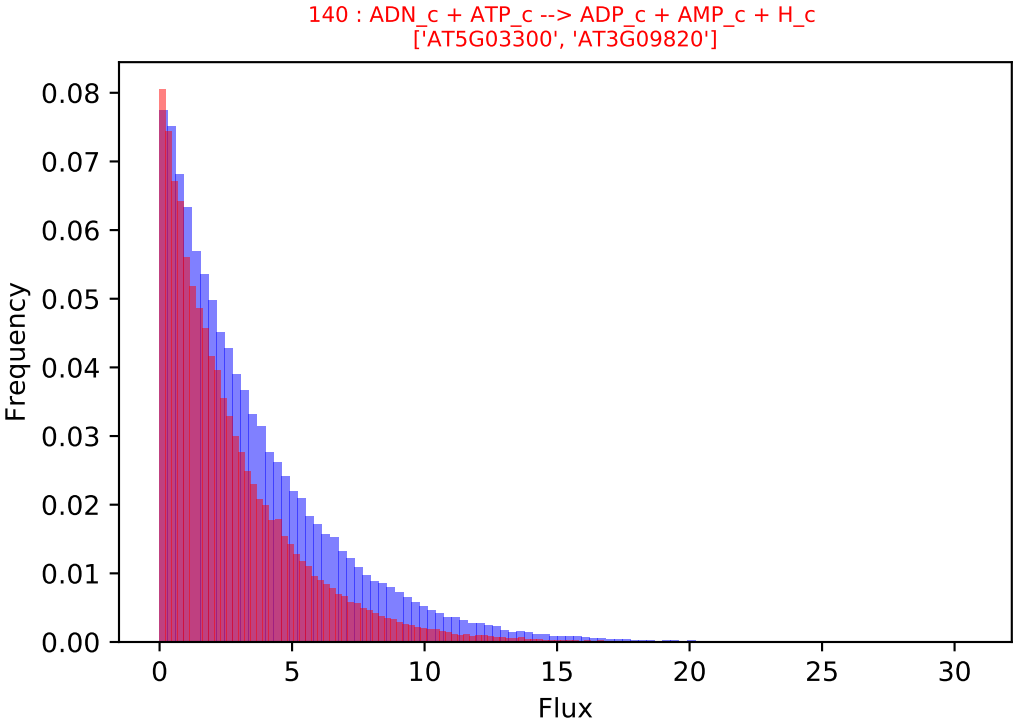

135 : F6P_c + PPi_c <=> FBP_c + H_c + Pi_c
['AT1G20950', 'AT4G04040', 'AT1G12000', 'AT1G76550']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−125
−100
−75
−50
−25
0
25
Flux

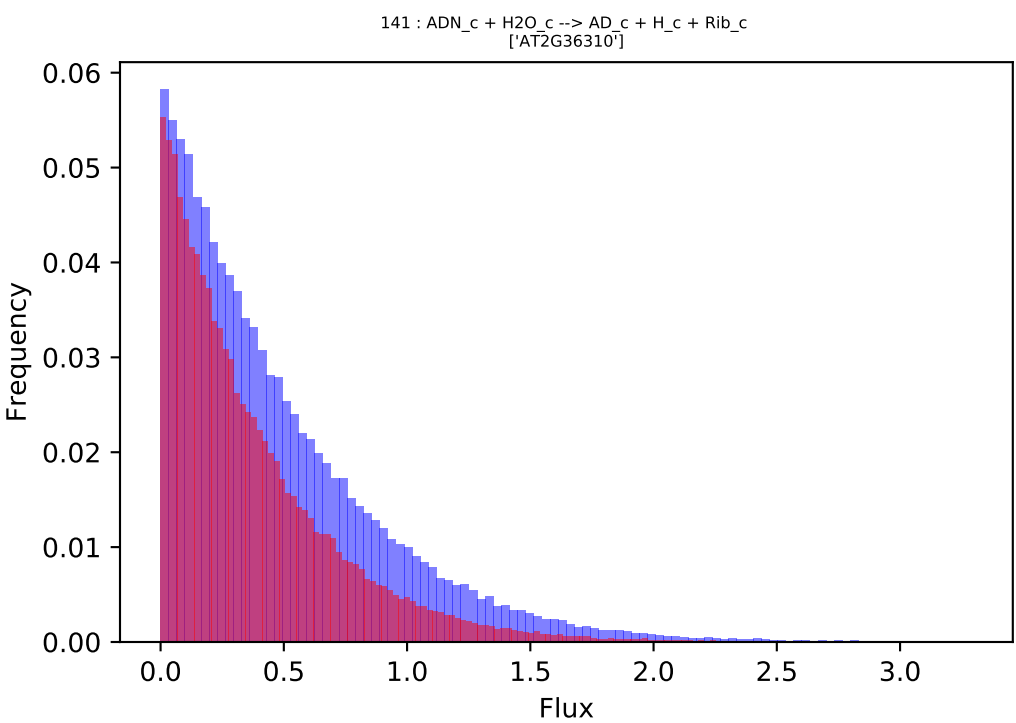

136 : CO2_h + NADH_h <=> For_h + NAD_h
['AT5G14780']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
Flux

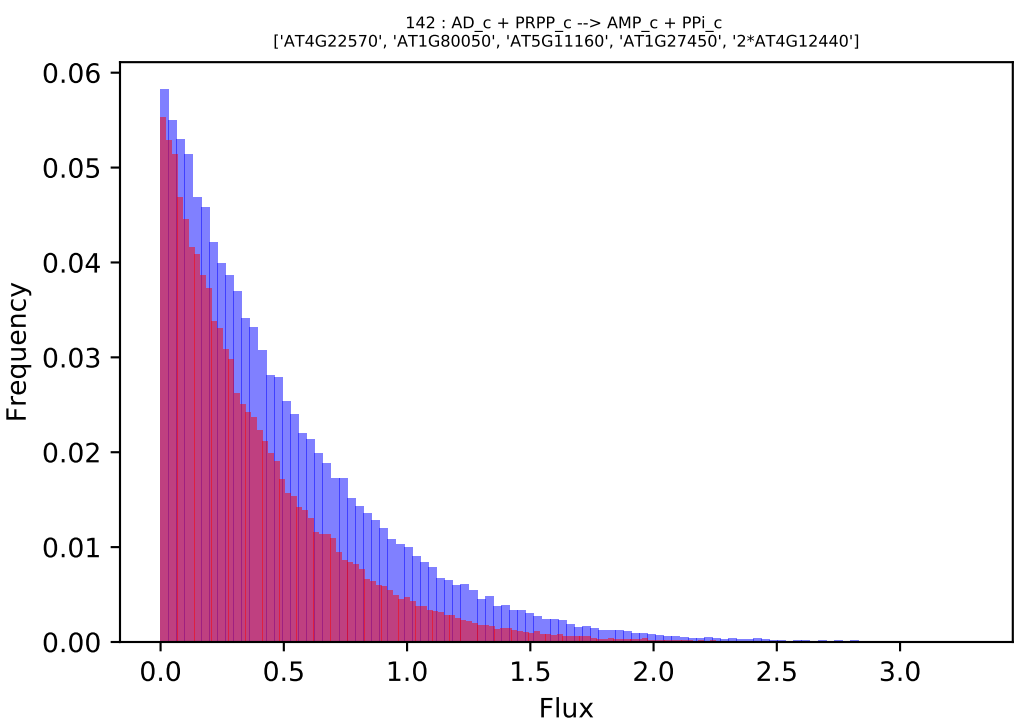

137 : ATP_h + For_h + H_h + THF_h --> ADP_h + F_DASH_THF_h + Pi_h
['AT1G50480']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
Flux

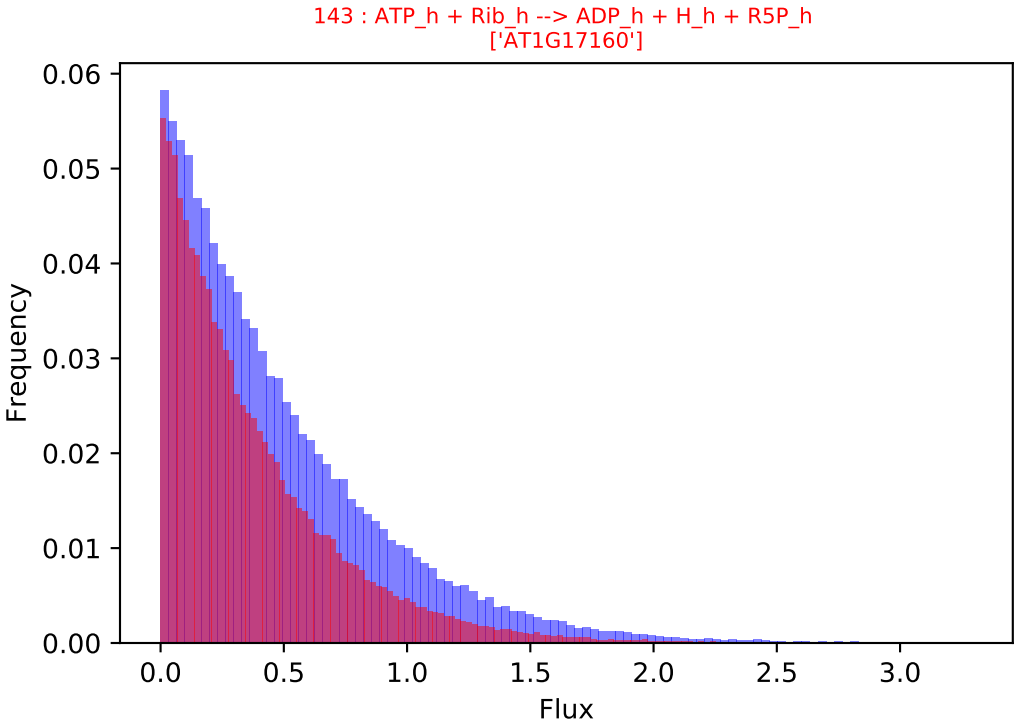

138 : DHF_c + NADPH_c --> NADP_c + THF_c
['AT2G16370', 'AT2G21550']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00005
0.00010
0.00015
0.00020
0.00025
0.00030
0.00035
0.00040
Flux

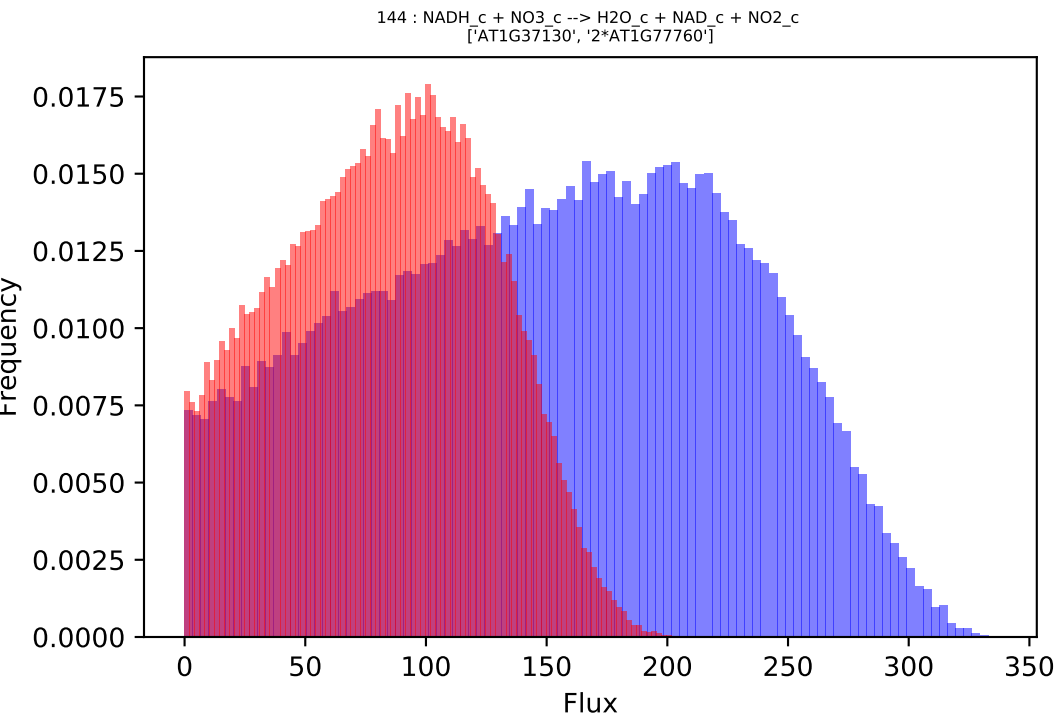

139 : NADPH_c + TRXox_c --> NADP_c + TRXrd_c
['AT2G41680', '2*AT4G35460', 'AT2G17420']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0000
0.0002
0.0004
0.0006
0.0008
0.0010
0.0012
Flux

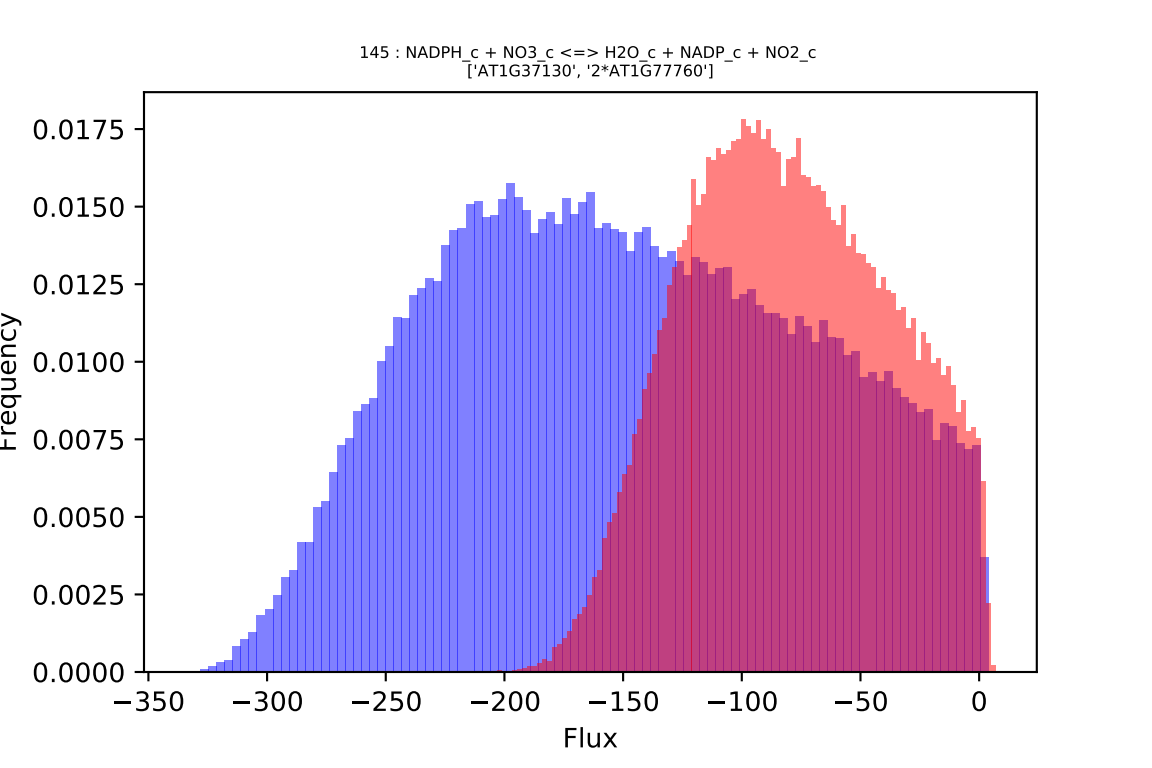

140 : ADN_c + ATP_c --> ADP_c + AMP_c + H_c
['AT5G03300', 'AT3G09820']
Frequency
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0
5
10
15
20
25
30
Flux

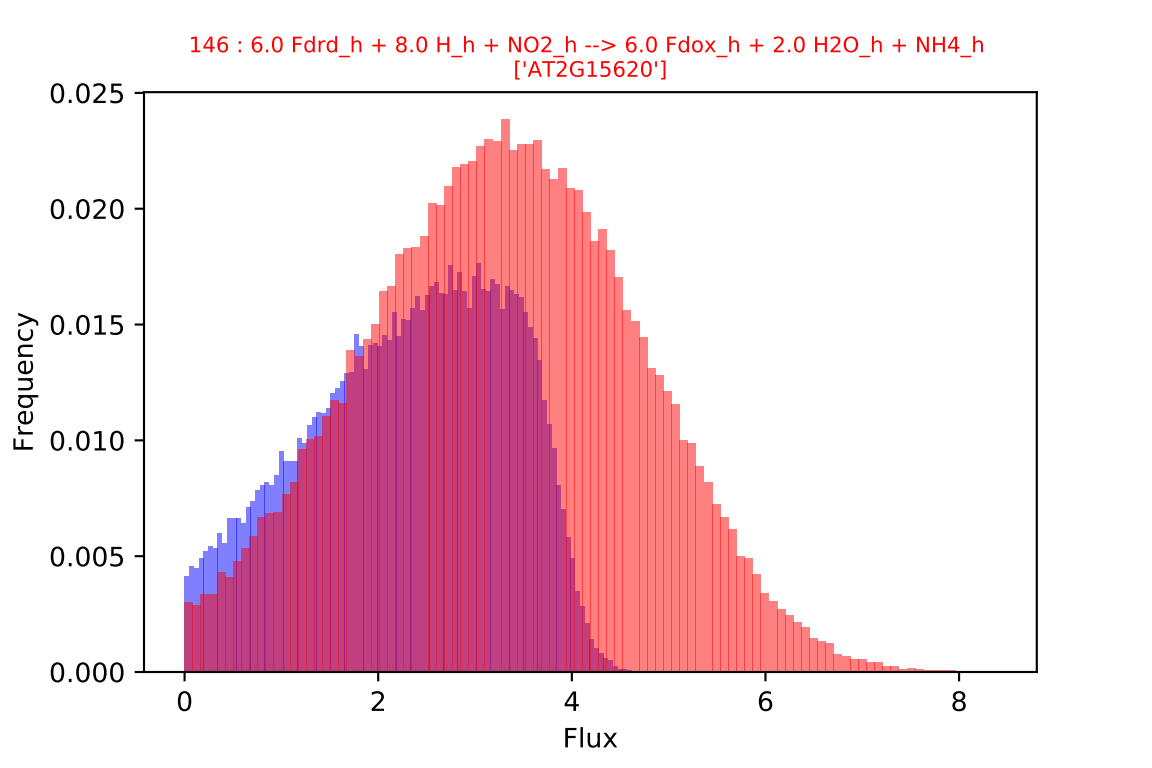

141 : ADN_c + H2O_c --> AD_c + H_c + Rib_c
['AT2G36310']
Frequency
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Flux

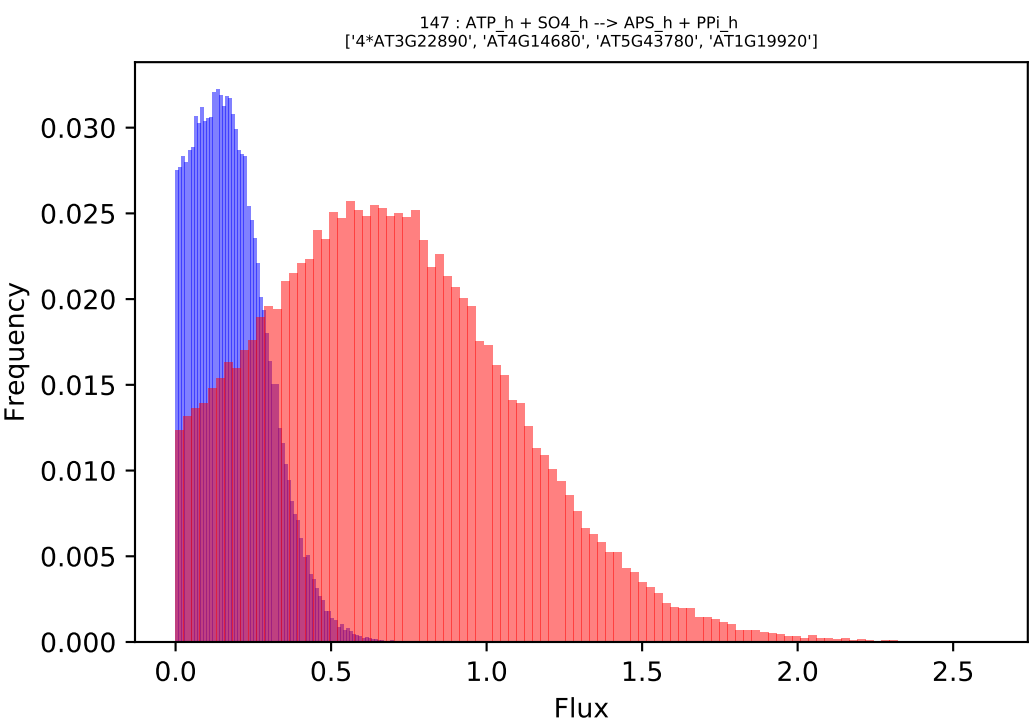

142 : AD_c + PRPP_c --> AMP_c + PPi_c
['AT4G22570', 'AT1G80050', 'AT5G11160', 'AT1G27450', '2*AT4G12440']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.5
1.0
1.5
2.0
2.5
3.0

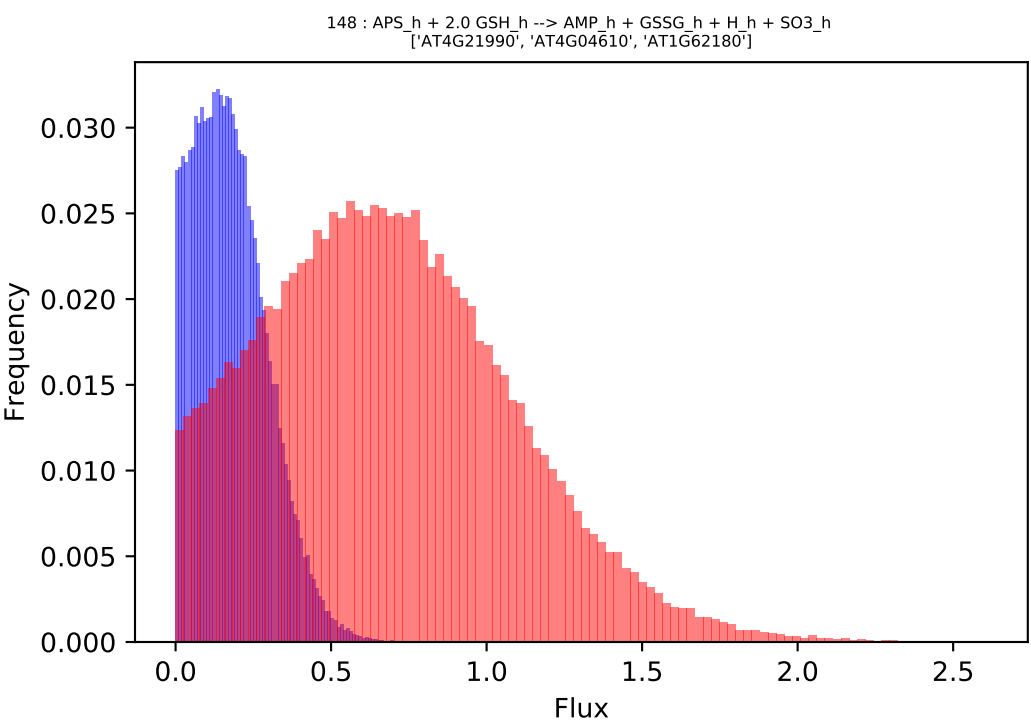

143 : ATP_h + Rib_h --> ADP_h + H_h + R5P_h
['AT1G17160']
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Flux

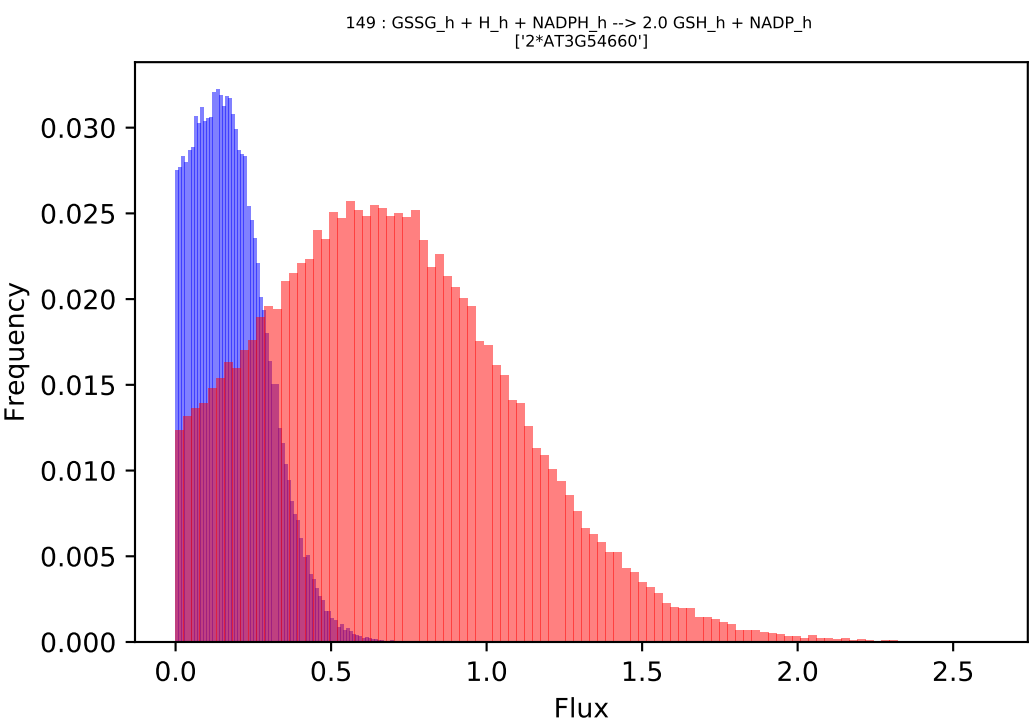

144 : NADH_c + NO3_c --> H2O_c + NAD_c + NO2_c
['AT1G37130', '2*AT1G77760']
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
Frequency
0
50
100
150
200
250
300
350
Flux

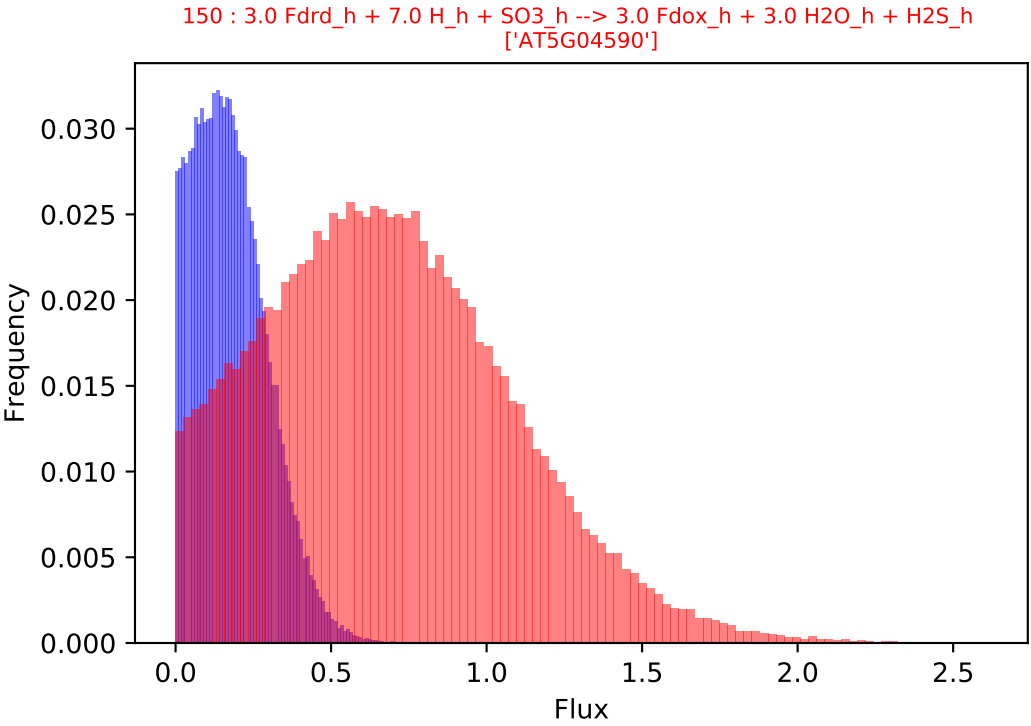

145 : NADPH_c + NO3_c <=> H2O_c + NADP_c + NO2_c
['AT1G37130', '2*AT1G77760']
Frequency
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
−350
−300
−250
−200
−150
−100
−50
0
Flux

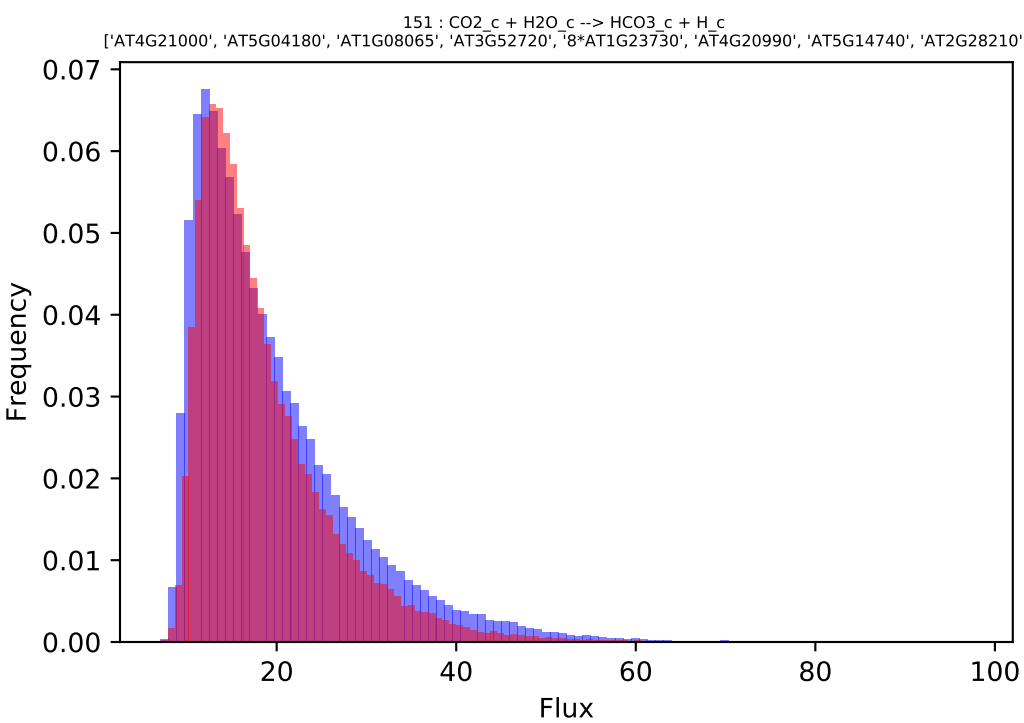

146 : 6.0 Fdrd_h + 8.0 H_h + NO2_h --> 6.0 Fdox_h + 2.0 H2O_h + NH4_h
['AT2G15620']
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
2
4
6
8
Flux

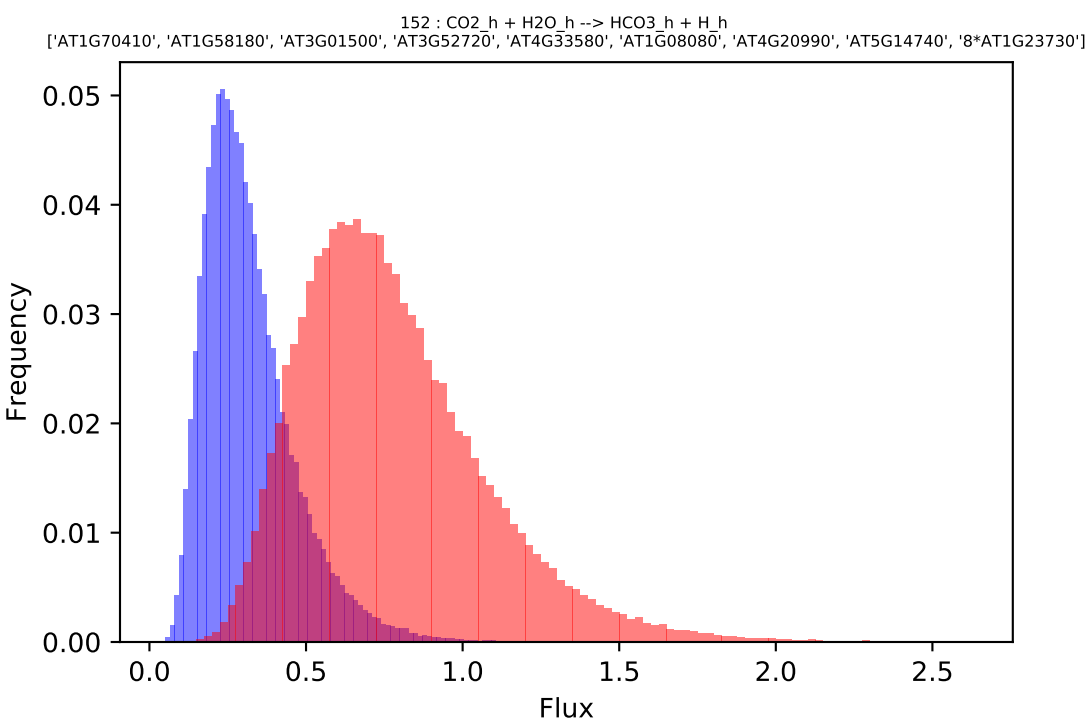

147 : ATP_h + SO4_h --> APS_h + PPi_h
['4*AT3G22890', 'AT4G14680', 'AT5G43780', 'AT1G19920']
Frequency
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.5
1.0
1.5
2.0
2.5
Flux

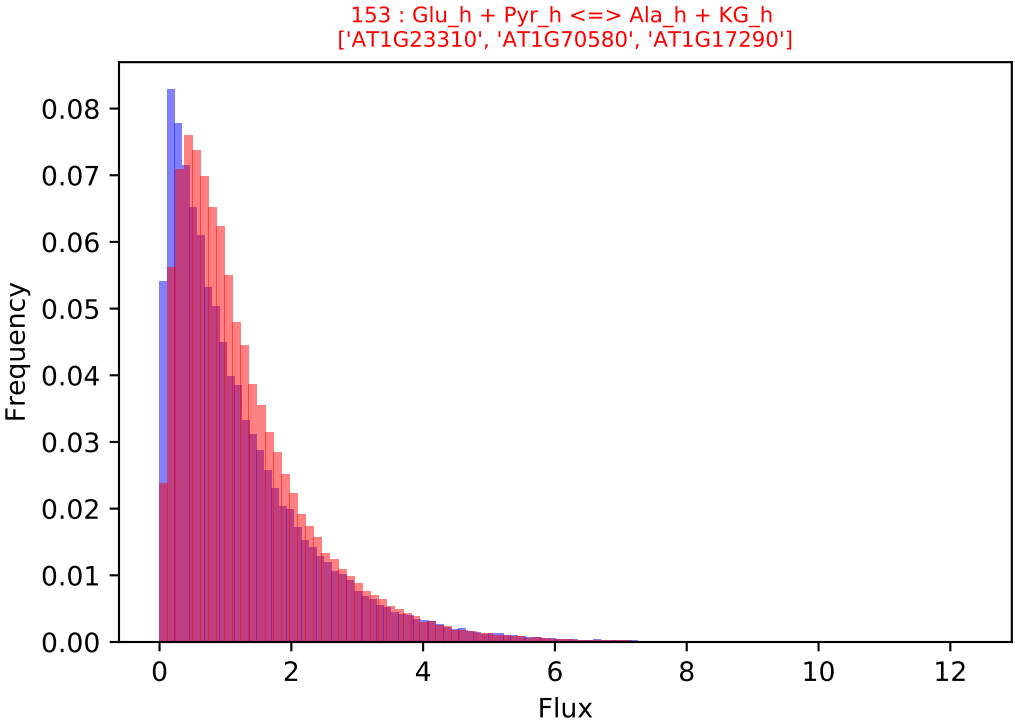

148 : APS_h + 2.0 GSH_h --> AMP_h + GSSG_h + H_h + SO3_h
['AT4G21990', 'AT4G04610', 'AT1G62180']
Frequency
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.5
1.0
1.5
2.0
2.5
Flux

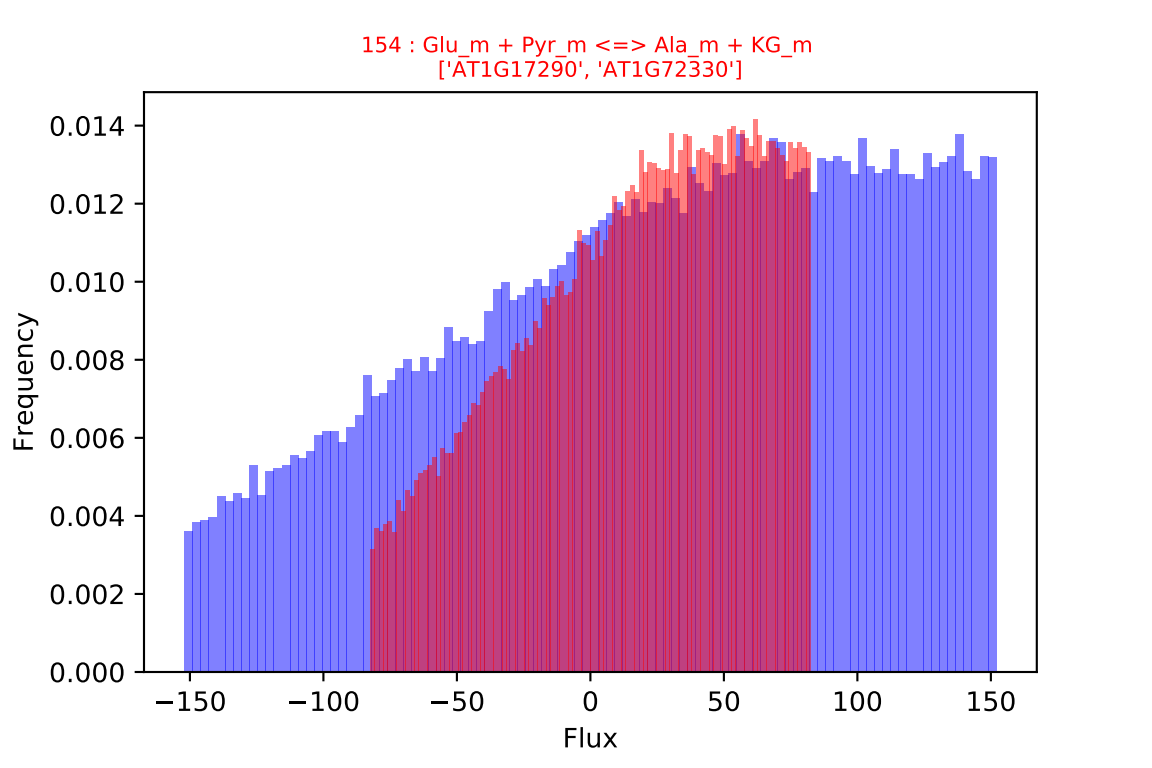

149 : GSSG_h + H_h + NADPH_h --> 2.0 GSH_h + NADP_h
['2*AT3G54660']
Frequency
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.5
1.0
1.5
2.0
2.5
Flux

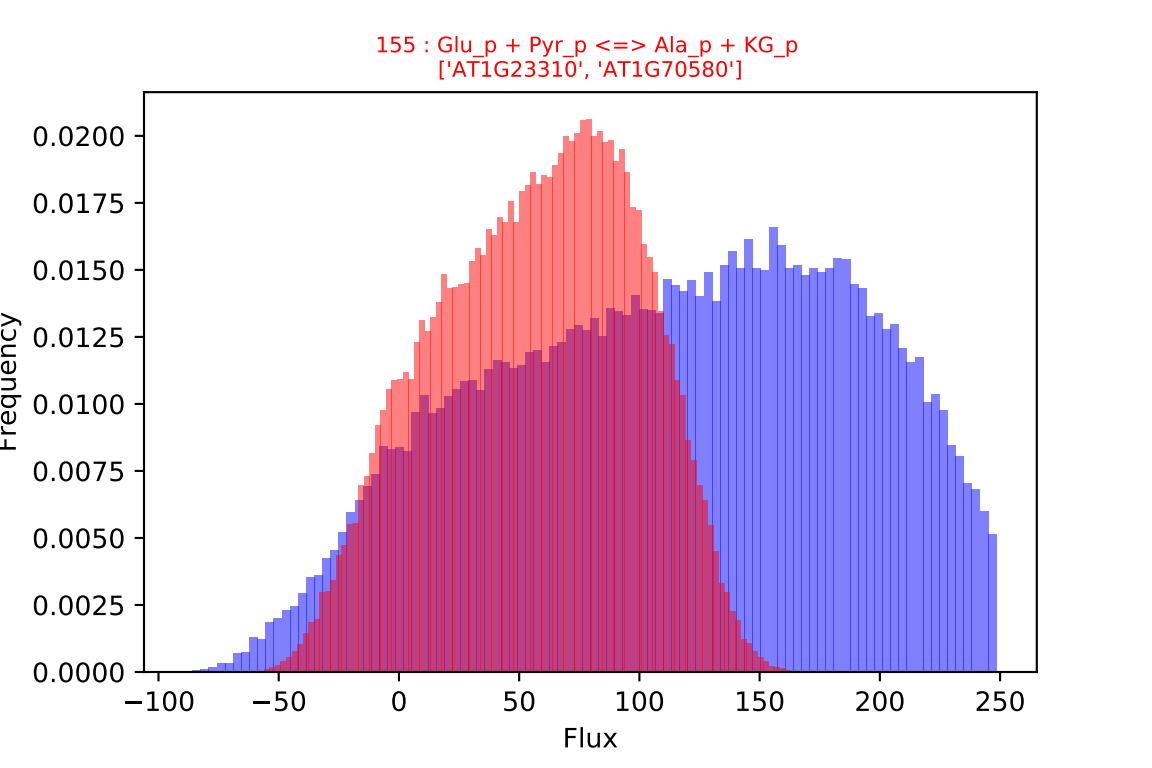

150 : 3.0 Fdrd_h + 7.0 H_h + SO3_h --> 3.0 Fdox_h + 3.0 H2O_h + H2S_h
['AT5G04590']
Frequency
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.5
1.0
1.5
2.0
2.5
Flux

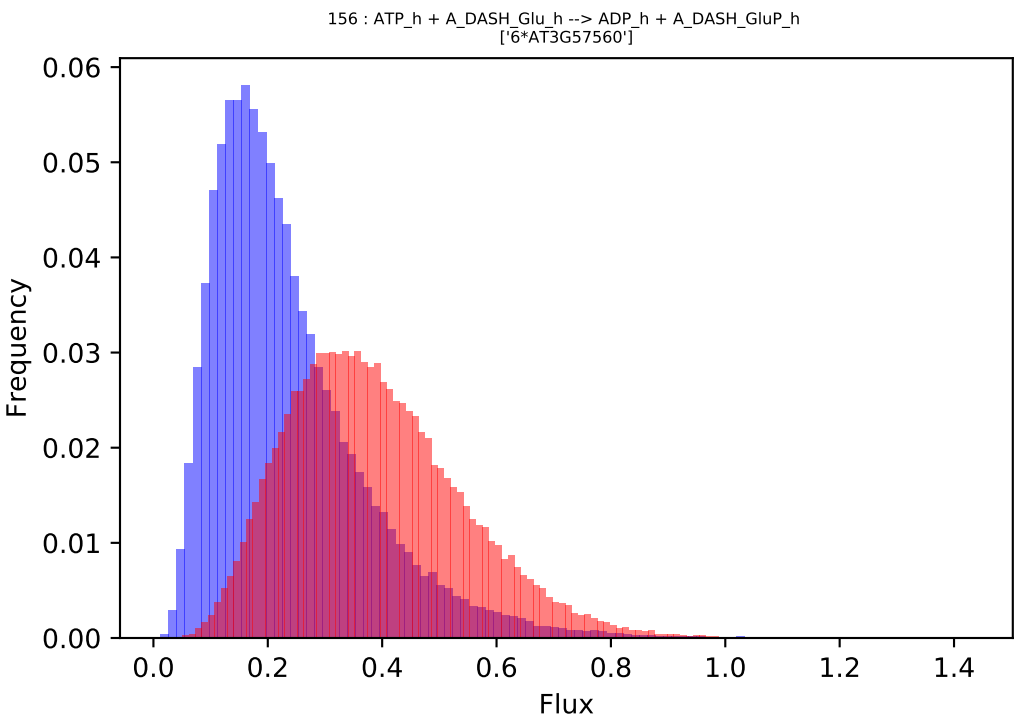

151 : CO2_c + H2O_c --> HCO3_c + H_c
['AT4G21000', 'AT5G04180', 'AT1G08065', 'AT3G52720', '8*AT1G23730', 'AT4G20990', 'AT5G14740', 'AT2G28210']
Frequency
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
20
40
60
80
100
Flux

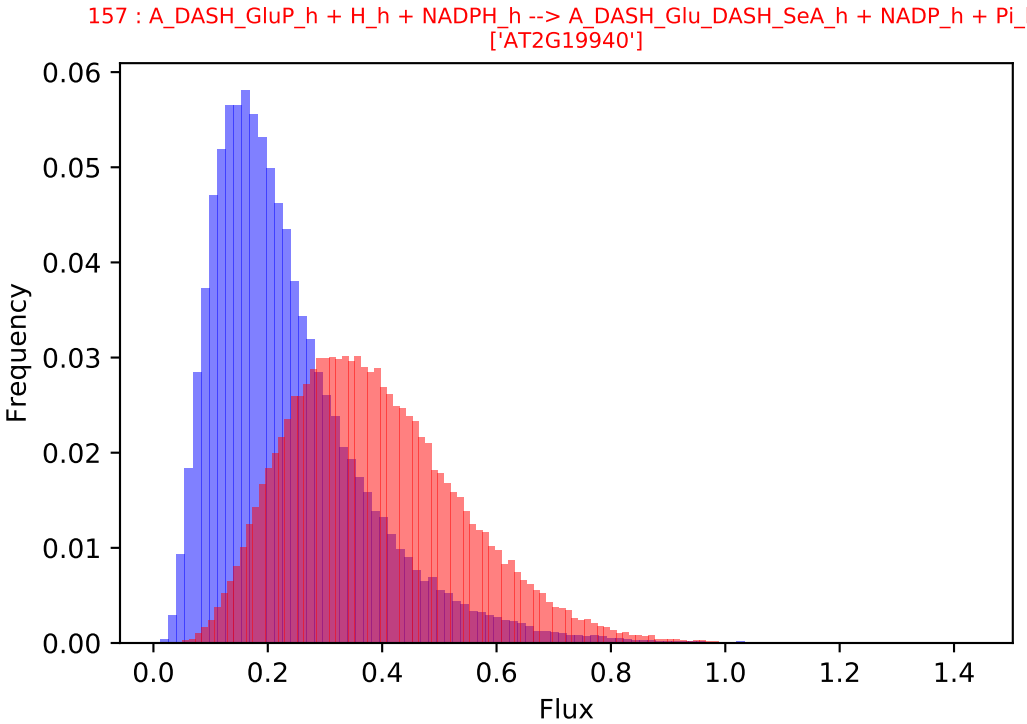

152 : CO2_h + H2O_h --> HCO3_h + H_h
['AT1G70410', 'AT1G58180', 'AT3G01500', 'AT3G52720', 'AT4G33580', 'AT1G08080', 'AT4G20990', 'AT5G14740', '8*AT1G23730']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.0
0.5
1.0
1.5
2.0
2.5
Flux

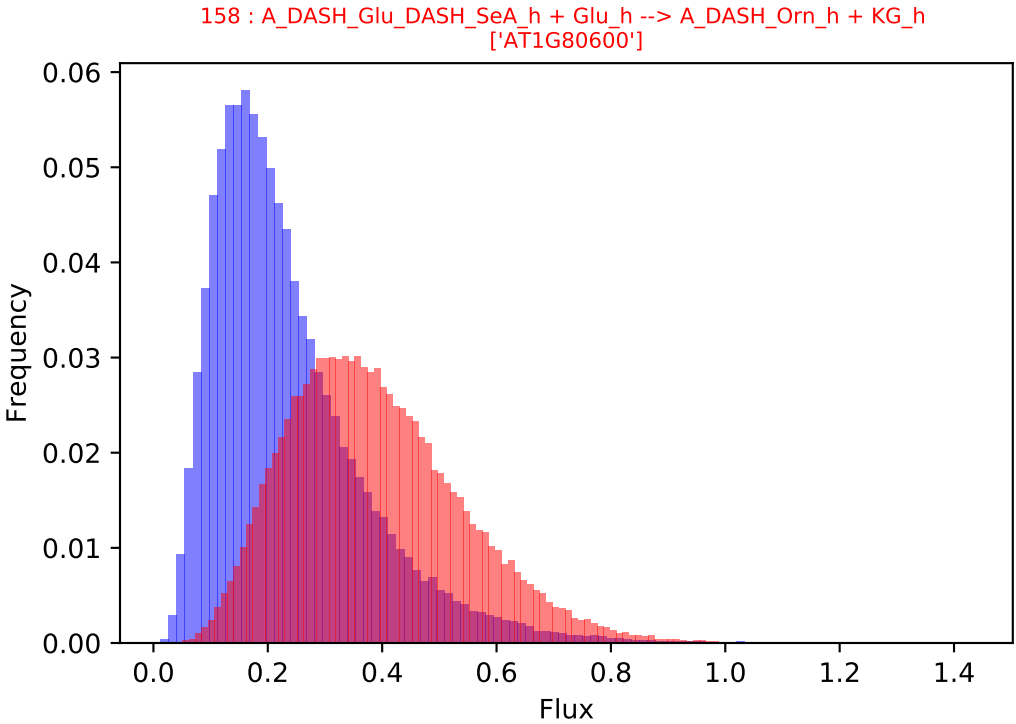

153 : Glu_h + Pyr_h <=> Ala_h + KG_h
['AT1G23310', 'AT1G70580', 'AT1G17290']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
Flux
0
2
4
6
8
10
12

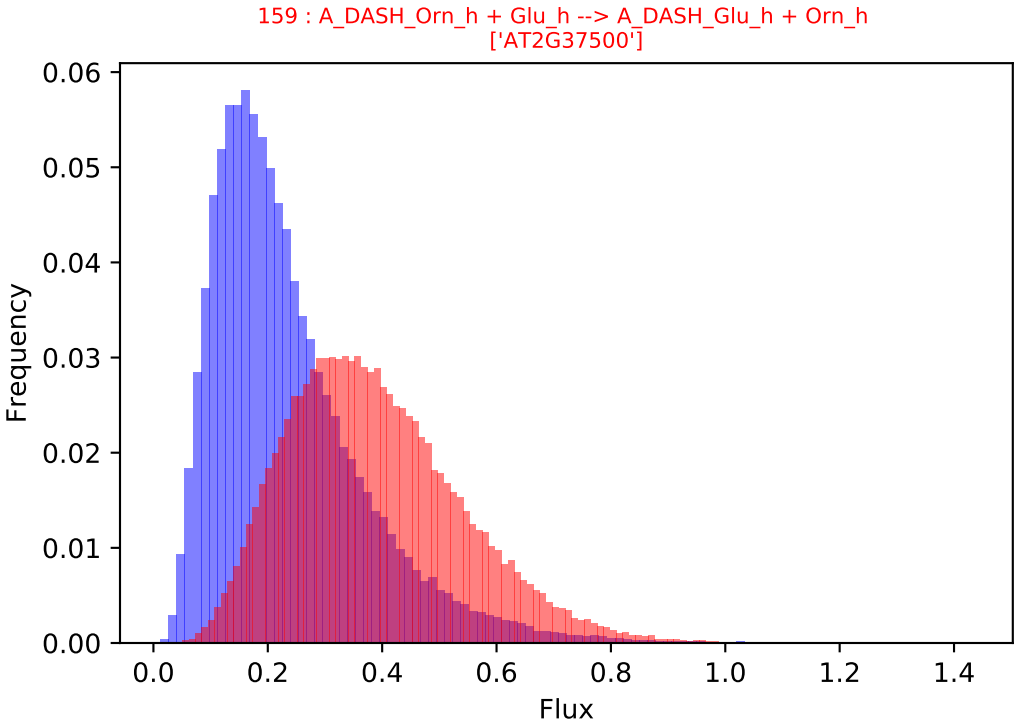

154 : Glu_m + Pyr_m <=> Ala_m + KG_m
['AT1G17290', 'AT1G72330']
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−150
−100
−50
0
50
100
150
Flux

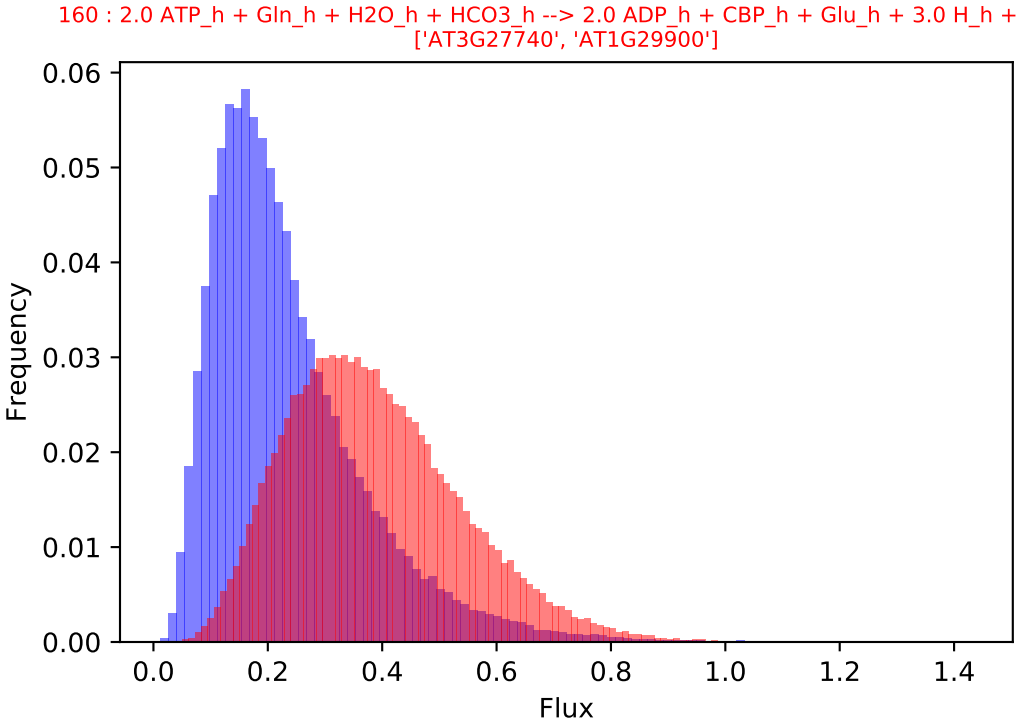

155 : Glu_p + Pyr_p <=> Ala_p + KG_p
['AT1G23310', 'AT1G70580']
Frequency
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
−100
−50
0
50
100
150
200
250
Flux

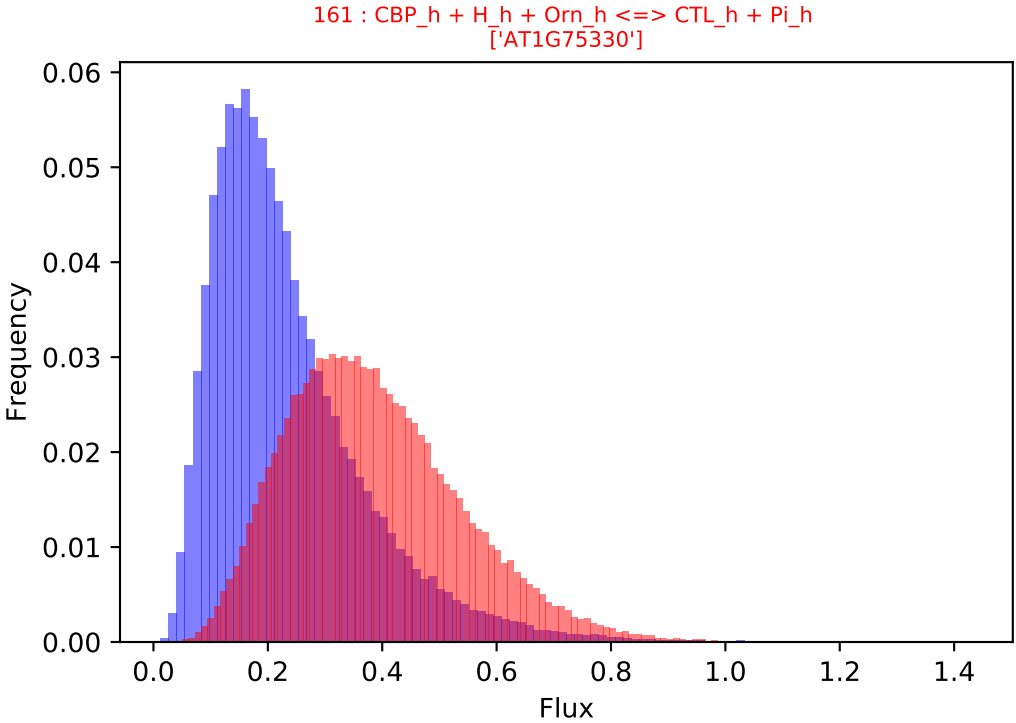

156 : ATP_h + A_DASH_Glu_h --> ADP_h + A_DASH_GluP_h
['6*AT3G57560']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4

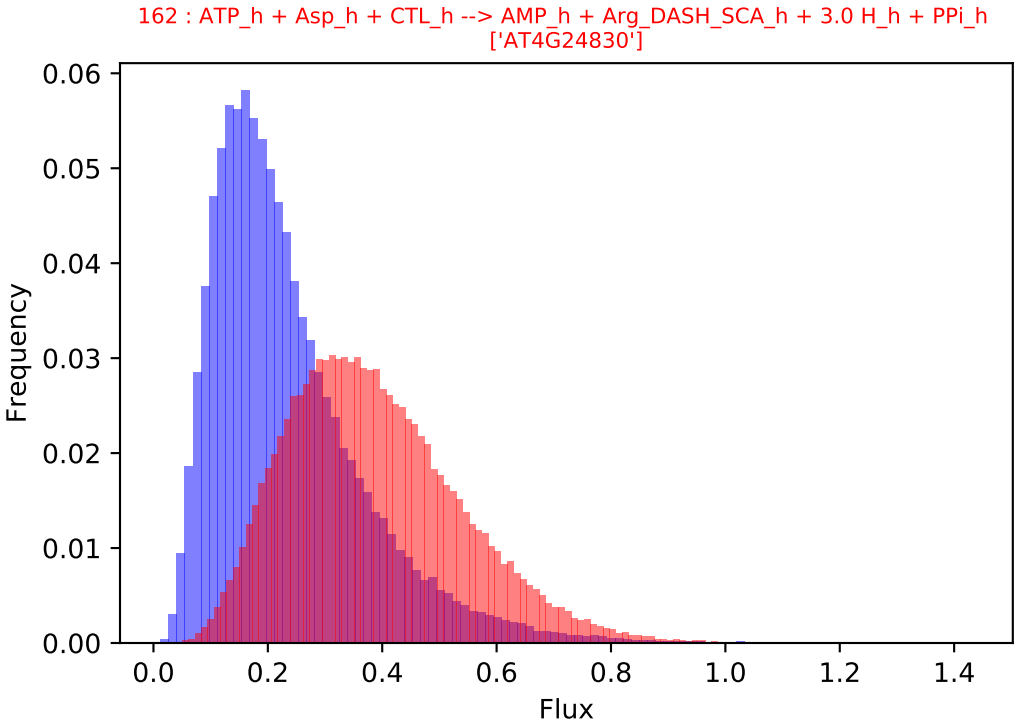

157 : A_DASH_GluP_h + H_h + NADPH_h --> A_DASH_Glu_DASH_SeA_h + NADP_h + Pi_h
['AT2G19940']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4

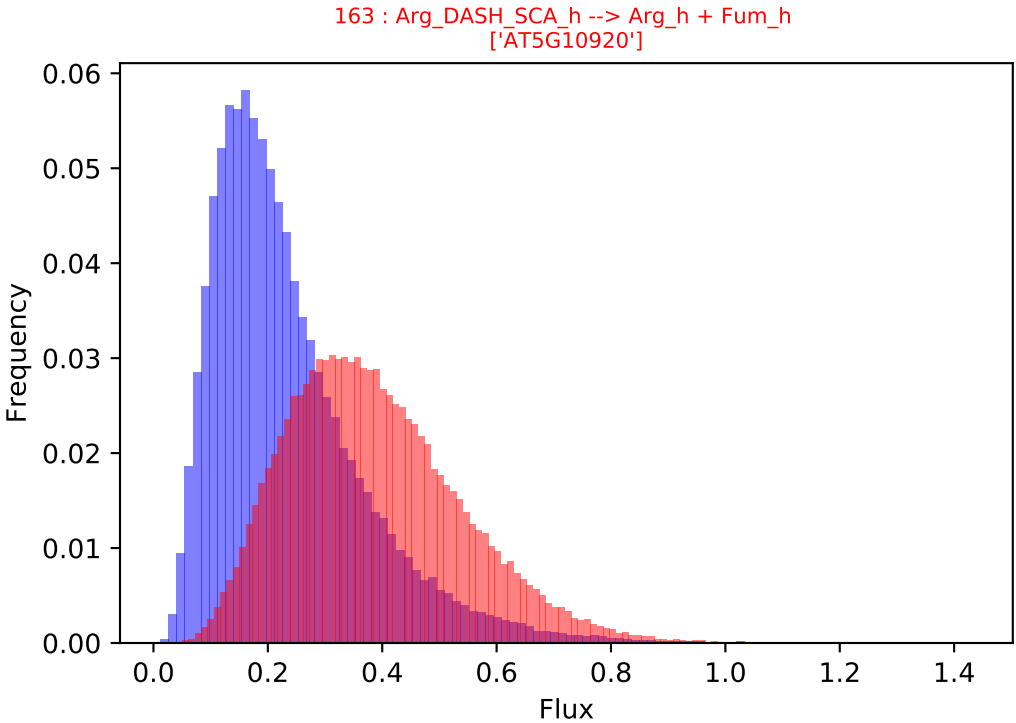

158 : A_DASH_Glu_DASH_SeA_h + Glu_h --> A_DASH_Orn_h + KG_h
['AT1G80600']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4

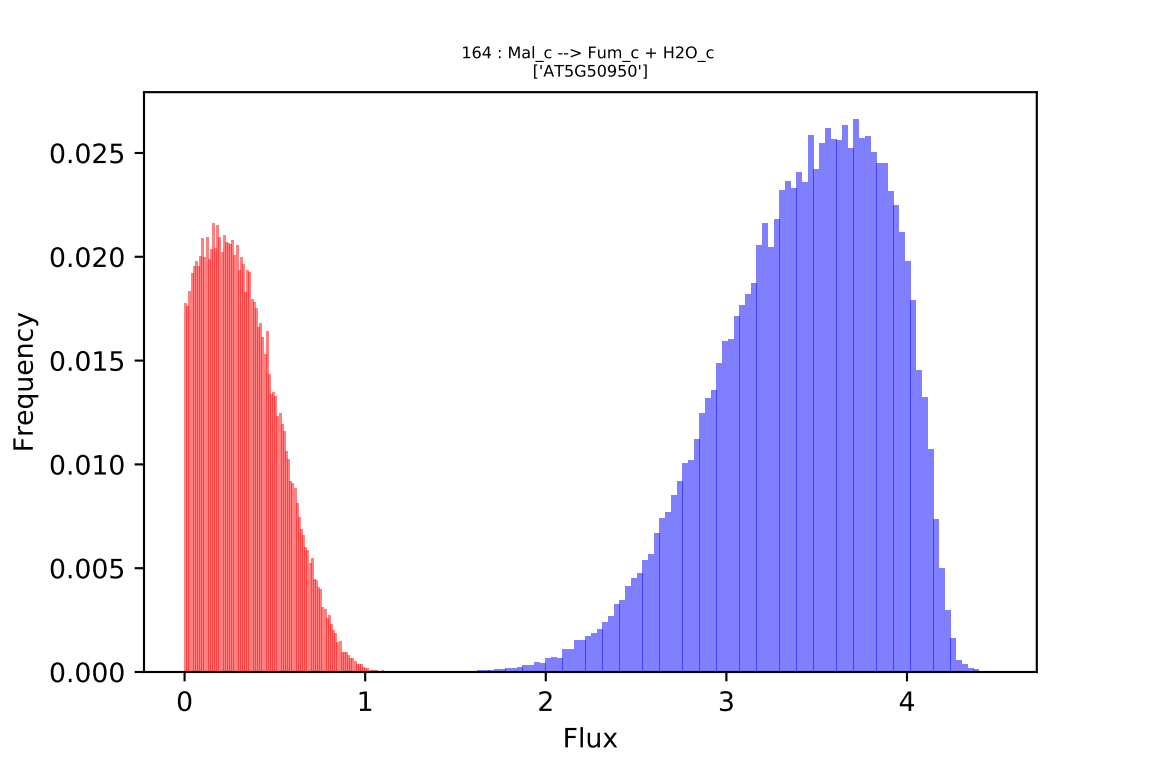

159 : A_DASH_Orn_h + Glu_h --> A_DASH_Glu_h + Orn_h
['AT2G37500']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4

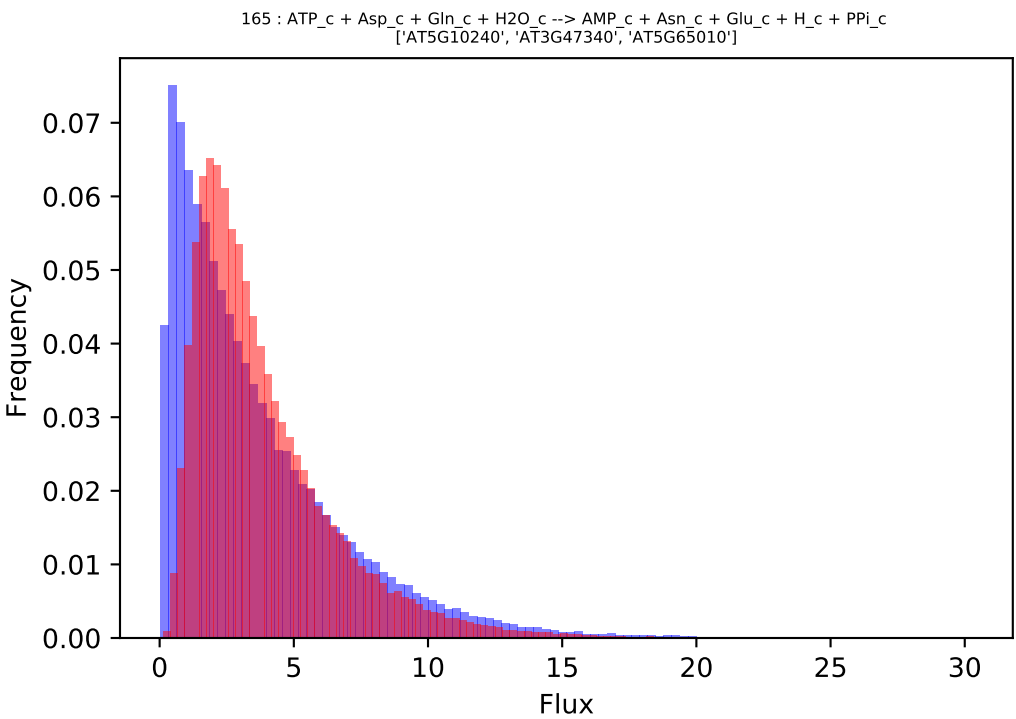

160 : 2.0 ATP_h + Gln_h + H2O_h + HCO3_h --> 2.0 ADP_h + CBP_h + Glu_h + 3.0 H_h + Pi_h
['AT3G27740', 'AT1G29900']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4

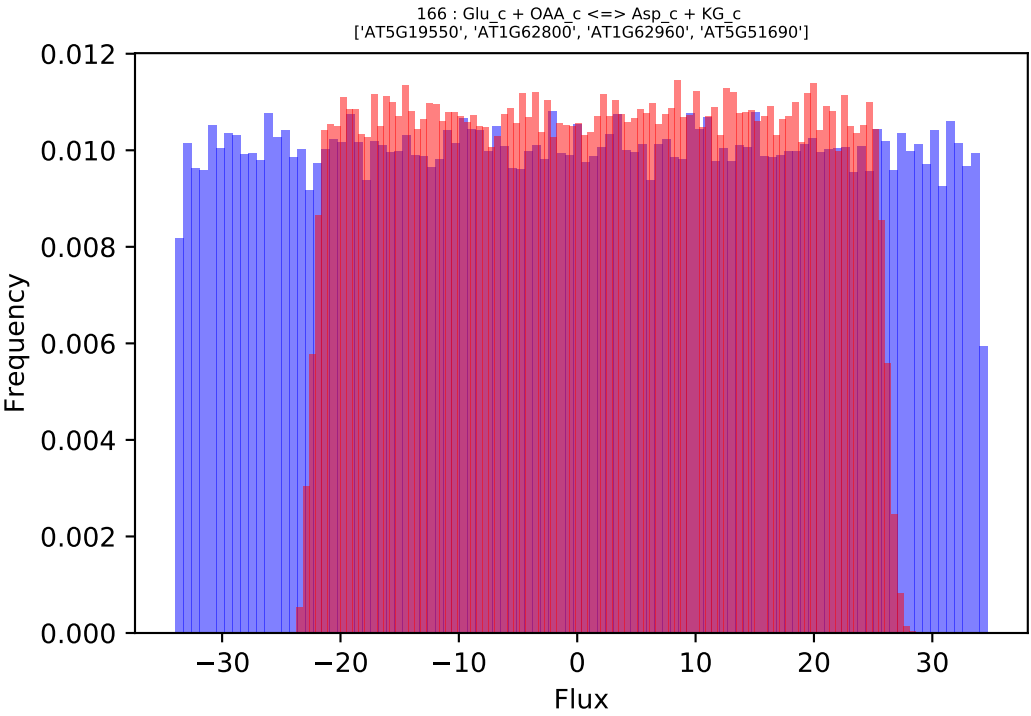

161 : CBP_h + H_h + Orn_h <=> CTL_h + Pi_h
['AT1G75330']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4

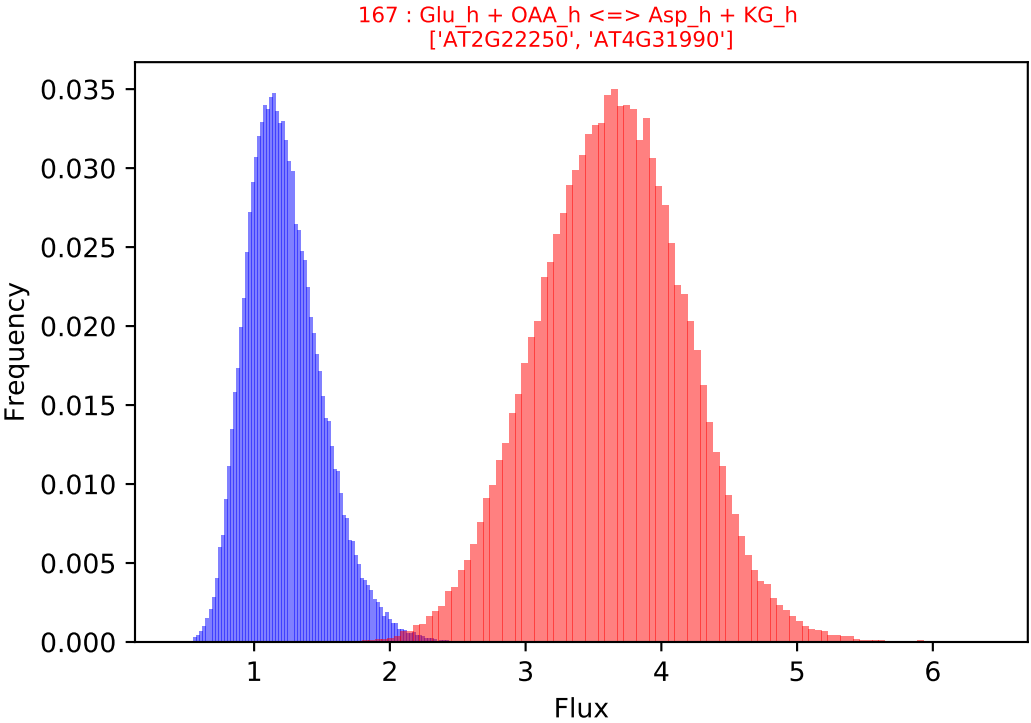

162 : ATP_h + Asp_h + CTL_h --> AMP_h + Arg_DASH_SCA_h + 3.0 H_h + PPi_h
['AT4G24830']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4

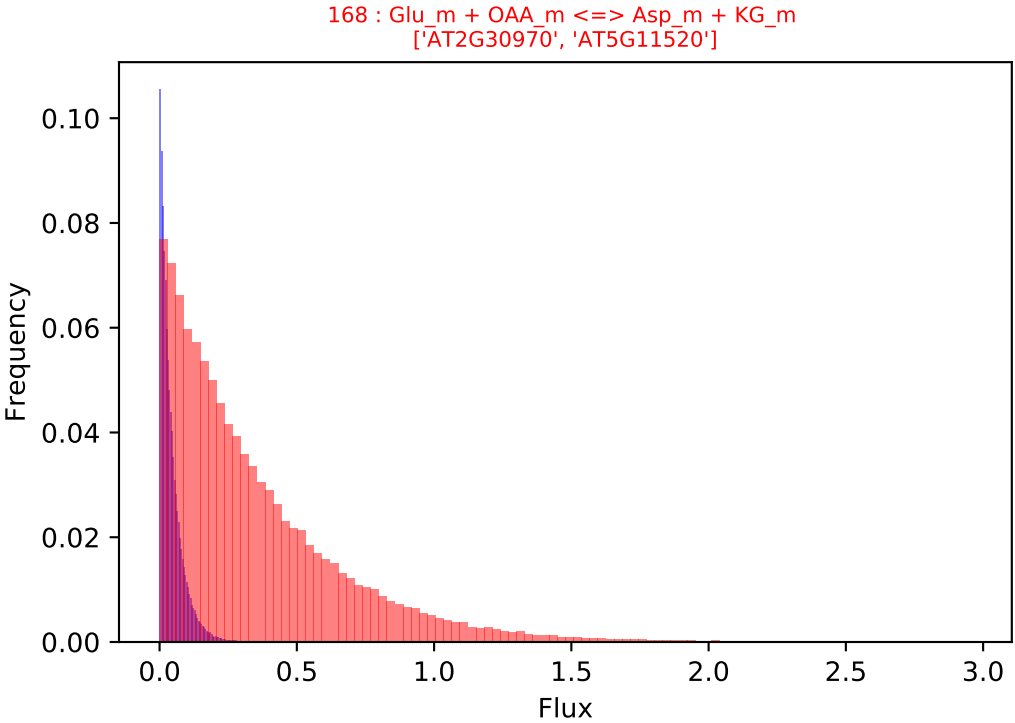

163 : Arg_DASH_SCA_h --> Arg_h + Fum_h
['AT5G10920']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4

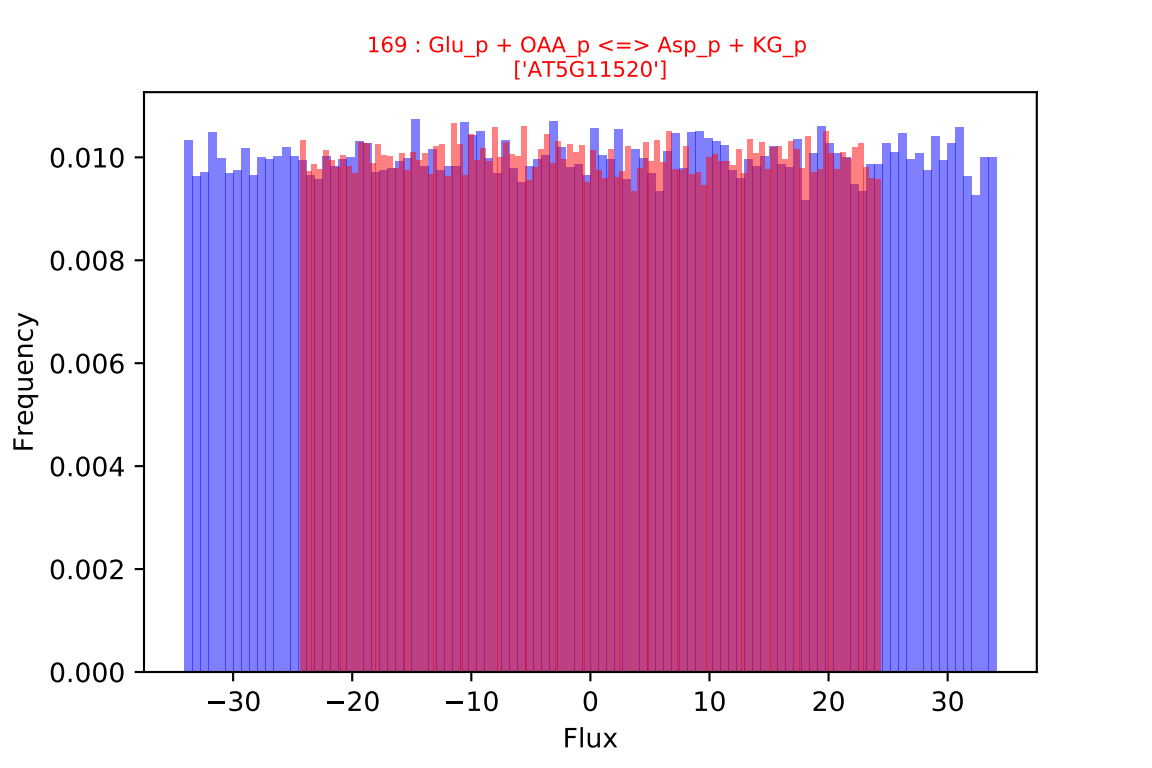

164 : Mal_c --> Fum_c + H2O_c
['AT5G50950']
Frequency
0.025
0.020
0.015
0.010
0.005
0.000
0
1
2
3
4
Flux

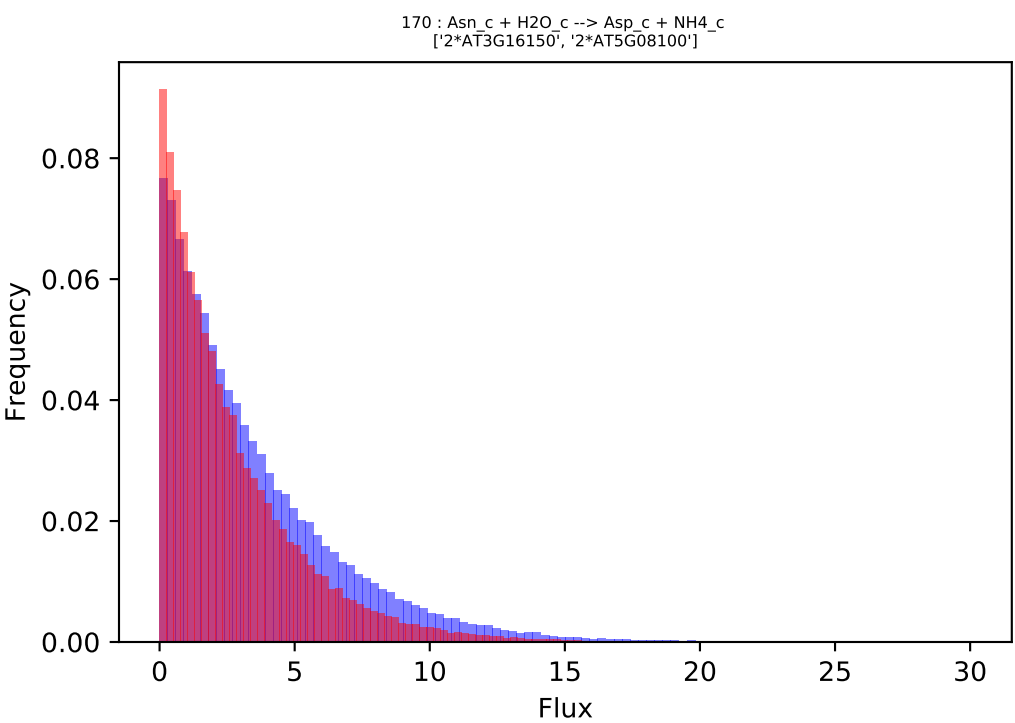

165 : ATP_c + Asp_c + Gln_c + H2O_c --> AMP_c + Asn_c + Glu_c + H_c + PPi_c
['AT5G10240', 'AT3G47340', 'AT5G65010']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0
5
10
15
20
25
30
Flux

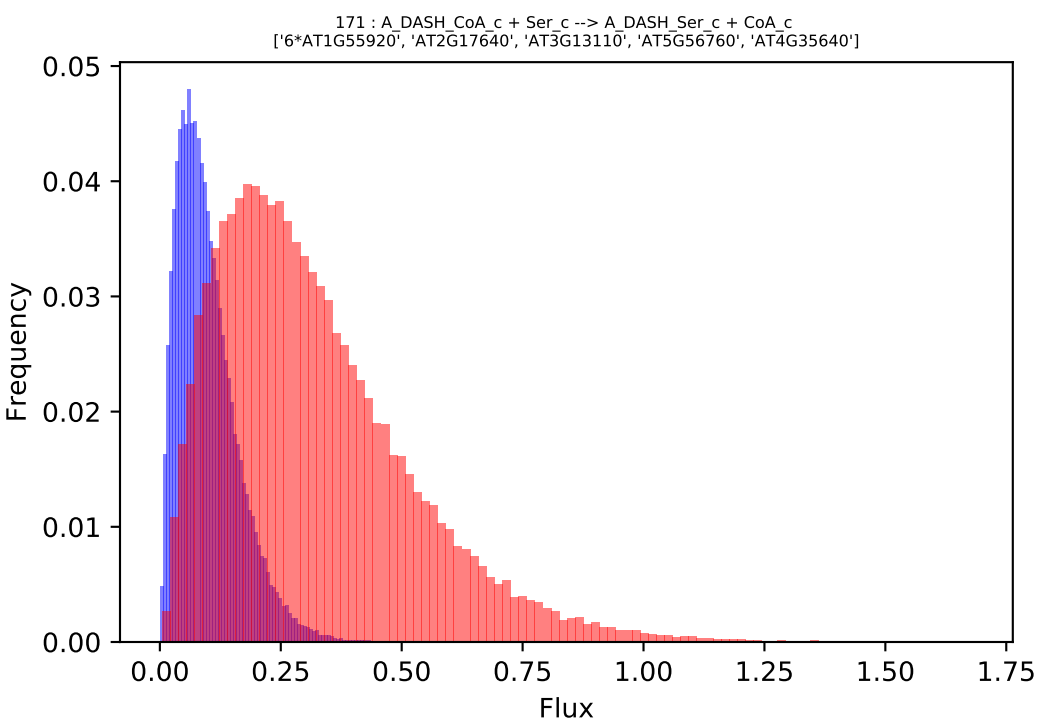

166 : Glu_c + OAA_c <=> Asp_c + KG_c
['AT5G19550', 'AT1G62800', 'AT1G62960', 'AT5G51690']
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−30
−20
−10
0
10
20
30
Flux

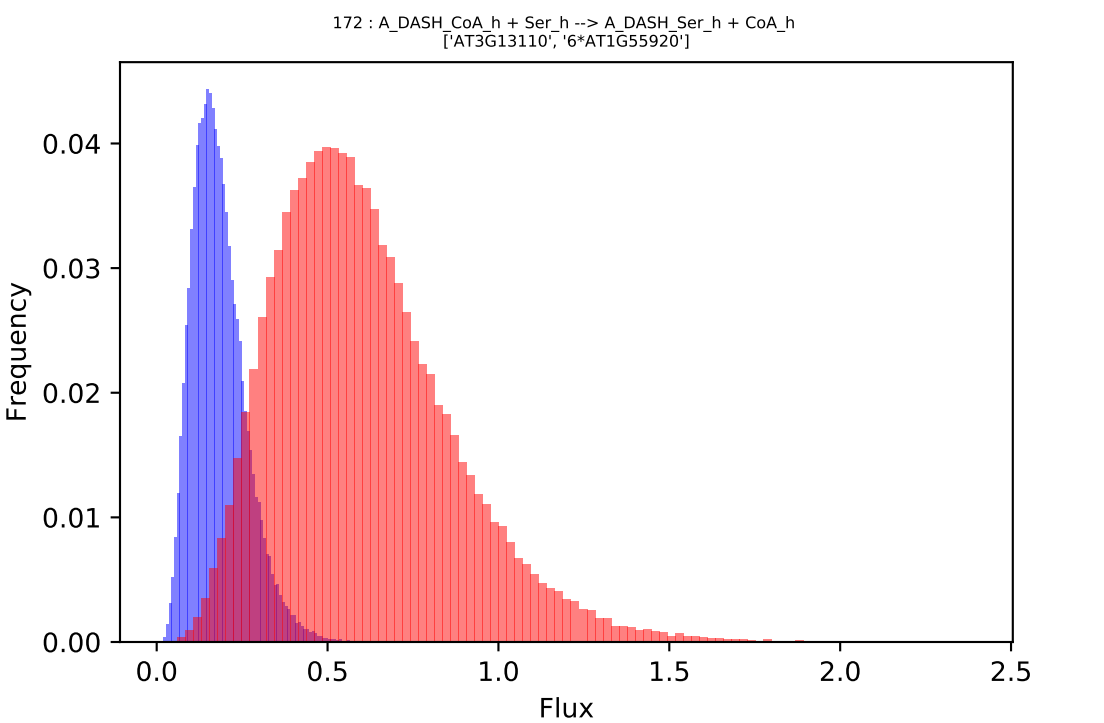

167 : Glu_h + OAA_h <=> Asp_h + KG_h
['AT2G22250', 'AT4G31990']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
1
2
3
4
5
6
Flux

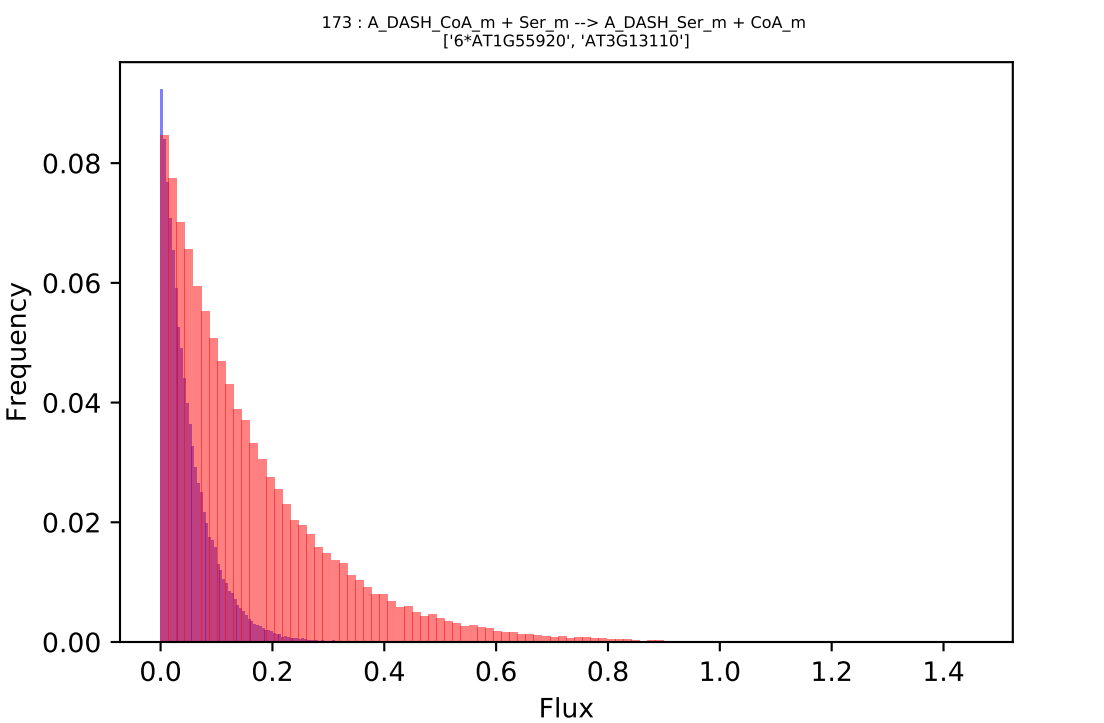

168 : Glu_m + OAA_m <=> Asp_m + KG_m
['AT2G30970', 'AT5G11520']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Flux

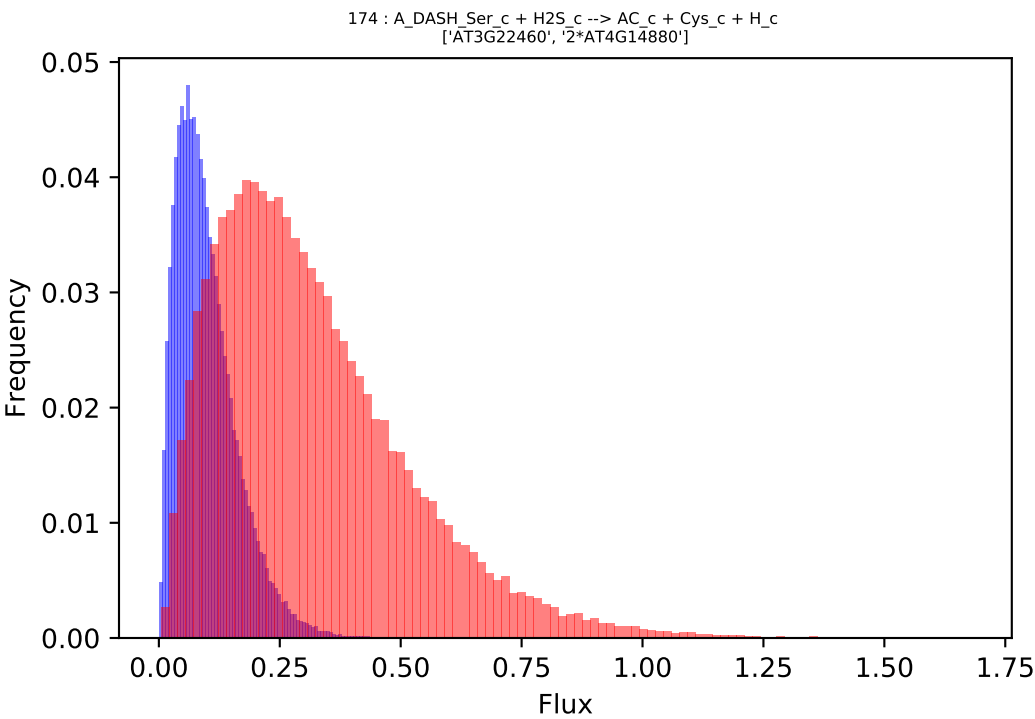

169 : Glu_p + OAA_p <=> Asp_p + KG_p
['AT5G11520']
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−30
−20
−10
0
10
20
30
Flux

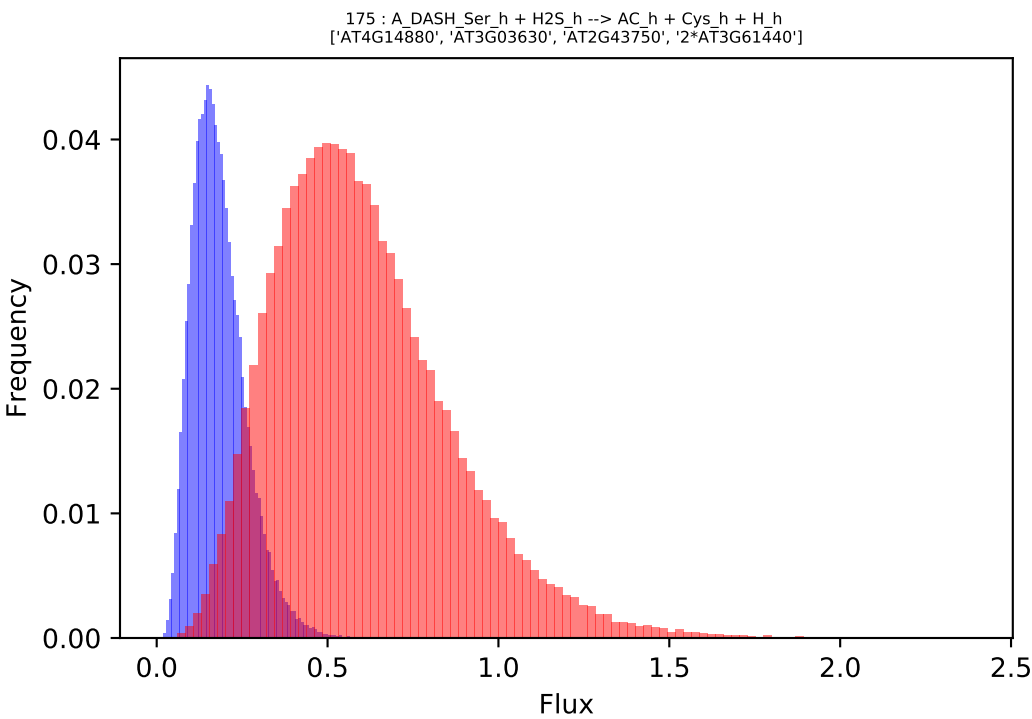

170 : Asn_c + H2O_c --> Asp_c + NH4_c
['2*AT3G16150', '2*AT5G08100']
Frequency
0.00
0.02
0.04
0.06
0.08
0
5
10
15
20
25
30
Flux

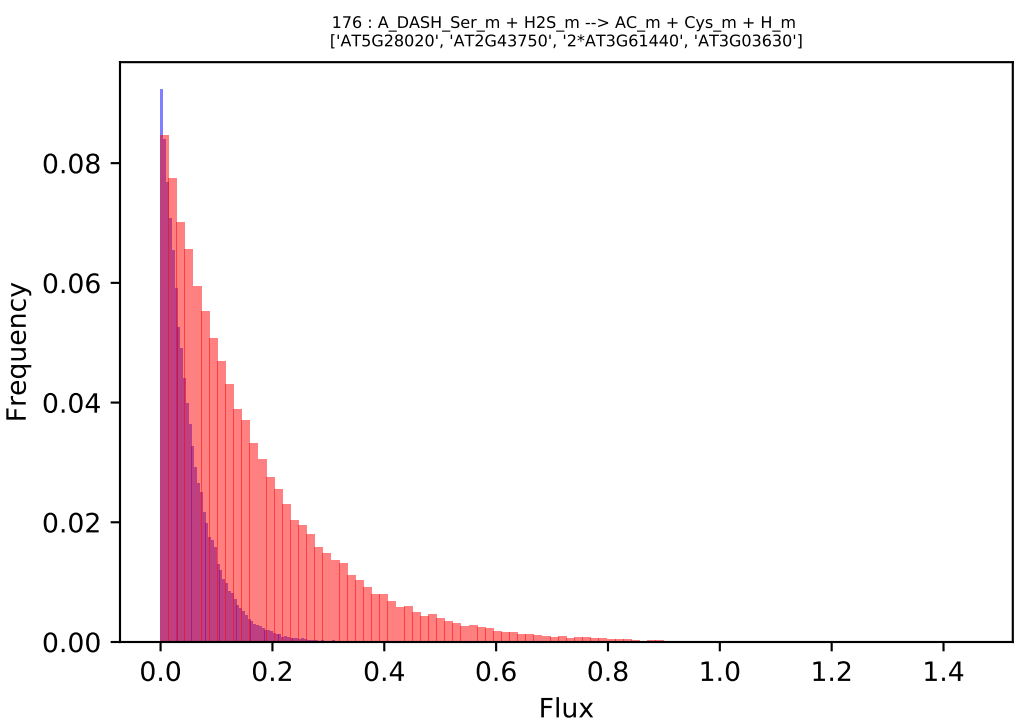

171 : A_DASH_CoA_c + Ser_c --> A_DASH_Ser_c + CoA_c
['6*AT1G55920', 'AT2G17640', 'AT3G13110', 'AT5G56760', 'AT4G35640']
Frequency
Flux
0.05
0.04
0.03
0.02
0.01
0.00
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75

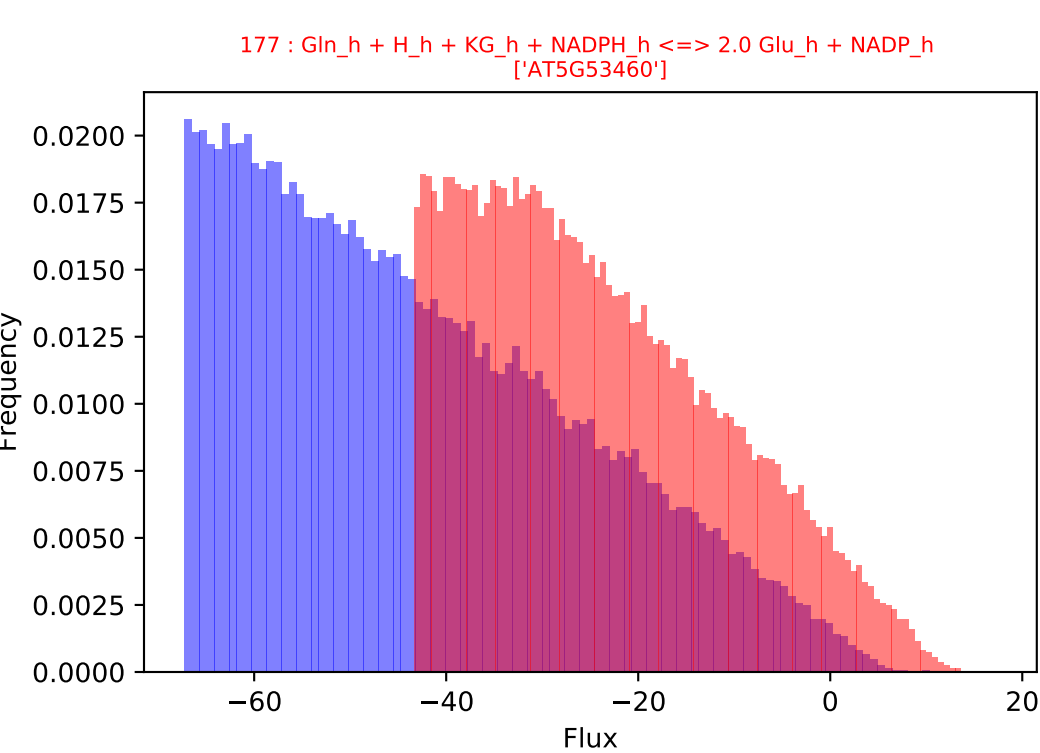

172 : A_DASH_CoA_h + Ser_h --> A_DASH_Ser_h + CoA_h
['AT3G13110', '6*AT1G55920']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.5
1.0
1.5
2.0
2.5
Flux

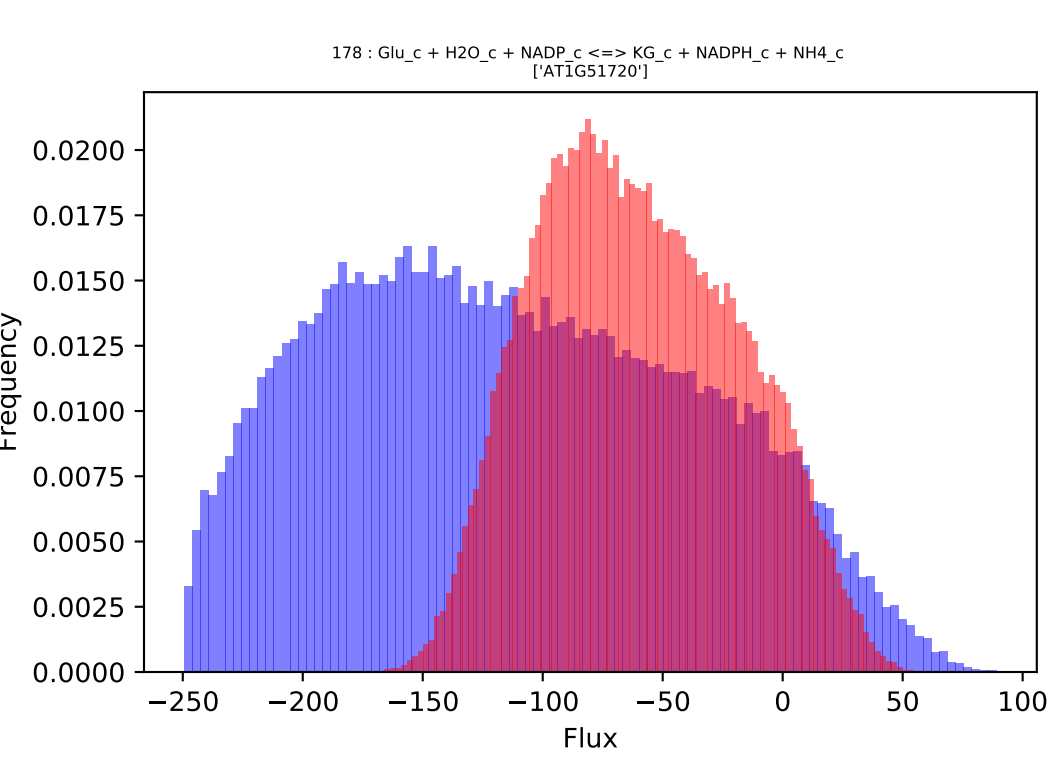

173 : A_DASH_CoA_m + Ser_m --> A_DASH_Ser_m + CoA_m
['6*AT1G55920', 'AT3G13110']
Frequency
0.00
0.02
0.04
0.06
0.08
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

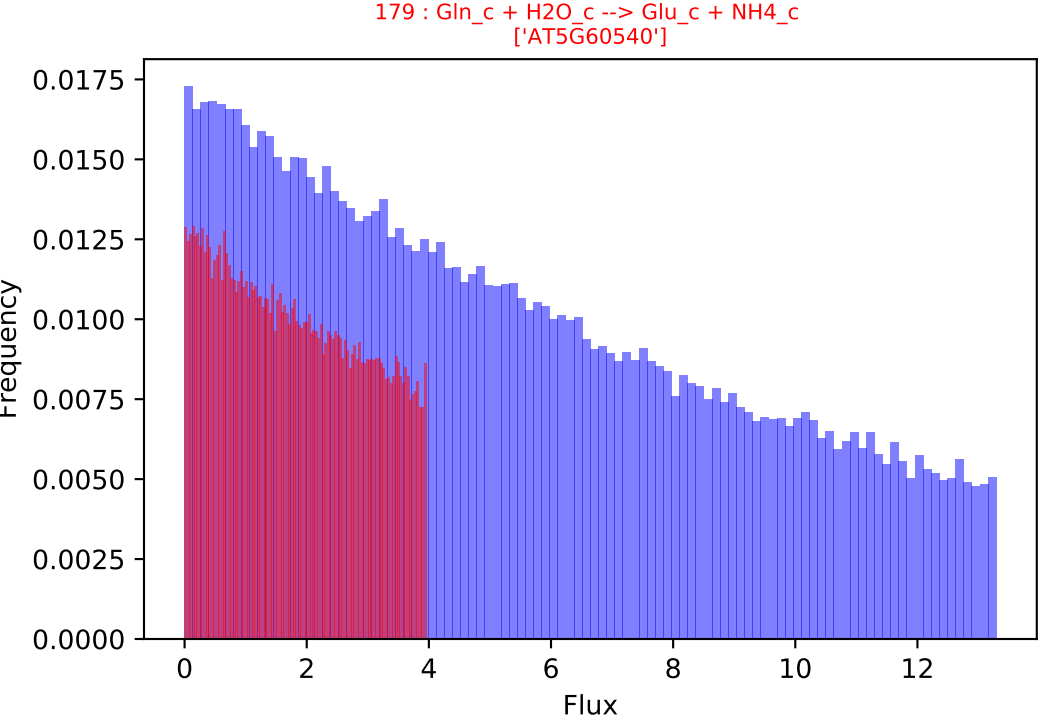

174 : A_DASH_Ser_c + H2S_c --> AC_c + Cys_c + H_c
['AT3G22460', '2*AT4G14880']
Frequency
Flux
0.05
0.04
0.03
0.02
0.01
0.00
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75

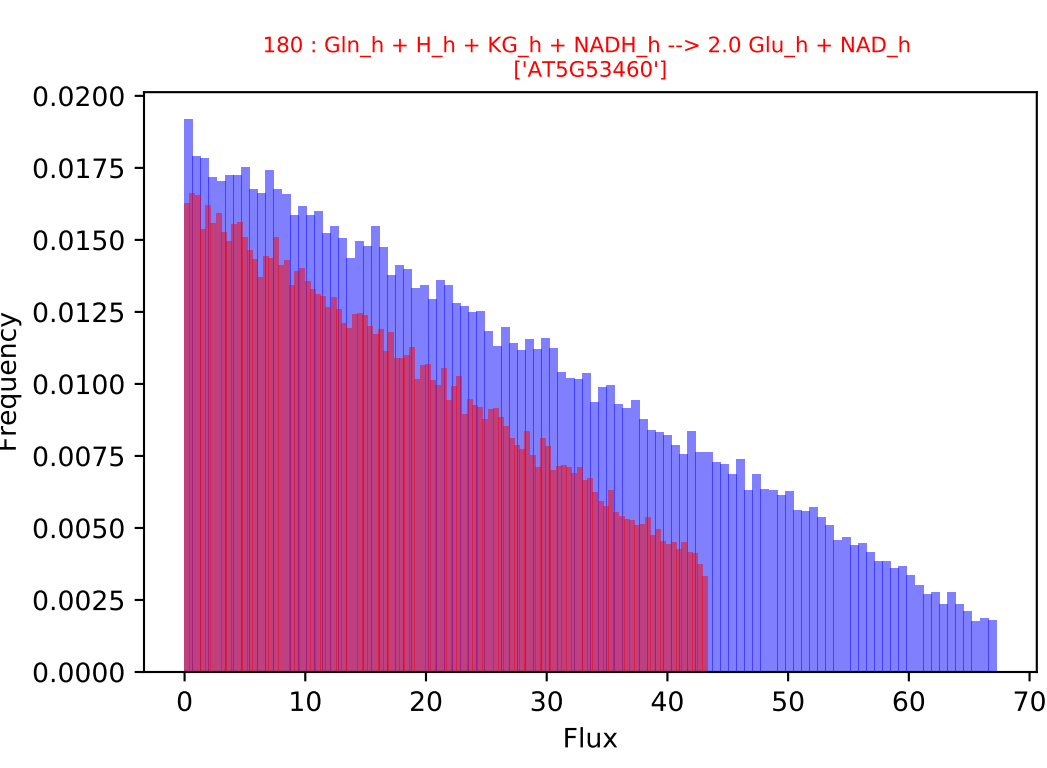

175 : A_DASH_Ser_h + H2S_h --> AC_h + Cys_h + H_h
['AT4G14880', 'AT3G03630', 'AT2G43750', '2*AT3G61440']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.5
1.0
1.5
2.0
2.5
Flux

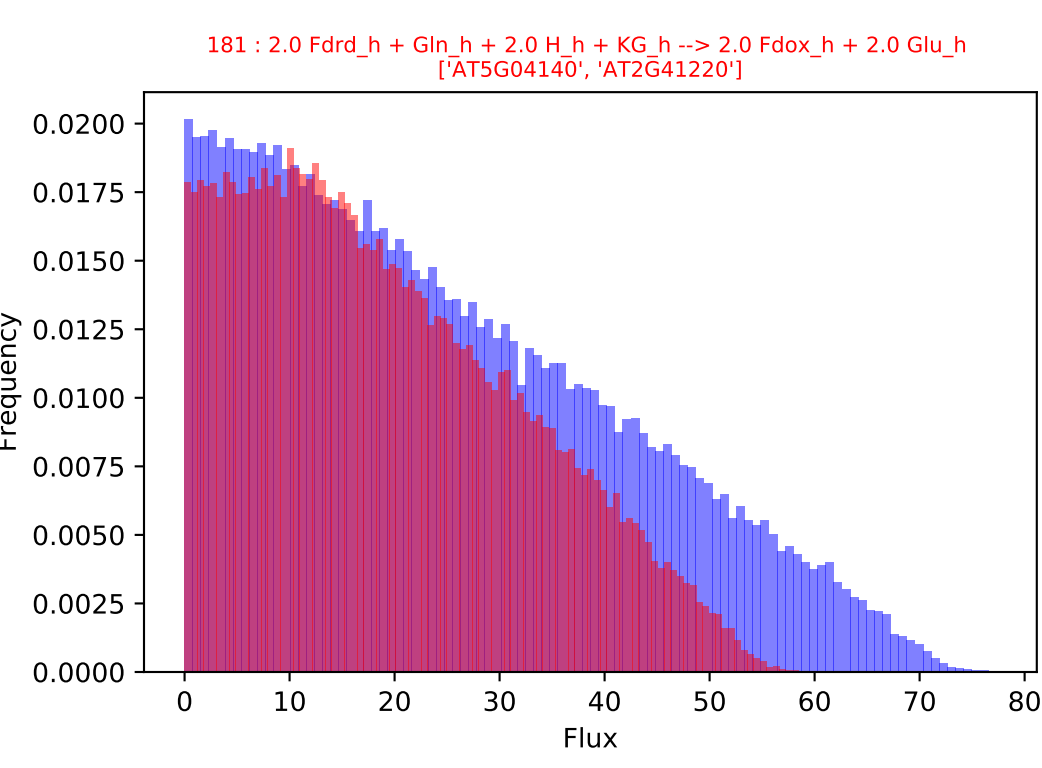

176 : A_DASH_Ser_m + H2S_m --> AC_m + Cys_m + H_m
['AT5G28020', 'AT2G43750', '2*AT3G61440', 'AT3G03630']
Frequency
0.00
0.02
0.04
0.06
0.08
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

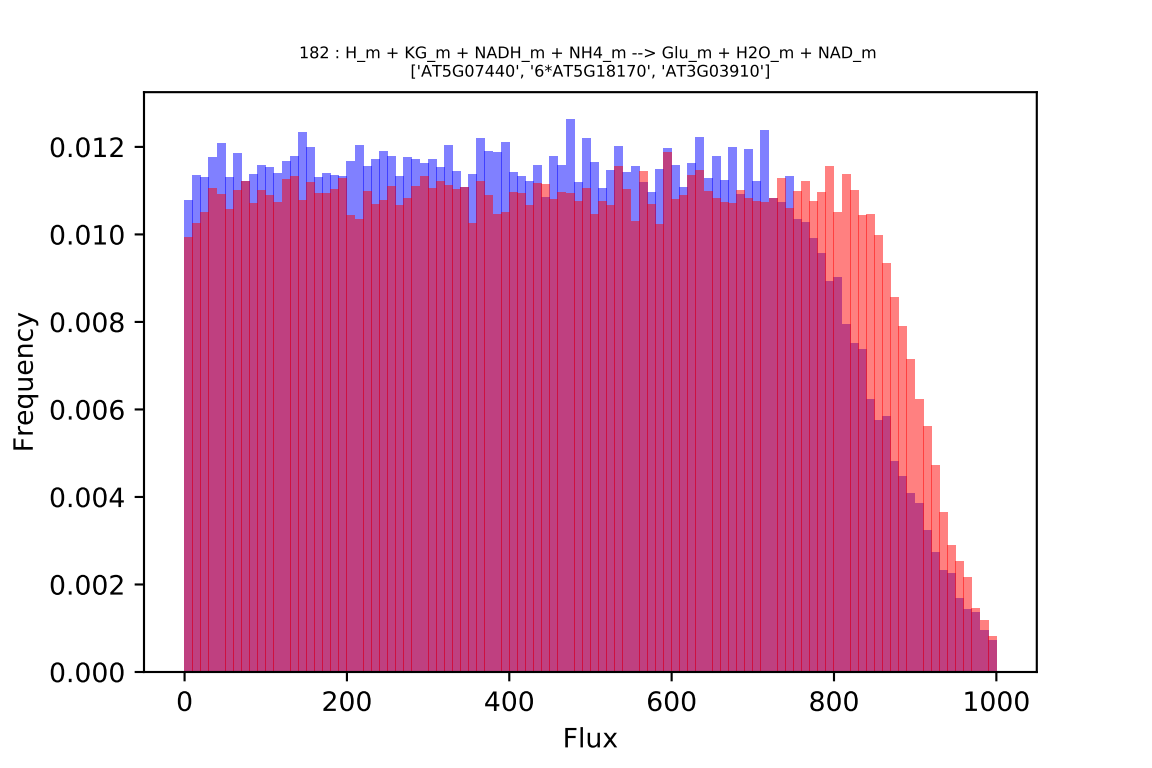

177 : Gln_h + H_h + KG_h + NADPH_h <=> 2.0 Glu_h + NADP_h
['AT5G53460']
Frequency
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
−60
−40
−20
0
20
Flux

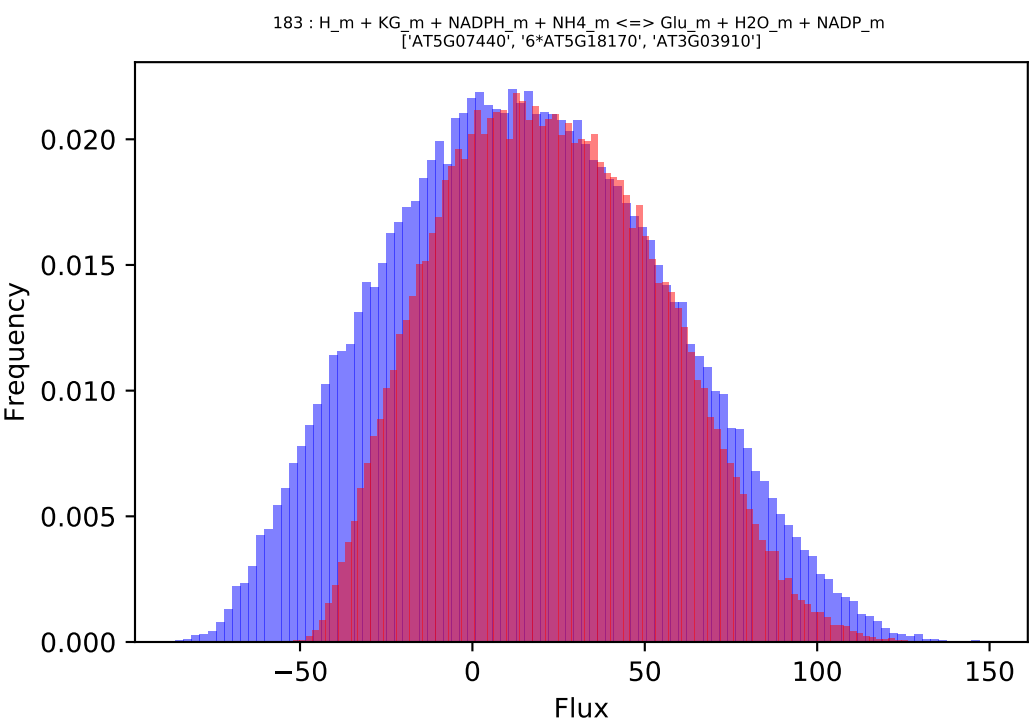

178 : Glu_c + H2O_c + NADP_c <=> KG_c + NADPH_c + NH4_c
['AT1G51720']
Frequency
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
−250
−200
−150
−100
−50
0
50
100
Flux

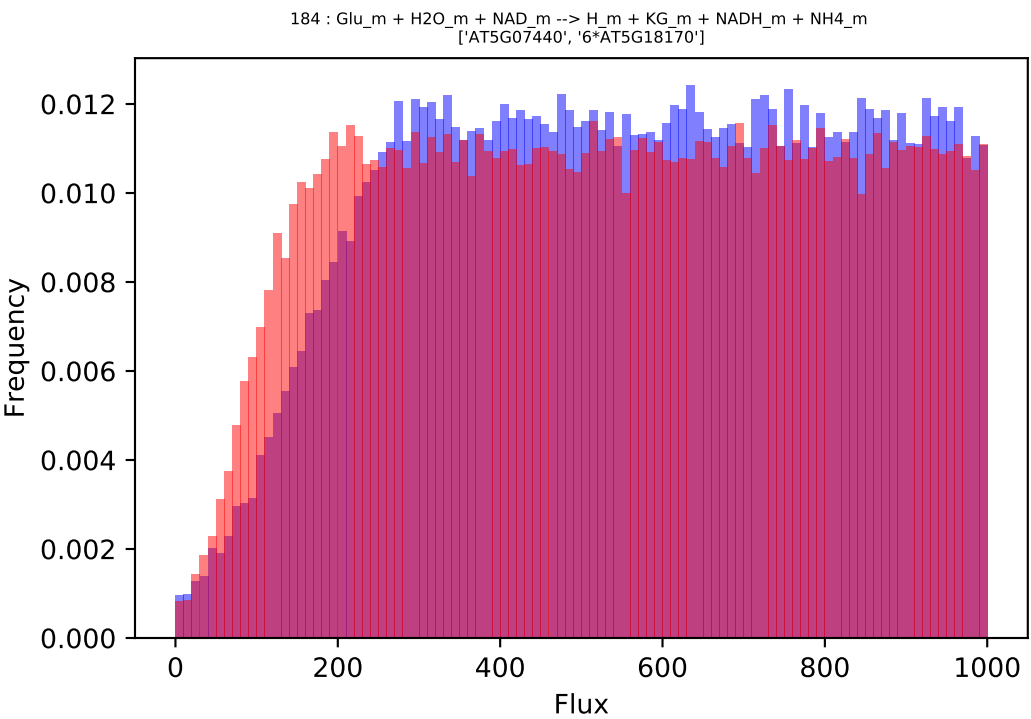

179 : Gln_c + H2O_c --> Glu_c + NH4_c
['AT5G60540']
Frequency
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
0
2
4
6
8
10
12
Flux

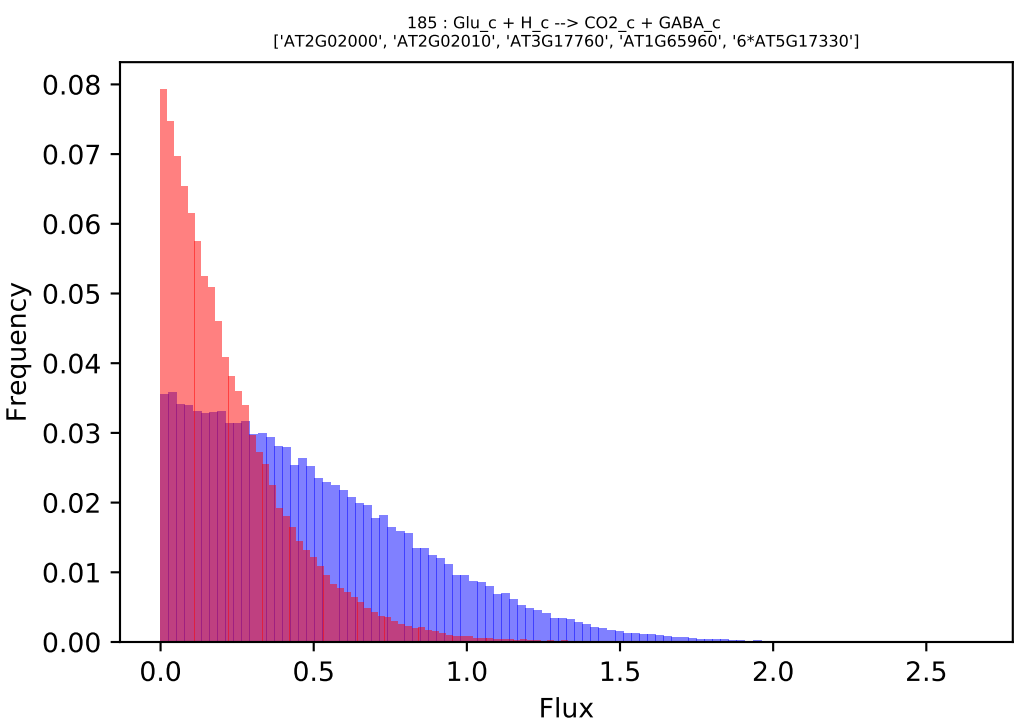

180 : Gln_h + H_h + KG_h + NADH_h --> 2.0 Glu_h + NAD_h
['AT5G53460']
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
Frequency
0
10
20
30
40
50
60
70
Flux

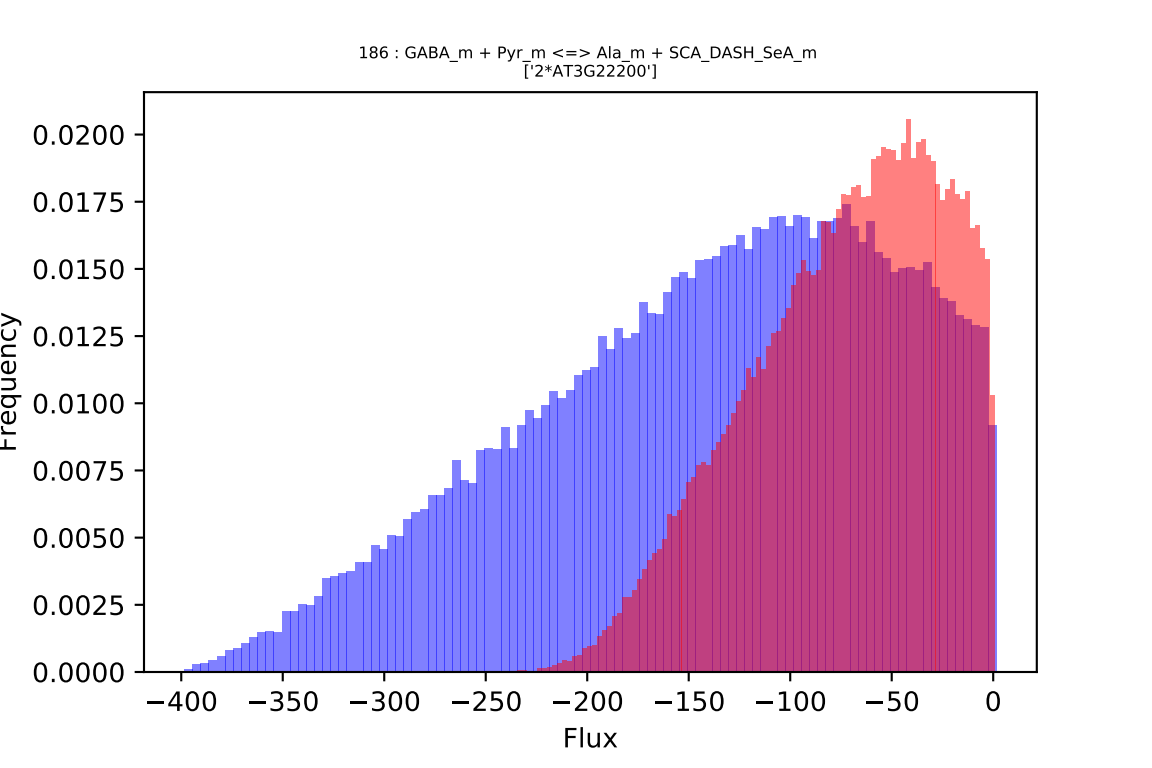

181 : 2.0 Fdrd_h + Gln_h + 2.0 H_h + KG_h --> 2.0 Fdox_h + 2.0 Glu_h
['AT5G04140', 'AT2G41220']
Frequency
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
0
10
20
30
40
50
60
70
80
Flux

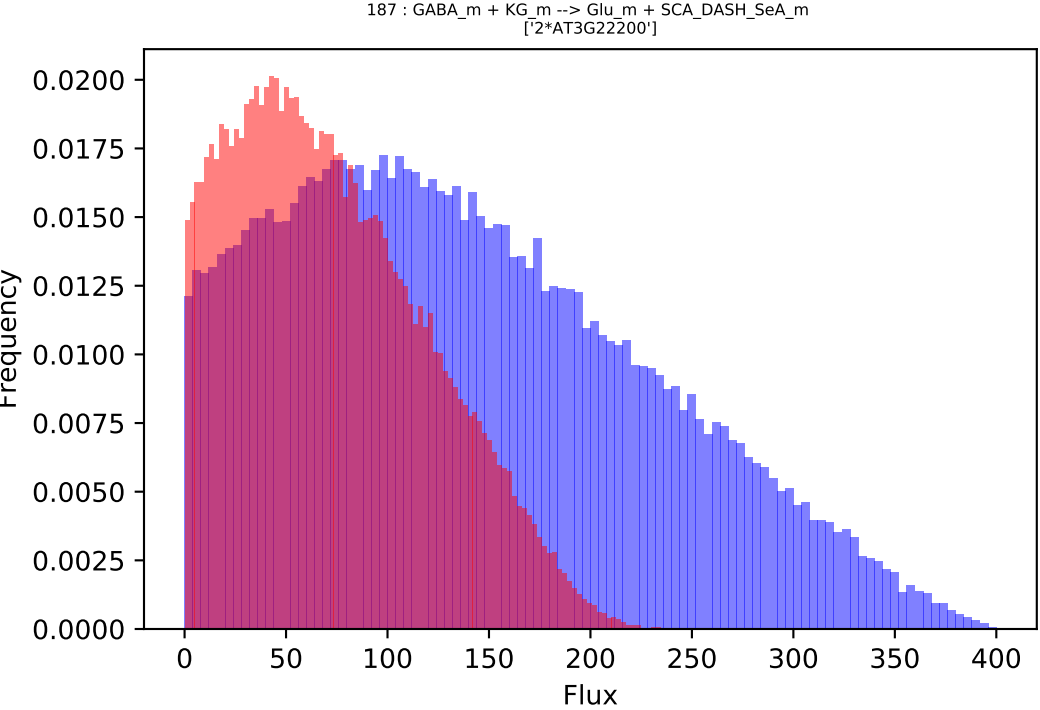

182 : H_m + KG_m + NADH_m + NH4_m --> Glu_m + H2O_m + NAD_m
['AT5G07440', '6*AT5G18170', 'AT3G03910']
Frequency
0.012
0.010
0.008
0.006
0.004
0.002
0.000
0
200
400
600
800
1000
Flux

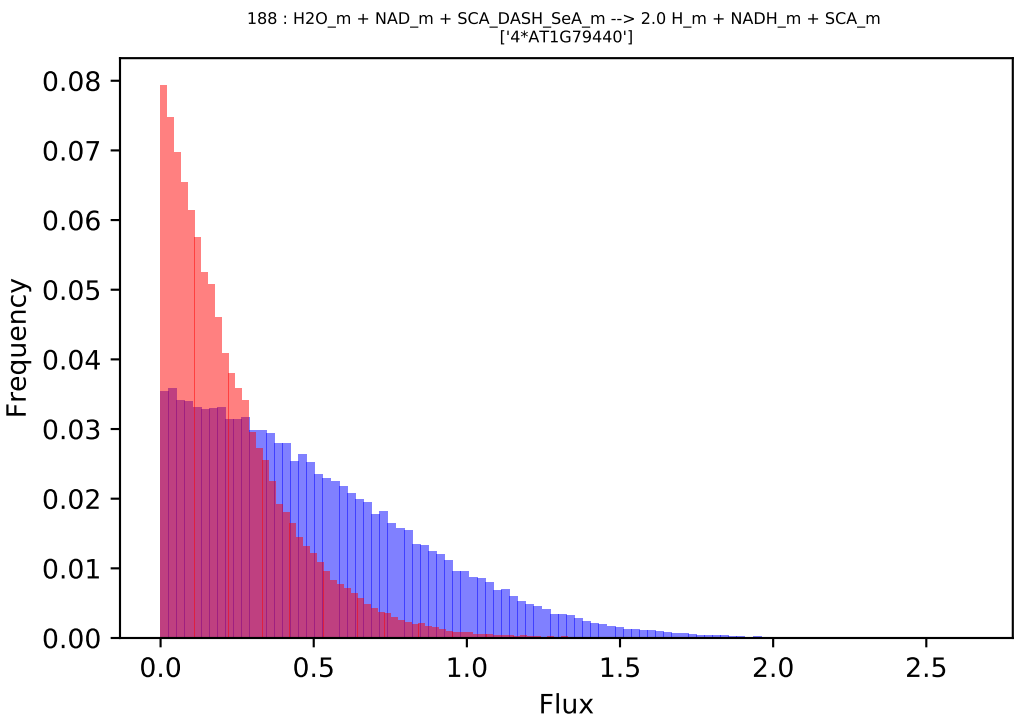

183 : H_m + KG_m + NADPH_m + NH4_m <=> Glu_m + H2O_m + NADP_m
['AT5G07440', '6*AT5G18170', 'AT3G03910']
Frequency
0.020
0.015
0.010
0.005
0.000
−50
0
50
100
150
Flux

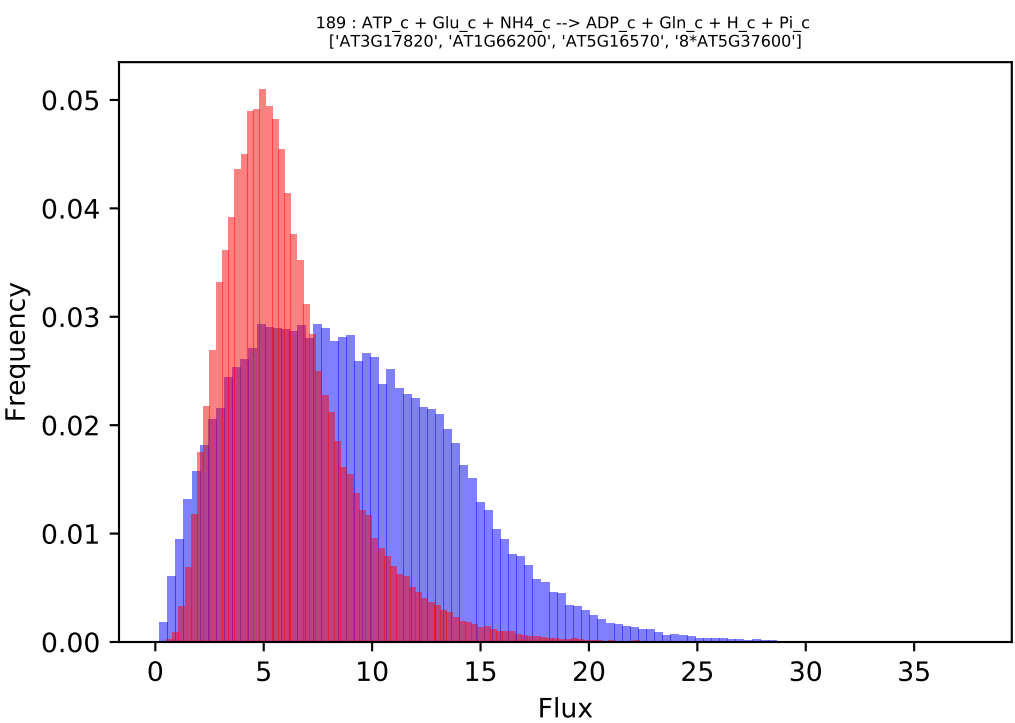

184 : Glu_m + H2O_m + NAD_m --> H_m + KG_m + NADH_m + NH4_m
['AT5G07440', '6*AT5G18170']
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
0
200
400
600
800
1000
Flux

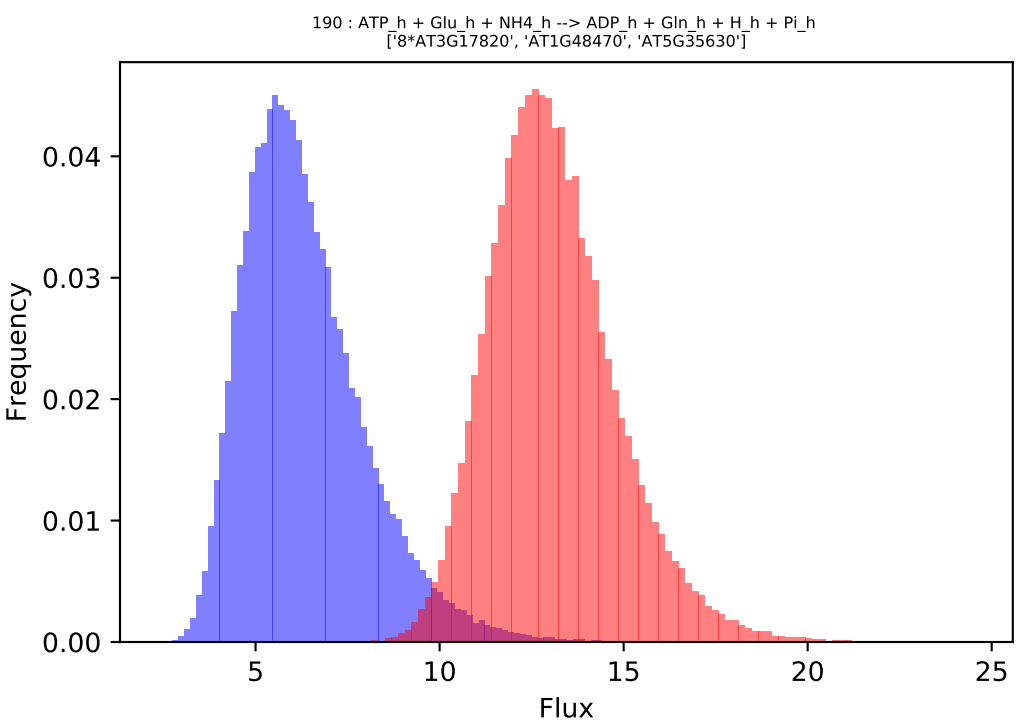

185 : Glu_c + H_c --> CO2_c + GABA_c
['AT2G02000', 'AT2G02010', 'AT3G17760', 'AT1G65960', '6*AT5G17330']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.0
0.5
1.0
1.5
2.0
2.5
Flux

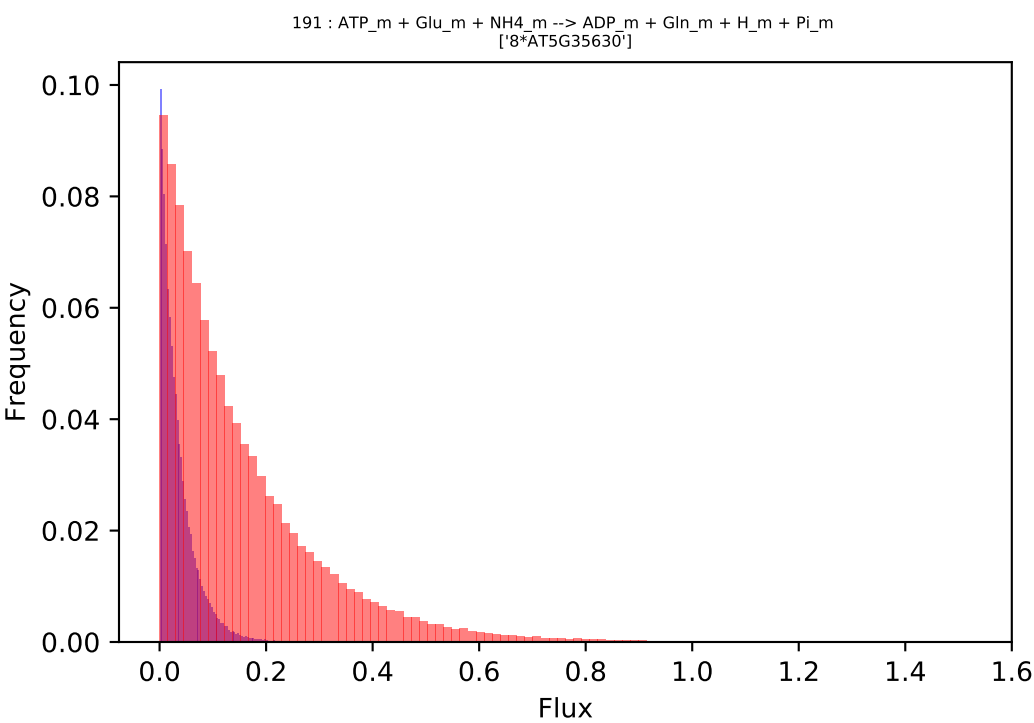

186 : GABA_m + Pyr_m <=> Ala_m + SCA_DASH_SeA_m
['2*AT3G22200']
Frequency
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
−400
−350
−300
−250
−200
−150
−100
−50
0
Flux

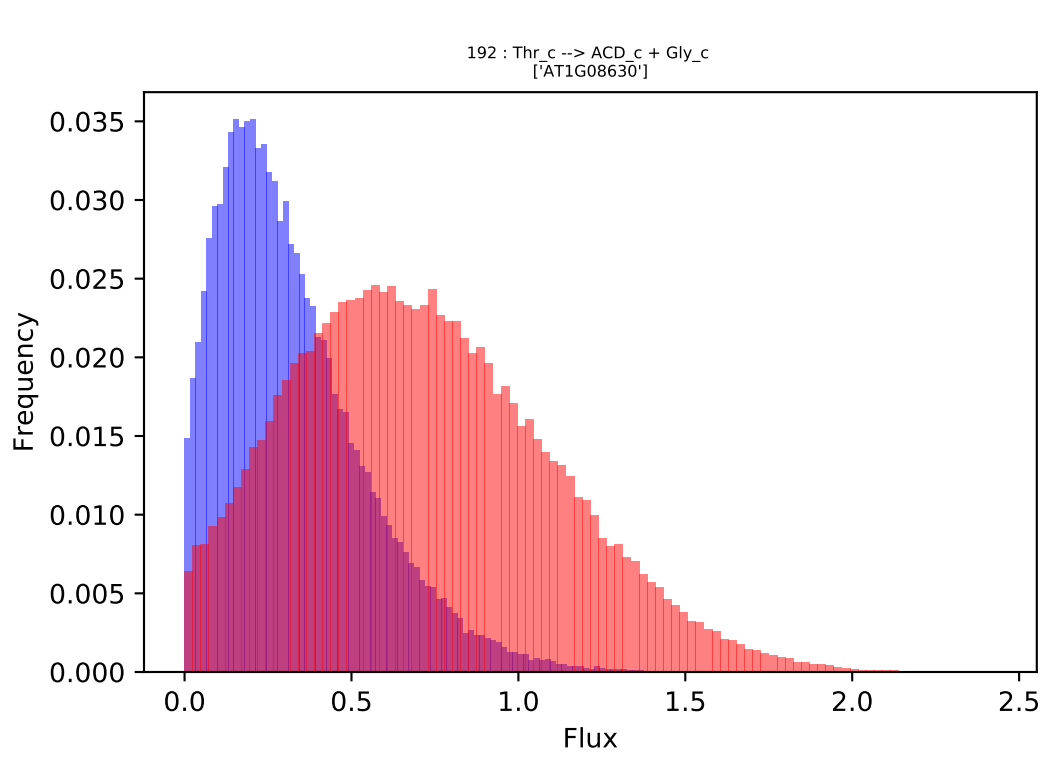

187 : GABA_m + KG_m --> Glu_m + SCA_DASH_SeA_m
['2*AT3G22200']
Frequency
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
0
50
100
150
200
250
300
350
400
Flux

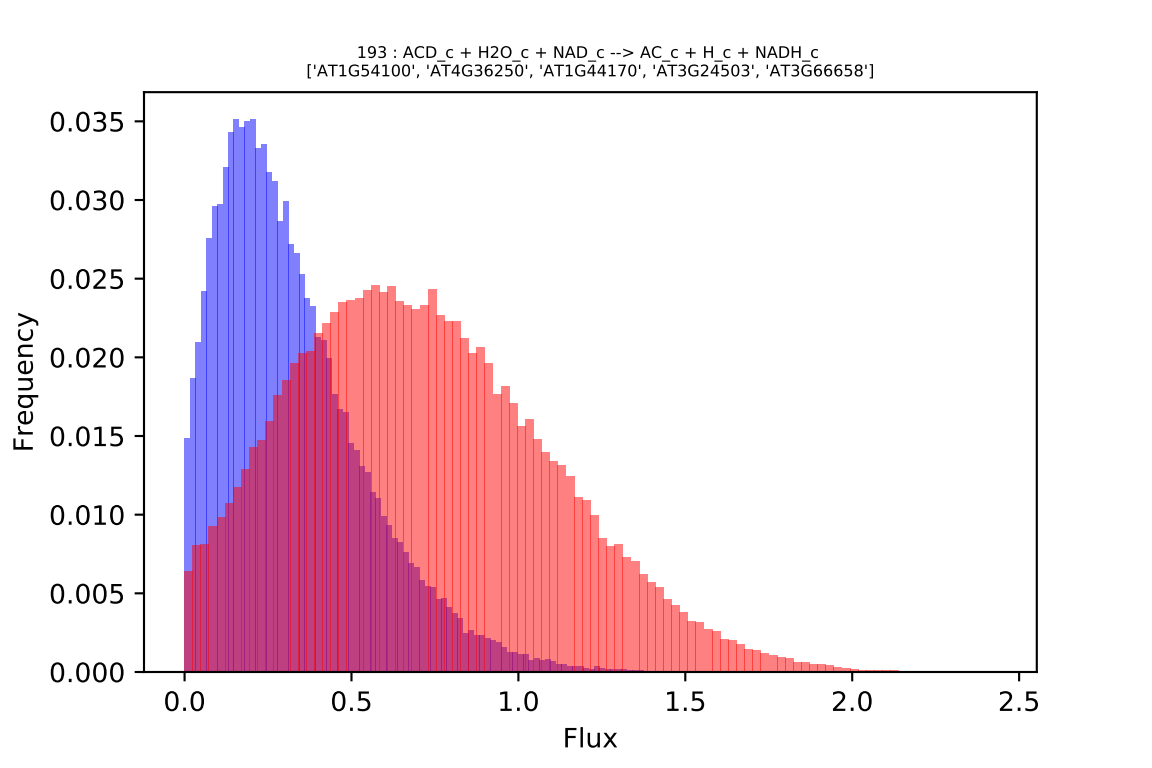

188 : H2O_m + NAD_m + SCA_DASH_SeA_m --> 2.0 H_m + NADH_m + SCA_m
['4*AT1G79440']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.0
0.5
1.0
1.5
2.0
2.5
Flux

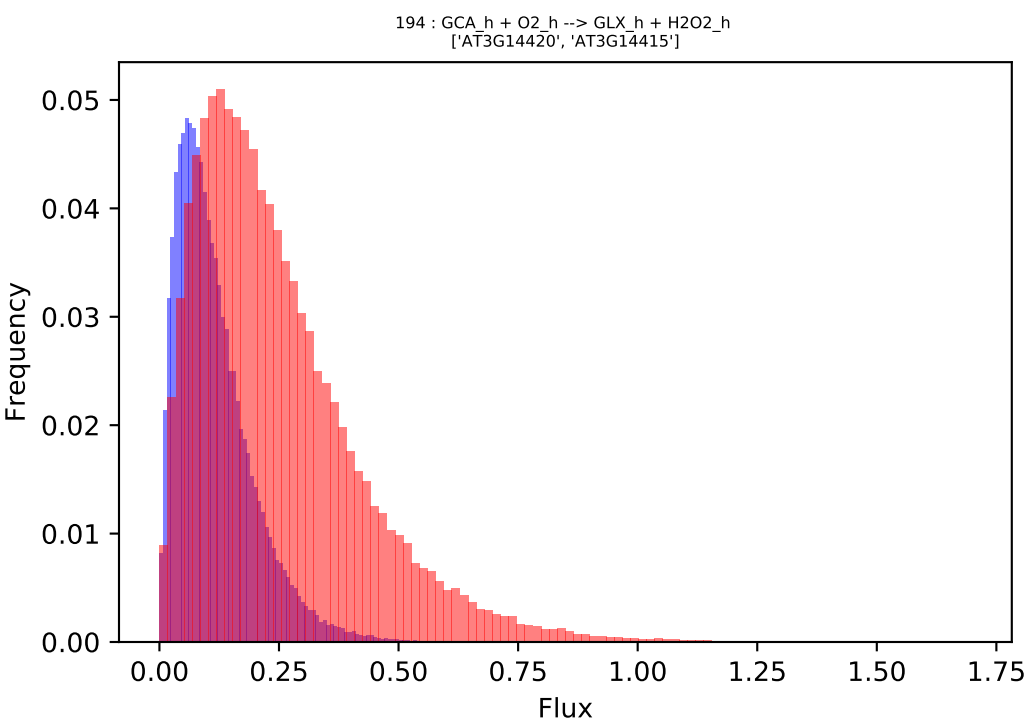

189 : ATP_c + Glu_c + NH4_c --> ADP_c + Gln_c + H_c + Pi_c
['AT3G17820', 'AT1G66200', 'AT5G16570', '8*AT5G37600']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0
5
10
15
20
25
30
35
Flux

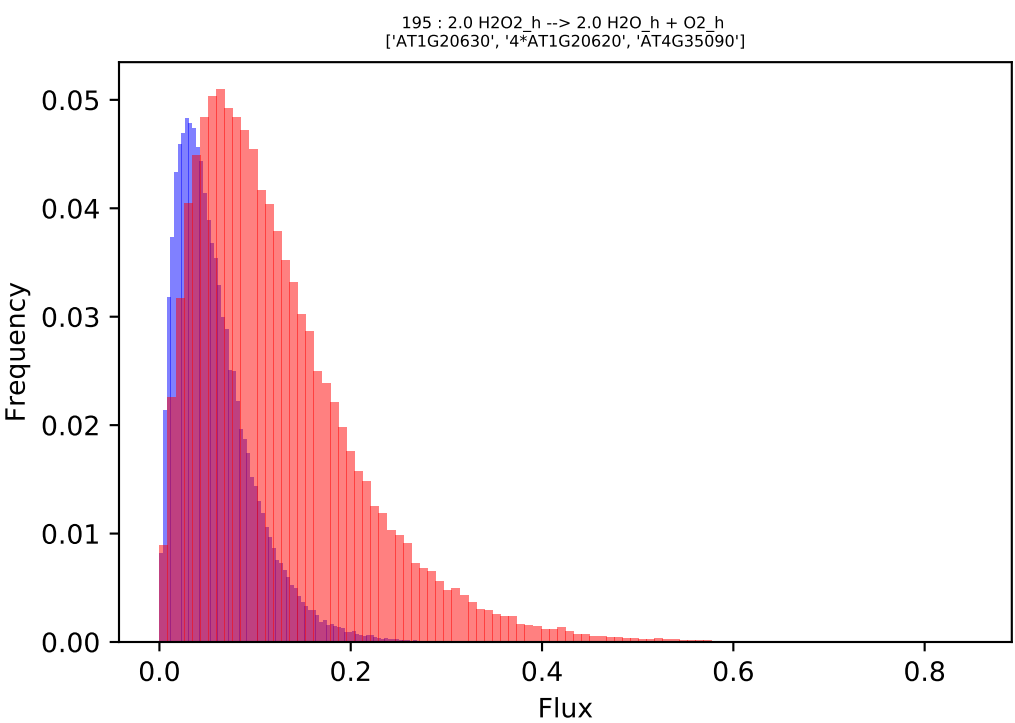

190 : ATP_h + Glu_h + NH4_h --> ADP_h + Gln_h + H_h + Pi_h
['8*AT3G17820', 'AT1G48470', 'AT5G35630']
Frequency
0.00
0.01
0.02
0.03
0.04
5
10
15
20
25
Flux

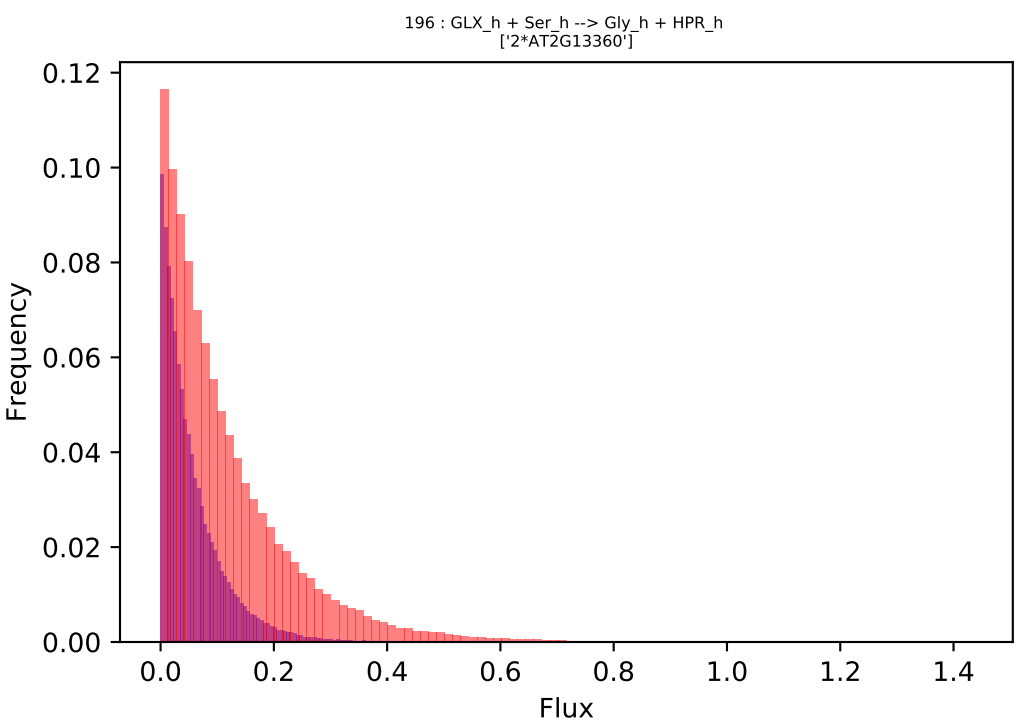

191 : ATP_m + Glu_m + NH4_m --> ADP_m + Gln_m + H_m + Pi_m
['8*AT5G35630']
Frequency
0.10
0.08
0.06
0.04
0.02
0.00
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Flux

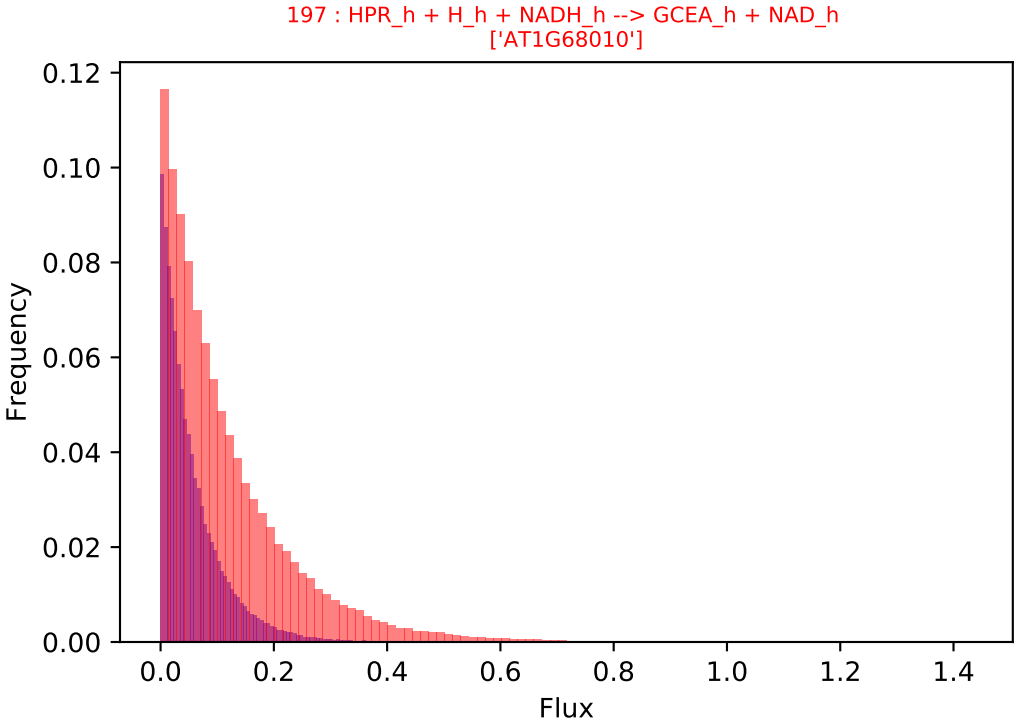

192 : Thr_c --> ACD_c + Gly_c
['AT1G08630']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.5
1.0
1.5
2.0
2.5
Flux

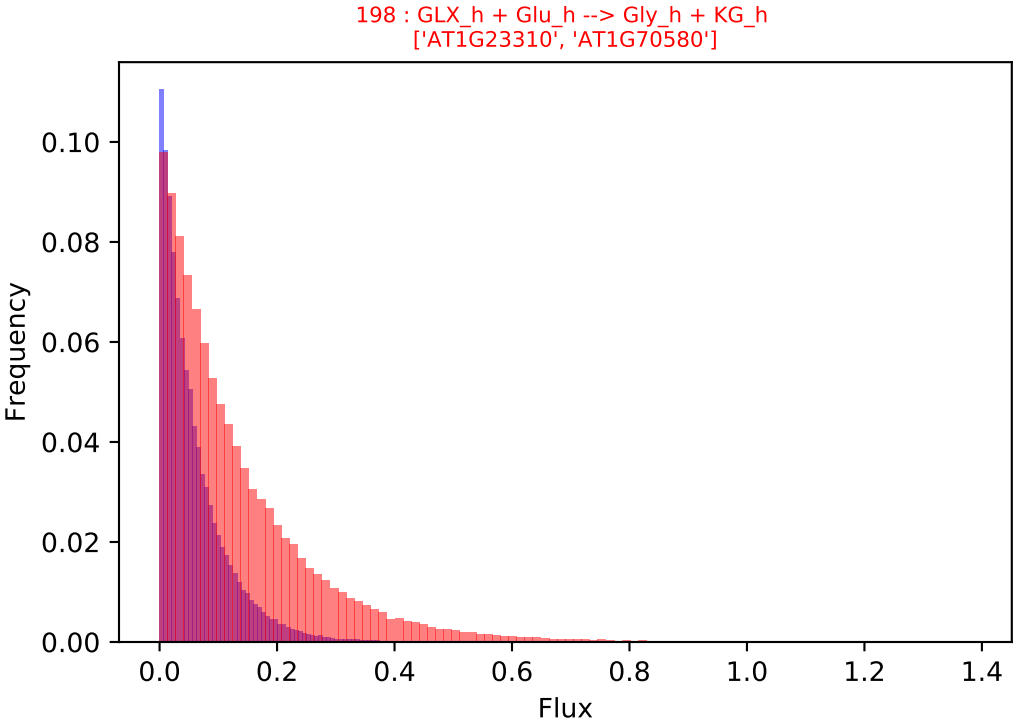

193 : ACD_c + H2O_c + NAD_c --> AC_c + H_c + NADH_c
['AT1G54100', 'AT4G36250', 'AT1G44170', 'AT3G24503', 'AT3G66658']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.5
1.0
1.5
2.0
2.5
Flux

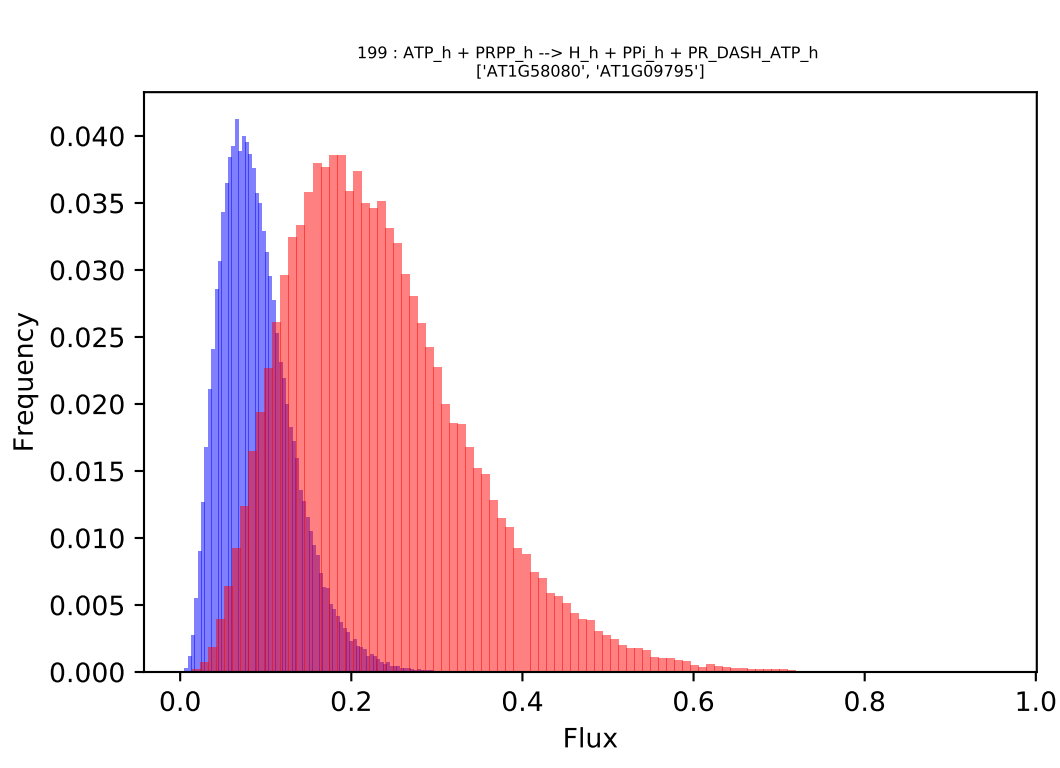

194 : GCA_h + O2_h --> GLX_h + H2O2_h
['AT3G14420', 'AT3G14415']
Frequency
0.05
0.04
0.03
0.02
0.01
0.00
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

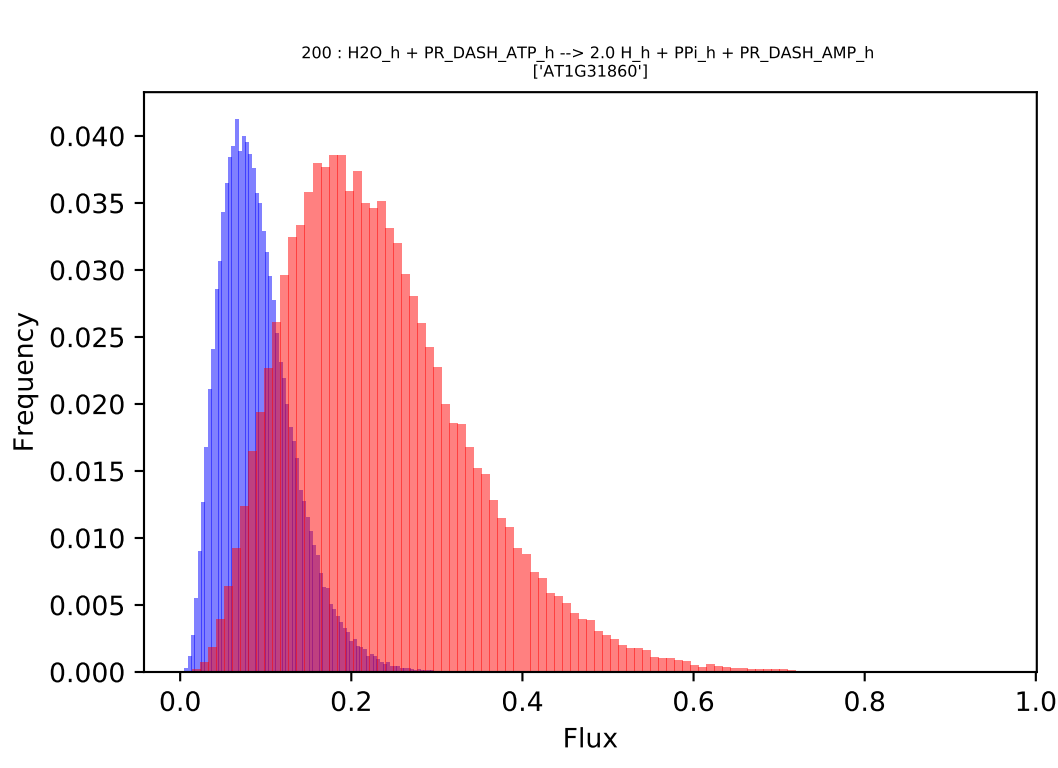

195 : 2.0 H2O2_h --> 2.0 H2O_h + O2_h
['AT1G20630', '4*AT1G20620', 'AT4G35090']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.0
0.2
0.4
0.6
0.8
Flux

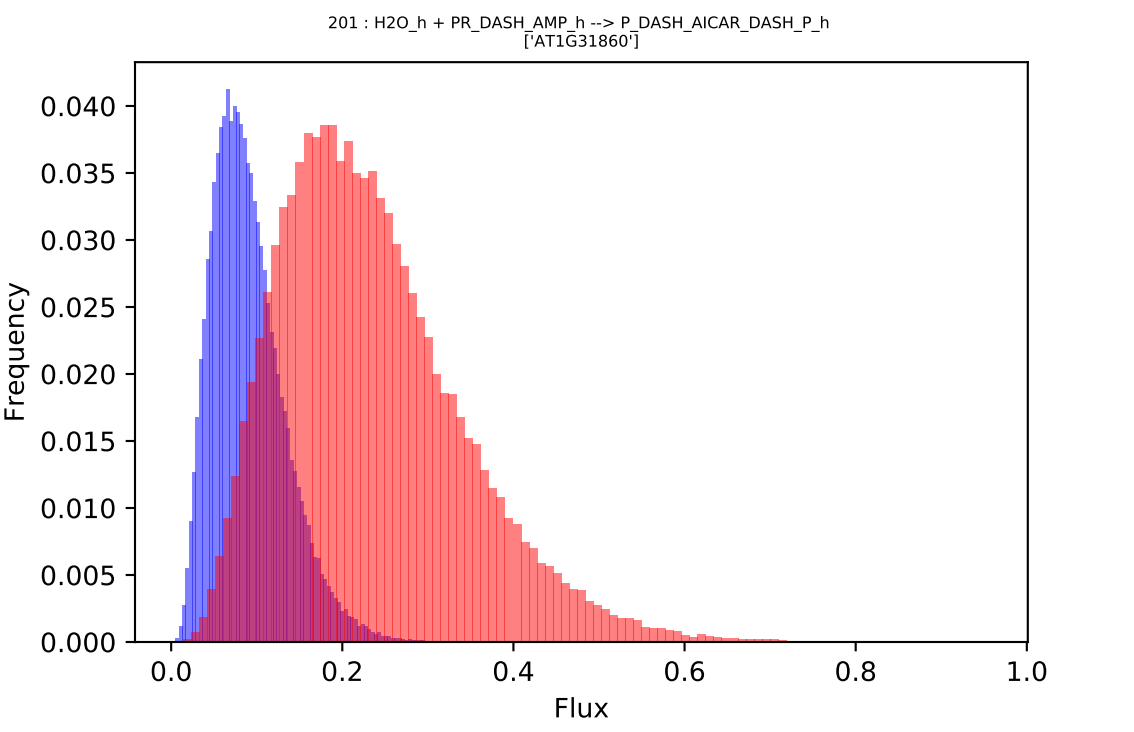

196 : GLX_h + Ser_h --> Gly_h + HPR_h
['2*AT2G13360']
Frequency
Flux
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4

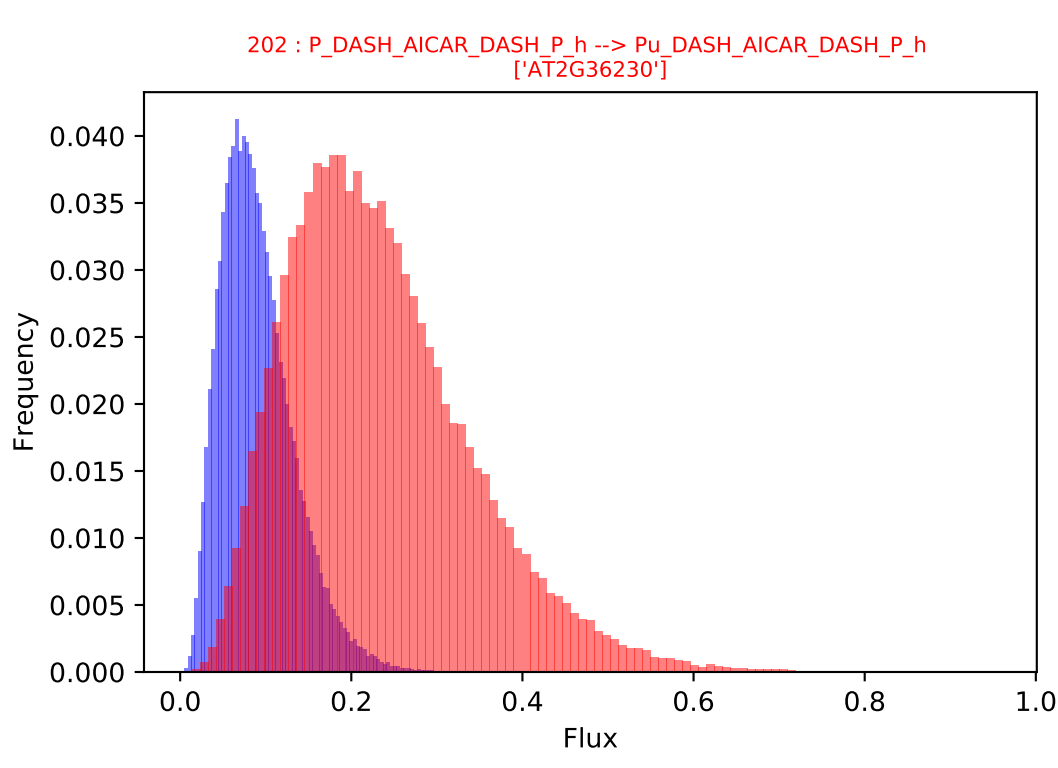

197 : HPR_h + H_h + NADH_h --> GCEA_h + NAD_h
['AT1G68010']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

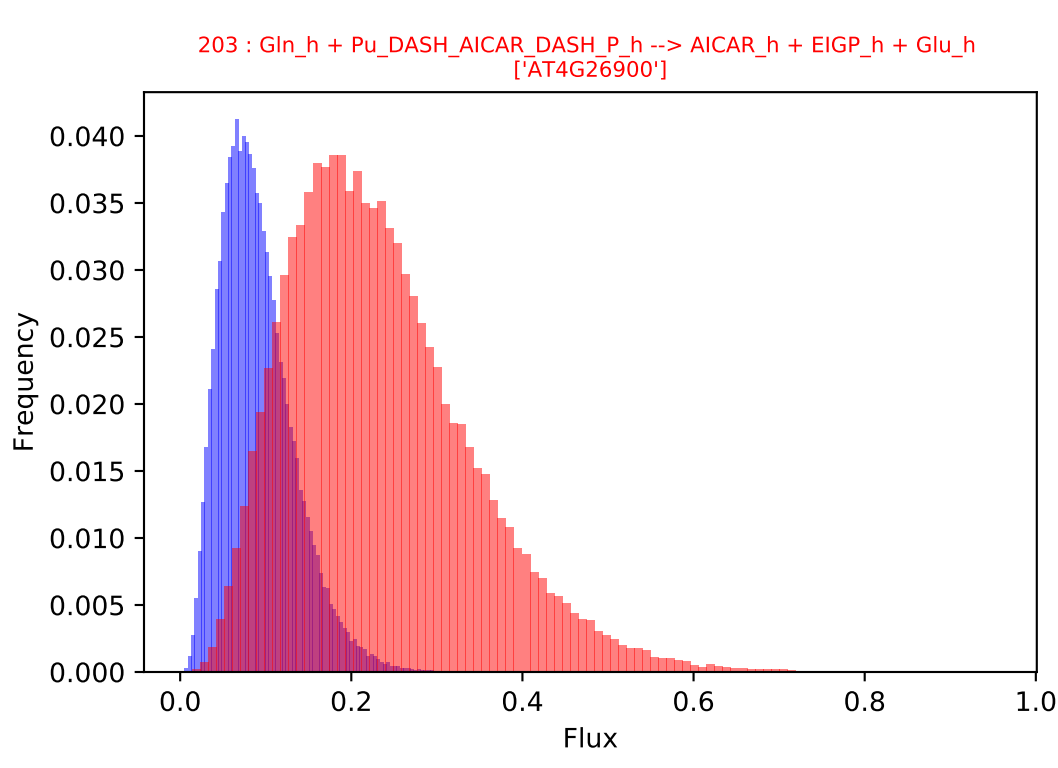

198 : GLX_h + Glu_h --> Gly_h + KG_h
['AT1G23310', 'AT1G70580']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

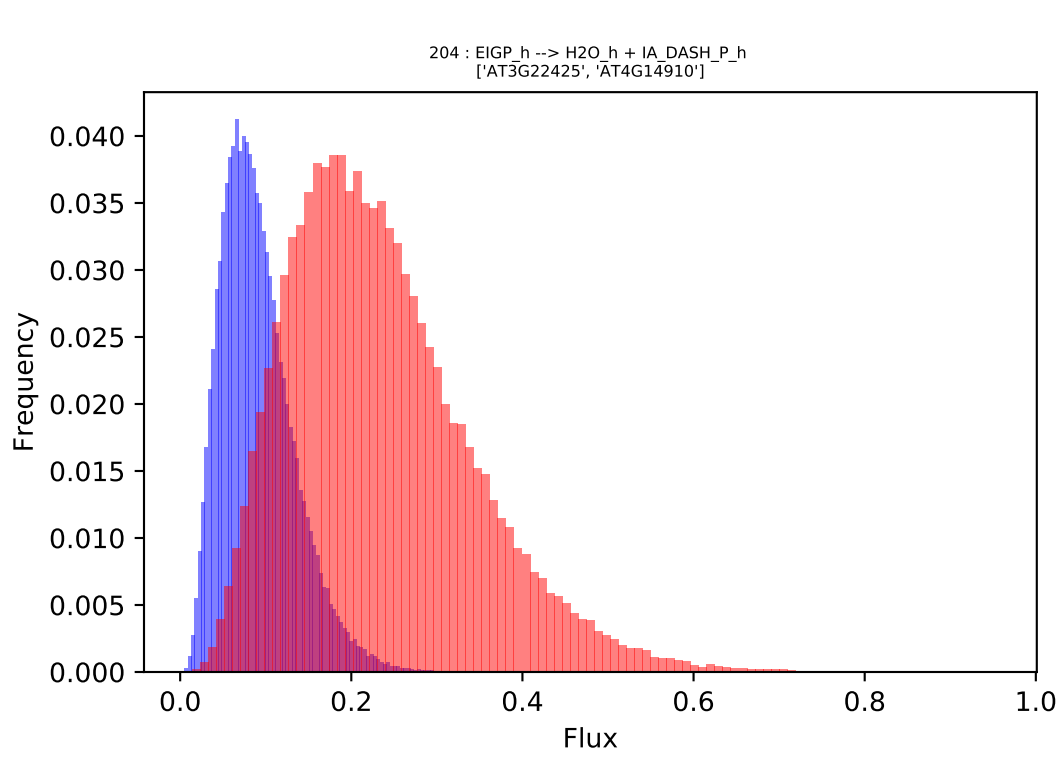

199 : ATP_h + PRPP_h --> H_h + PPi_h + PR_DASH_ATP_h
['AT1G58080', 'AT1G09795']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
Flux

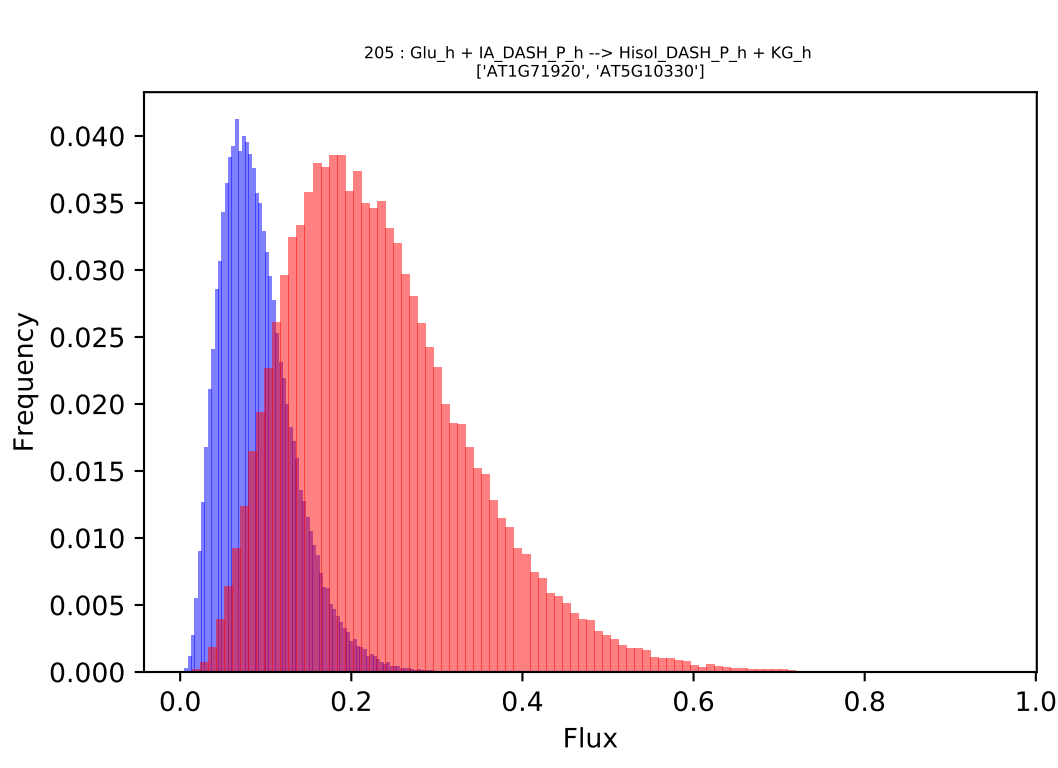

200 : H2O_h + PR_DASH_ATP_h --> 2.0 H_h + PPi_h + PR_DASH_AMP_h
['AT1G31860']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
Flux

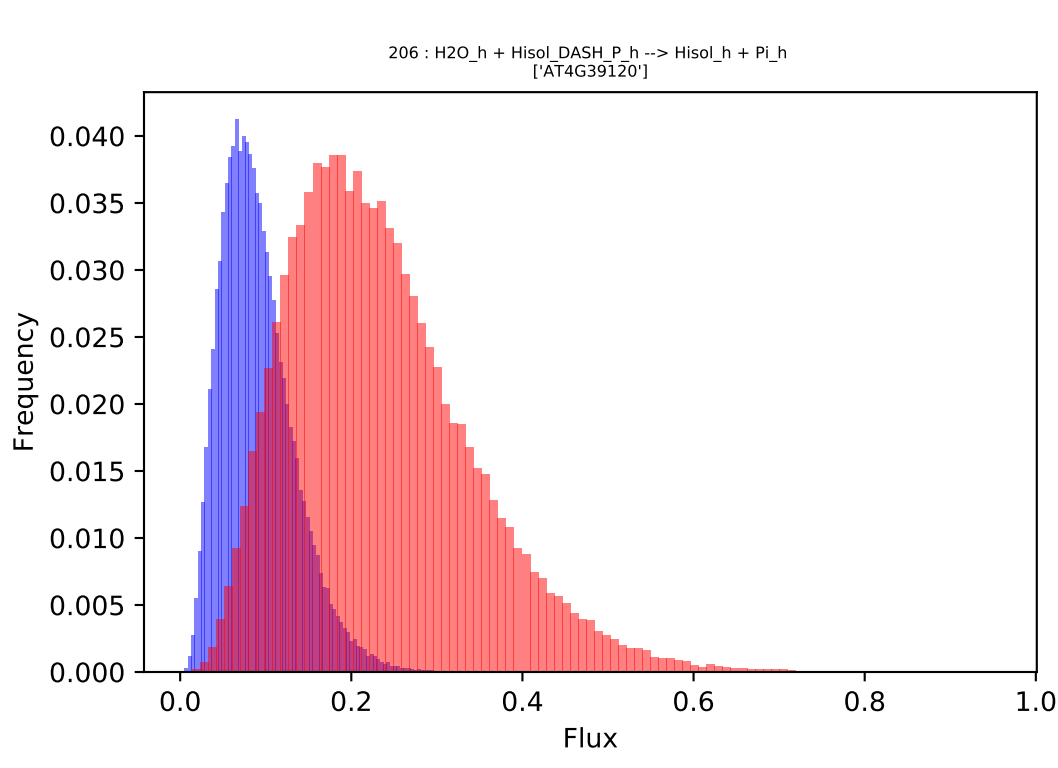

201 : H2O_h + PR_DASH_AMP_h --> P_DASH_AICAR_DASH_P_h
['AT1G31860']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
Flux

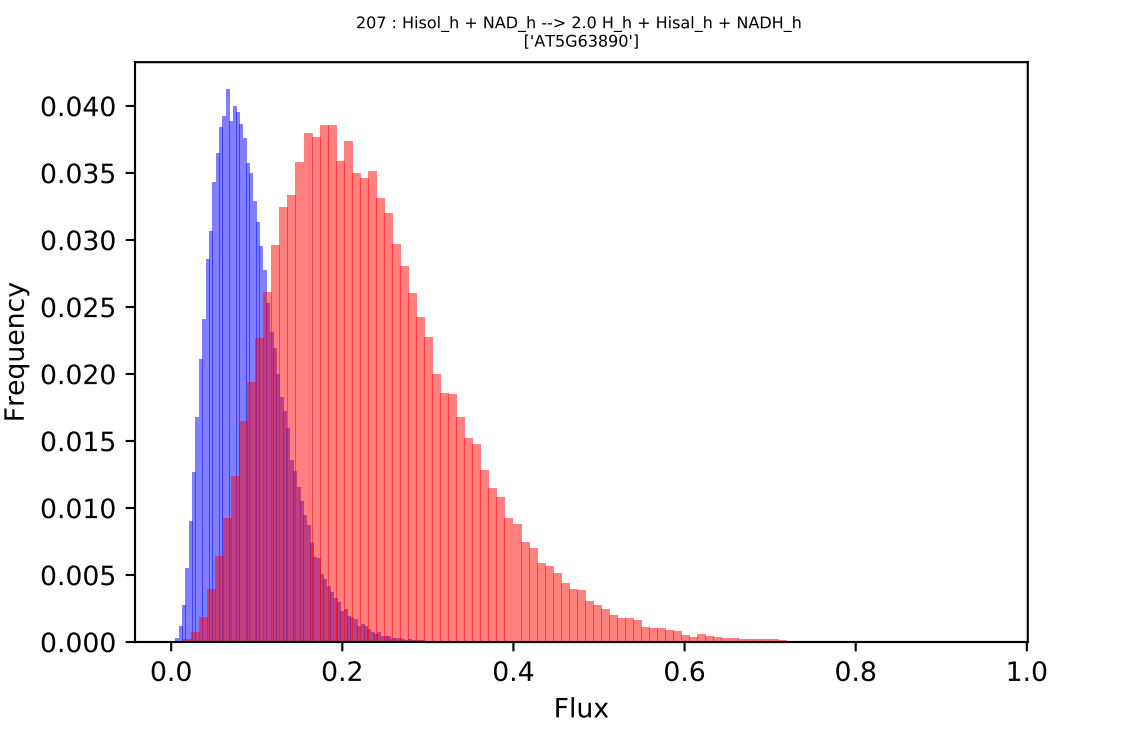

202 : P_DASH_AICAR_DASH_P_h --> Pu_DASH_AICAR_DASH_P_h
['AT2G36230']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
Flux

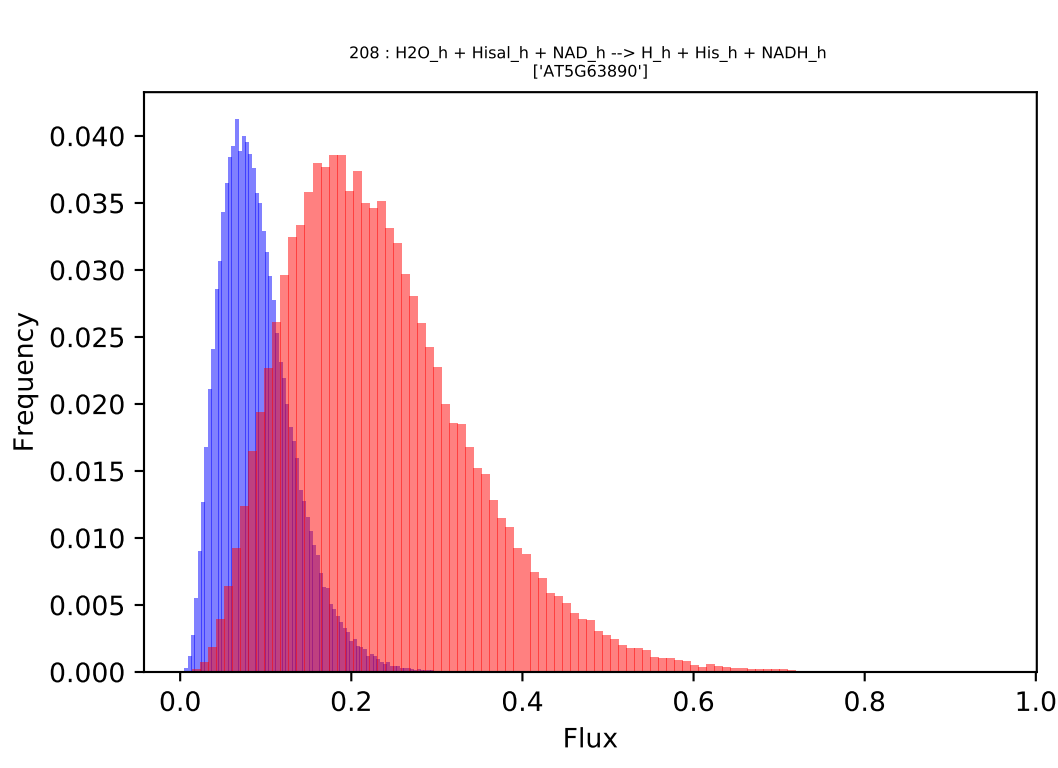

203 : Gln_h + Pu_DASH_AICAR_DASH_P_h --> AICAR_h + EIGP_h + Glu_h
['AT4G26900']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
Flux

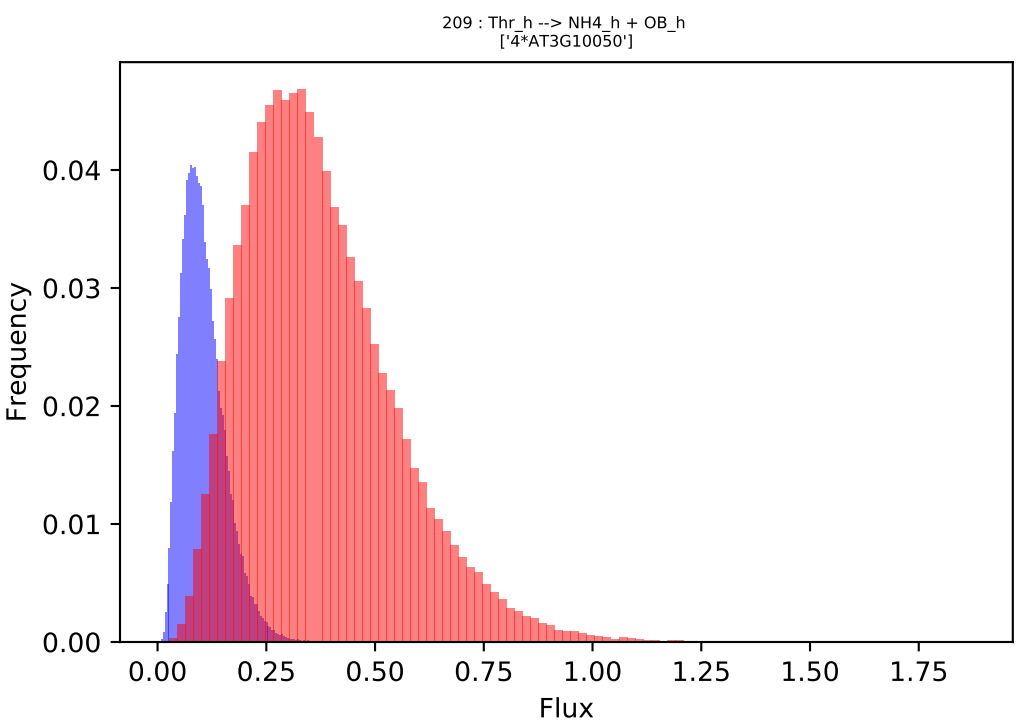

204 : EIGP_h --> H2O_h + IA_DASH_P_h
['AT3G22425', 'AT4G14910']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
Flux

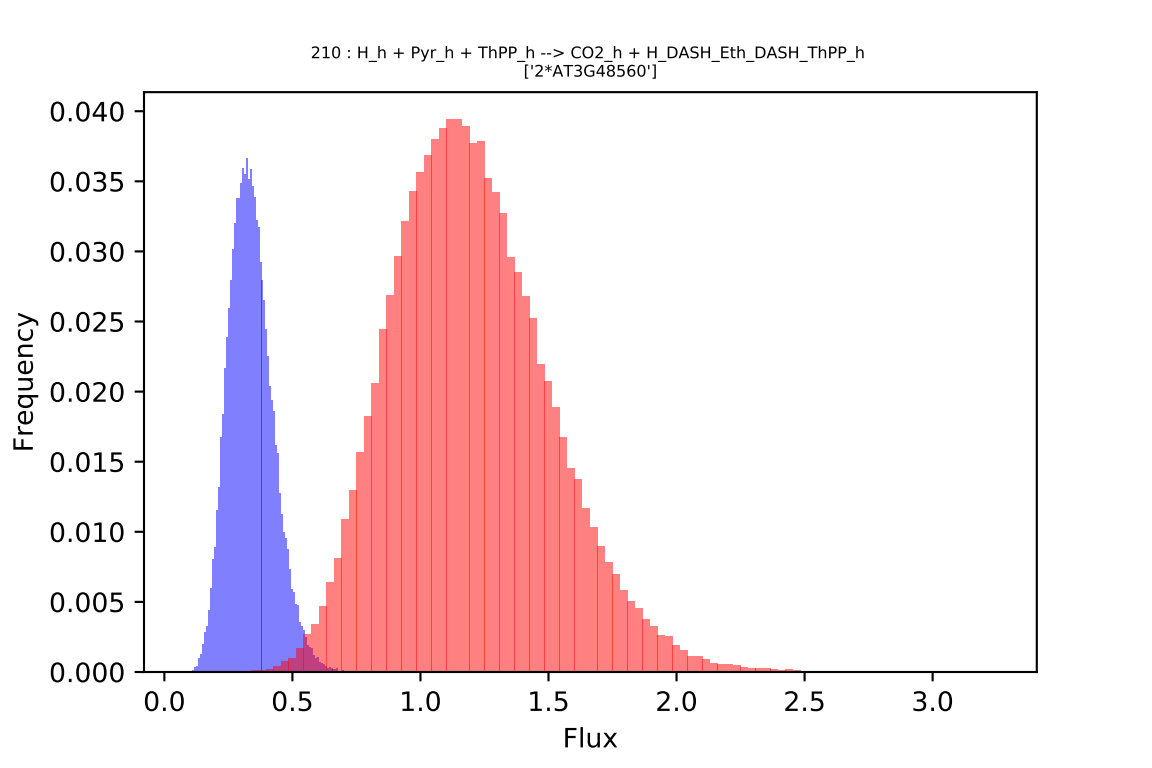

205 : Glu_h + IA_DASH_P_h --> Hisol_DASH_P_h + KG_h
['AT1G71920', 'AT5G10330']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
Flux

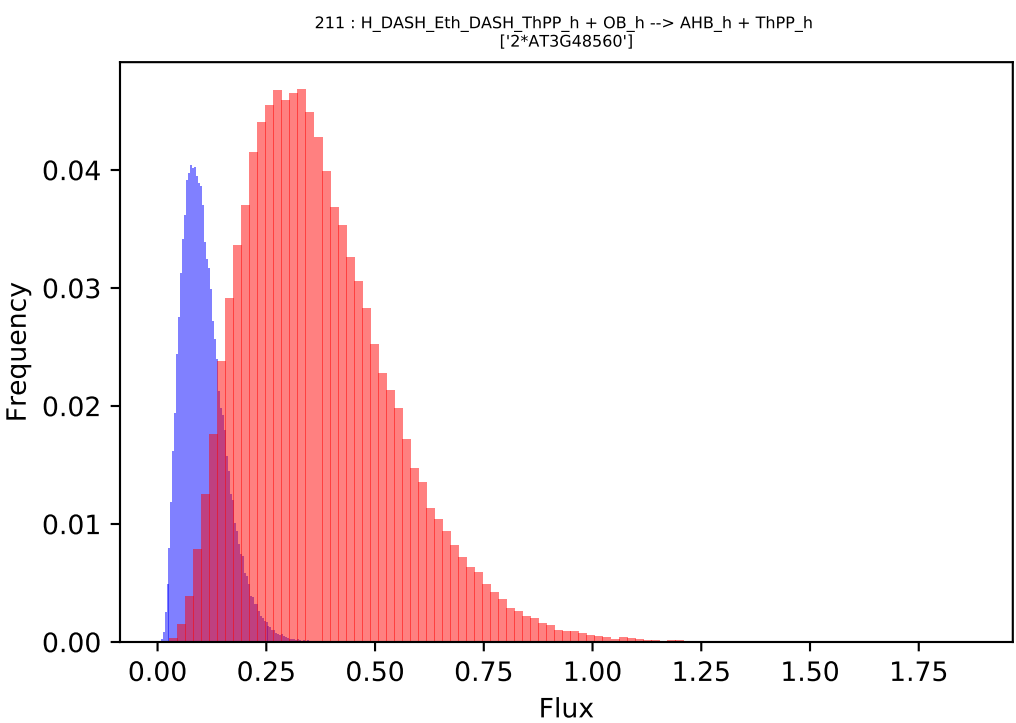

206 : H2O_h + Hisol_DASH_P_h --> Hisol_h + Pi_h
['AT4G39120']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
Flux

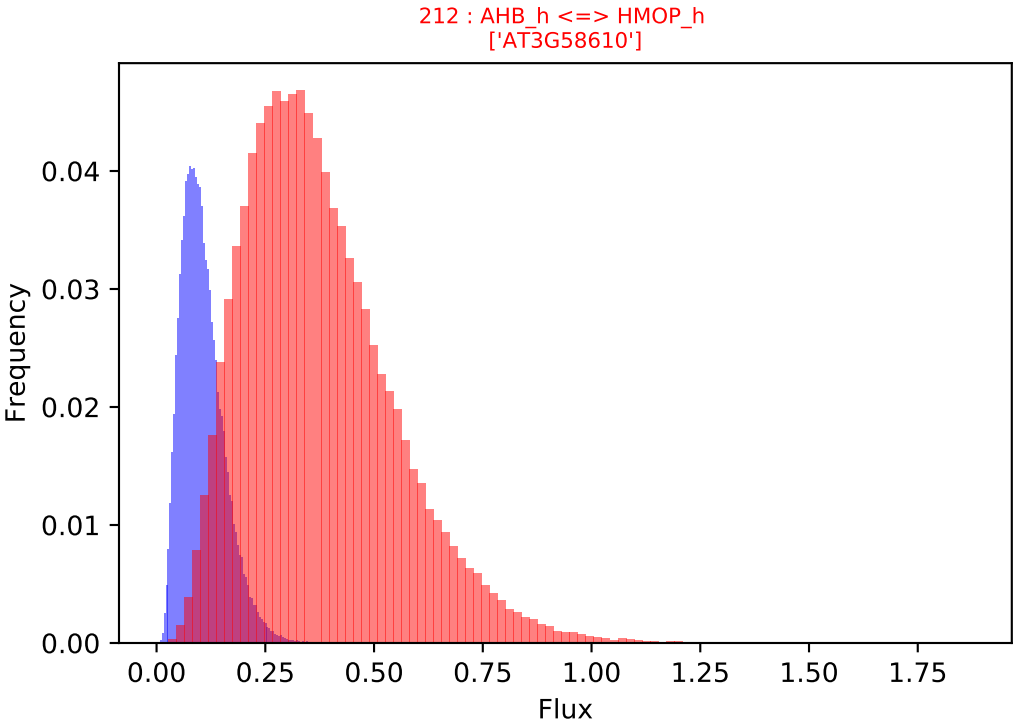

207 : Hisol_h + NAD_h --> 2.0 H_h + Hisal_h + NADH_h
['AT5G63890']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
Flux

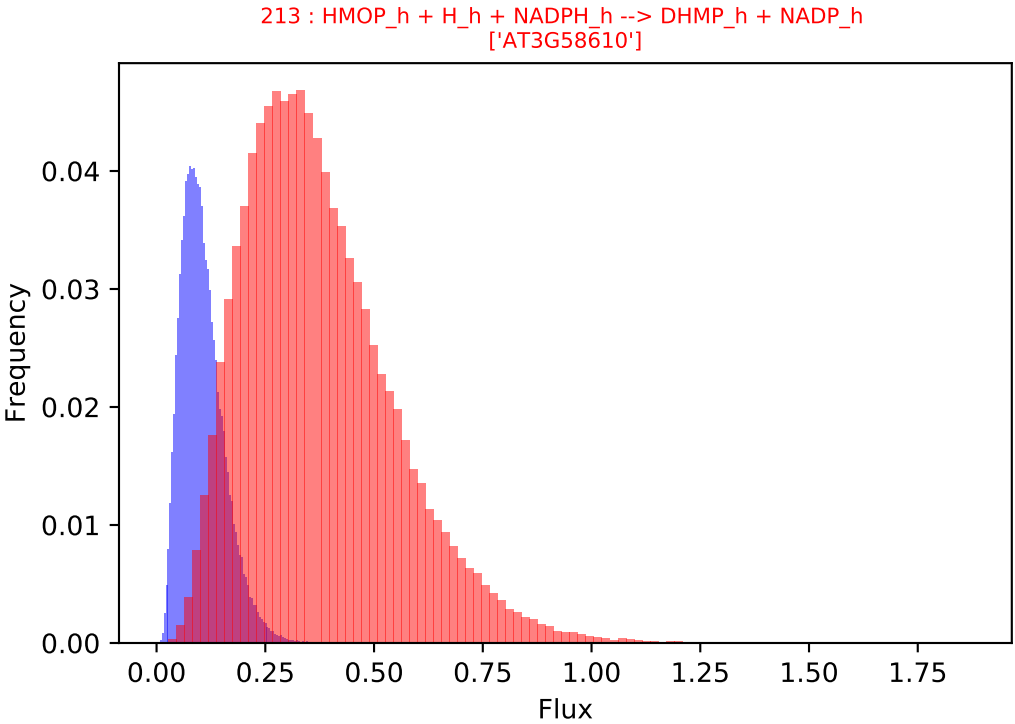

208 : H2O_h + Hisal_h + NAD_h --> H_h + His_h + NADH_h
['AT5G63890']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
Flux

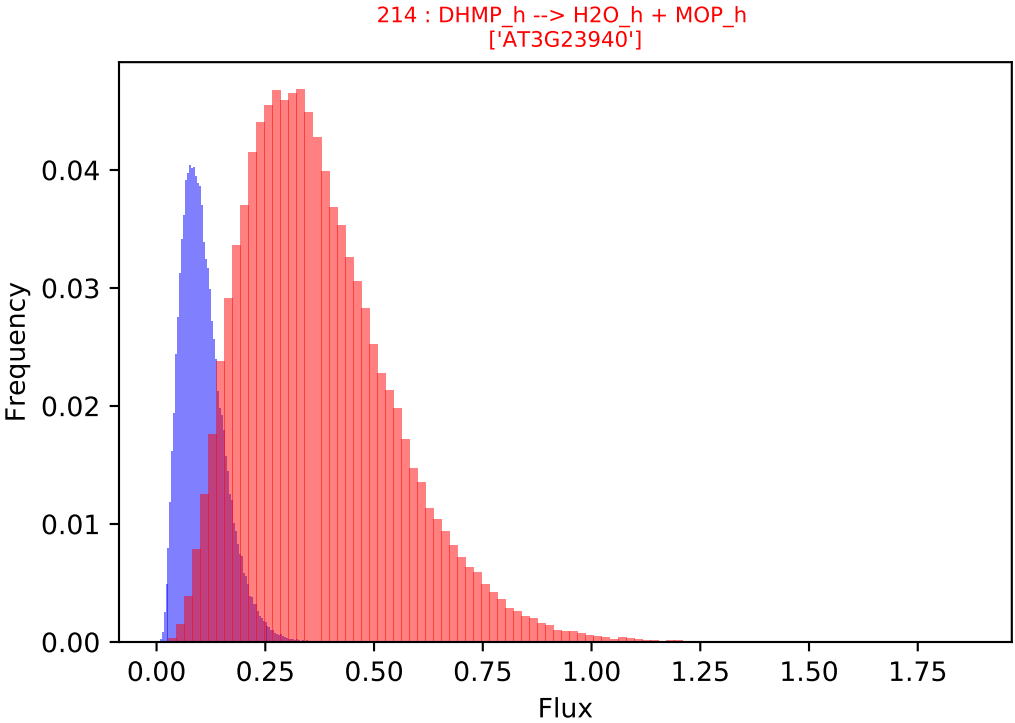

209 : Thr_h --> NH4_h + OB_h
['4*AT3G10050']
Frequency
0.00
0.01
0.02
0.03
0.04
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

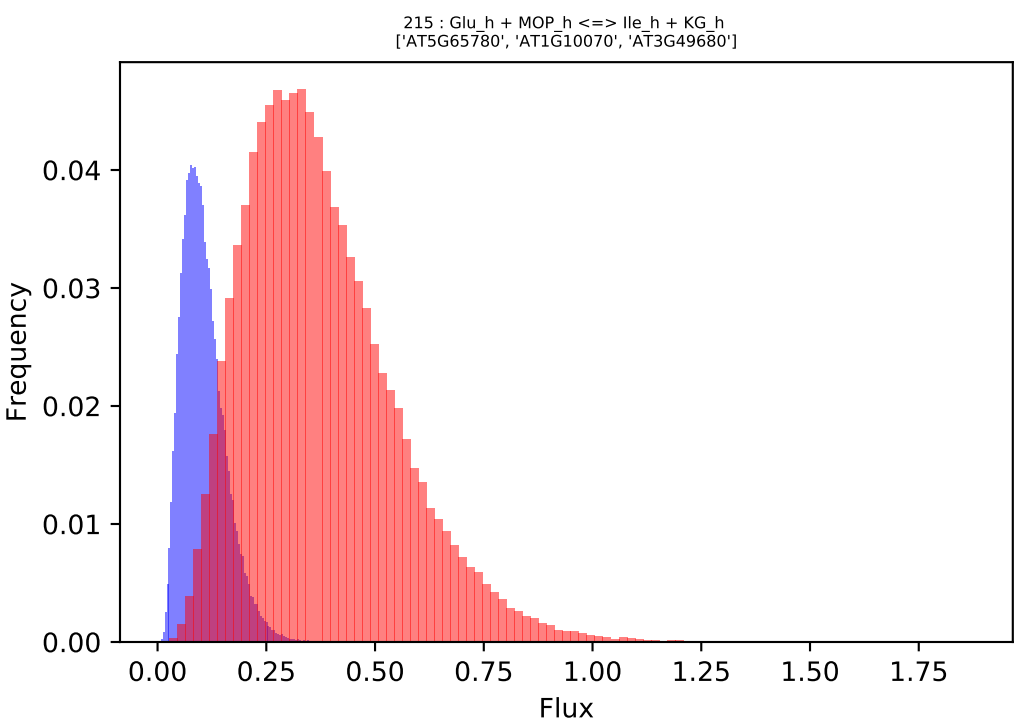

210 : H_h + Pyr_h + ThPP_h --> CO2_h + H_DASH_Eth_DASH_ThPP_h
['2*AT3G48560']
Frequency
Flux
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
0.040
0.0
0.5
1.0
1.5
2.0
2.5
3.0

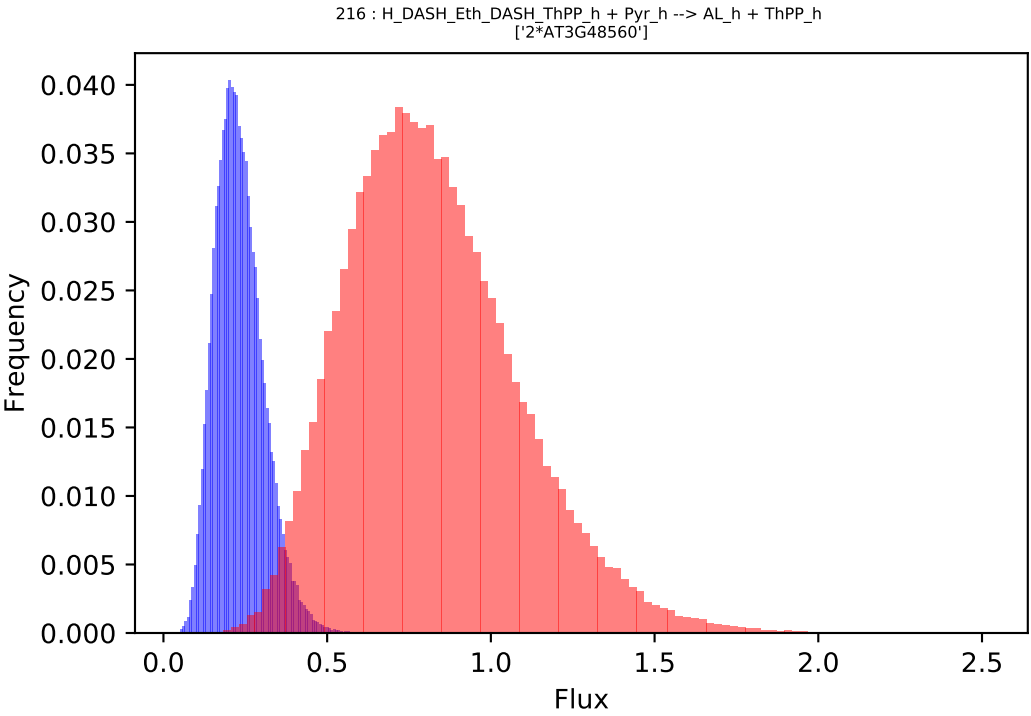

211 : H_DASH_Eth_DASH_ThPP_h + OB_h --> AHB_h + ThPP_h
['2*AT3G48560']
Frequency
0.00
0.01
0.02
0.03
0.04
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

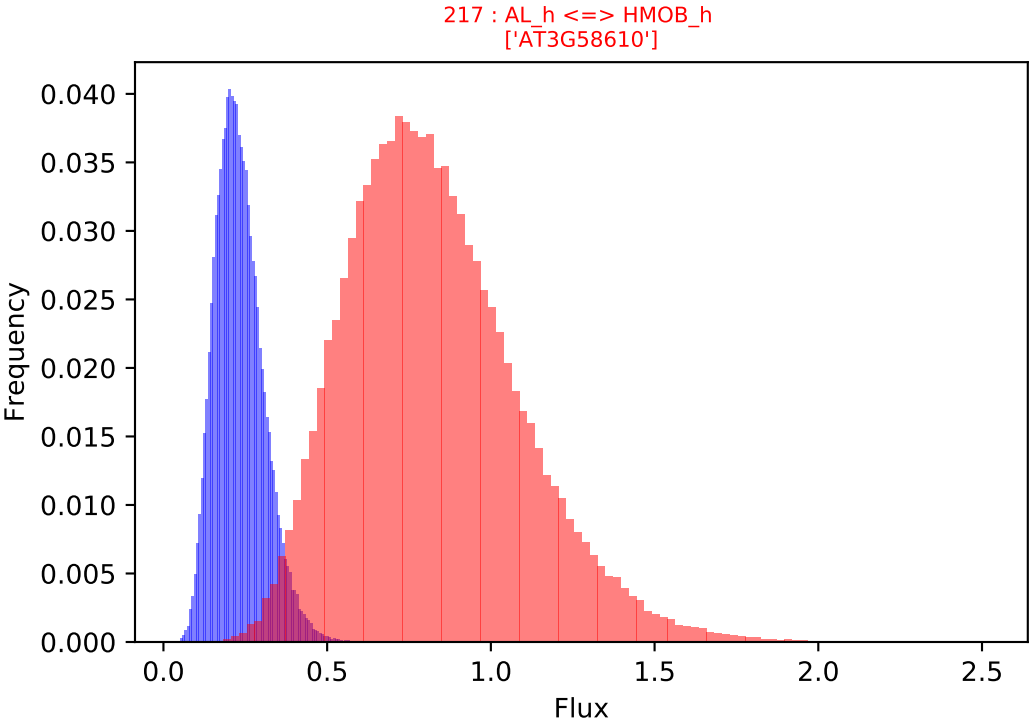

212 : AHB_h <=> HMOP_h
['AT3G58610']
Frequency
0.00
0.01
0.02
0.03
0.04
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

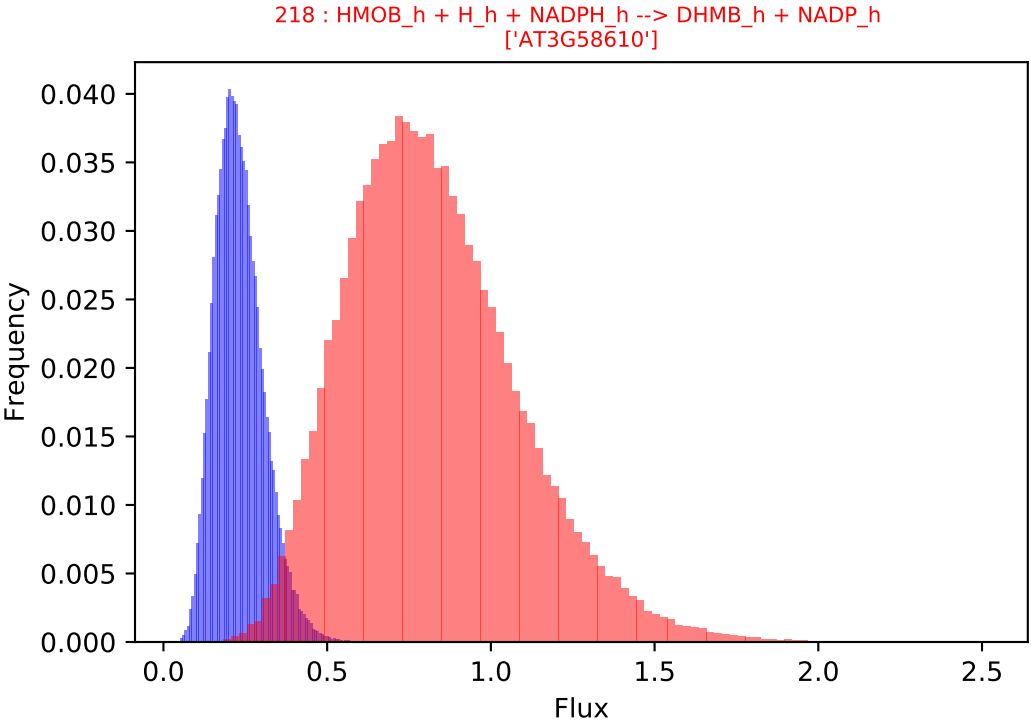

213 : HMOP_h + H_h + NADPH_h --> DHMP_h + NADP_h
['AT3G58610']
Frequency
0.00
0.01
0.02
0.03
0.04
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

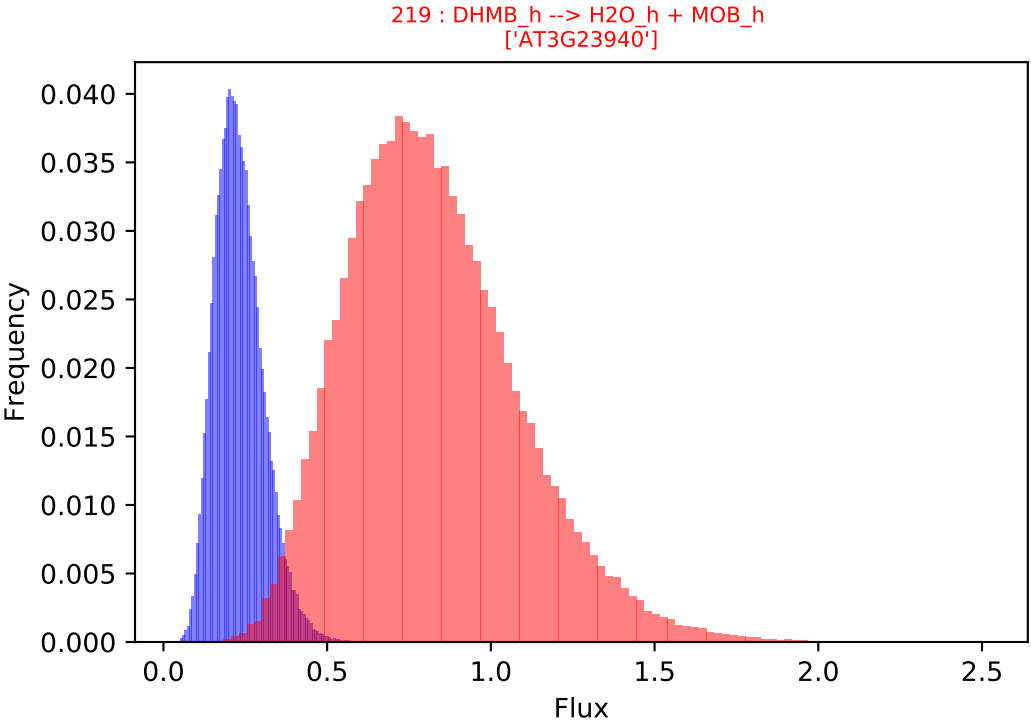

214 : DHMP_h --> H2O_h + MOP_h
['AT3G23940']
Frequency
0.04
0.03
0.02
0.01
0.00
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

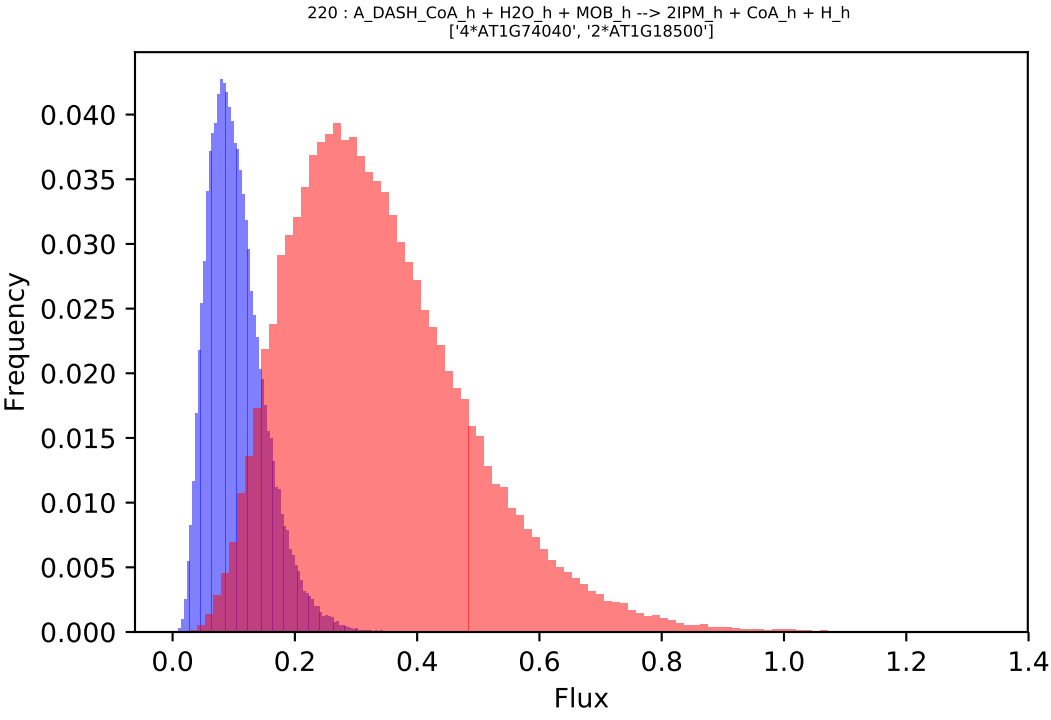

215 : Glu_h + MOP_h <=> Ile_h + KG_h
['AT5G65780', 'AT1G10070', 'AT3G49680']
Frequency
0.00
0.01
0.02
0.03
0.04
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

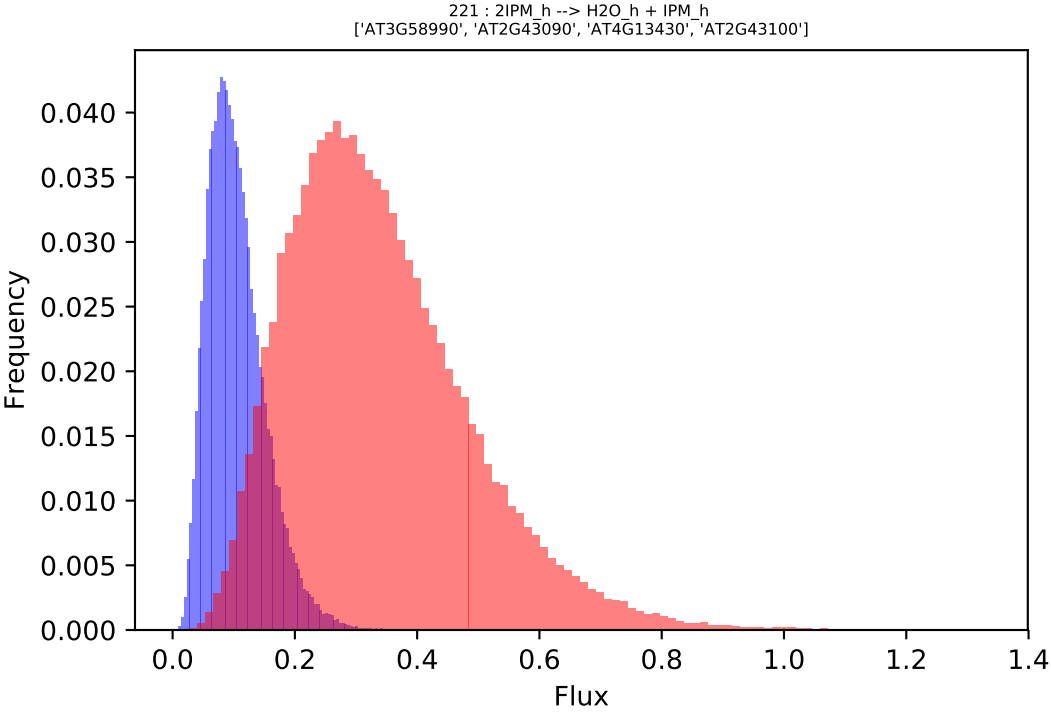

216 : H_DASH_Eth_DASH_ThPP_h + Pyr_h --> AL_h + ThPP_h
['2*AT3G48560']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.5
1.0
1.5
2.0
2.5
Flux

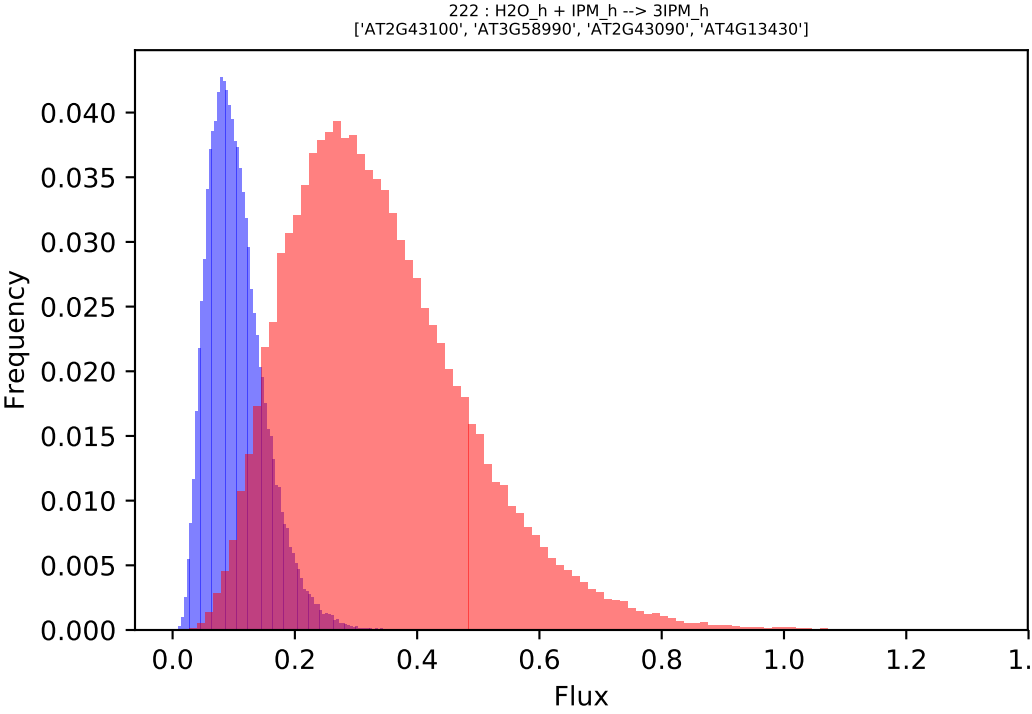

217 : AL_h <=> HMOB_h
['AT3G58610']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
Flux

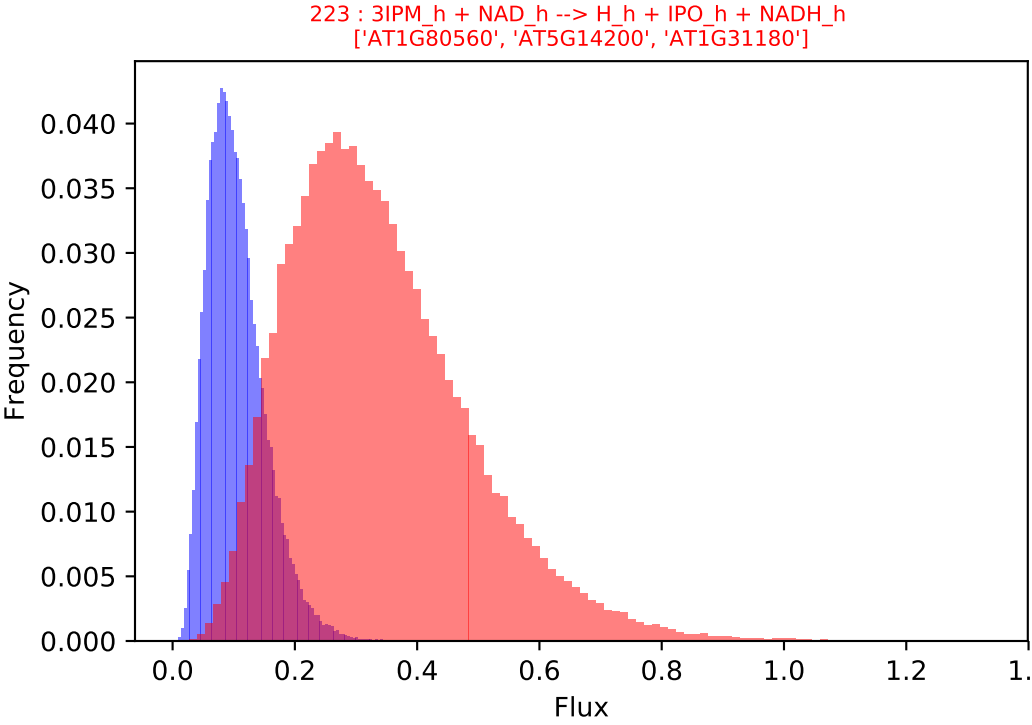

218 : HMOB_h + H_h + NADPH_h --> DHMB_h + NADP_h
['AT3G58610']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.5
1.0
1.5
2.0
2.5
Flux

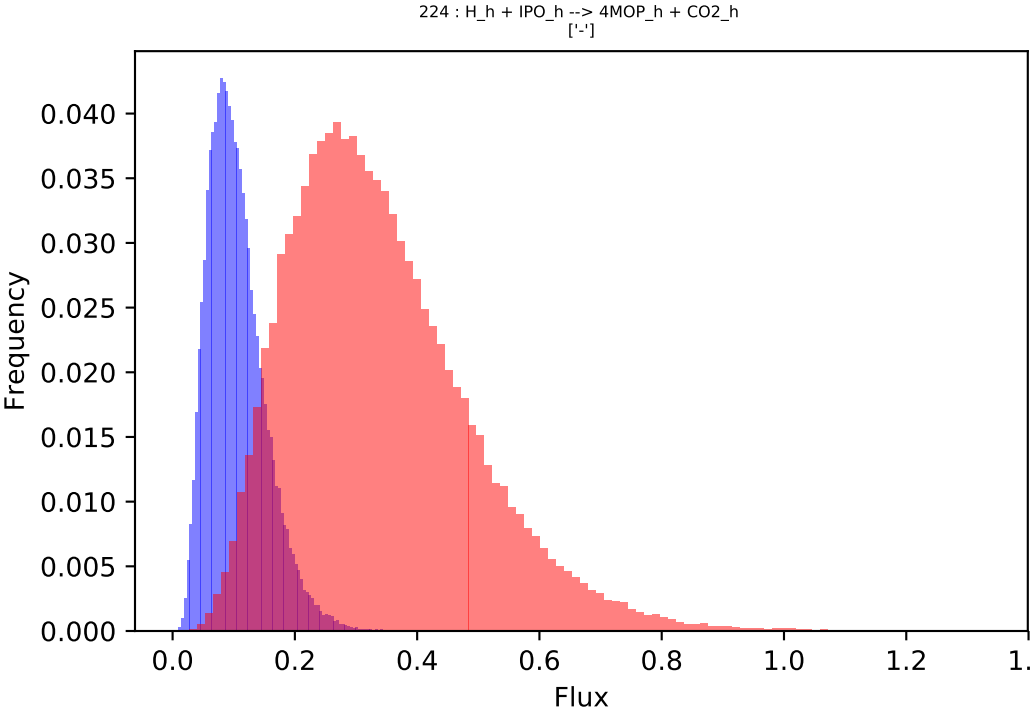

219 : DHMB_h --> H2O_h + MOB_h
['AT3G23940']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.5
1.0
1.5
2.0
2.5
Flux

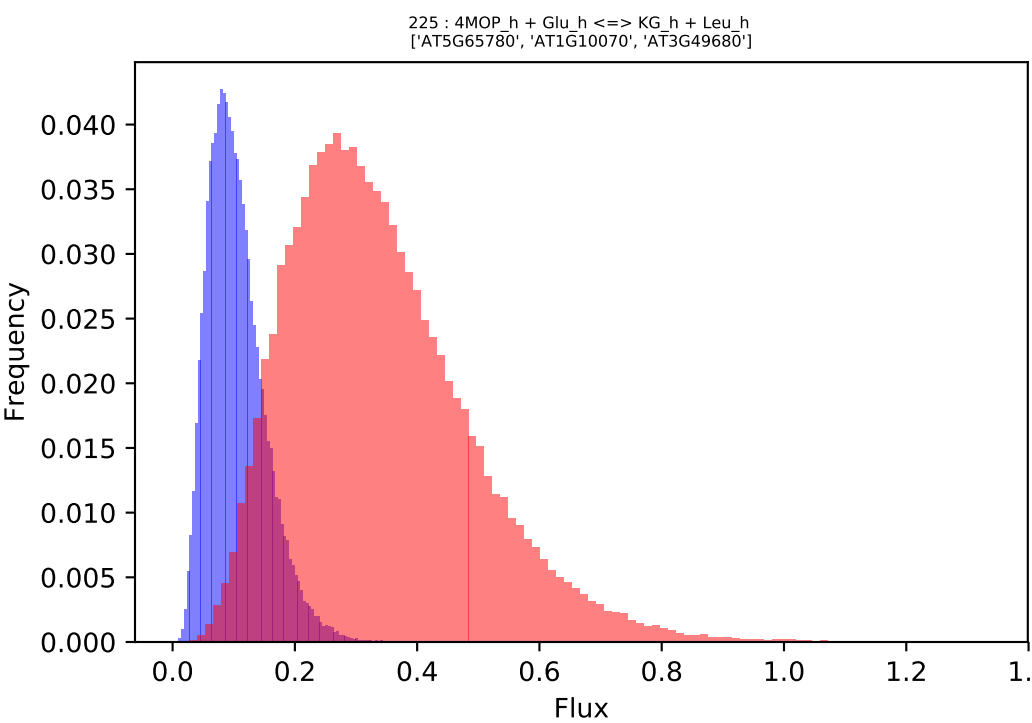

220 : A_DASH_CoA_h + H2O_h + MOB_h --> 2IPM_h + CoA_h + H_h
['4*AT1G74040', '2*AT1G18500']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

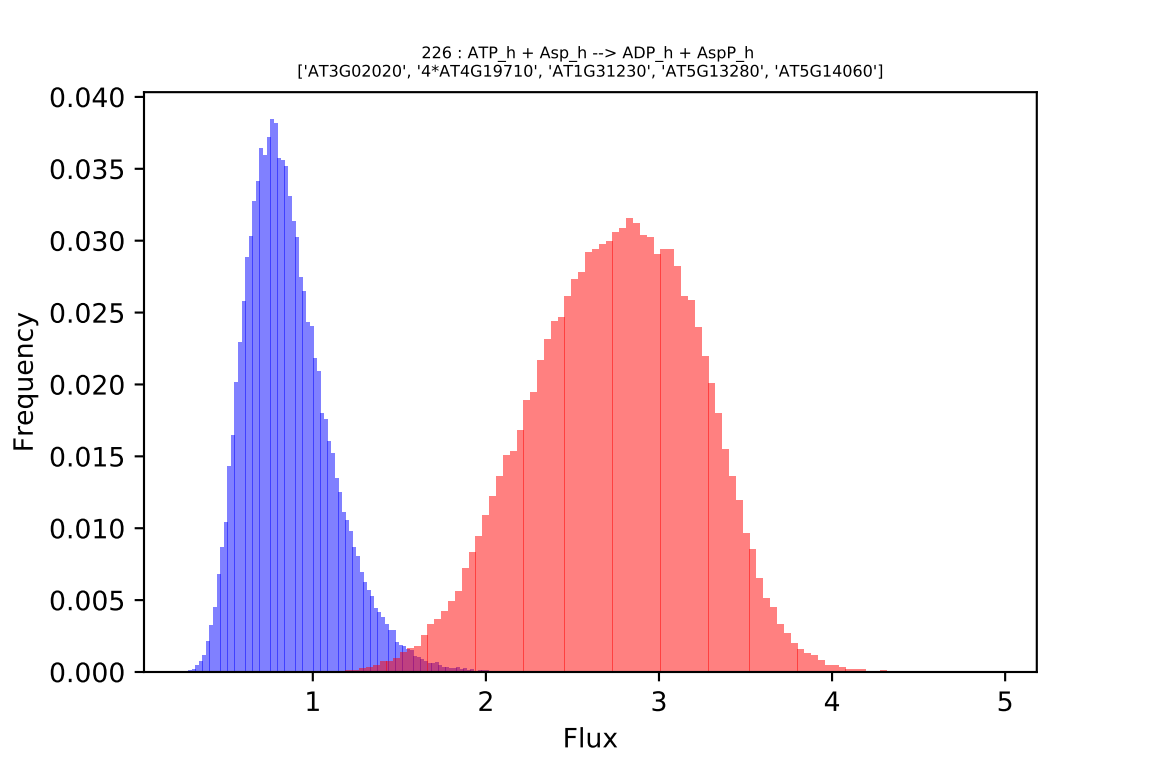

221 : 2IPM_h --> H2O_h + IPM_h
['AT3G58990', 'AT2G43090', 'AT4G13430', 'AT2G43100']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

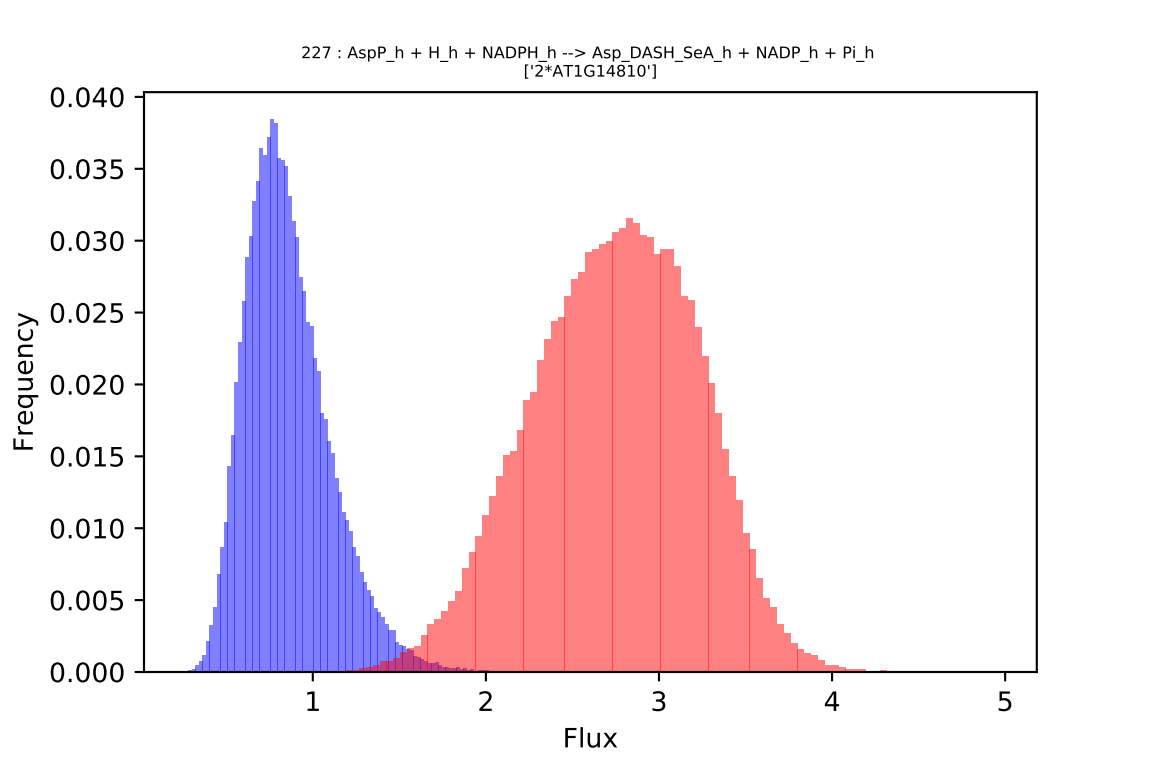

222 : H2O_h + IPM_h --> 3IPM_h
['AT2G43100', 'AT3G58990', 'AT2G43090', 'AT4G13430']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

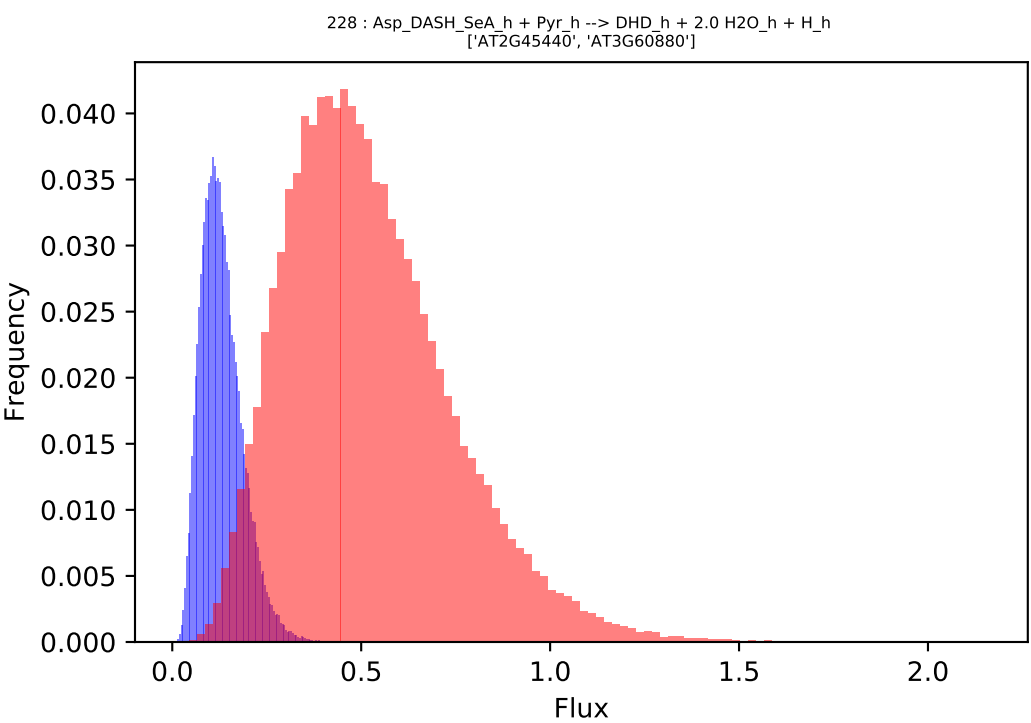

223 : 3IPM_h + NAD_h --> H_h + IPO_h + NADH_h
['AT1G80560', 'AT5G14200', 'AT1G31180']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

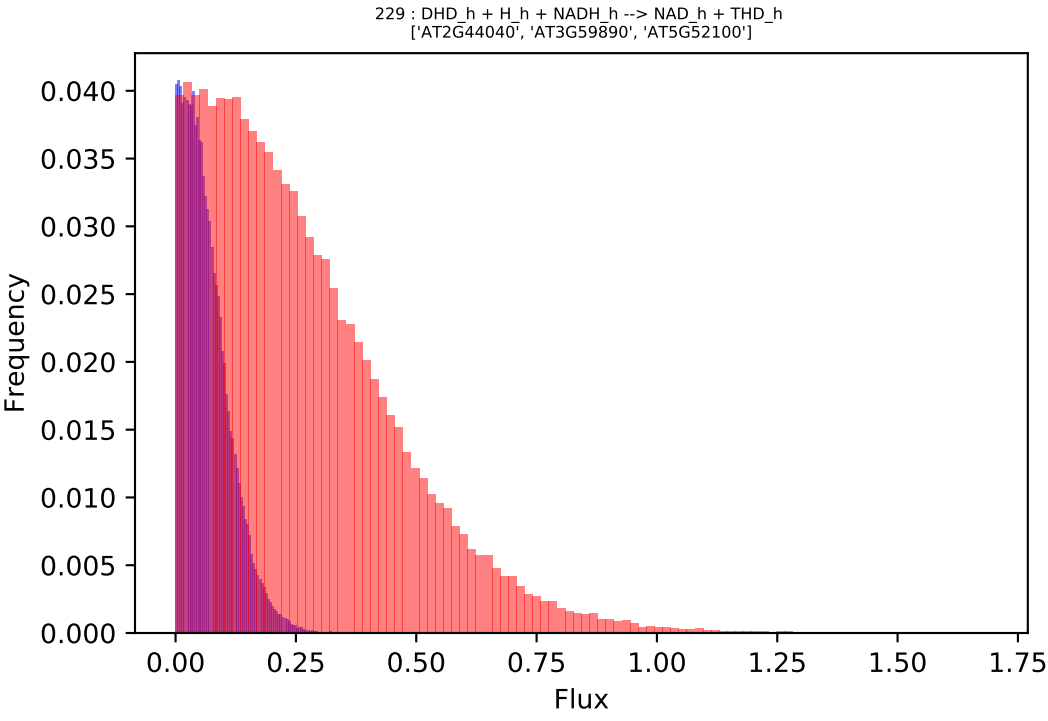

224 : H_h + IPO_h --> 4MOP_h + CO2_h
['-']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

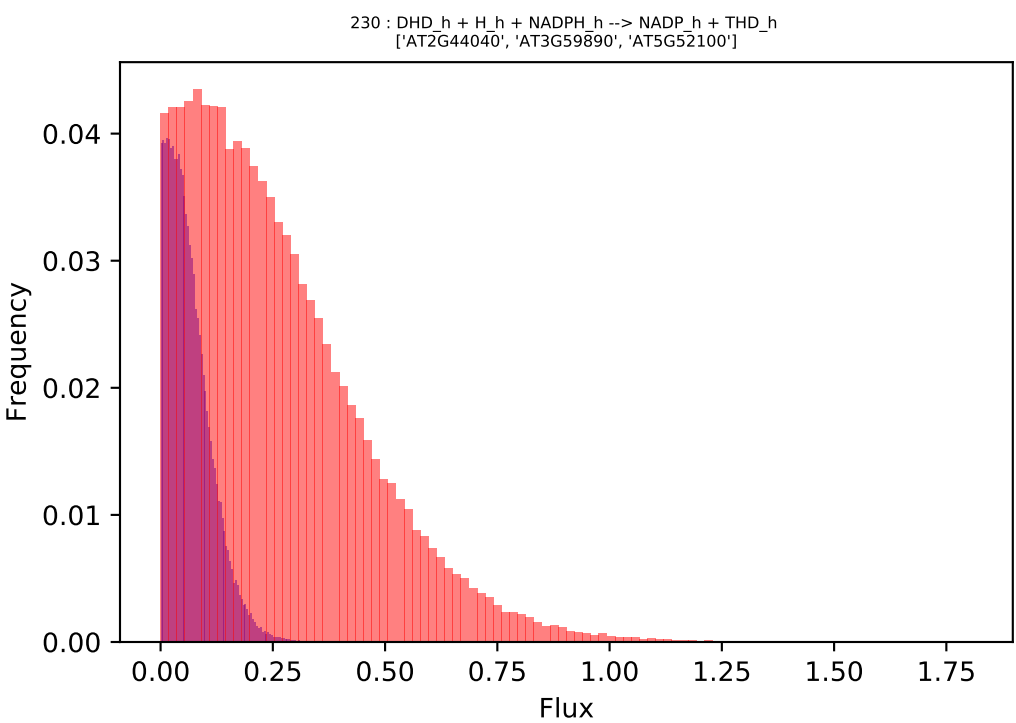

225 : 4MOP_h + Glu_h <=> KG_h + Leu_h
['AT5G65780', 'AT1G10070', 'AT3G49680']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

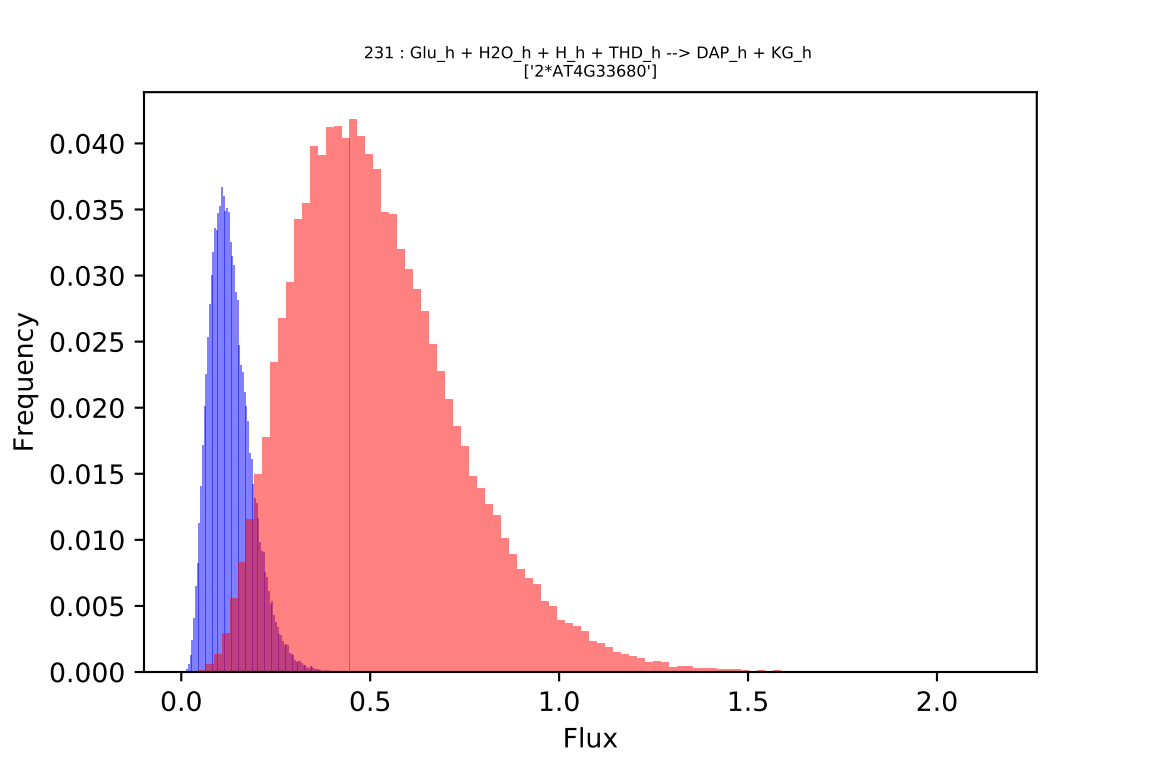

226 : ATP_h + Asp_h --> ADP_h + AspP_h
['AT3G02020', '4*AT4G19710', 'AT1G31230', 'AT5G13280', 'AT5G14060']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
1
2
3
4
5
Flux

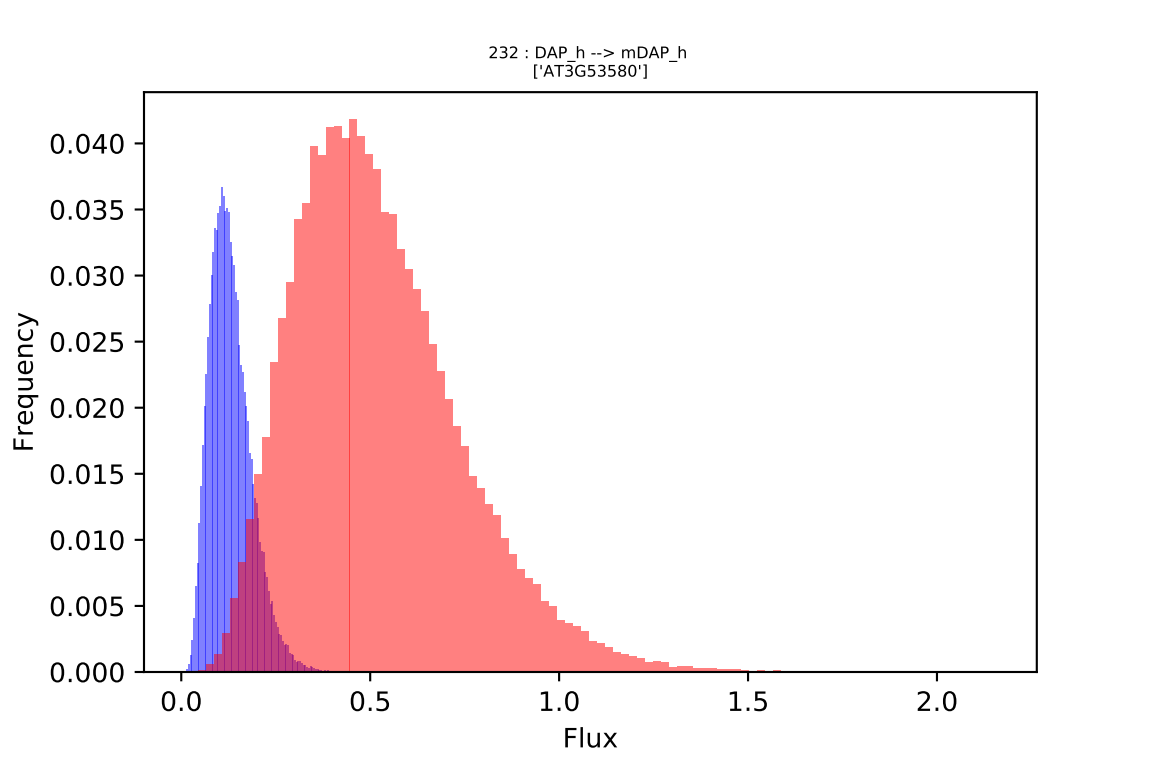

227 : AspP_h + H_h + NADPH_h --> Asp_DASH_SeA_h + NADP_h + Pi_h
['2*AT1G14810']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
1
2
3
4
5
Flux

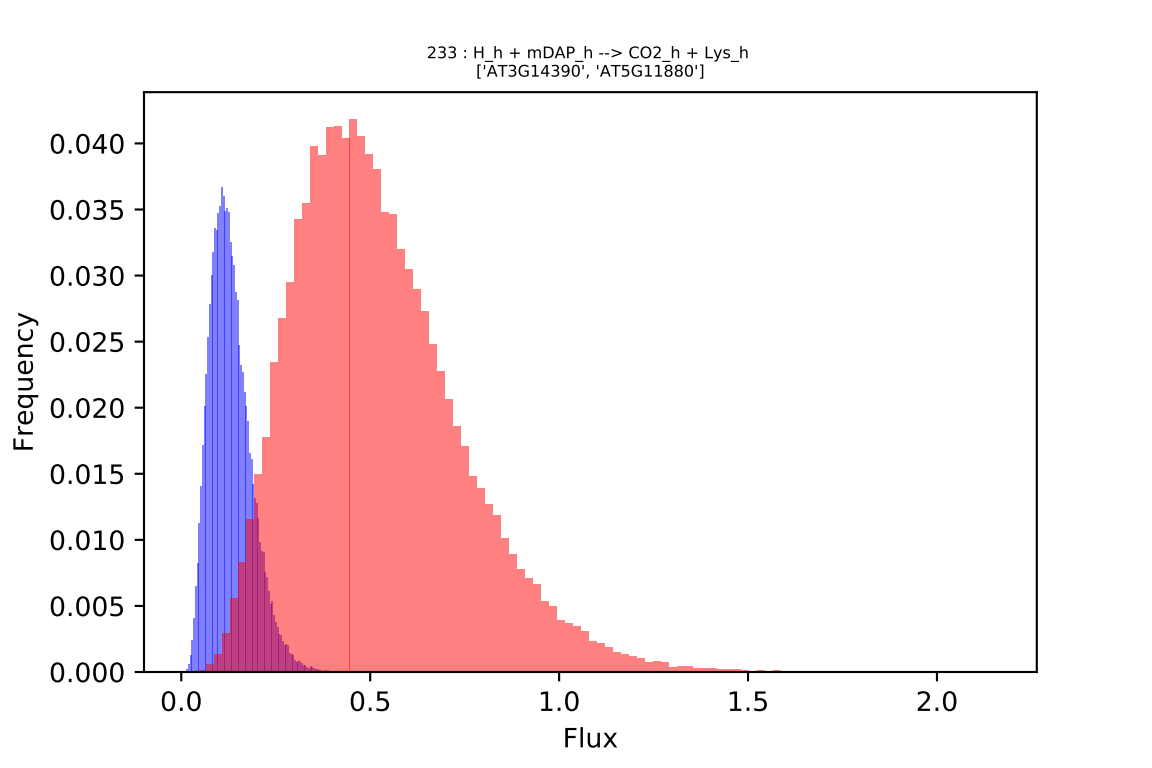

228 : Asp_DASH_SeA_h + Pyr_h --> DHD_h + 2.0 H2O_h + H_h
['AT2G45440', 'AT3G60880']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.5
1.0
1.5
2.0
Flux

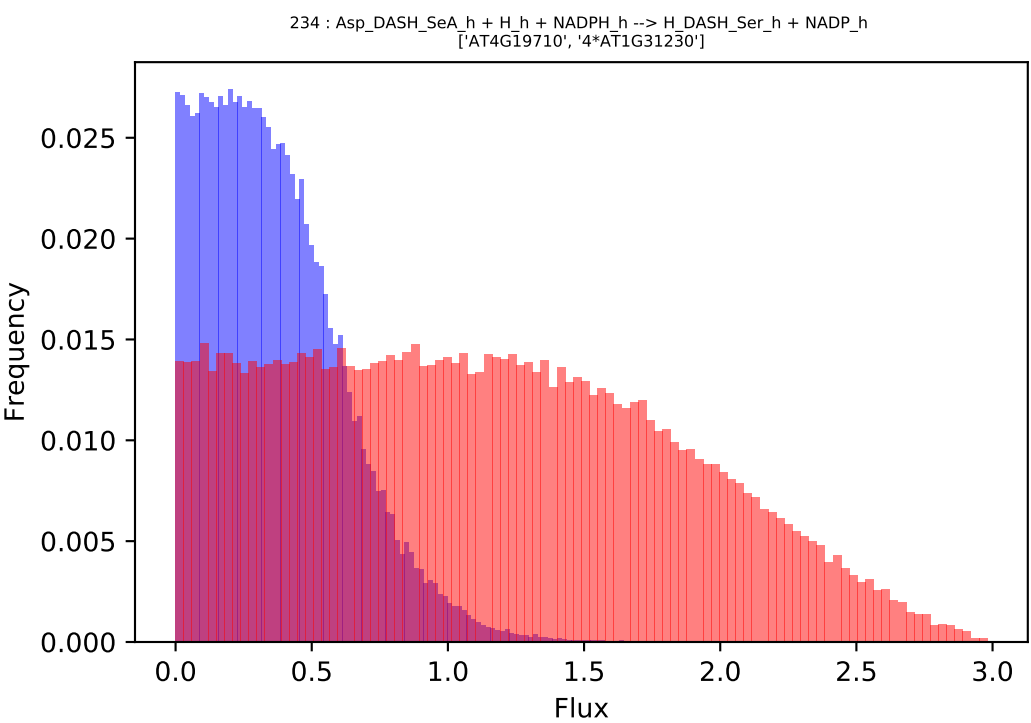

229 : DHD_h + H_h + NADH_h --> NAD_h + THD_h
['AT2G44040', 'AT3G59890', 'AT5G52100']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

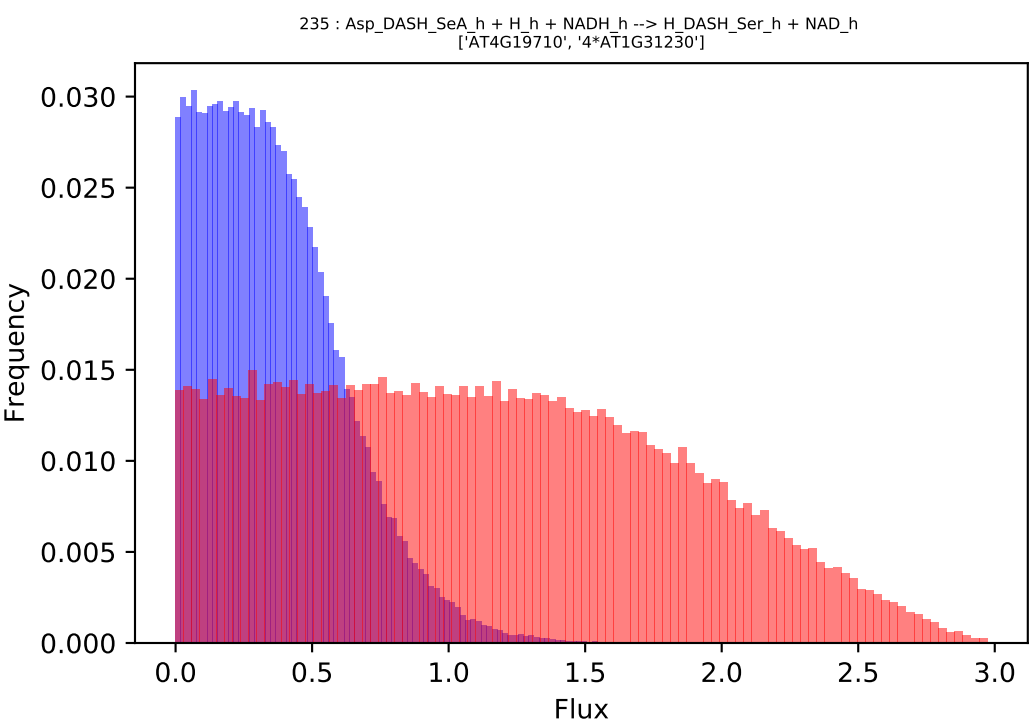

230 : DHD_h + H_h + NADPH_h --> NADP_h + THD_h
['AT2G44040', 'AT3G59890', 'AT5G52100']
Frequency
0.00
0.01
0.02
0.03
0.04
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

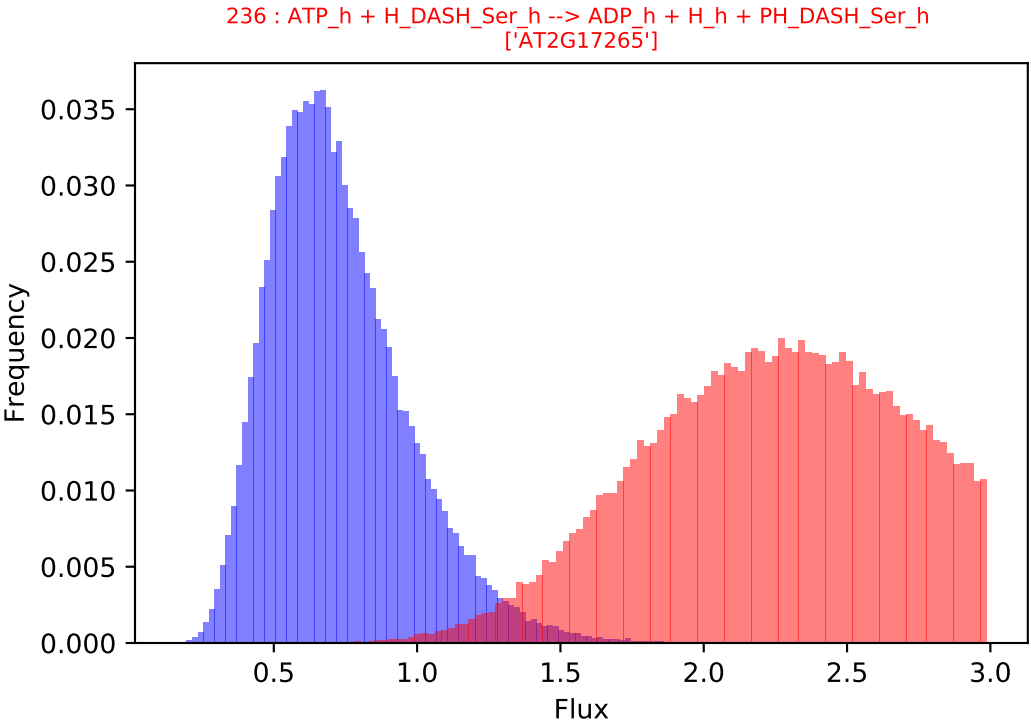

231 : Glu_h + H2O_h + H_h + THD_h --> DAP_h + KG_h
['2*AT4G33680']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.5
1.0
1.5
2.0
Flux


232 : DAP_h --> mDAP_h
['AT3G53580']
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
Flux


233 : H_h + mDAP_h --> CO2_h + Lys_h
['AT3G14390', 'AT5G11880']
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
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
0.5
1.0
1.5
2.0
2.5
3.0
Flux


235 : Asp_DASH_SeA_h + H_h + NADH_h --> H_DASH_Ser_h + NAD_h
['AT4G19710', '4*AT1G31230']
Frequency
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


236 : ATP_h + H_DASH_Ser_h --> ADP_h + H_h + PH_DASH_Ser_h
['AT2G17265']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
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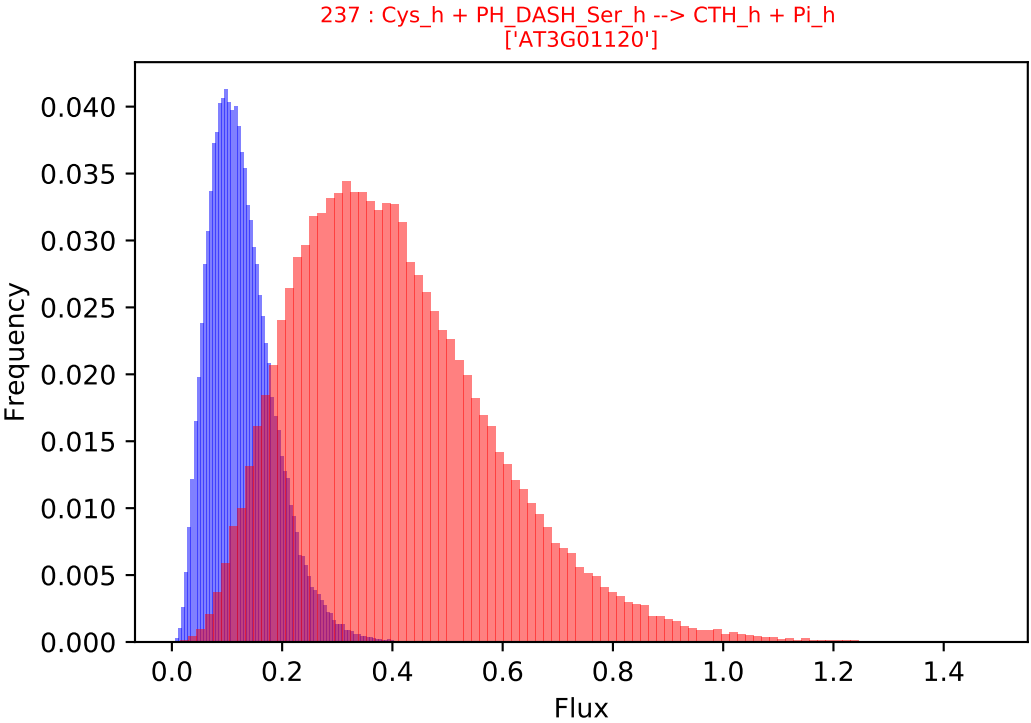
1.5
2.0
2.5
3.0
Flux


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
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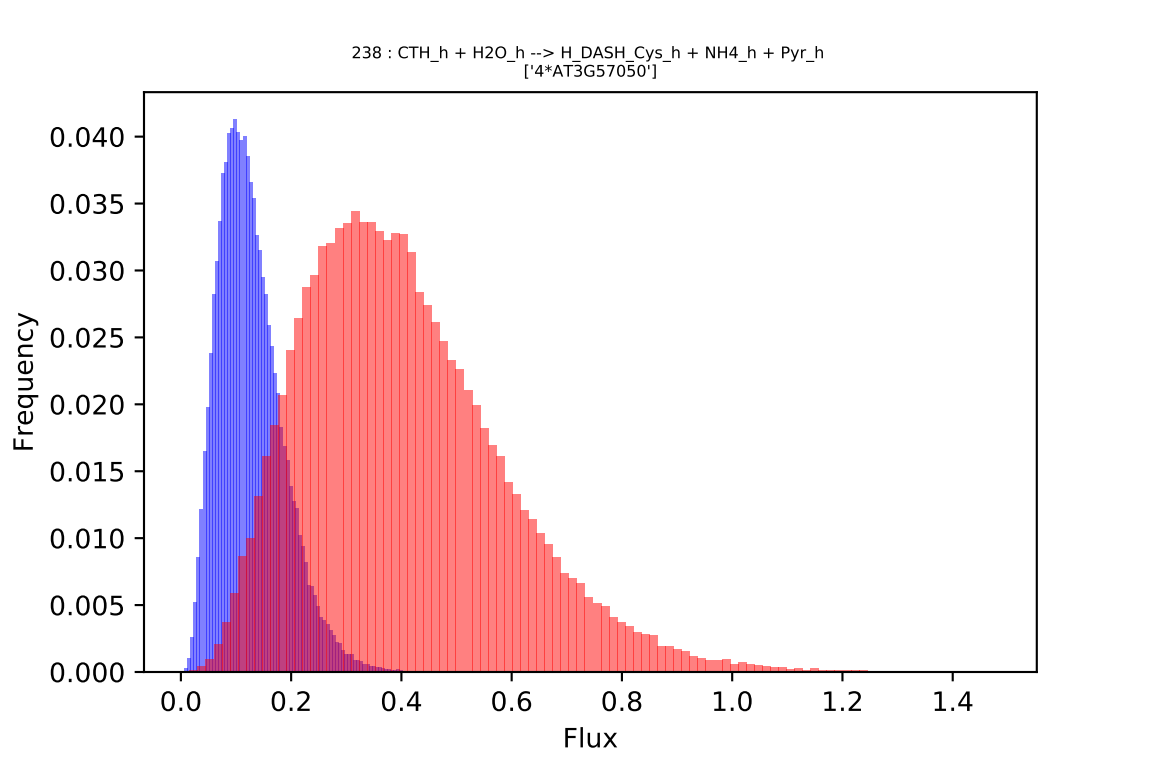
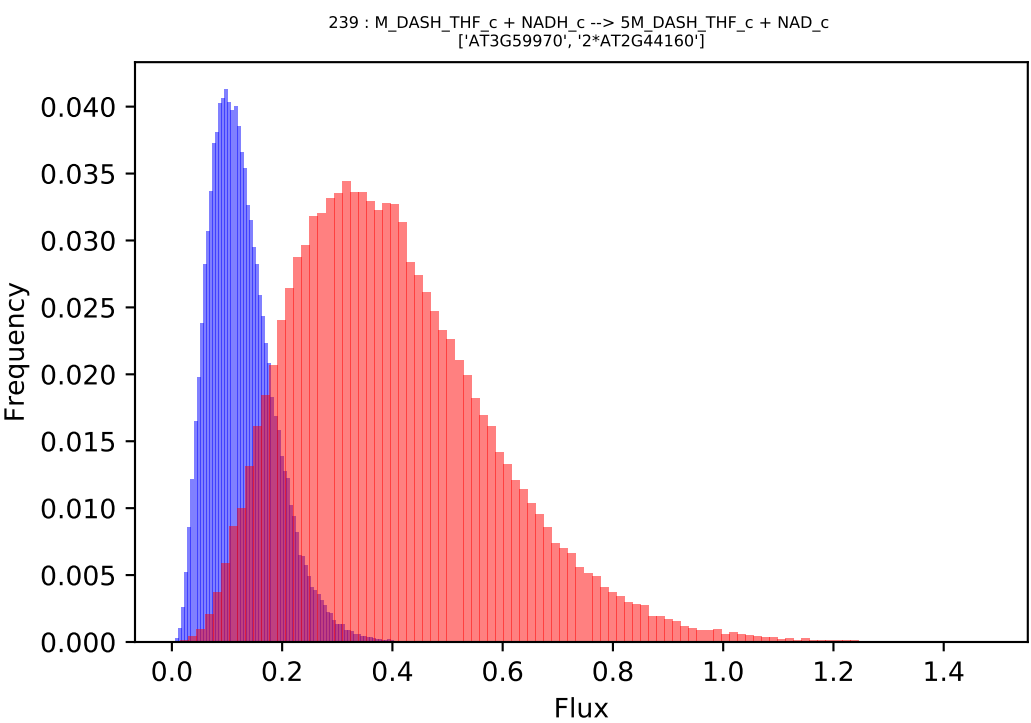
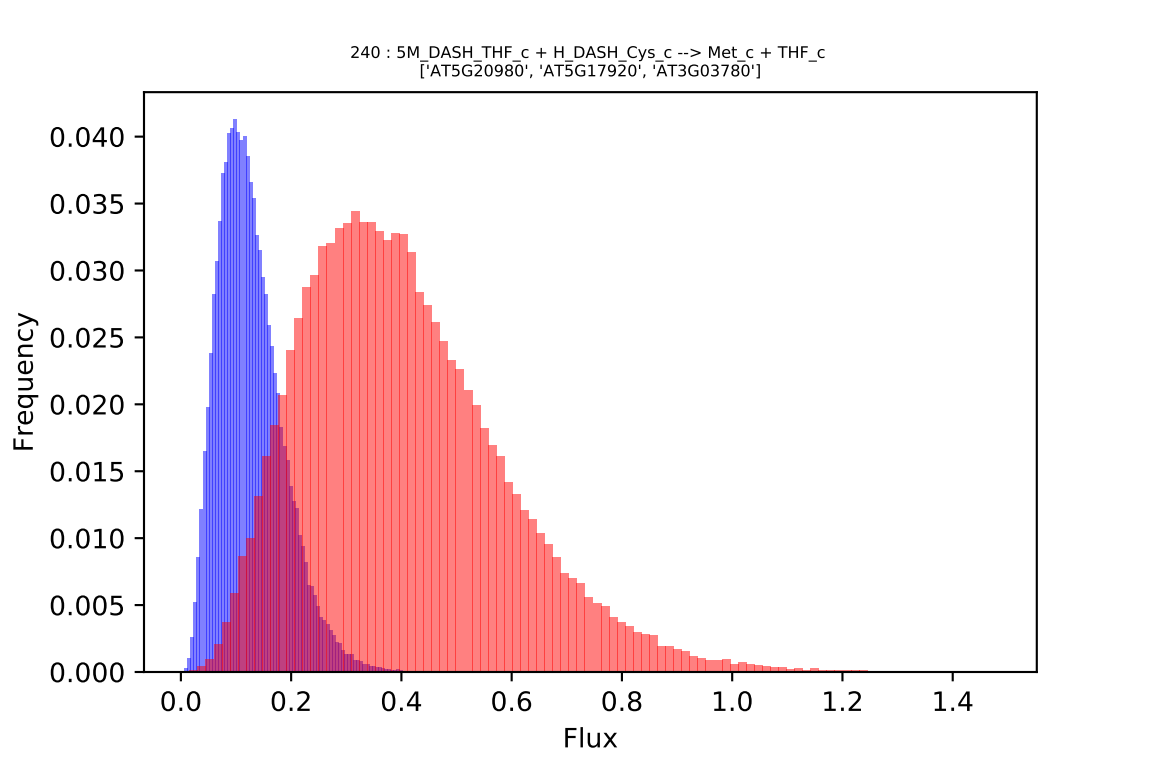
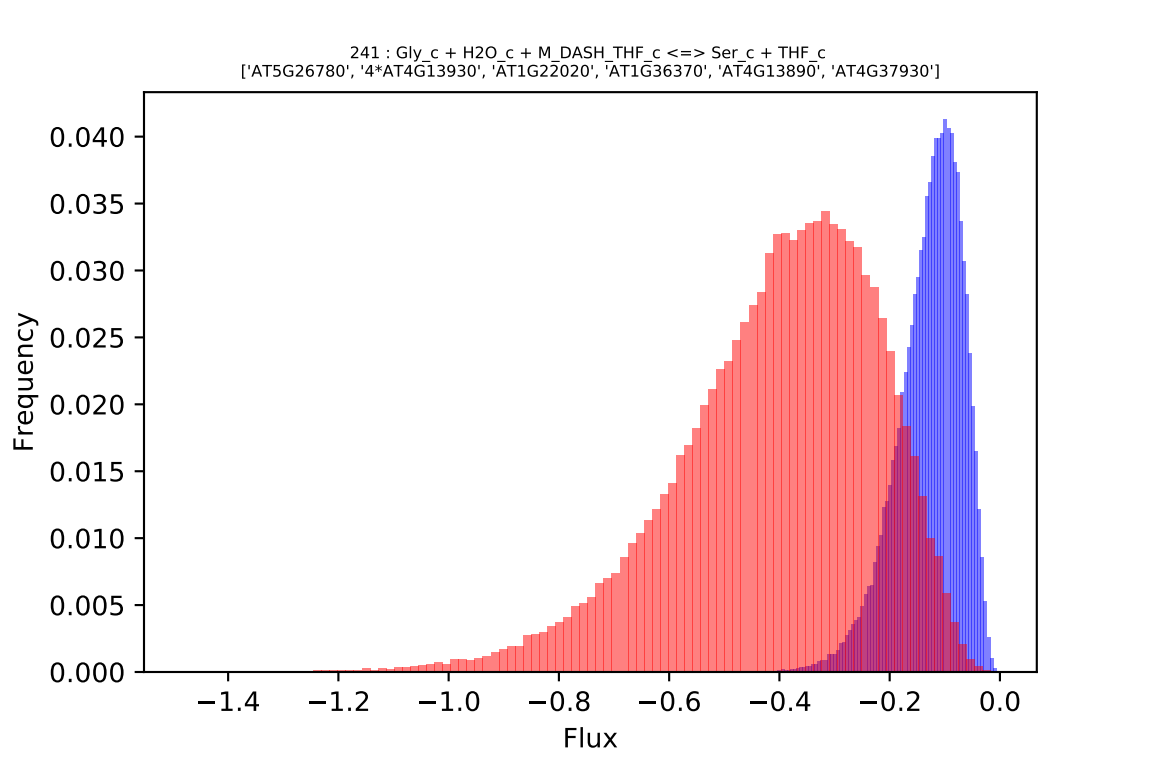
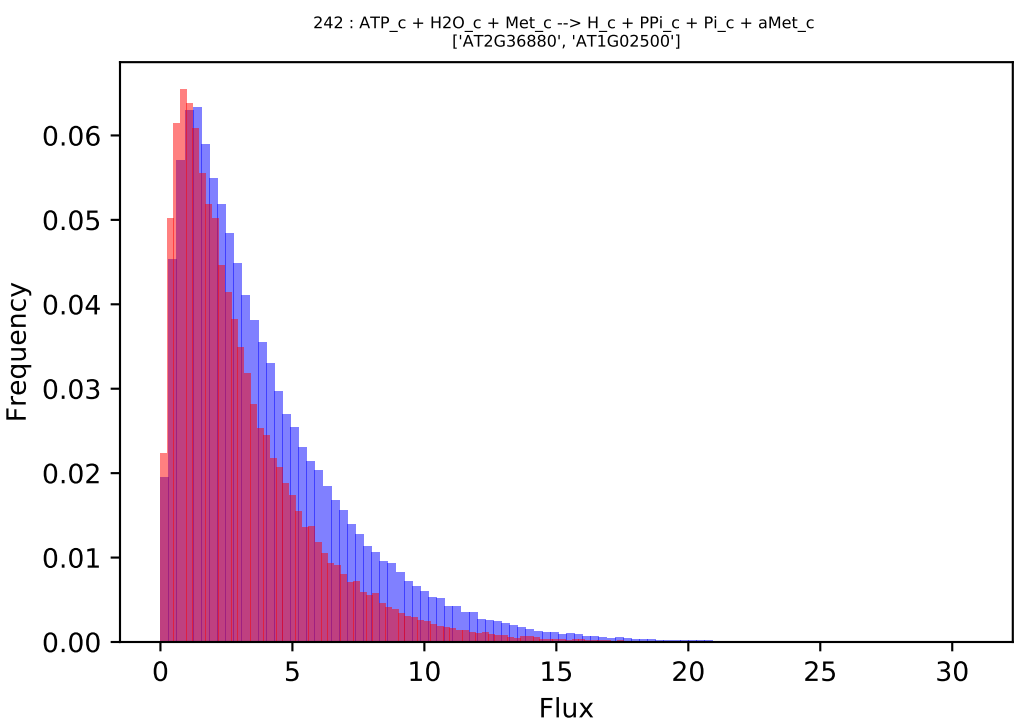
0.4
0.6
0.8
1.0
1.2
1.4
Flux

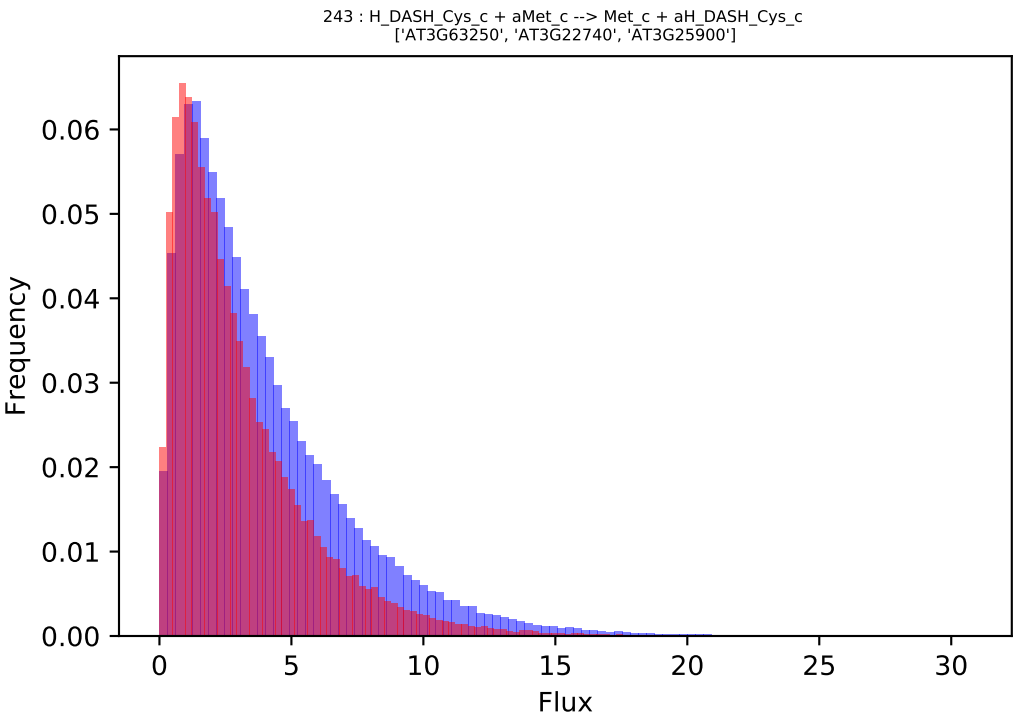

238 : CTH_h + H2O_h --> H_DASH_Cys_h + NH4_h + Pyr_h
['4*AT3G57050']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

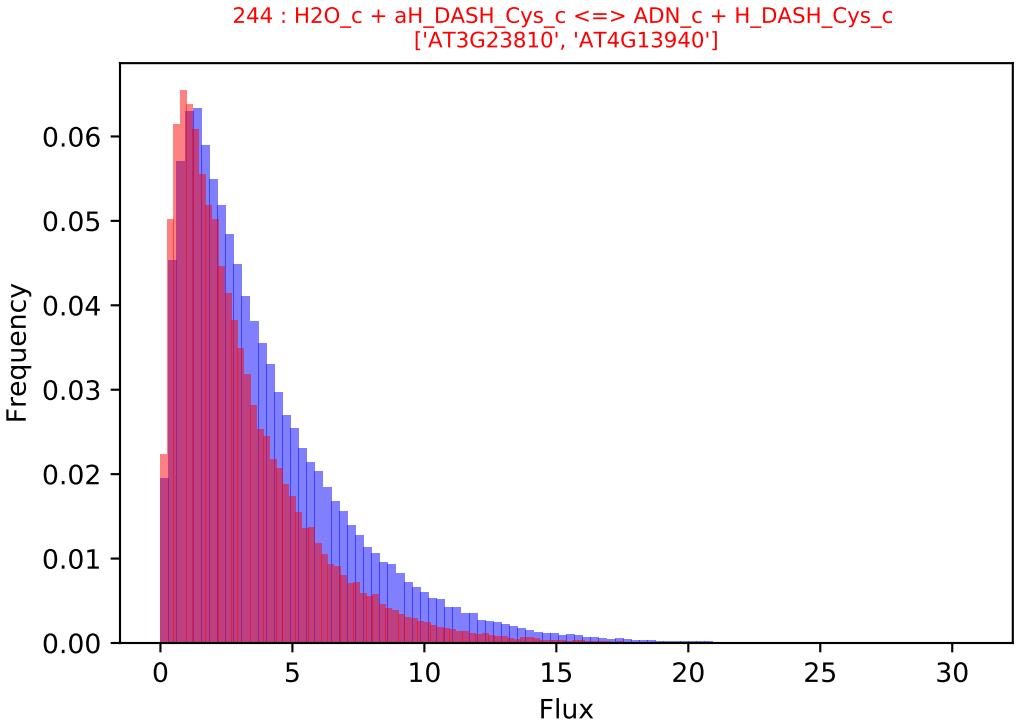

239 : M_DASH_THF_c + NADH_c --> 5M_DASH_THF_c + NAD_c
['AT3G59970', '2*AT2G44160']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

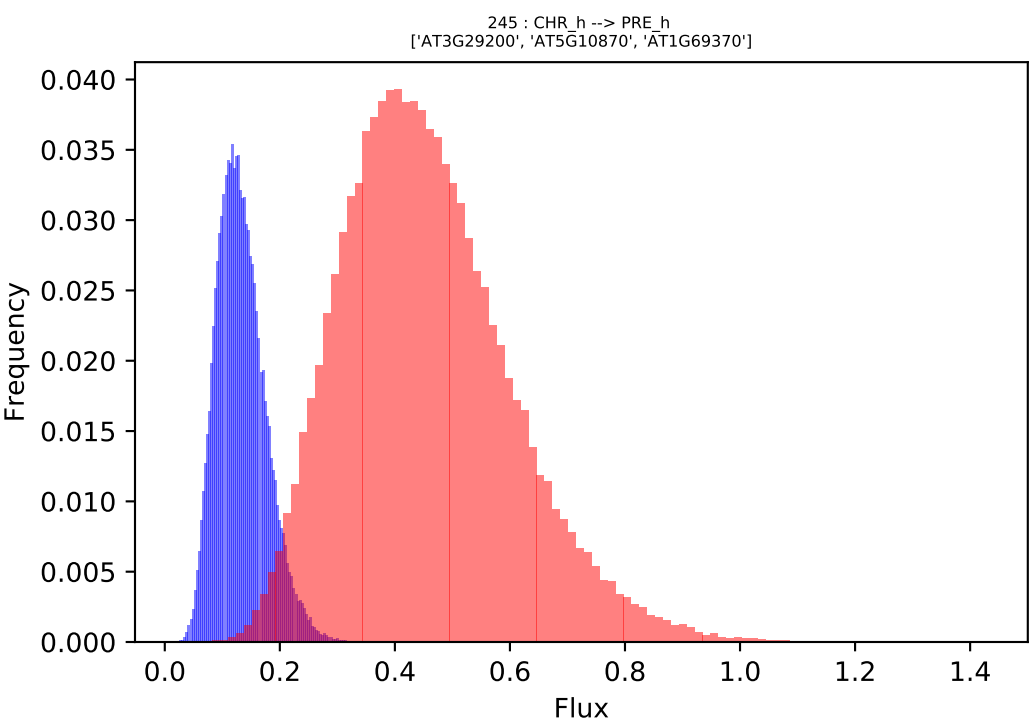

240 : 5M_DASH_THF_c + H_DASH_Cys_c --> Met_c + THF_c
['AT5G20980', 'AT5G17920', 'AT3G03780']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

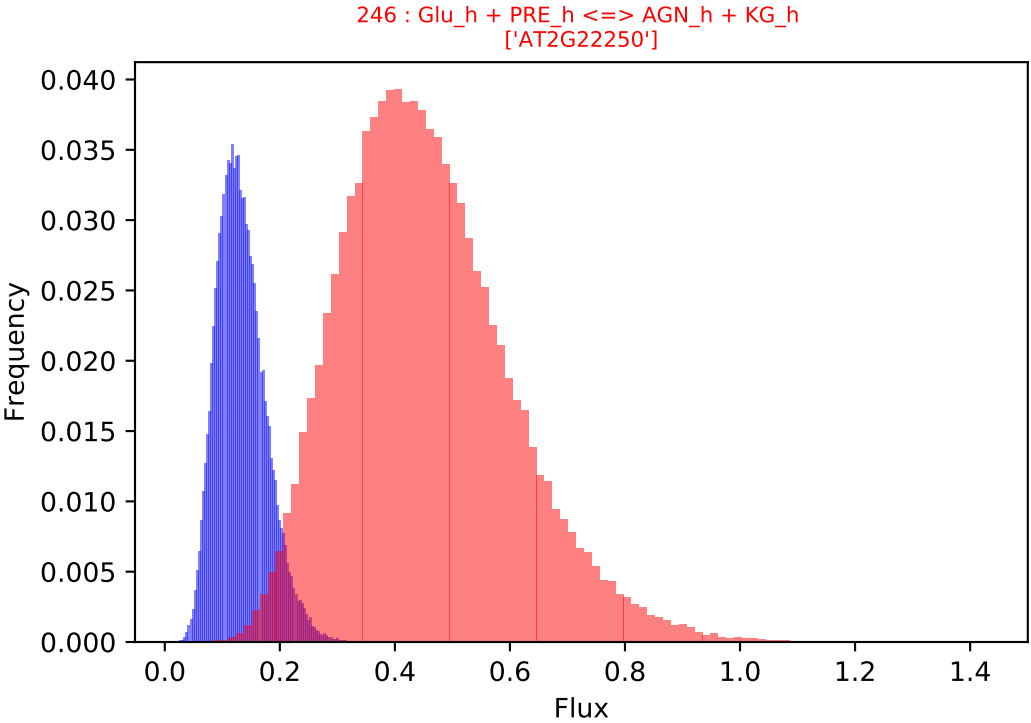

241 : Gly_c + H2O_c + M_DASH_THF_c <=> Ser_c + THF_c
['AT5G26780', '4*AT4G13930', 'AT1G22020', 'AT1G36370', 'AT4G13890', 'AT4G37930']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
−1.4
−1.2
−1.0
−0.8
−0.6
−0.4
−0.2
0.0
Flux

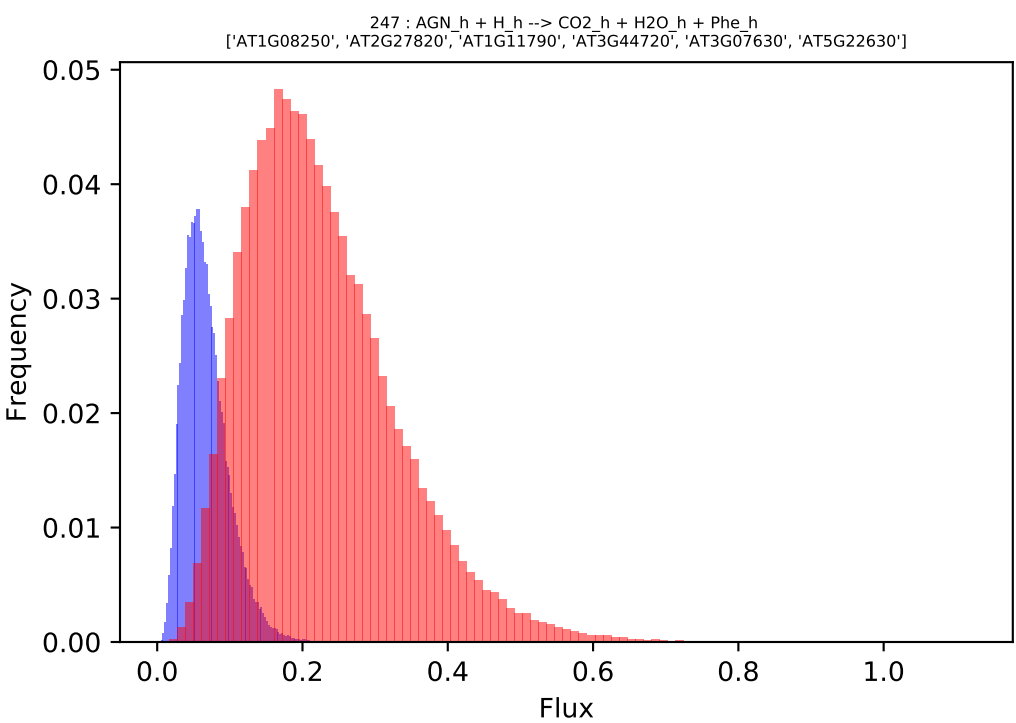

242 : ATP_c + H2O_c + Met_c --> H_c + PPi_c + Pi_c + aMet_c
['AT2G36880', 'AT1G02500']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0
5
10
15
20
25
30
Flux

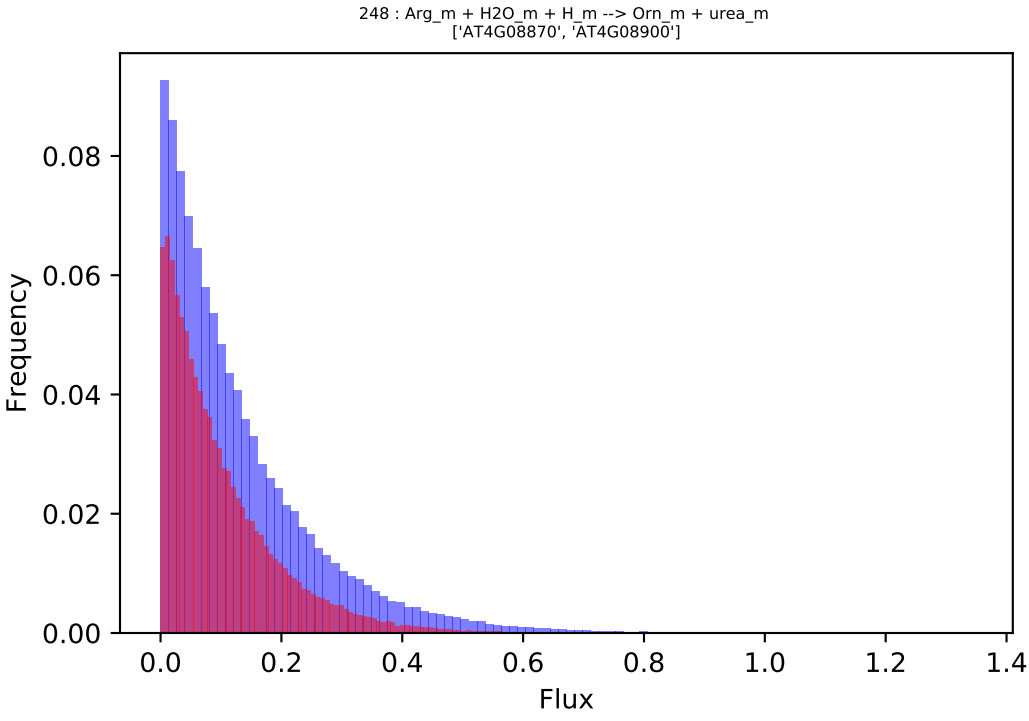

243 : H_DASH_Cys_c + aMet_c --> Met_c + aH_DASH_Cys_c
['AT3G63250', 'AT3G22740', 'AT3G25900']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0
5
10
15
20
25
30
Flux

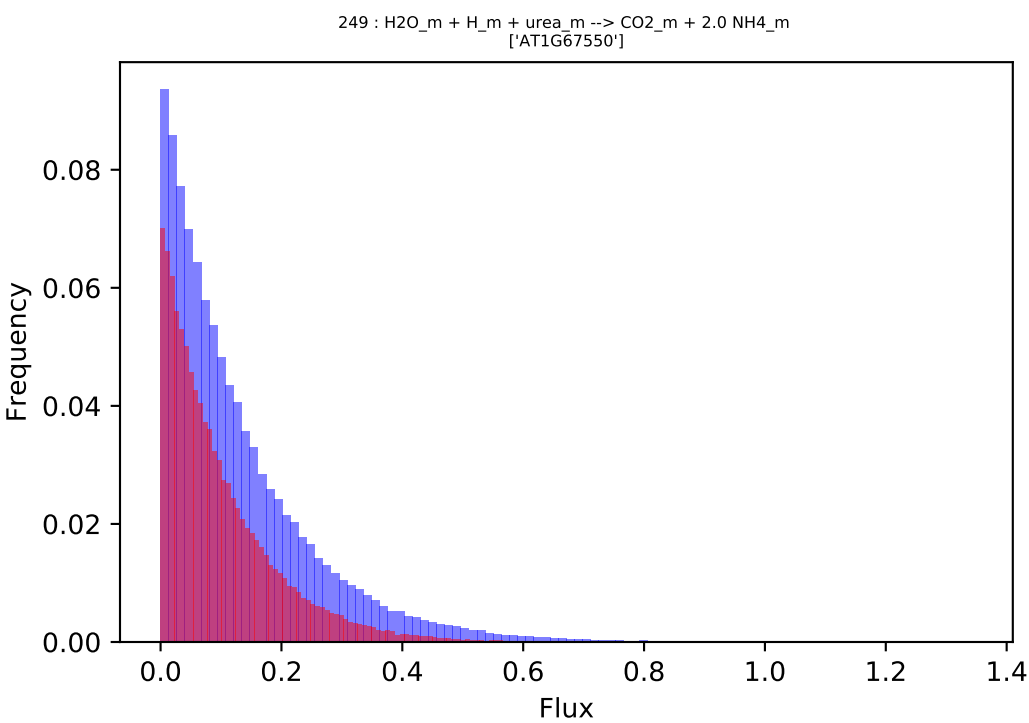

244 : H2O_c + aH_DASH_Cys_c <=> ADN_c + H_DASH_Cys_c
['AT3G23810', 'AT4G13940']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0
5
10
15
20
25
30
Flux

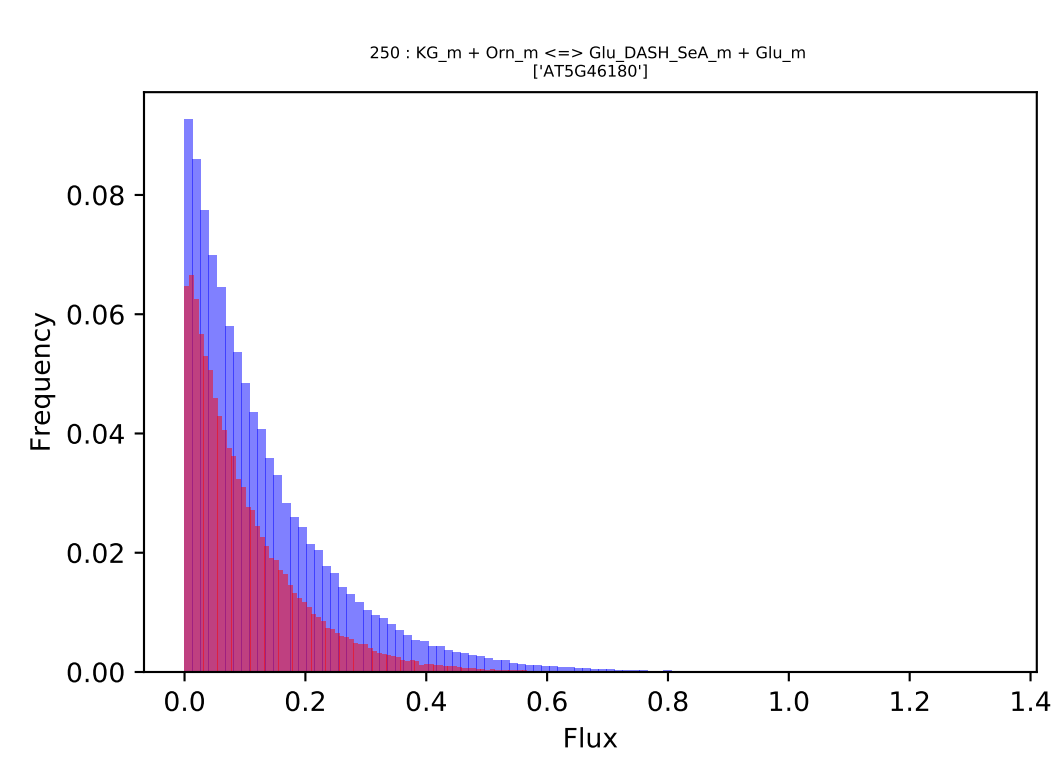

245 : CHR_h --> PRE_h
['AT3G29200', 'AT5G10870', 'AT1G69370']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

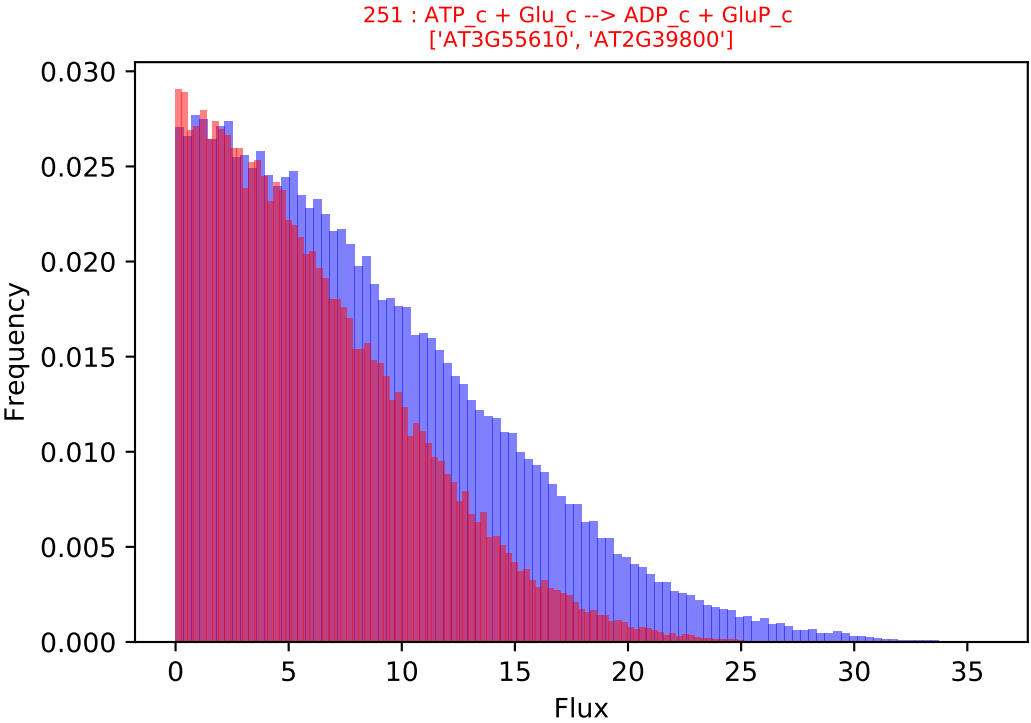

246 : Glu_h + PRE_h <=> AGN_h + KG_h
['AT2G22250']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

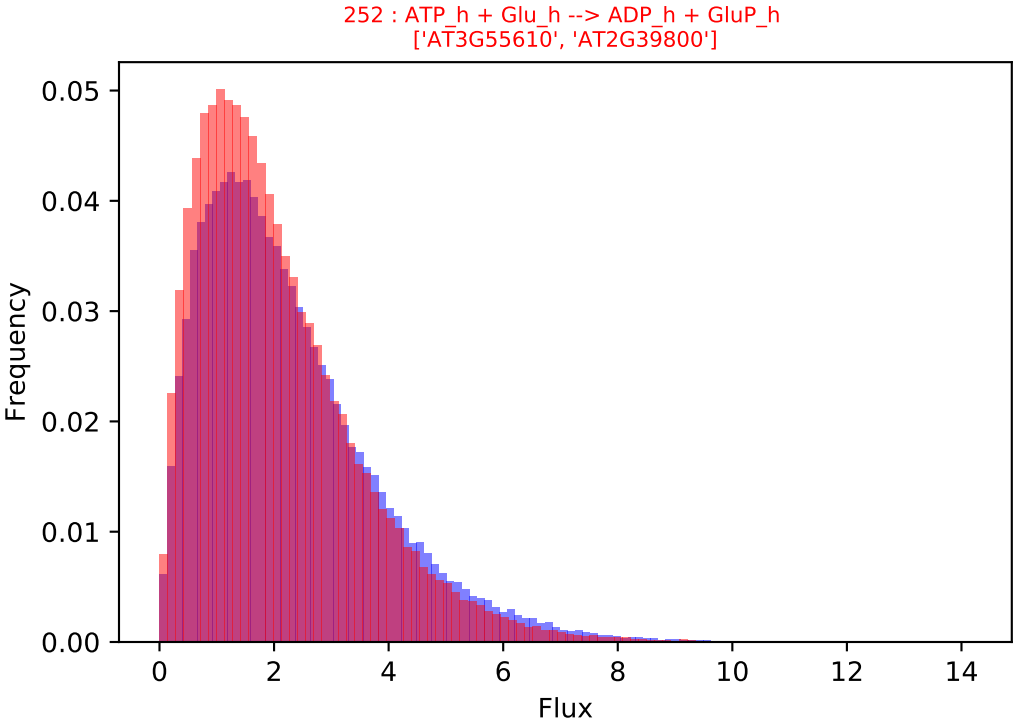

247 : AGN_h + H_h --> CO2_h + H2O_h + Phe_h
['AT1G08250', 'AT2G27820', 'AT1G11790', 'AT3G44720', 'AT3G07630', 'AT5G22630']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0.0
0.2
0.4
0.6
0.8
1.0

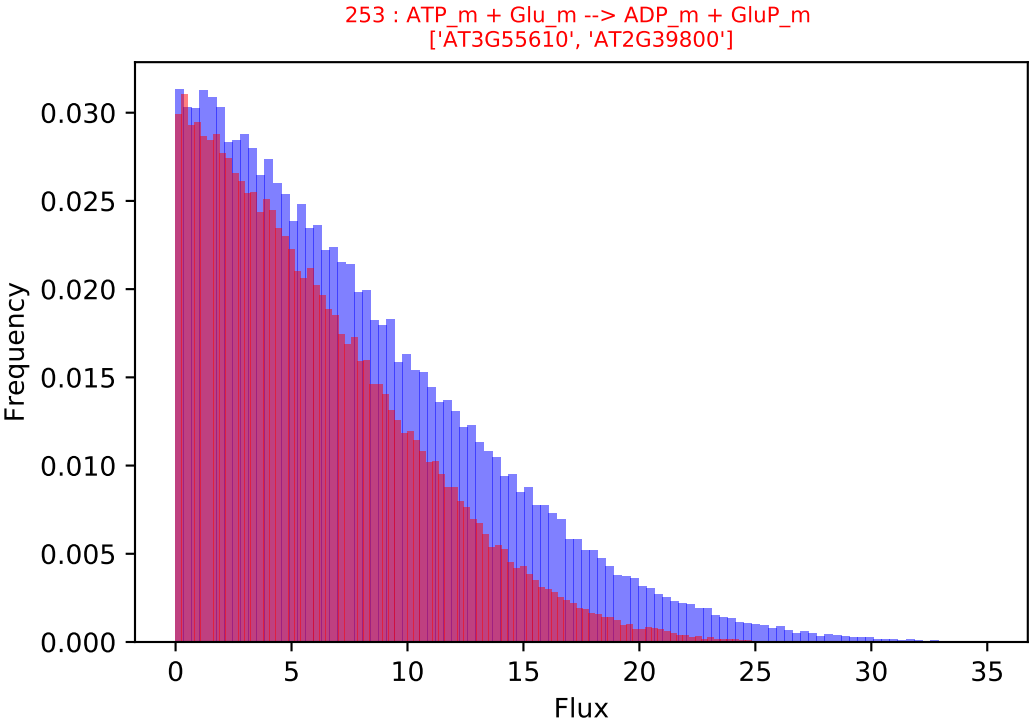

248 : Arg_m + H2O_m + H_m --> Orn_m + urea_m
['AT4G08870', 'AT4G08900']
Frequency
0.00
0.02
0.04
0.06
0.08
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

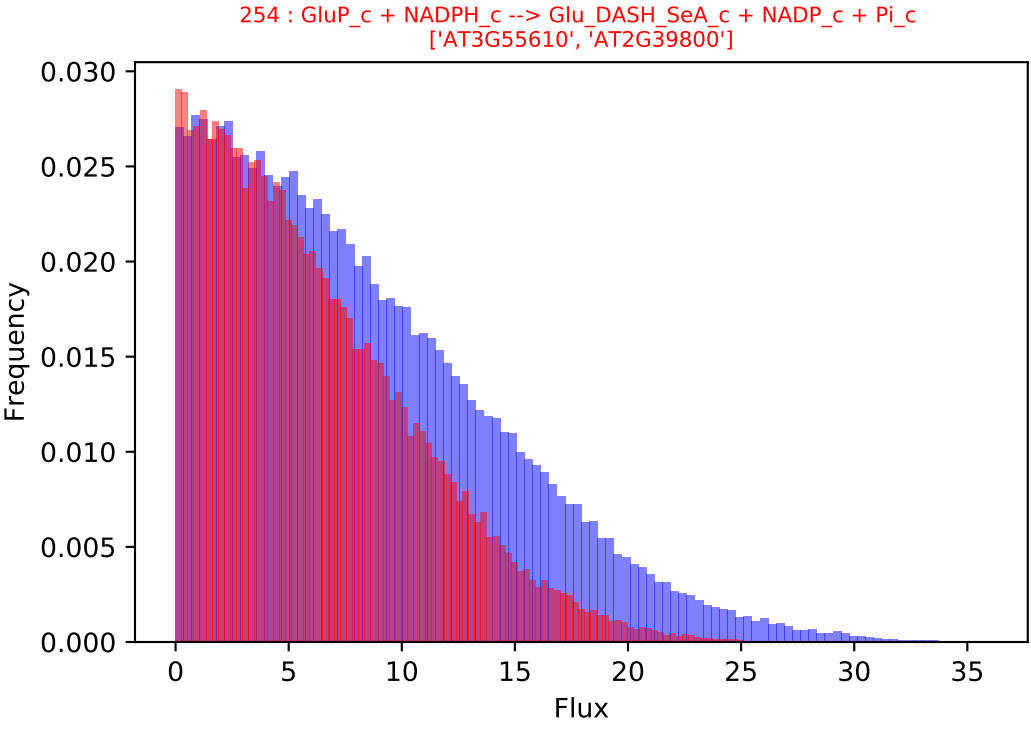

249 : H2O_m + H_m + urea_m --> CO2_m + 2.0 NH4_m
['AT1G67550']
Frequency
0.00
0.02
0.04
0.06
0.08
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

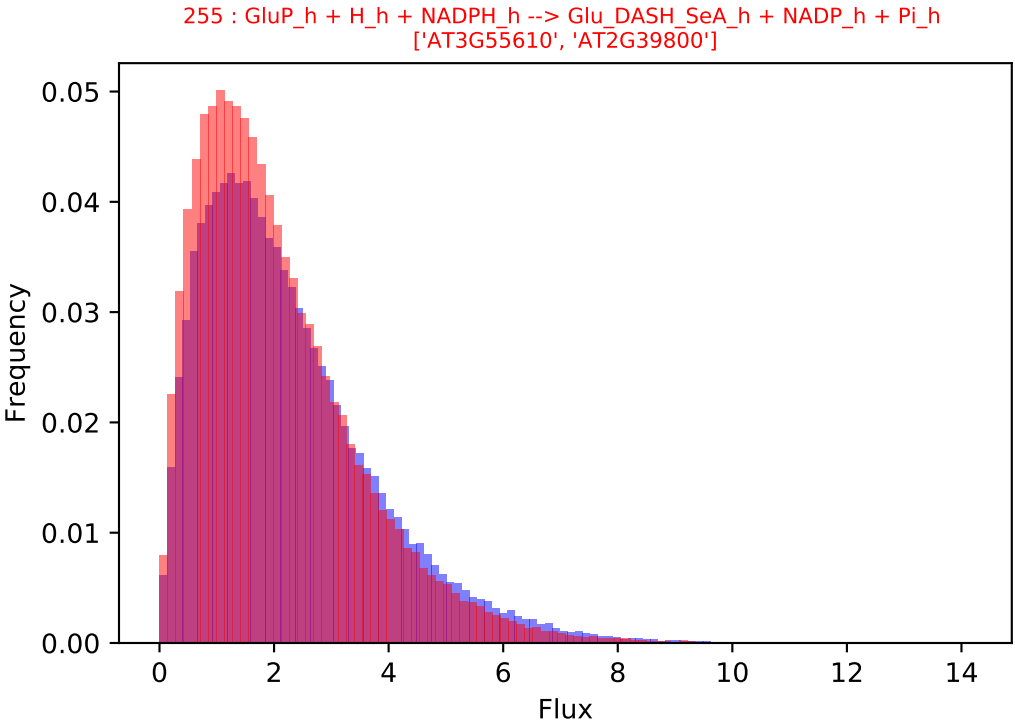

250 : KG_m + Orn_m <=> Glu_DASH_SeA_m + Glu_m
['AT5G46180']
Frequency
0.00
0.02
0.04
0.06
0.08
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

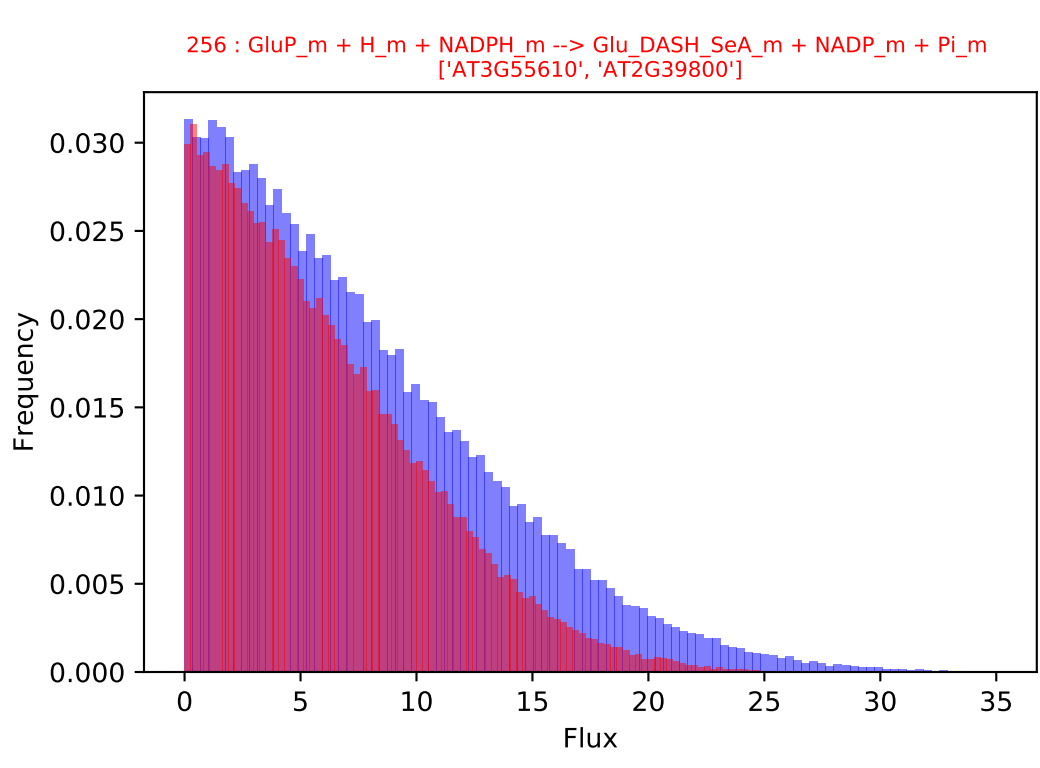

251 : ATP_c + Glu_c --> ADP_c + GluP_c
['AT3G55610', 'AT2G39800']
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
5
10
15
20
25
30
35
Flux

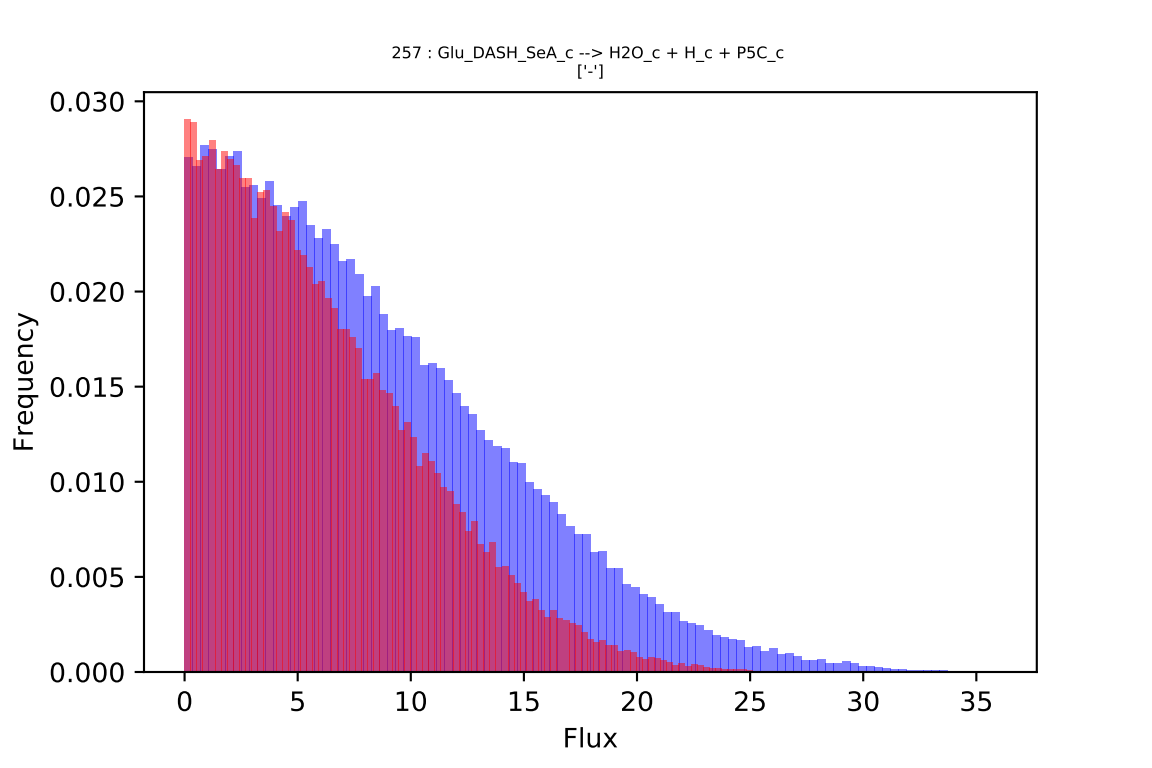

252 : ATP_h + Glu_h --> ADP_h + GluP_h
['AT3G55610', 'AT2G39800']
Frequency
0.05
0.04
0.03
0.02
0.01
0.00
0
2
4
6
8
10
12
14
Flux

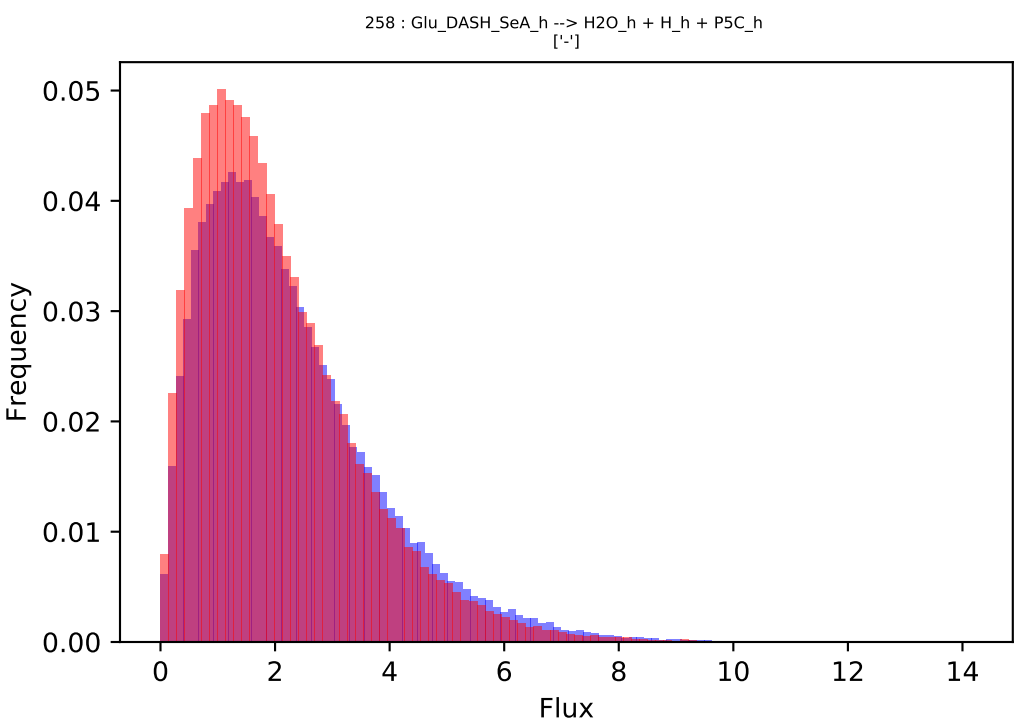

253 : ATP_m + Glu_m --> ADP_m + GluP_m
['AT3G55610', 'AT2G39800']
Frequency
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0
5
10
15
20
25
30
35
Flux

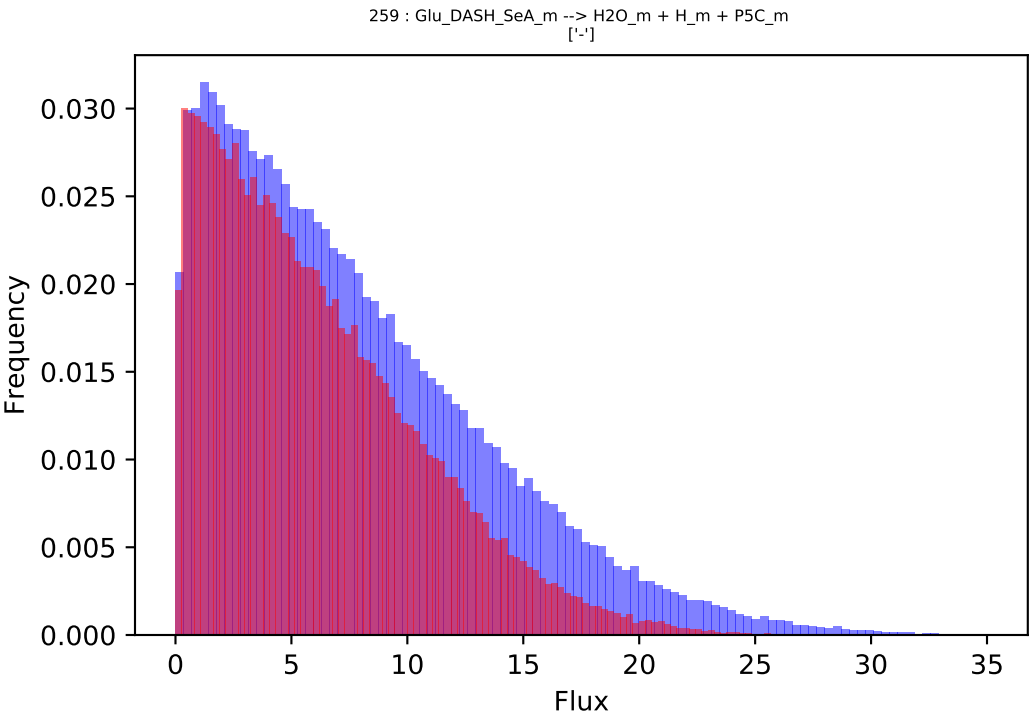

254 : GluP_c + NADPH_c --> Glu_DASH_SeA_c + NADP_c + Pi_c
['AT3G55610', 'AT2G39800']
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
5
10
15
20
25
30
35
Flux

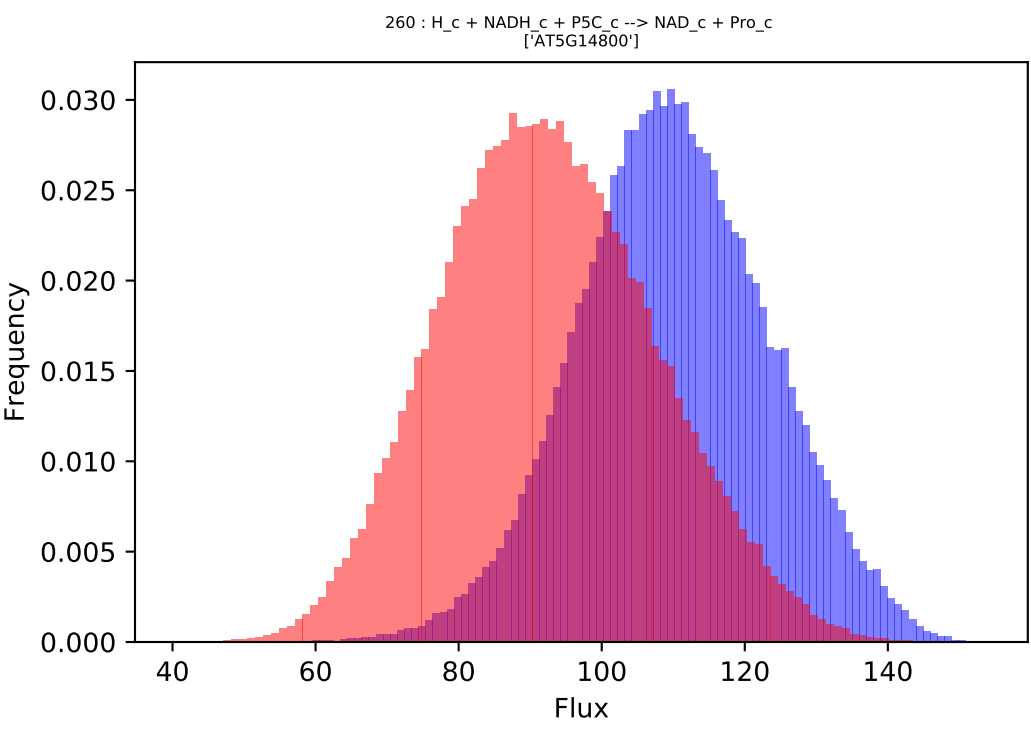

255 : GluP_h + H_h + NADPH_h --> Glu_DASH_SeA_h + NADP_h + Pi_h
['AT3G55610', 'AT2G39800']
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
0
2
4
6
8
10
12
14
Flux

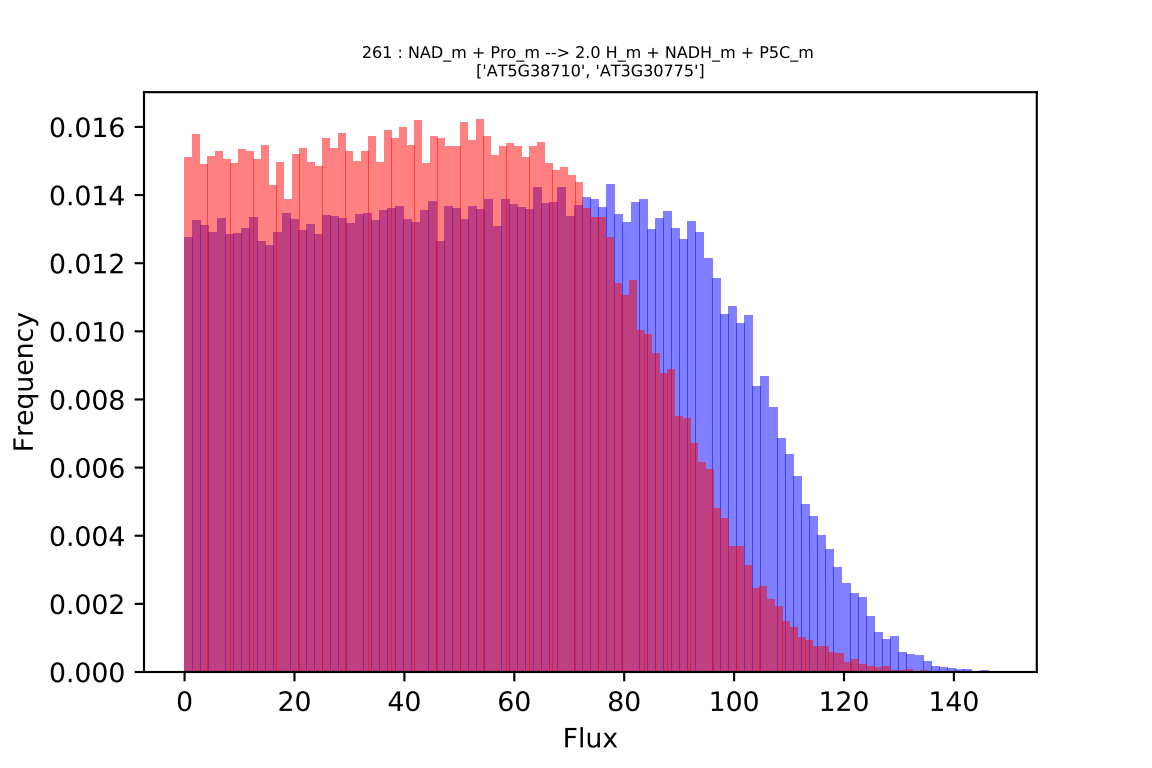

256 : GluP_m + H_m + NADPH_m --> Glu_DASH_SeA_m + NADP_m + Pi_m
['AT3G55610', 'AT2G39800']
Frequency
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0
5
10
15
20
25
30
35
Flux

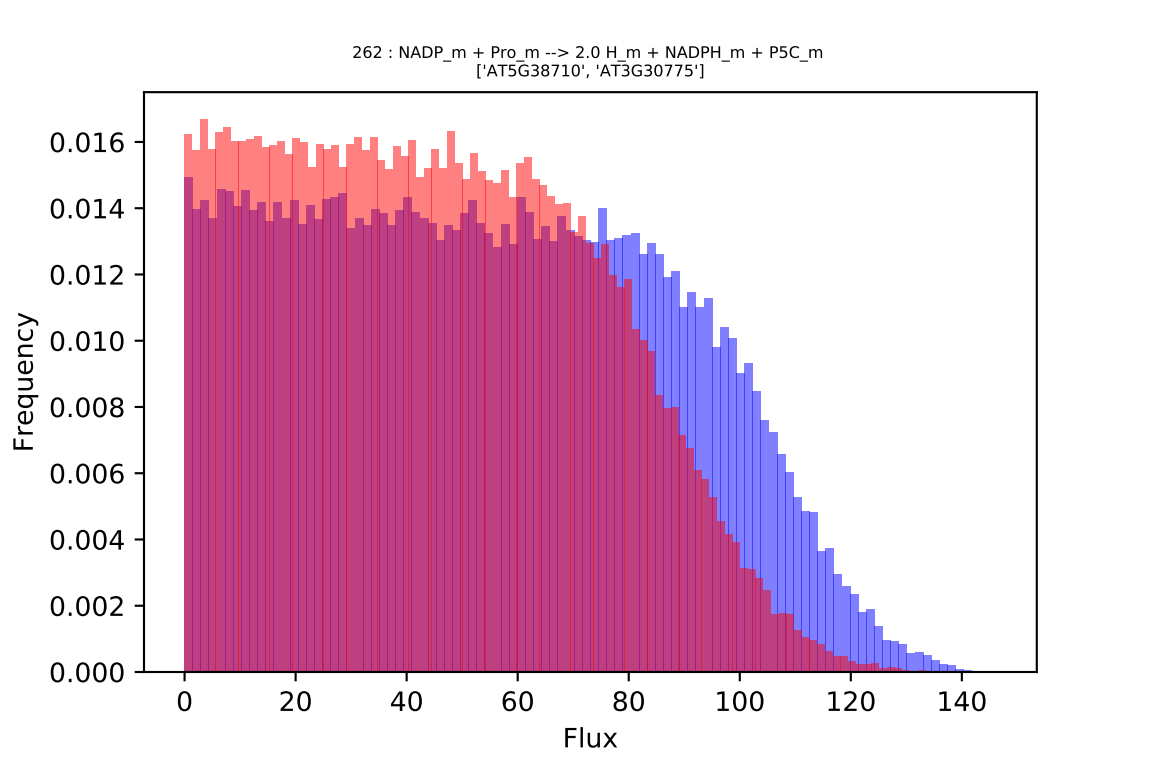

257 : Glu_DASH_SeA_c --> H2O_c + H_c + P5C_c
['-']
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
5
10
15
20
25
30
35
Flux

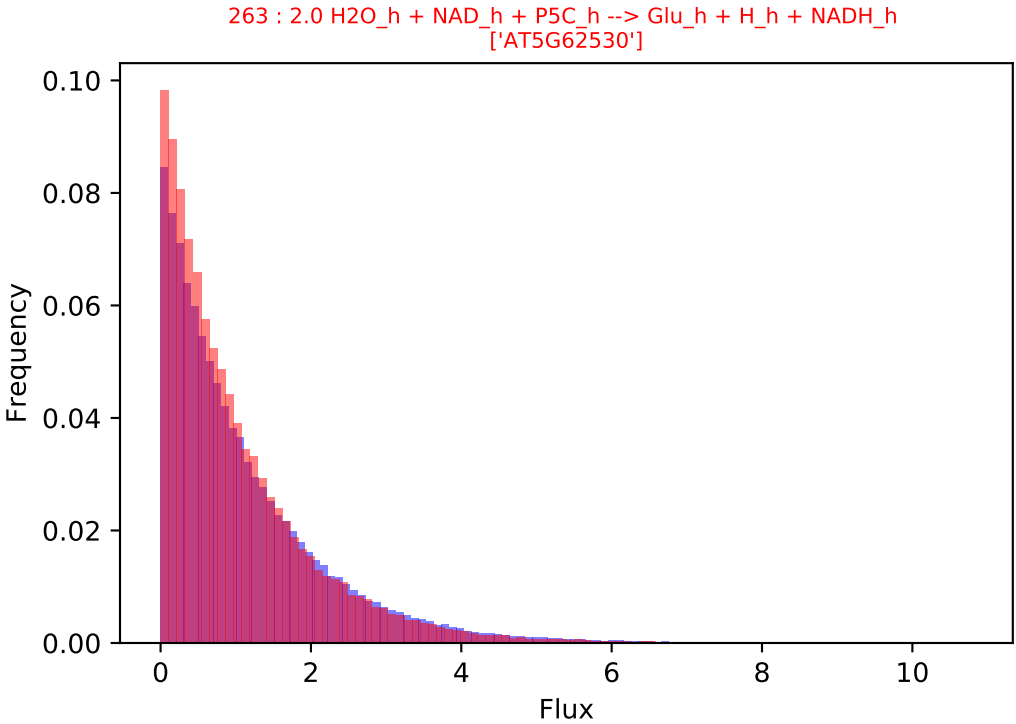

258 : Glu_DASH_SeA_h --> H2O_h + H_h + P5C_h
['-']
Frequency
Flux
0.00
0.01
0.02
0.03
0.04
0.05
0
2
4
6
8
10
12
14

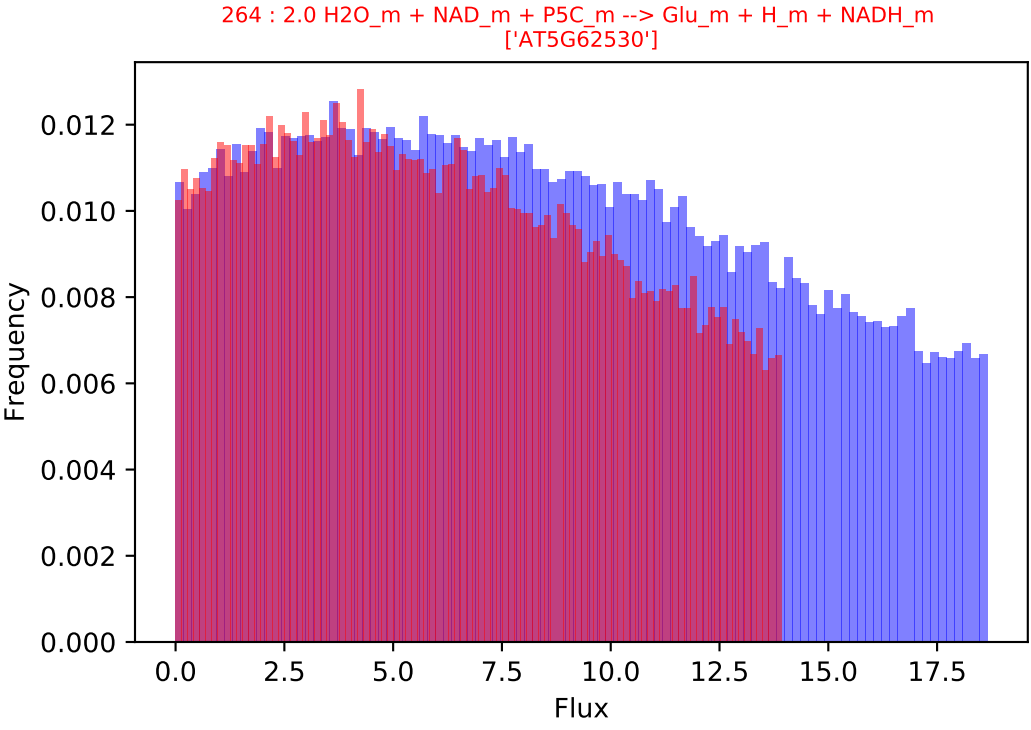

259 : Glu_DASH_SeA_m --> H2O_m + H_m + P5C_m
['-']
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
5
10
15
20
25
30
35
Flux

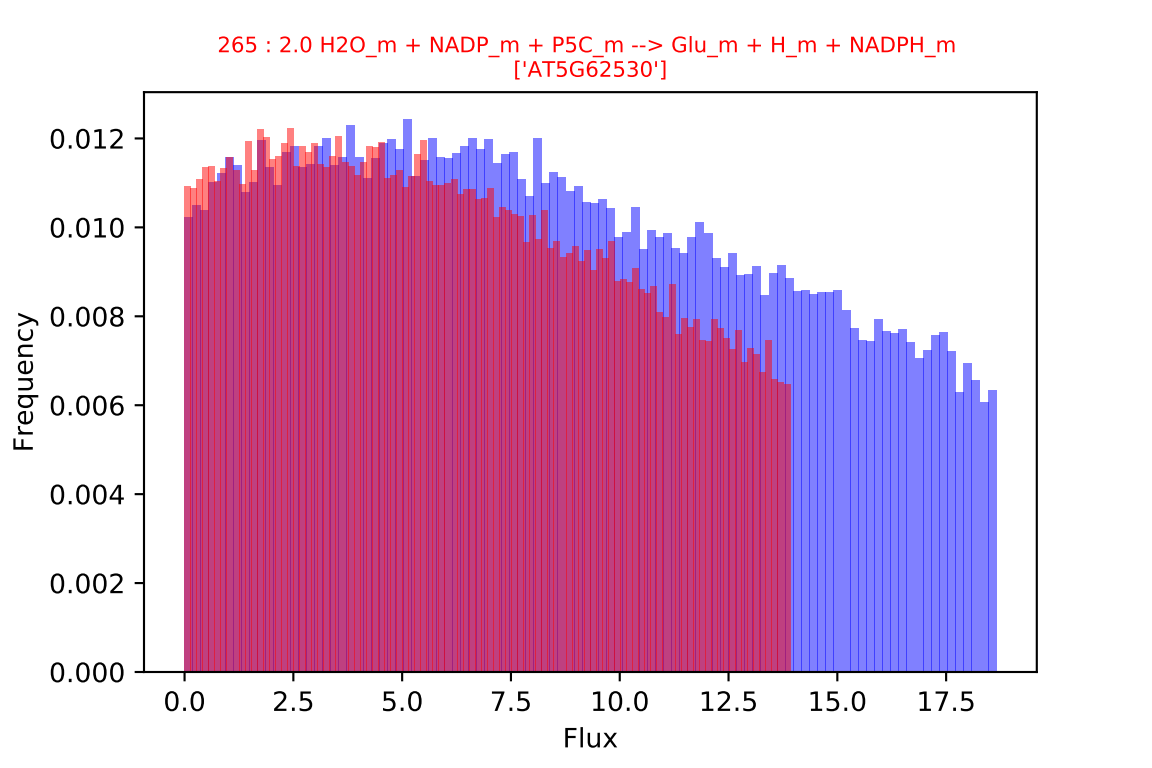

260 : H_c + NADH_c + P5C_c --> NAD_c + Pro_c
['AT5G14800']
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
40
60
80
100
120
140
Flux

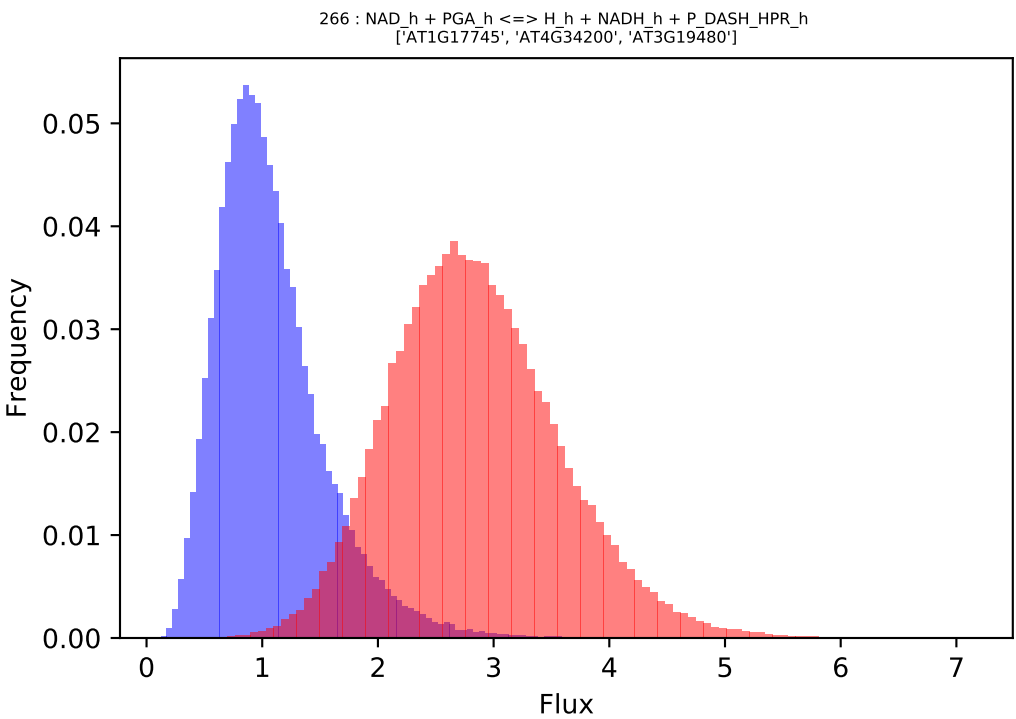

261 : NAD_m + Pro_m --> 2.0 H_m + NADH_m + P5C_m
['AT5G38710', 'AT3G30775']
Frequency
0.016
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
0
20
40
60
80
100
120
140
Flux

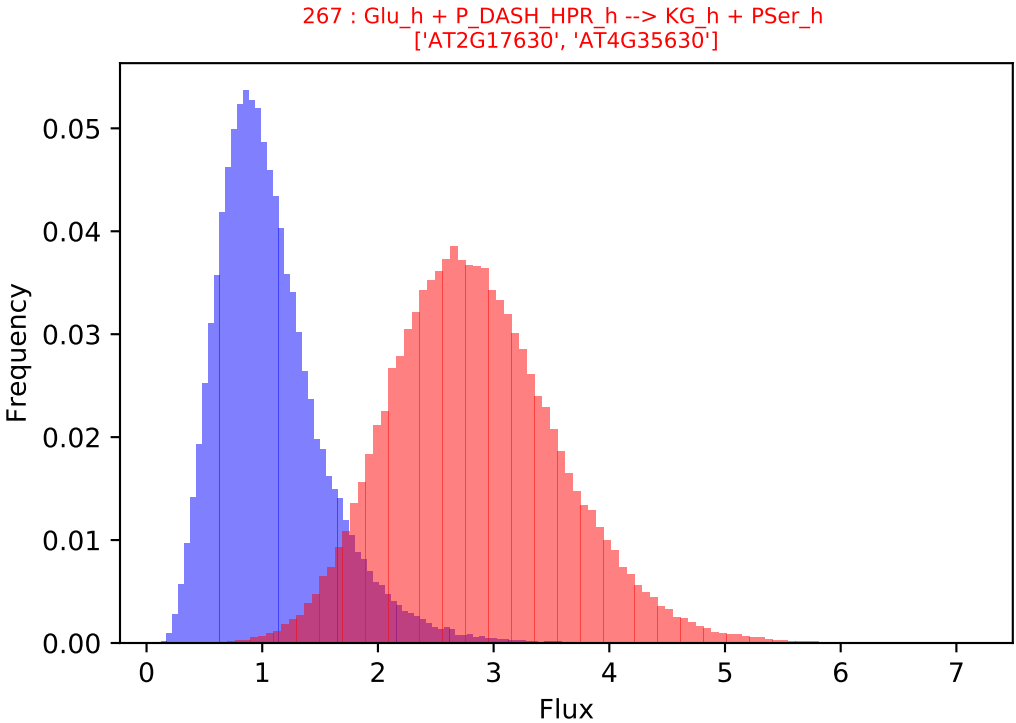

262 : NADP_m + Pro_m --> 2.0 H_m + NADPH_m + P5C_m
['AT5G38710', 'AT3G30775']
Frequency
0.016
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
0
20
40
60
80
100
120
140
Flux

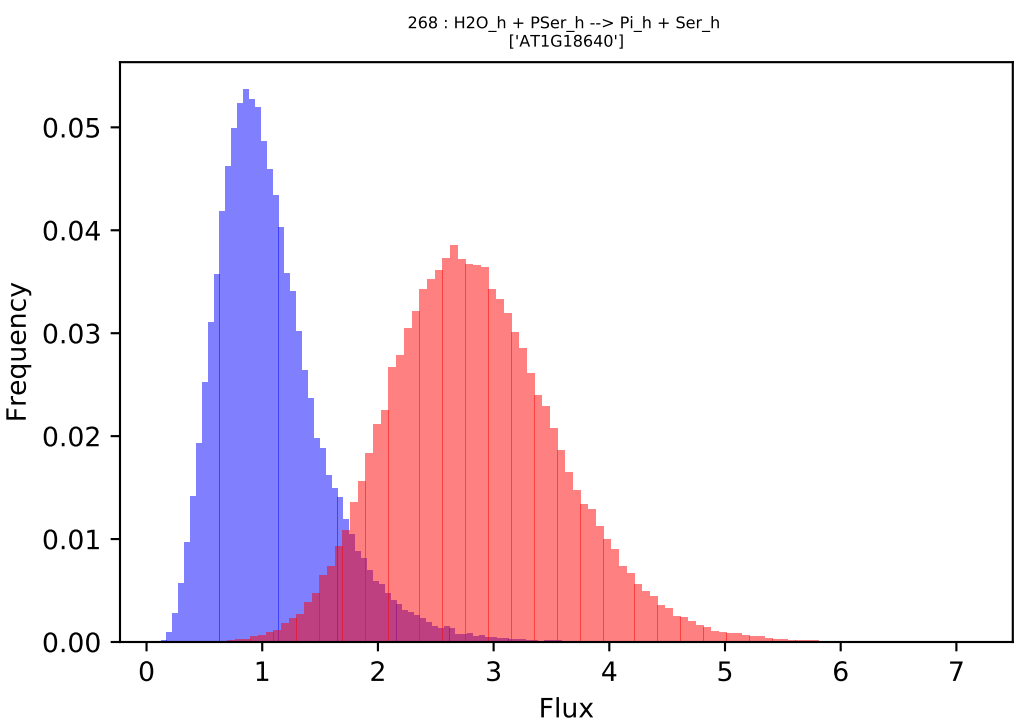

263 : 2.0 H2O_h + NAD_h + P5C_h --> Glu_h + H_h + NADH_h
['AT5G62530']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0
2
4
6
8
10
Flux

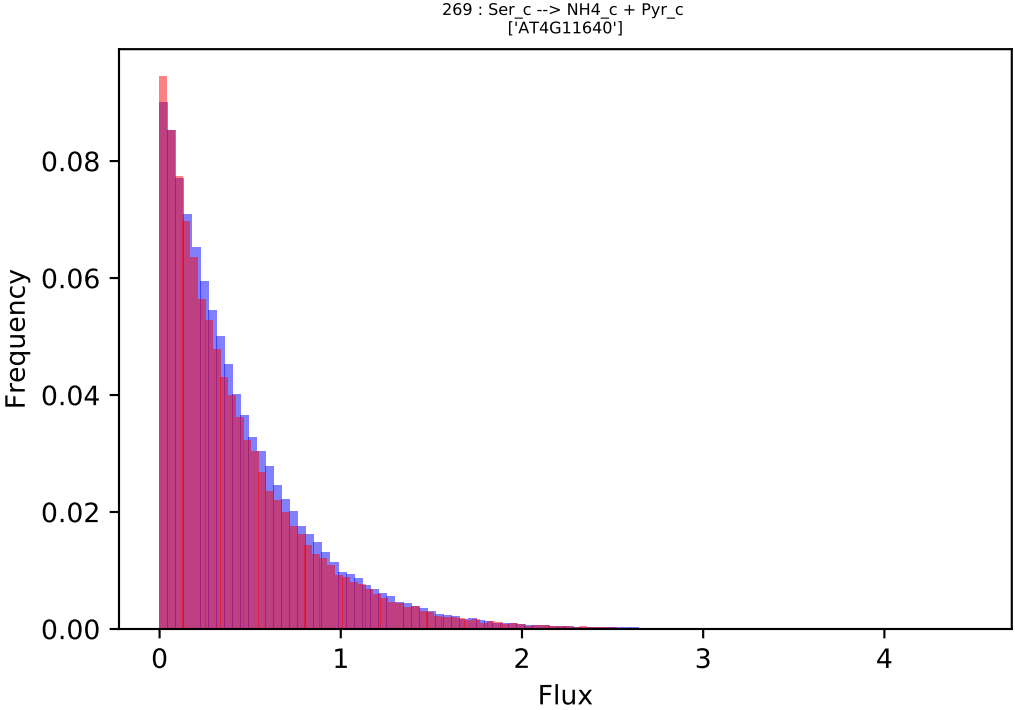

264 : 2.0 H2O_m + NAD_m + P5C_m --> Glu_m + H_m + NADH_m
['AT5G62530']
Frequency
0.000
0.002
0.004
0.006
0.008
0.010
0.012
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
Flux

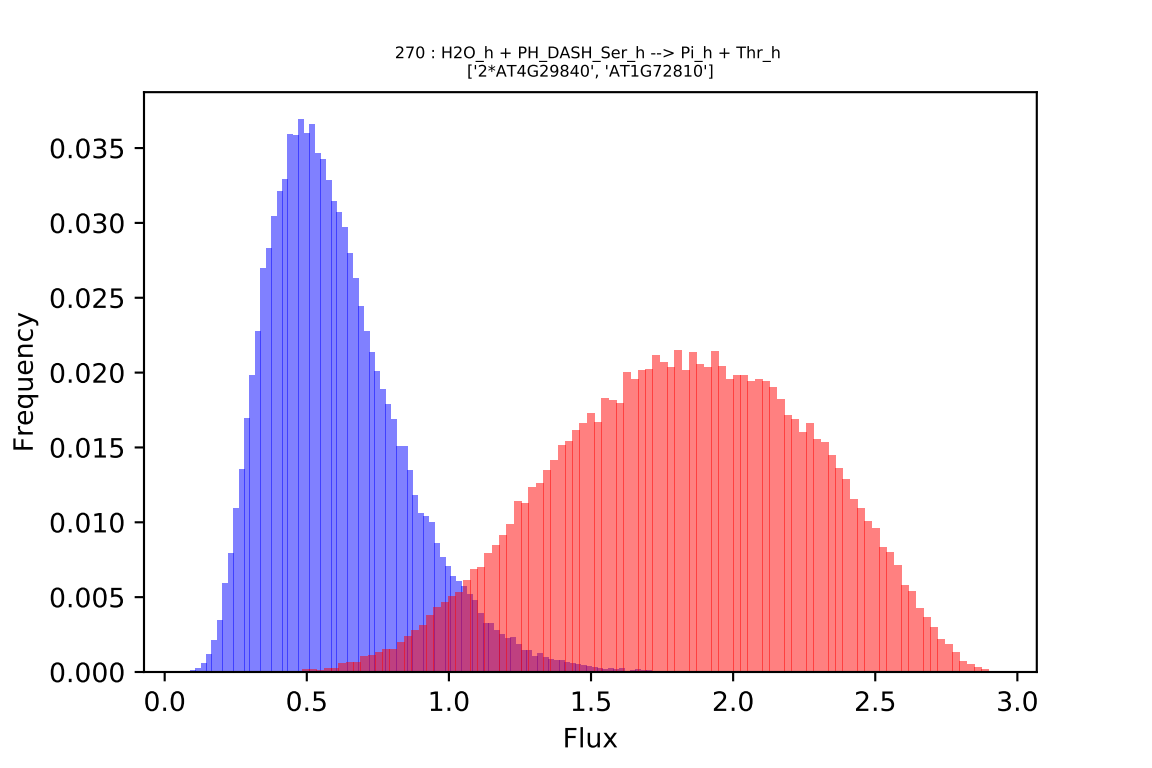

265 : 2.0 H2O_m + NADP_m + P5C_m --> Glu_m + H_m + NADPH_m
['AT5G62530']
Frequency
0.012
0.010
0.008
0.006
0.004
0.002
0.000
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
Flux

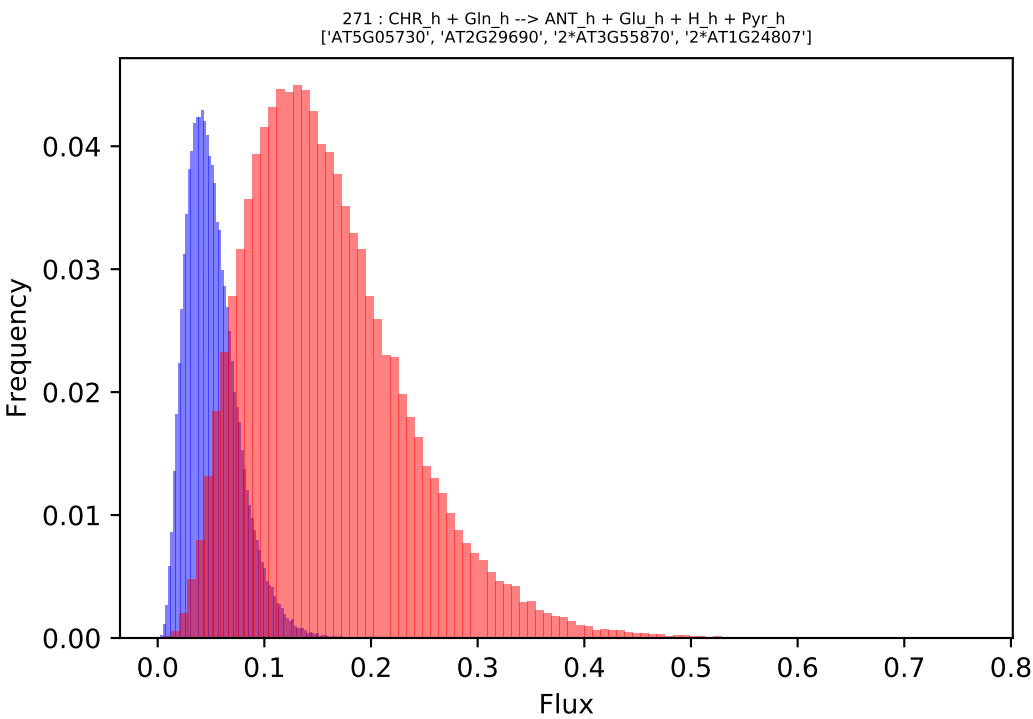

266 : NAD_h + PGA_h <=> H_h + NADH_h + P_DASH_HPR_h
['AT1G17745', 'AT4G34200', 'AT3G19480']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0
1
2
3
4
5
6
7
Flux

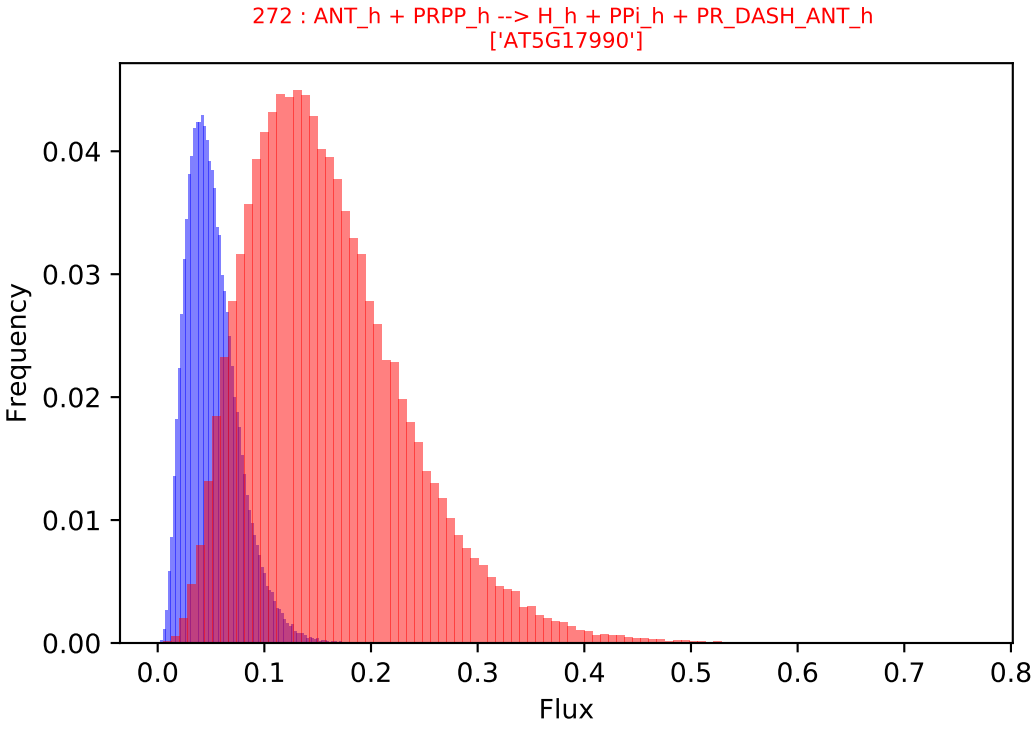

267 : Glu_h + P_DASH_HPR_h --> KG_h + PSer_h
['AT2G17630', 'AT4G35630']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0
1
2
3
4
5
6
7
Flux

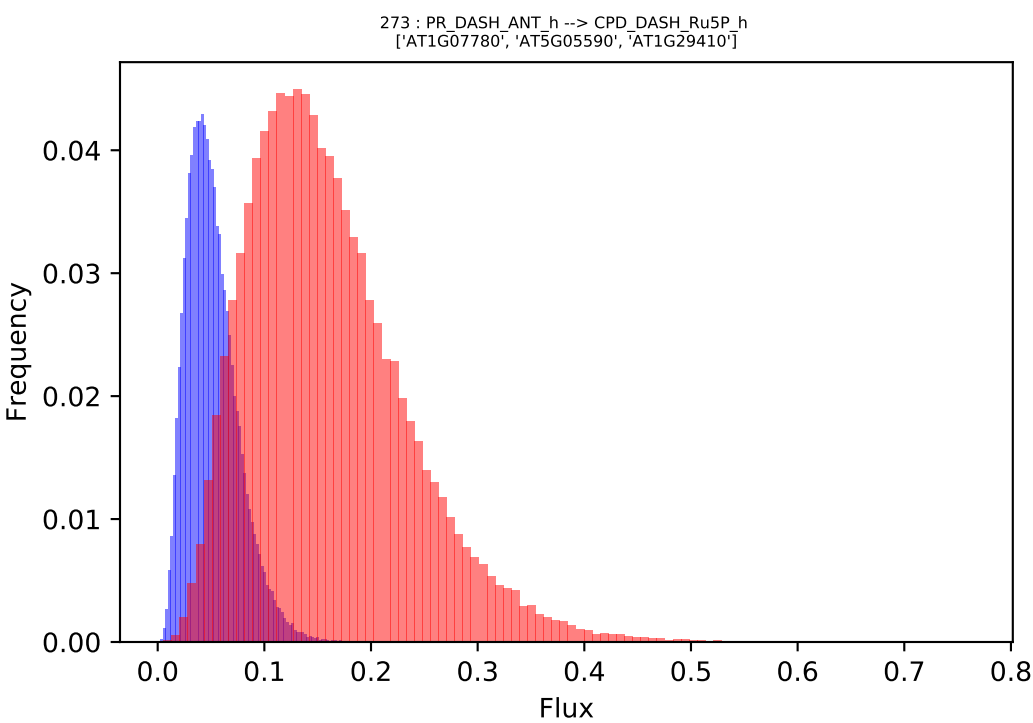

268 : H2O_h + PSer_h --> Pi_h + Ser_h
['AT1G18640']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0
1
2
3
4
5
6
7
Flux

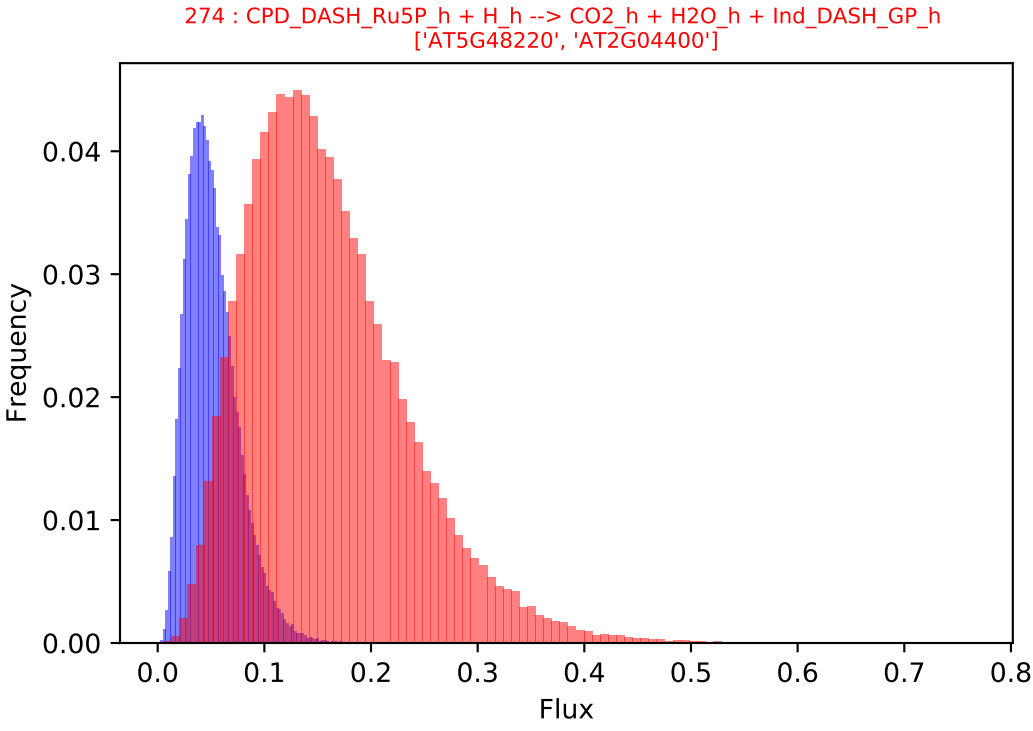

269 : Ser_c --> NH4_c + Pyr_c
['AT4G11640']
Frequency
0.00
0.02
0.04
0.06
0.08
0
1
2
3
4
Flux

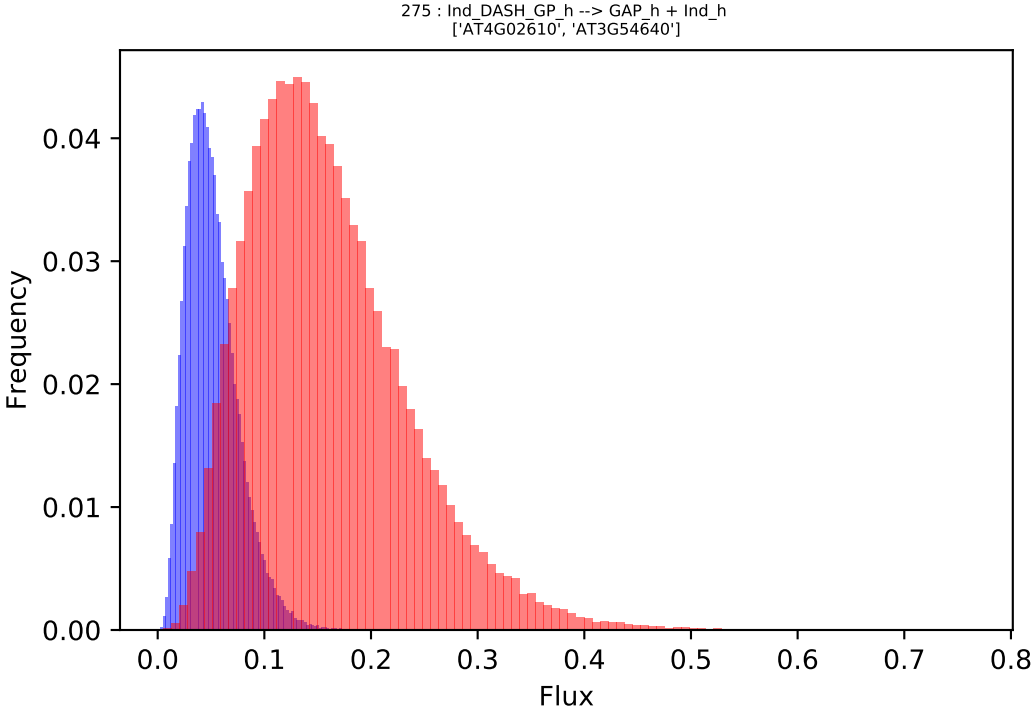

270 : H2O_h + PH_DASH_Ser_h --> Pi_h + Thr_h
['2*AT4G29840', 'AT1G72810']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Flux

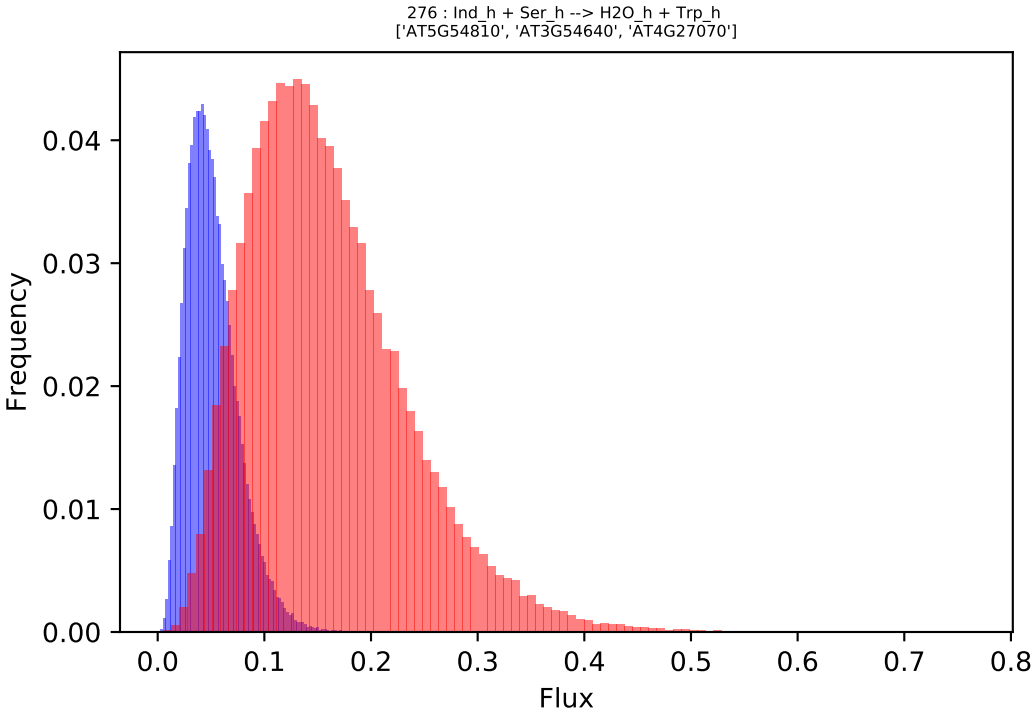

271 : CHR_h + Gln_h --> ANT_h + Glu_h + H_h + Pyr_h
['AT5G05730', 'AT2G29690', '2*AT3G55870', '2*AT1G24807']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
Flux

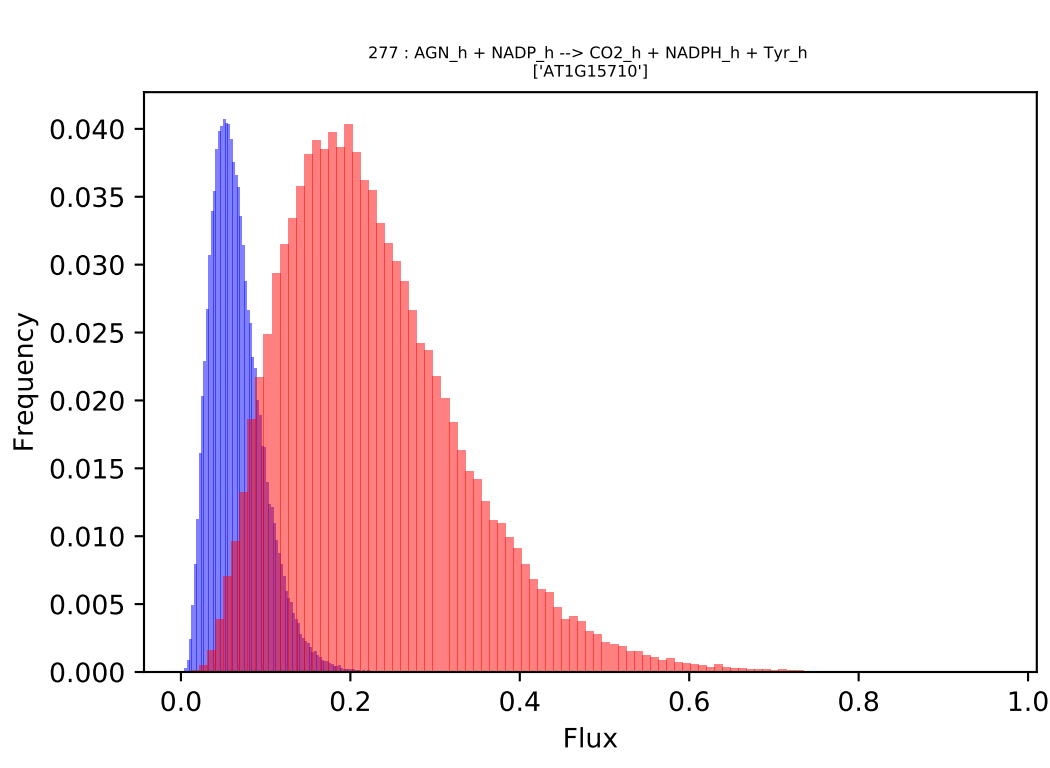

272 : ANT_h + PRPP_h --> H_h + PPi_h + PR_DASH_ANT_h
['AT5G17990']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
Flux

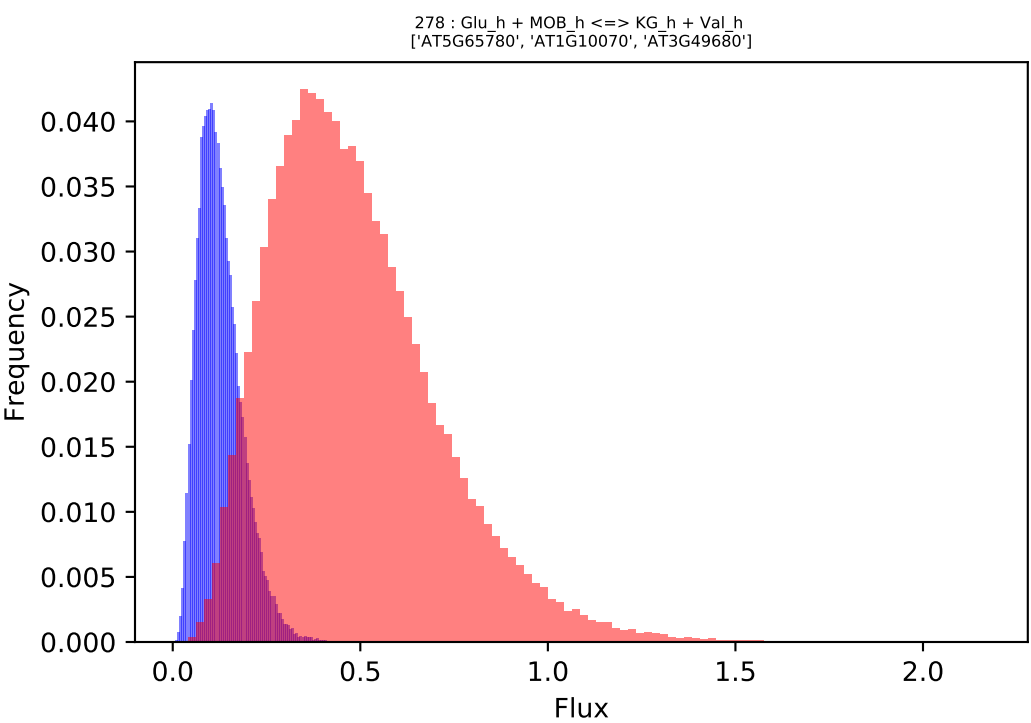

273 : PR_DASH_ANT_h --> CPD_DASH_Ru5P_h
['AT1G07780', 'AT5G05590', 'AT1G29410']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
Flux

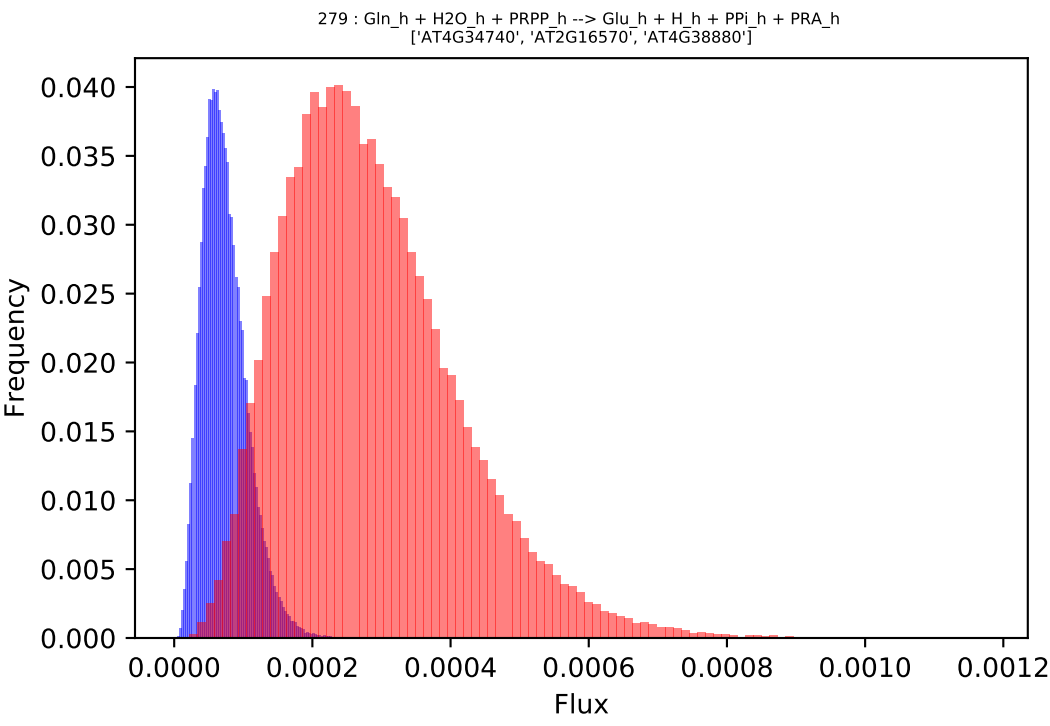

274 : CPD_DASH_Ru5P_h + H_h --> CO2_h + H2O_h + Ind_DASH_GP_h
['AT5G48220', 'AT2G04400']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
Flux


275 : Ind_DASH_GP_h --> GAP_h + Ind_h
['AT4G02610', 'AT3G54640']
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


276 : Ind_h + Ser_h --> H2O_h + Trp_h
['AT5G54810', 'AT3G54640', 'AT4G27070']
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


277 : AGN_h + NADP_h --> CO2_h + NADPH_h + Tyr_h
['AT1G15710']
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
Flux


278 : Glu_h + MOB_h <=> KG_h + Val_h
['AT5G65780', 'AT1G10070', 'AT3G49680']
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
Flux


279 : Gln_h + H2O_h + PRPP_h --> Glu_h + H_h + PPi_h + PRA_h
['AT4G34740', 'AT2G16570', 'AT4G38880']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0000
0.0002
0.0004
0.0006
0.0008
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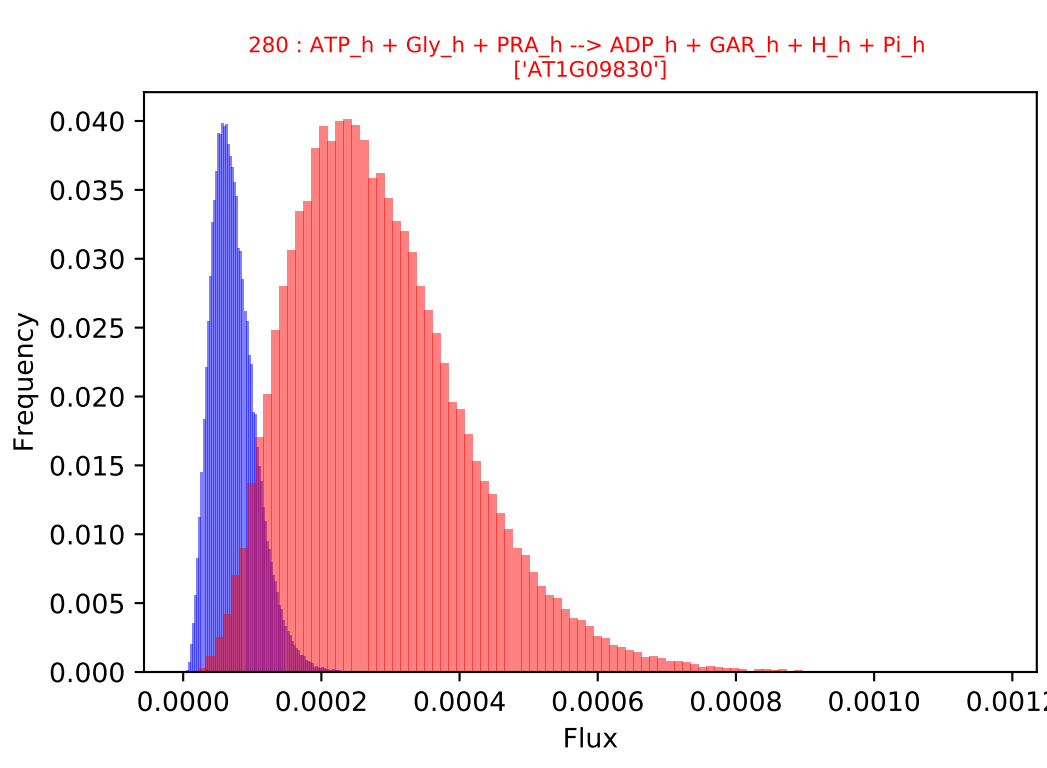
0.0012
Flux


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
0.0000
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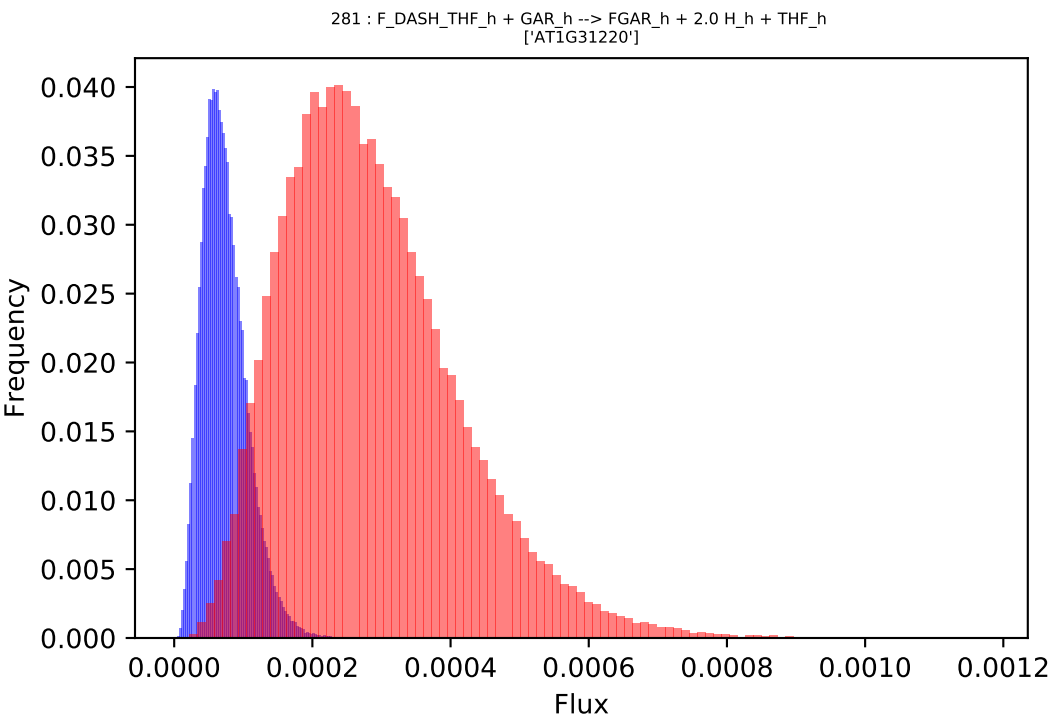
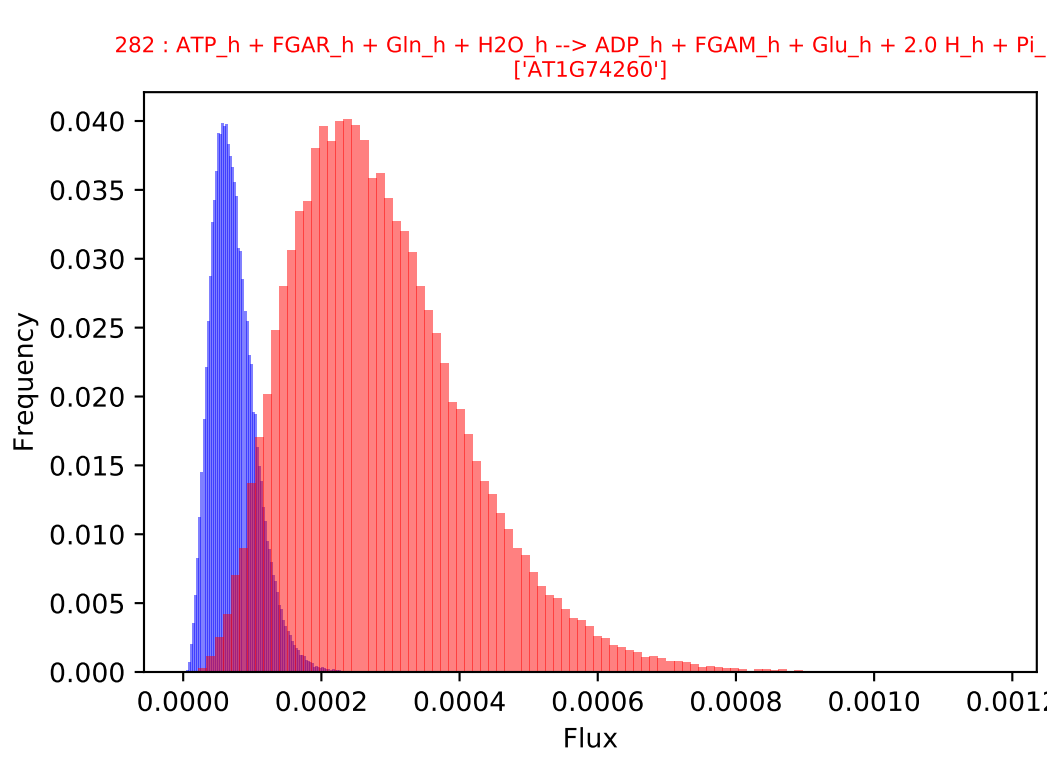
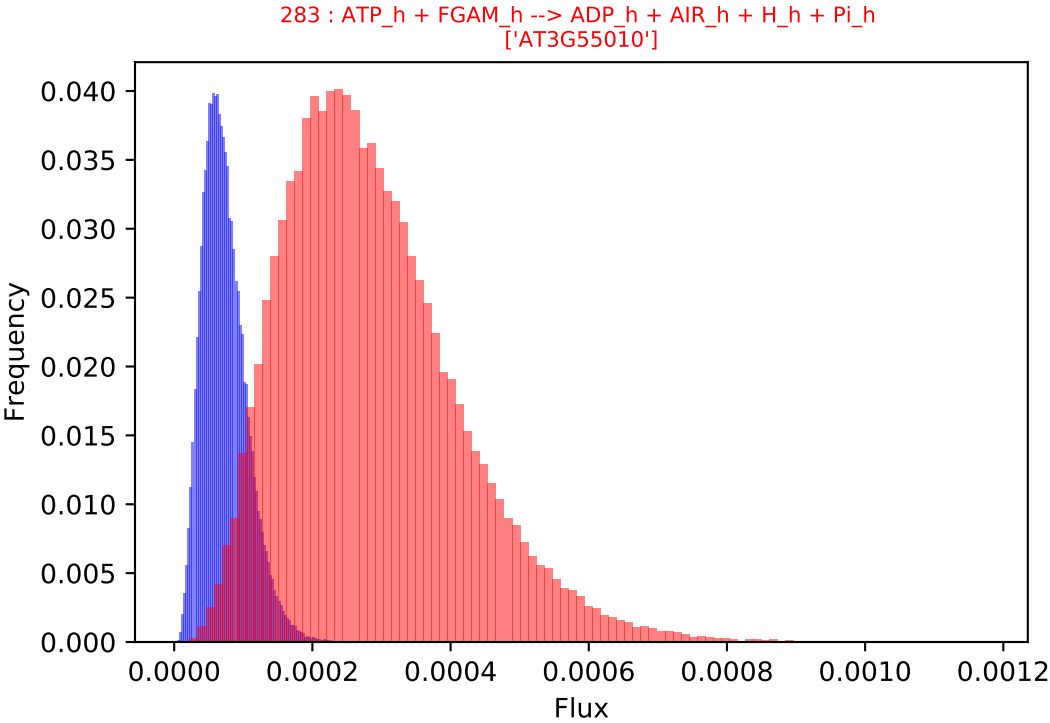
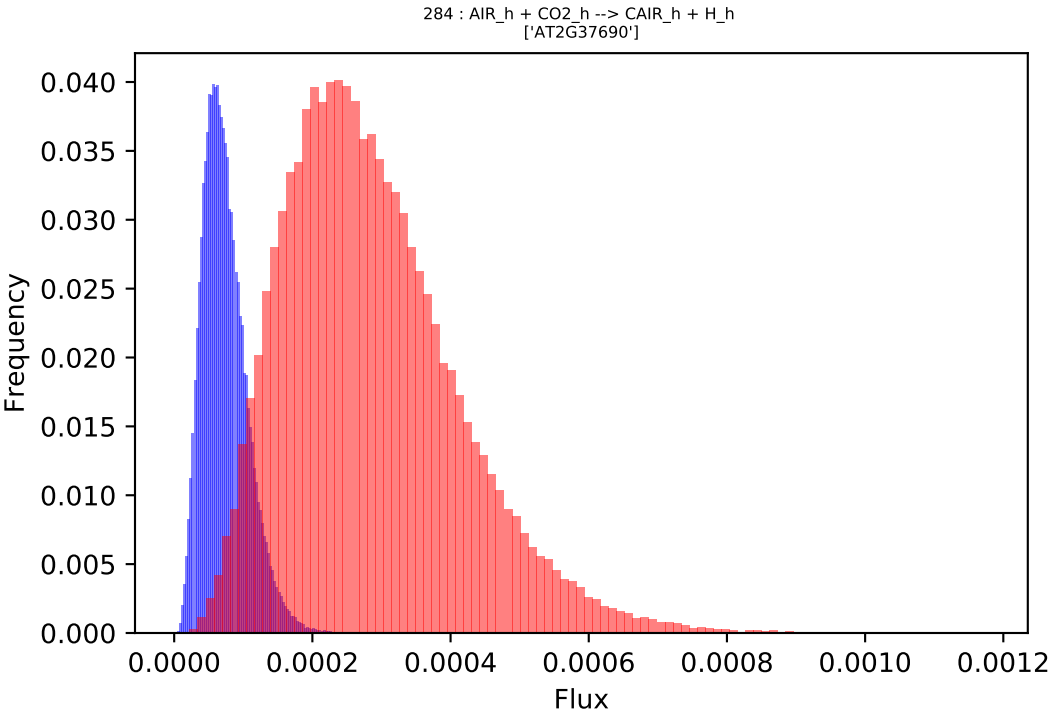
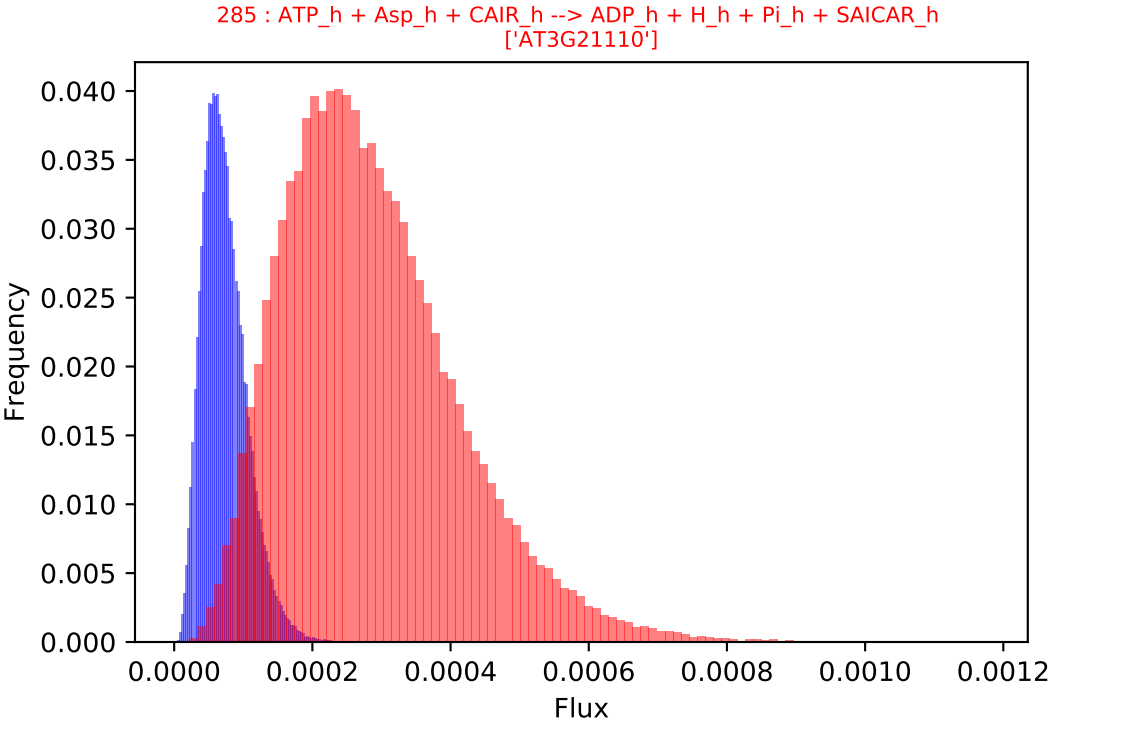
0.0006
0.0008
0.0010
0.0012
Flux

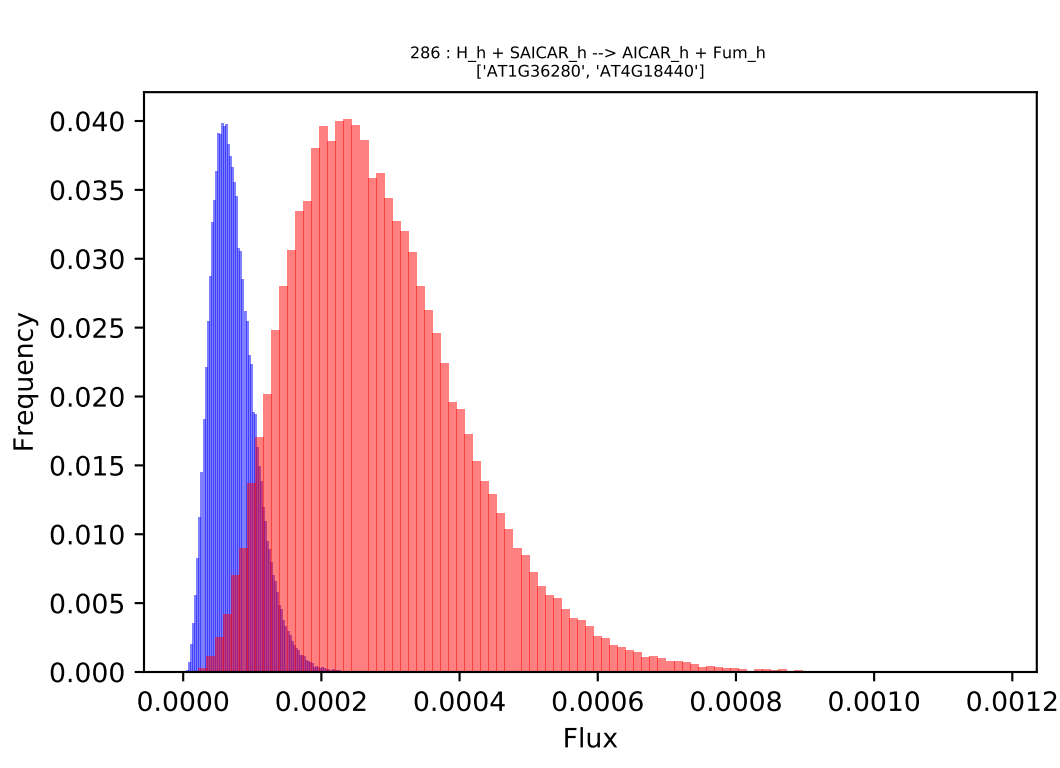

281 : F_DASH_THF_h + GAR_h --> FGAR_h + 2.0 H_h + THF_h
['AT1G31220']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0000
0.0002
0.0004
0.0006
0.0008
0.0010
0.0012
Flux

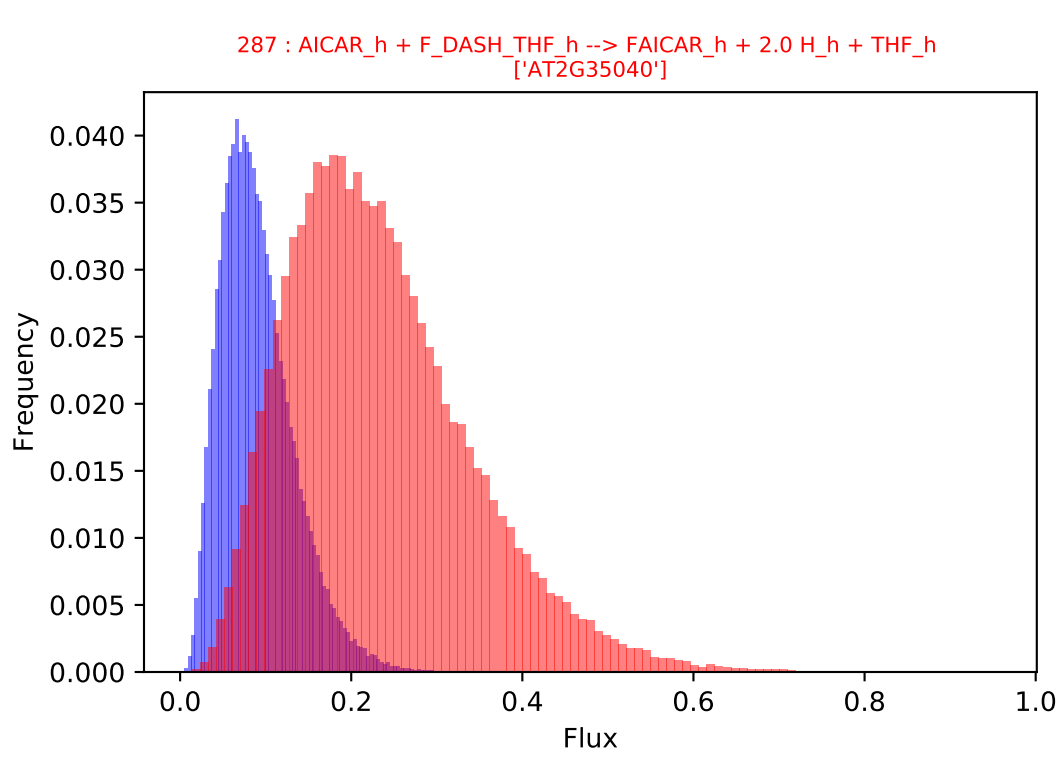

282 : ATP_h + FGAR_h + Gln_h + H2O_h --> ADP_h + FGAM_h + Glu_h + 2.0 H_h + Pi_h
['AT1G74260']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0000
0.0002
0.0004
0.0006
0.0008
0.0010
0.0012
Flux

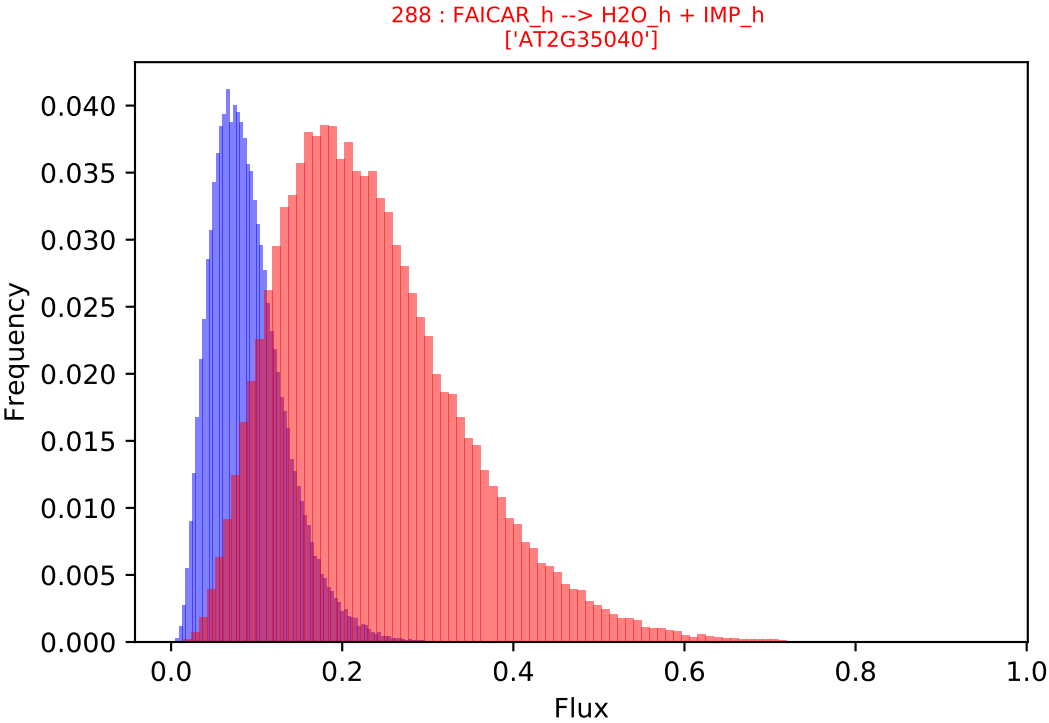

283 : ATP_h + FGAM_h --> ADP_h + AIR_h + H_h + Pi_h
['AT3G55010']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0000
0.0002
0.0004
0.0006
0.0008
0.0010
0.0012
Flux

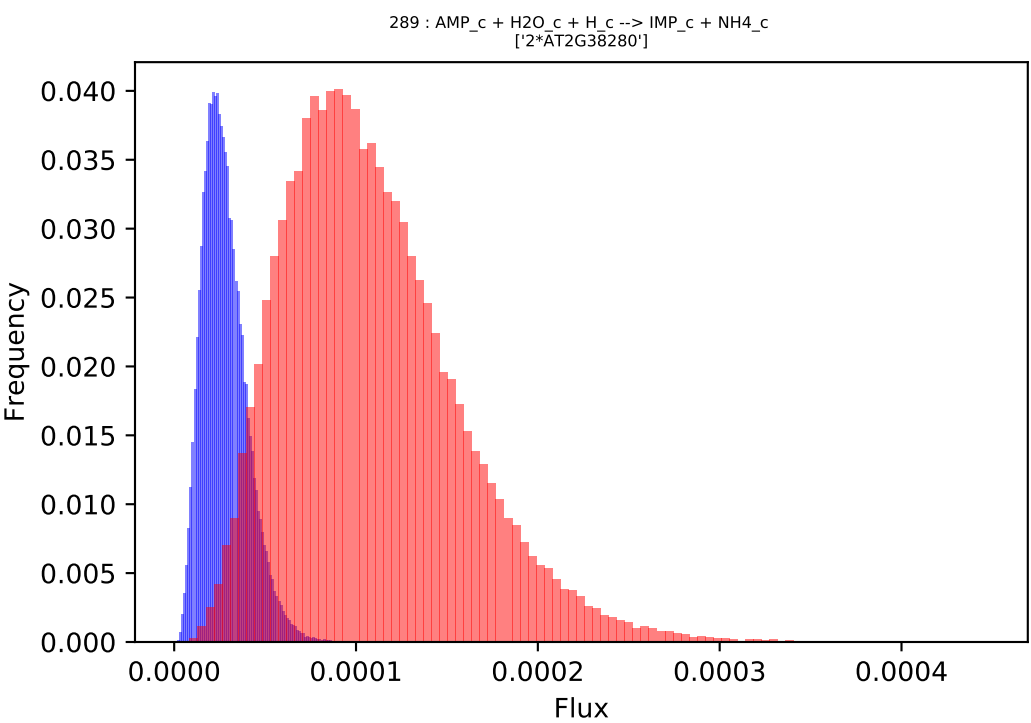

284 : AIR_h + CO2_h --> CAIR_h + H_h
['AT2G37690']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0000
0.0002
0.0004
0.0006
0.0008
0.0010
0.0012
Flux

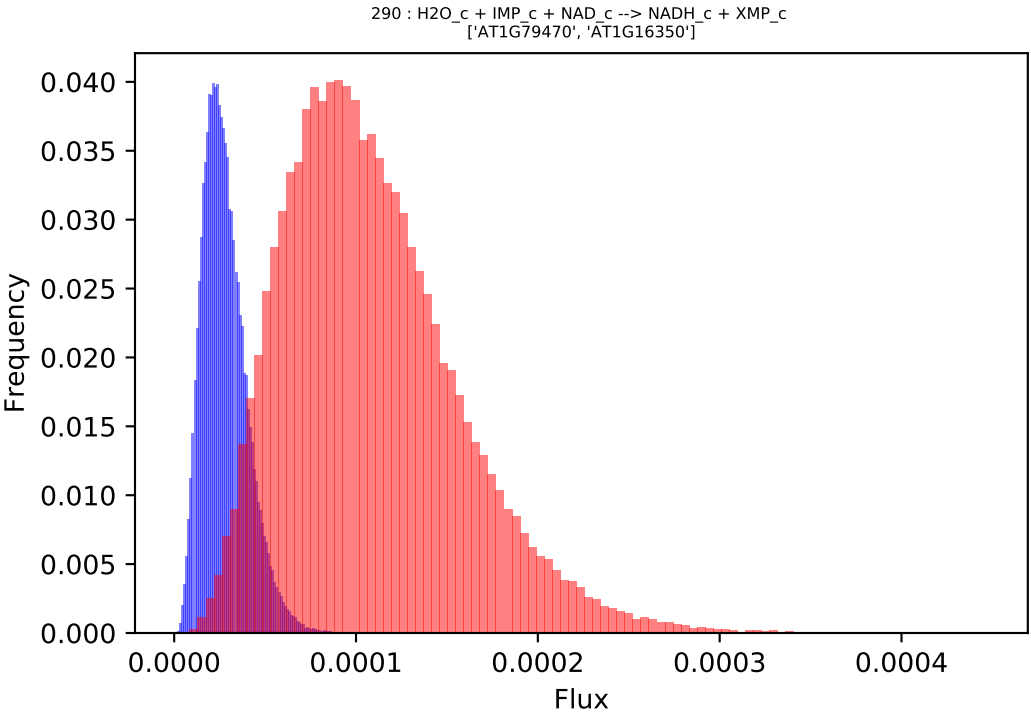

285 : ATP_h + Asp_h + CAIR_h --> ADP_h + H_h + Pi_h + SAICAR_h
['AT3G21110']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0000
0.0002
0.0004
0.0006
0.0008
0.0010
0.0012
Flux

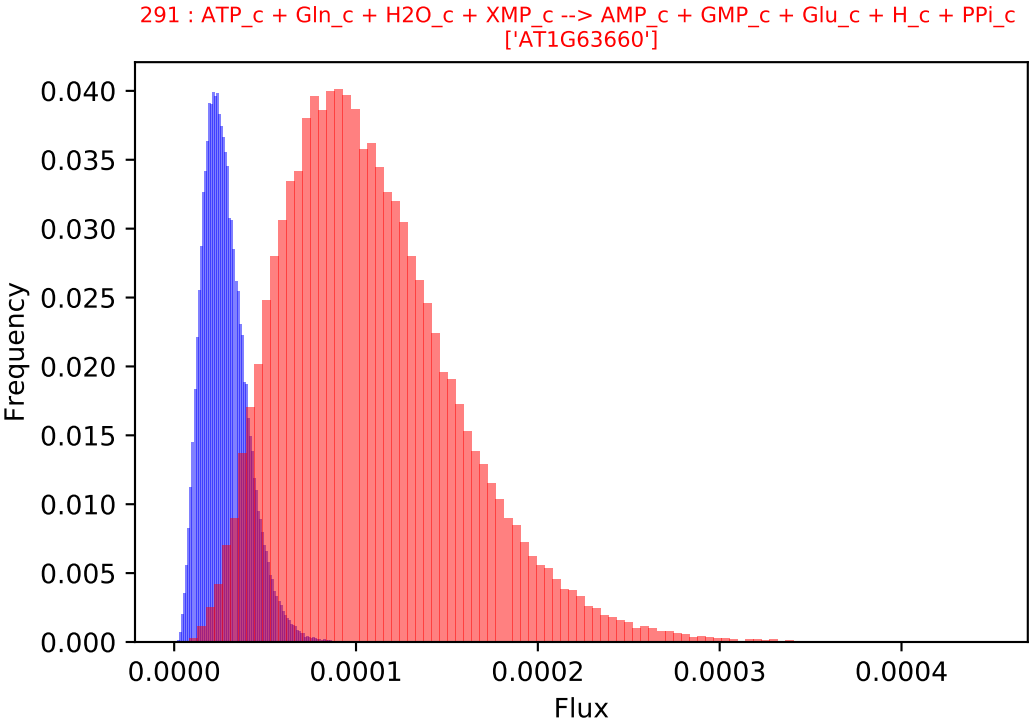

286 : H_h + SAICAR_h --> AICAR_h + Fum_h
['AT1G36280', 'AT4G18440']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0000
0.0002
0.0004
0.0006
0.0008
0.0010
0.0012
Flux

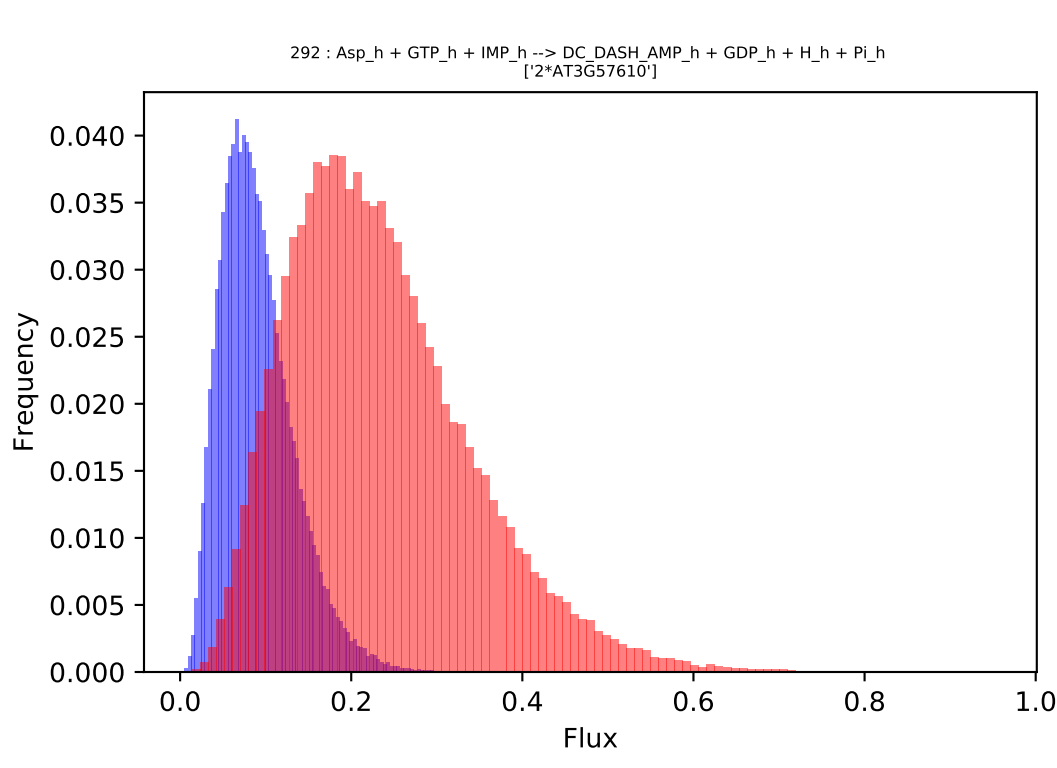

287 : AICAR_h + F_DASH_THF_h --> FAICAR_h + 2.0 H_h + THF_h
['AT2G35040']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
Flux

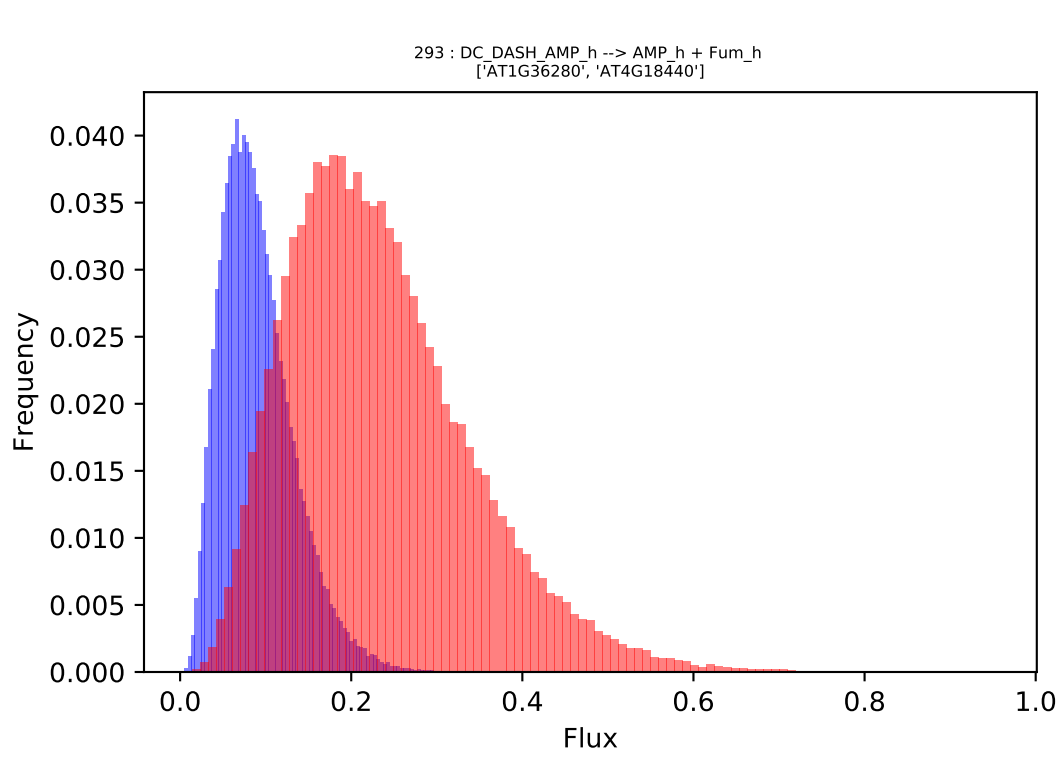

288 : FAICAR_h --> H2O_h + IMP_h
['AT2G35040']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
Flux

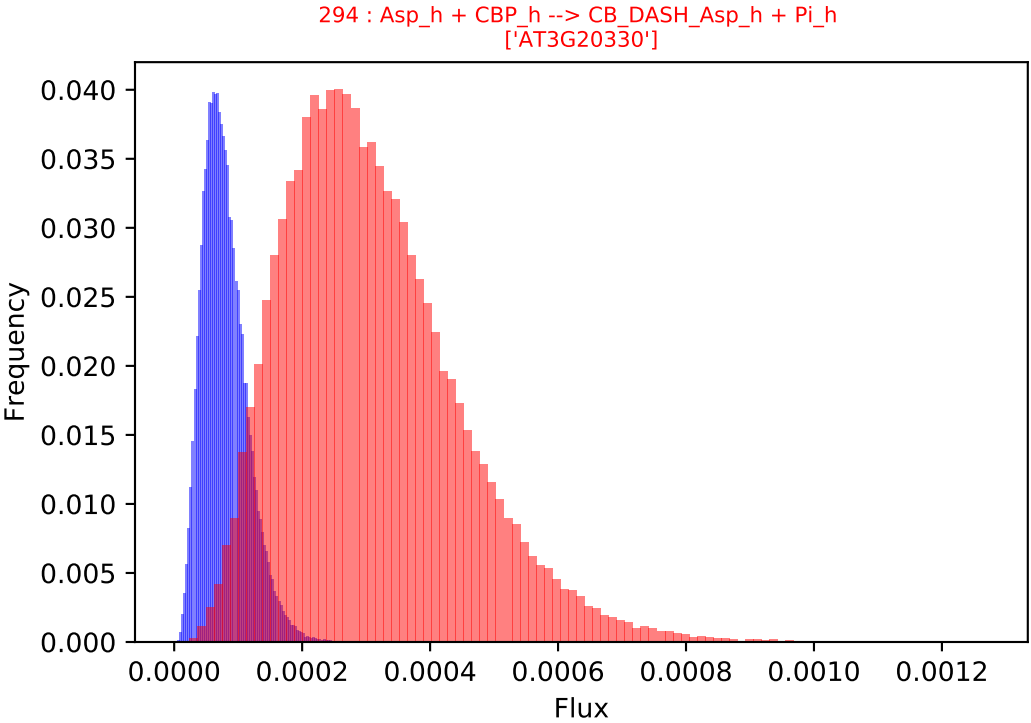

289 : AMP_c + H2O_c + H_c --> IMP_c + NH4_c
['2*AT2G38280']
Frequency
Flux
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0000
0.0001
0.0002
0.0003
0.0004


290 : H2O_c + IMP_c + NAD_c --> NADH_c + XMP_c
['AT1G79470', 'AT1G16350']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0000
0.0001
0.0002
0.0003
0.0004
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
0.0000
0.0001
0.0002
0.0003
0.0004
Flux


292 : Asp_h + GTP_h + IMP_h --> DC_DASH_AMP_h + GDP_h + H_h + Pi_h
['2*AT3G57610']
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
Flux


293 : DC_DASH_AMP_h --> AMP_h + Fum_h
['AT1G36280', 'AT4G18440']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
Flux


294 : Asp_h + CBP_h --> CB_DASH_Asp_h + Pi_h
['AT3G20330']
Frequency
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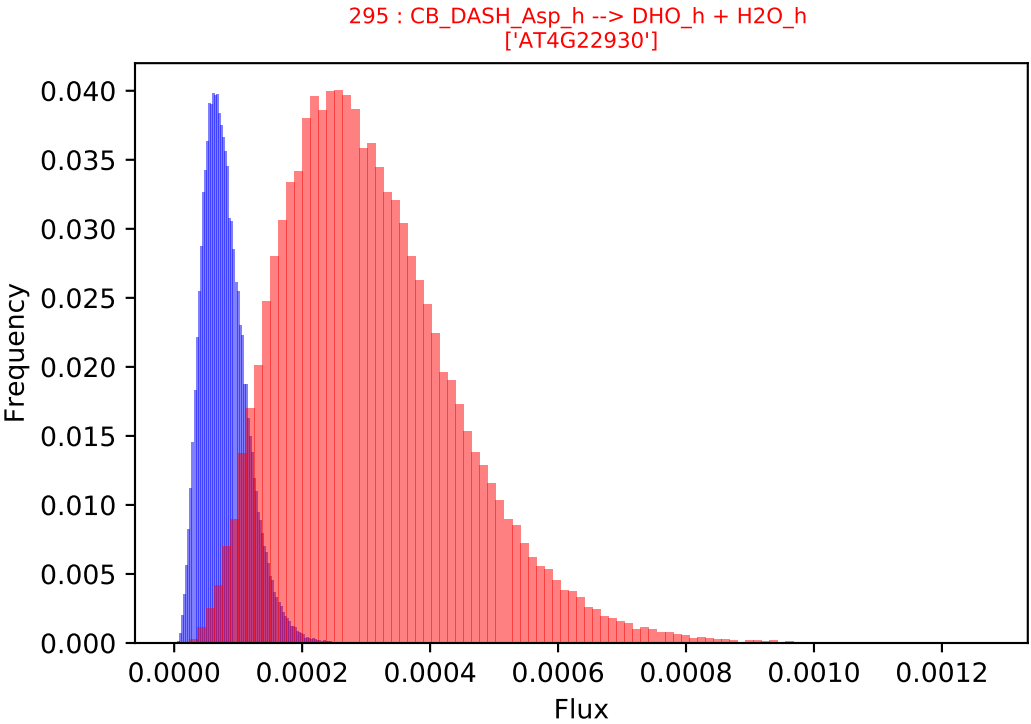
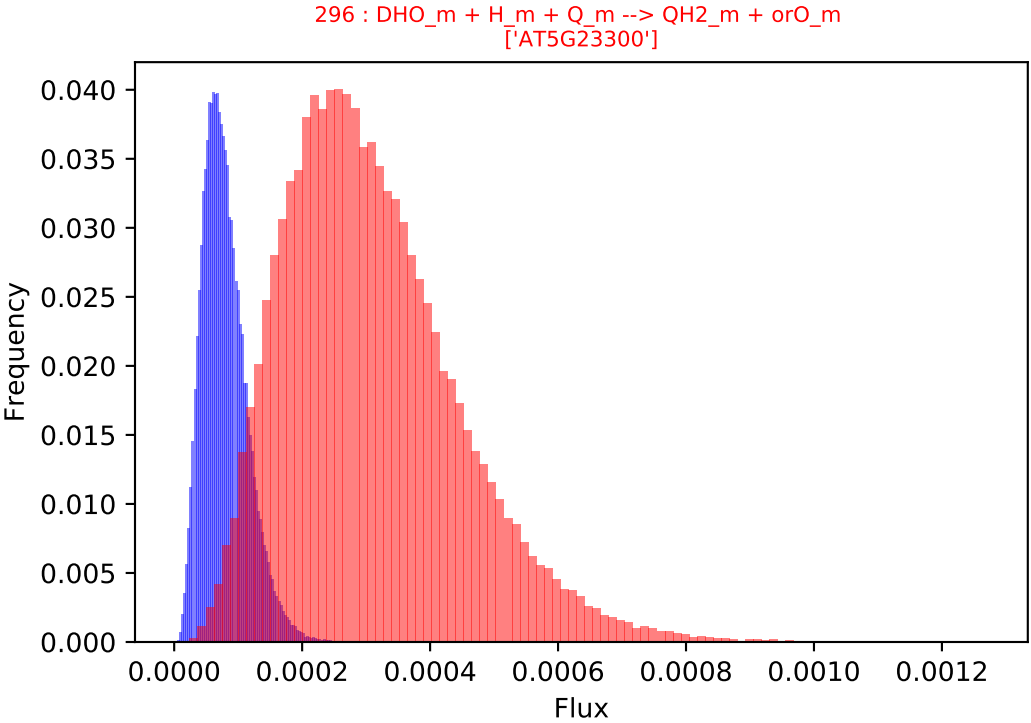
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0000
0.0002
0.0004
0.0006
0.0008
0.0010
0.0012
Flux


295 : CB_DASH_Asp_h --> DHO_h + H2O_h
['AT4G22930']
Frequency
Flux
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
0.040
0.0000
0.0002
0.0004
0.0006
0.0008
0.0010
0.0012


296 : DHO_m + H_m + Q_m --> QH2_m + orO_m
['AT5G23300']
Frequency
Flux
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
0.040
0.0000
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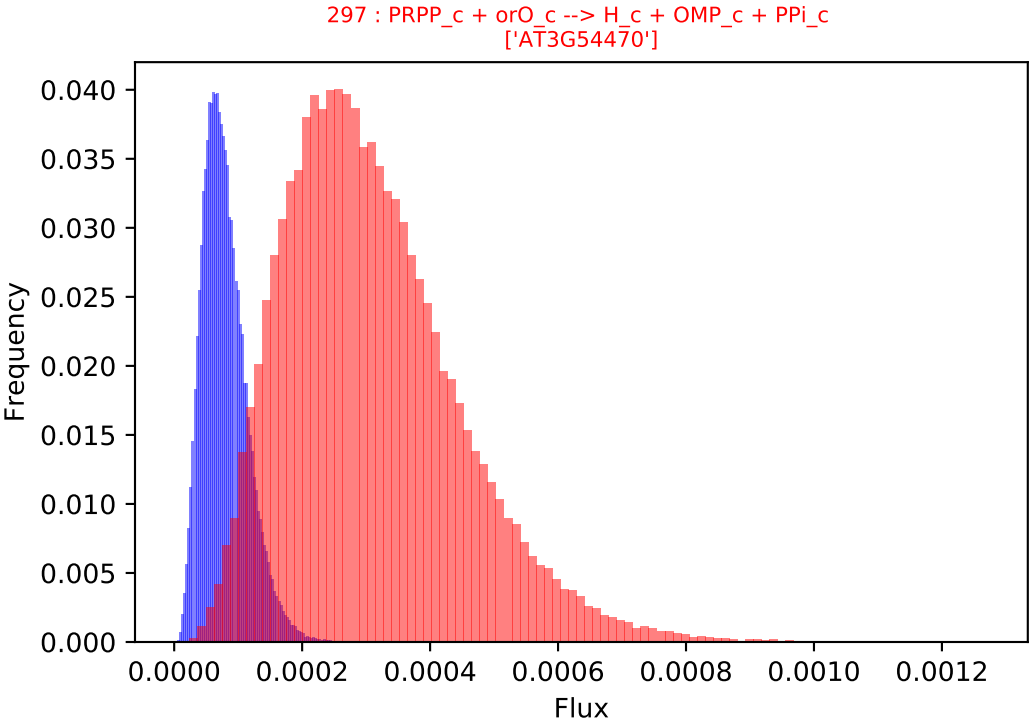
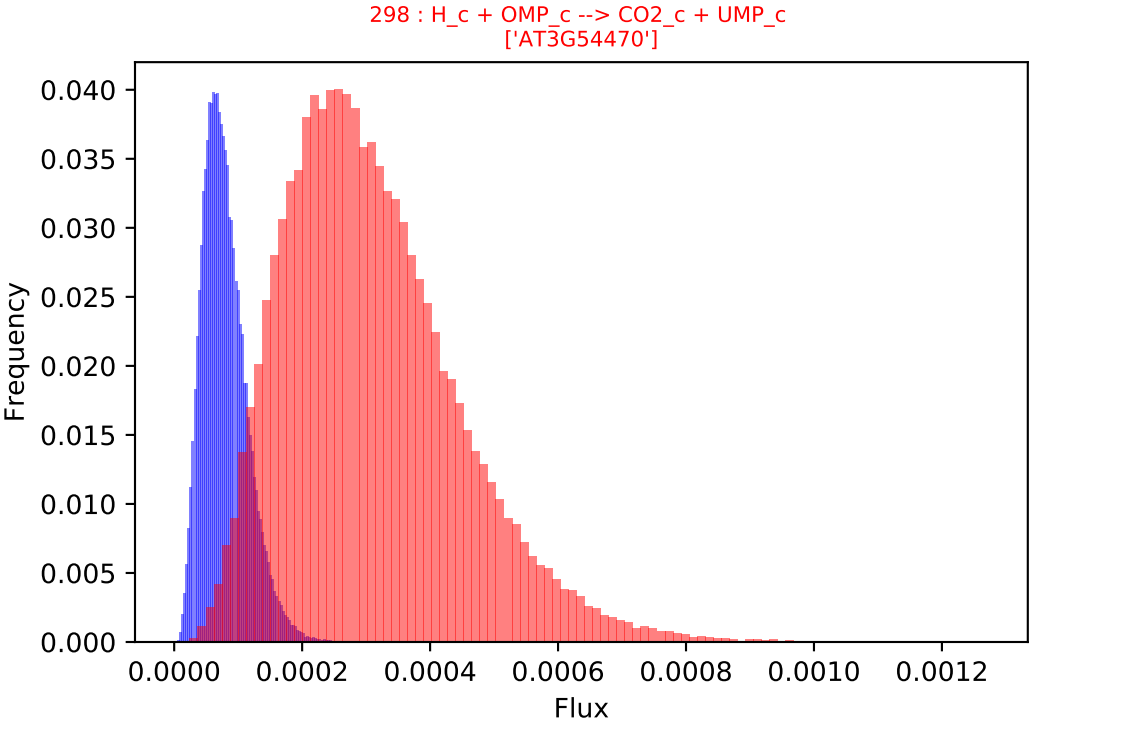
0.0004
0.0006
0.0008
0.0010
0.0012


297 : PRPP_c + orO_c --> H_c + OMP_c + PPi_c
['AT3G54470']
Frequency
Flux
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
0.040
0.0000
0.0002
0.0004
0.0006
0.0008
0.0010
0.0012


298 : H_c + OMP_c --> CO2_c + UMP_c
['AT3G54470']
Frequency
Flux
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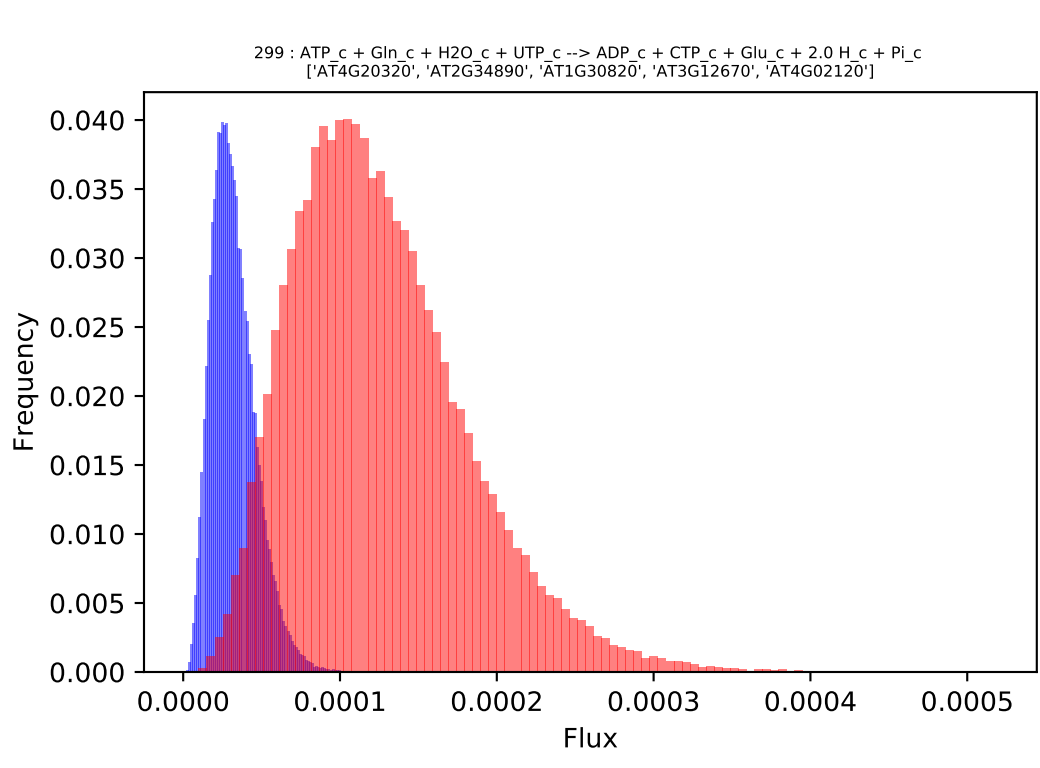
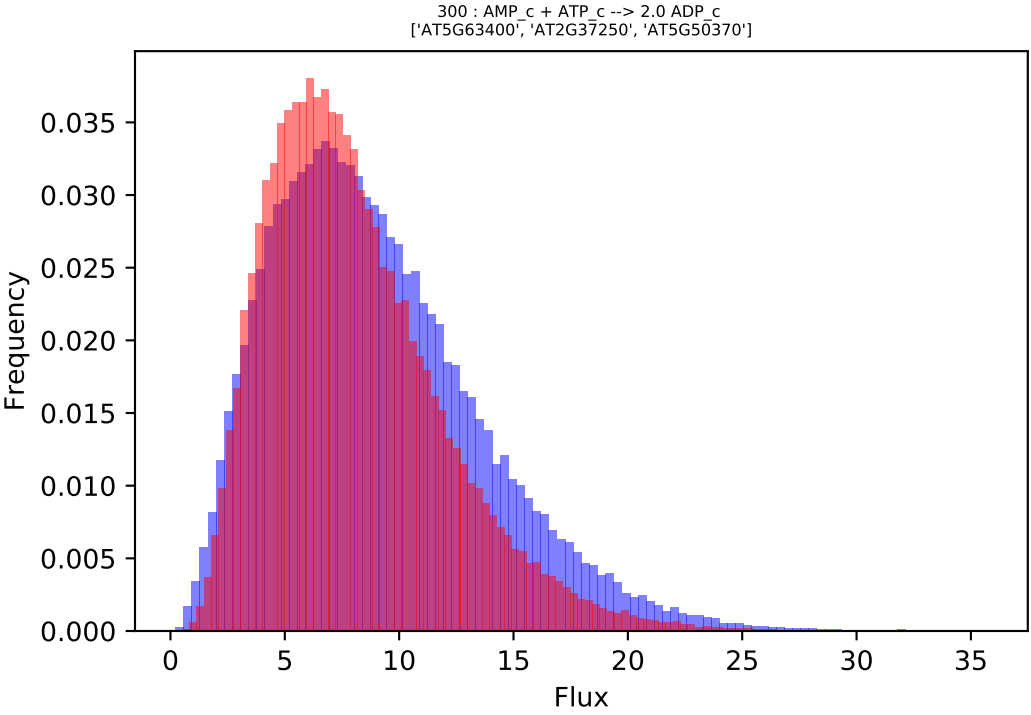
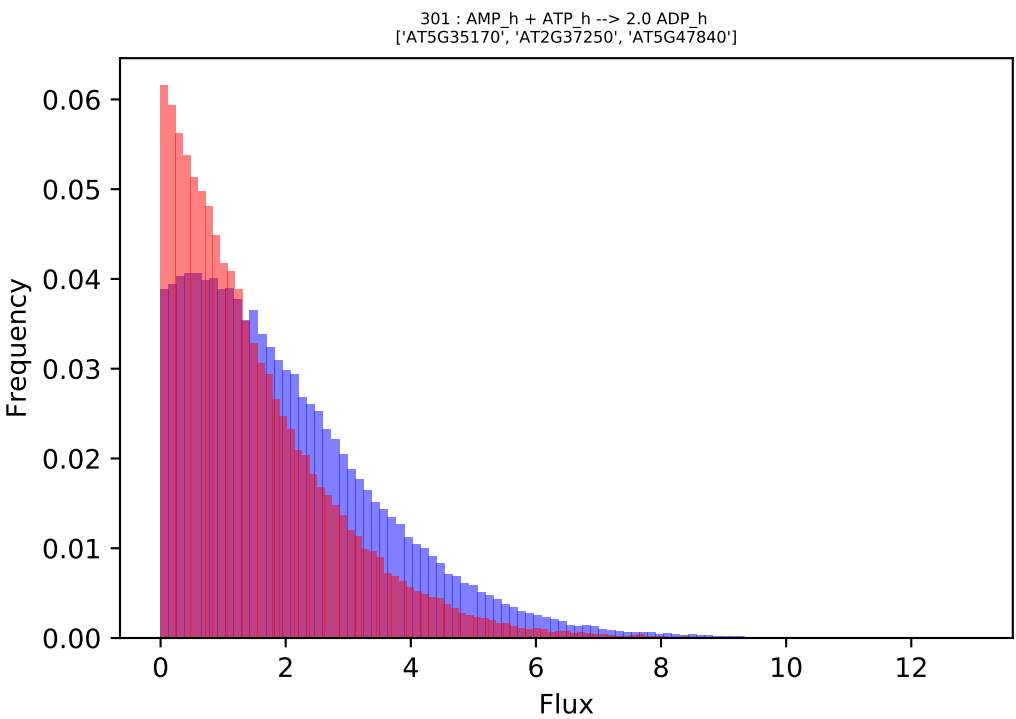
0.005
0.010
0.015
0.020
0.025
0.030
0.035
0.040
0.0000
0.0002
0.0004
0.0006
0.0008
0.0010
0.0012


299 : ATP_c + Gln_c + H2O_c + UTP_c --> ADP_c + CTP_c + Glu_c + 2.0 H_c + Pi_c
['AT4G20320', 'AT2G34890', 'AT1G30820', 'AT3G12670', 'AT4G02120']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0000
0.0001
0.0002
0.0003
0.0004
0.0005
Flux


300 : AMP_c + ATP_c --> 2.0 ADP_c
['AT5G63400', 'AT2G37250', '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
35
Flux


301 : AMP_h + ATP_h --> 2.0 ADP_h
['AT5G35170', 'AT2G37250', 'AT5G47840']
Frequency
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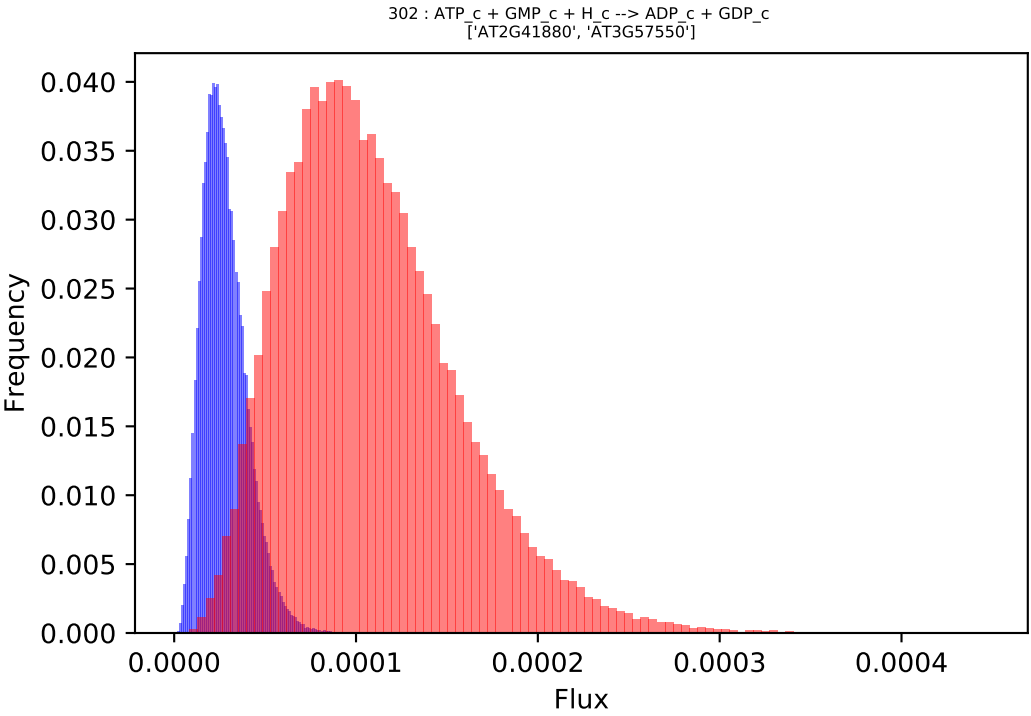
0.02
0.03
0.04
0.05
0.06
0
2
4
6
8
10
12
Flux


302 : ATP_c + GMP_c + H_c --> ADP_c + GDP_c
['AT2G41880', 'AT3G57550']
Frequency
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0.035
0.030
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0.020
0.015
0.010
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0.0001
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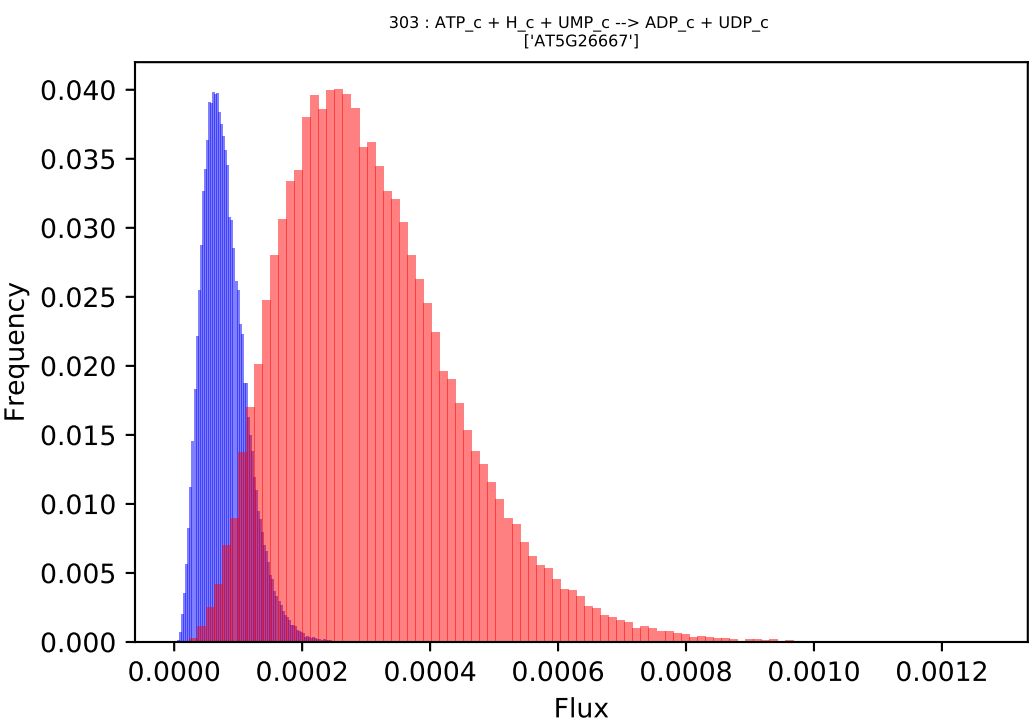
Flux


303 : ATP_c + H_c + UMP_c --> ADP_c + UDP_c
['AT5G26667']
Frequency
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0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0000
0.0002
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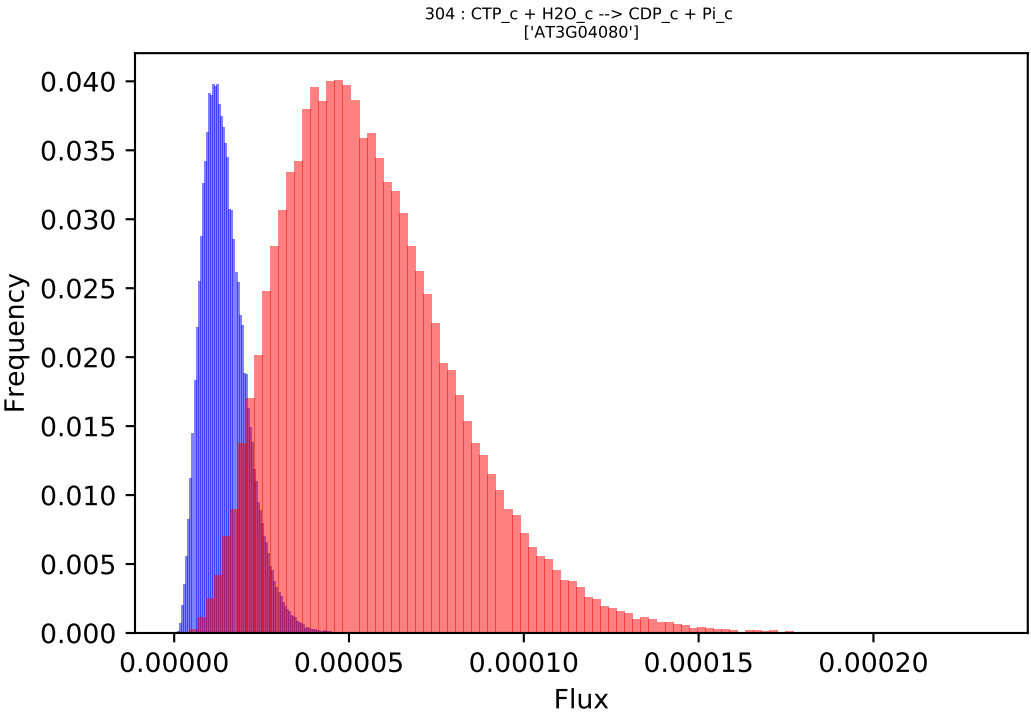
0.0006
0.0008
0.0010
0.0012
Flux


304 : CTP_c + H2O_c --> CDP_c + Pi_c
['AT3G04080']
Frequency
0.040
0.035
0.030
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0.020
0.015
0.010
0.005
0.000
0.00000
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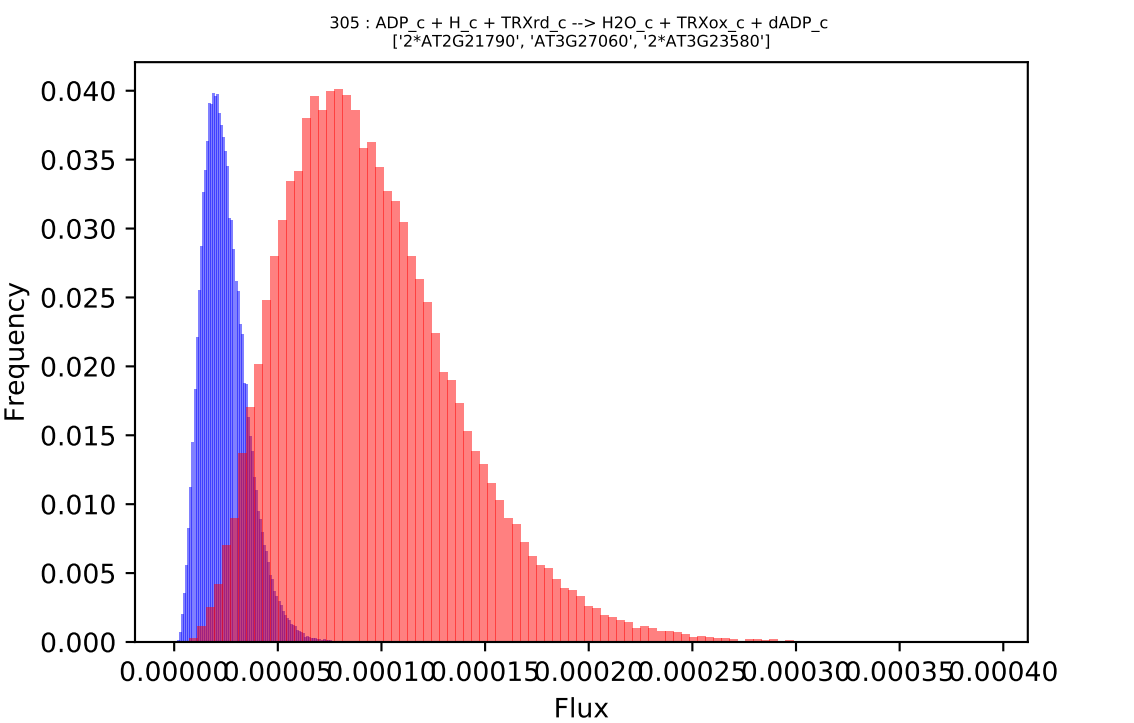
0.00010
0.00015
0.00020
Flux


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
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0.00010
0.00015
0.00020
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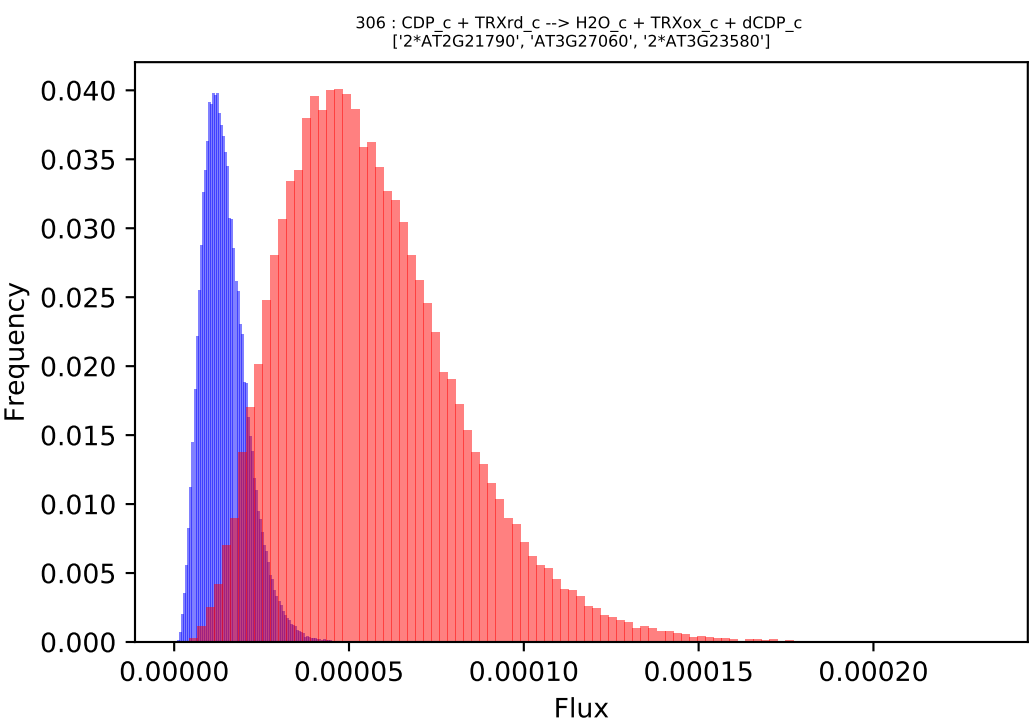
0.00030
0.00035
0.00040
Flux


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
0.00005
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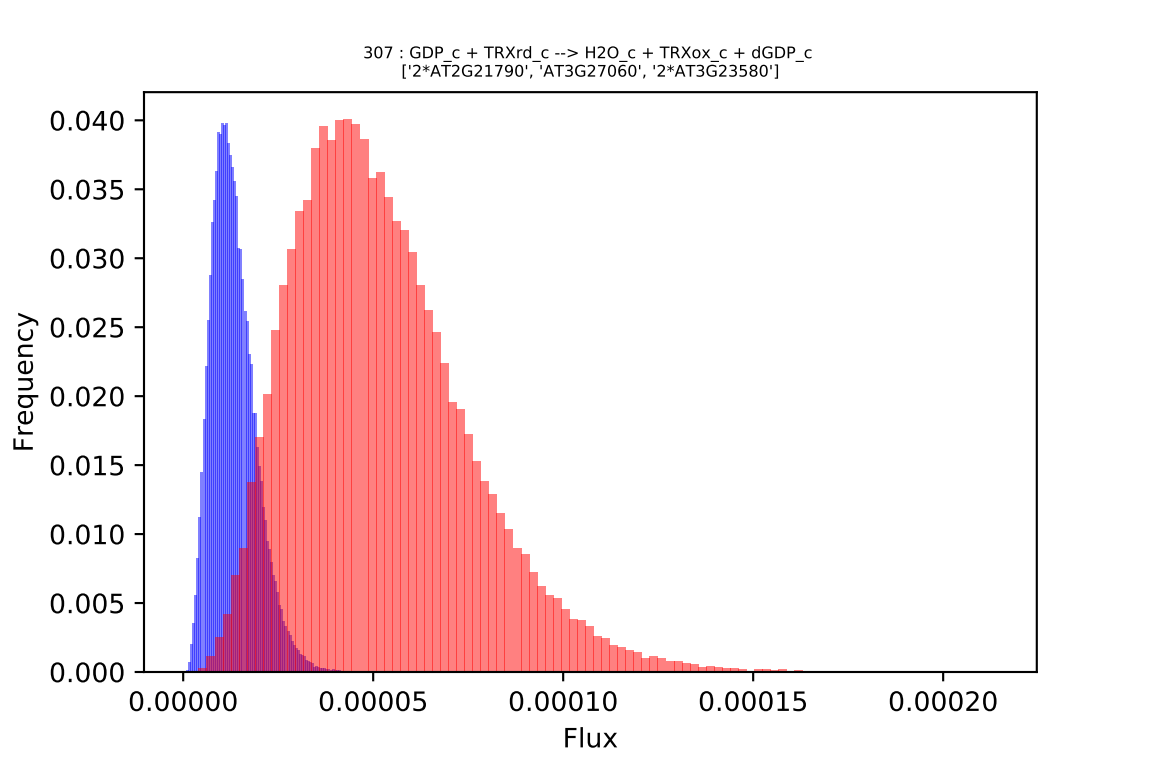
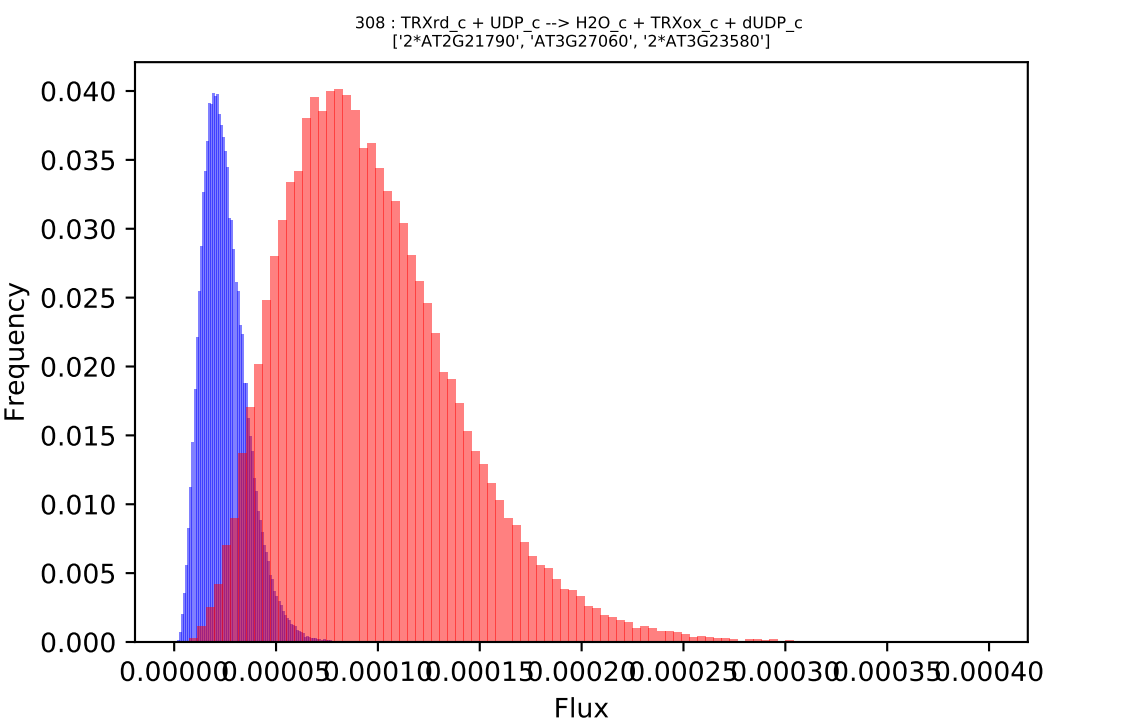
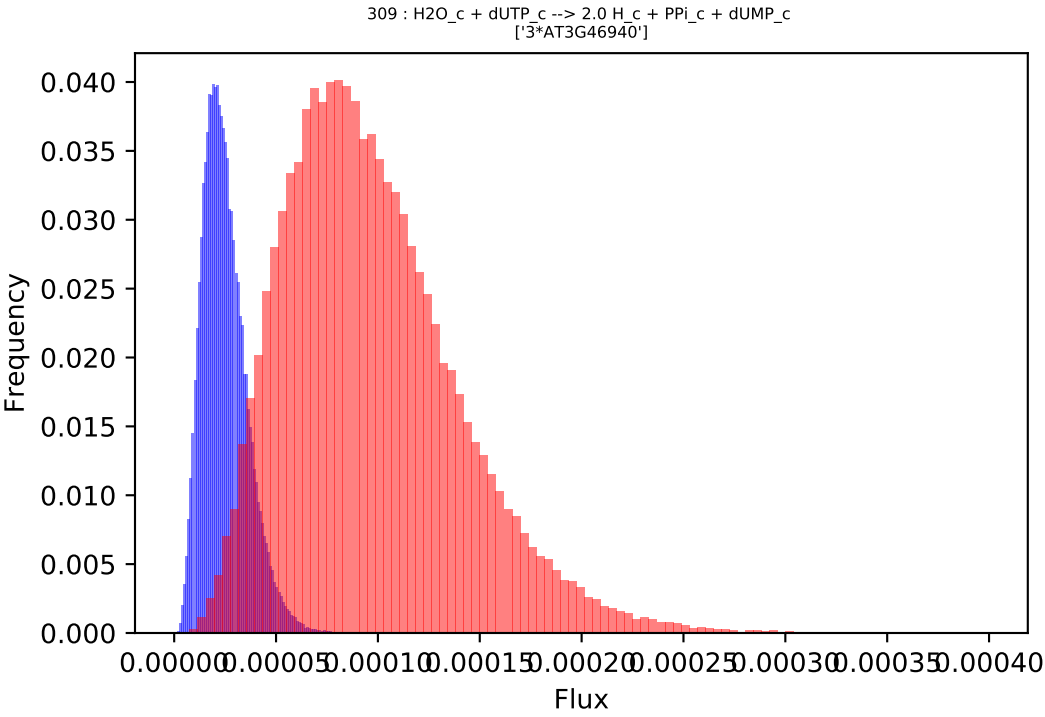
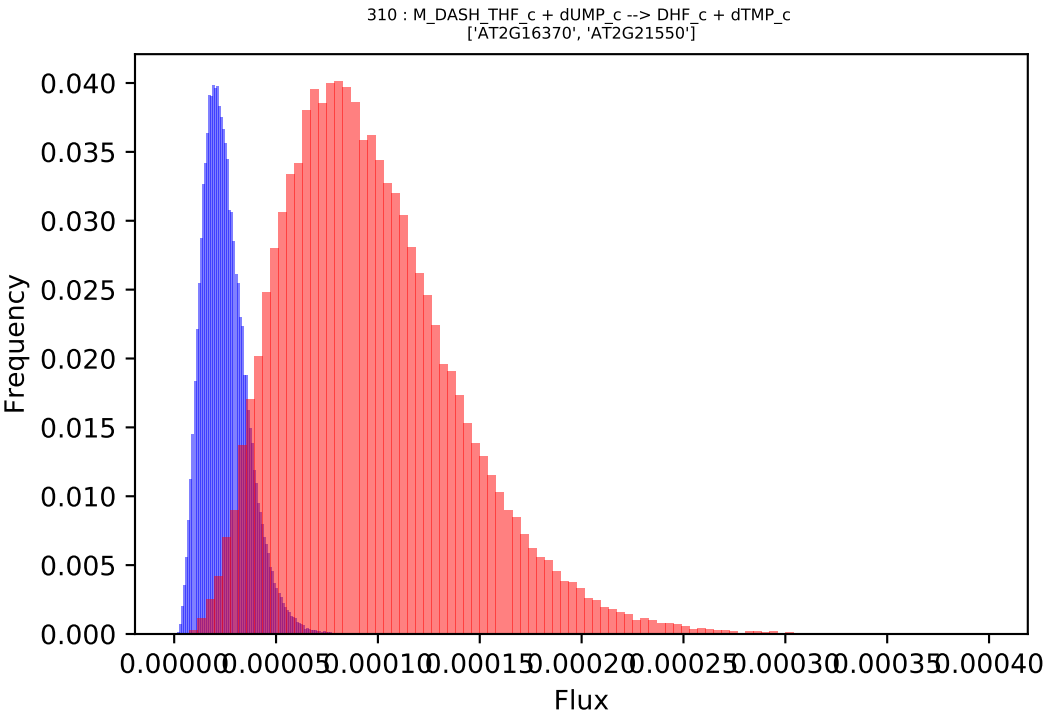
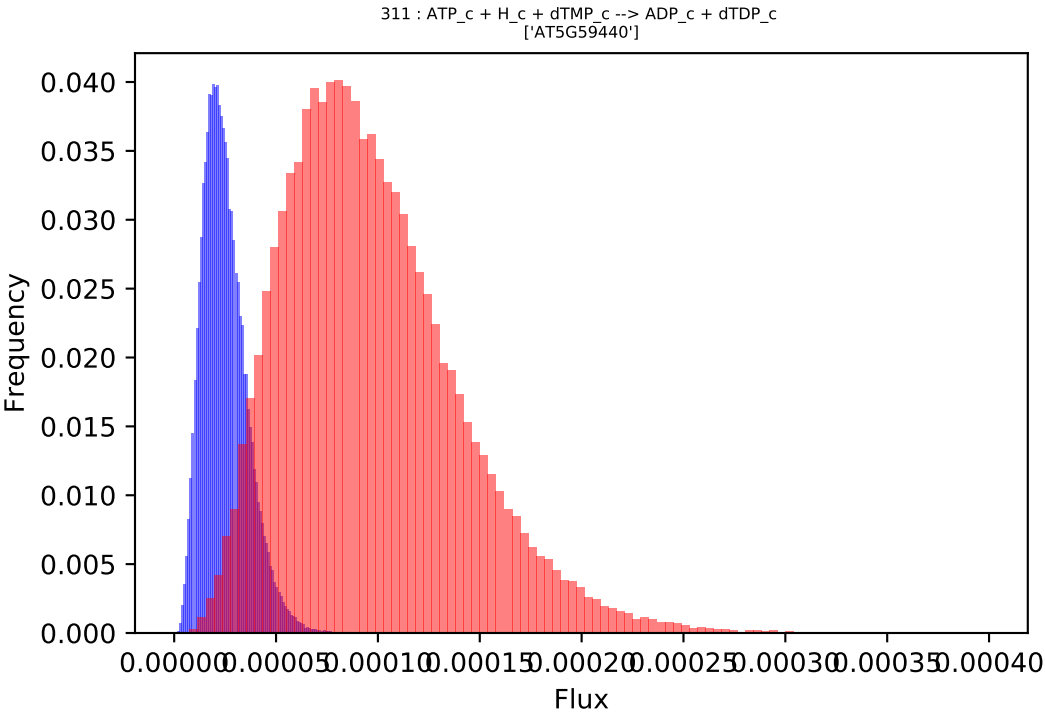
Flux

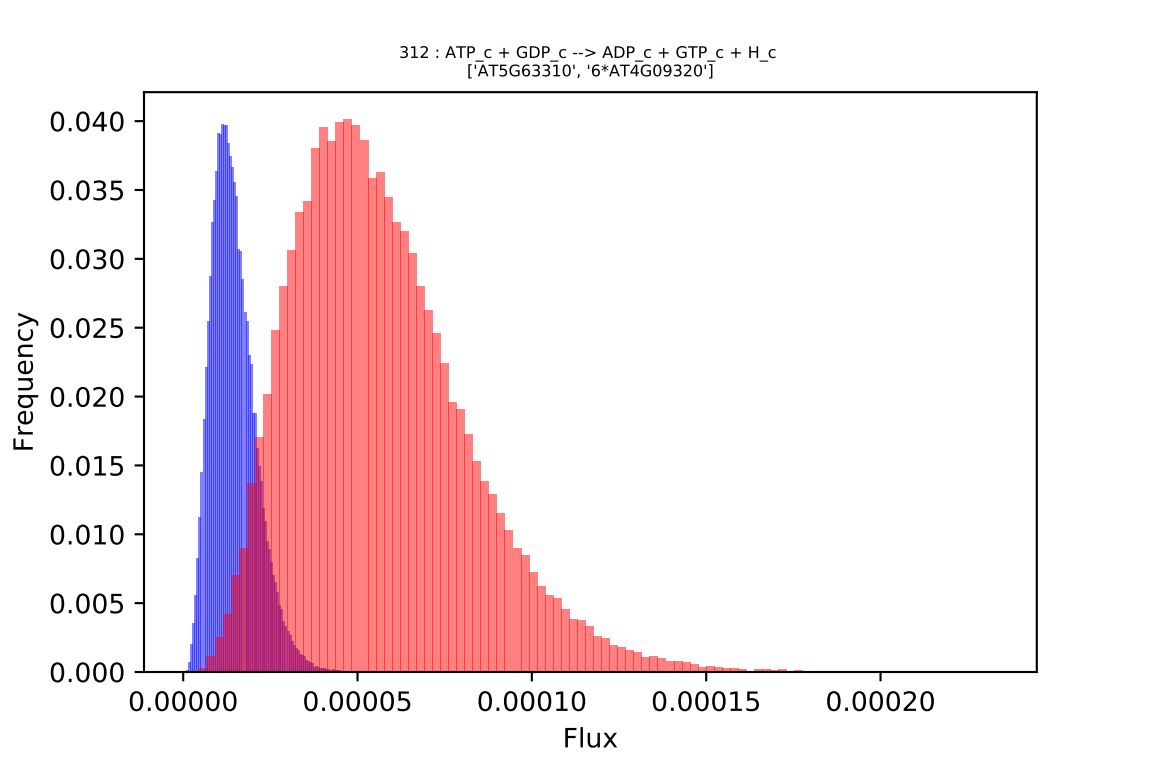

307 : GDP_c + TRXrd_c --> H2O_c + TRXox_c + dGDP_c
['2*AT2G21790', 'AT3G27060', '2*AT3G23580']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00005
0.00010
0.00015
0.00020
Flux

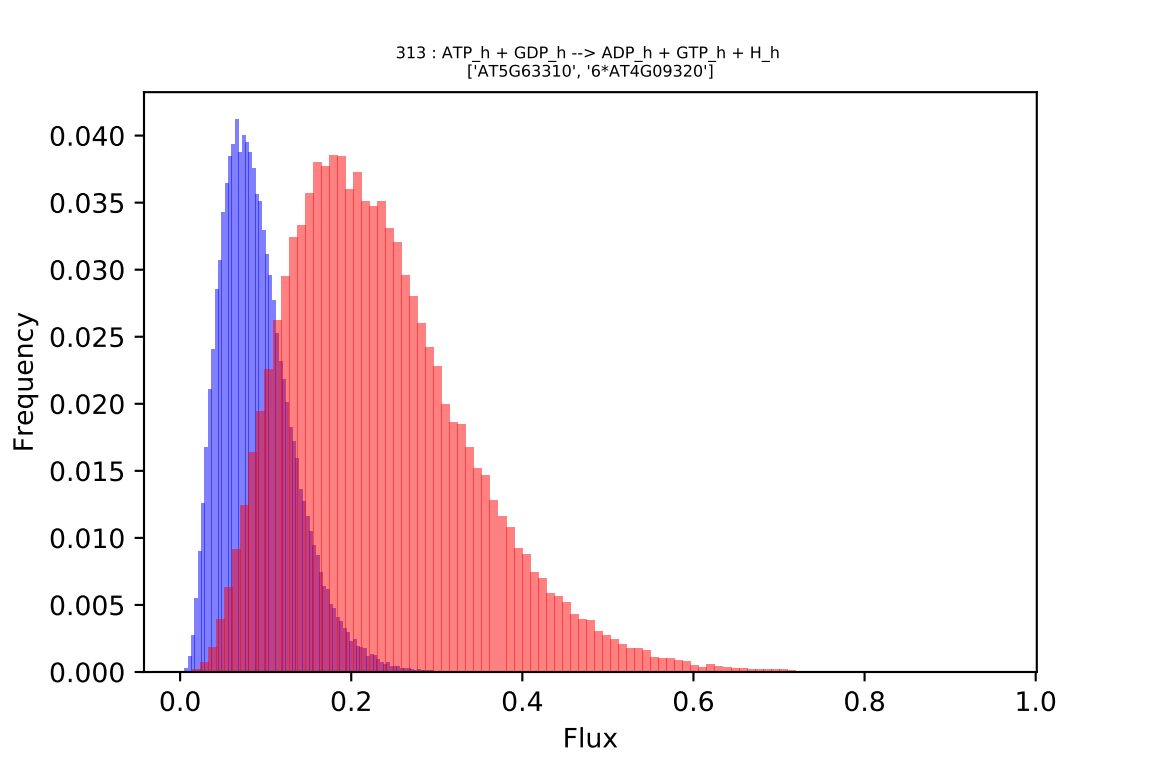

308 : TRXrd_c + UDP_c --> H2O_c + TRXox_c + dUDP_c
['2*AT2G21790', 'AT3G27060', '2*AT3G23580']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00005
0.00010
0.00015
0.00020
0.00025
0.00030
0.00035
0.00040
Flux

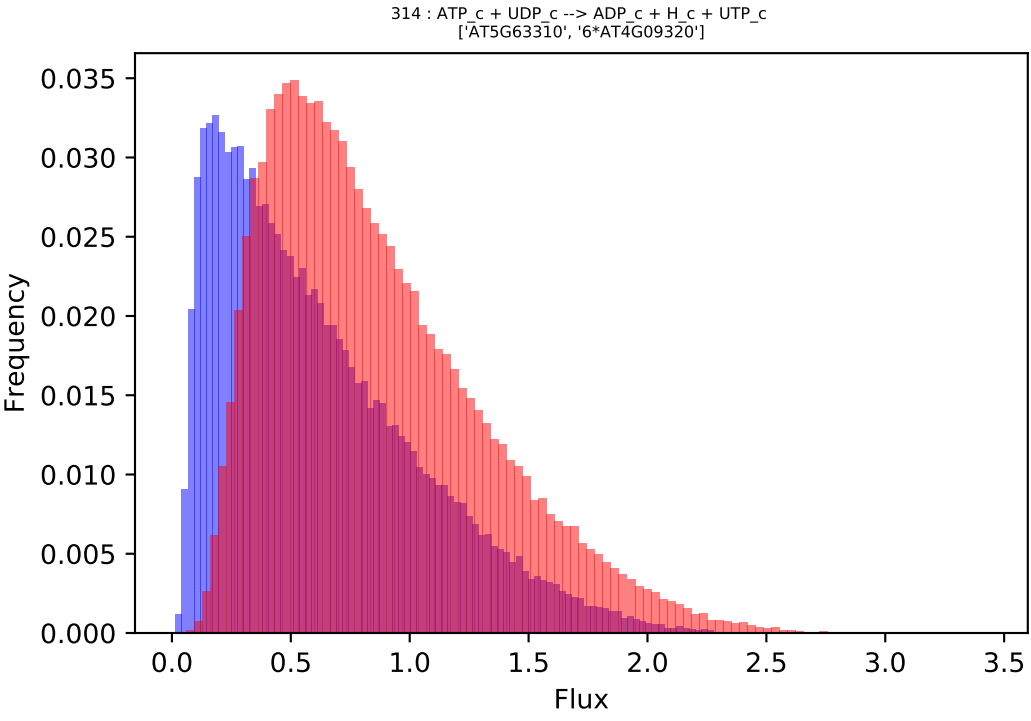

309 : H2O_c + dUTP_c --> 2.0 H_c + PPi_c + dUMP_c
['3*AT3G46940']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00005
0.00010
0.00015
0.00020
0.00025
0.00030
0.00035
0.00040
Flux

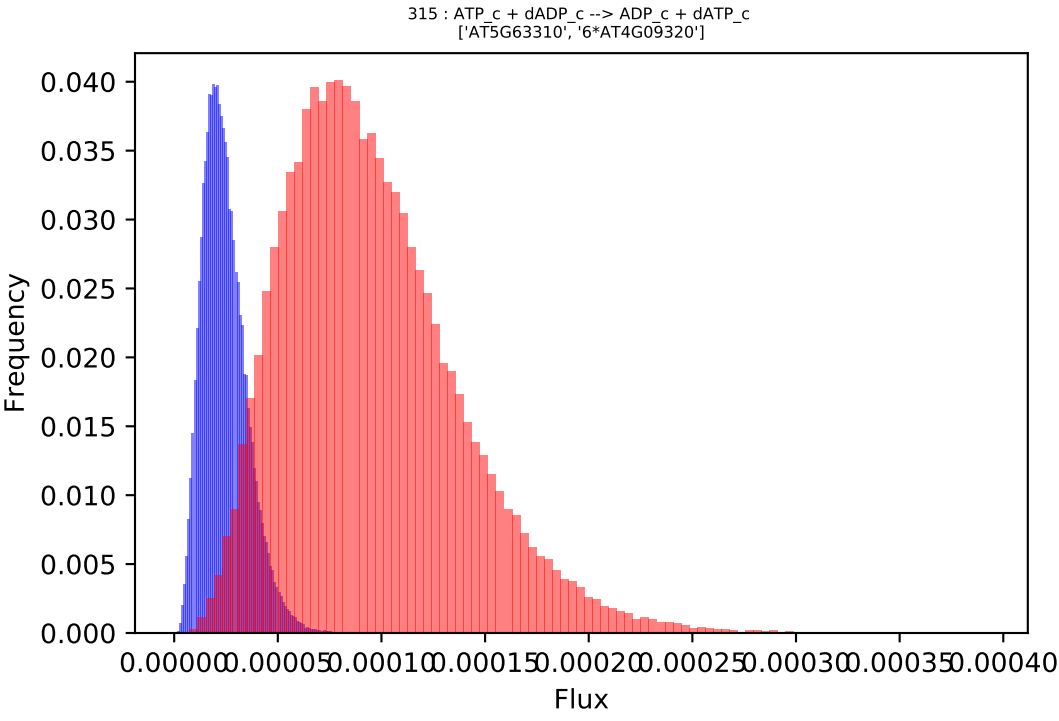

310 : M_DASH_THF_c + dUMP_c --> DHF_c + dTMP_c
['AT2G16370', 'AT2G21550']
Frequency
Flux
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
0.040
0.00000
0.00005
0.00010
0.00015
0.00020
0.00025
0.00030
0.00035
0.00040

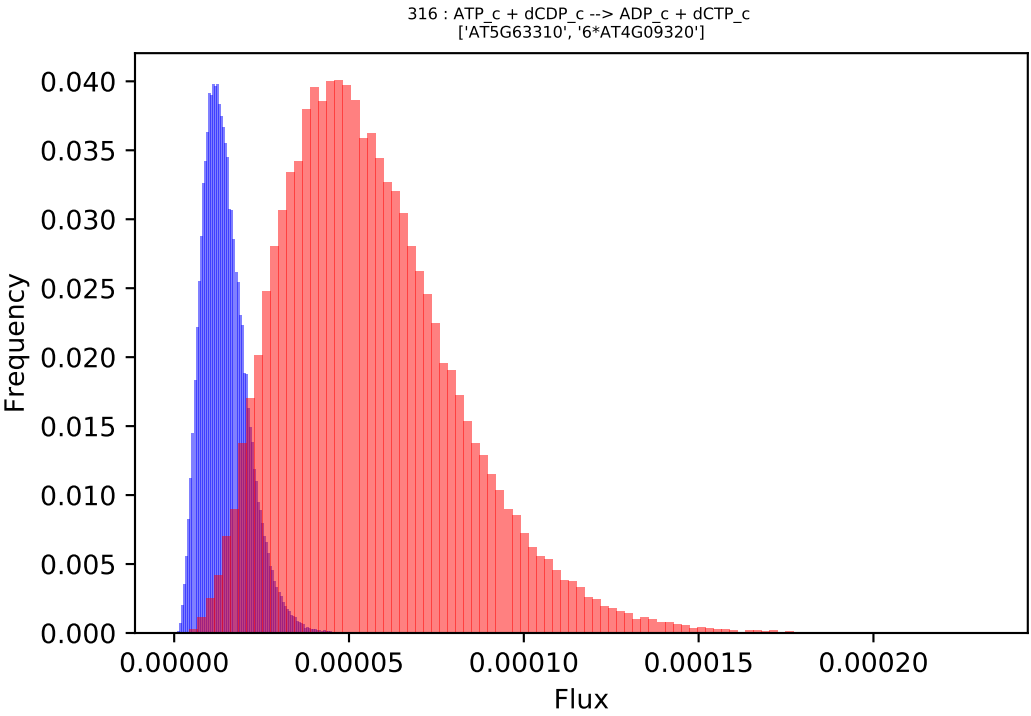

311 : ATP_c + H_c + dTMP_c --> ADP_c + dTDP_c
['AT5G59440']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00005
0.00010
0.00015
0.00020
0.00025
0.00030
0.00035
0.00040
Flux

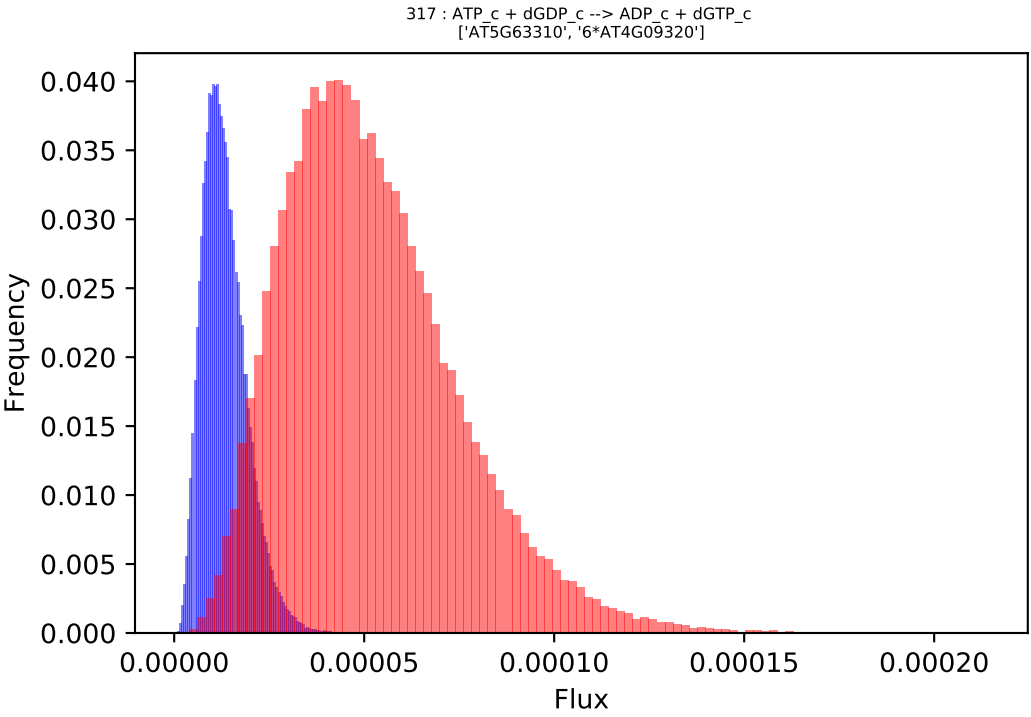

312 : ATP_c + GDP_c --> ADP_c + GTP_c + H_c
['AT5G63310', '6*AT4G09320']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00005
0.00010
0.00015
0.00020
Flux

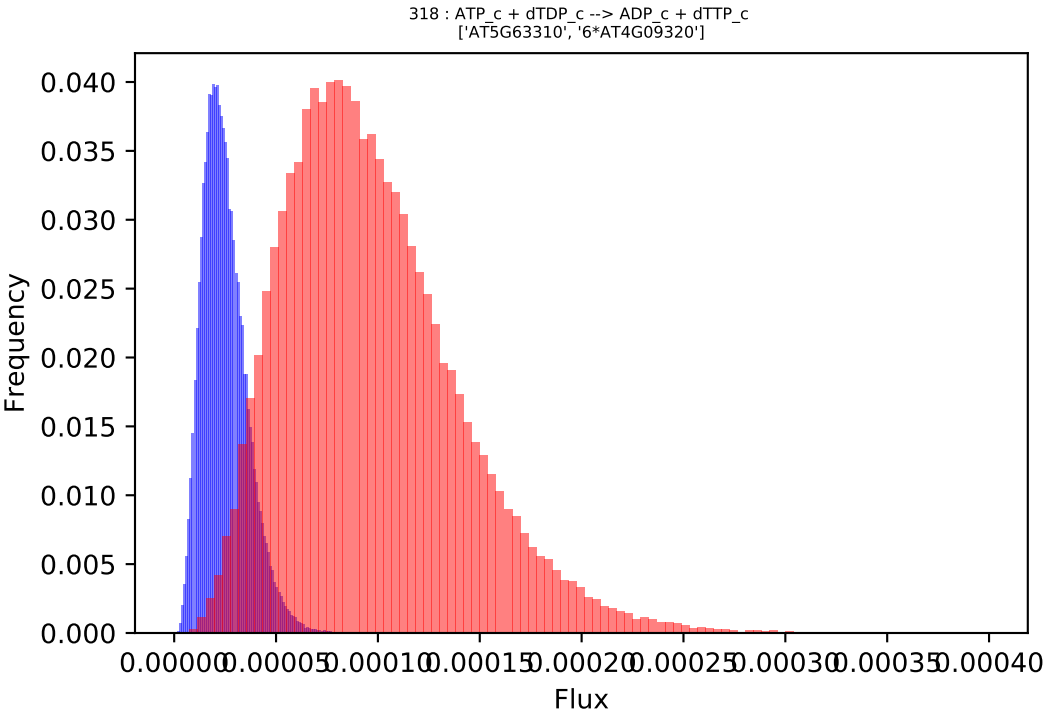

313 : ATP_h + GDP_h --> ADP_h + GTP_h + H_h
['AT5G63310', '6*AT4G09320']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
1.0
Flux

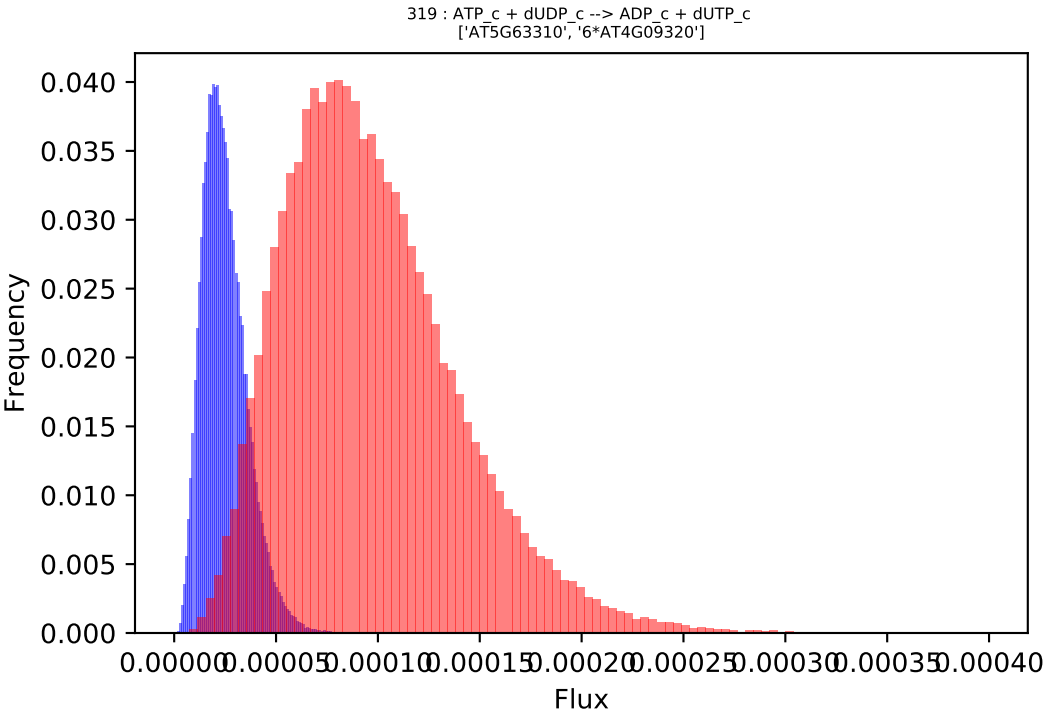

314 : ATP_c + UDP_c --> ADP_c + H_c + UTP_c
['AT5G63310', '6*AT4G09320']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
Flux

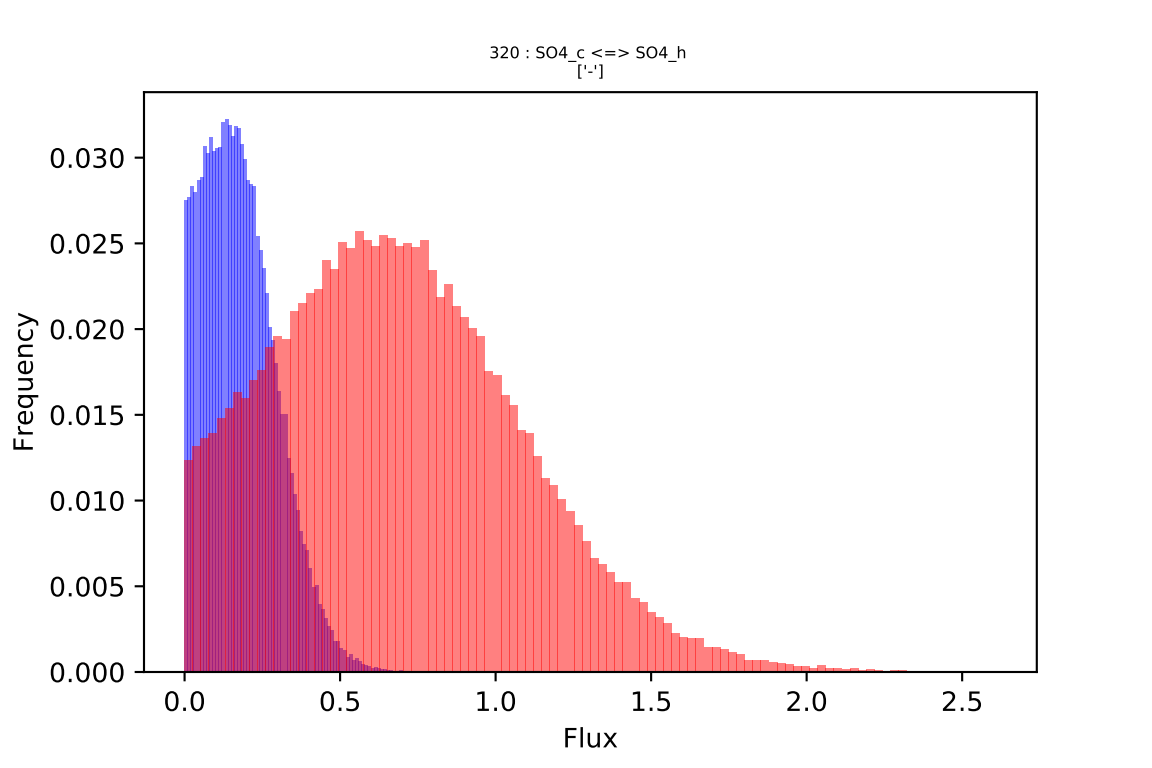

315 : ATP_c + dADP_c --> ADP_c + dATP_c
['AT5G63310', '6*AT4G09320']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00005
0.00010
0.00015
0.00020
0.00025
0.00030
0.00035
0.00040
Flux

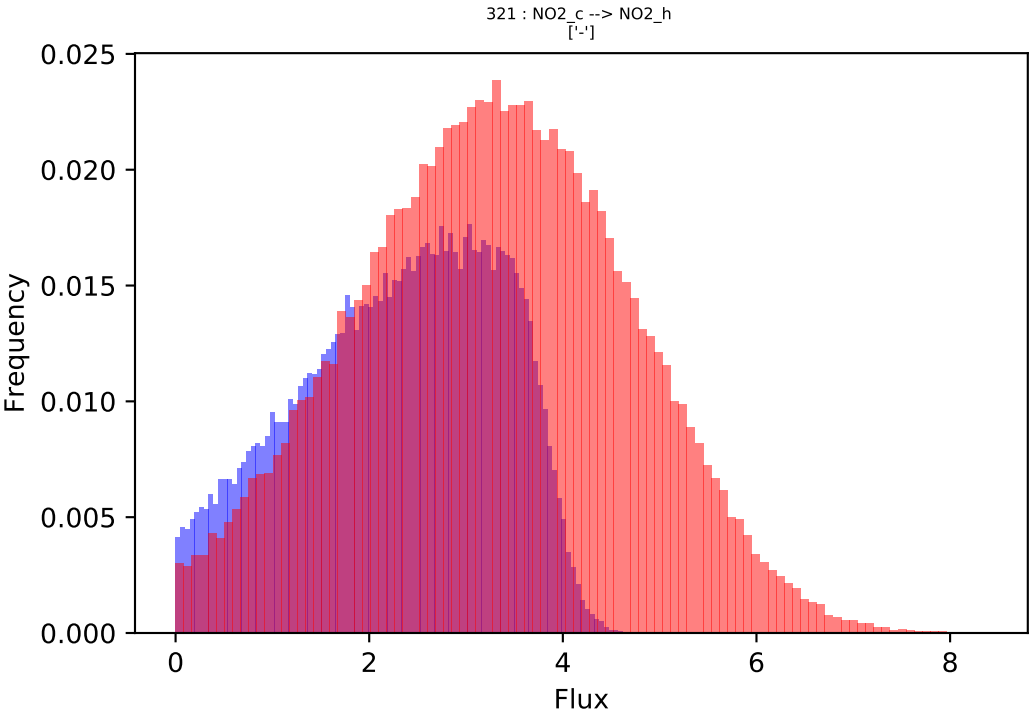

316 : ATP_c + dCDP_c --> ADP_c + dCTP_c
['AT5G63310', '6*AT4G09320']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00005
0.00010
0.00015
0.00020
Flux

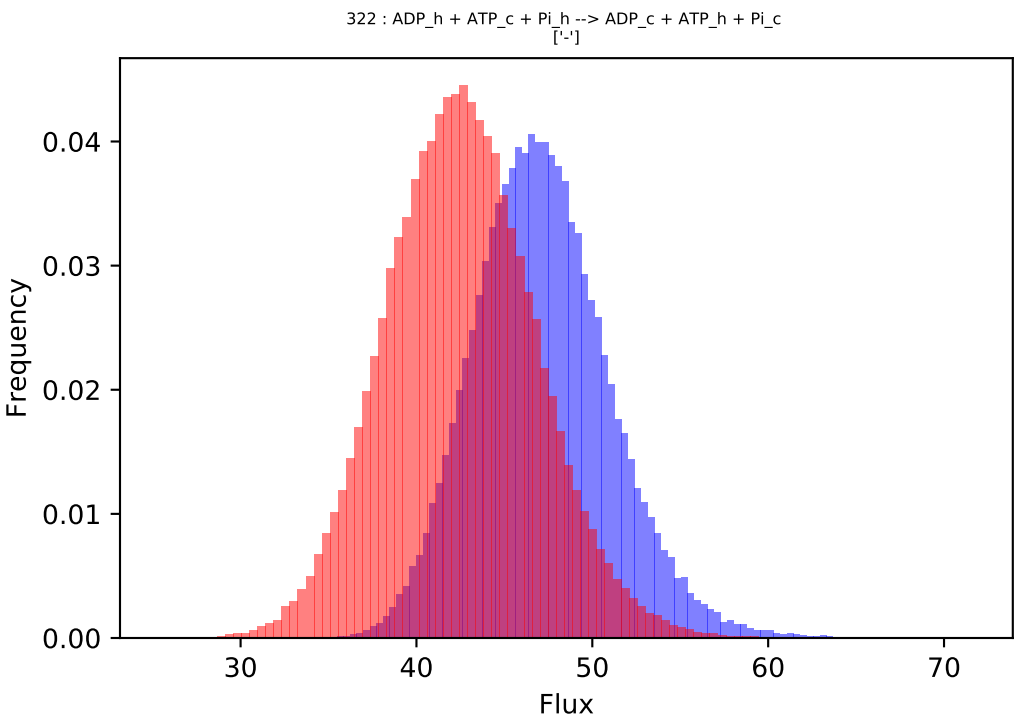

317 : ATP_c + dGDP_c --> ADP_c + dGTP_c
['AT5G63310', '6*AT4G09320']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00005
0.00010
0.00015
0.00020
Flux

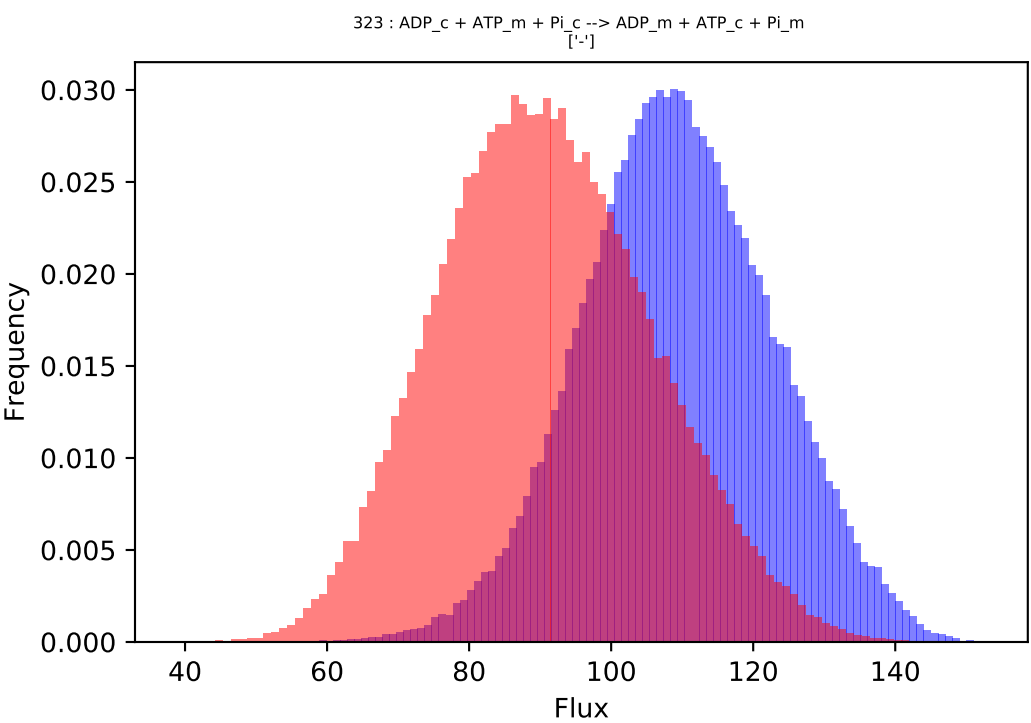

318 : ATP_c + dTDP_c --> ADP_c + dTTP_c
['AT5G63310', '6*AT4G09320']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00005
0.00010
0.00015
0.00020
0.00025
0.00030
0.00035
0.00040
Flux

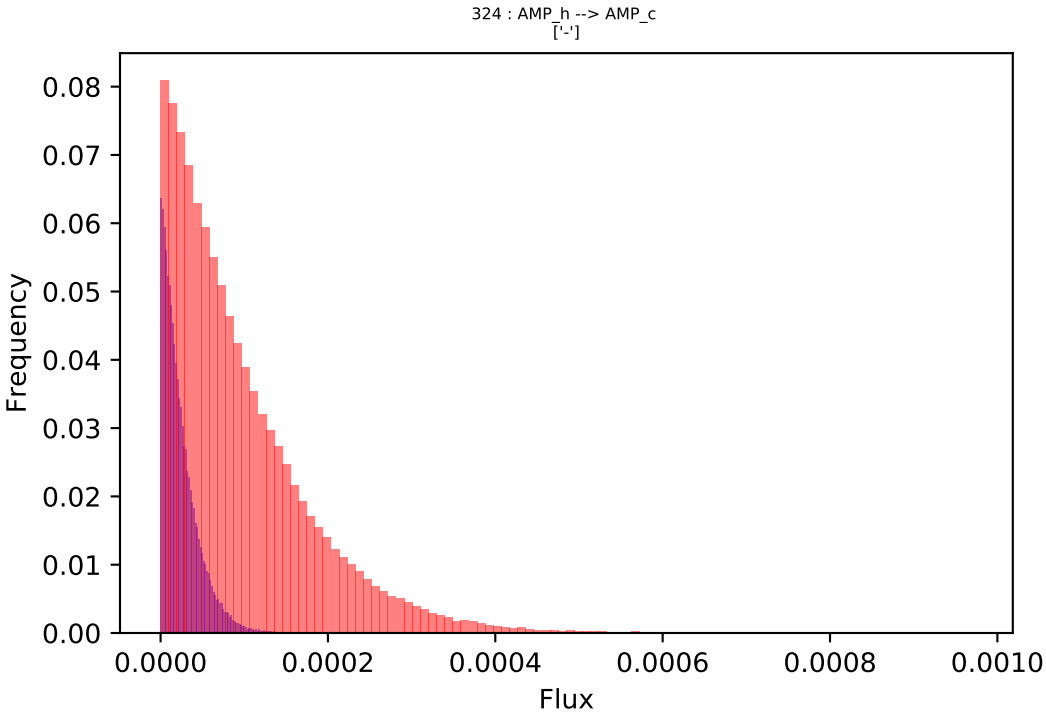

319 : ATP_c + dUDP_c --> ADP_c + dUTP_c
['AT5G63310', '6*AT4G09320']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00000
0.00005
0.00010
0.00015
0.00020
0.00025
0.00030
0.00035
0.00040
Flux

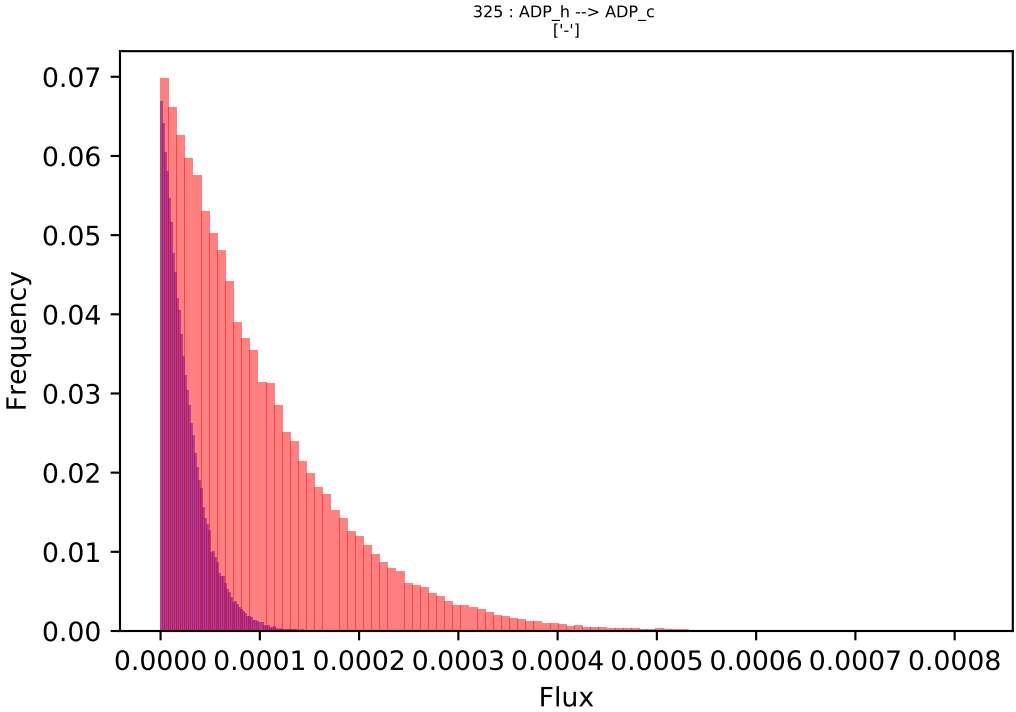

320 : SO4_c <=> SO4_h
['-']
Frequency
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.5
1.0
1.5
2.0
2.5
Flux

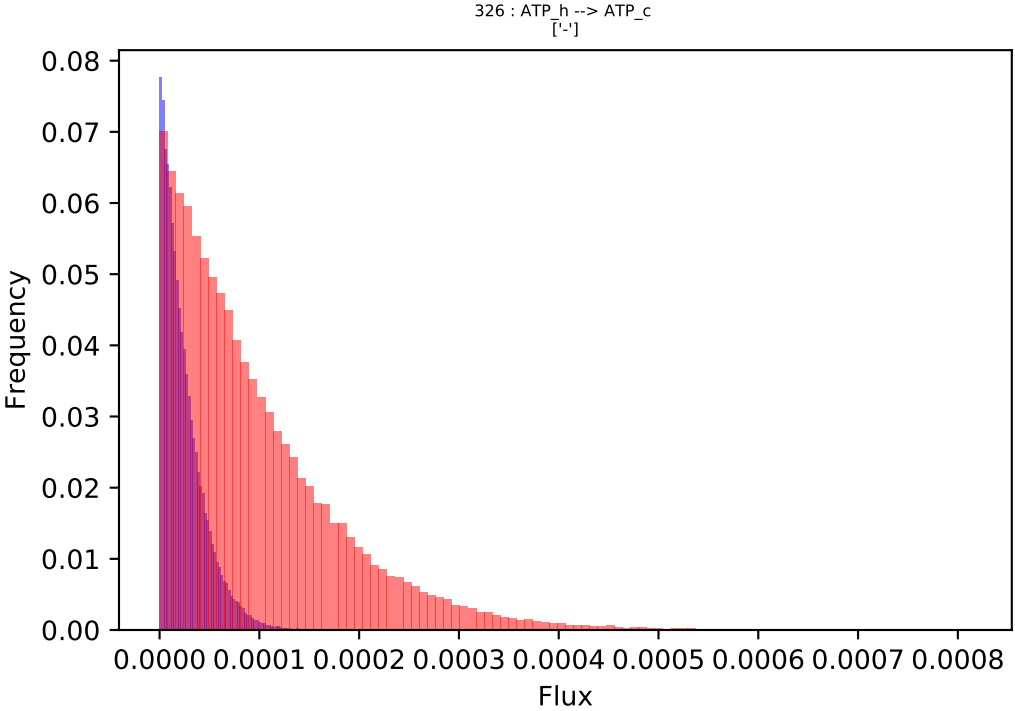

321 : NO2_c --> NO2_h
['-']
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
2
4
6
8
Flux

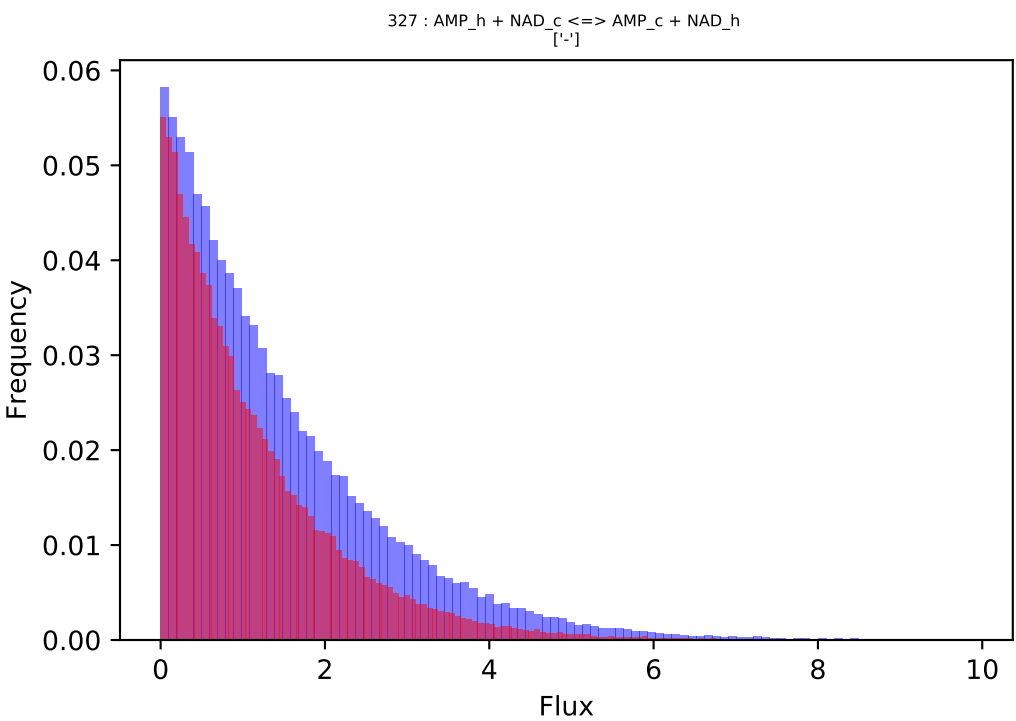

322 : ADP_h + ATP_c + Pi_h --> ADP_c + ATP_h + Pi_c
['-']
0.04
0.03
0.02
0.01
0.00
Frequency
30
40
50
60
70
Flux

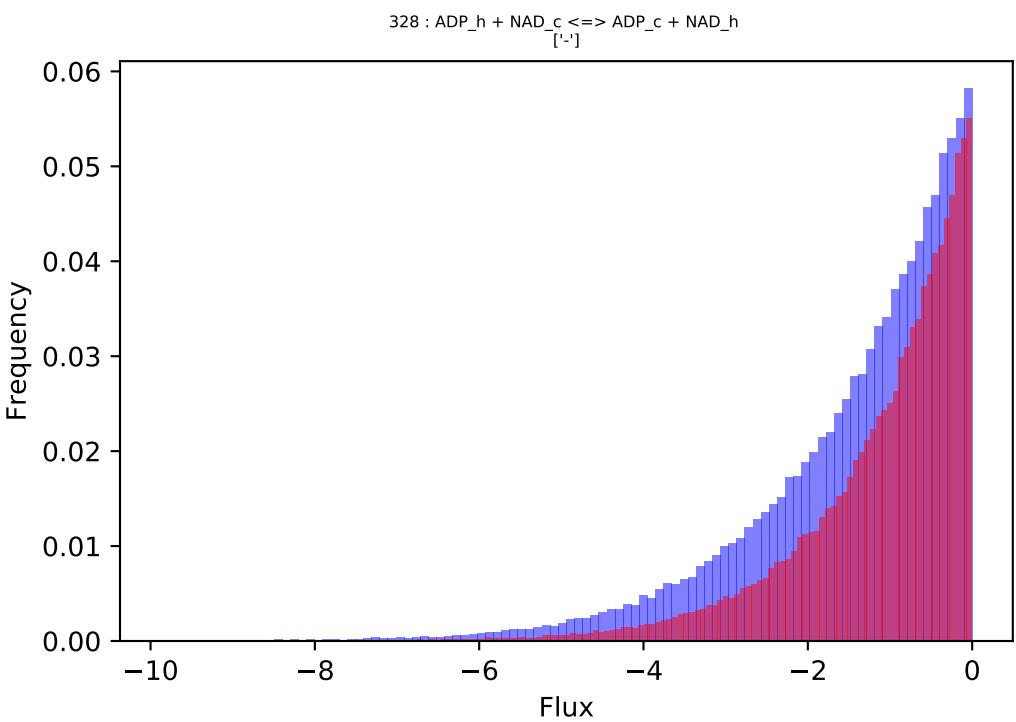

323 : ADP_c + ATP_m + Pi_c --> ADP_m + ATP_c + Pi_m
['-']
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
40
60
80
100
120
140
Flux

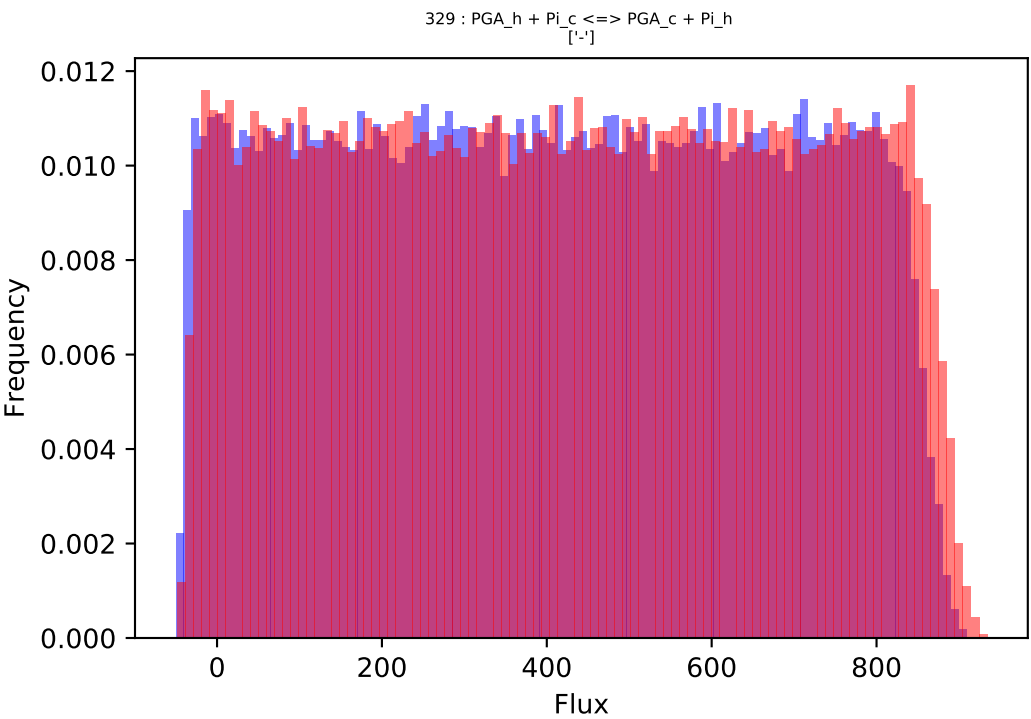

324 : AMP_h --> AMP_c
['-']
Frequency
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0.0000
0.0002
0.0004
0.0006
0.0008
0.0010
Flux

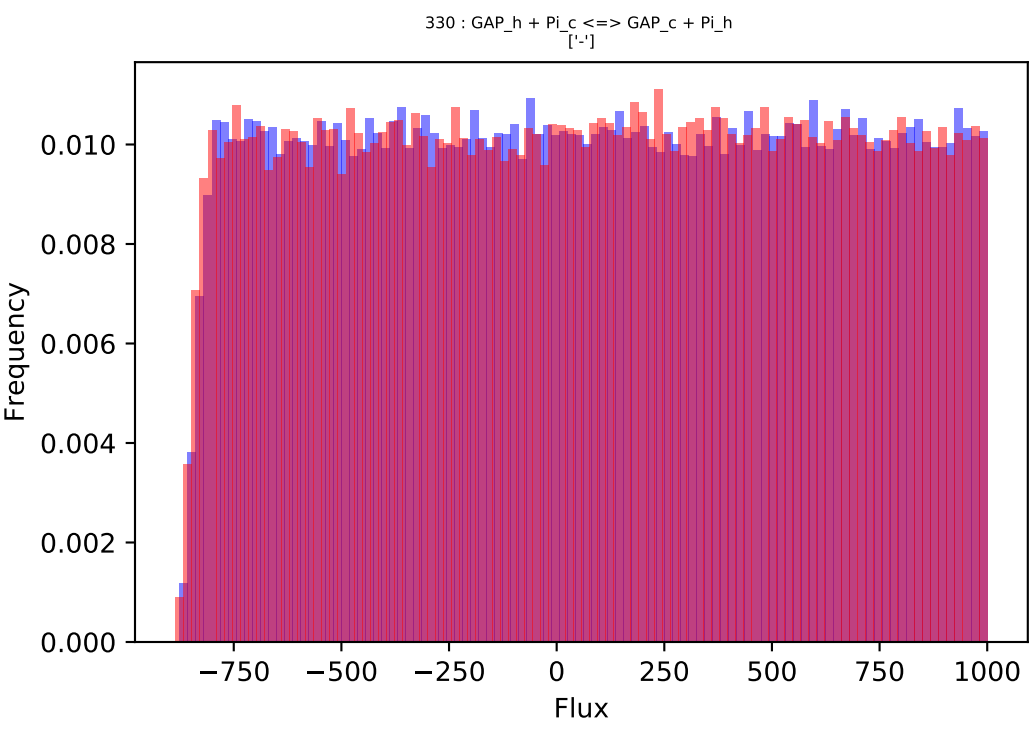

325 : ADP_h --> ADP_c
['-']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.0000 0.0001 0.0002 0.0003 0.0004 0.0005 0.0006 0.0007 0.0008
Flux

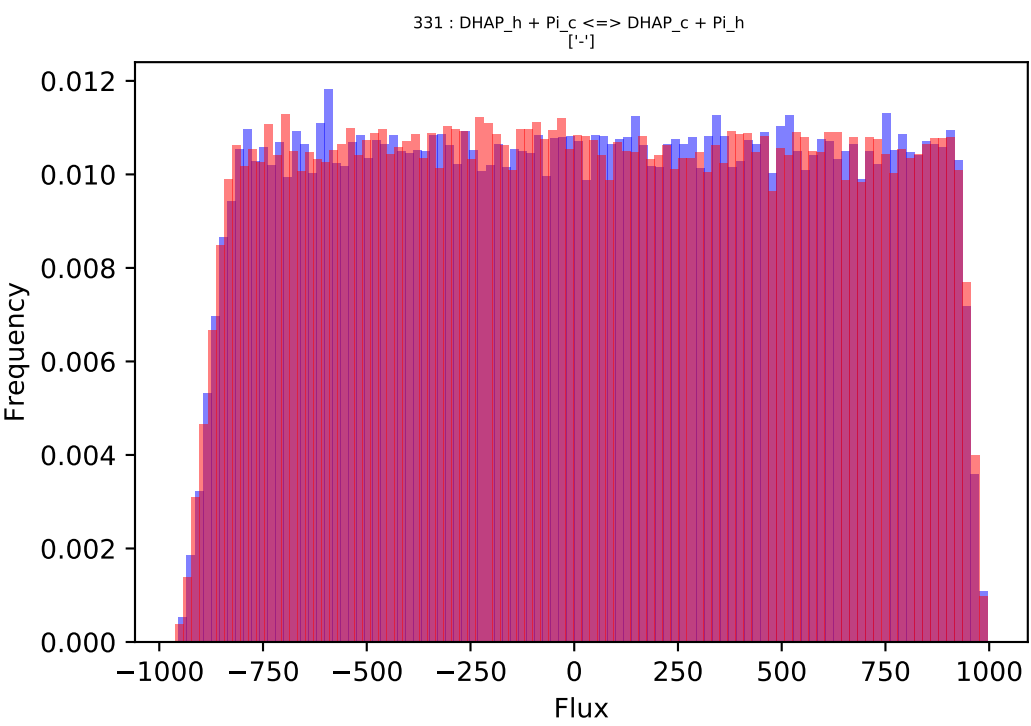

326 : ATP_h --> ATP_c
['-']
Frequency
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0.0000 0.0001 0.0002 0.0003 0.0004 0.0005 0.0006 0.0007 0.0008
Flux

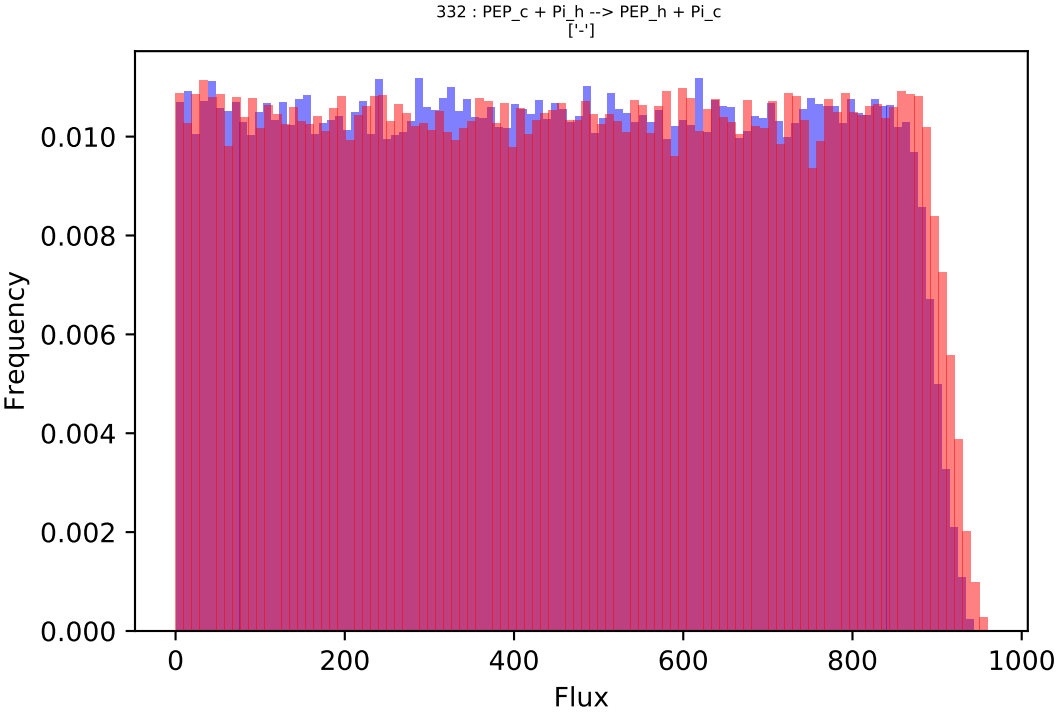

327 : AMP_h + NAD_c <=> AMP_c + NAD_h
['-']
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
0
2
4
6
8
10
Flux

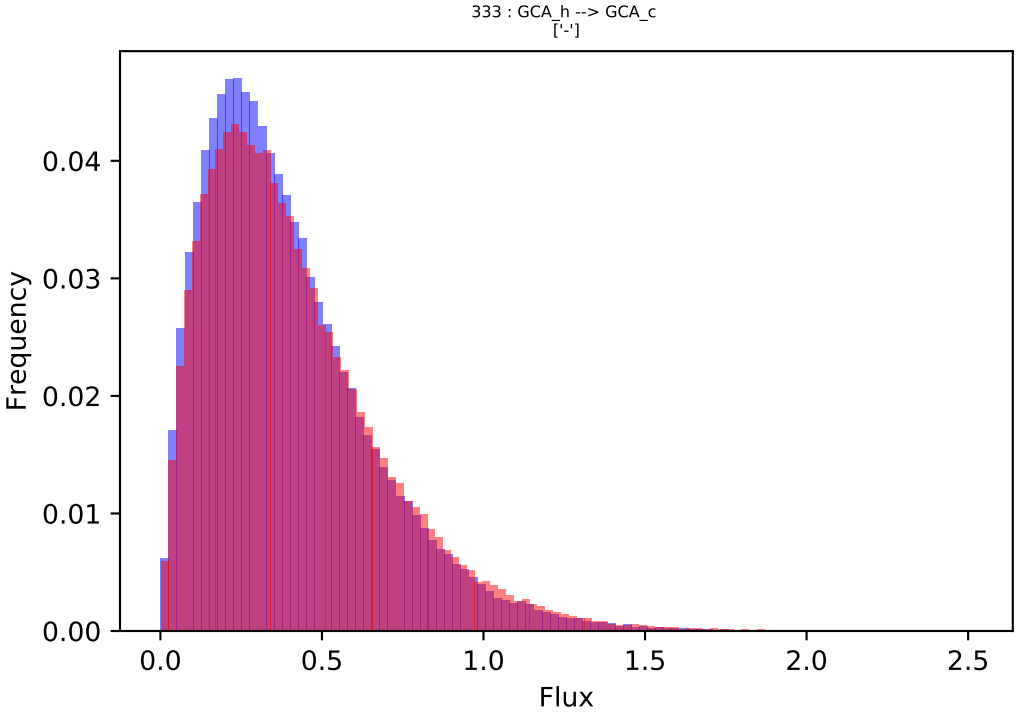

328 : ADP_h + NAD_c <=> ADP_c + NAD_h
['-']
Frequency
0.06
0.05
0.04
0.03
0.02
0.01
0.00
−10
−8
−6
−4
−2
0
Flux

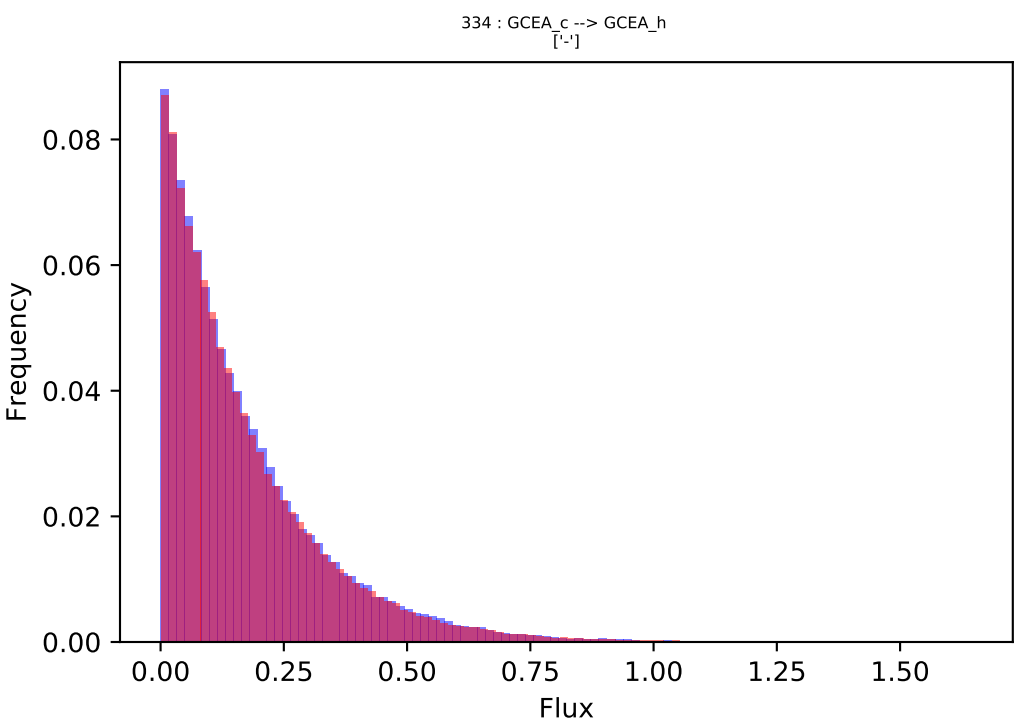

329 : PGA_h + Pi_c <=> PGA_c + Pi_h
['-']
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
0
200
400
600
800
Flux

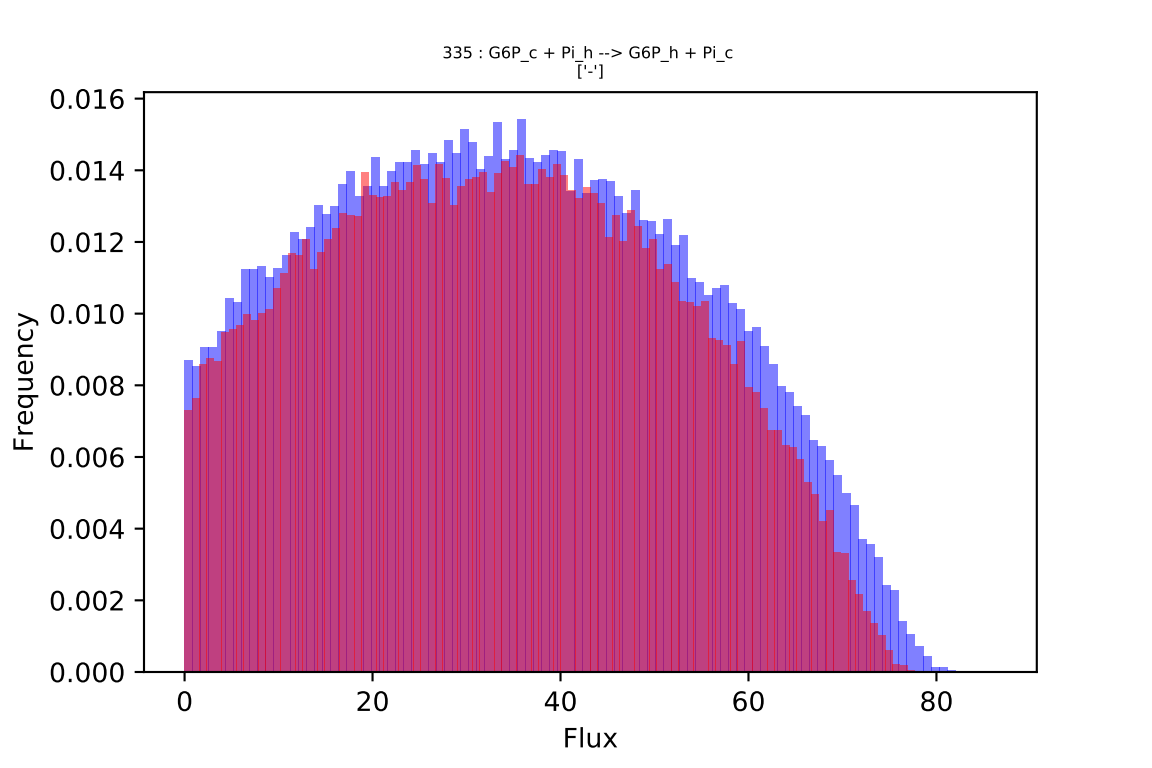

330 : GAP_h + Pi_c <=> GAP_c + Pi_h
['-']
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−750
−500
−250
0
250
500
750
1000
Flux

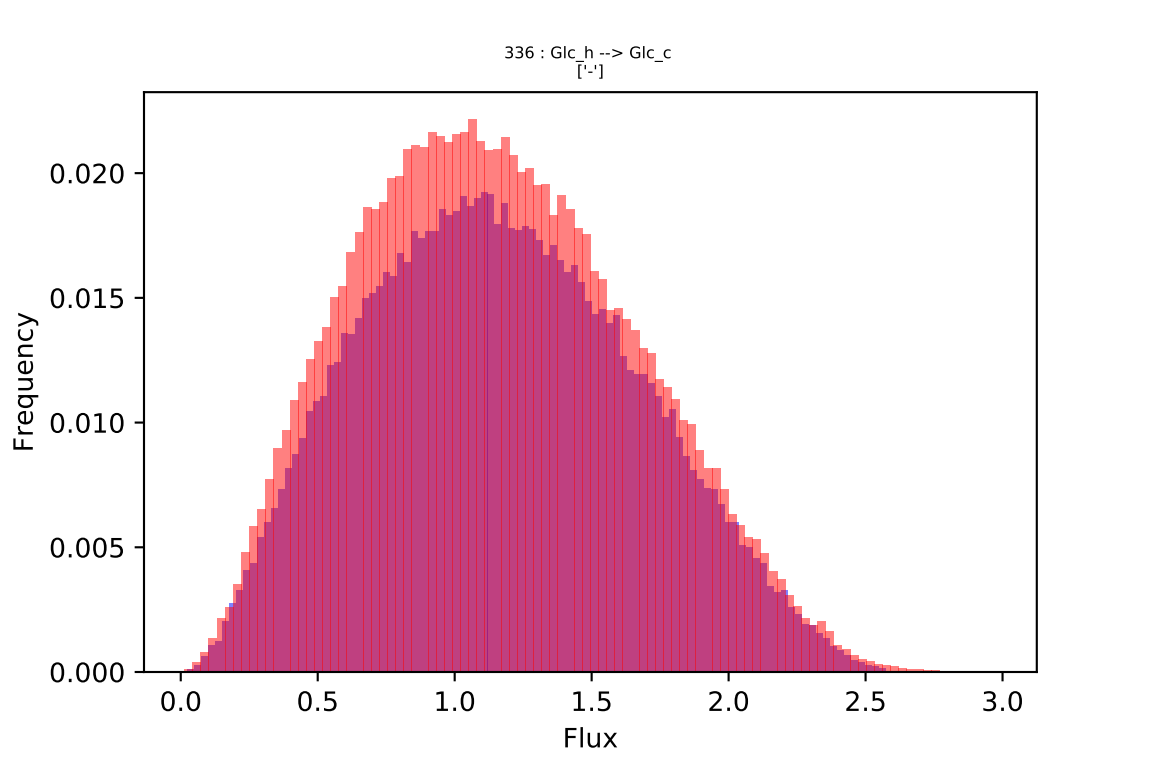

331 : DHAP_h + Pi_c <=> DHAP_c + Pi_h
['-']
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−1000
−750
−500
−250
0
250
500
750
1000
Flux

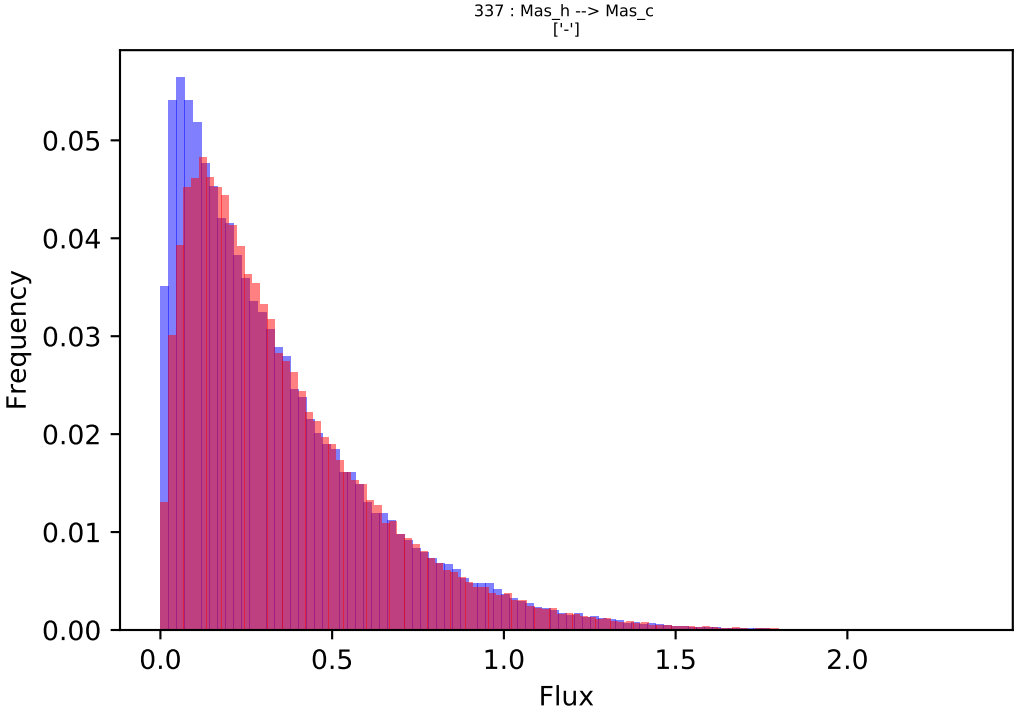

332 : PEP_c + Pi_h --> PEP_h + Pi_c
['-']
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
0
200
400
600
800
1000
Flux

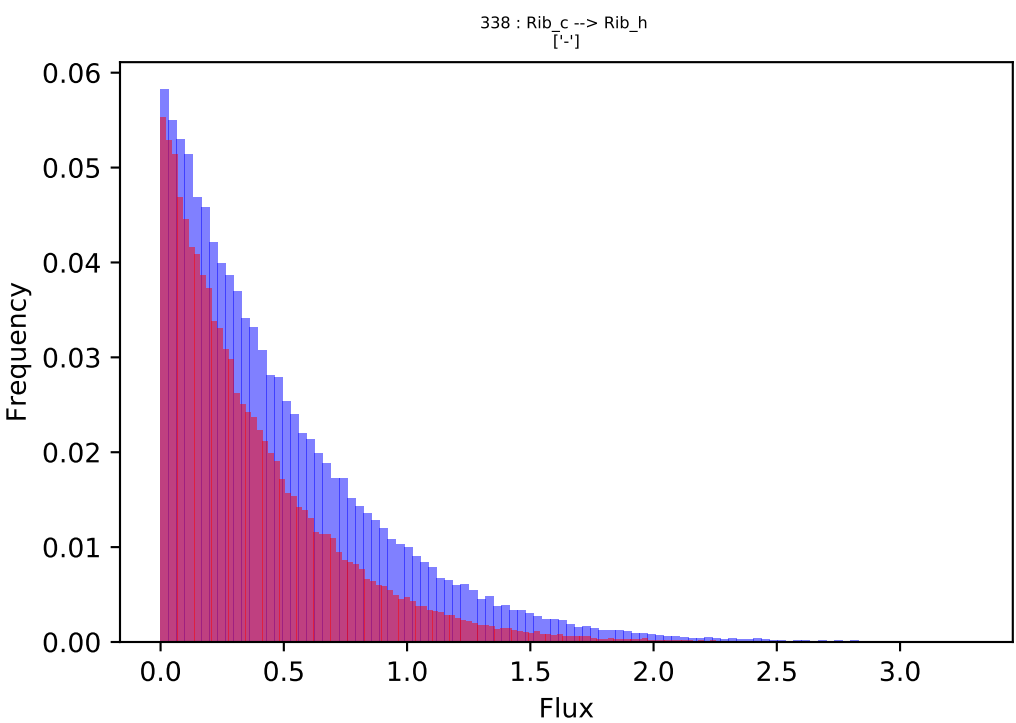

333 : GCA_h --> GCA_c
['-']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.5
1.0
1.5
2.0
2.5
Flux

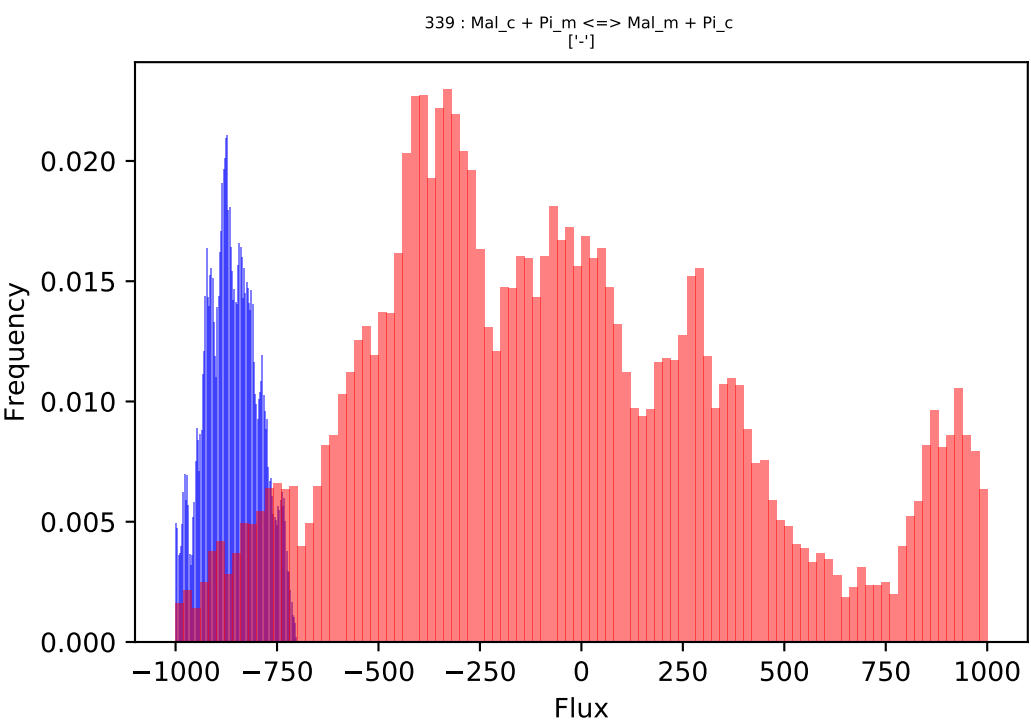

334 : GCEA_c --> GCEA_h
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0.00
0.25
0.50
0.75
1.00
1.25
1.50
Flux

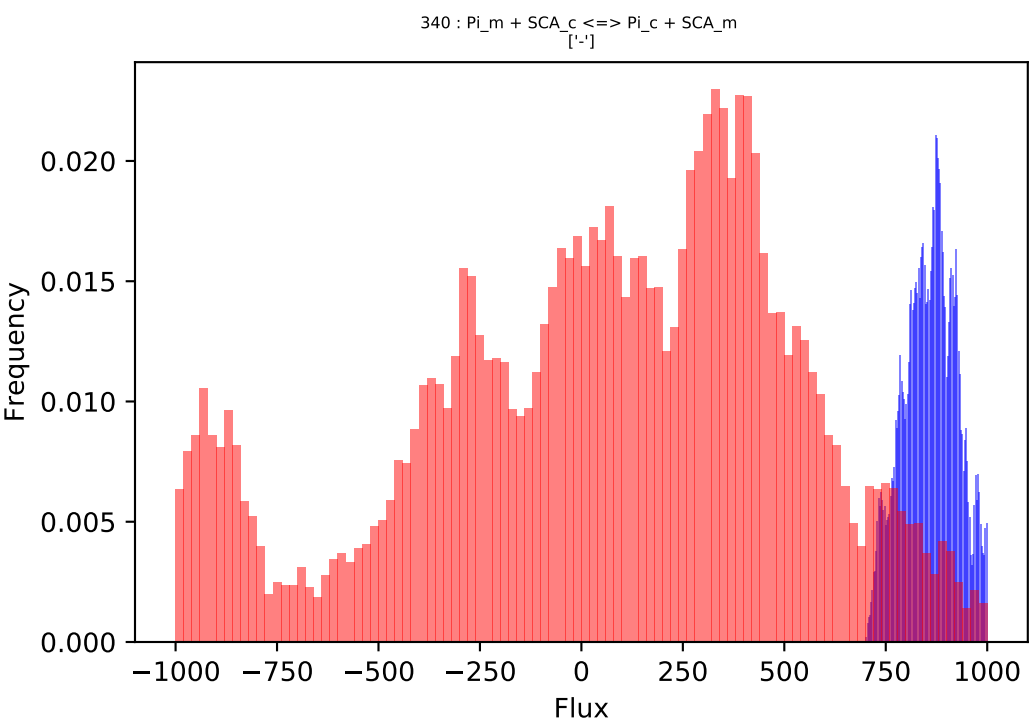

335 : G6P_c + Pi_h --> G6P_h + Pi_c
['-']
0.016
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
0
20
40
60
80
Flux

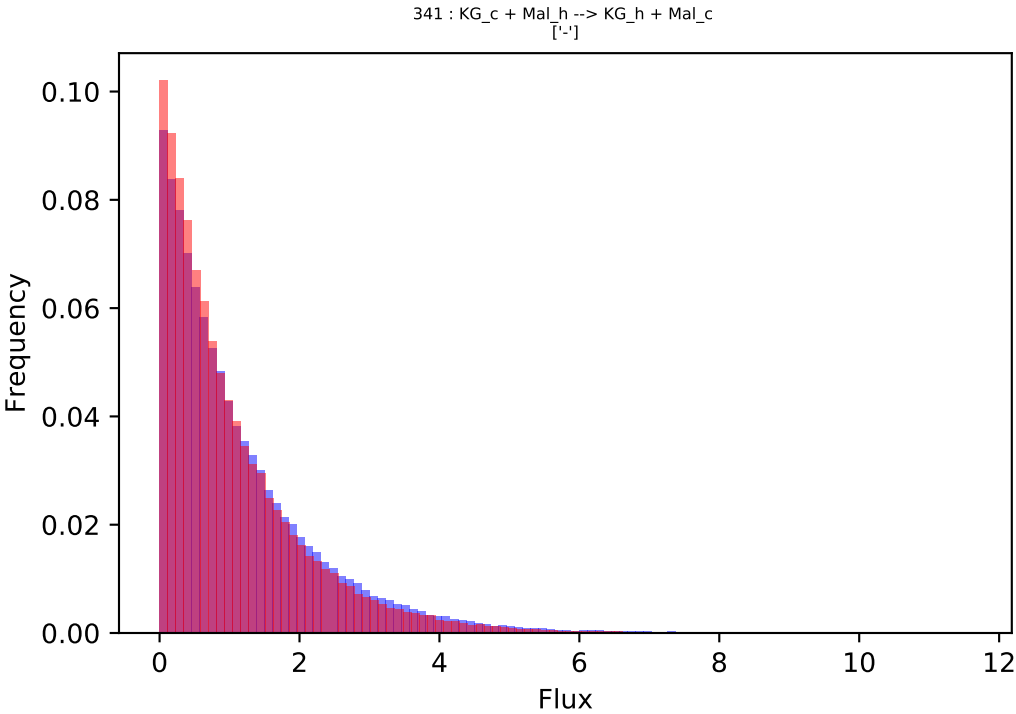

336 : Glc_h --> Glc_c
['-']
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Flux

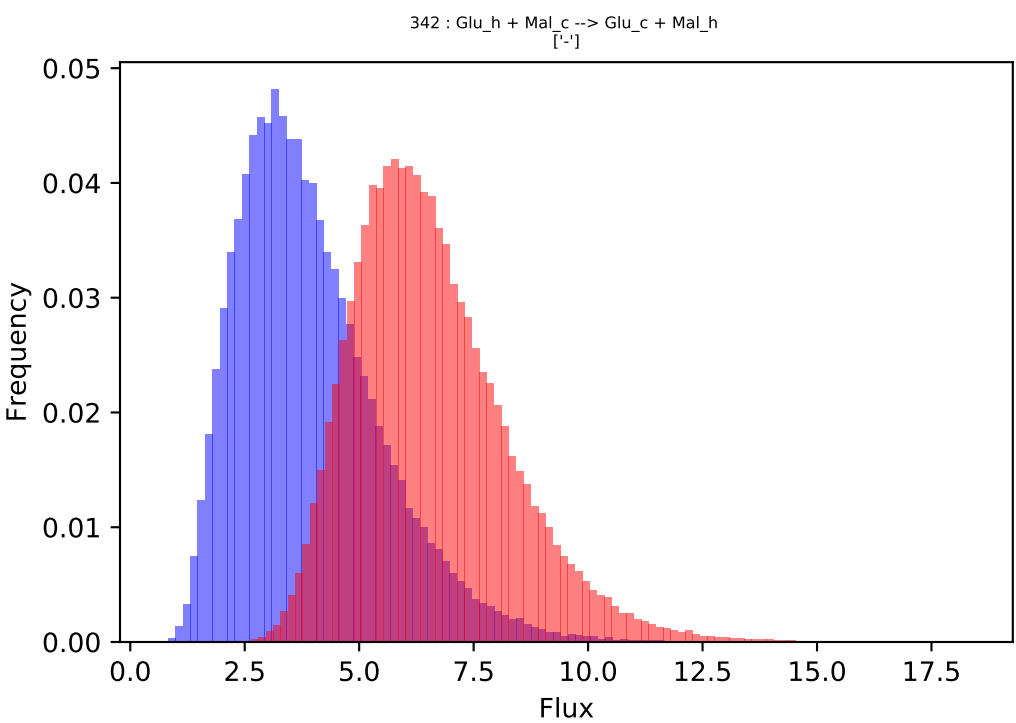

337 : Mas_h --> Mas_c
['-']
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
0.0
0.5
1.0
1.5
2.0
Flux

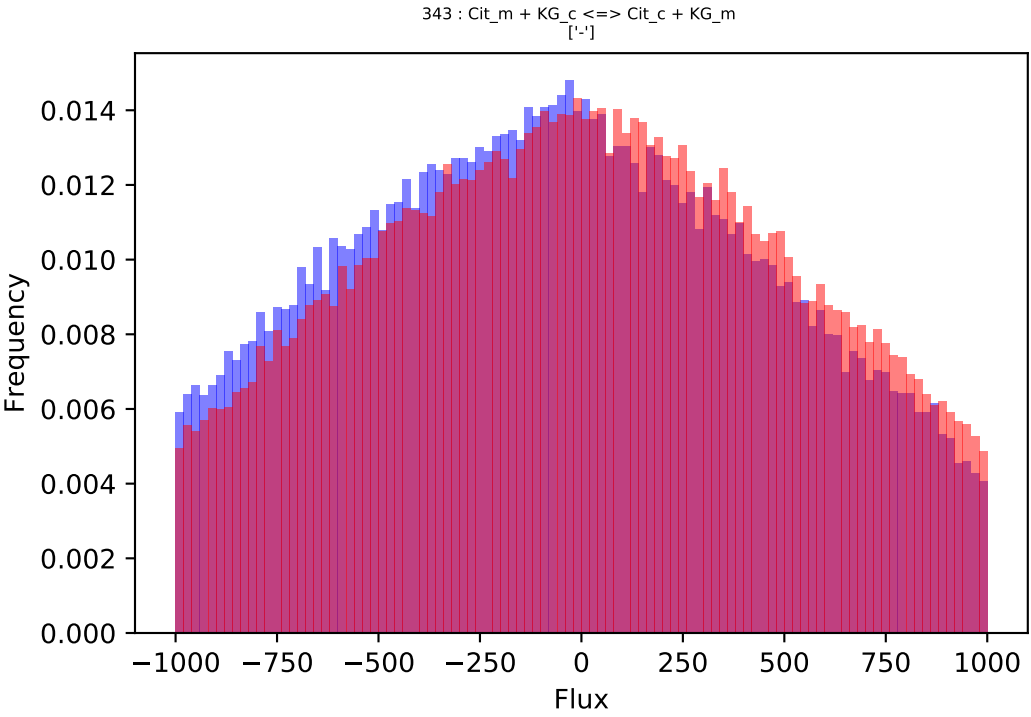

338 : Rib_c --> Rib_h
['-']
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Flux

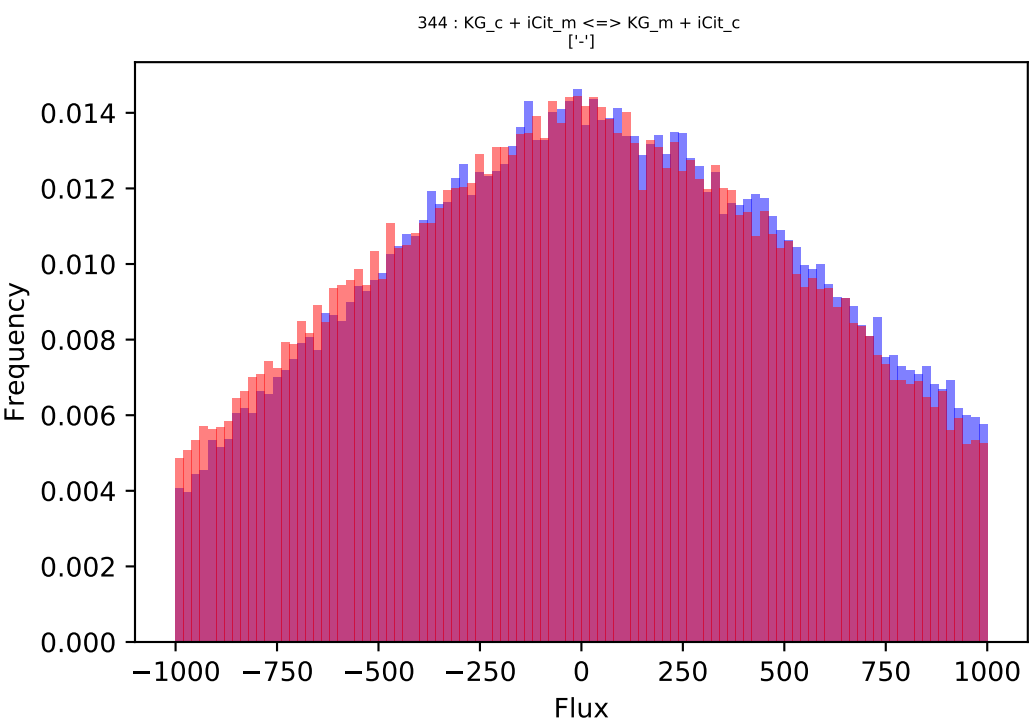

339 : Mal_c + Pi_m <=> Mal_m + Pi_c
['-']
0.020
0.015
0.010
0.005
0.000
Frequency
−1000
−750
−500
−250
0
250
500
750
1000
Flux

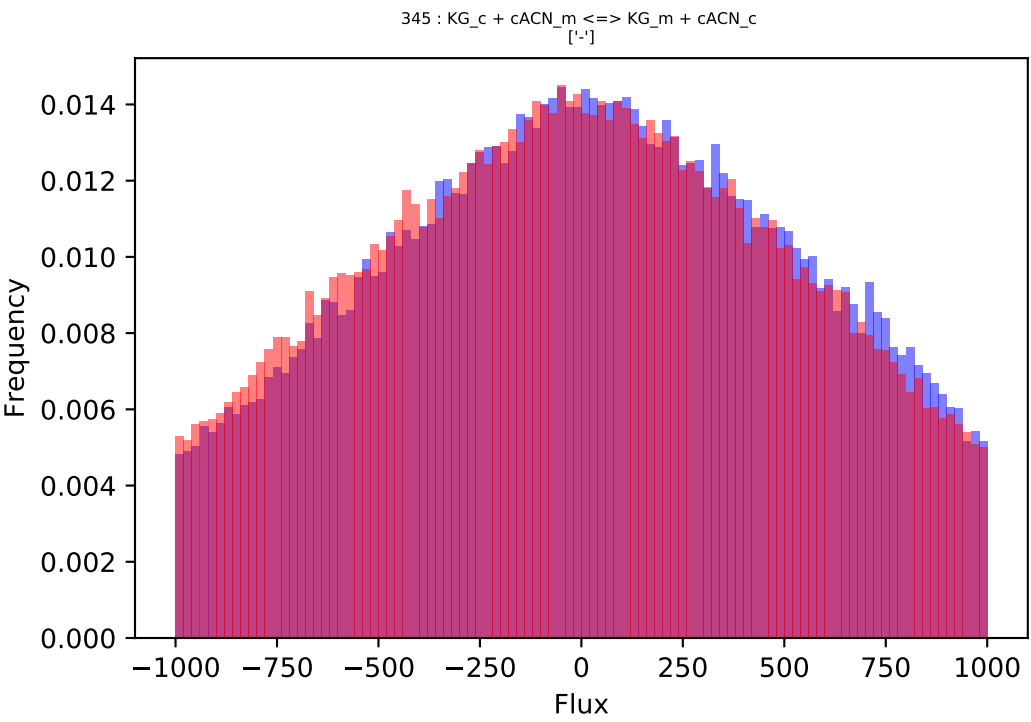

340 : Pi_m + SCA_c <=> Pi_c + SCA_m
['-']
Frequency
0.020
0.015
0.010
0.005
0.000
−1000
−750
−500
−250
0
250
500
750
1000
Flux

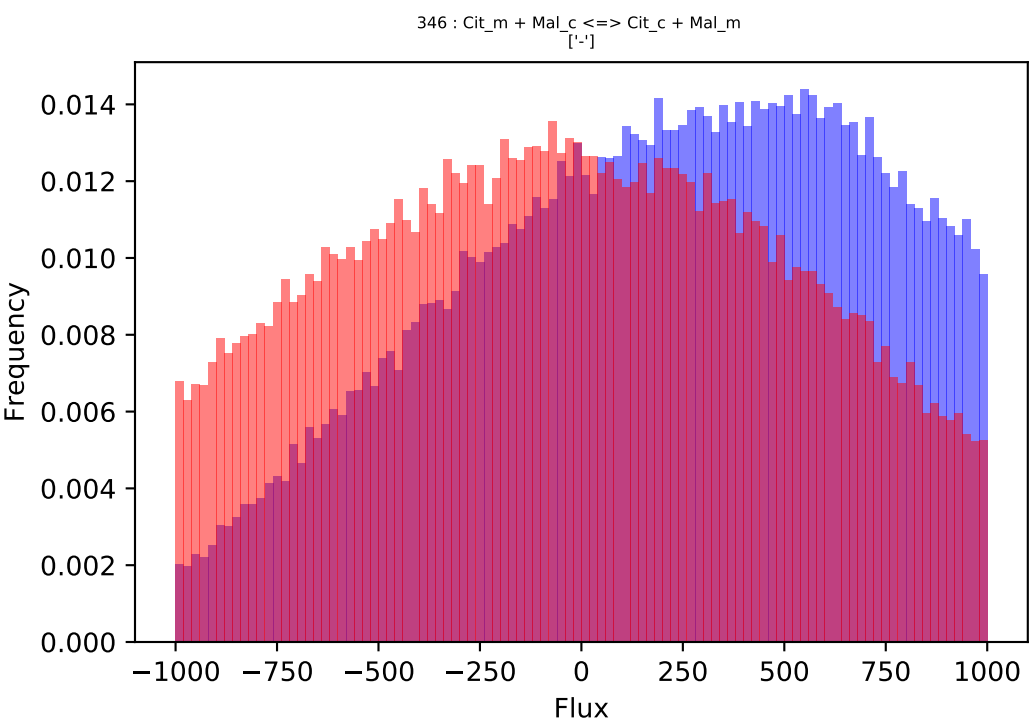

341 : KG_c + Mal_h --> KG_h + Mal_c
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0
2
4
6
8
10
12
Flux

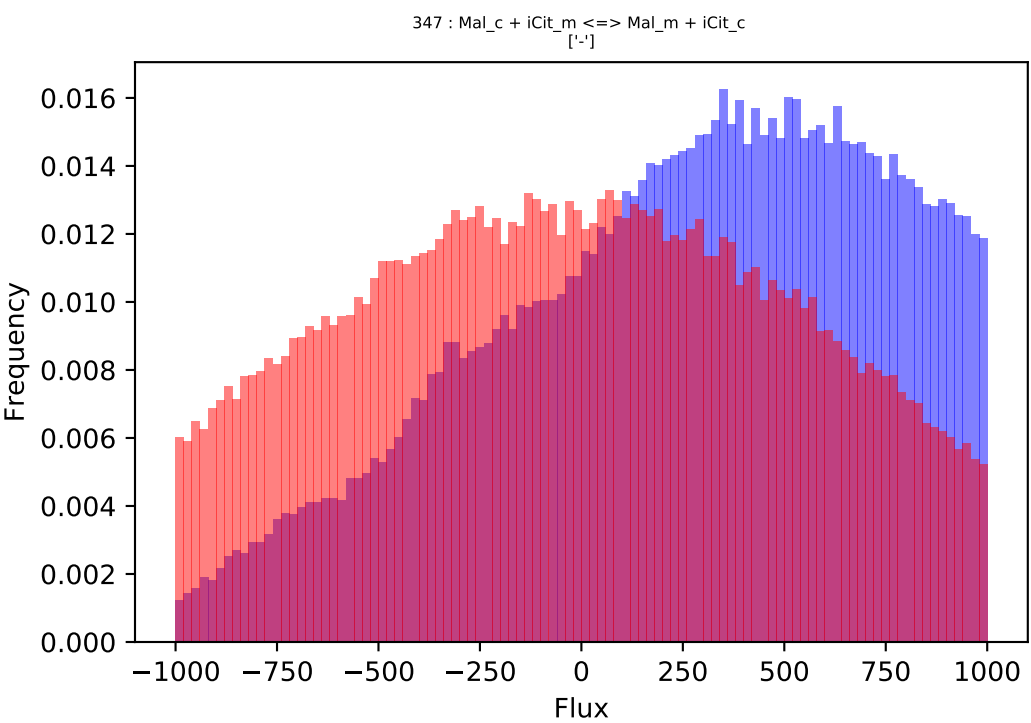

342 : Glu_h + Mal_c --> Glu_c + Mal_h
['-']
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
Flux

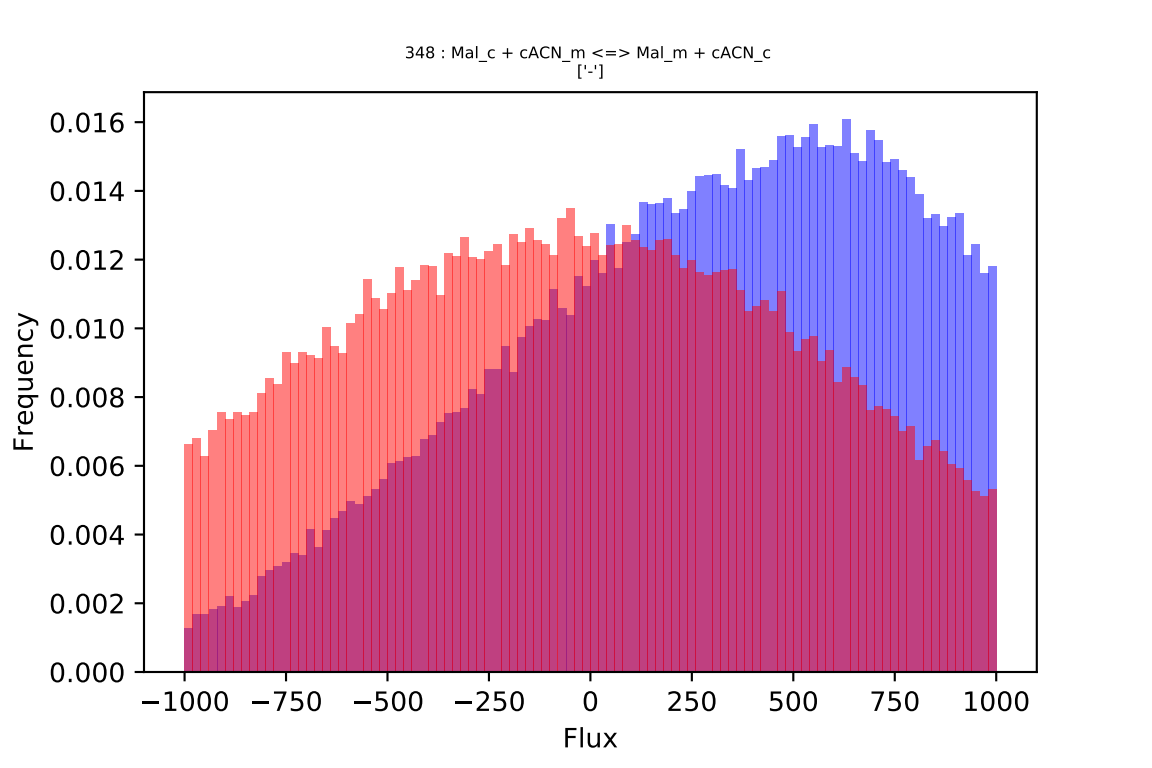

343 : Cit_m + KG_c <=> Cit_c + KG_m
['-']
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−1000
−750
−500
−250
0
250
500
750
1000
Flux

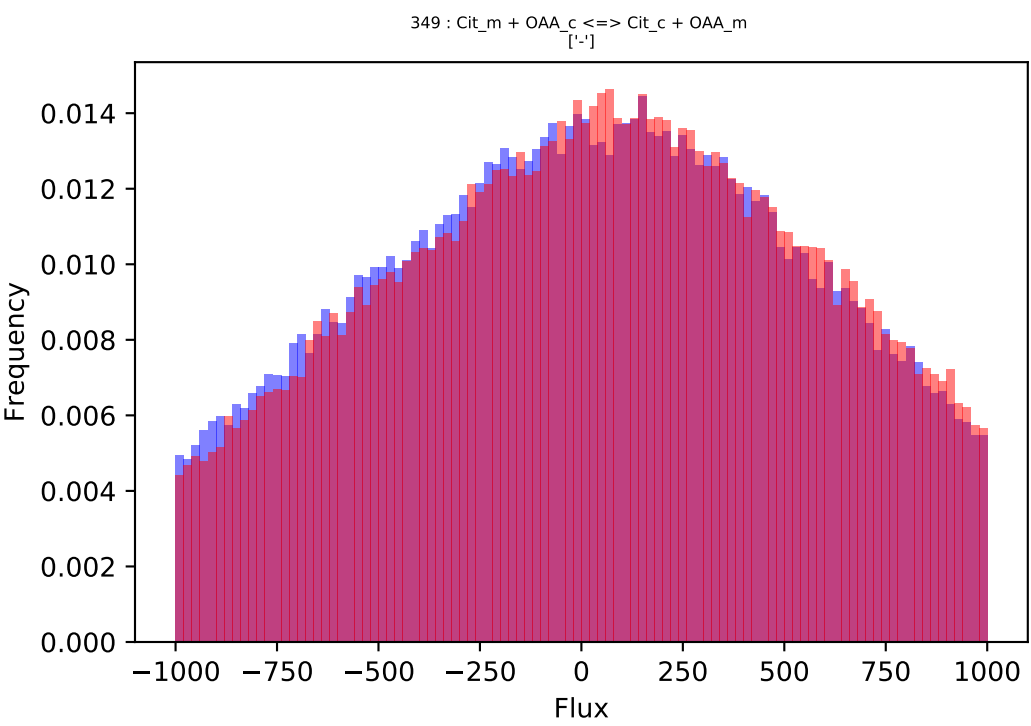

344 : KG_c + iCit_m <=> KG_m + iCit_c
['-']
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−1000
−750
−500
−250
0
250
500
750
1000
Flux

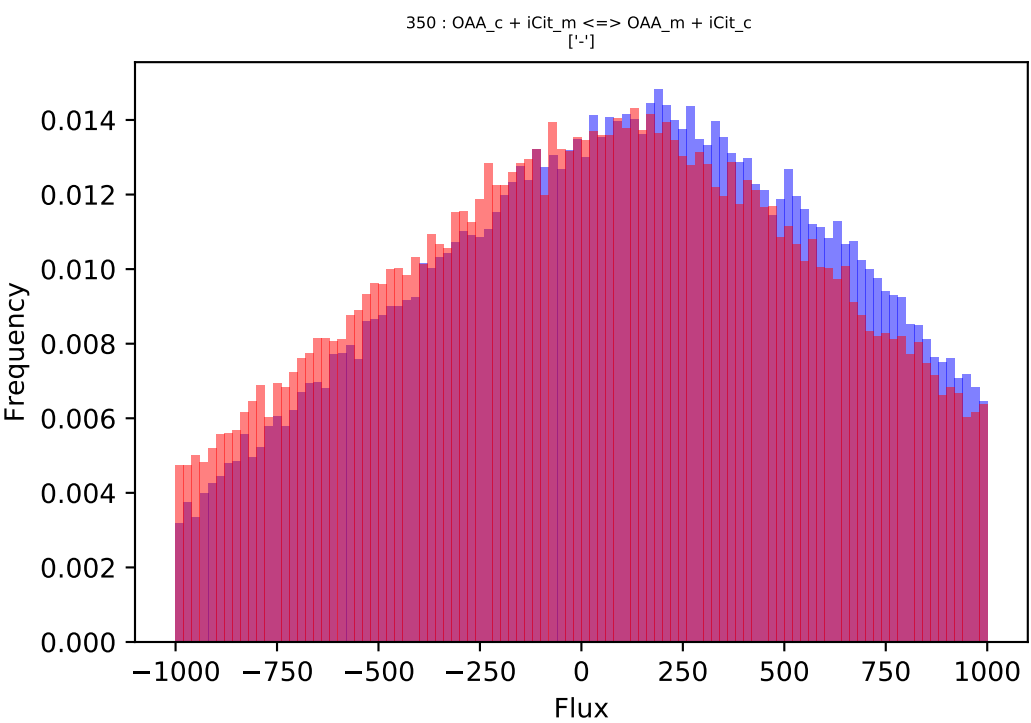

345 : KG_c + cACN_m <=> KG_m + cACN_c
['-']
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−1000
−750
−500
−250
0
250
500
750
1000
Flux

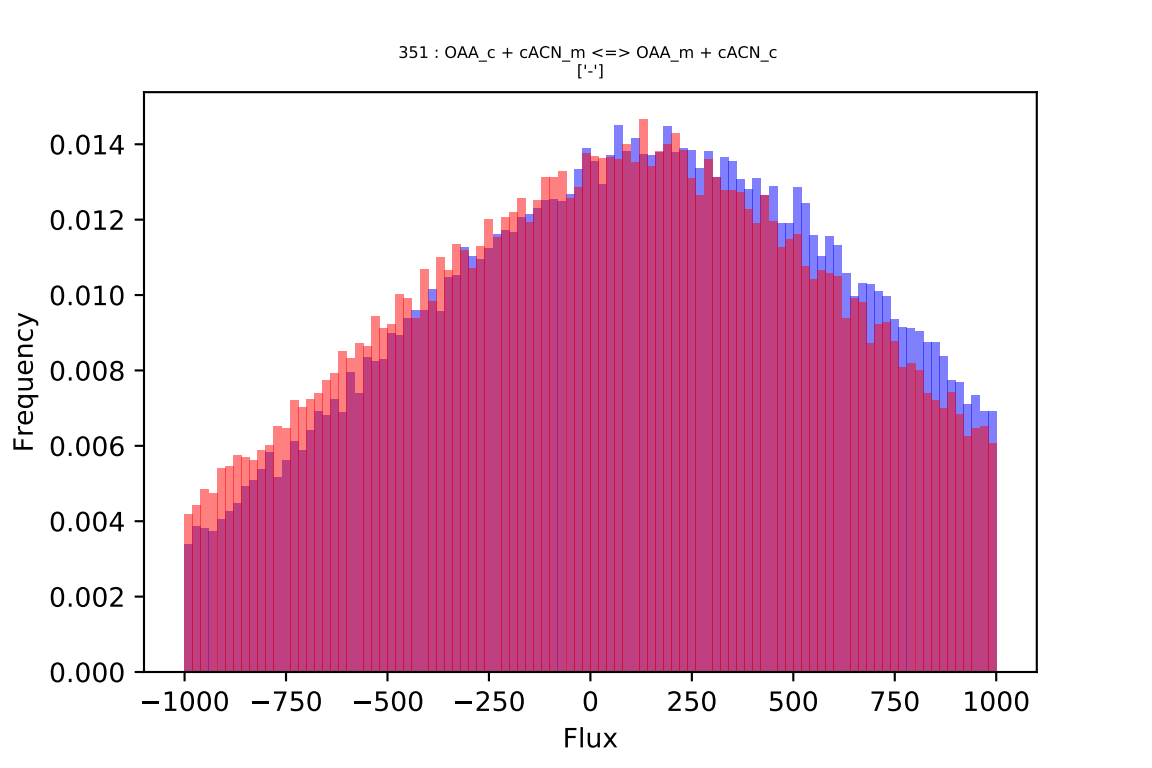

346 : Cit_m + Mal_c <=> Cit_c + Mal_m
['-']
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−1000
−750
−500
−250
0
250
500
750
1000
Flux

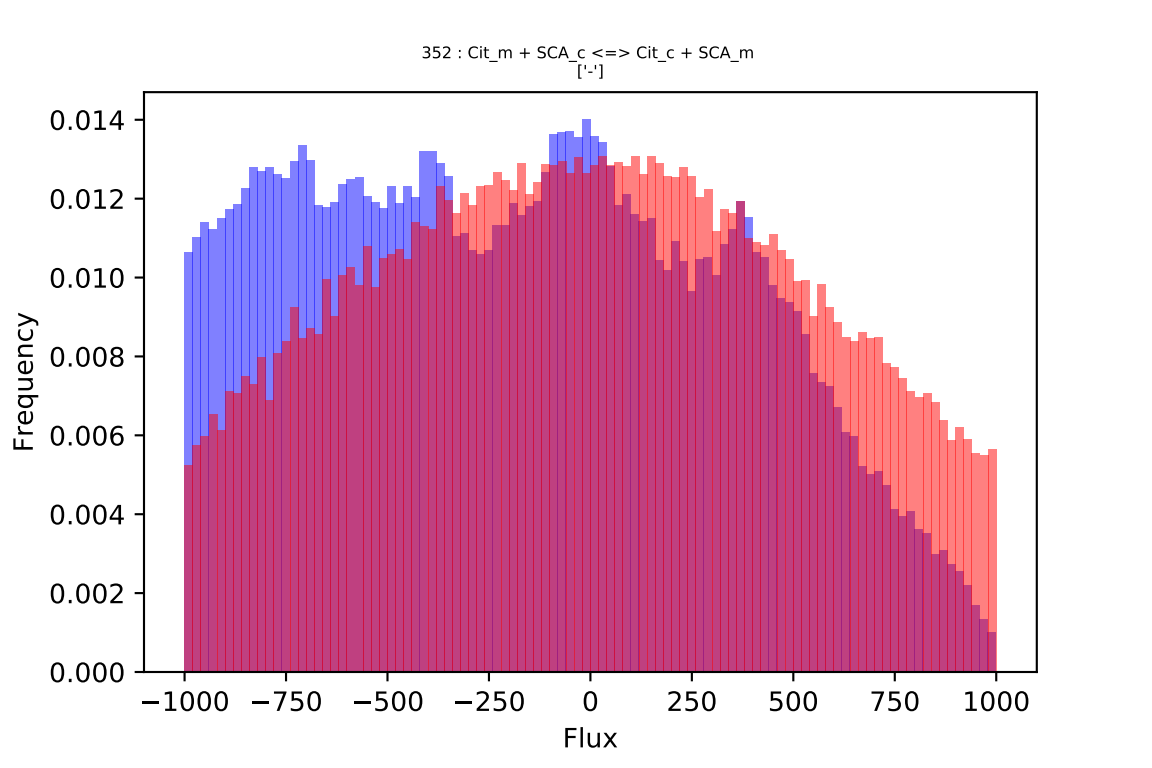

347 : Mal_c + iCit_m <=> Mal_m + iCit_c
['-']
0.016
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−1000
−750
−500
−250
0
250
500
750
1000
Flux

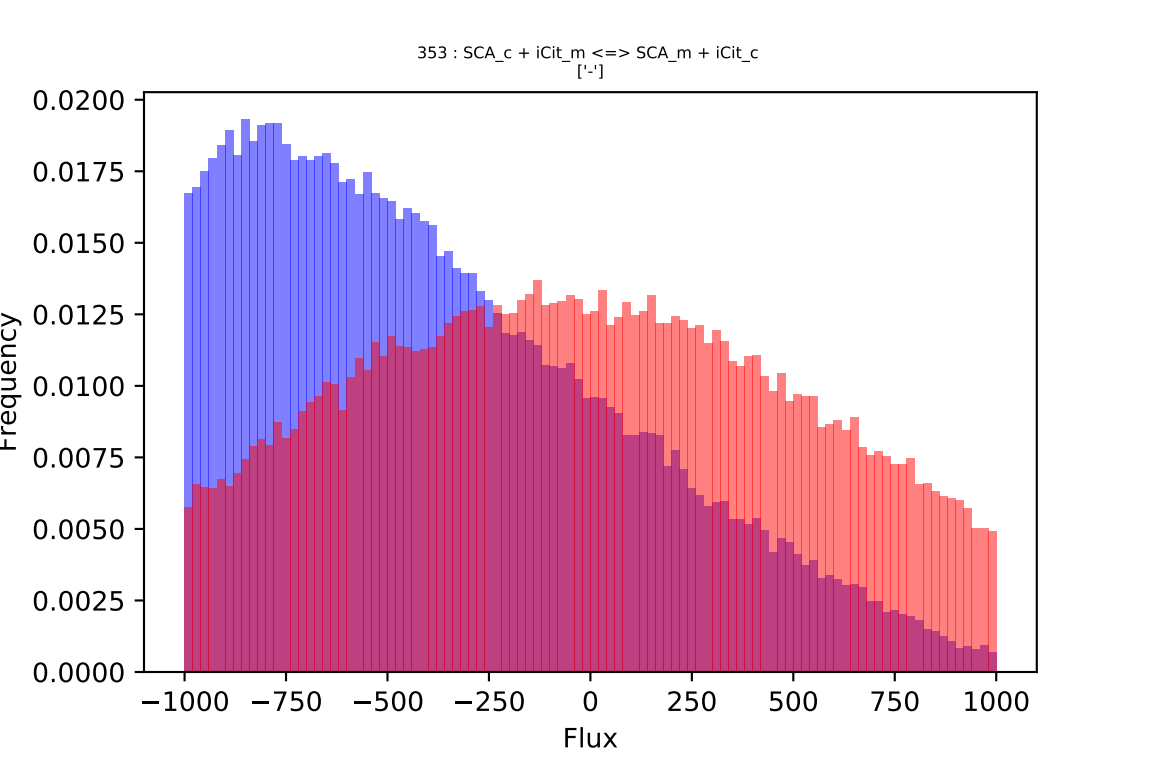

348 : Mal_c + cACN_m <=> Mal_m + cACN_c
['-']
0.016
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−1000
−750
−500
−250
0
250
500
750
1000
Flux

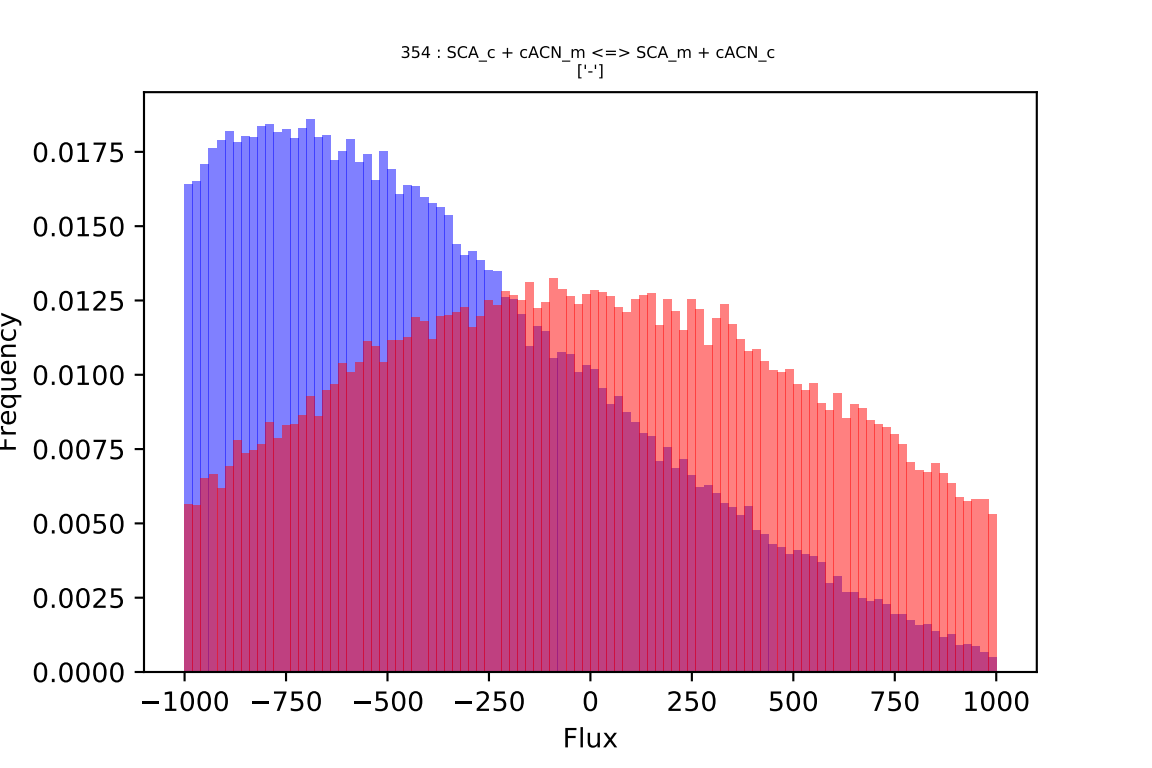

349 : Cit_m + OAA_c <=> Cit_c + OAA_m
['-']
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−1000
−750
−500
−250
0
250
500
750
1000
Flux

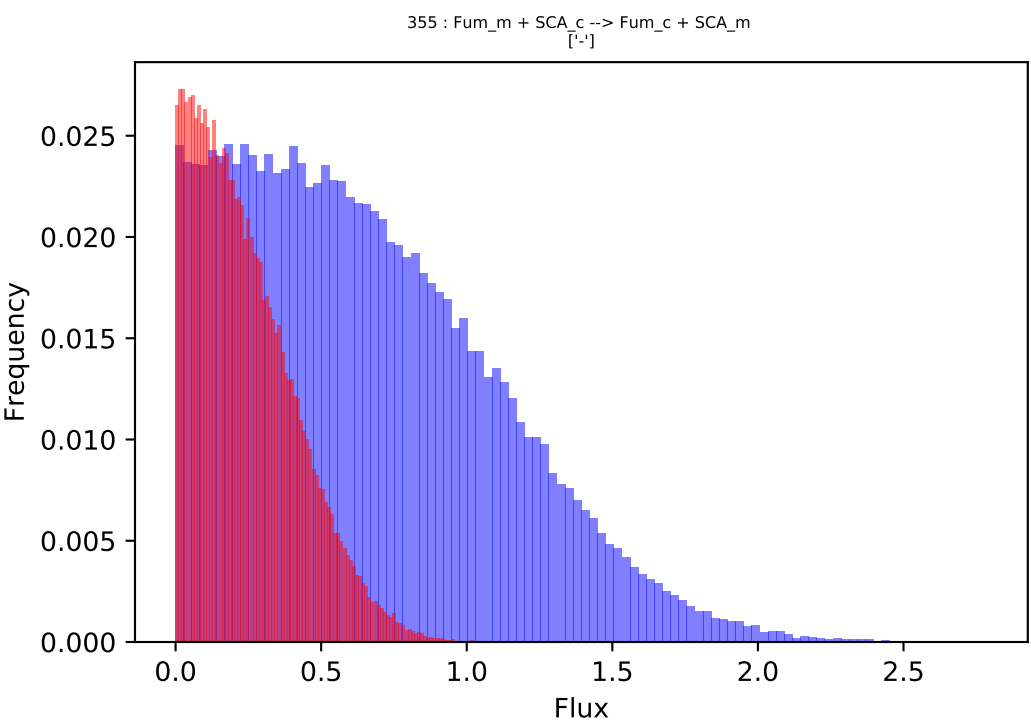

350 : OAA_c + iCit_m <=> OAA_m + iCit_c
['-']
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−1000
−750
−500
−250
0
250
500
750
1000
Flux

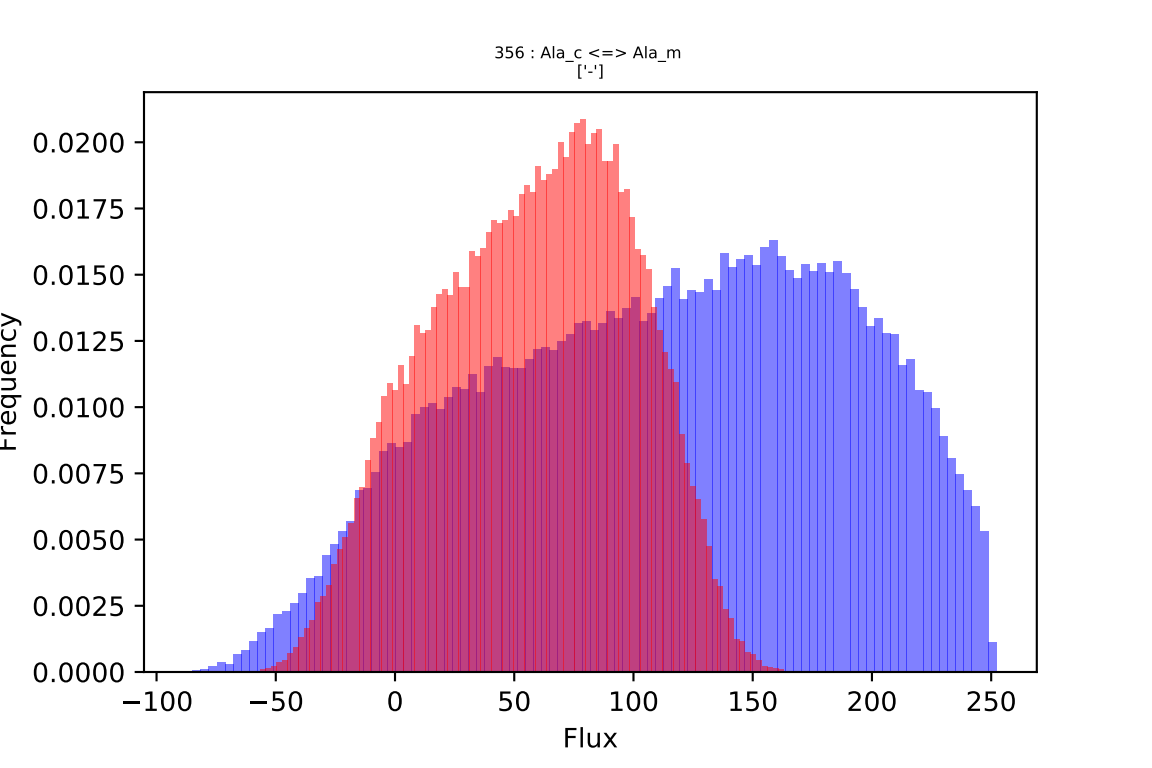

351 : OAA_c + cACN_m <=> OAA_m + cACN_c
['-']
Frequency
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
−1000
−750
−500
−250
0
250
500
750
1000
Flux

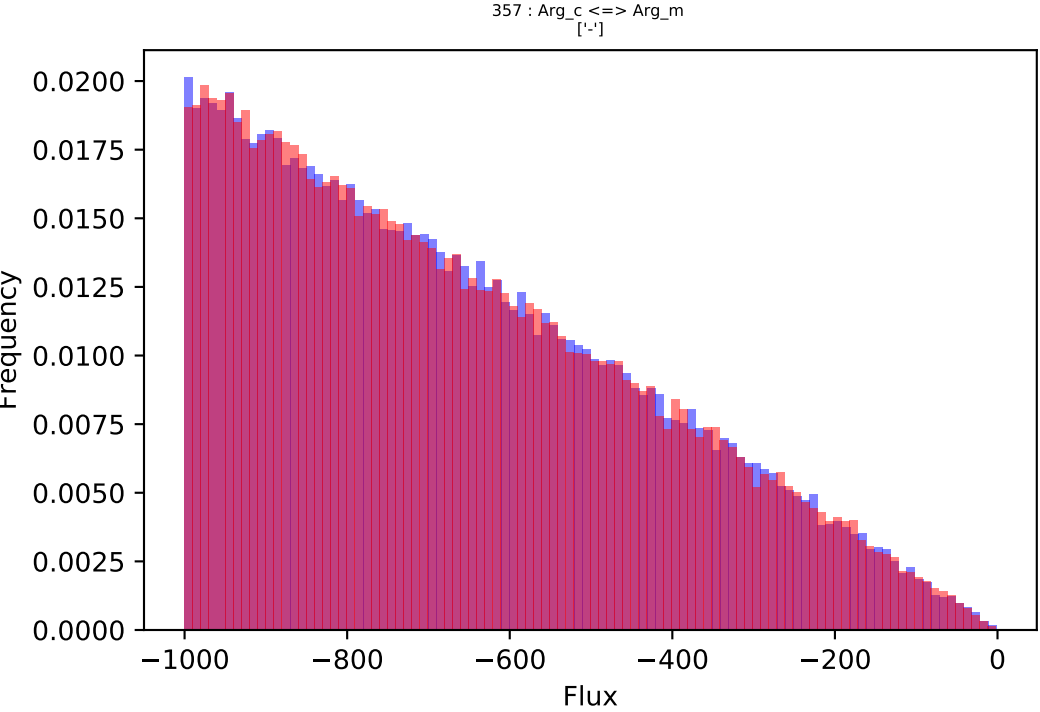

352 : Cit_m + SCA_c <=> Cit_c + SCA_m
['-']
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−1000
−750
−500
−250
0
250
500
750
1000
Flux

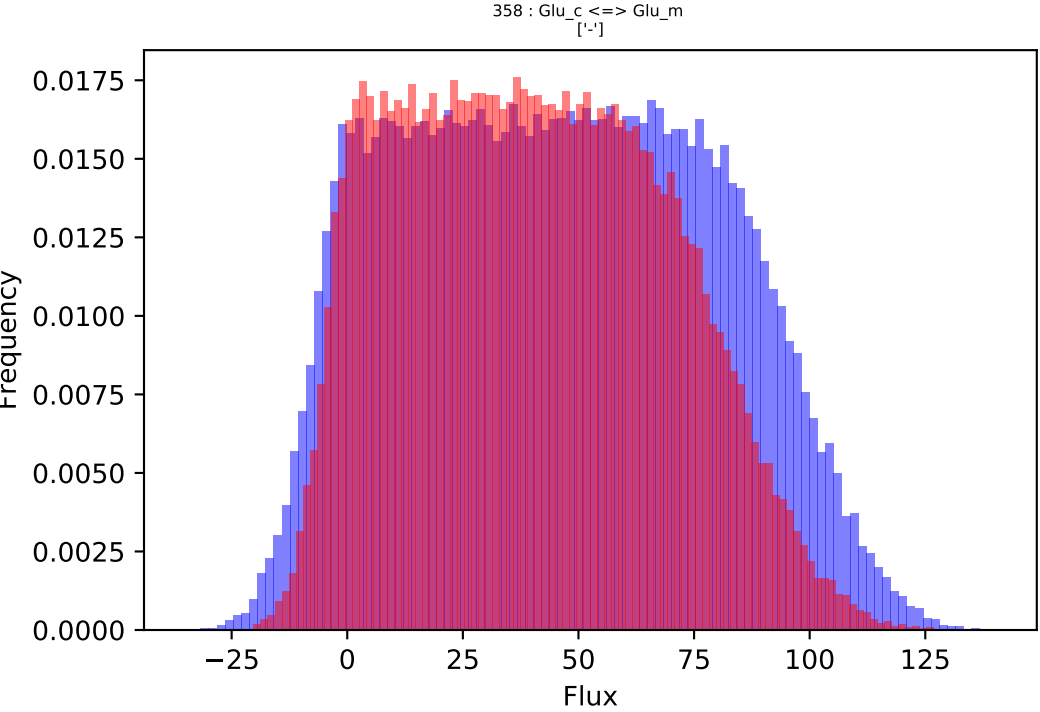

353 : SCA_c + iCit_m <=> SCA_m + iCit_c
['-']
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
Frequency
−1000
−750
−500
−250
0
250
500
750
1000
Flux

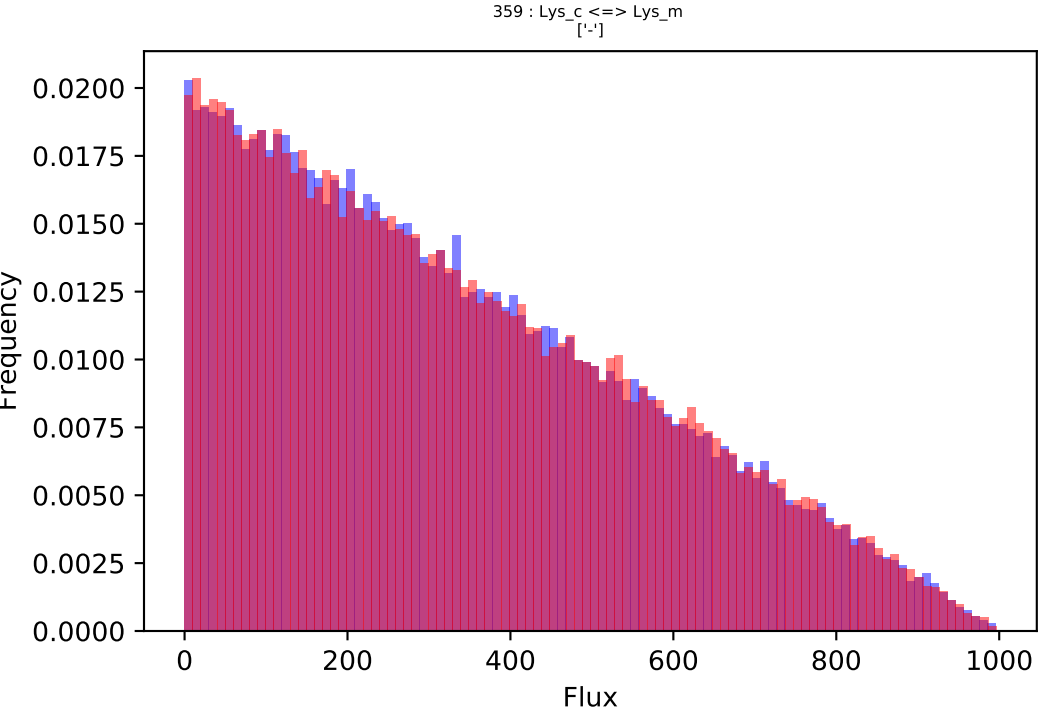

354 : SCA_c + cACN_m <=> SCA_m + cACN_c
['-']
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
Frequency
−1000
−750
−500
−250
0
250
500
750
1000
Flux

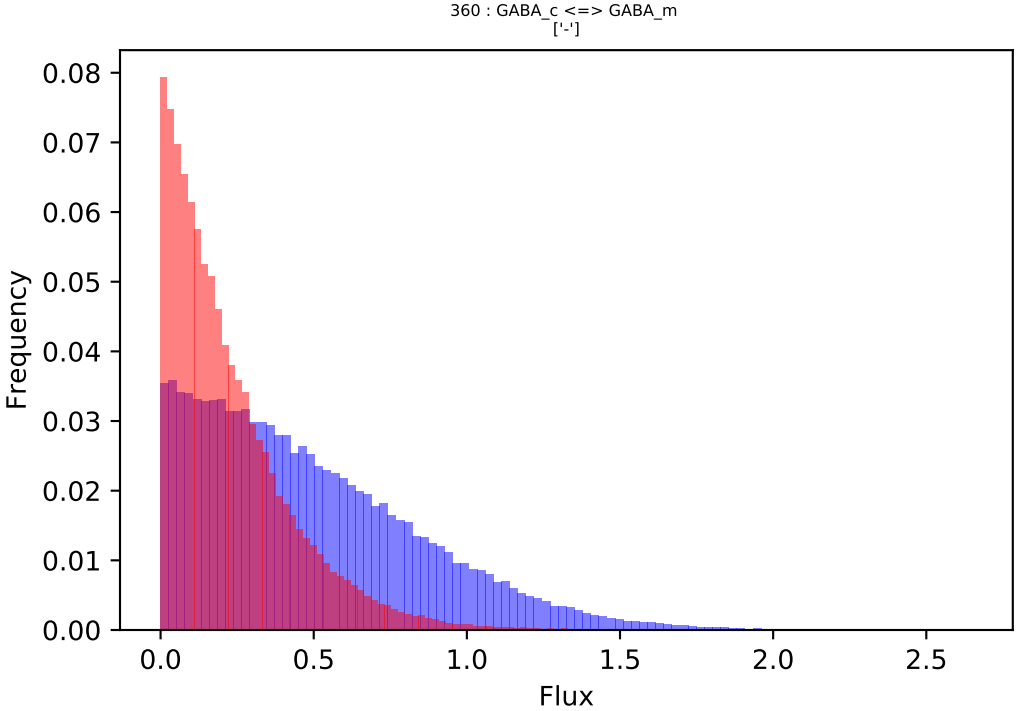

355 : Fum_m + SCA_c --> Fum_c + SCA_m
['-']
Frequency
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.5
1.0
1.5
2.0
2.5
Flux

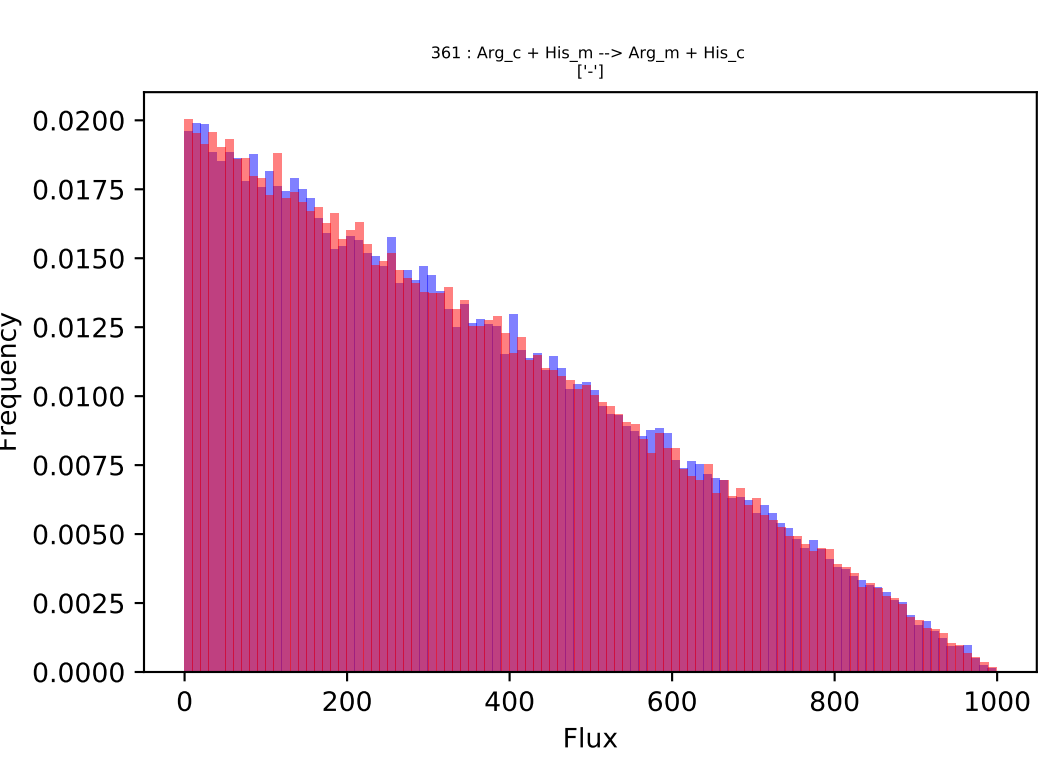

356 : Ala_c <=> Ala_m
['-']
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
Frequency
−100
−50
0
50
100
150
200
250
Flux

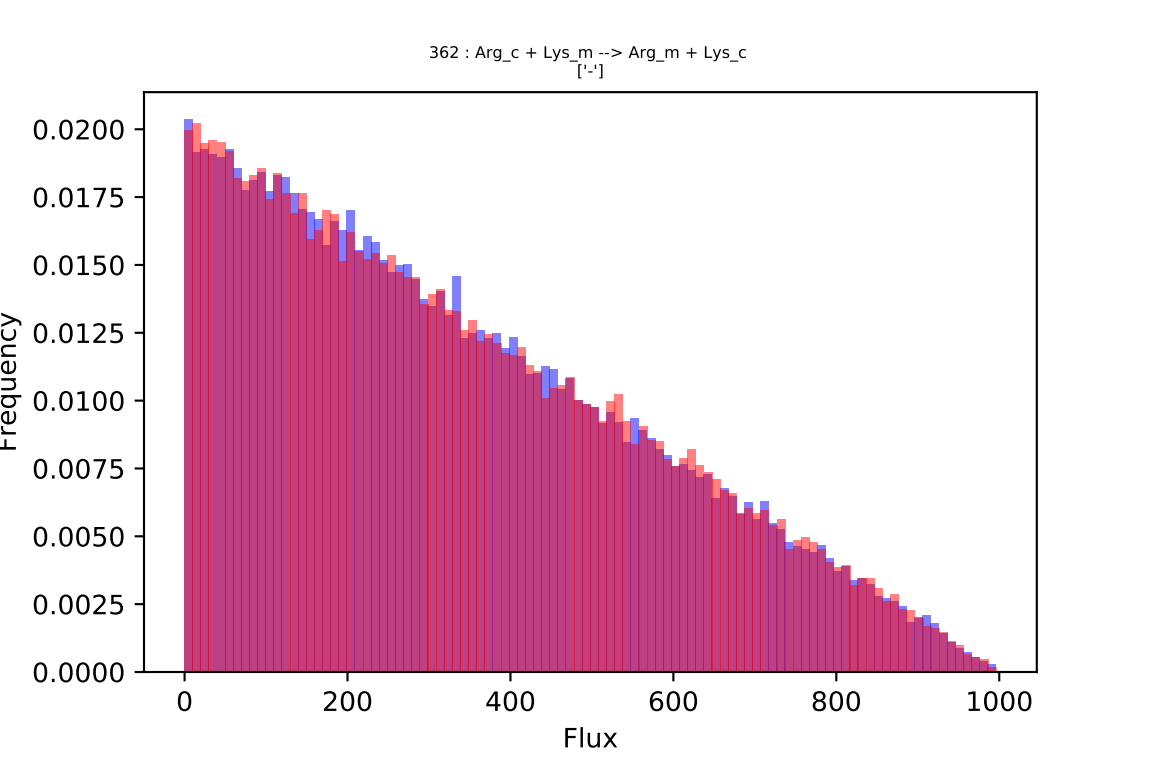

357 : Arg_c <=> Arg_m
['-']
Frequency
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
−1000
−800
−600
−400
−200
0
Flux

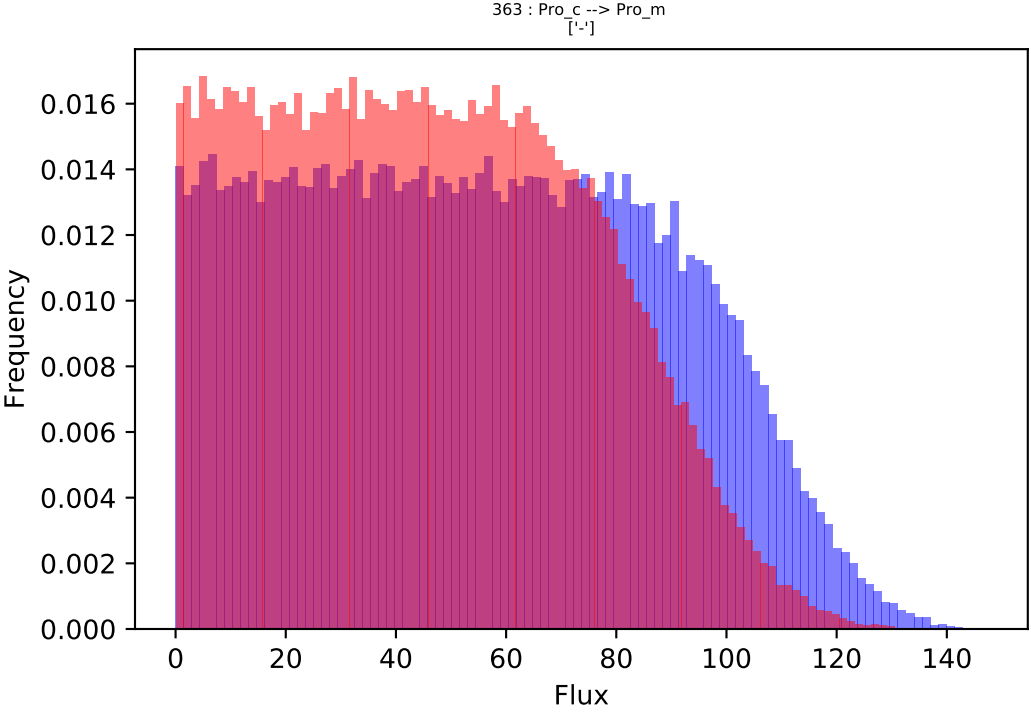

358 : Glu_c <=> Glu_m
['-']
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
Frequency
−25
0
25
50
75
100
125
Flux

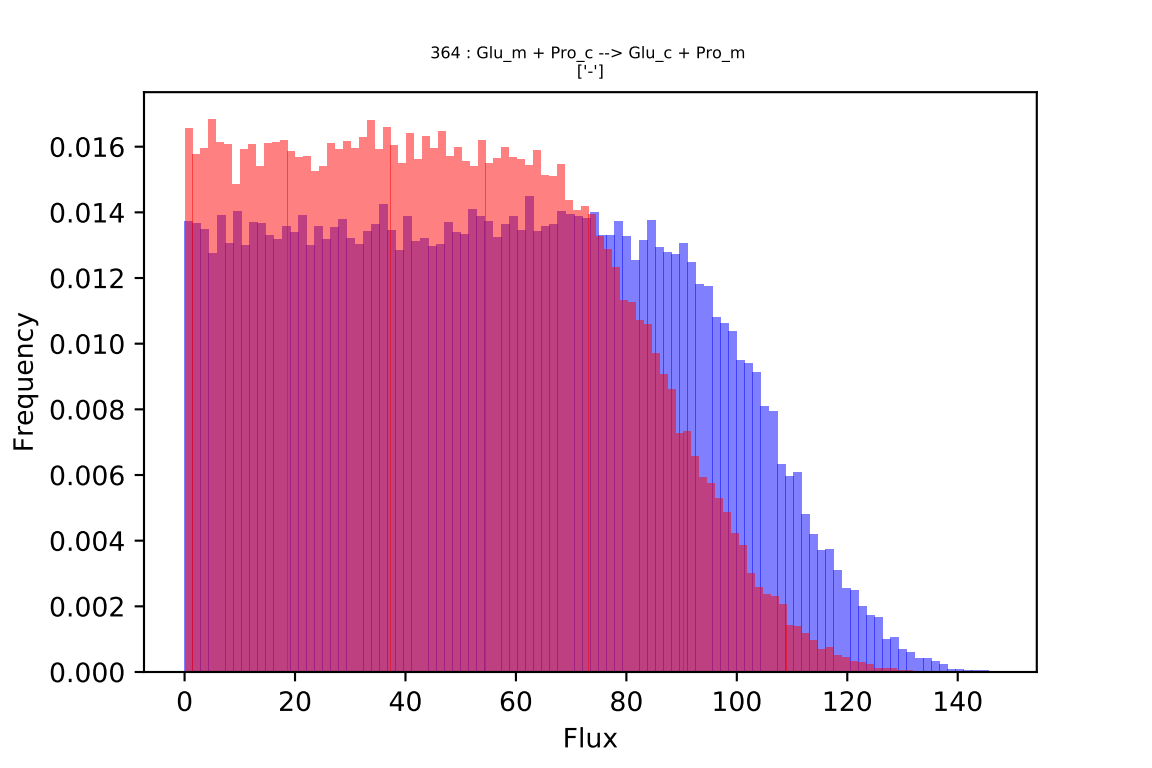

359 : Lys_c <=> Lys_m
['-']
Frequency
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
0
200
400
600
800
1000
Flux

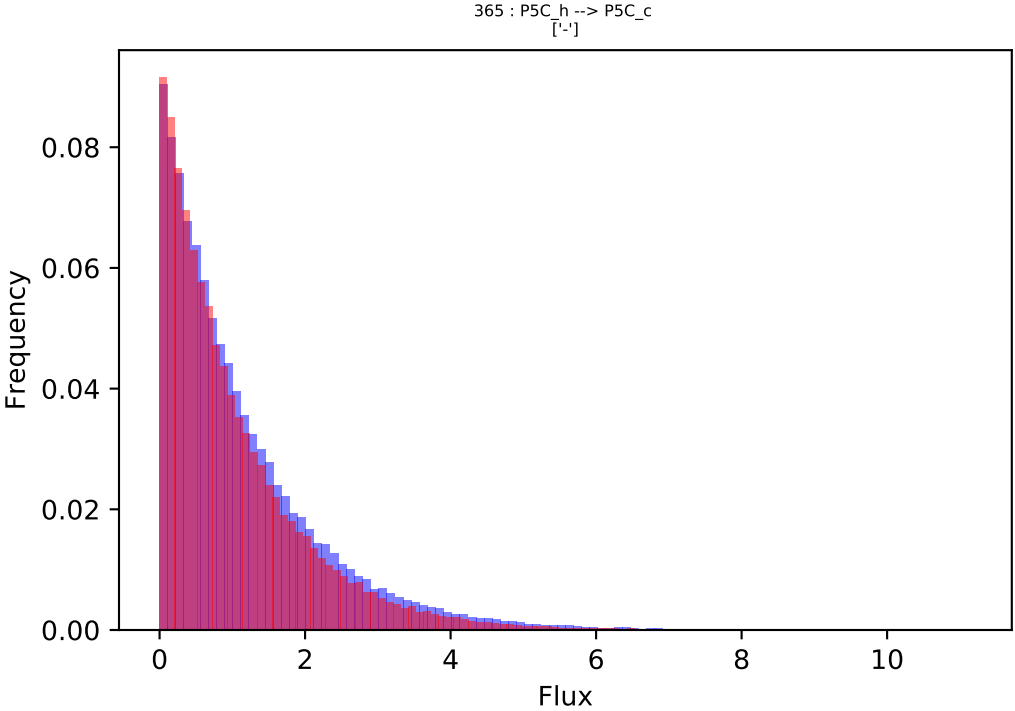

360 : GABA_c <=> GABA_m
['-']
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
Flux

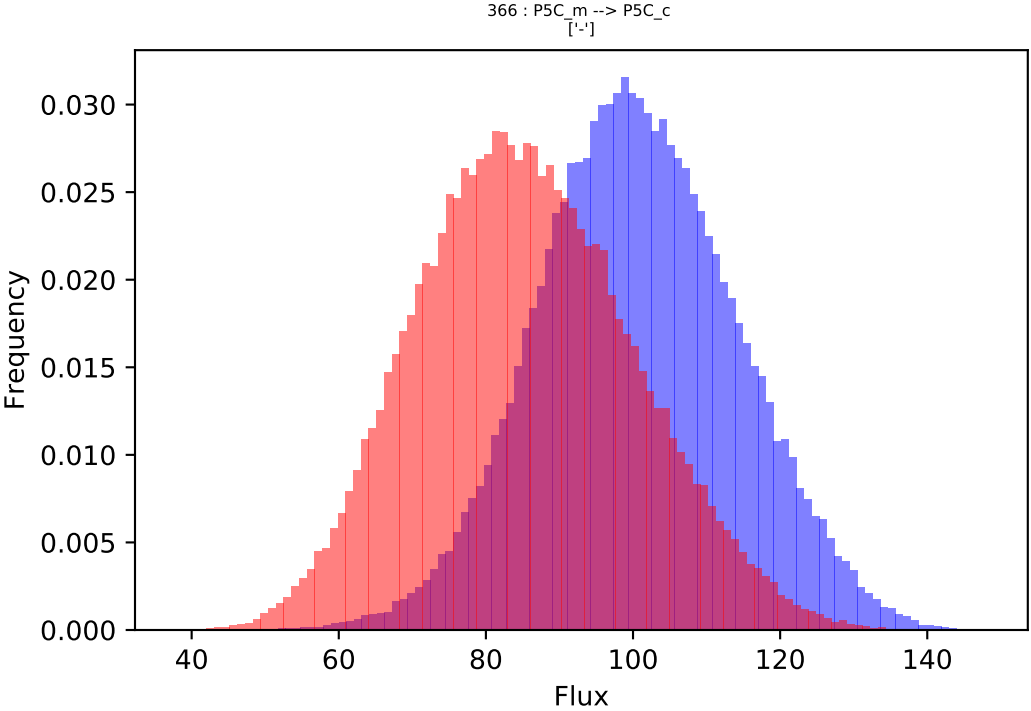

361 : Arg_c + His_m --> Arg_m + His_c
['-']
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
Frequency
0
200
400
600
800
1000
Flux

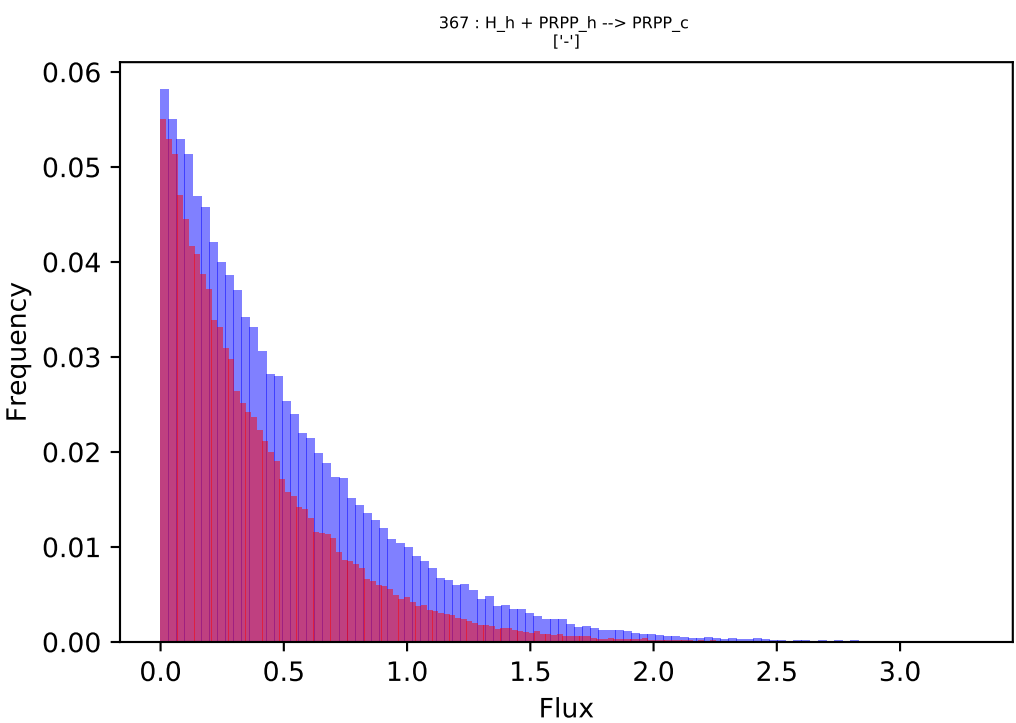

362 : Arg_c + Lys_m --> Arg_m + Lys_c
['-']
Frequency
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
0
200
400
600
800
1000
Flux

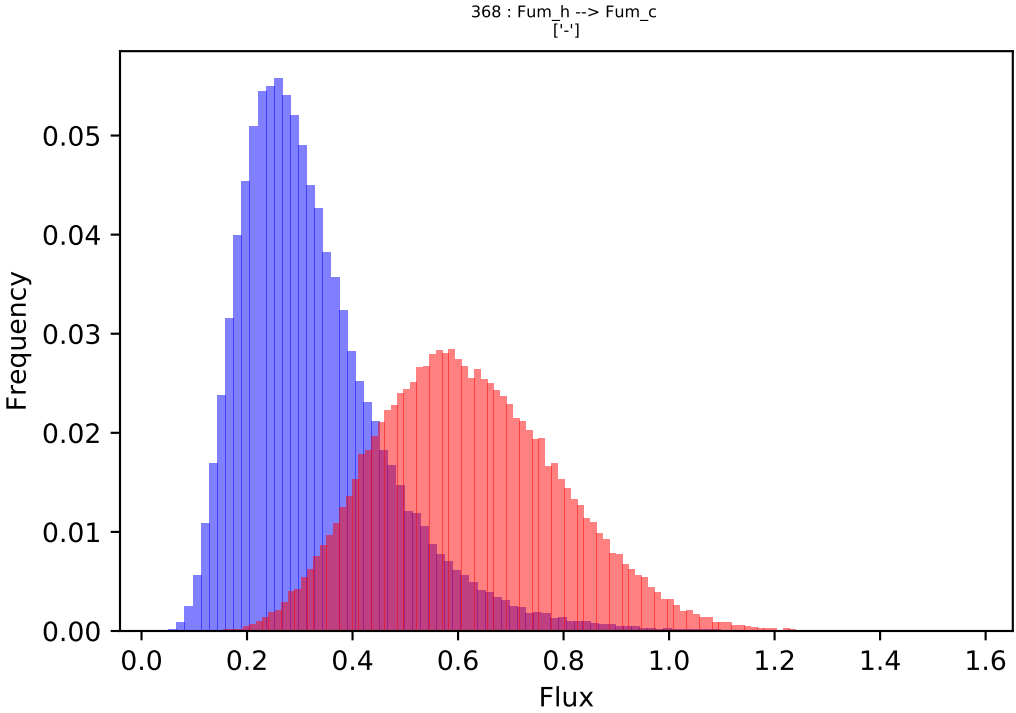

363 : Pro_c --> Pro_m
['-']
Frequency
0.016
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
0
20
40
60
80
100
120
140
Flux

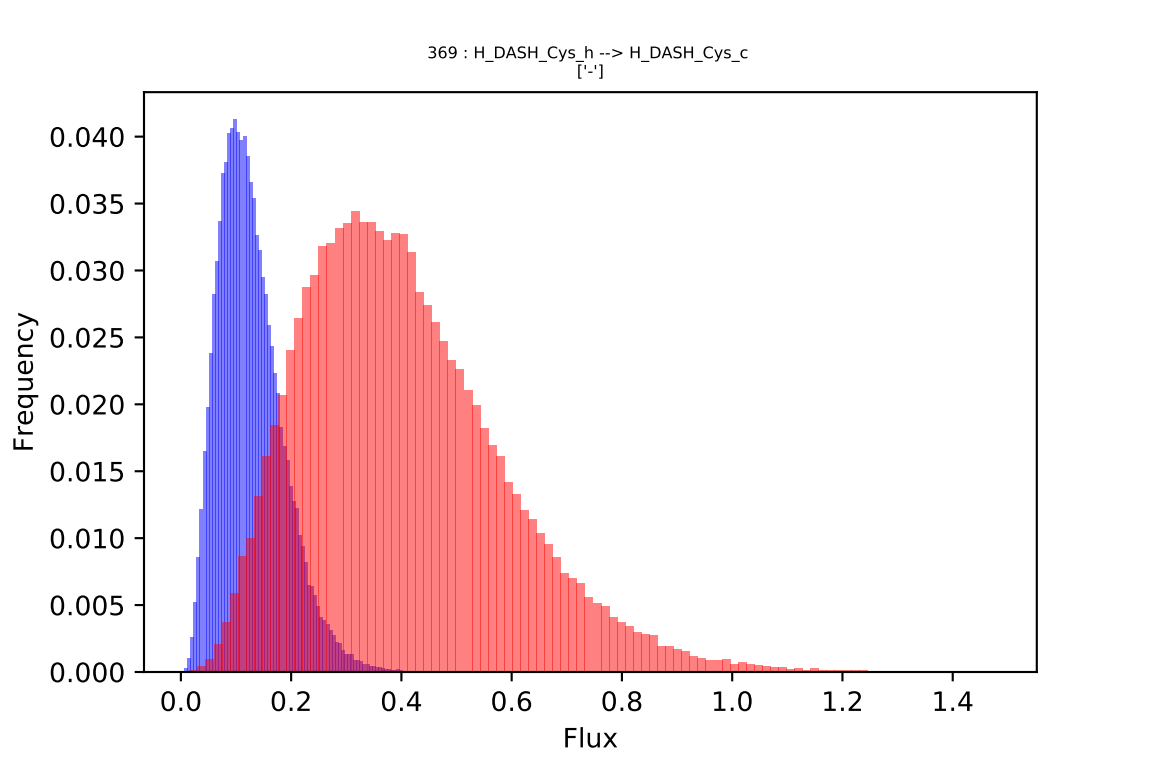

364 : Glu_m + Pro_c --> Glu_c + Pro_m
['-']
Frequency
0.016
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
0
20
40
60
80
100
120
140
Flux

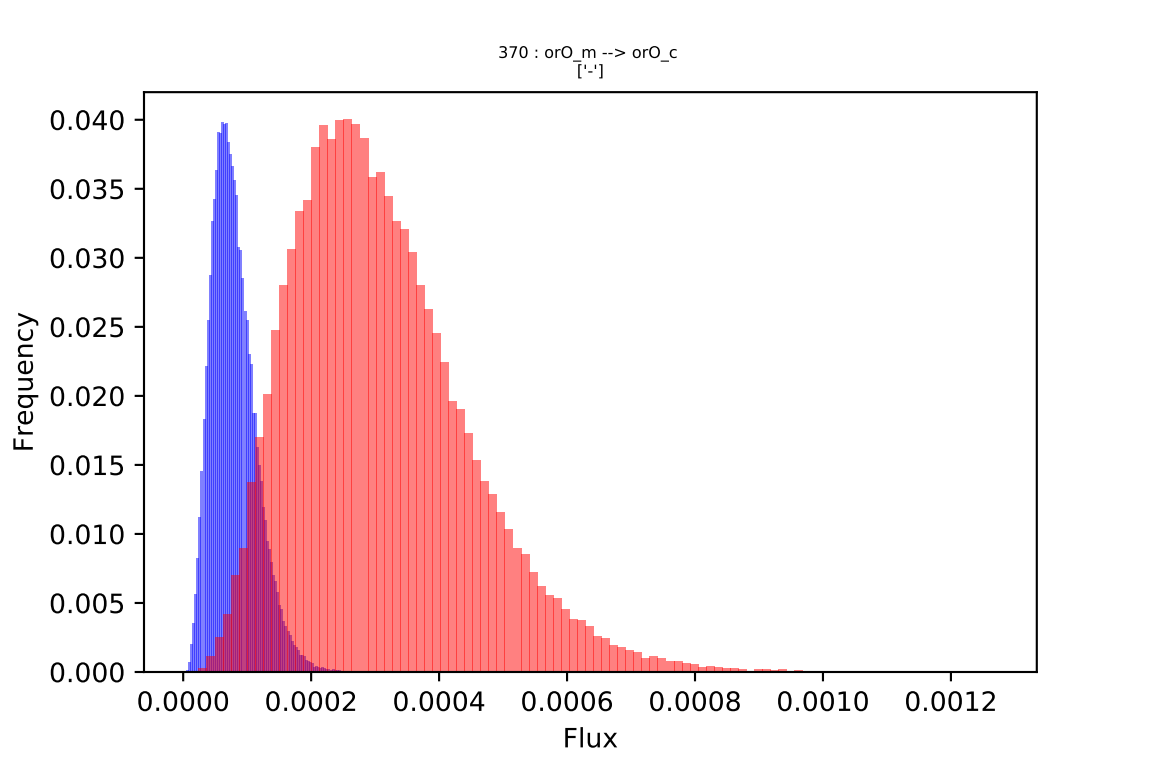

365 : P5C_h --> P5C_c
['-']
0.08
0.06
0.04
0.02
0.00
Frequency
0
2
4
6
8
10
Flux

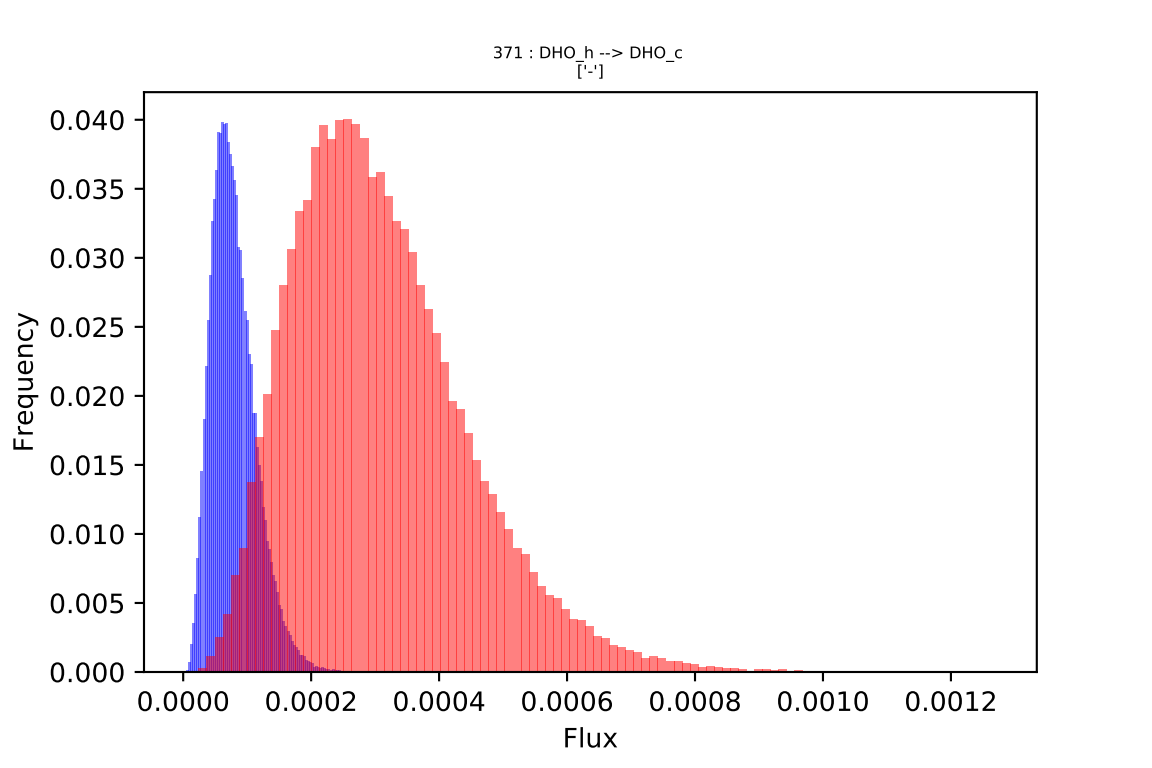

366 : P5C_m --> P5C_c
['-']
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
40
60
80
100
120
140
Flux

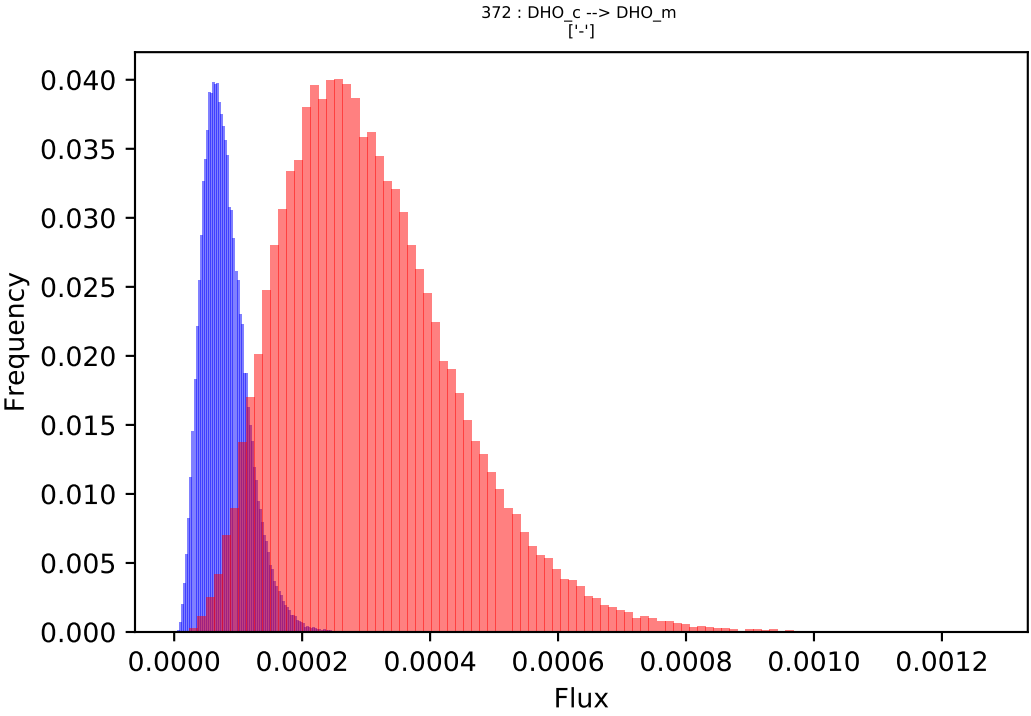

367 : H_h + PRPP_h --> PRPP_c
['-']
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Flux

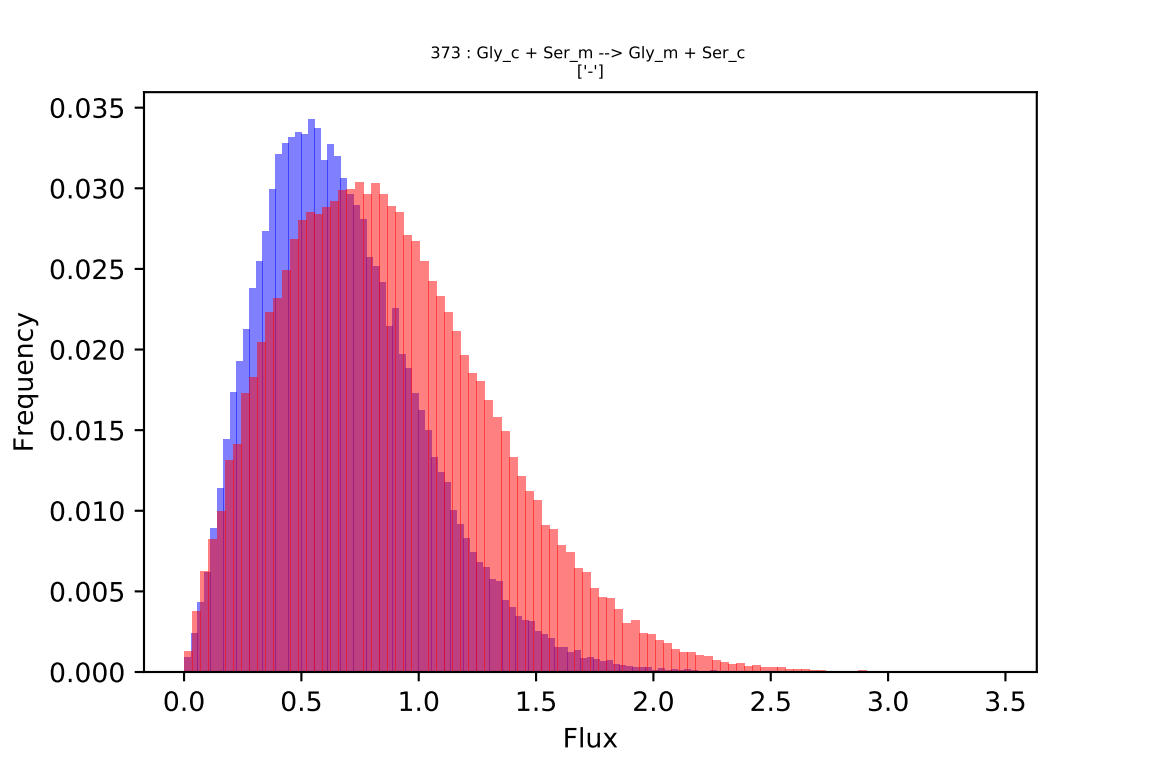

368 : Fum_h --> Fum_c
['-']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Flux

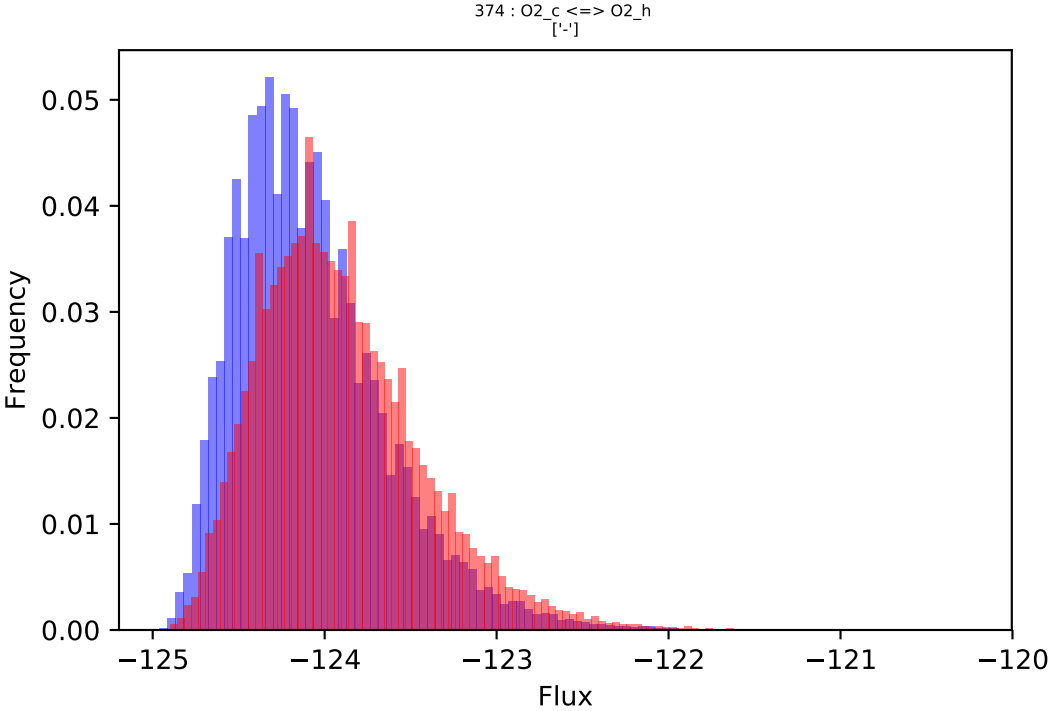

369 : H_DASH_Cys_h --> H_DASH_Cys_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

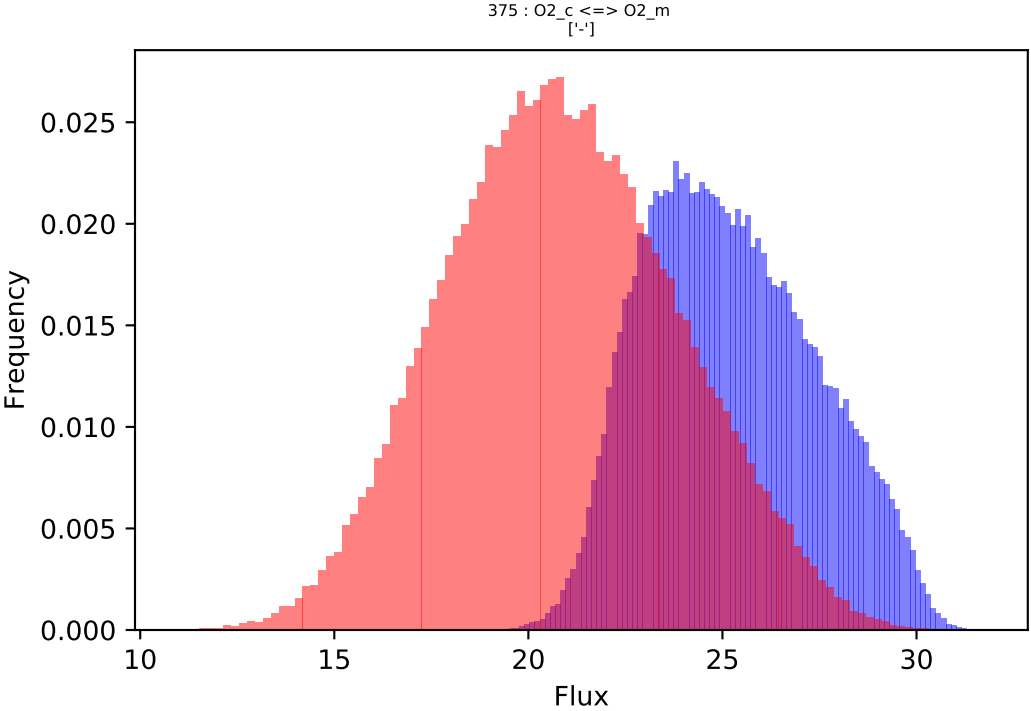

370 : orO_m --> orO_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0000
0.0002
0.0004
0.0006
0.0008
0.0010
0.0012
Flux

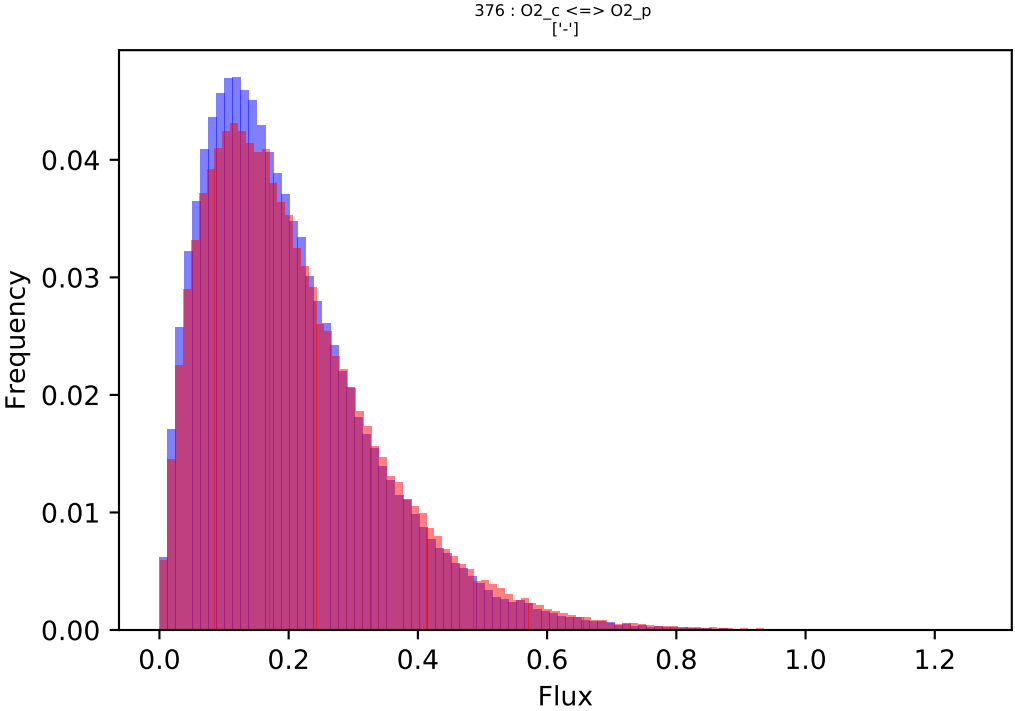

371 : DHO_h --> DHO_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0000
0.0002
0.0004
0.0006
0.0008
0.0010
0.0012
Flux

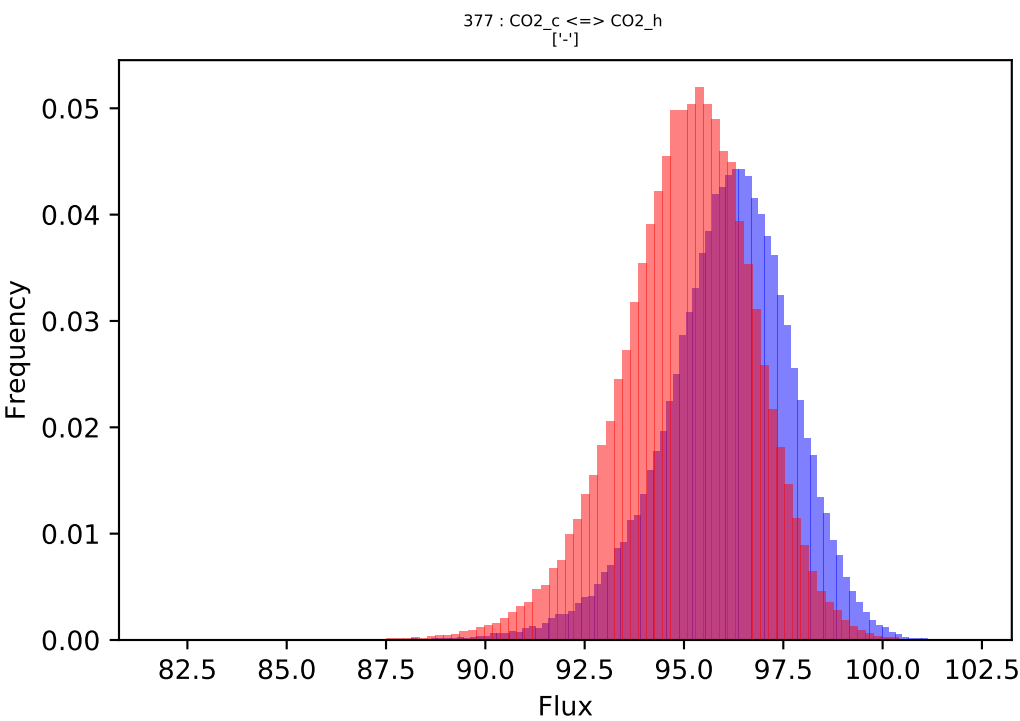

372 : DHO_c --> DHO_m
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0000
0.0002
0.0004
0.0006
0.0008
0.0010
0.0012
Flux

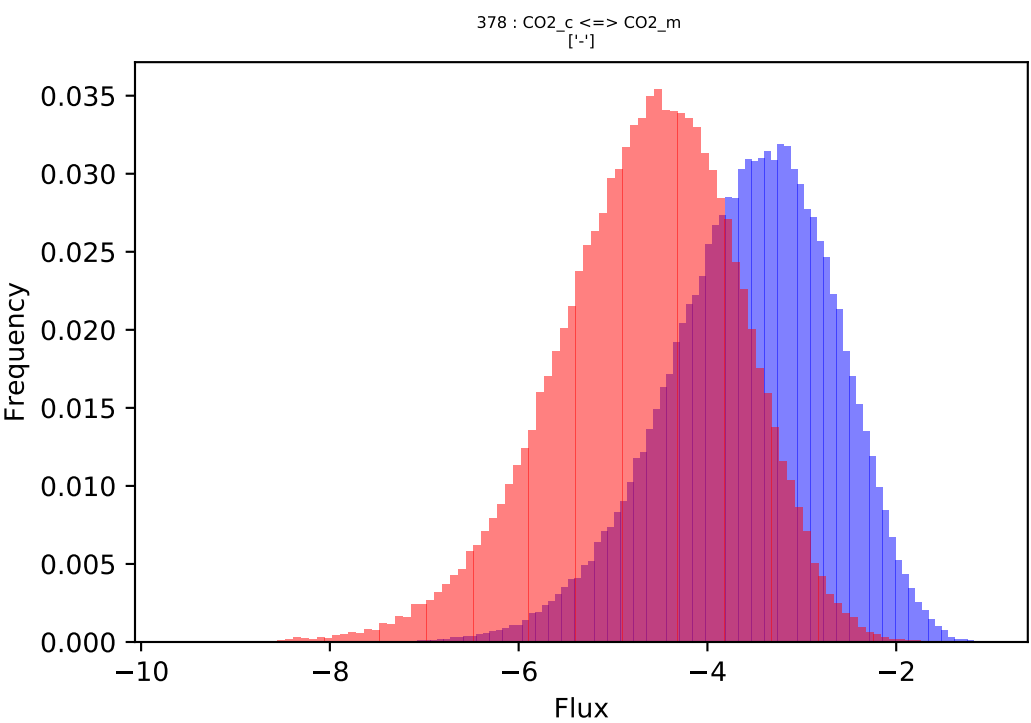

373 : Gly_c + Ser_m --> Gly_m + Ser_c
['-']
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
Flux

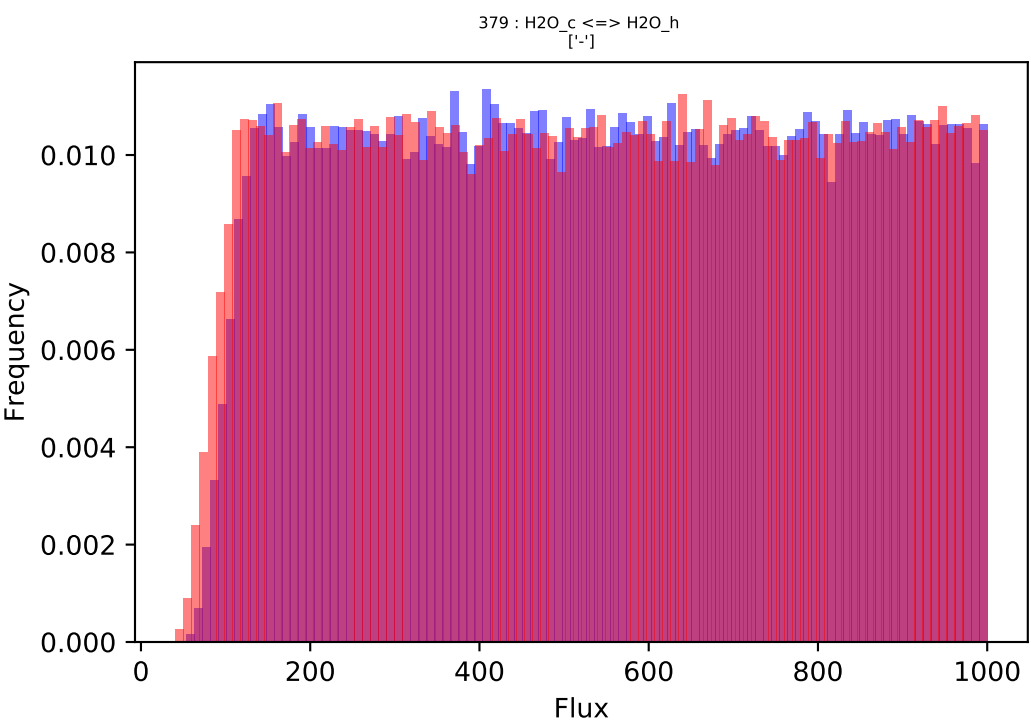

374 : O2_c <=> O2_h
['-']
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
−125
−124
−123
−122
−121
−120
Flux

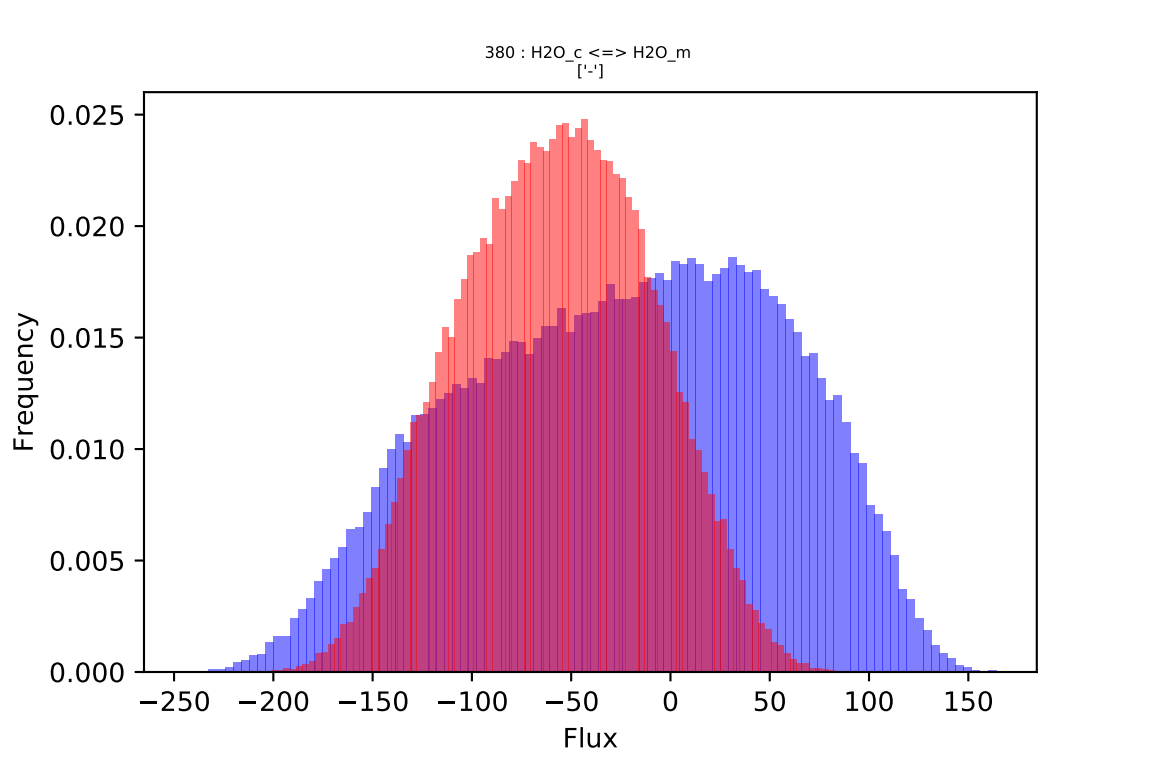

375 : O2_c <=> O2_m
['-']
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
10
15
20
25
30
Flux

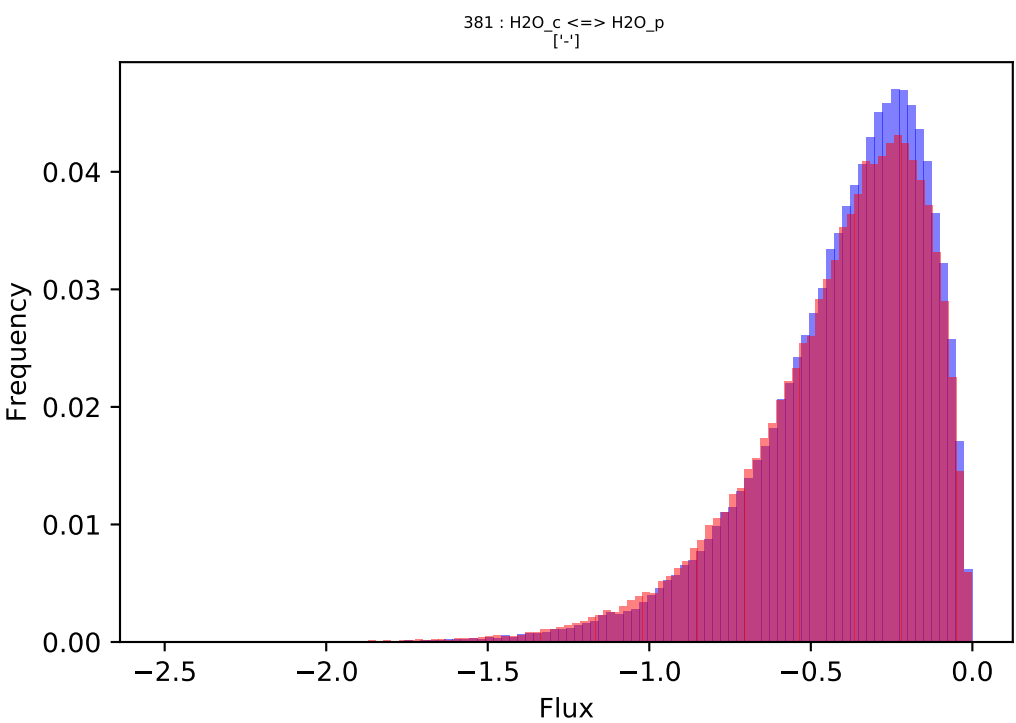

376 : O2_c <=> O2_p
['-']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Flux

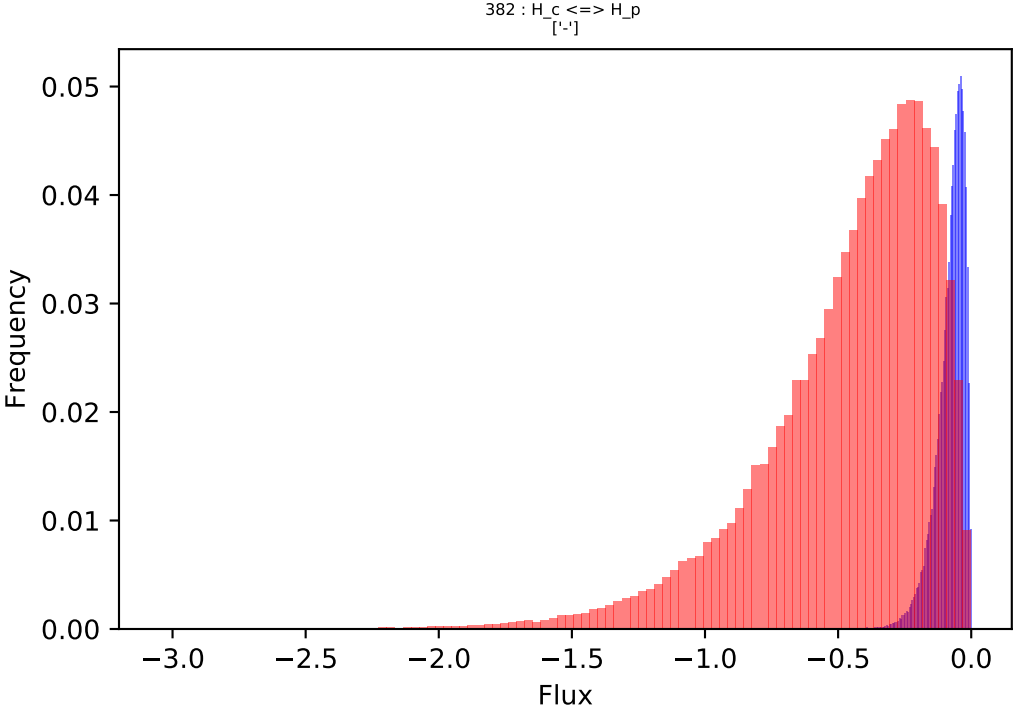

377 : CO2_c <=> CO2_h
['-']
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
82.5
85.0
87.5
90.0
92.5
95.0
97.5
100.0
102.5
Flux

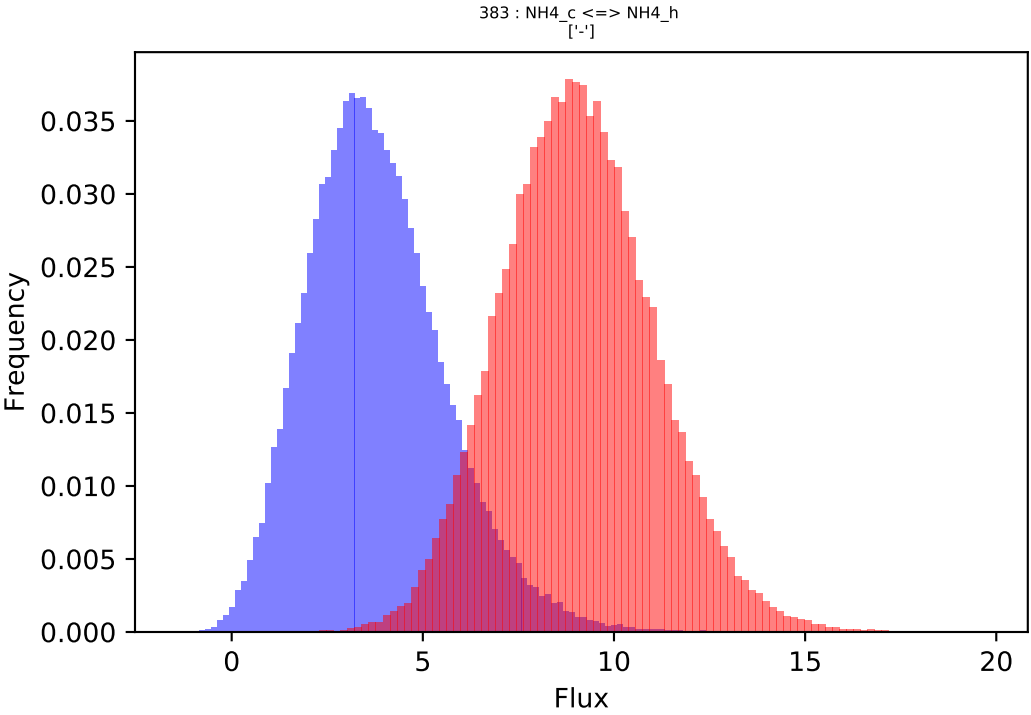

378 : CO2_c <=> CO2_m
['-']
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−10
−8
−6
−4
−2
Flux

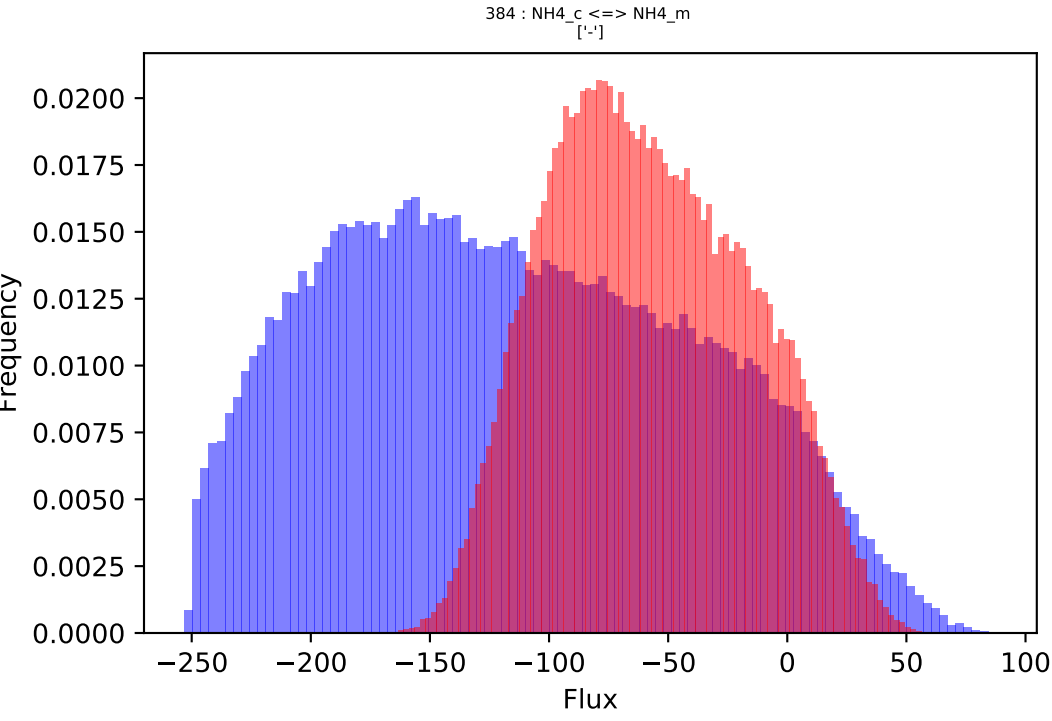

379 : H2O_c <=> H2O_h
['-']
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
0
200
400
600
800
1000
Flux

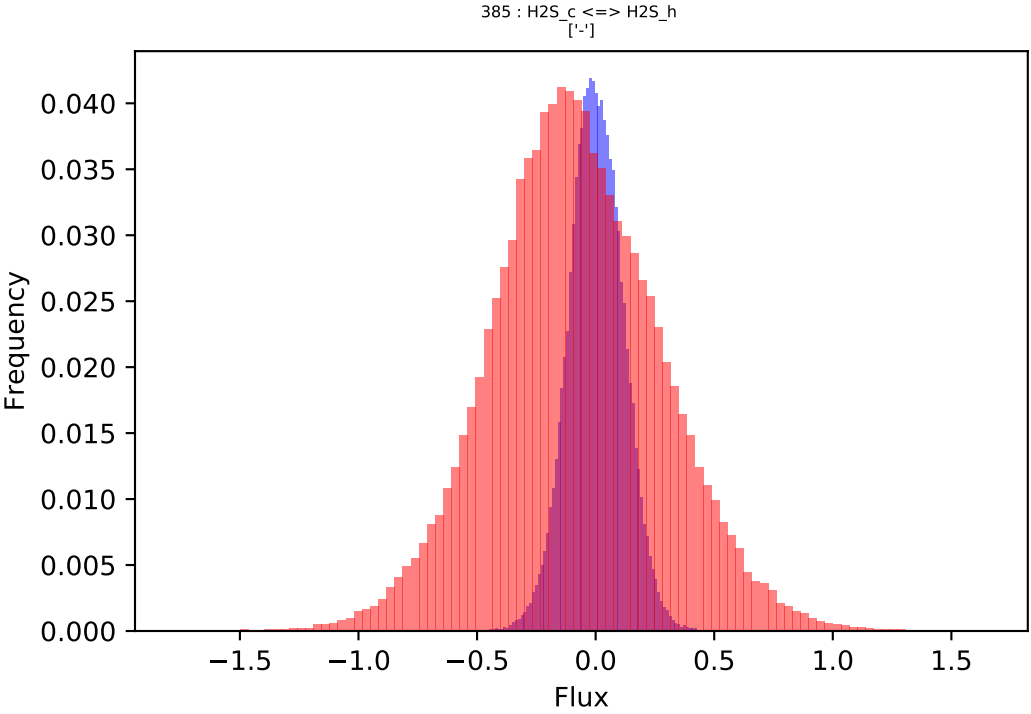

380 : H2O_c <=> H2O_m
['-']
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−250
−200
−150
−100
−50
0
50
100
150
Flux

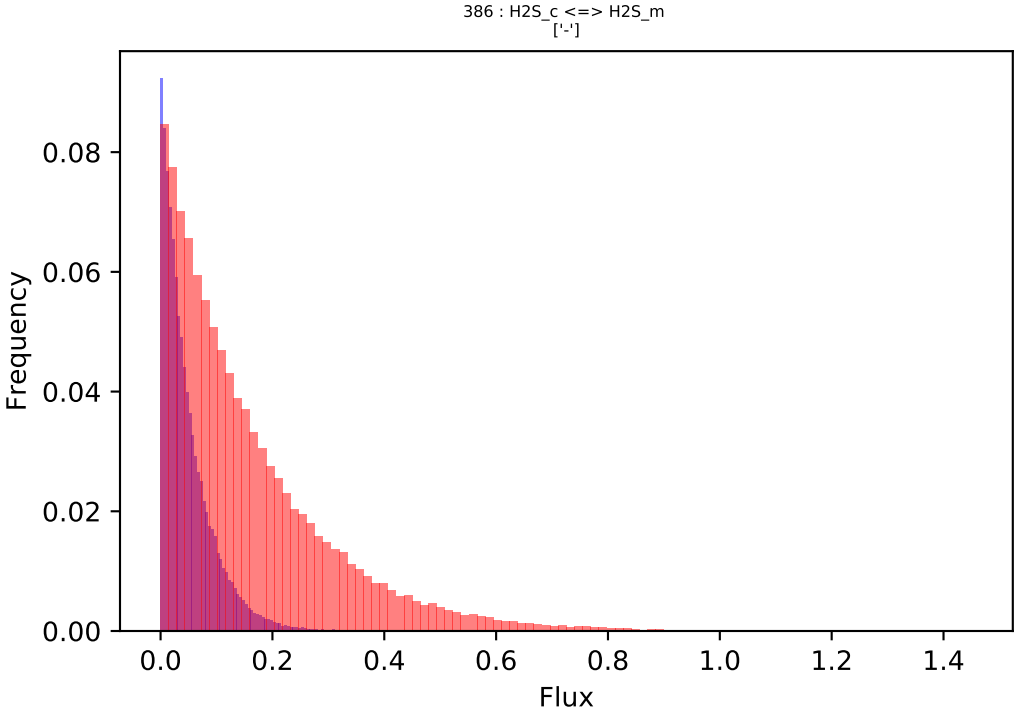

381 : H2O_c <=> H2O_p
['-']
Frequency
0.00
0.01
0.02
0.03
0.04
−2.5
−2.0
−1.5
−1.0
−0.5
0.0
Flux

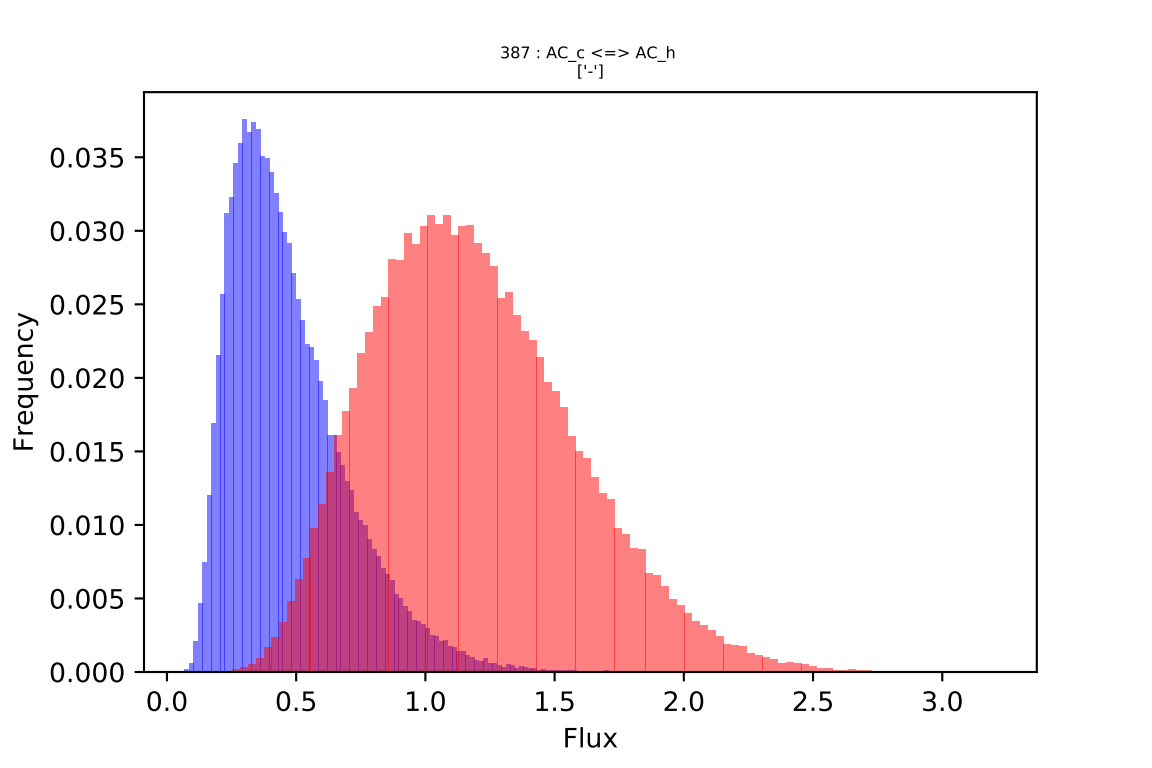

382 : H_c <=> H_p
['-']
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
−3.0
−2.5
−2.0
−1.5
−1.0
−0.5
0.0
Flux

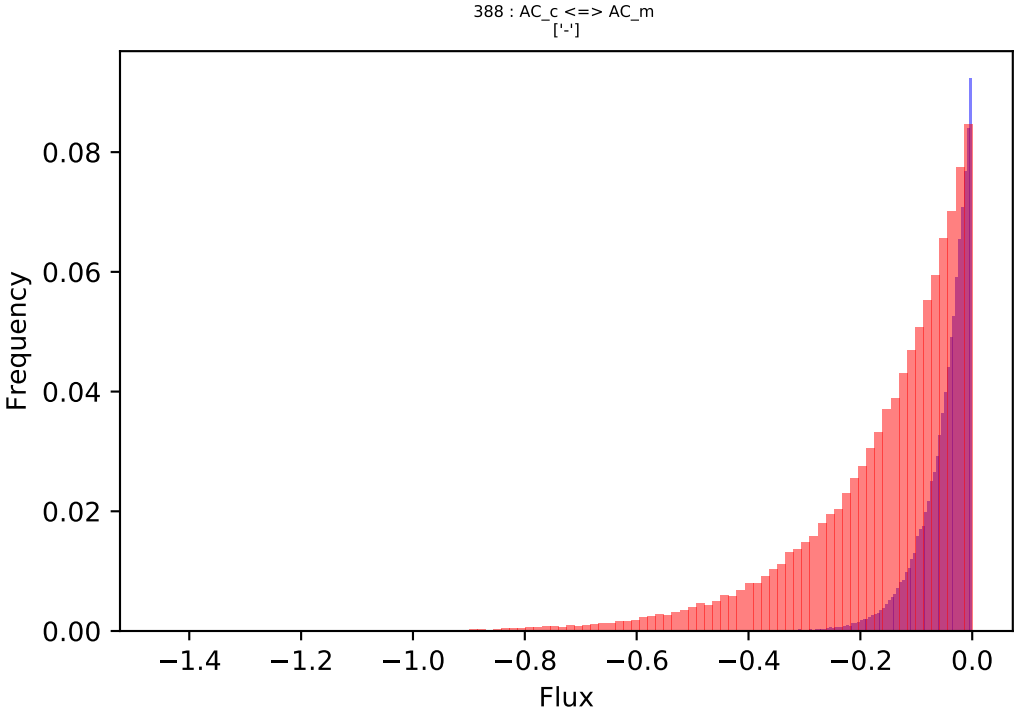

383 : NH4_c <=> NH4_h
['-']
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
5
10
15
20
Flux

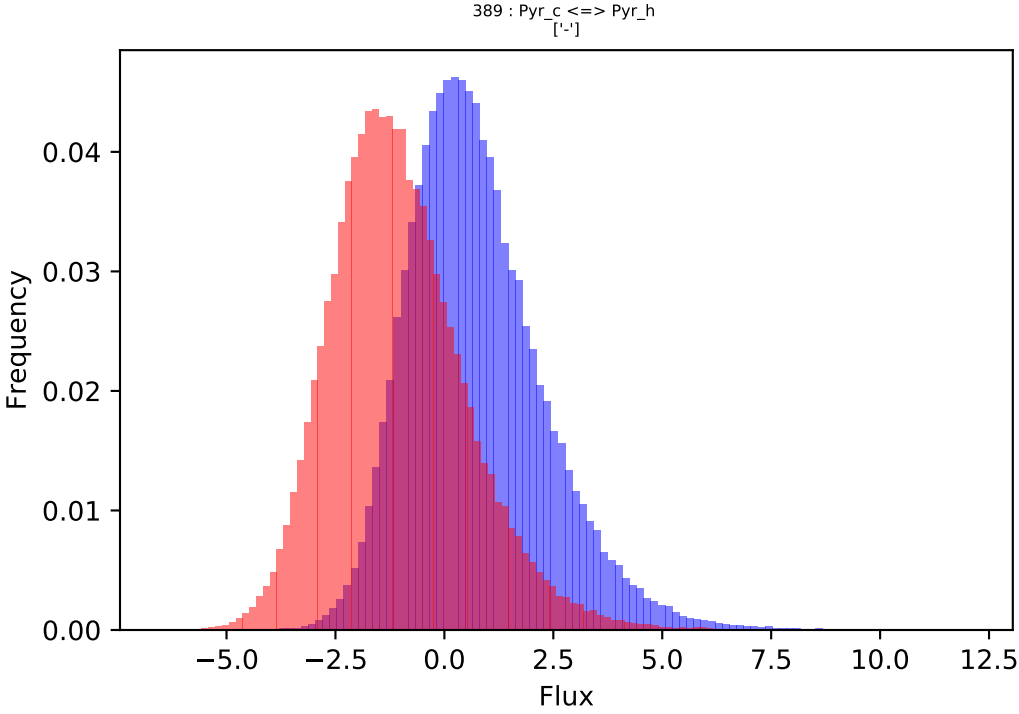

384 : NH4_c <=> NH4_m
['-']
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
Frequency
−250
−200
−150
−100
−50
0
50
100
Flux

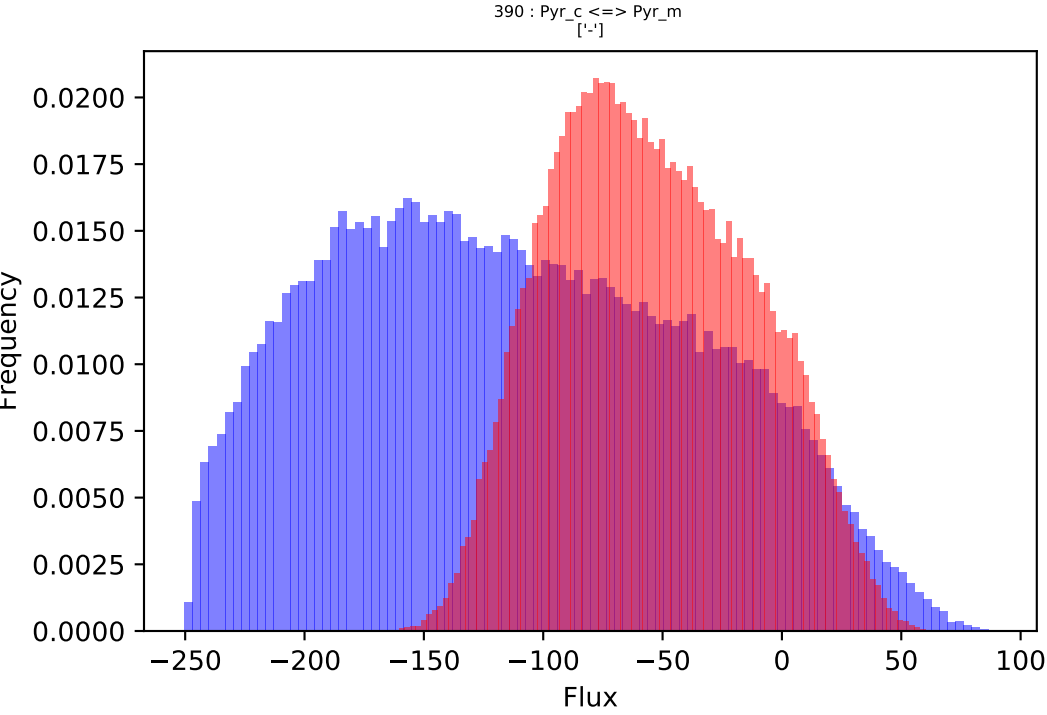

385 : H2S_c <=> H2S_h
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−1.5
−1.0
−0.5
0.0
0.5
1.0
1.5
Flux

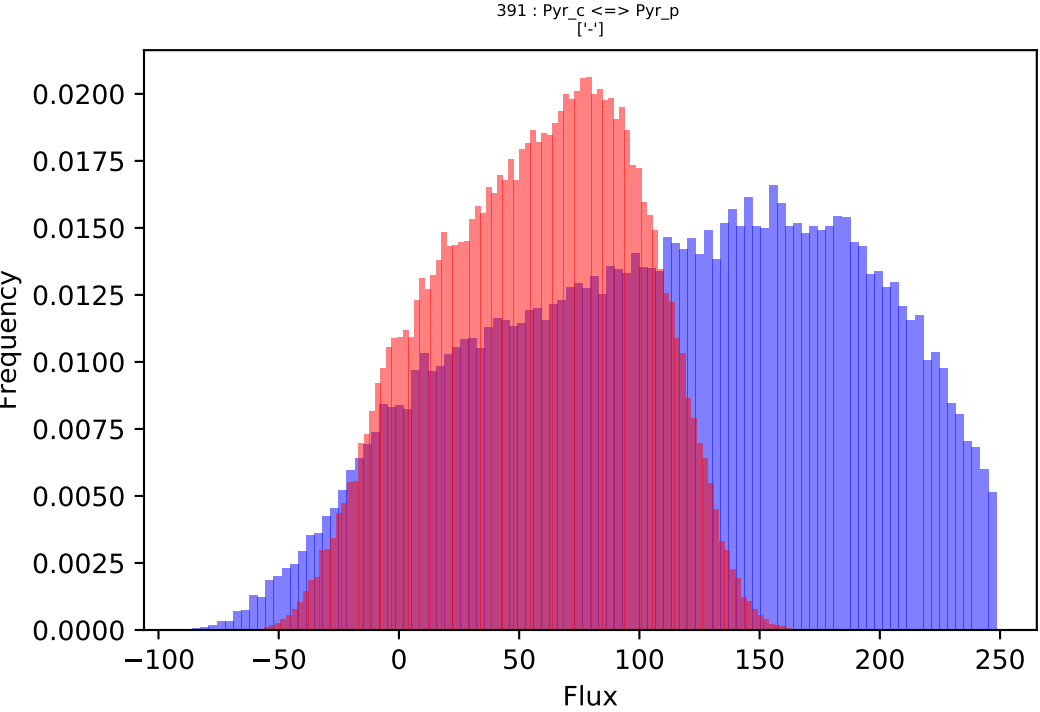

386 : H2S_c <=> H2S_m
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

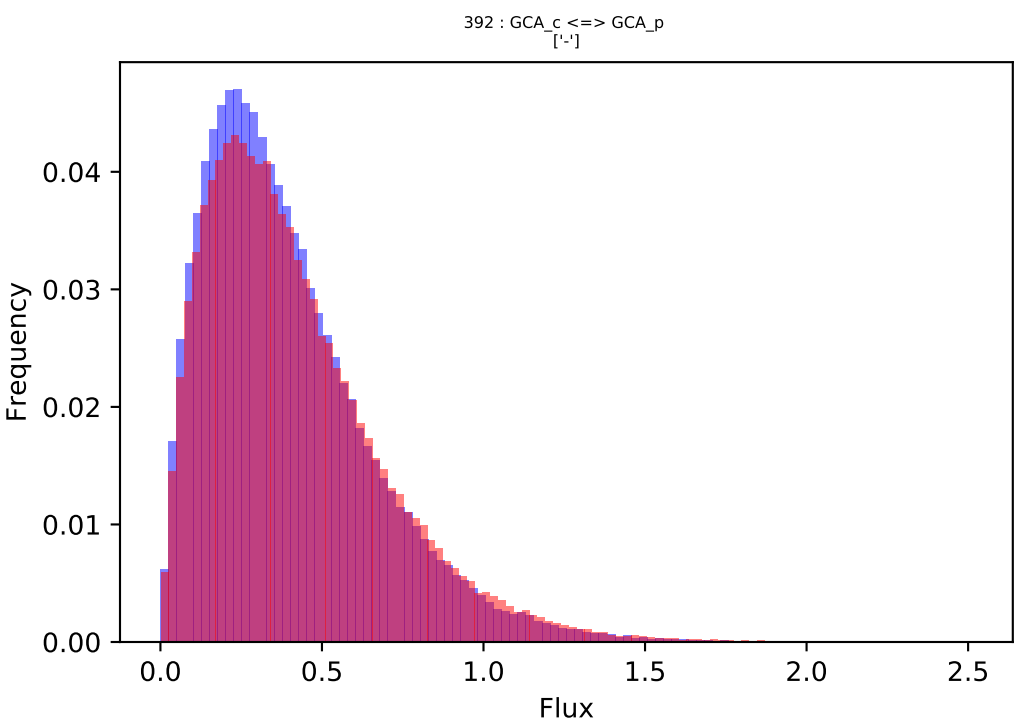

387 : AC_c <=> AC_h
['-']
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Flux

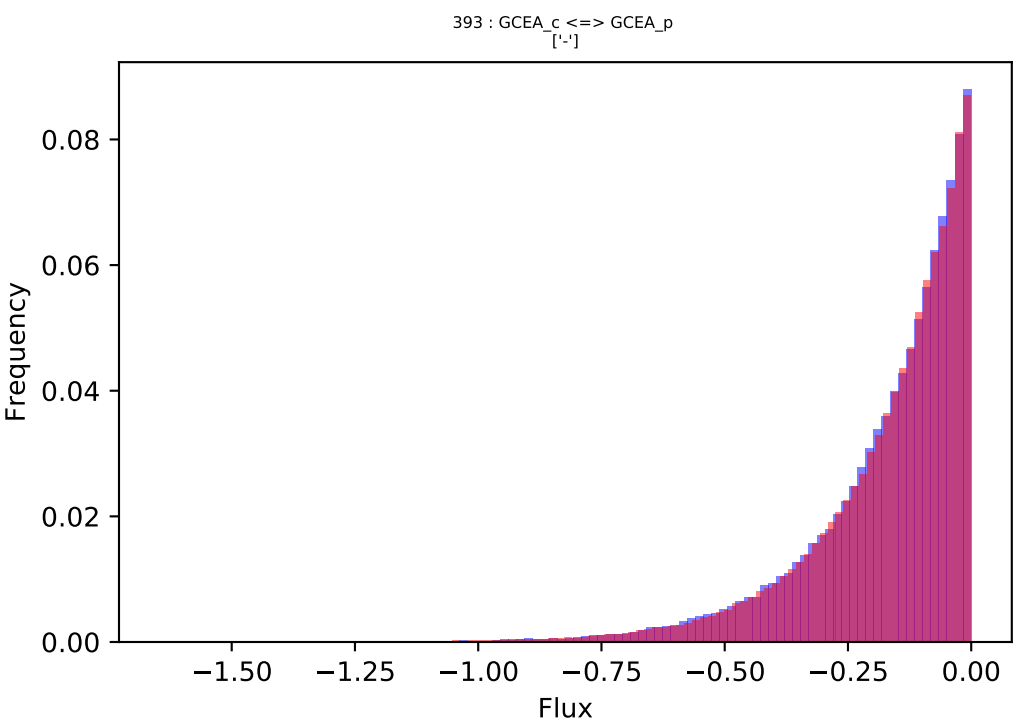

388 : AC_c <=> AC_m
['-']
0.08
0.06
0.04
0.02
0.00
Frequency
−1.4
−1.2
−1.0
−0.8
−0.6
−0.4
−0.2
0.0
Flux

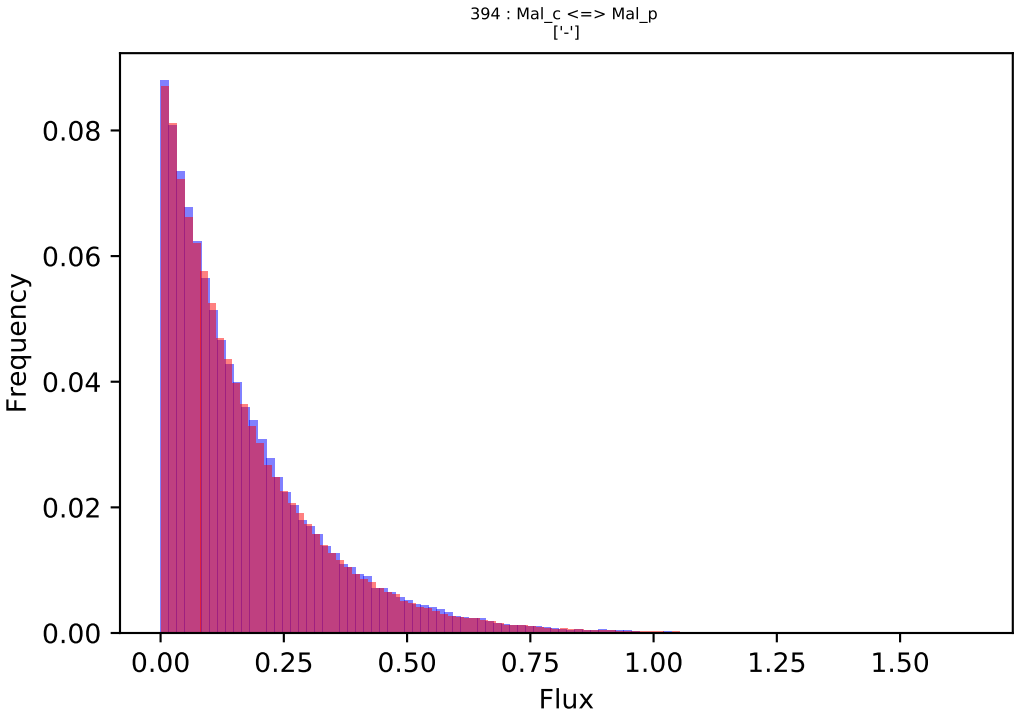

389 : Pyr_c <=> Pyr_h
['-']
Frequency
0.00
0.01
0.02
0.03
0.04
−5.0
−2.5
0.0
2.5
5.0
7.5
10.0
12.5
Flux

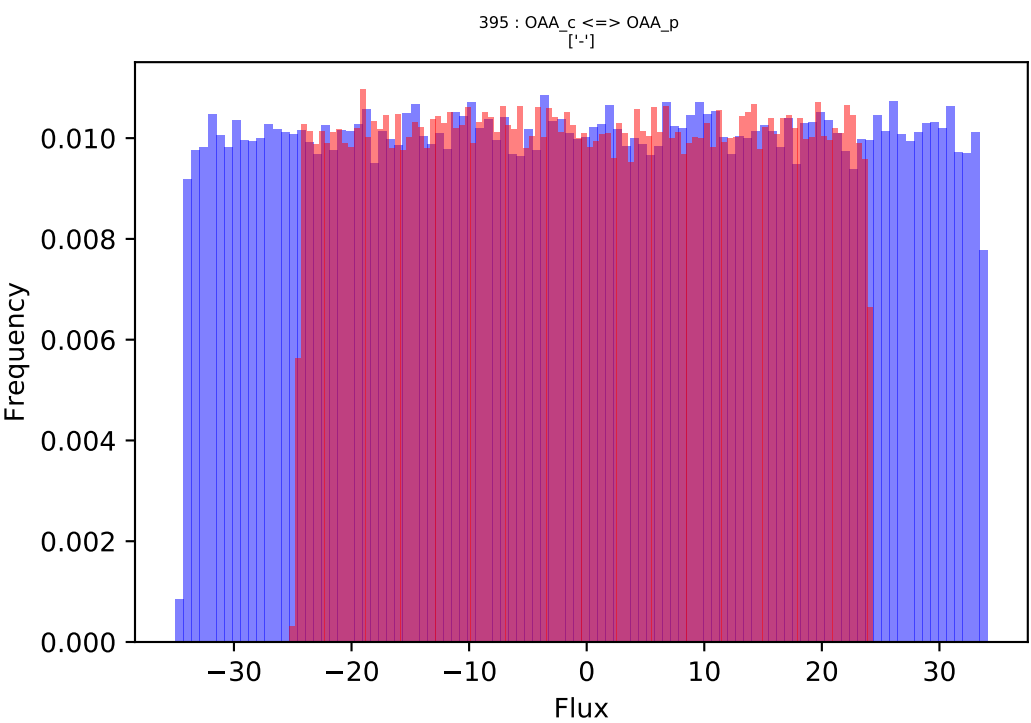

390 : Pyr_c <=> Pyr_m
['-']
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
Frequency
−250
−200
−150
−100
−50
0
50
100
Flux

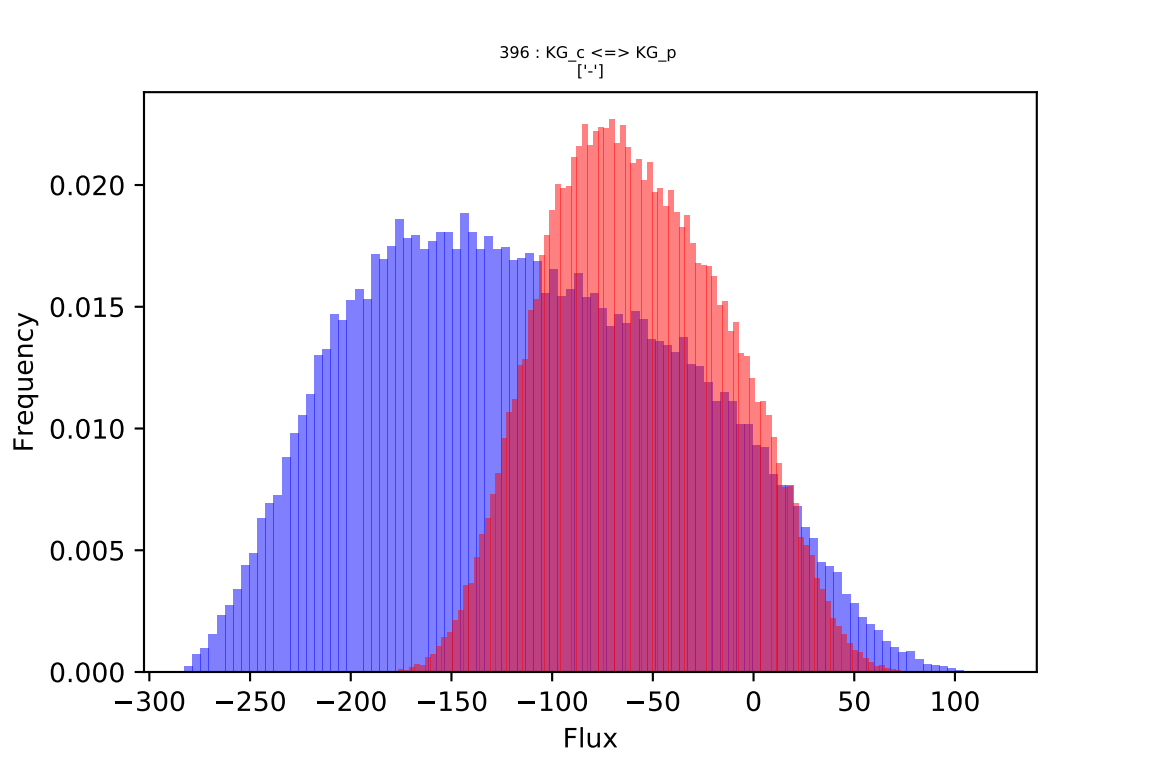

391 : Pyr_c <=> Pyr_p
['-']
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
Frequency
−100
−50
0
50
100
150
200
250
Flux

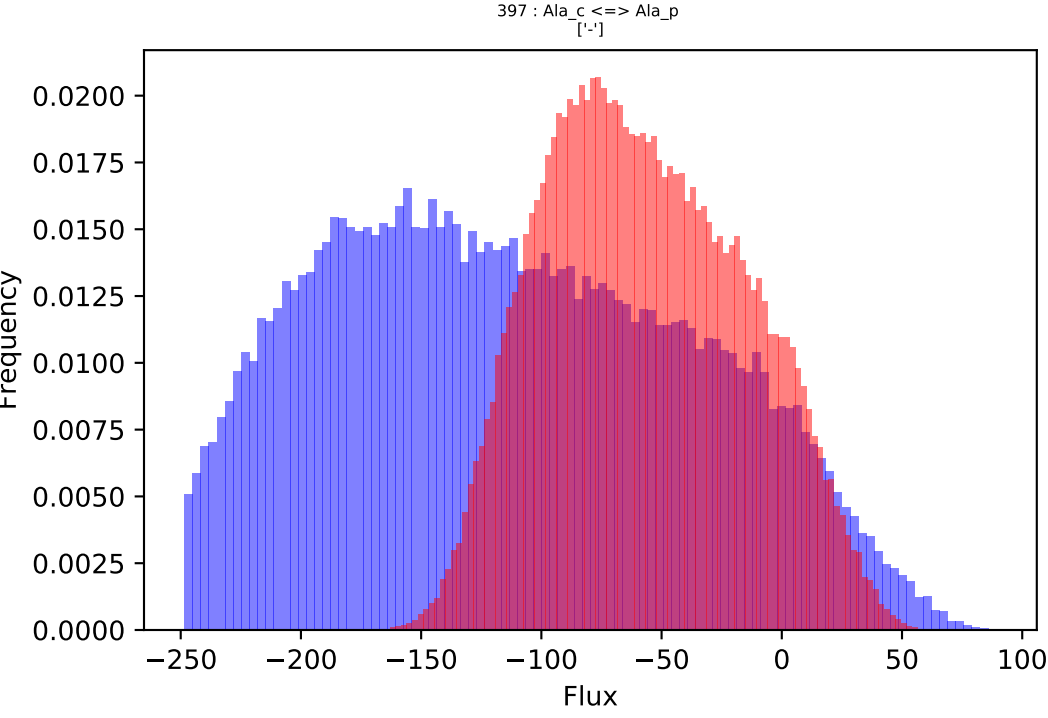

392 : GCA_c <=> GCA_p
['-']
Frequency
0.00
0.01
0.02
0.03
0.04
0.0
0.5
1.0
1.5
2.0
2.5
Flux

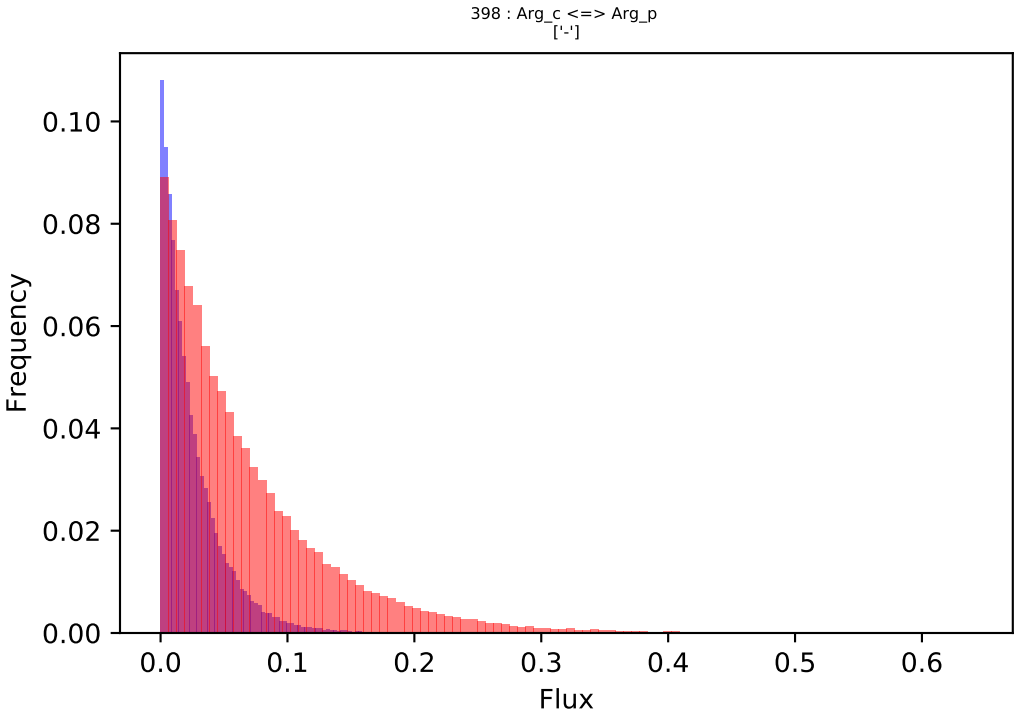

393 : GCEA_c <=> GCEA_p
['-']
0.08
0.06
0.04
0.02
0.00
Frequency
−1.50
−1.25
−1.00
−0.75
−0.50
−0.25
0.00
Flux

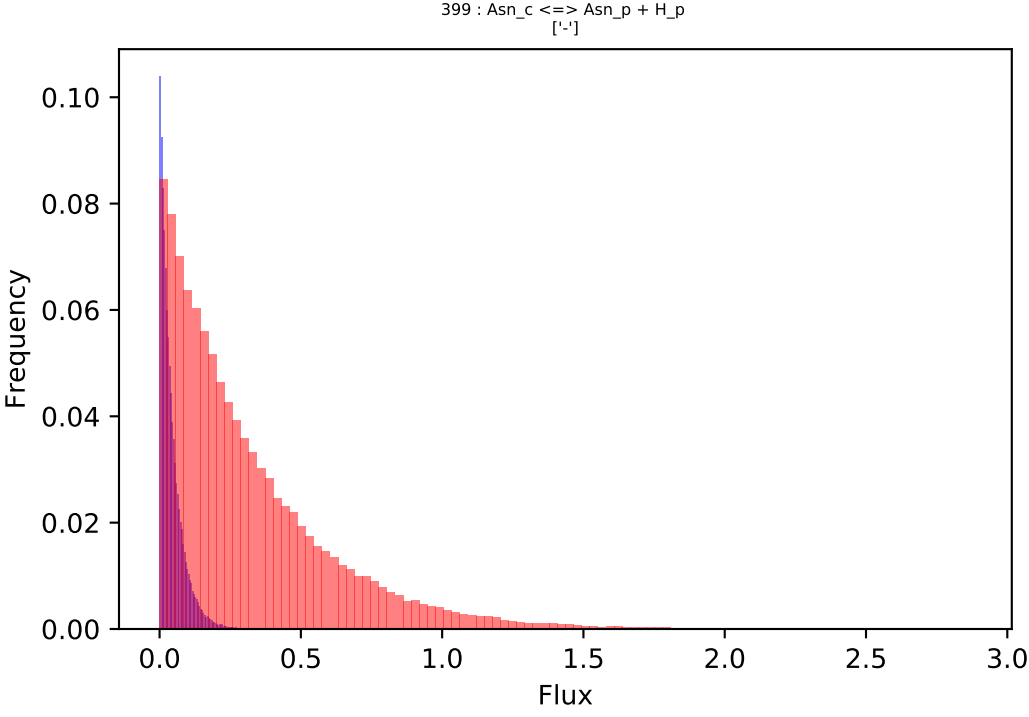

394 : Mal_c <=> Mal_p
['-']
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.25
0.50
0.75
1.00
1.25
1.50
Flux

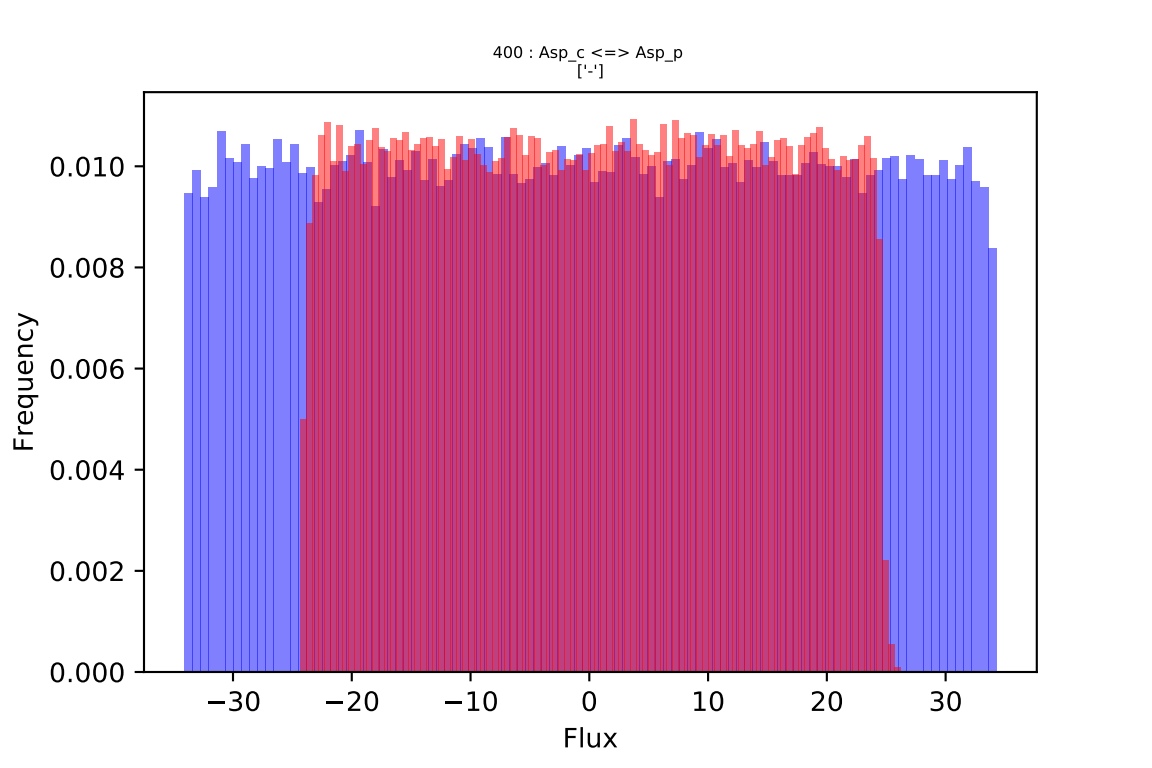

395 : OAA_c <=> OAA_p
['-']
0.010
0.008
0.006
0.004
0.002
0.000
Frequency
−30
−20
−10
0
10
20
30
Flux

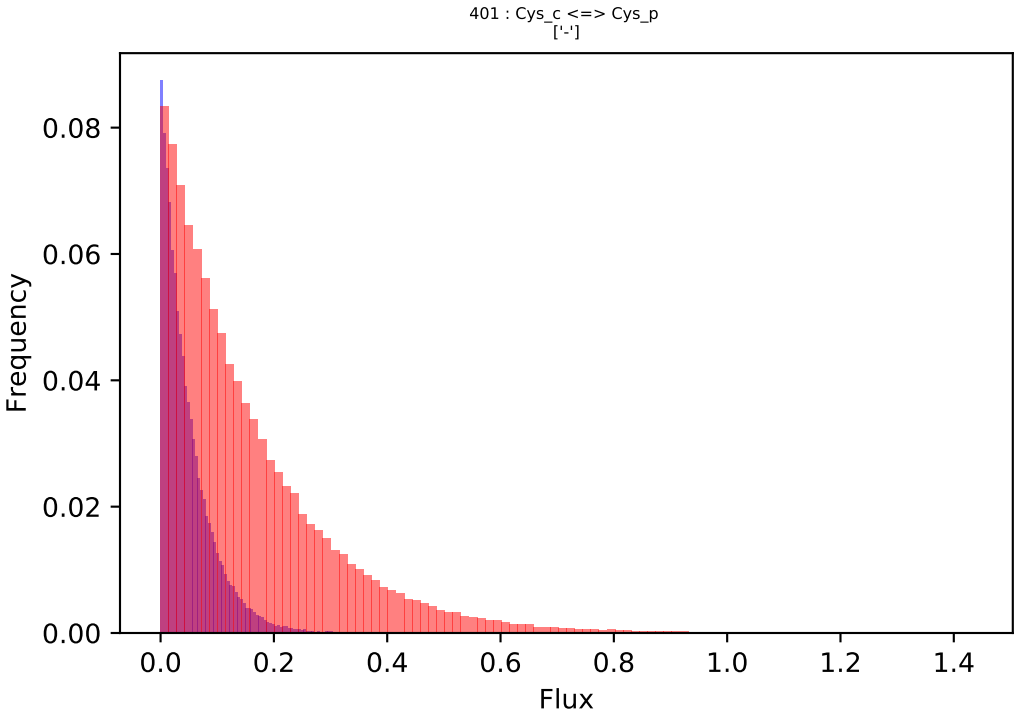

396 : KG_c <=> KG_p
['-']
0.020
0.015
0.010
0.005
0.000
Frequency
−300
−250
−200
−150
−100
−50
0
50
100
Flux

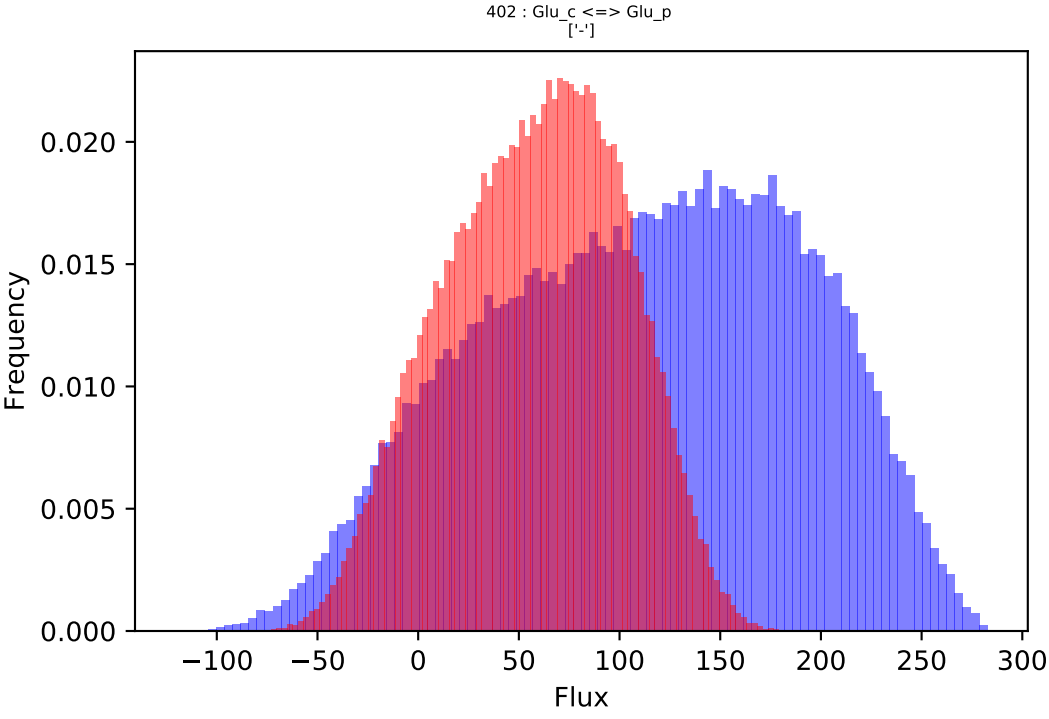

397 : Ala_c <=> Ala_p
['-']
Frequency
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
−250
−200
−150
−100
−50
0
50
100
Flux

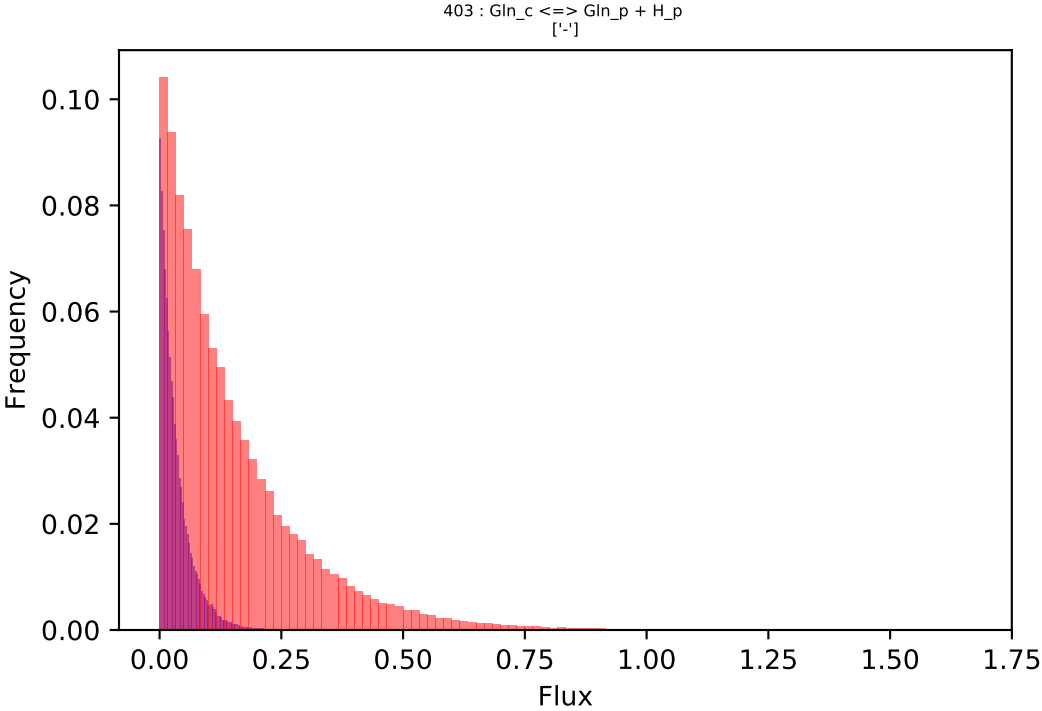

398 : Arg_c <=> Arg_p
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Flux

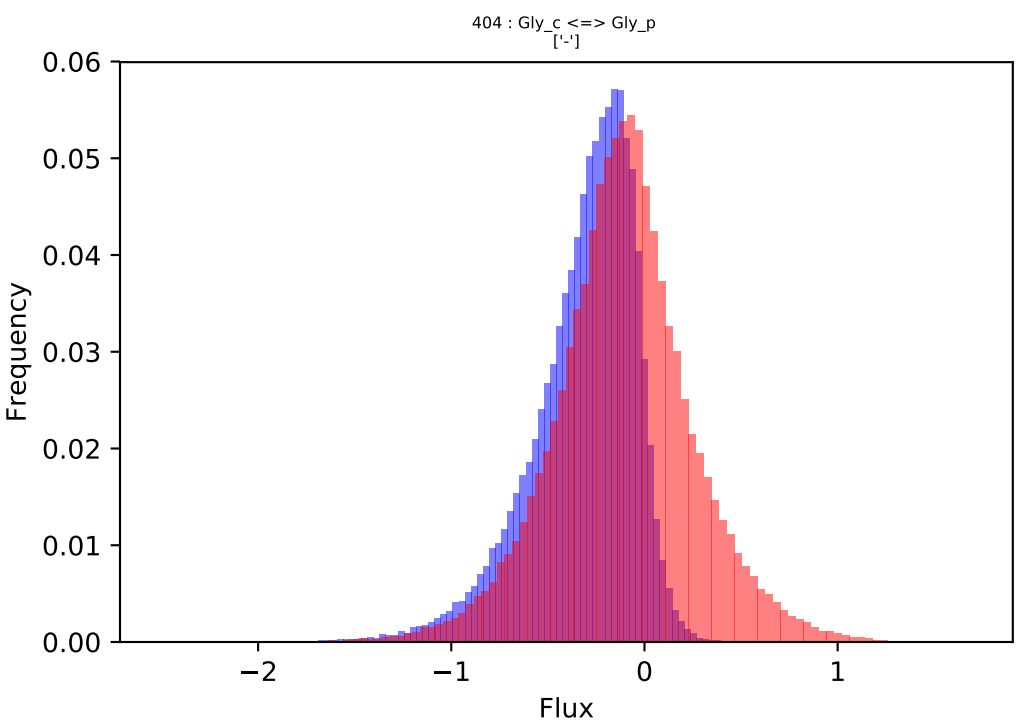

399 : Asn_c <=> Asn_p + H_p
['-']
Frequency
0.10
0.08
0.06
0.04
0.02
0.00
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Flux

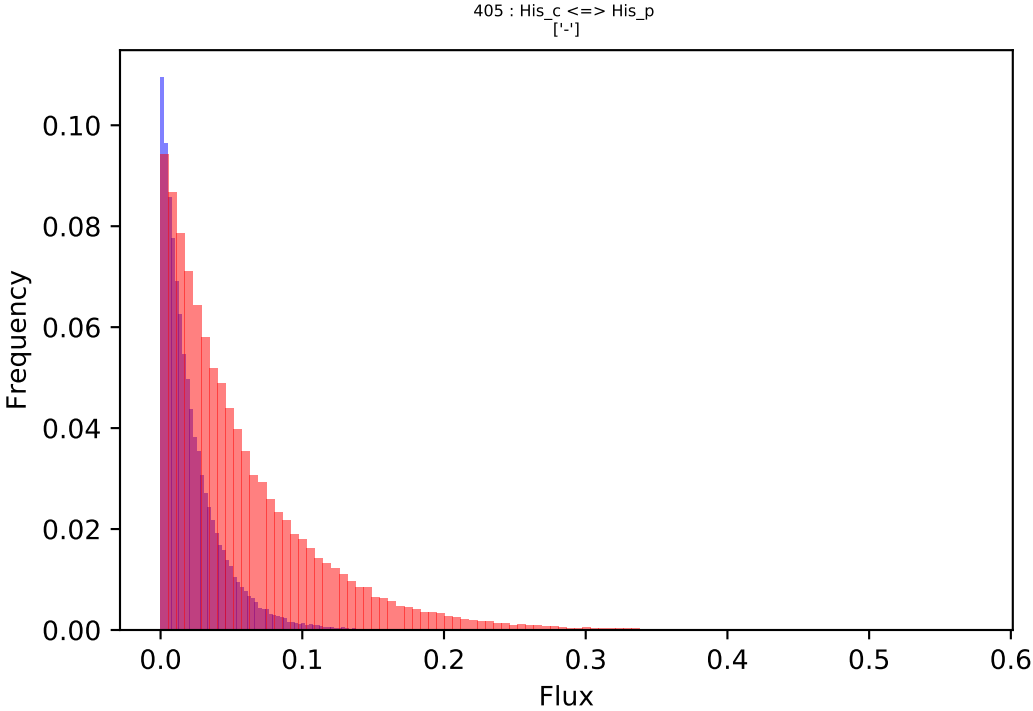

400 : Asp_c <=> Asp_p
['-']
Frequency
0.010
0.008
0.006
0.004
0.002
0.000
−30
−20
−10
0
10
20
30
Flux

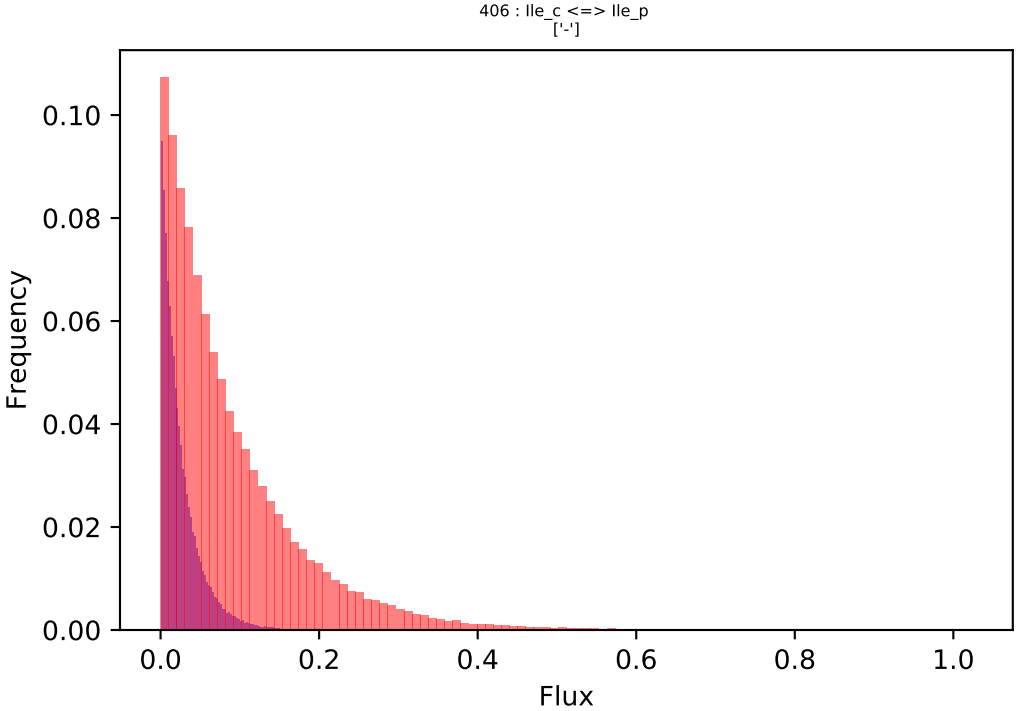

401 : Cys_c <=> Cys_p
['-']
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

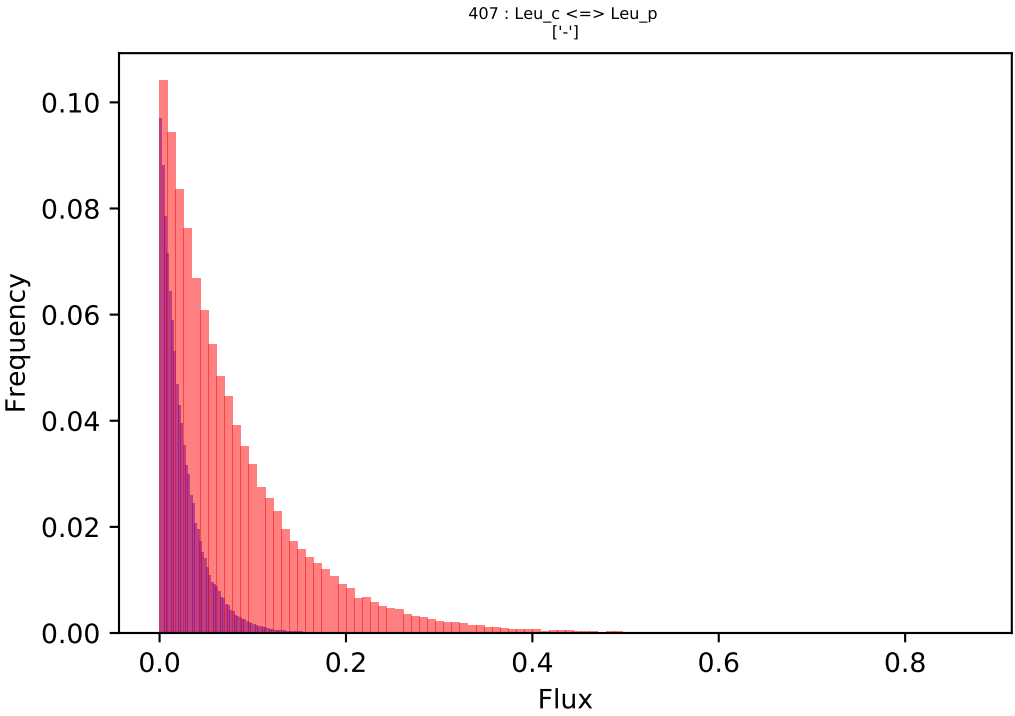

402 : Glu_c <=> Glu_p
['-']
Frequency
0.020
0.015
0.010
0.005
0.000
−100
−50
0
50
100
150
200
250
300
Flux

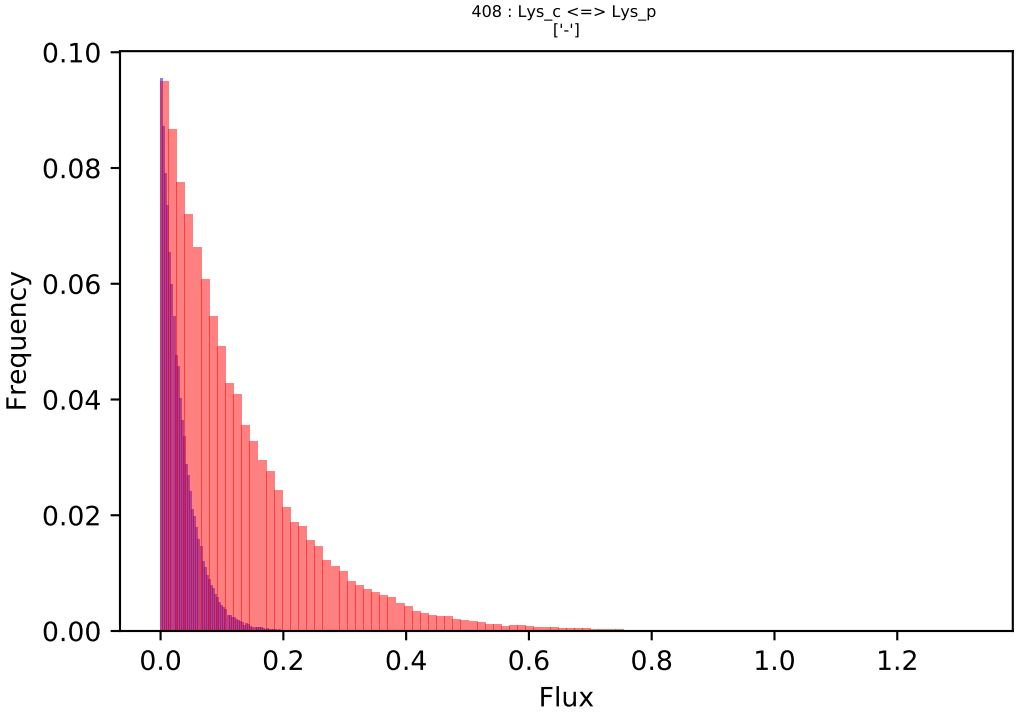

403 : Gln_c <=> Gln_p + H_p
['-']
Frequency
0.10
0.08
0.06
0.04
0.02
0.00
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

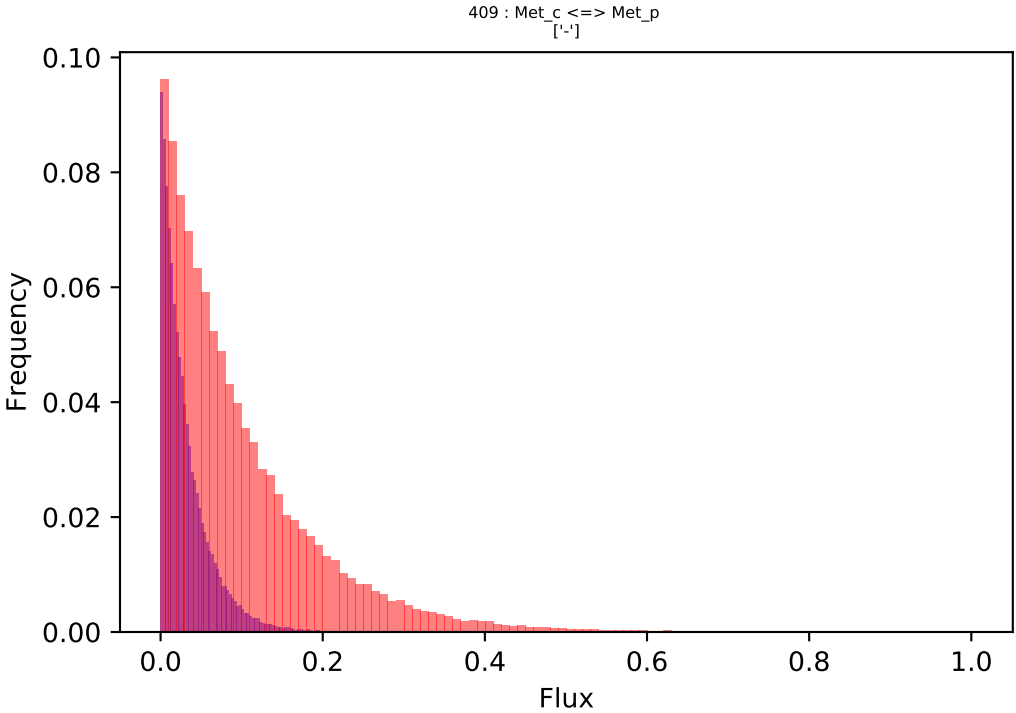

404 : Gly_c <=> Gly_p
['-']
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
−2
−1
0
1
Flux

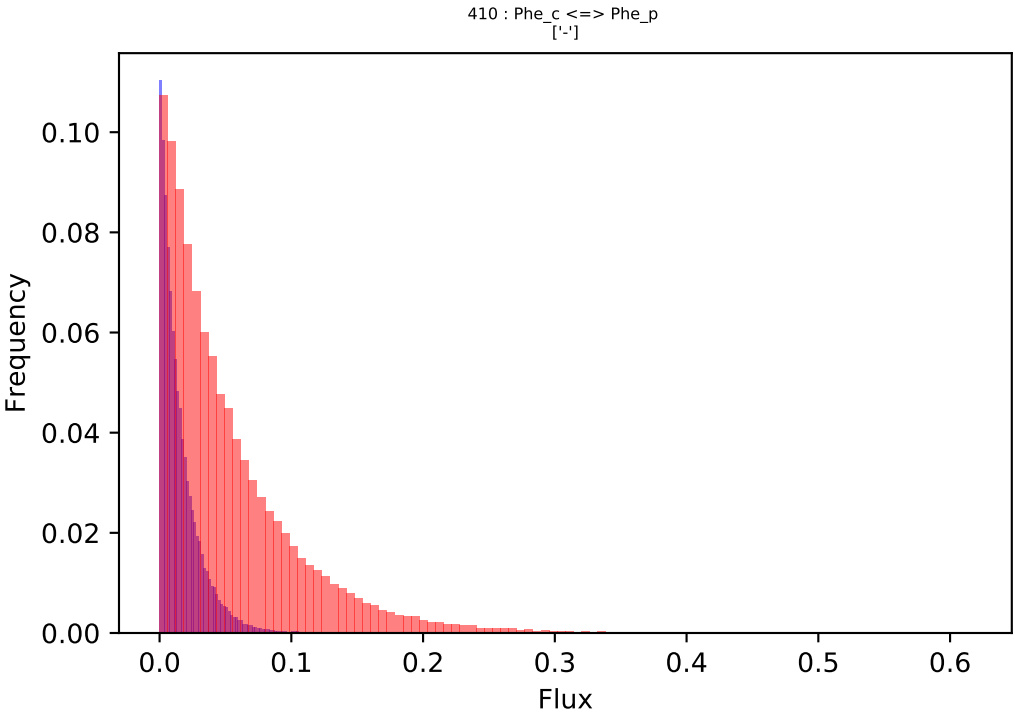

405 : His_c <=> His_p
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Flux

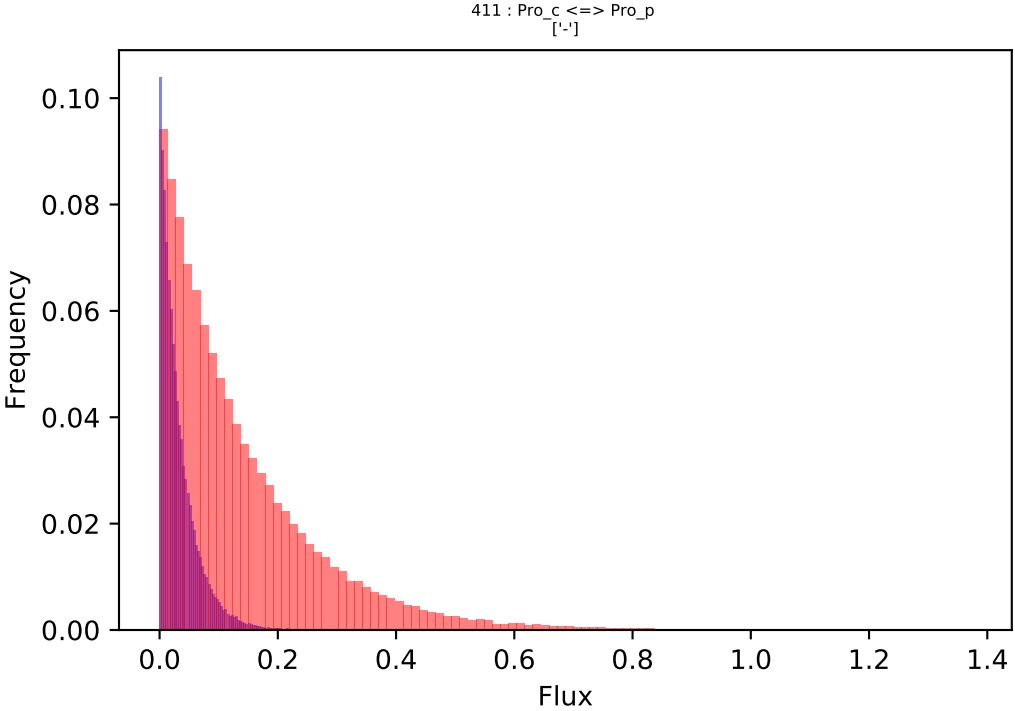

406 : Ile_c <=> Ile_p
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.0
0.2
0.4
0.6
0.8
1.0
Flux

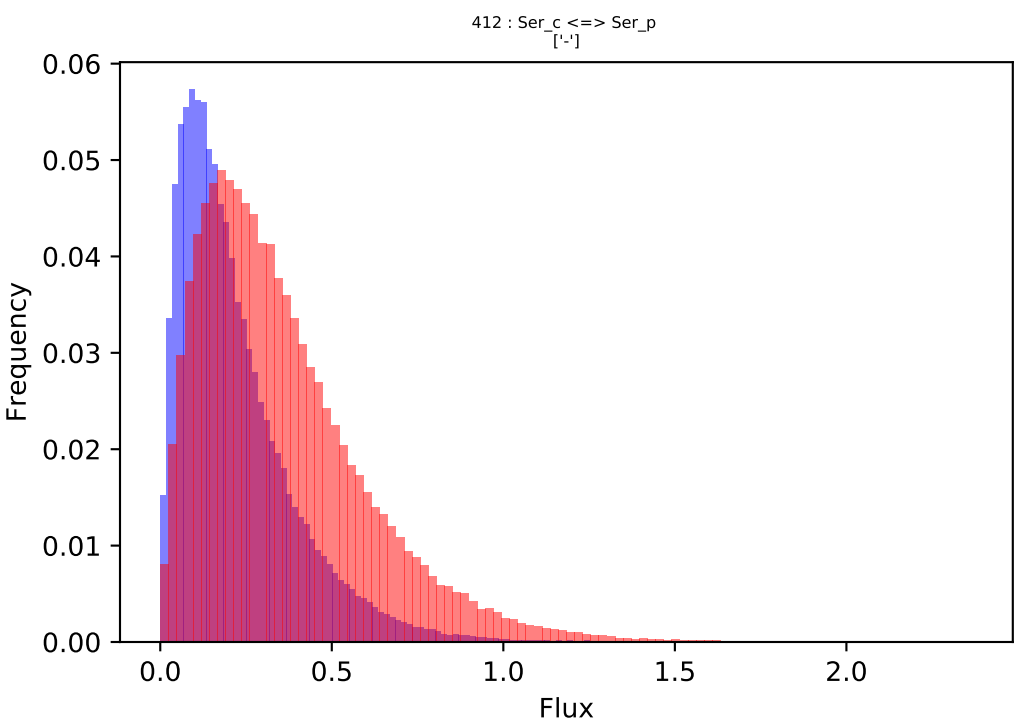

407 : Leu_c <=> Leu_p
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
Flux

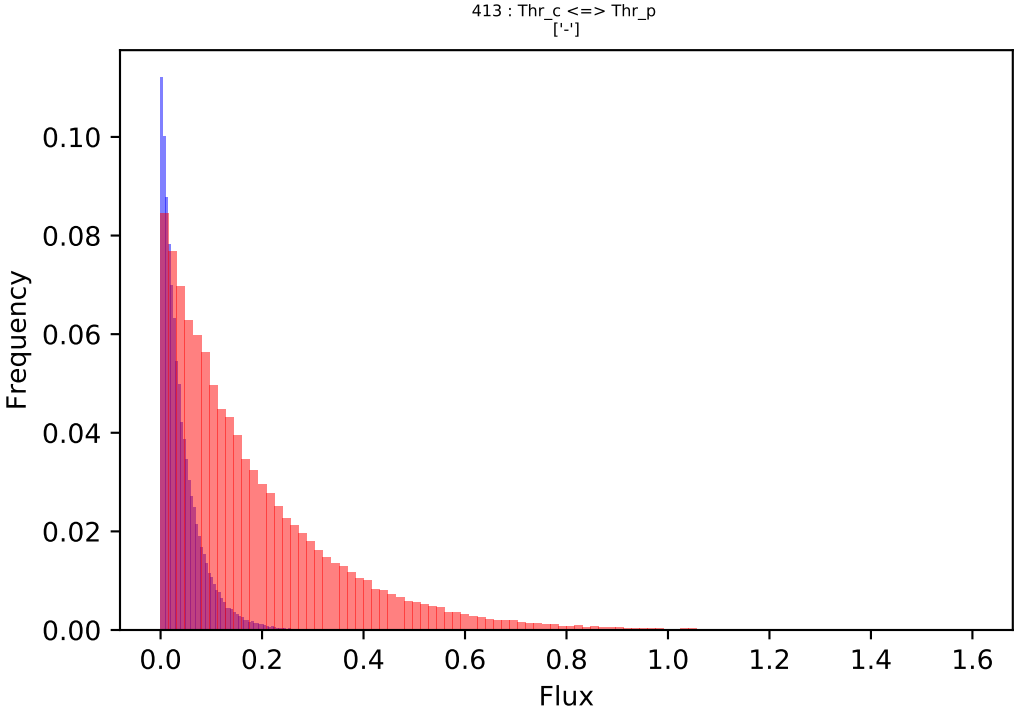

408 : Lys_c <=> Lys_p
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Flux

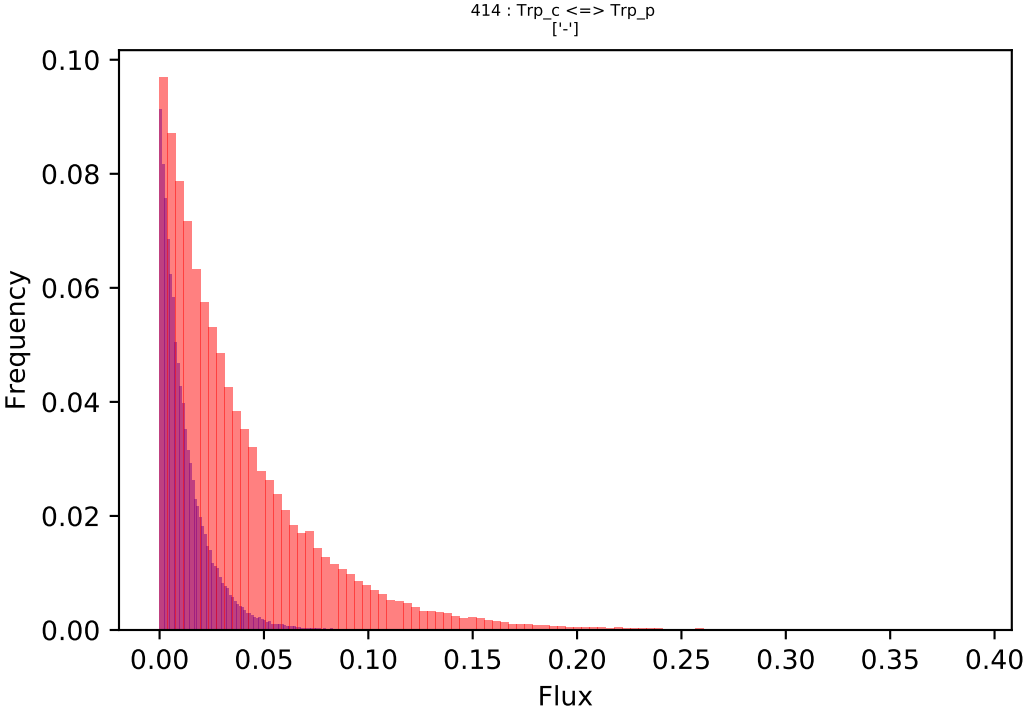

409 : Met_c <=> Met_p
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
Flux

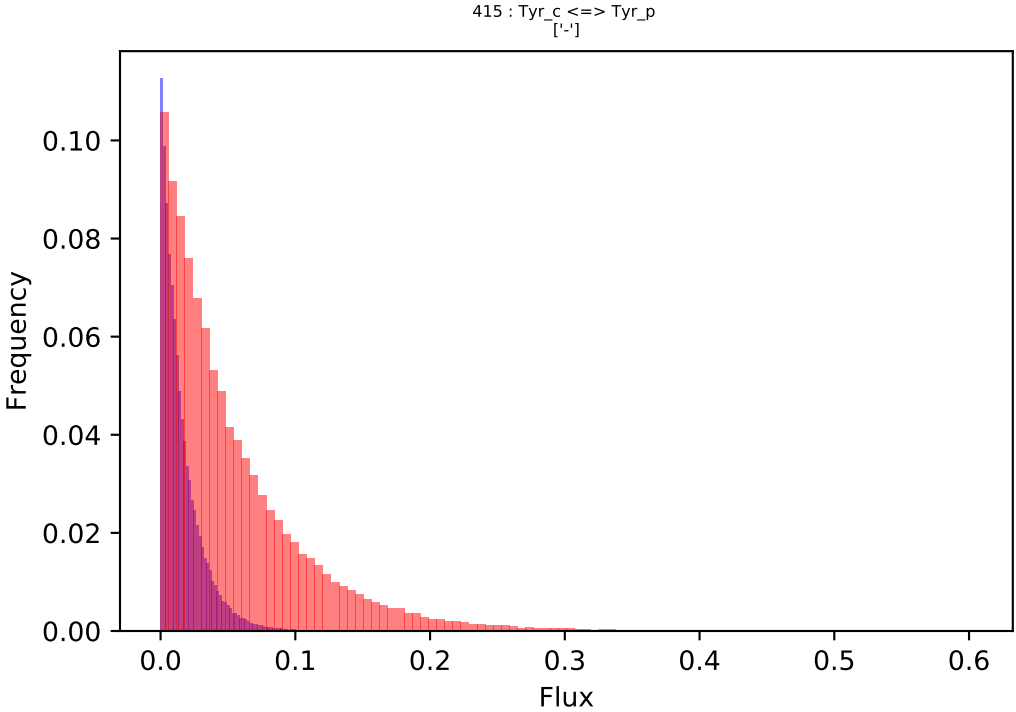

410 : Phe_c <=> Phe_p
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Flux

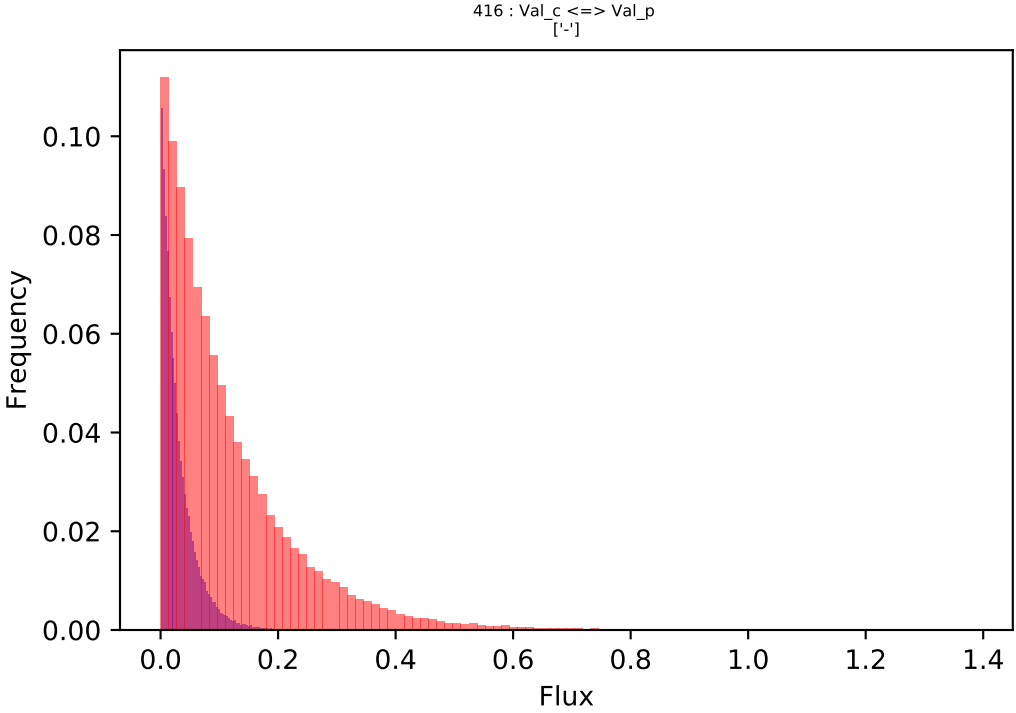

411 : Pro_c <=> Pro_p
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

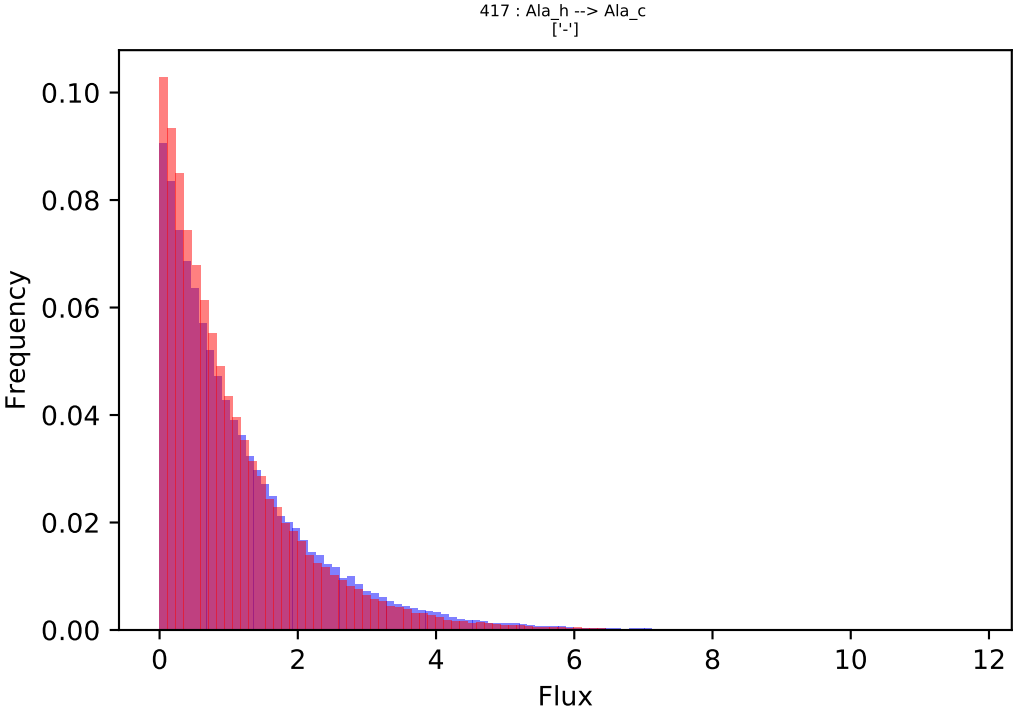

412 : Ser_c <=> Ser_p
['-']
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
0.0
0.5
1.0
1.5
2.0
Flux

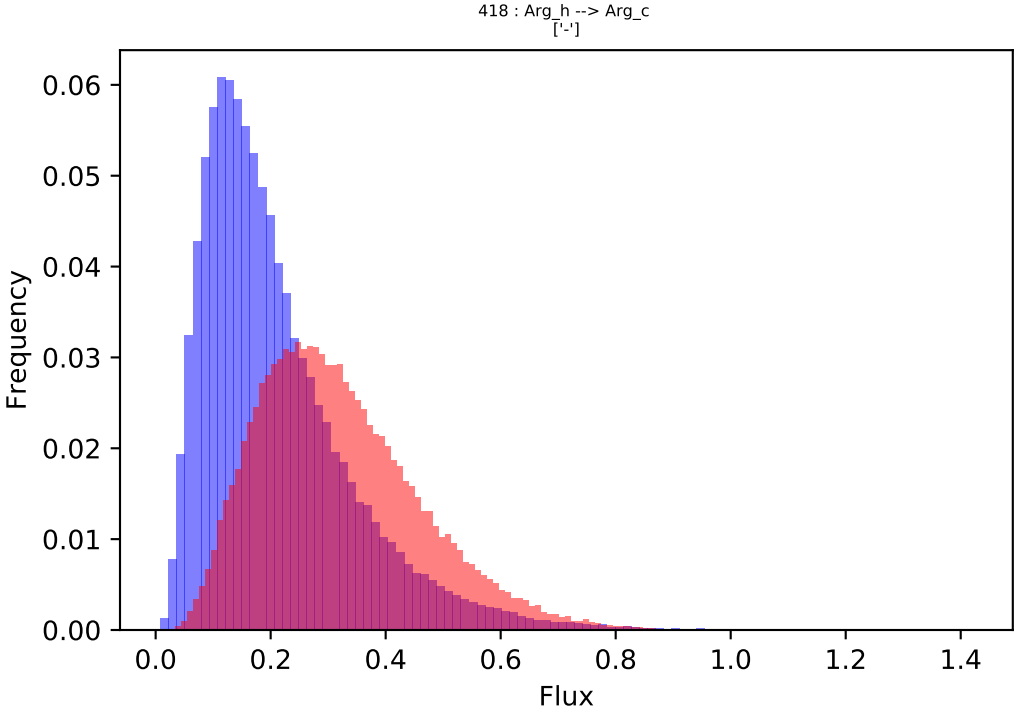

413 : Thr_c <=> Thr_p
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Flux

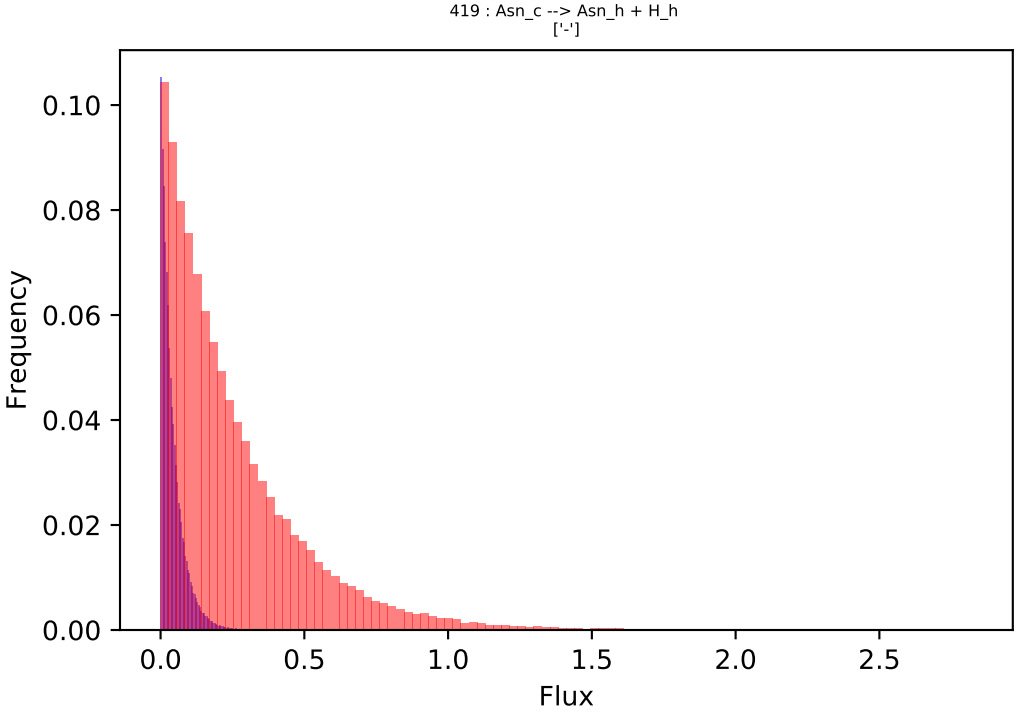

414 : Trp_c <=> Trp_p
['-']
Frequency
Flux
0.00
0.02
0.04
0.06
0.08
0.10
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40

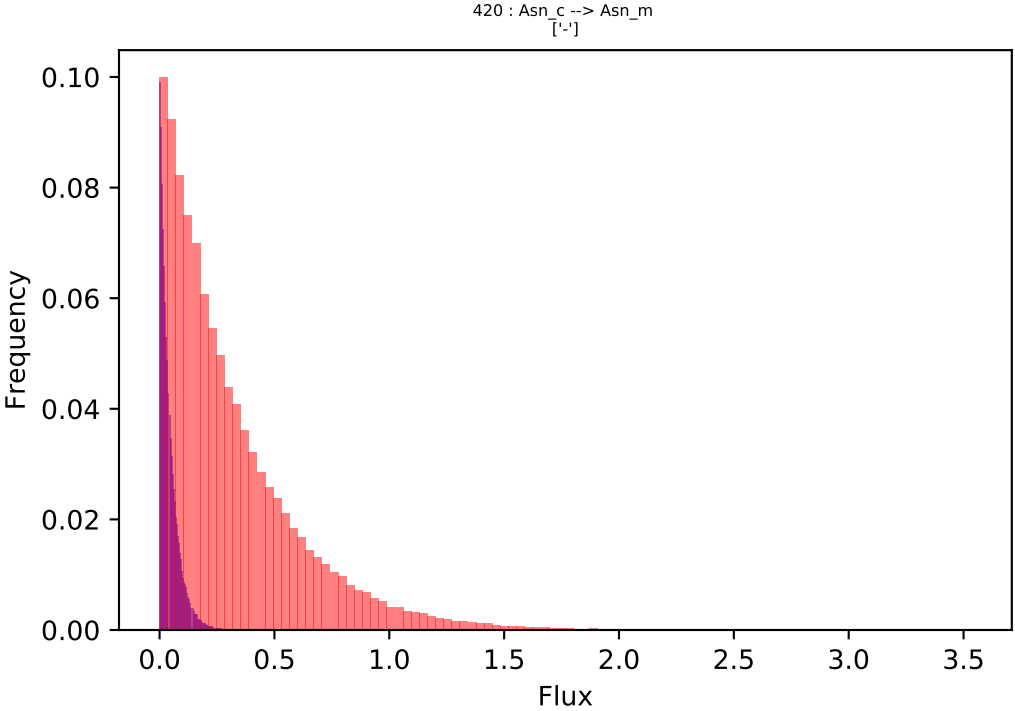

415 : Tyr_c <=> Tyr_p
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Flux

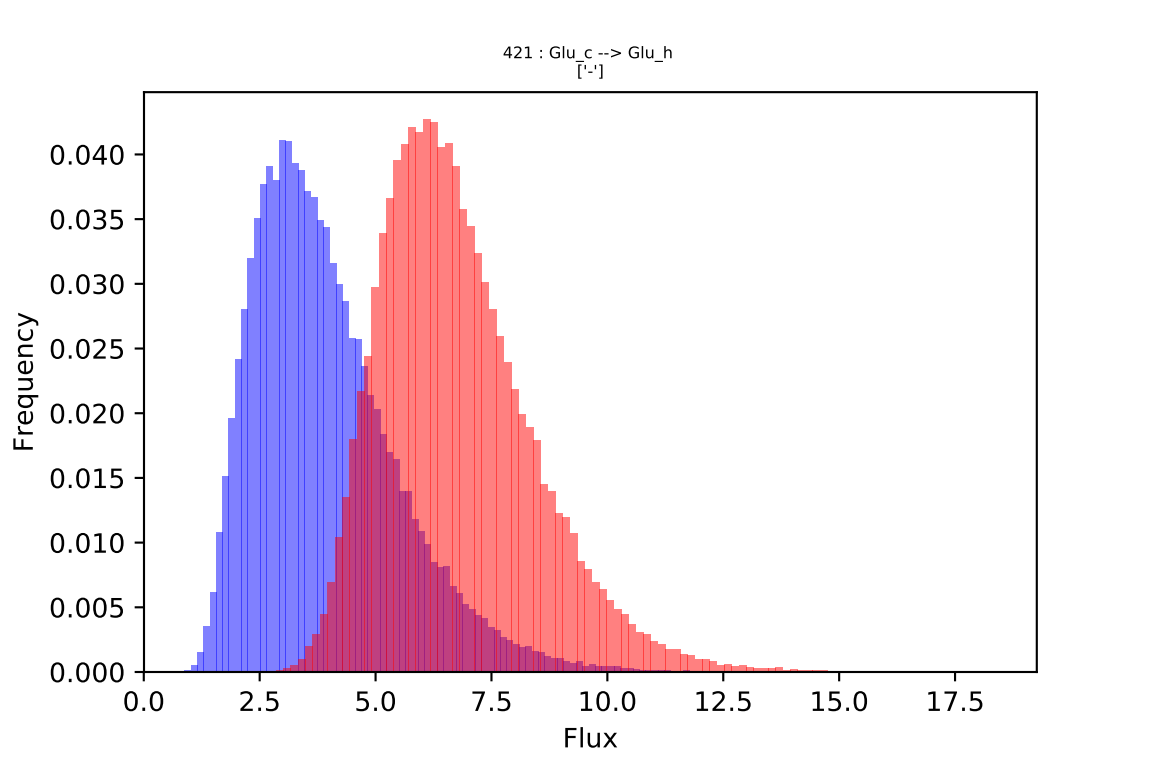

416 : Val_c <=> Val_p
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

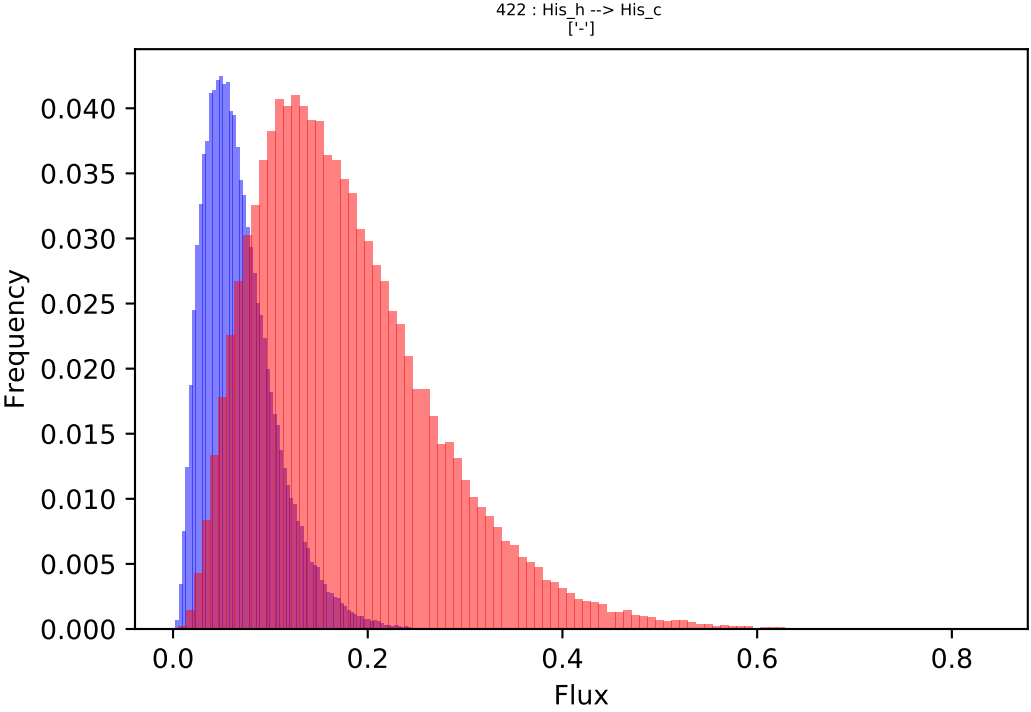

417 : Ala_h --> Ala_c
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0
2
4
6
8
10
12
Flux

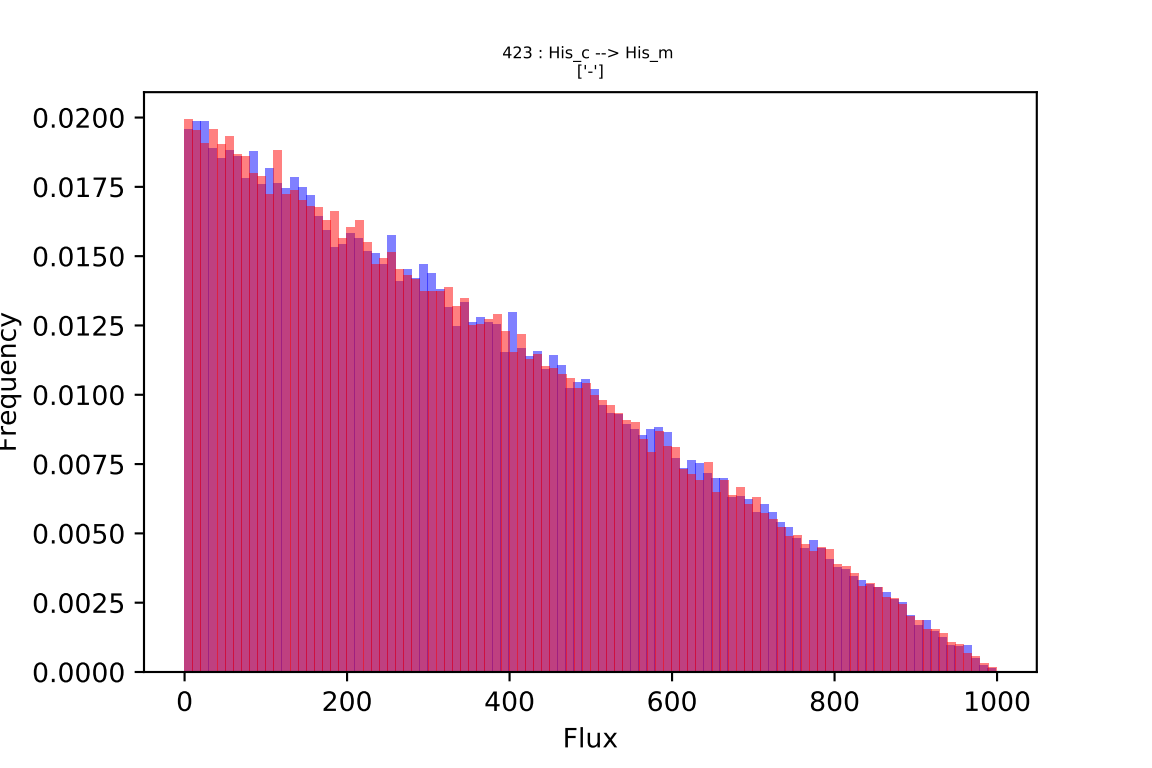

418 : Arg_h --> Arg_c
['-']
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

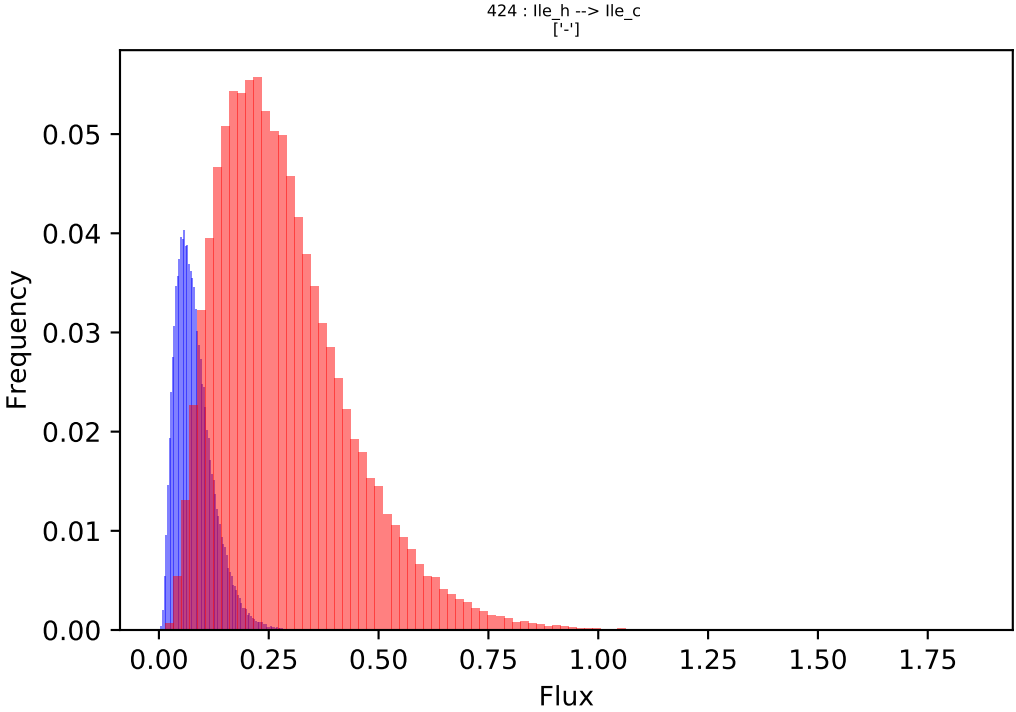

419 : Asn_c --> Asn_h + H_h
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
Flux

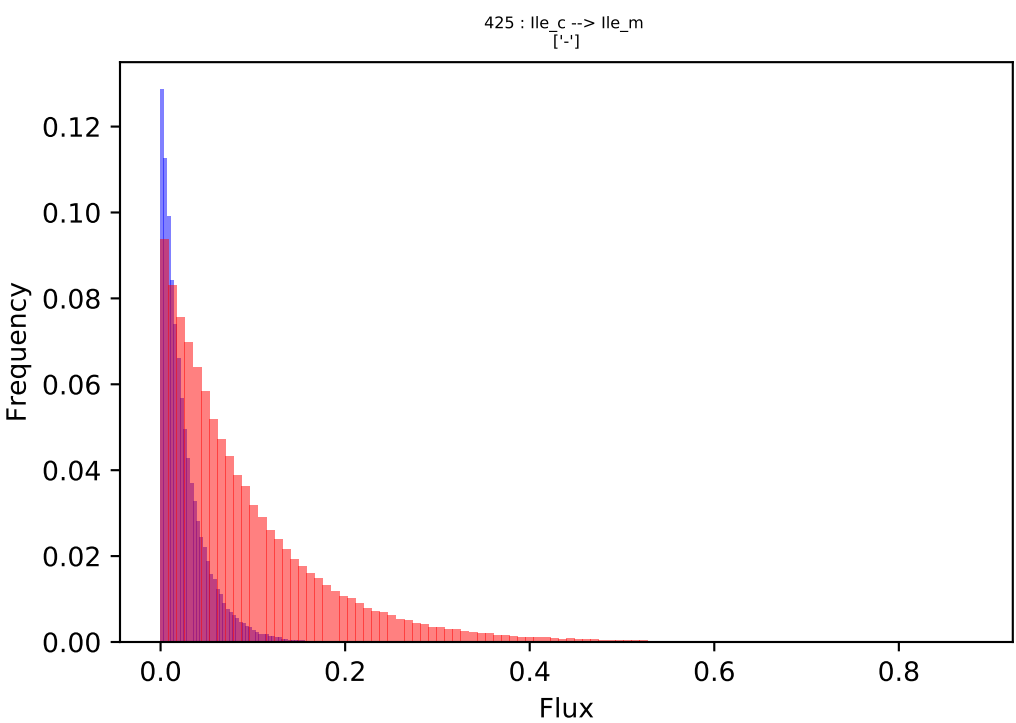

420 : Asn_c --> Asn_m
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
Flux

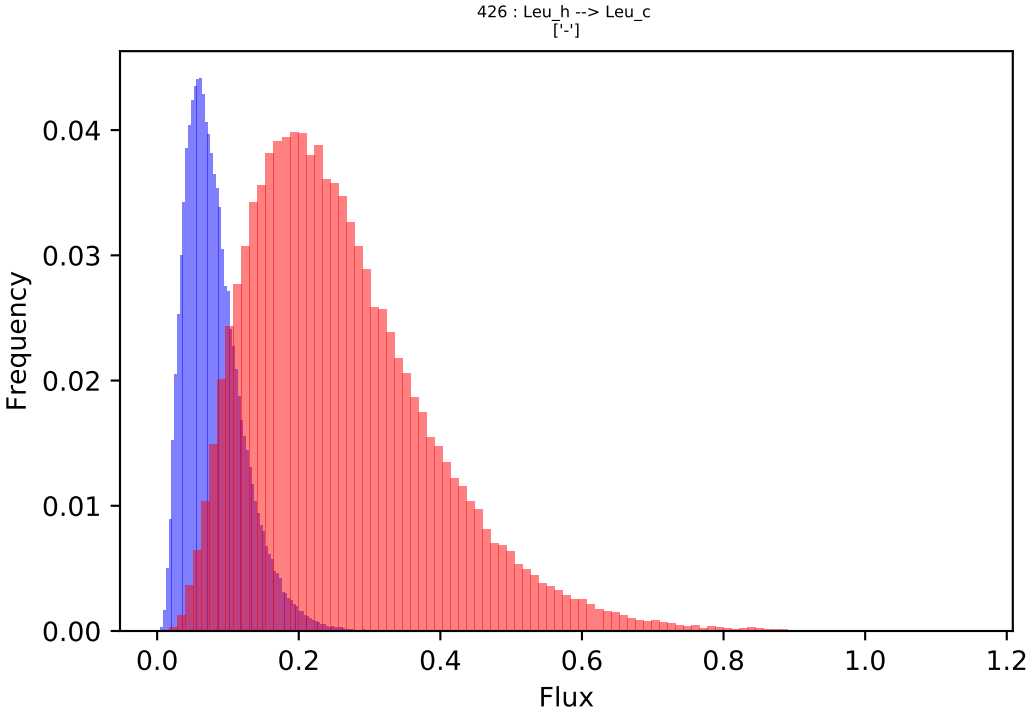

421 : Glu_c --> Glu_h
['-']
Frequency
Flux
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
0.040
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5

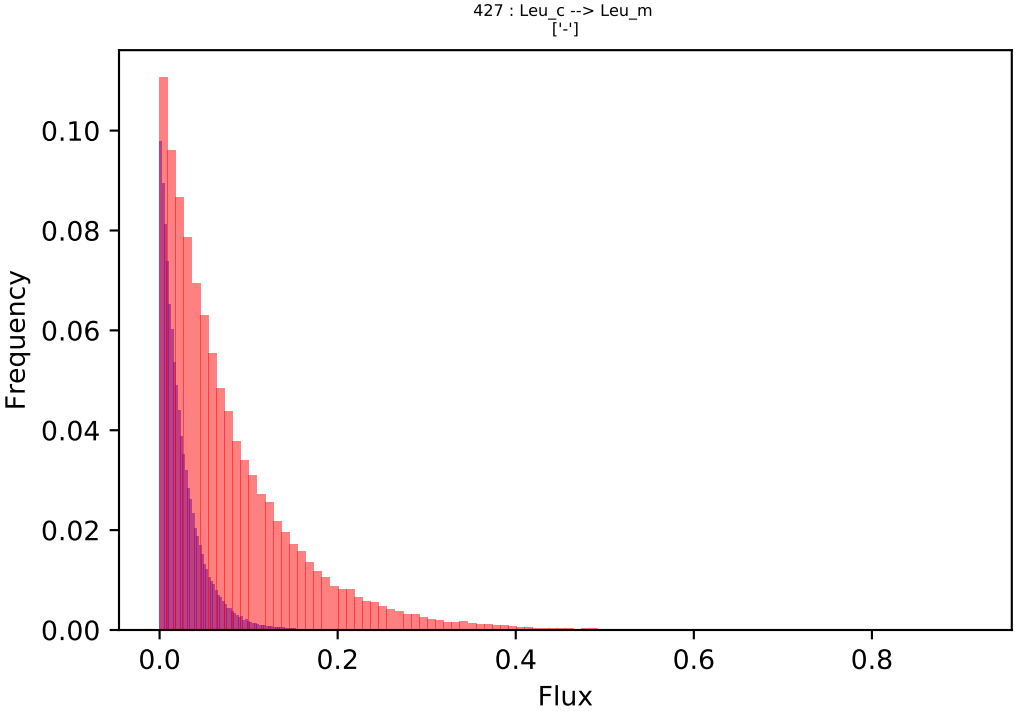

422 : His_h --> His_c
['-']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.2
0.4
0.6
0.8
Flux

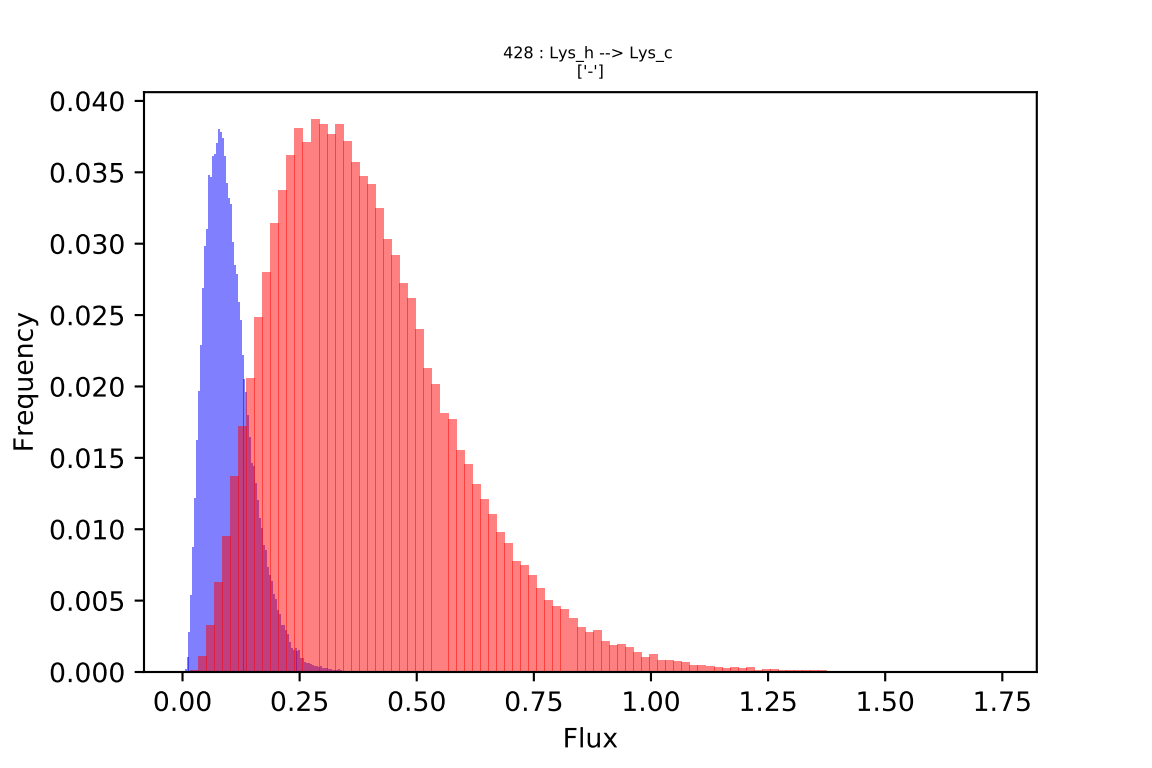

423 : His_c --> His_m
['-']
0.0200
0.0175
0.0150
0.0125
0.0100
0.0075
0.0050
0.0025
0.0000
Frequency
0
200
400
600
800
1000
Flux

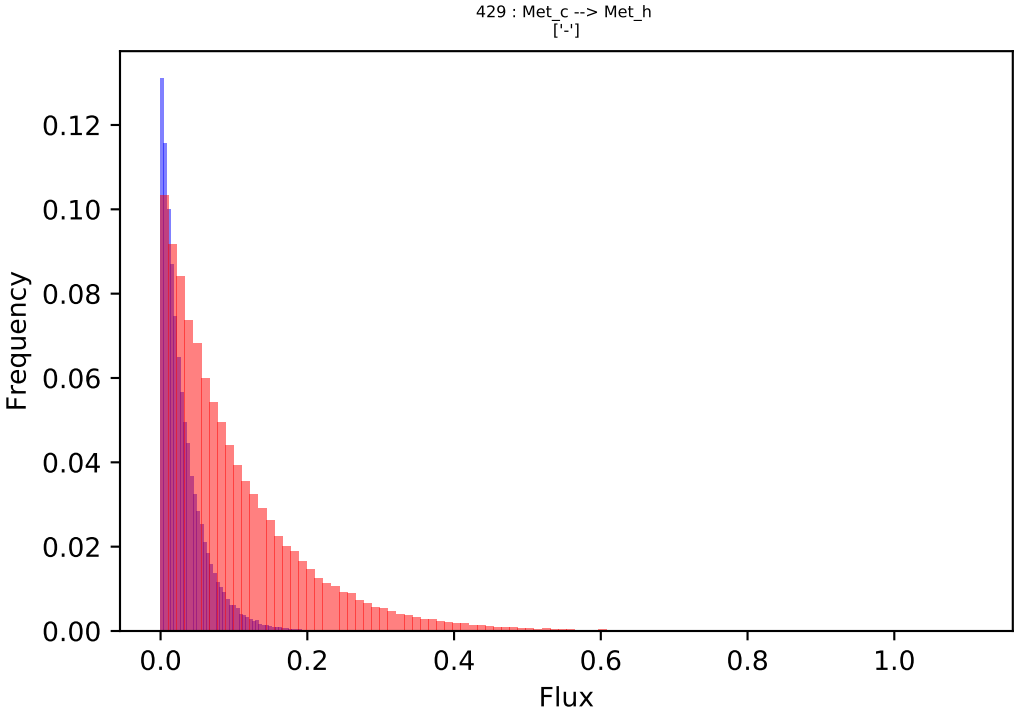

424 : Ile_h --> Ile_c
['-']
Frequency
0.05
0.04
0.03
0.02
0.01
0.00
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

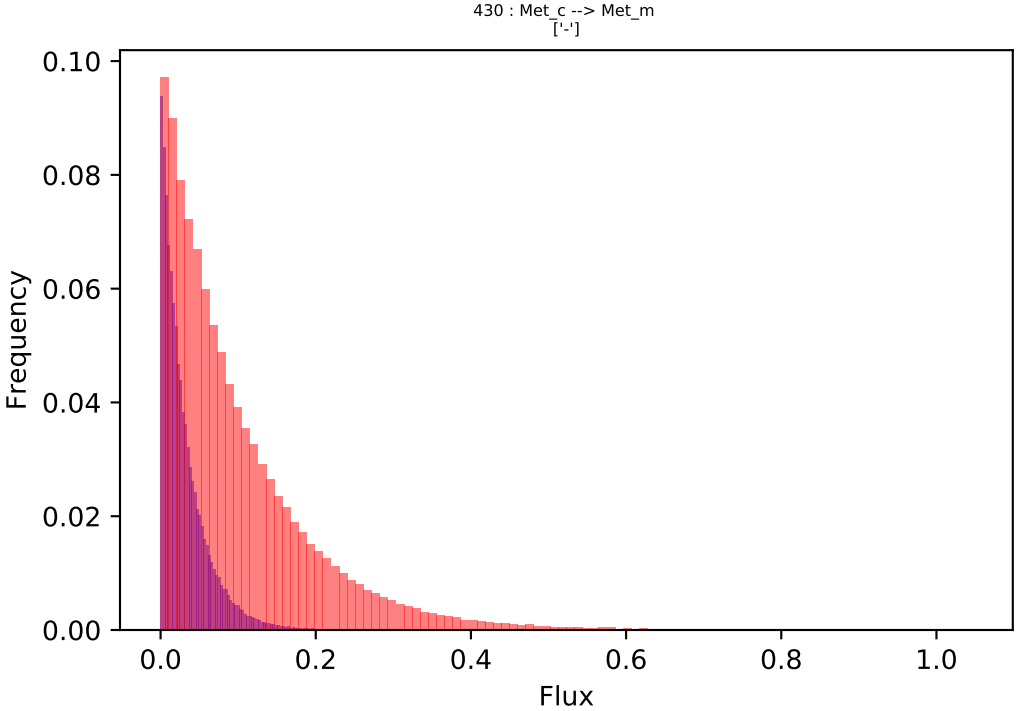

425 : Ile_c --> Ile_m
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
Flux

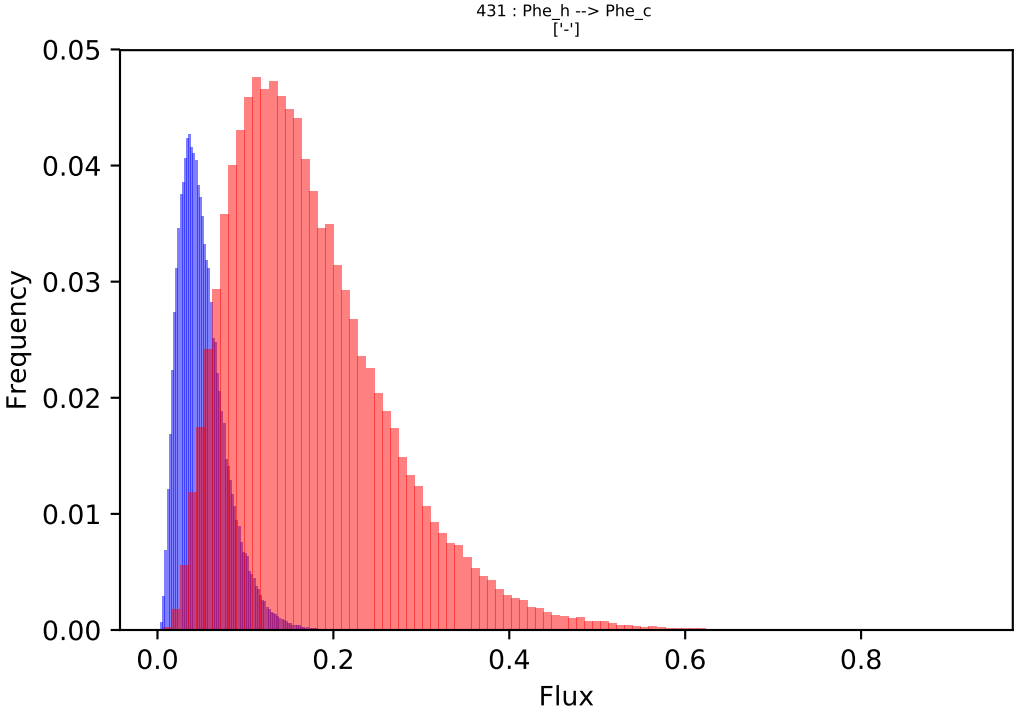

426 : Leu_h --> Leu_c
['-']
0.04
0.03
0.02
0.01
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Flux

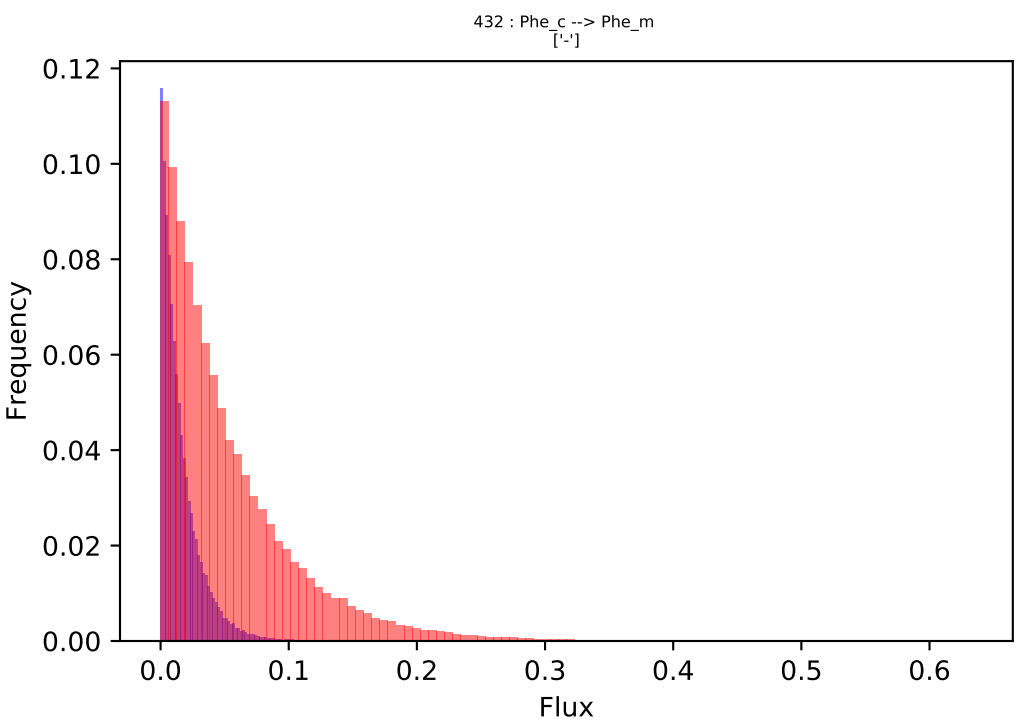

427 : Leu_c --> Leu_m
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.0
0.2
0.4
0.6
0.8
Flux

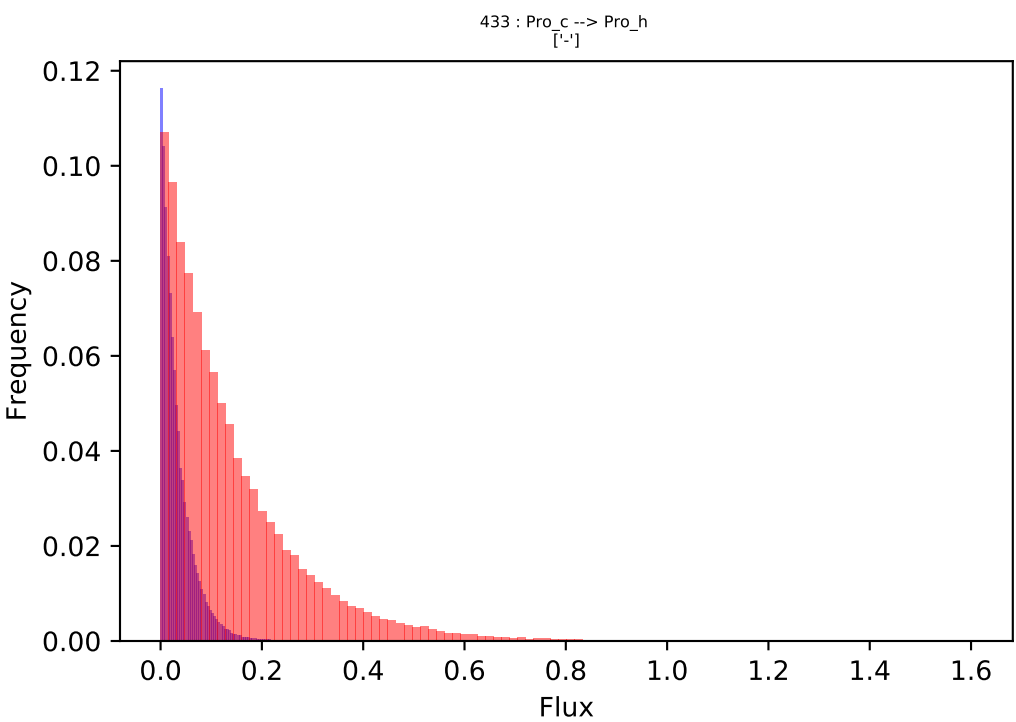

428 : Lys_h --> Lys_c
['-']
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

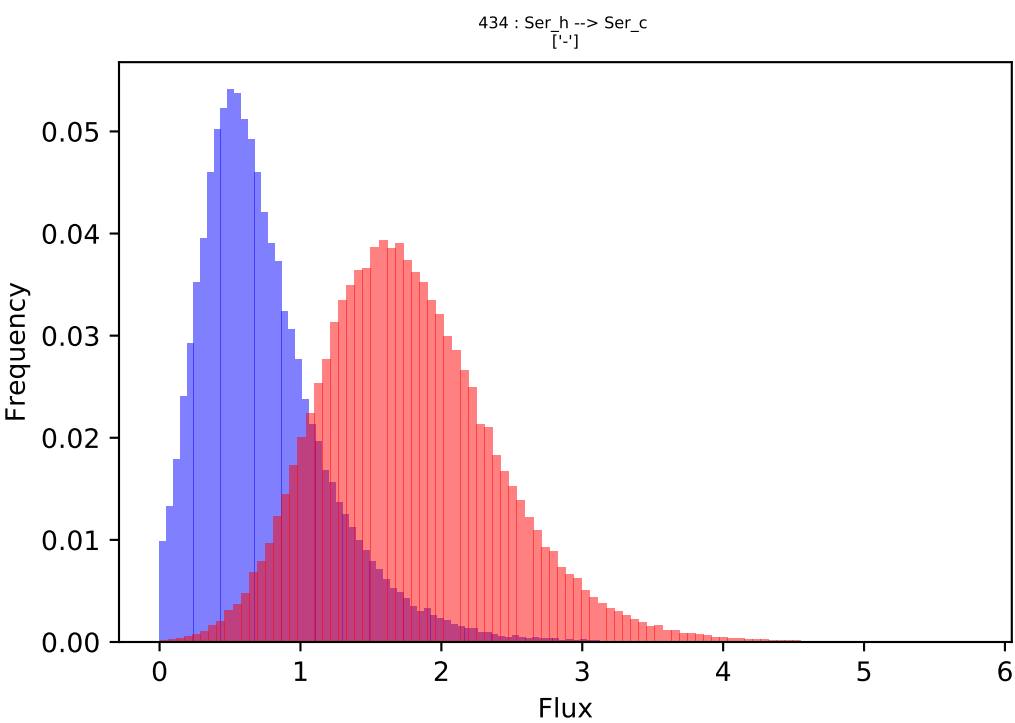

429 : Met_c --> Met_h
['-']
Frequency
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0.0
0.2
0.4
0.6
0.8
1.0
Flux

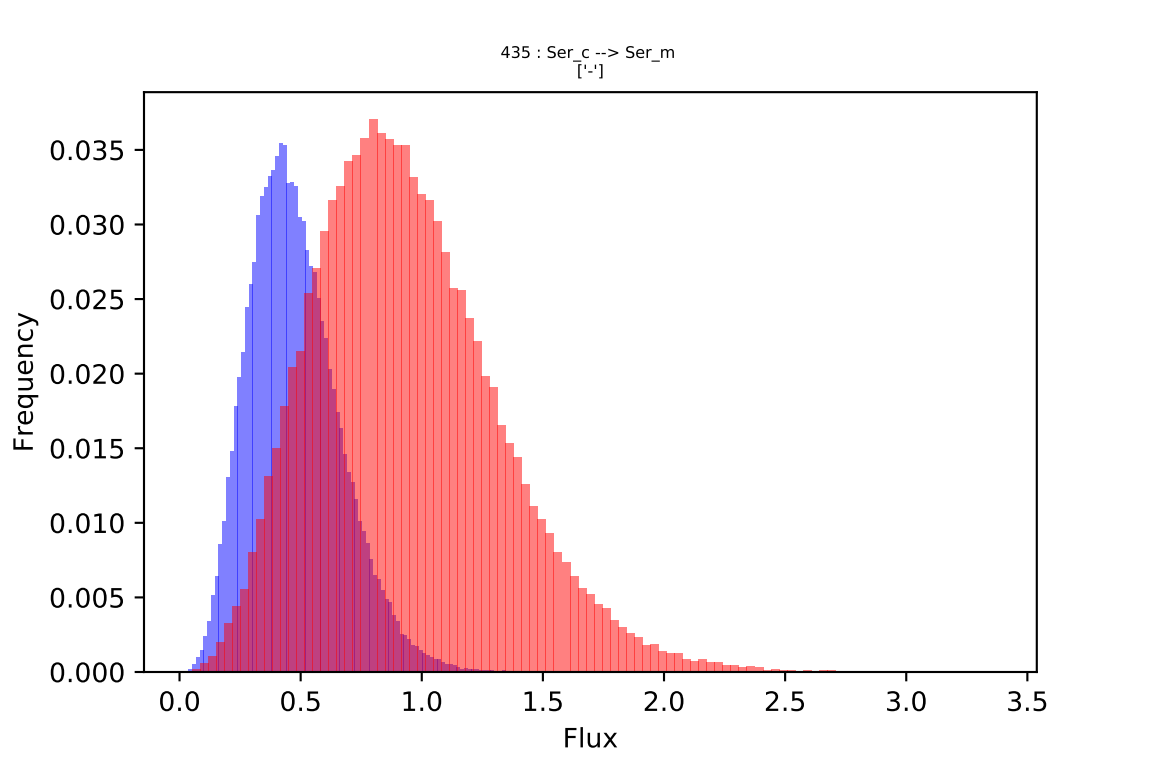

430 : Met_c --> Met_m
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
Flux

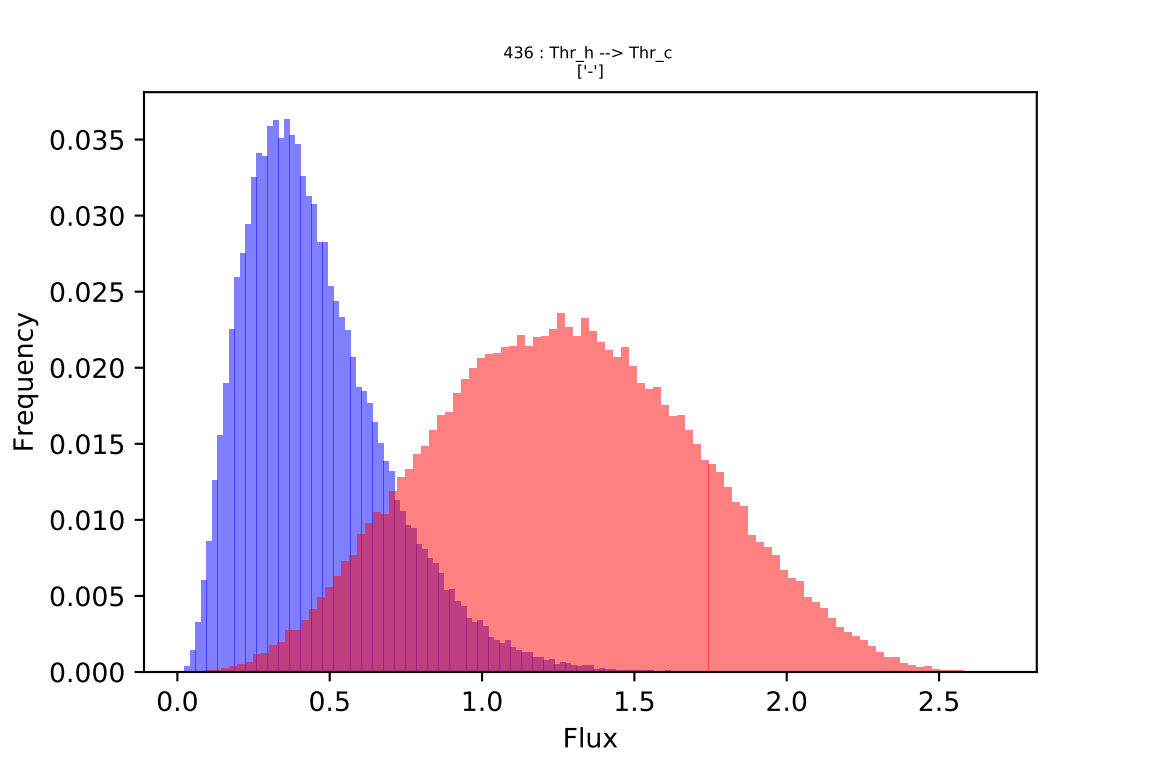

431 : Phe_h --> Phe_c
['-']
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
Flux

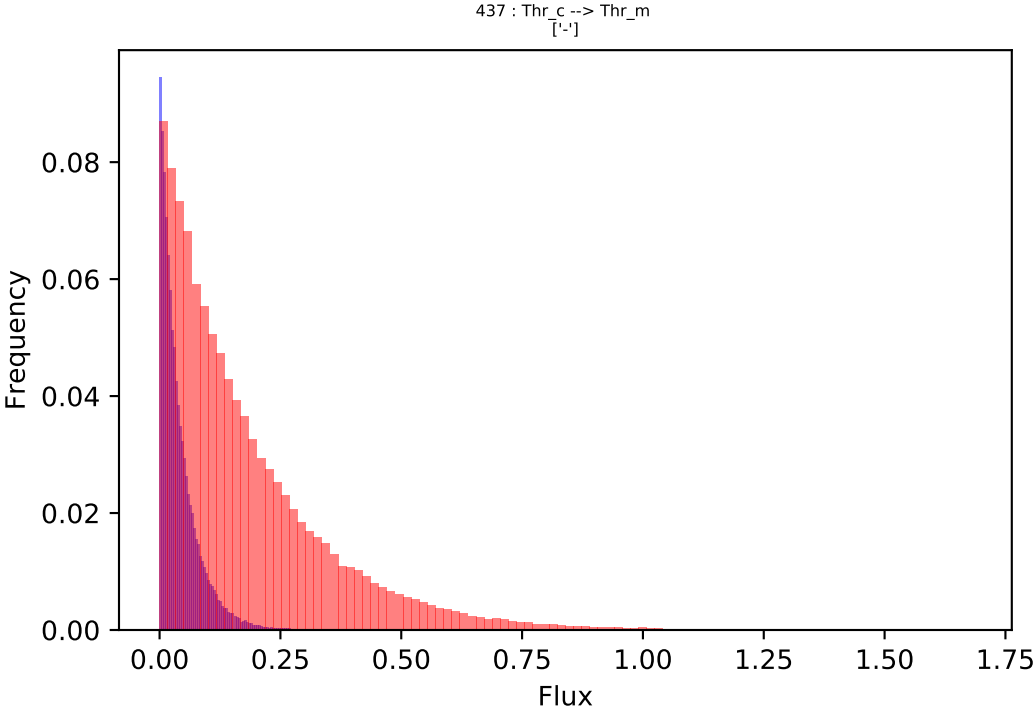

432 : Phe_c --> Phe_m
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Flux

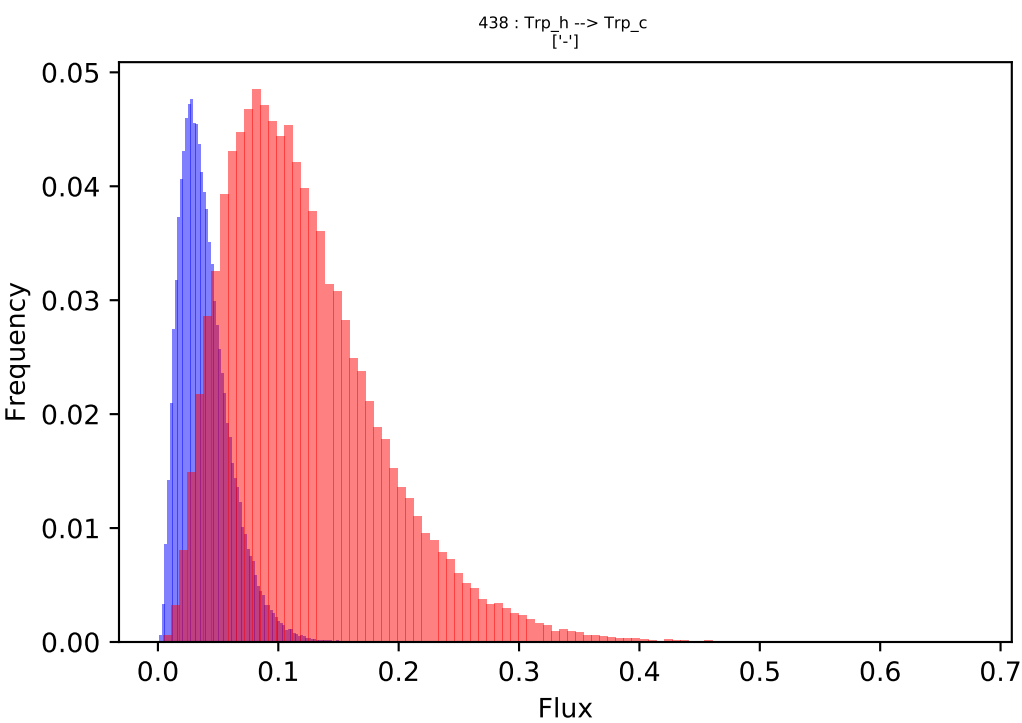

433 : Pro_c --> Pro_h
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Flux

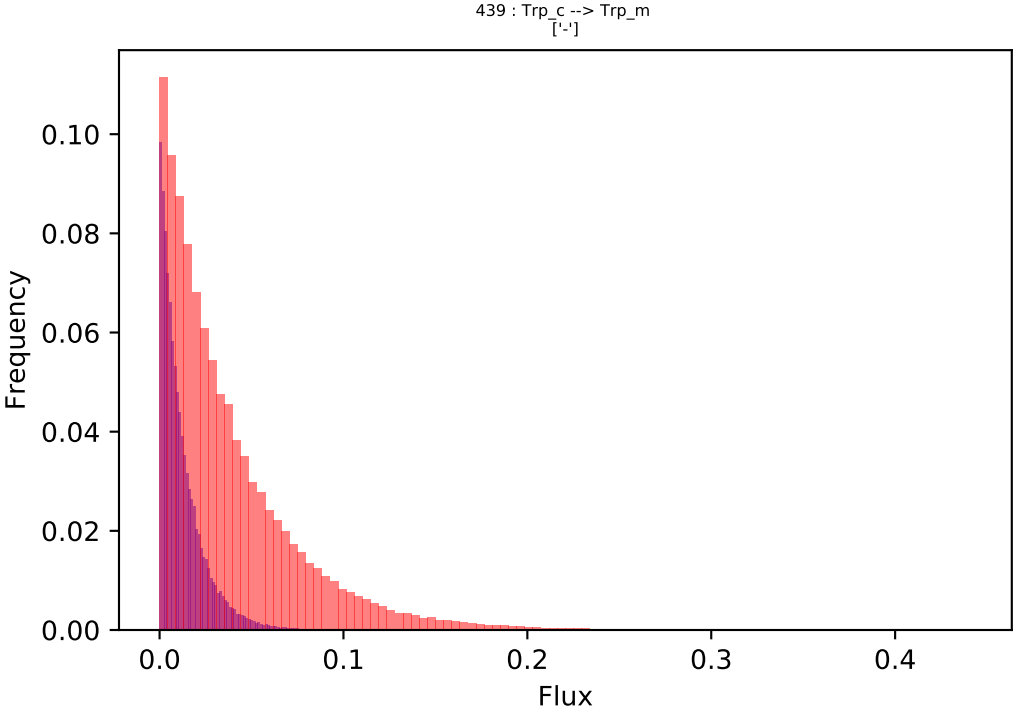

434 : Ser_h --> Ser_c
['-']
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
0
1
2
3
4
5
6
Flux

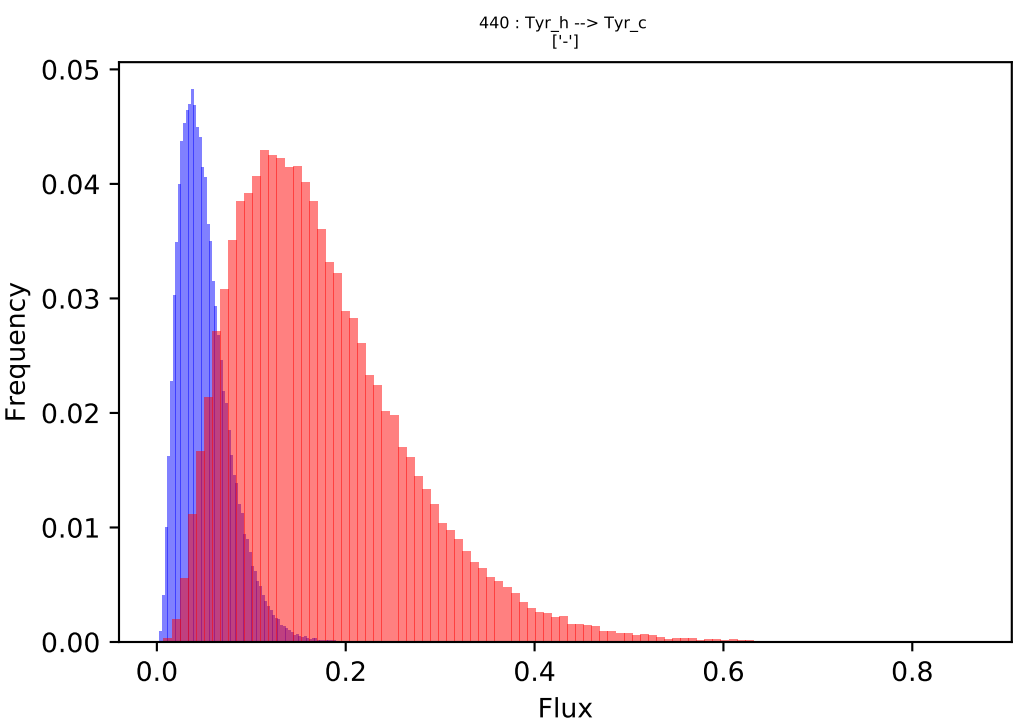

435 : Ser_c --> Ser_m
['-']
Frequency
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
Flux

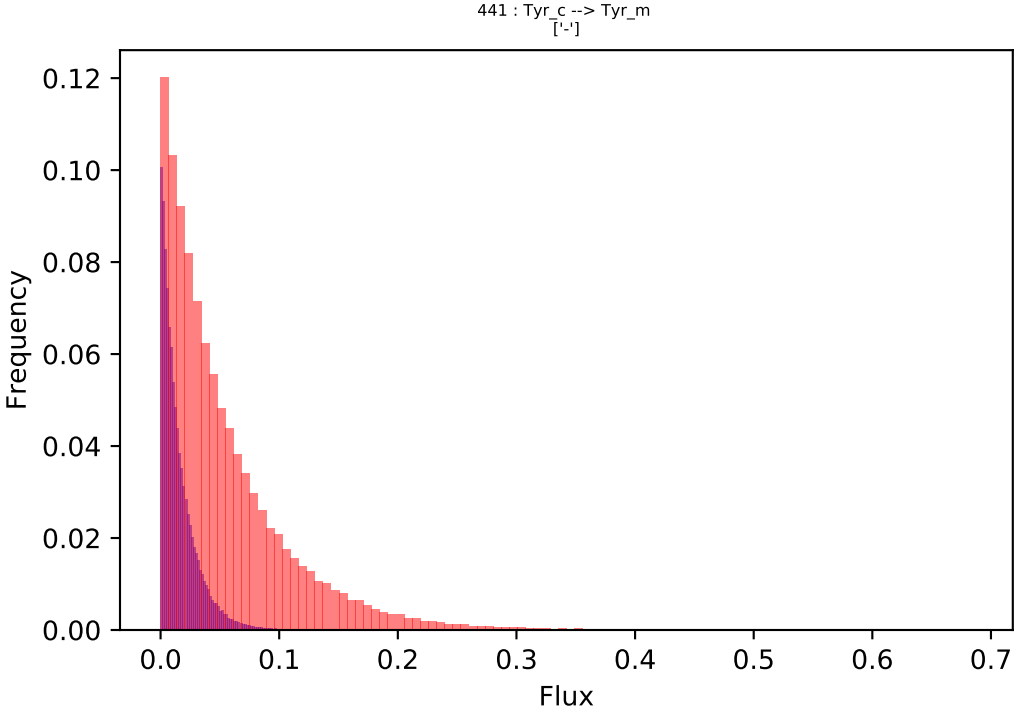

436 : Thr_h --> Thr_c
['-']
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
Flux

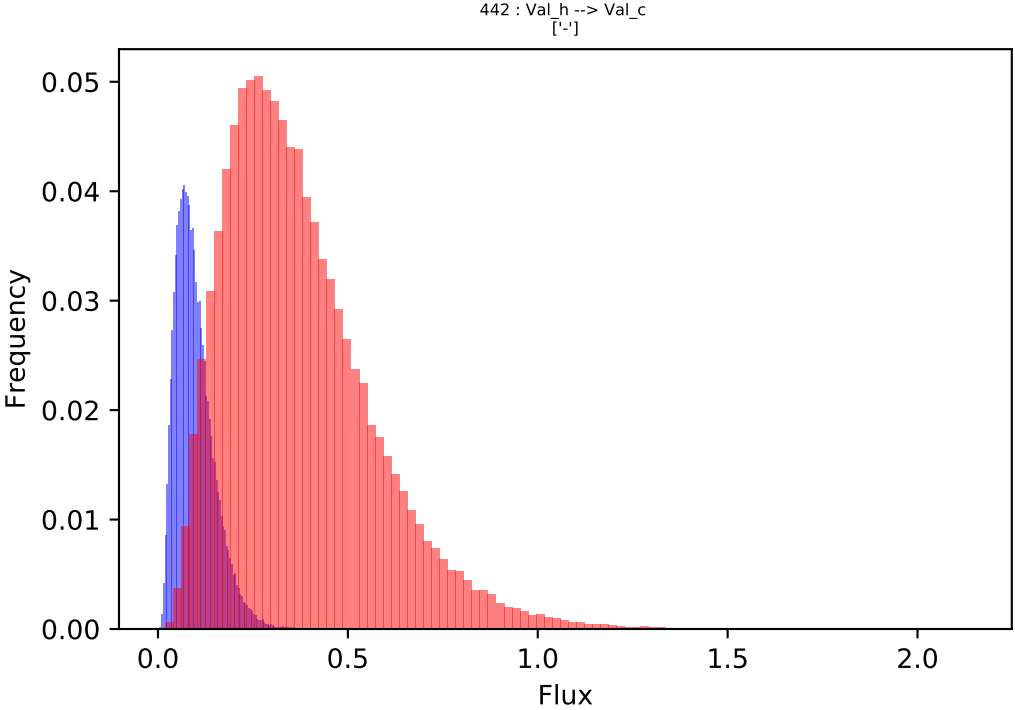

437 : Thr_c --> Thr_m
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

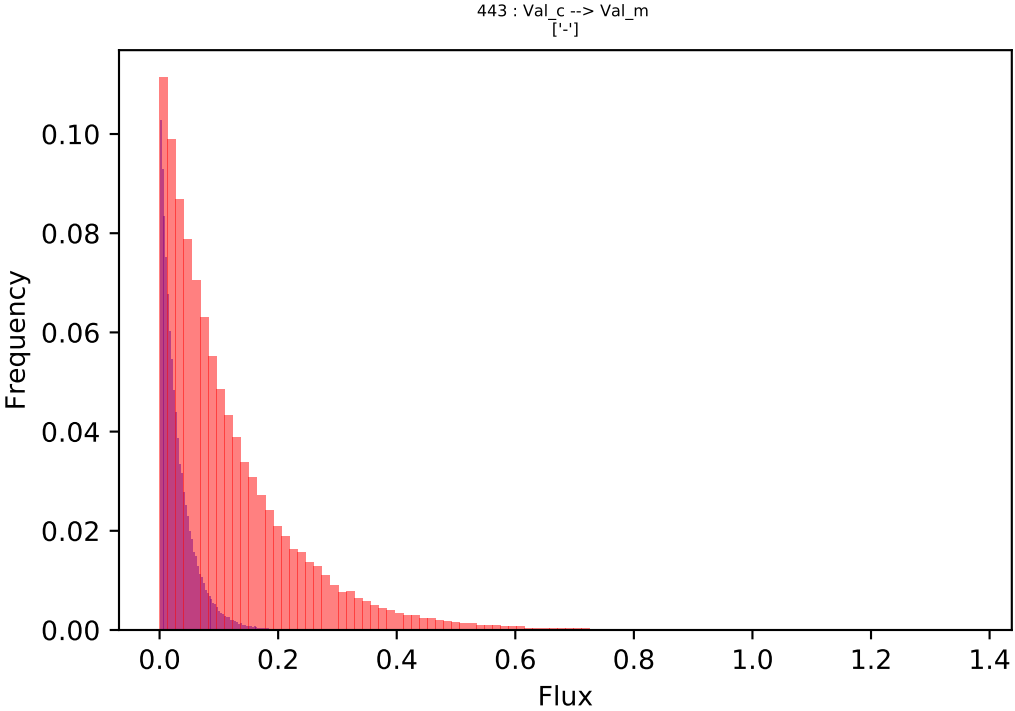

438 : Trp_h --> Trp_c
['-']
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Flux

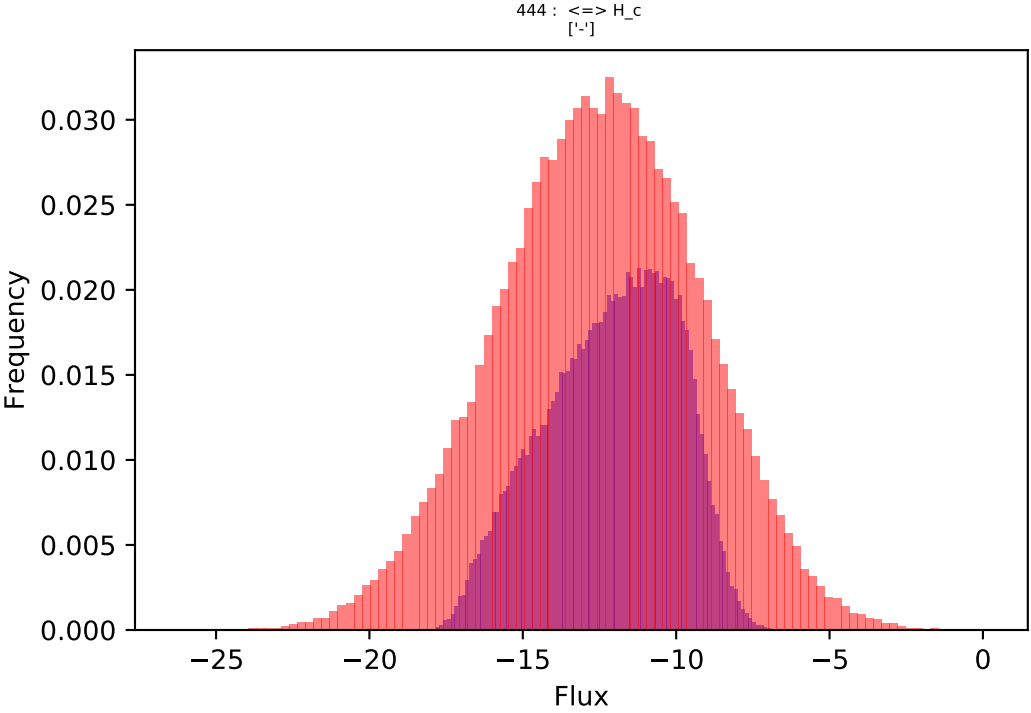

439 : Trp_c --> Trp_m
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.0
0.1
0.2
0.3
0.4
Flux

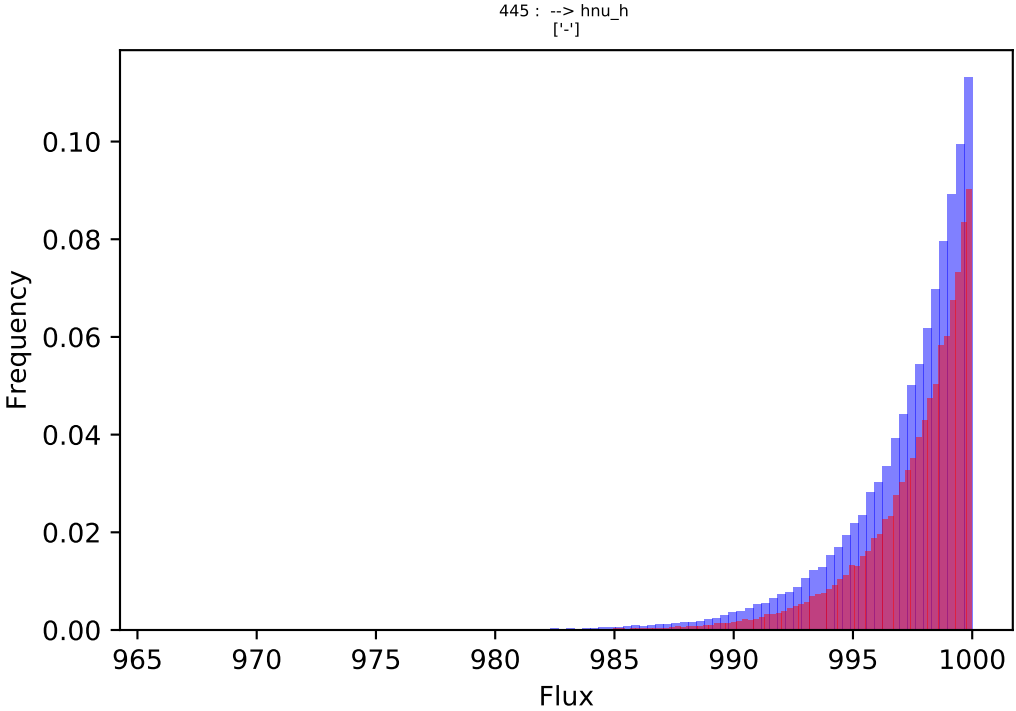

440 : Tyr_h --> Tyr_c
['-']
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
Flux

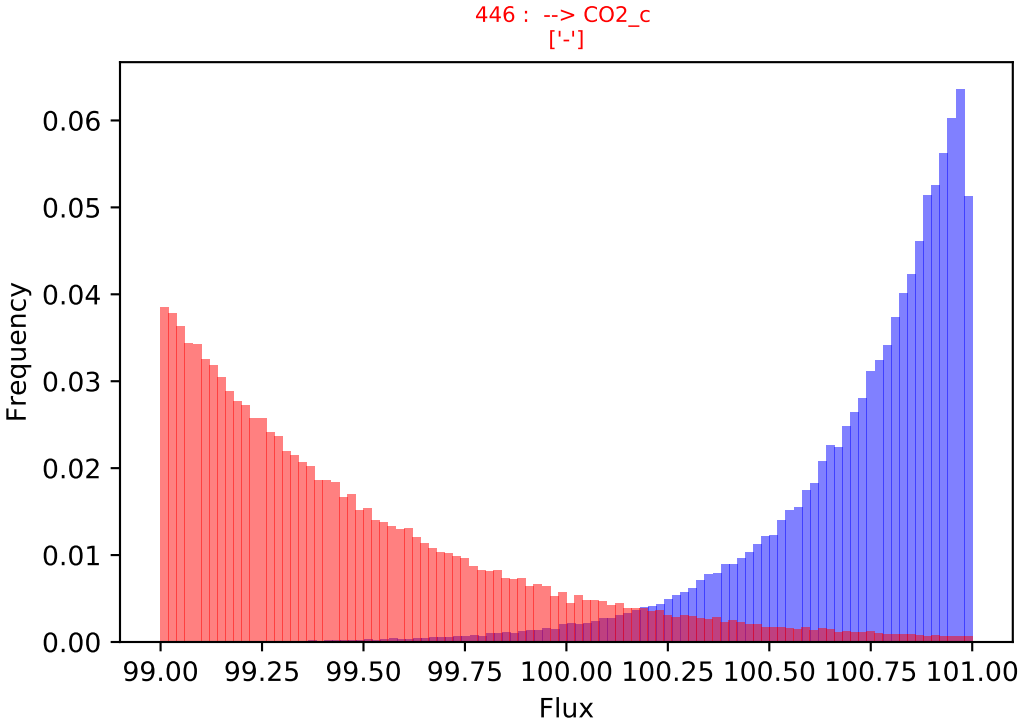

441 : Tyr_c --> Tyr_m
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Flux

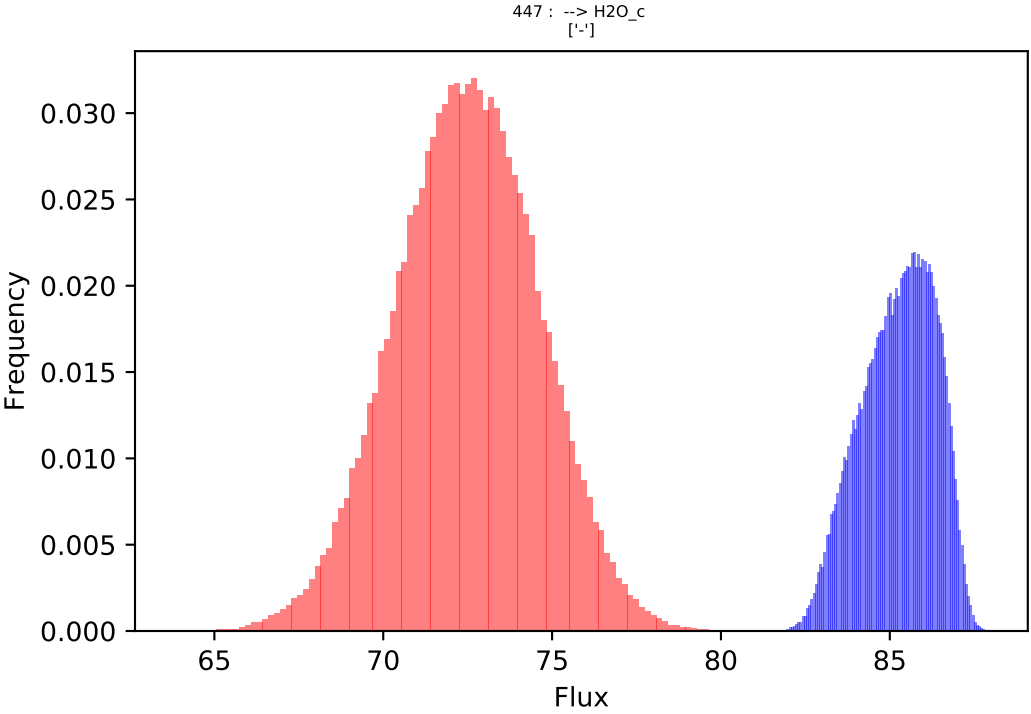

442 : Val_h --> Val_c
['-']
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
0.0
0.5
1.0
1.5
2.0
Flux

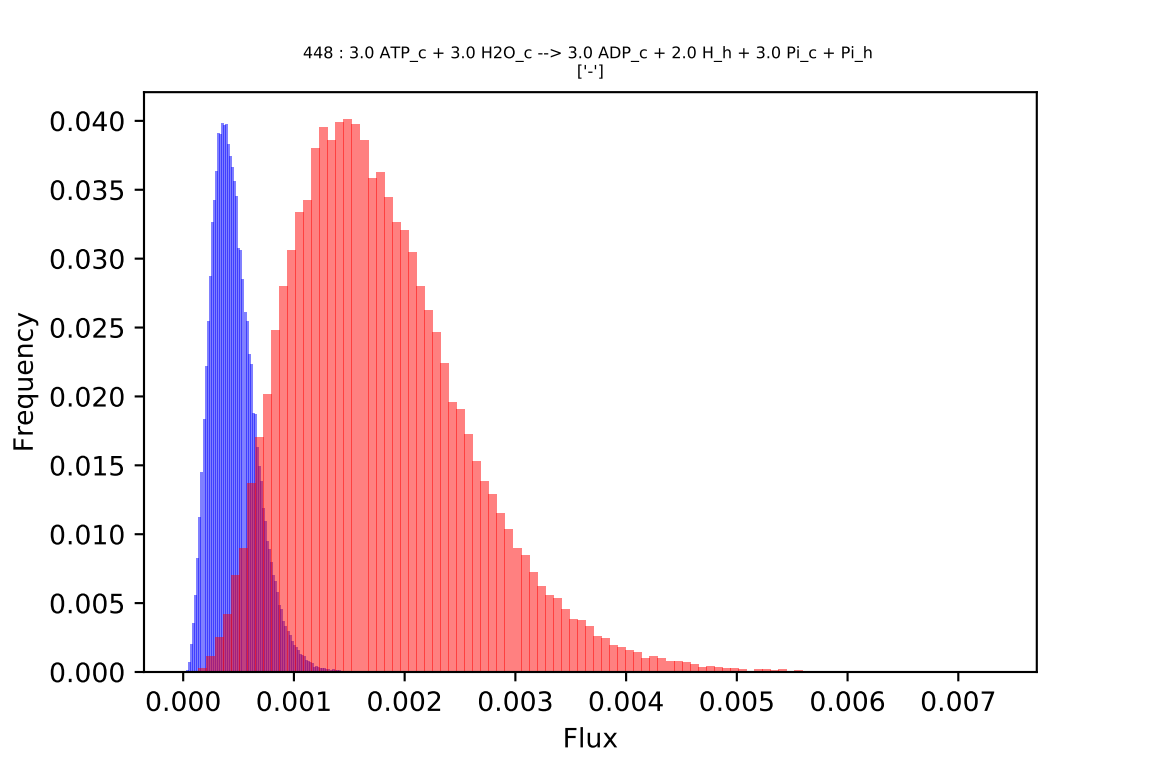

443 : Val_c --> Val_m
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

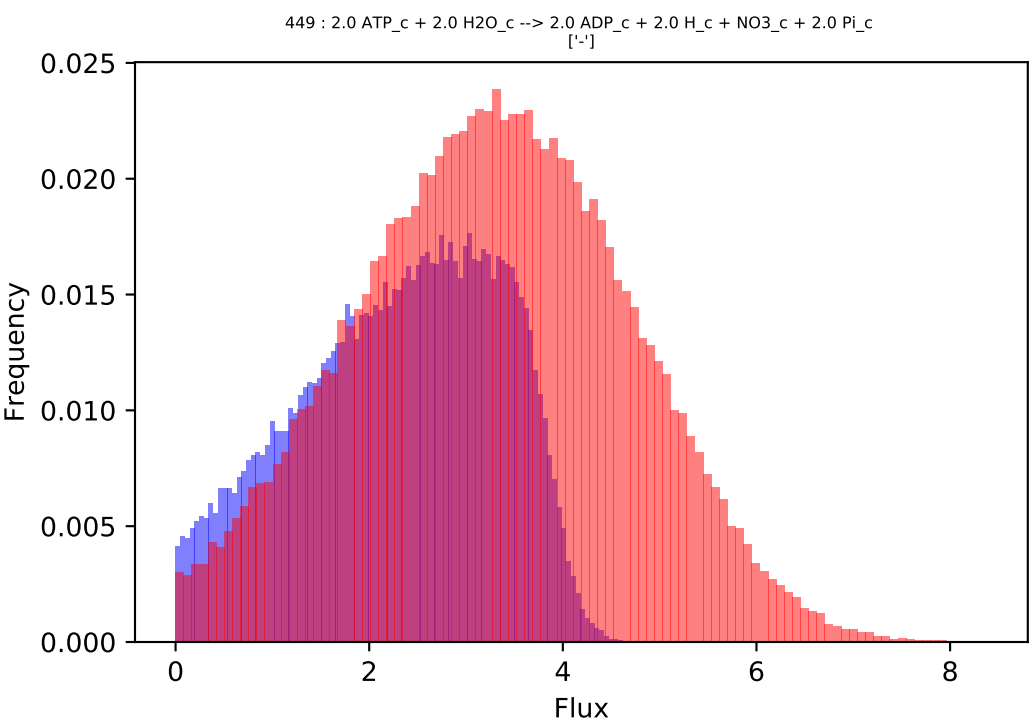

444 : <=> H_c
['-']
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
−25
−20
−15
−10
−5
0
Flux

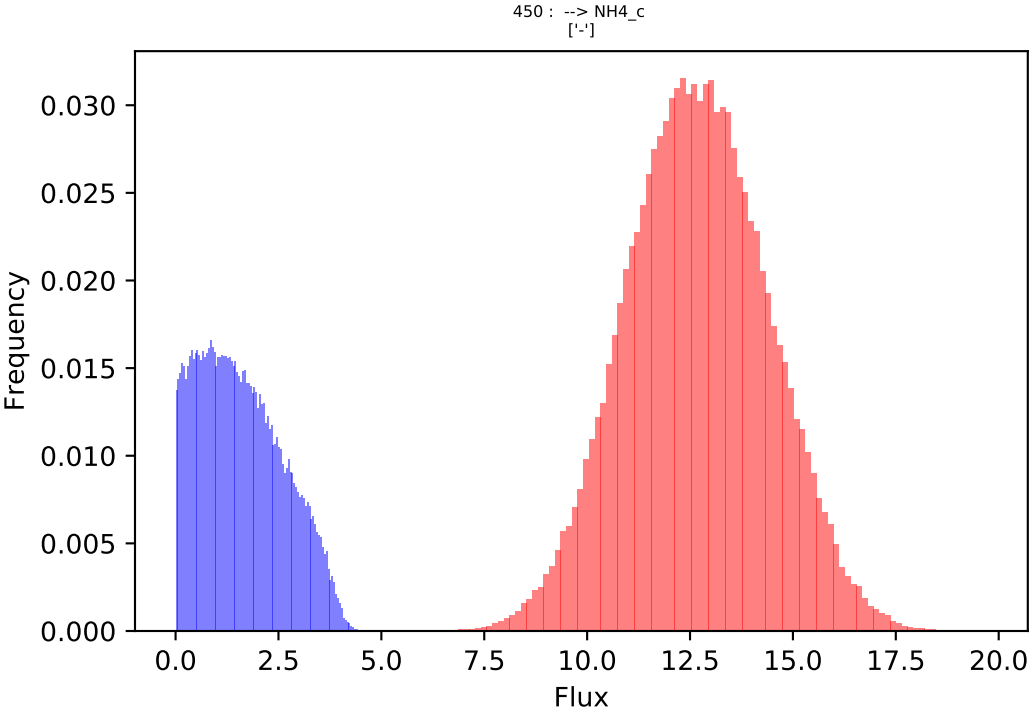

445 : --> hnu_h
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
965
970
975
980
985
990
995
1000
Flux

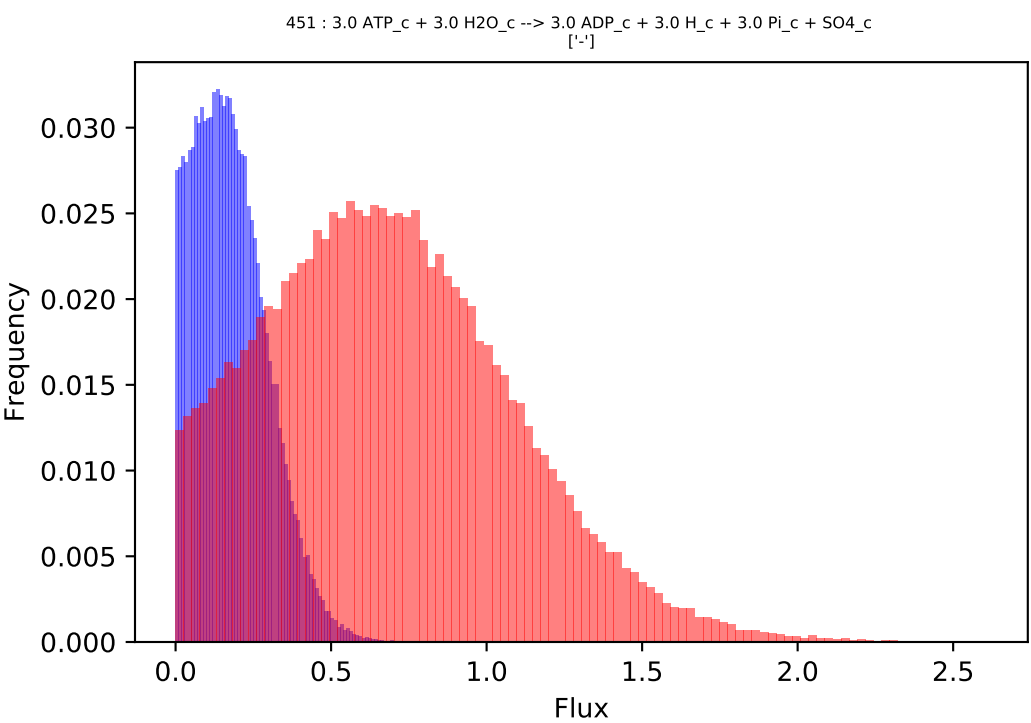

446 : --> CO2_c
['-']
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
99.00
99.25
99.50
99.75
100.00
100.25
100.50
100.75
101.00
Flux

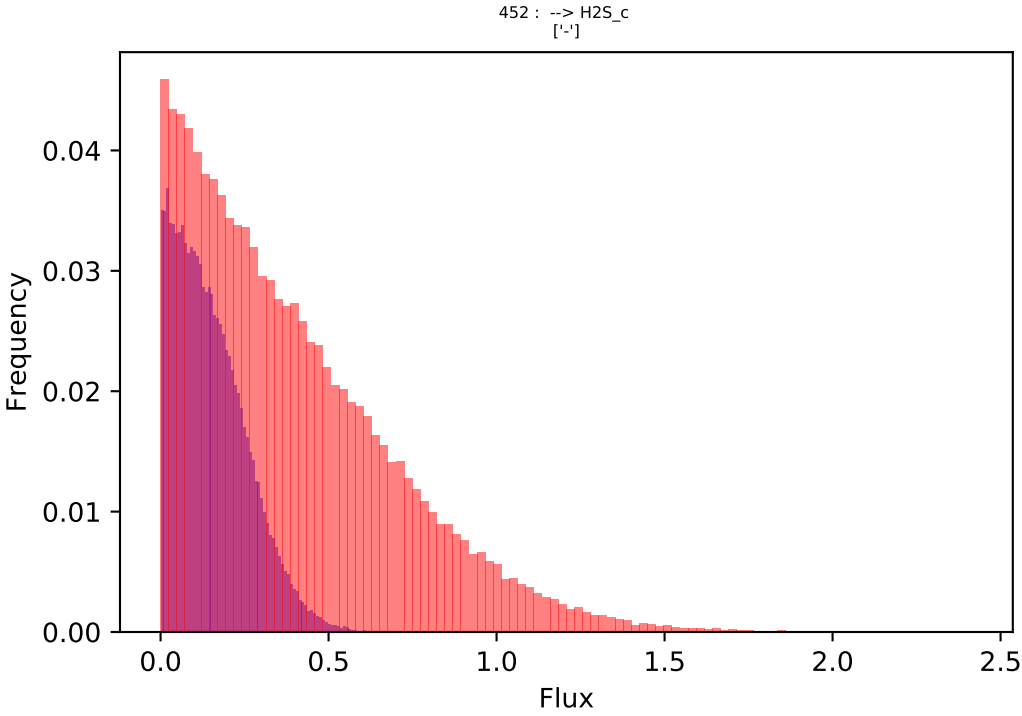

447 : --> H2O_c
['-']
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
65
70
75
80
85
Flux

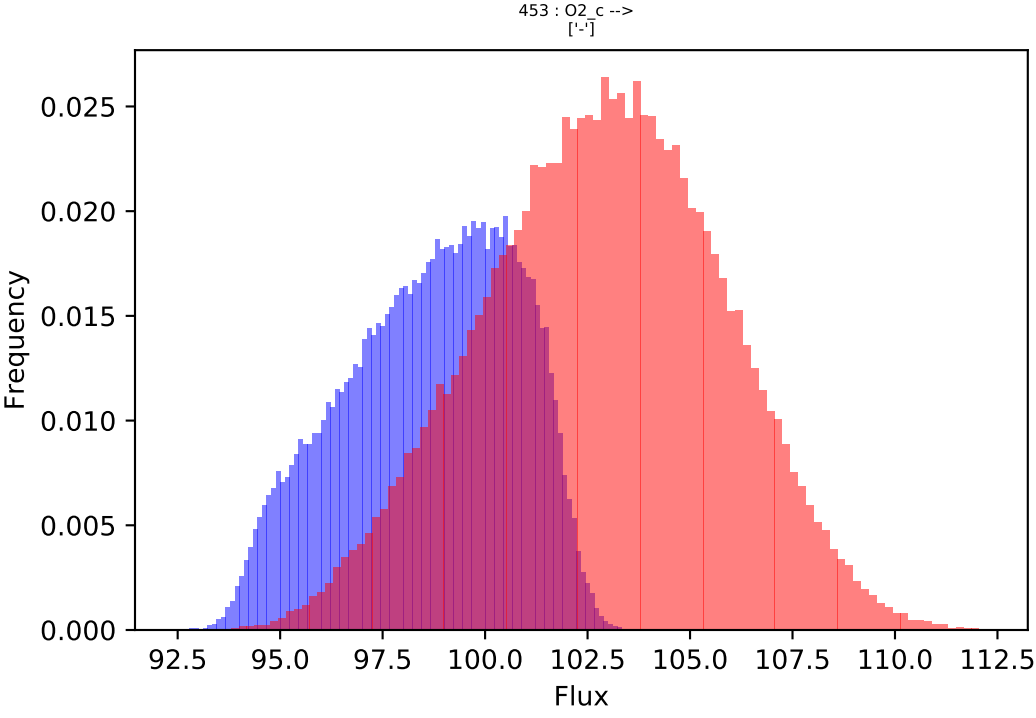

448 : 3.0 ATP_c + 3.0 H2O_c --> 3.0 ADP_c + 2.0 H_h + 3.0 Pi_c + Pi_h
['-']
Frequency
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.000
0.001
0.002
0.003
0.004
0.005
0.006
0.007
Flux

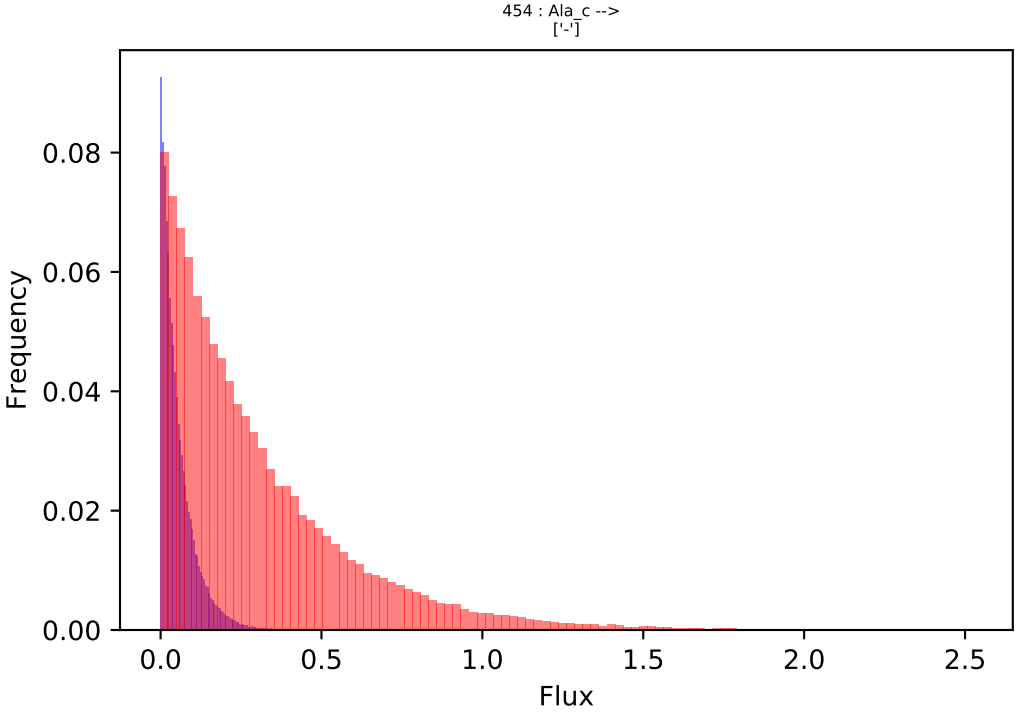

449 : 2.0 ATP_c + 2.0 H2O_c --> 2.0 ADP_c + 2.0 H_c + NO3_c + 2.0 Pi_c
['-']
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0
2
4
6
8
Flux

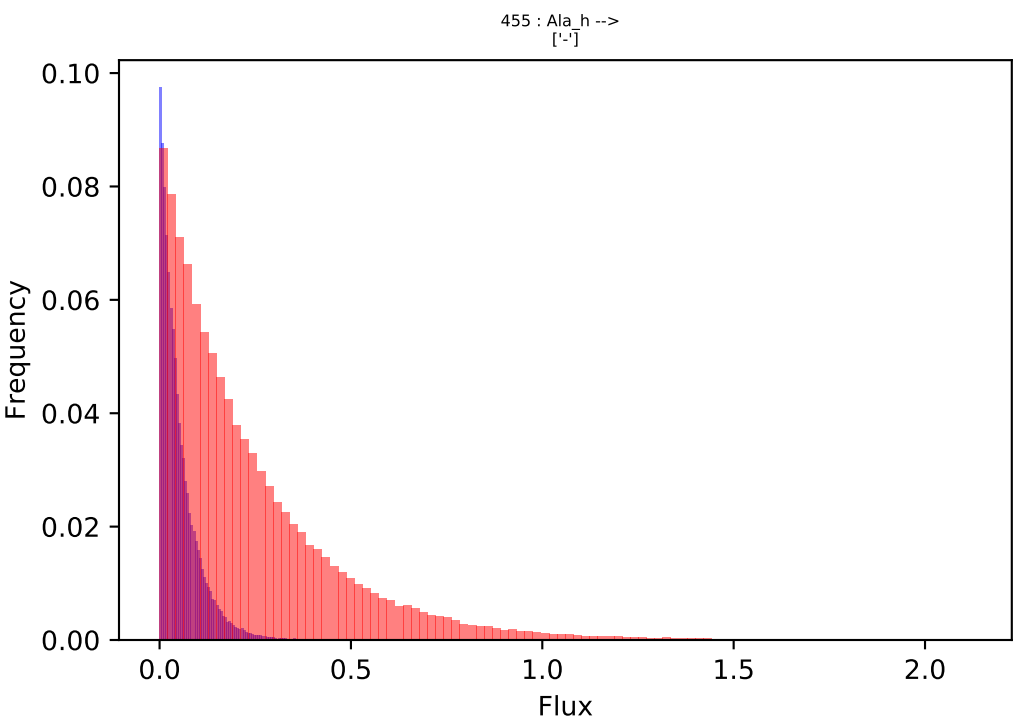

450 : --> NH4_c
['-']
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
Flux

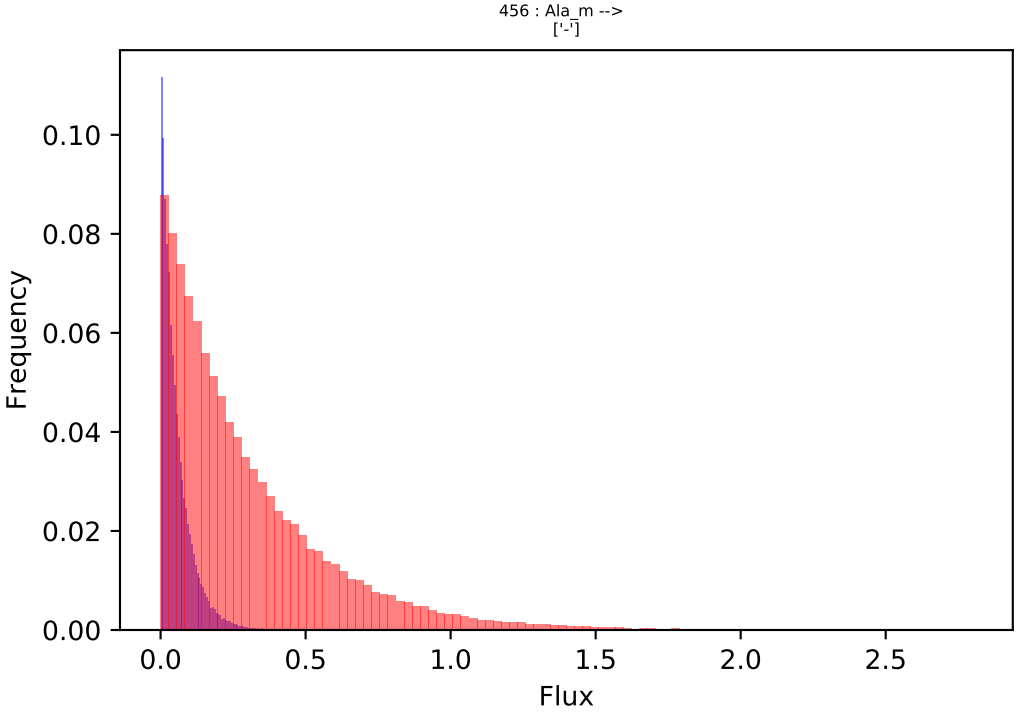

451 : 3.0 ATP_c + 3.0 H2O_c --> 3.0 ADP_c + 3.0 H_c + 3.0 Pi_c + SO4_c
['-']
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
Flux

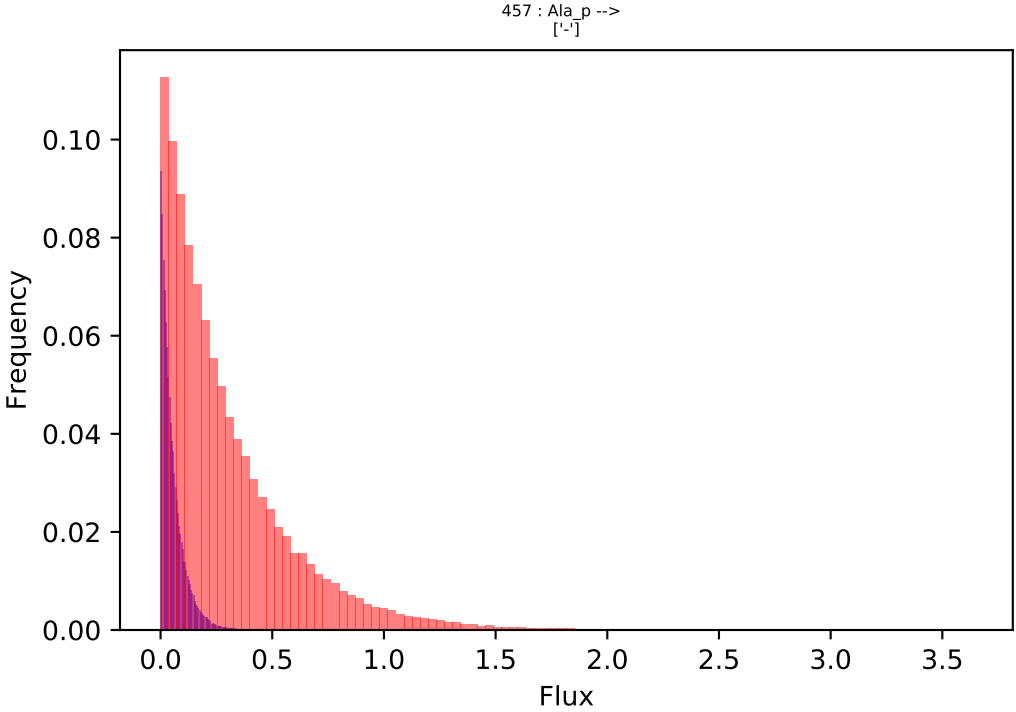

452 : --> H2S_c
['-']
Frequency
0.04
0.03
0.02
0.01
0.00
0.0
0.5
1.0
1.5
2.0
2.5
Flux

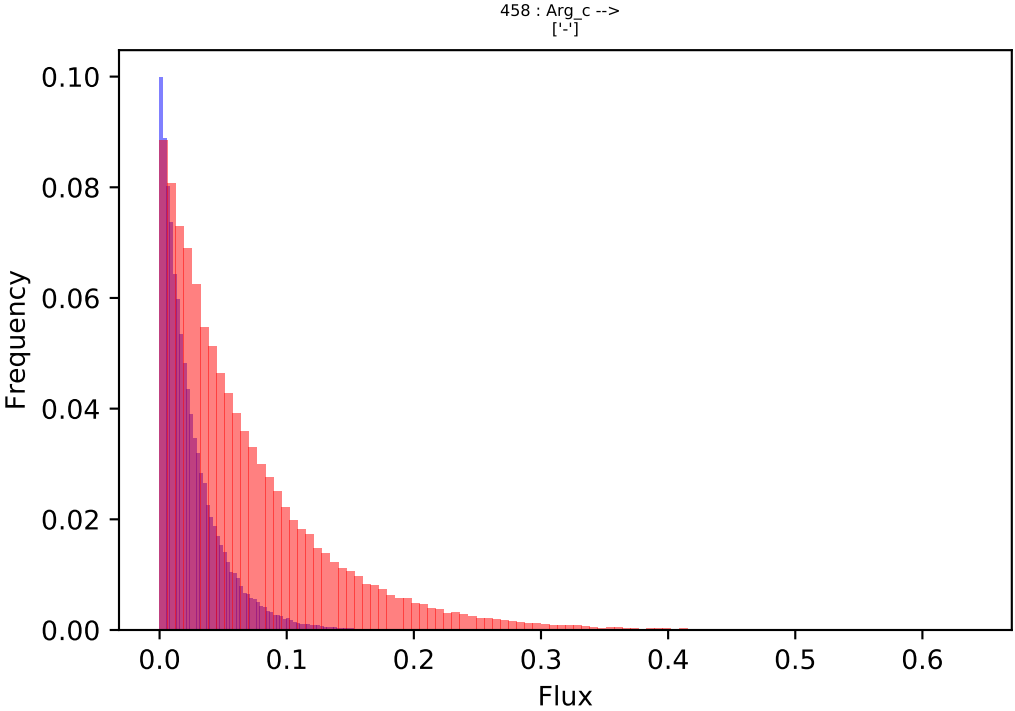

453 : O2_c -->
['-']
0.025
0.020
0.015
0.010
0.005
0.000
Frequency
92.5
95.0
97.5
100.0
102.5
105.0
107.5
110.0
112.5
Flux

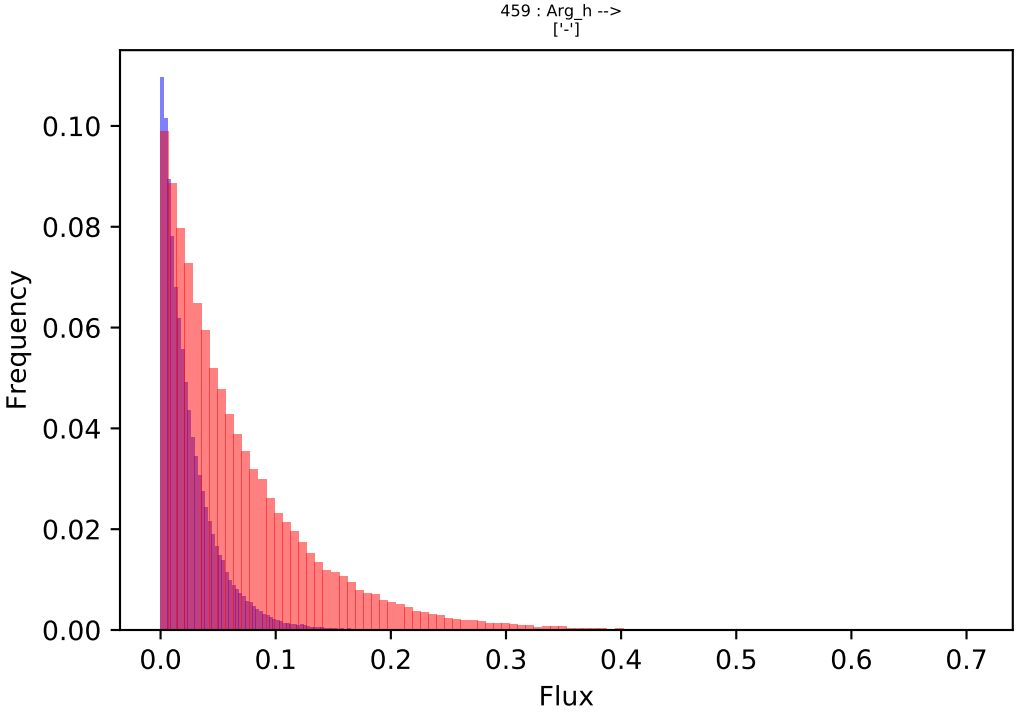

454 : Ala_c -->
['-']
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
Flux

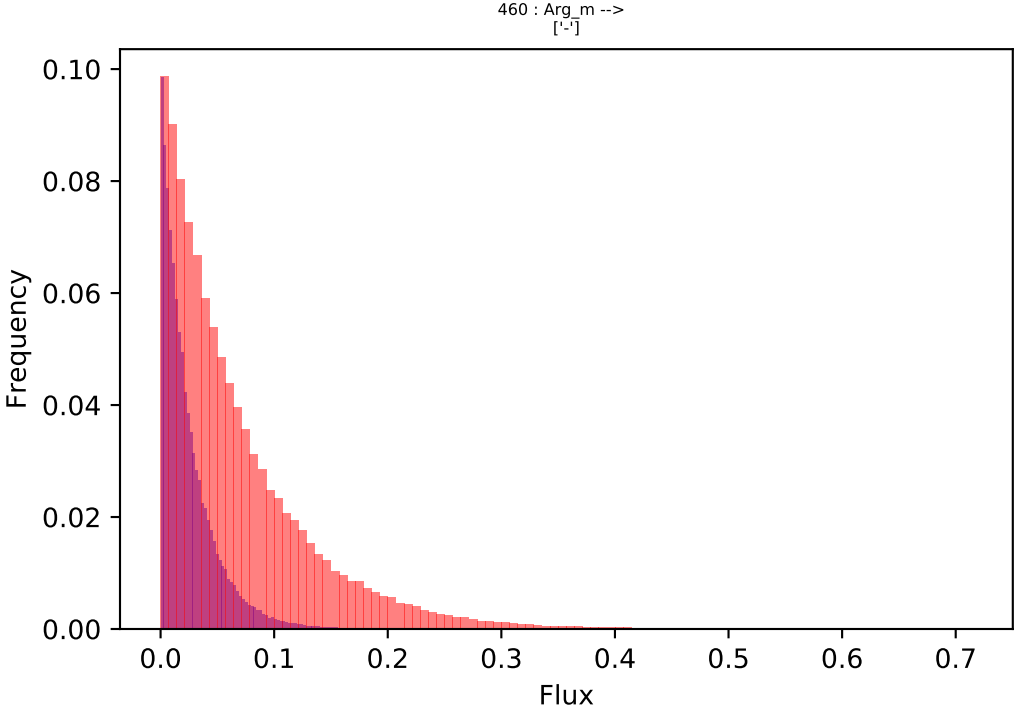

455 : Ala_h -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.5
1.0
1.5
2.0
Flux

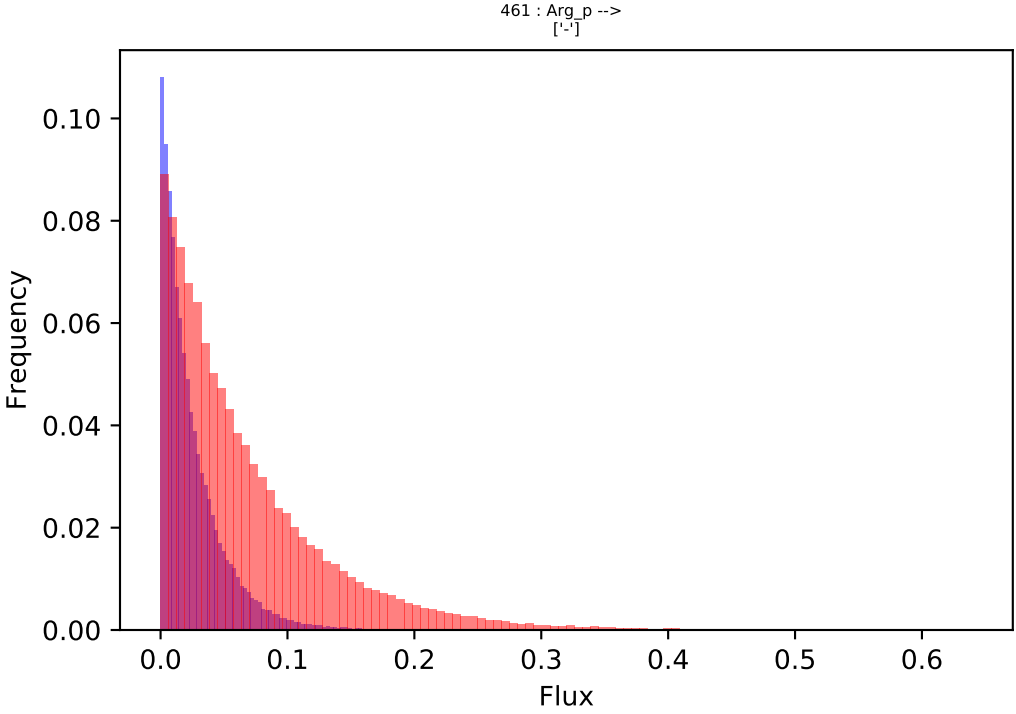

456 : Ala_m -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
Flux

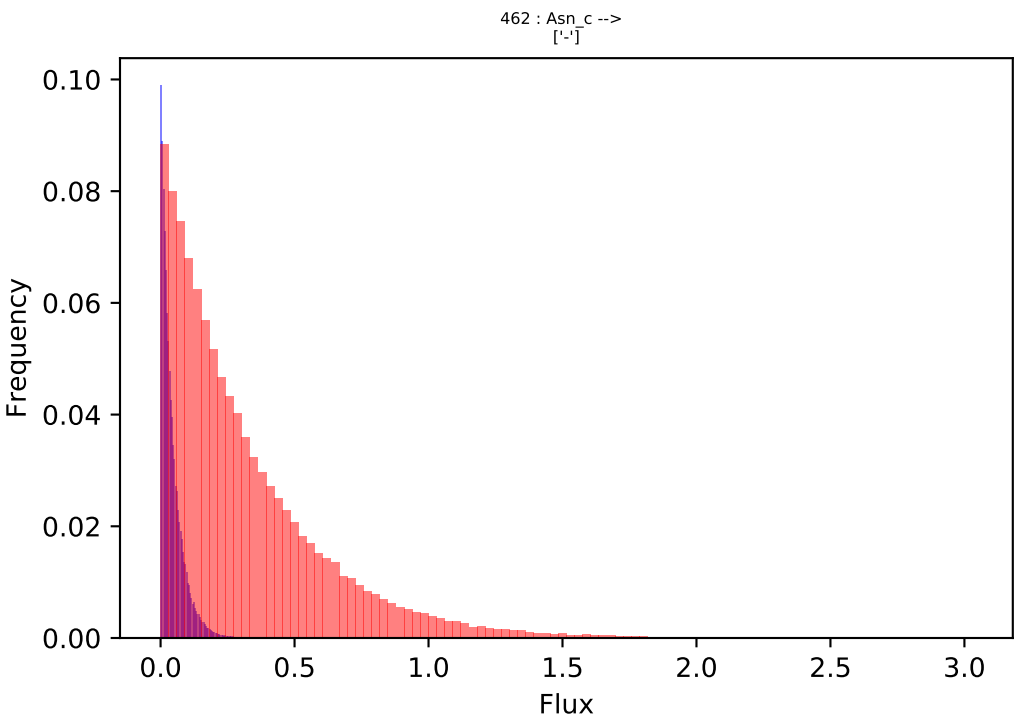

457 : Ala_p -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
Flux

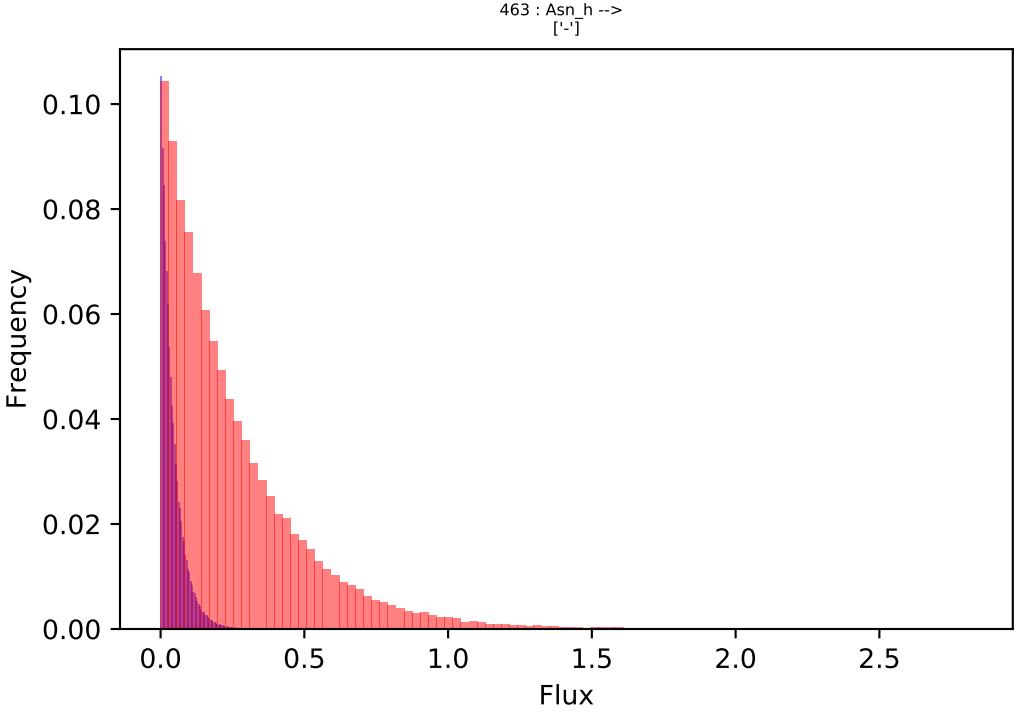

458 : Arg_c -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Flux

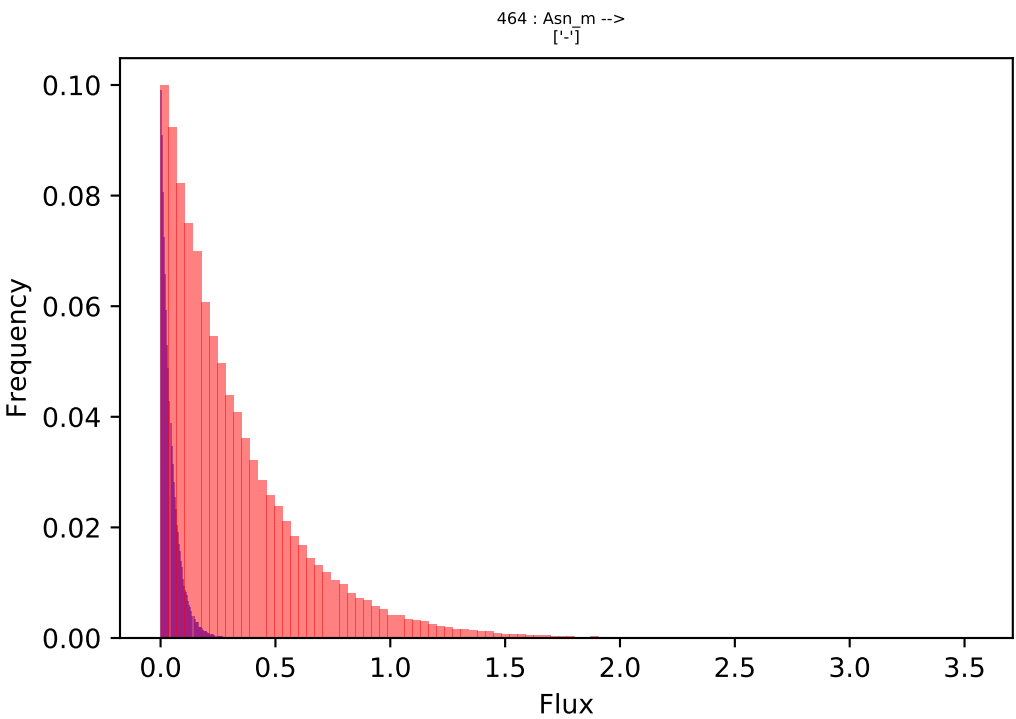

459 : Arg_h -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Flux

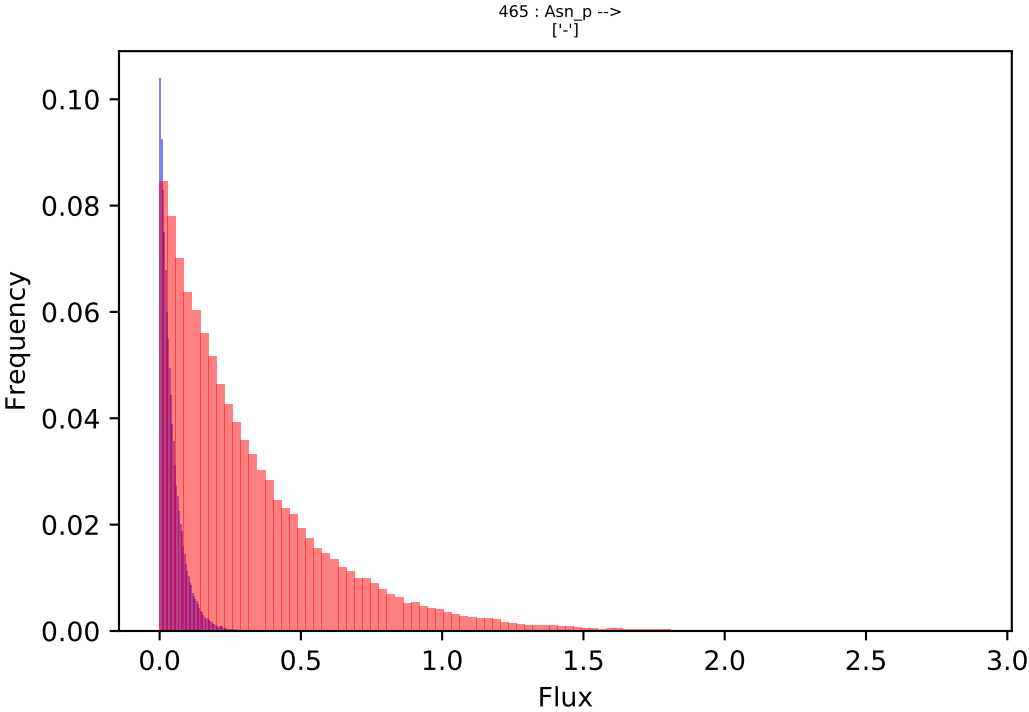

460 : Arg_m -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Flux

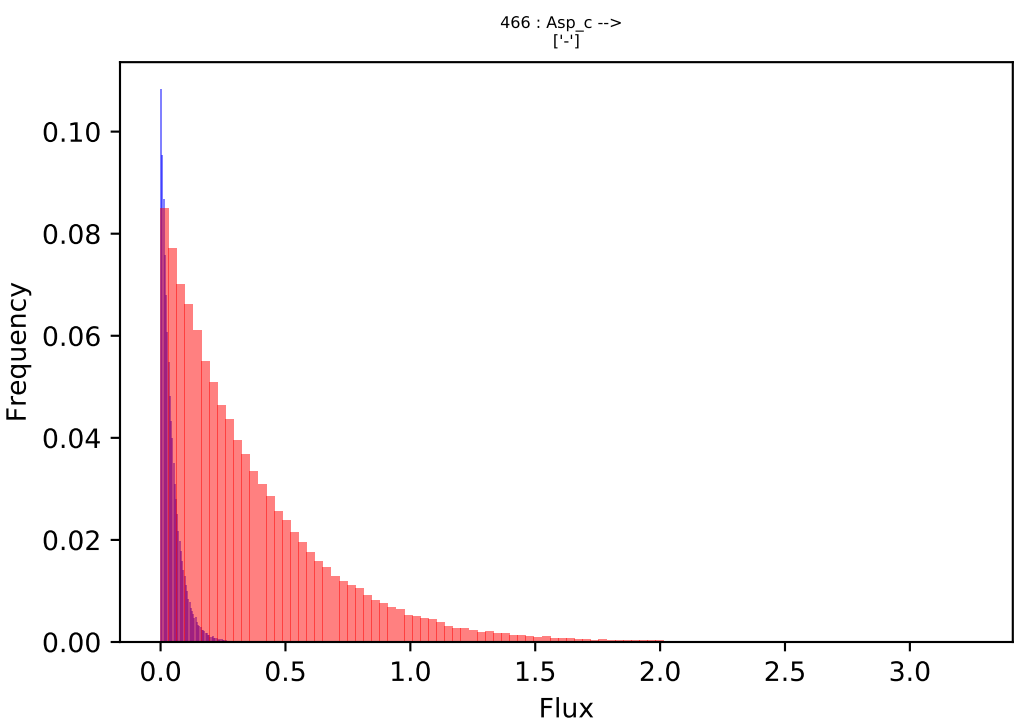

461 : Arg_p -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Flux

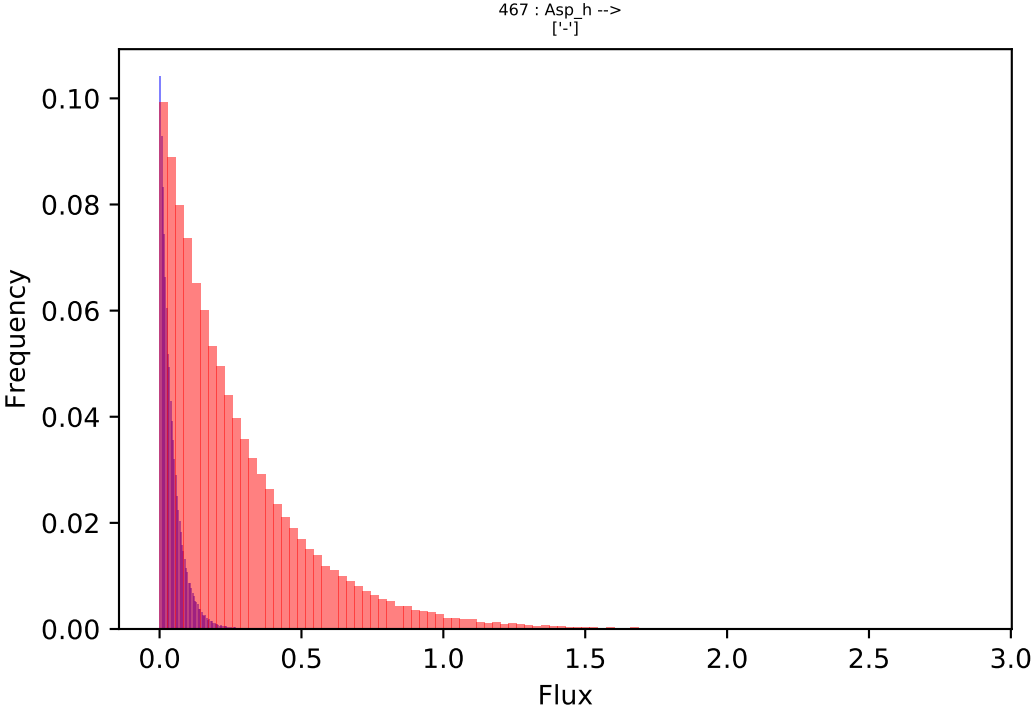

462 : Asn_c -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Flux

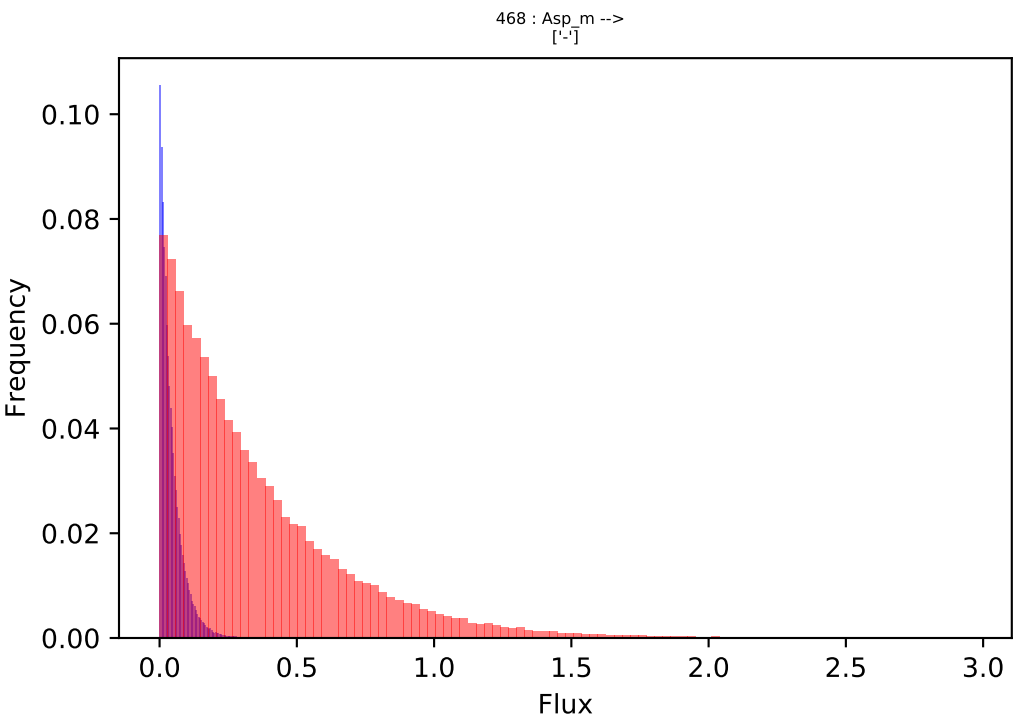

463 : Asn_h -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
Flux

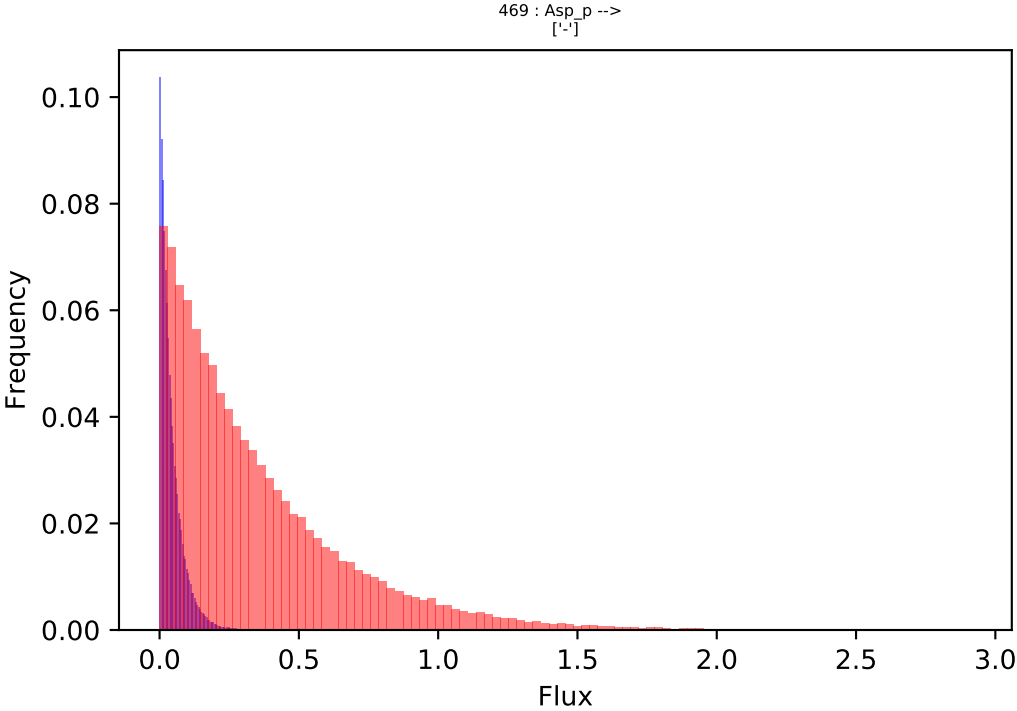

464 : Asn_m -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
Flux

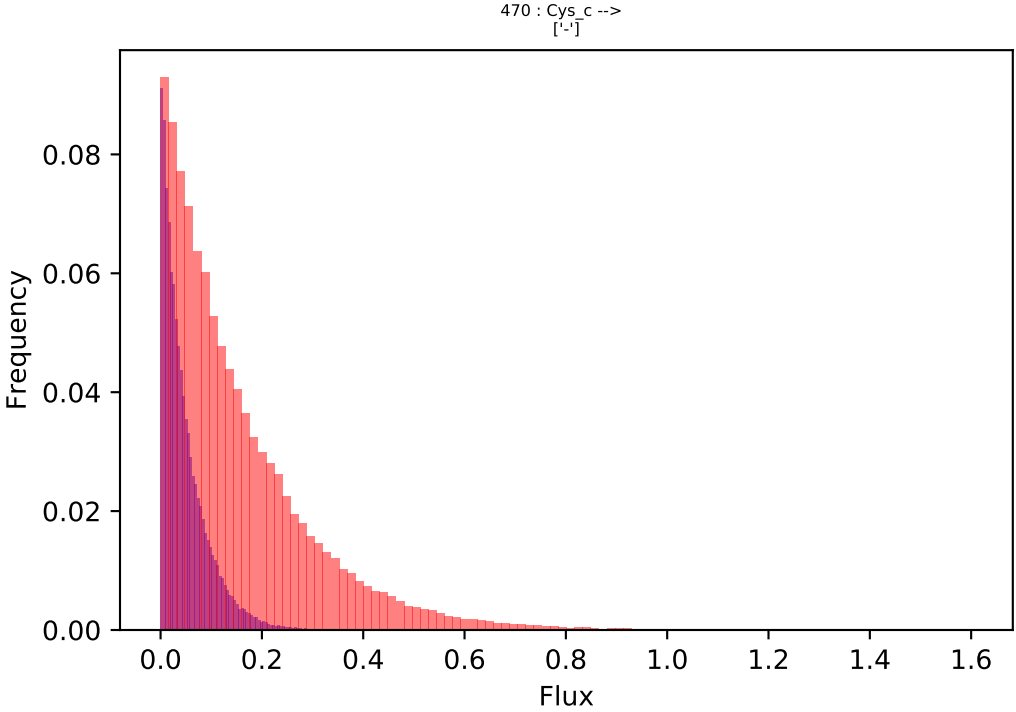

465 : Asn_p -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Flux

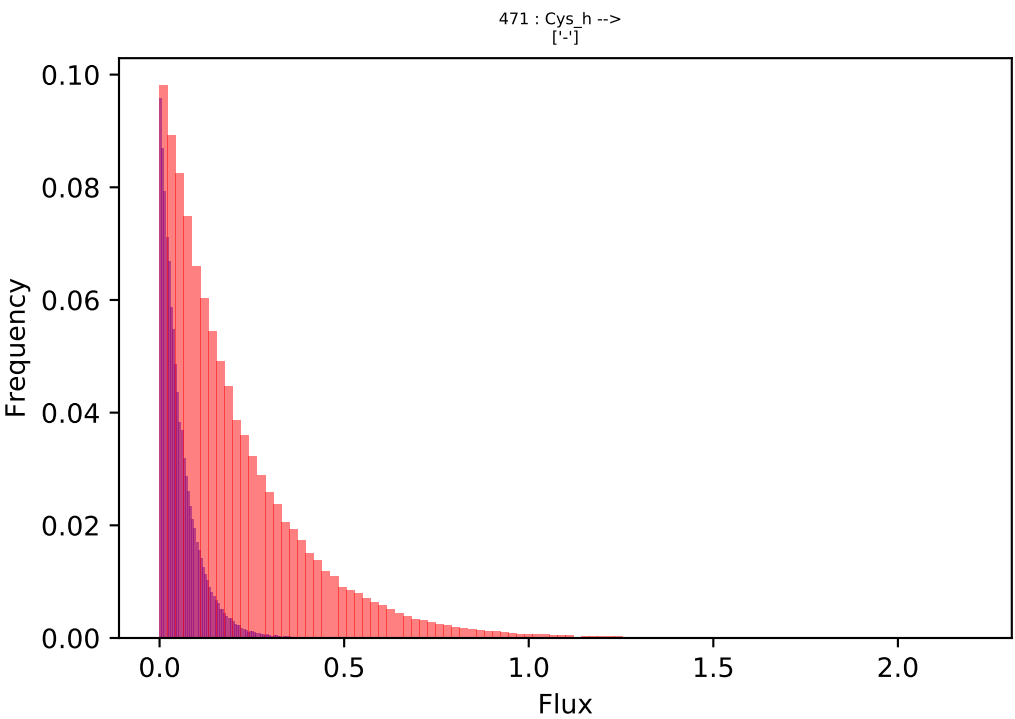

466 : Asp_c -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Flux

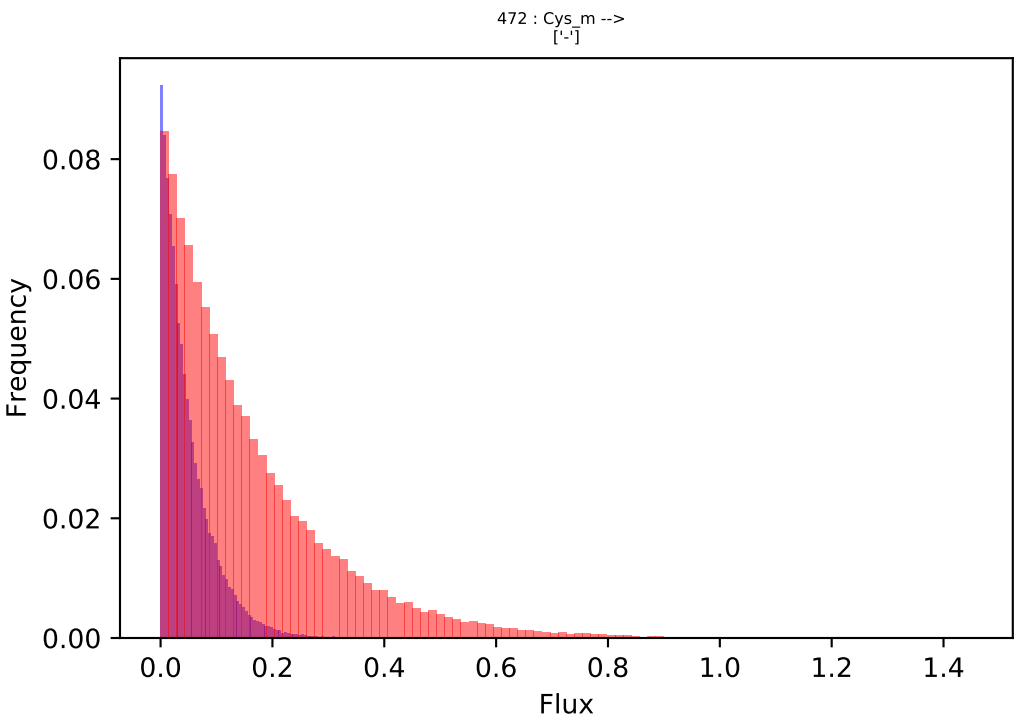

467 : Asp_h -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Flux

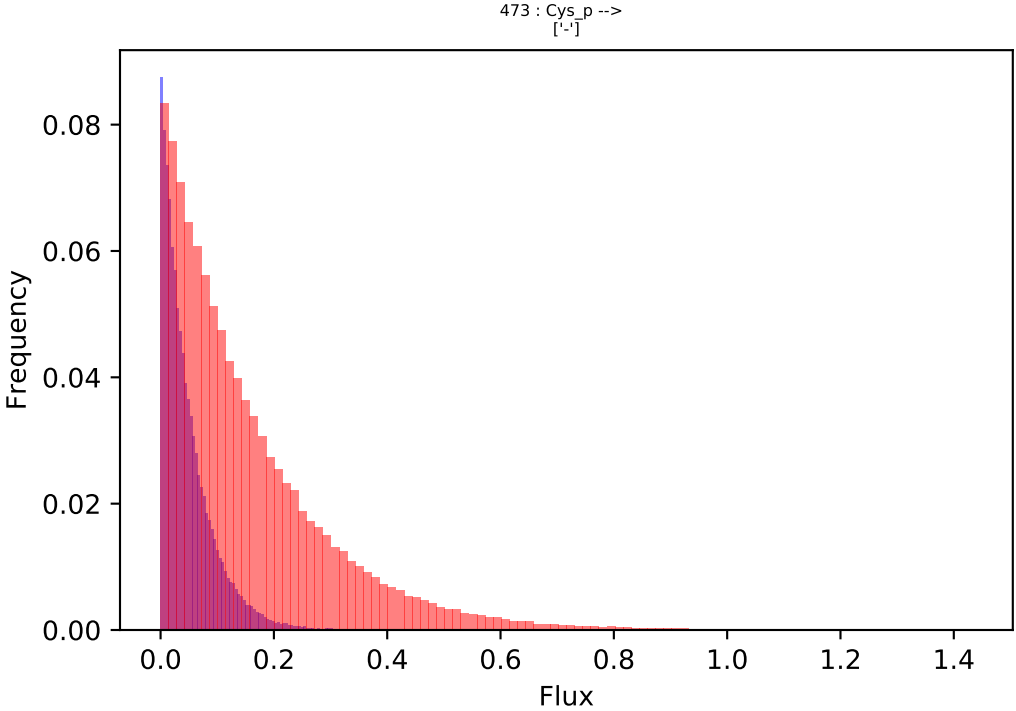

468 : Asp_m -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Flux

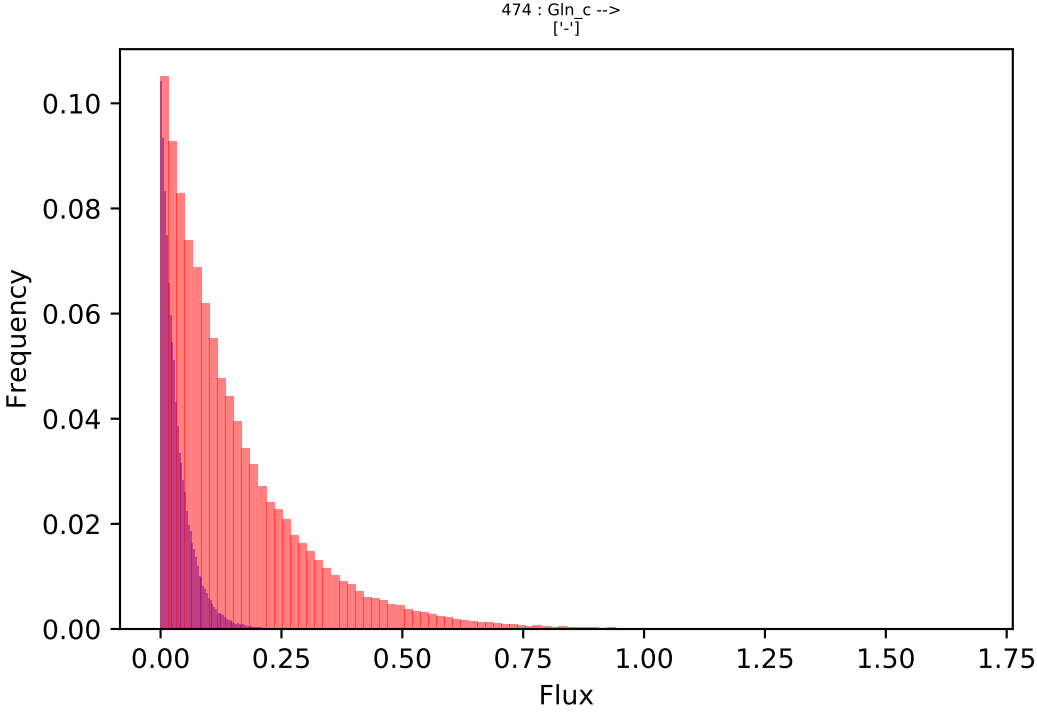

469 : Asp_p -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Flux

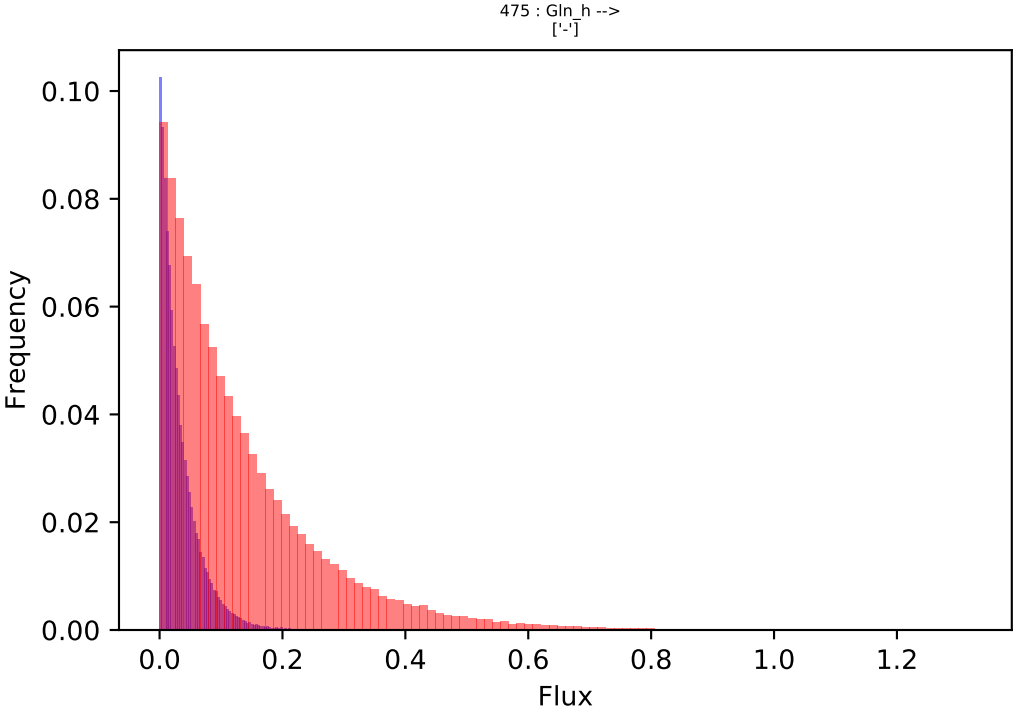

470 : Cys_c -->
['-']
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Flux

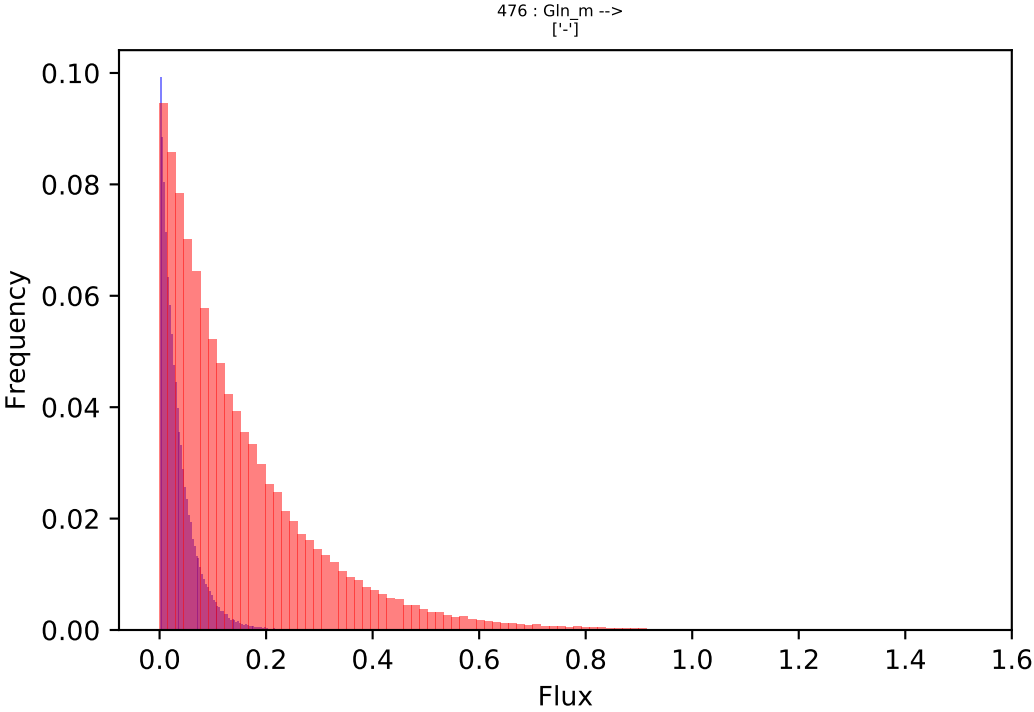

471 : Cys_h -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.5
1.0
1.5
2.0
Flux

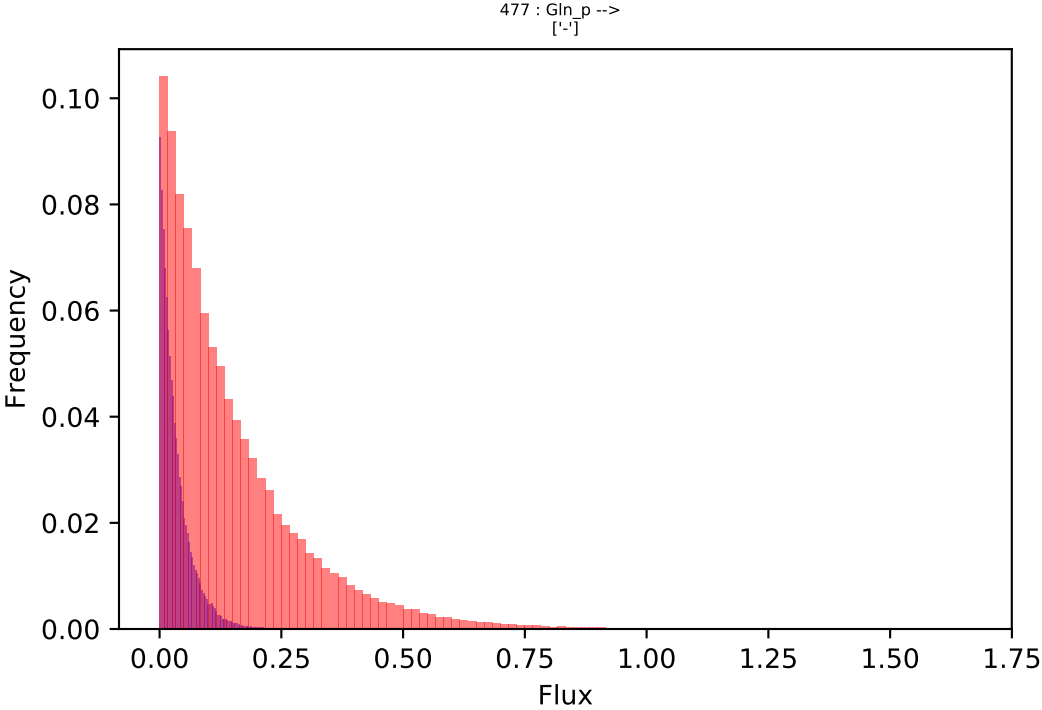

472 : Cys_m -->
['-']
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

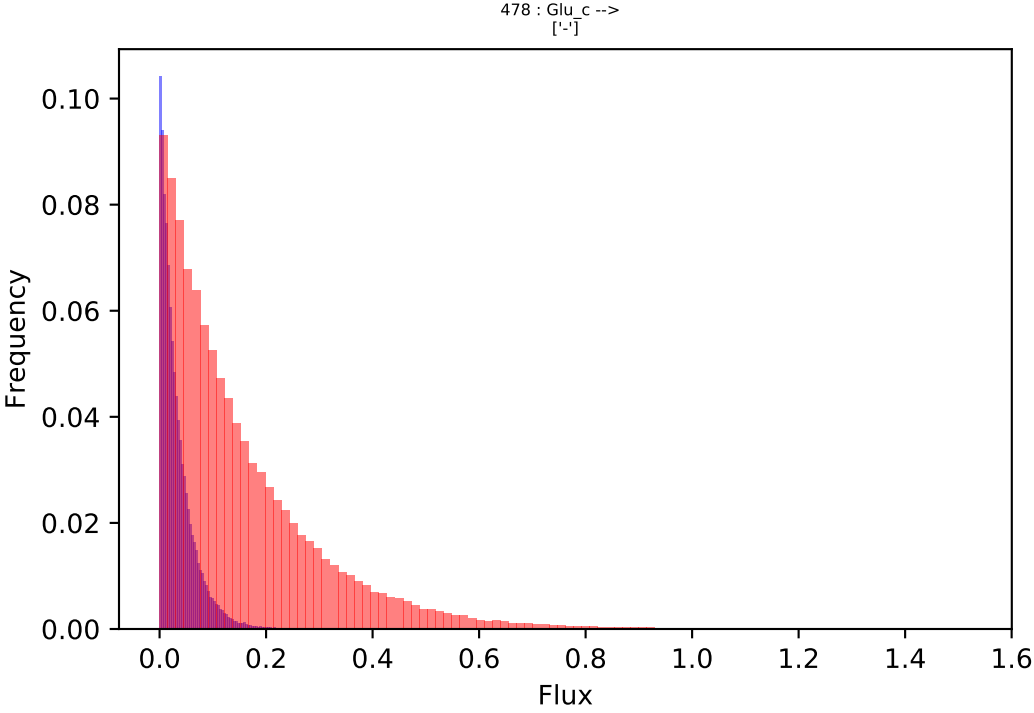

473 : Cys_p -->
['-']
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

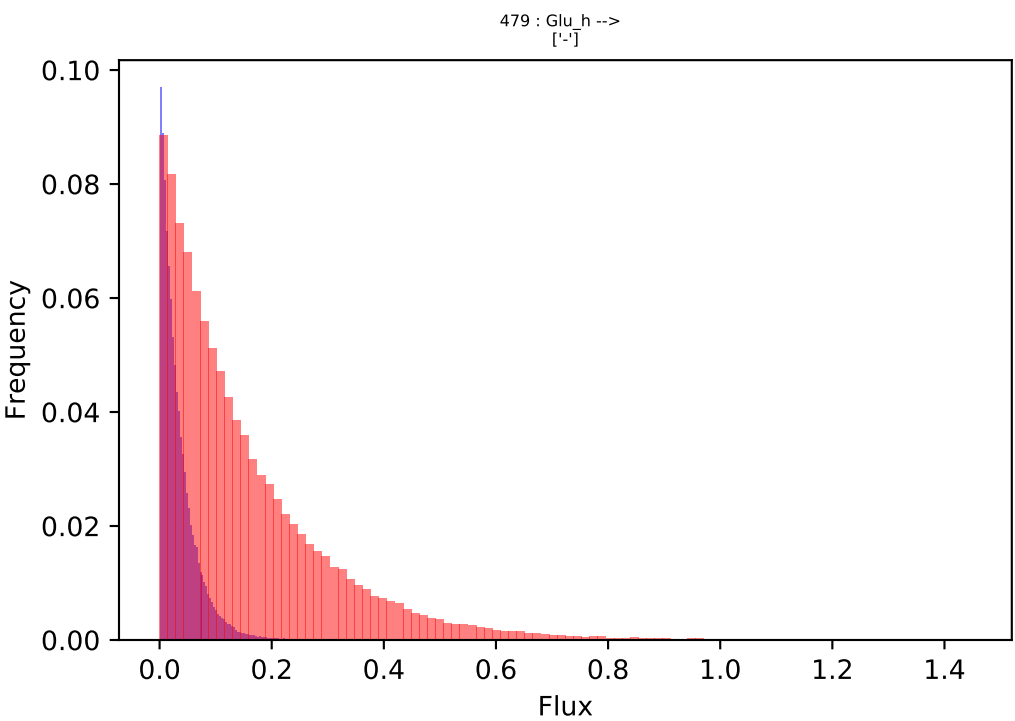

474 : Gln_c -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

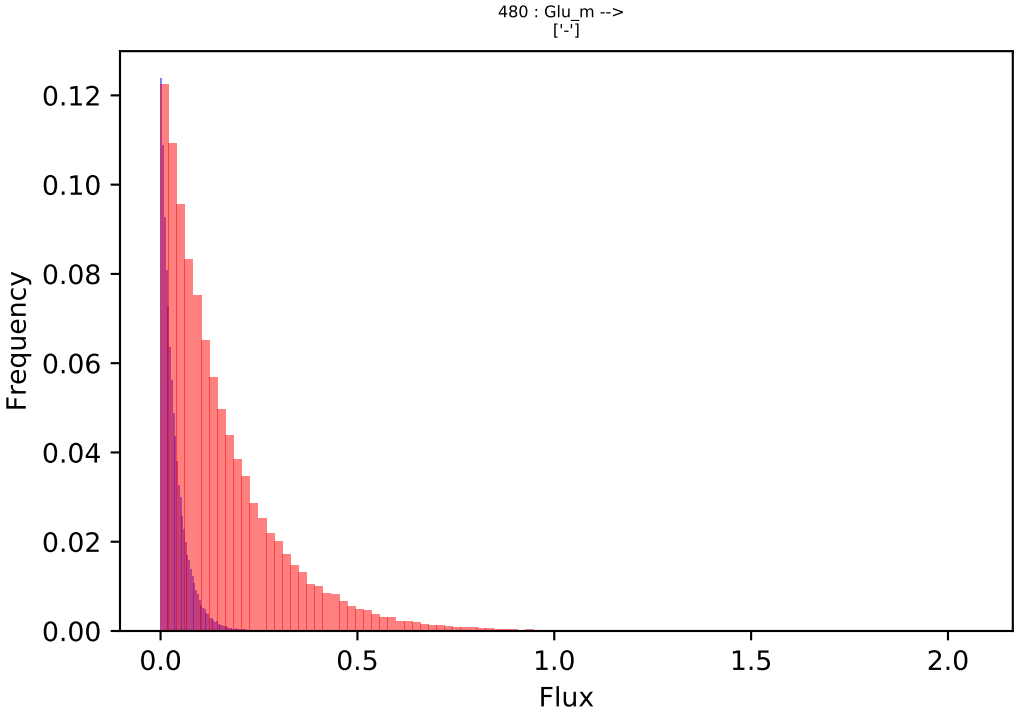

475 : Gln_h -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Flux

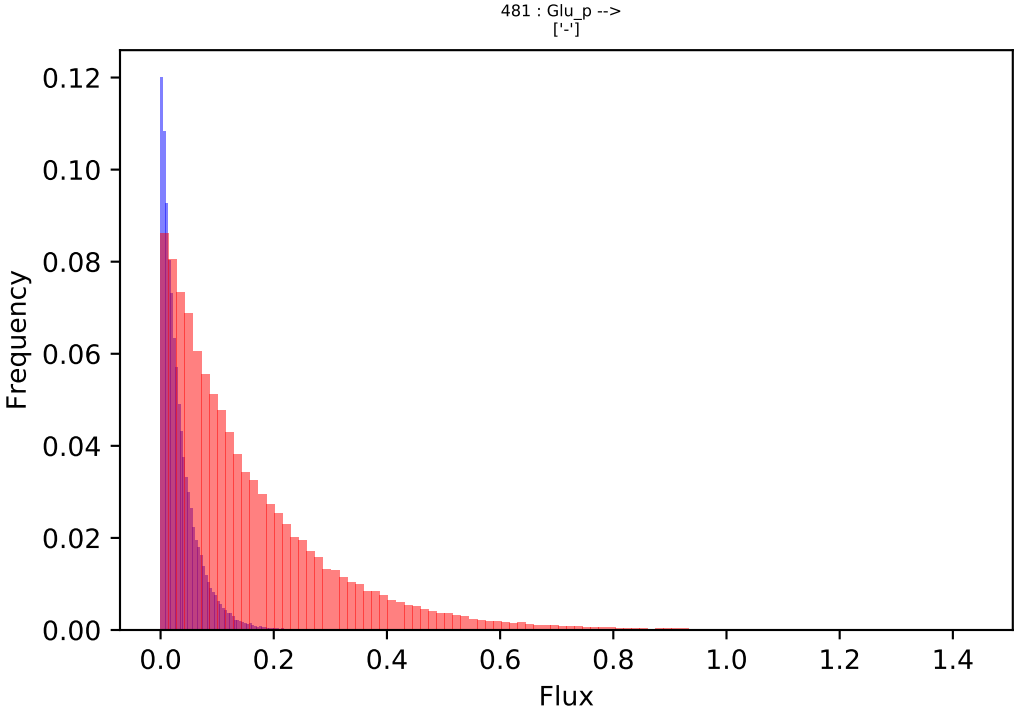

476 : Gln_m -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Flux


477 : Gln_p -->
['-']
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


478 : Glu_c -->
['-']
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
1.6
Flux


479 : Glu_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


480 : Glu_m -->
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.5
1.0
1.5
2.0
Flux


481 : Glu_p -->
['-']
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0.10
0.08
0.06
0.04
0.02
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Frequency
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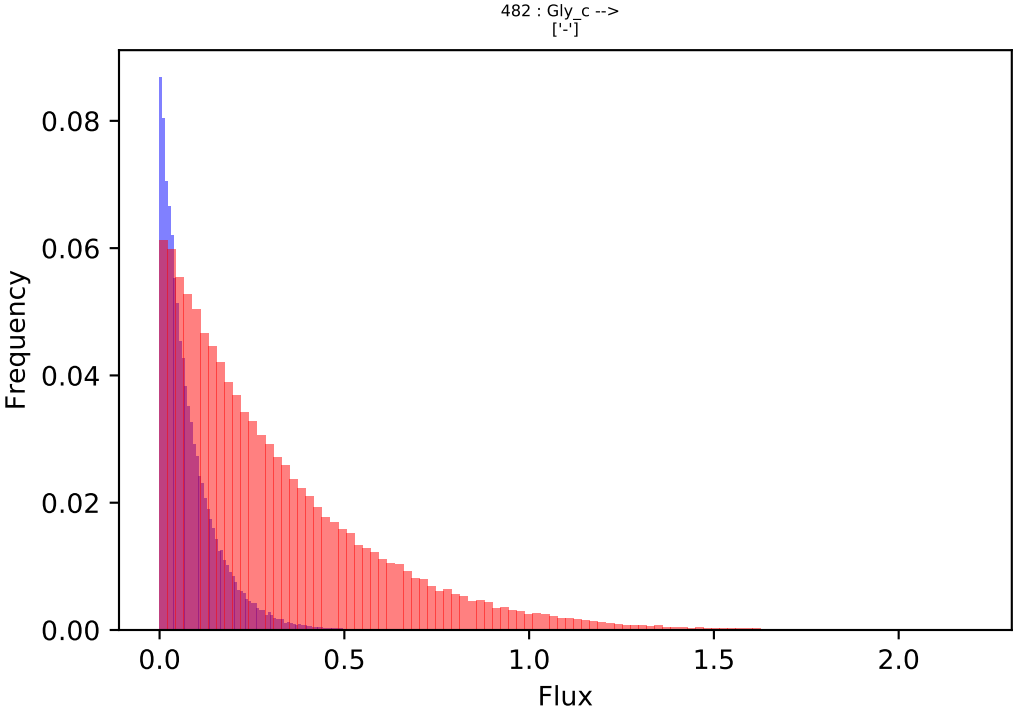
1.2
1.4
Flux


482 : Gly_c -->
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0.02
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Frequency
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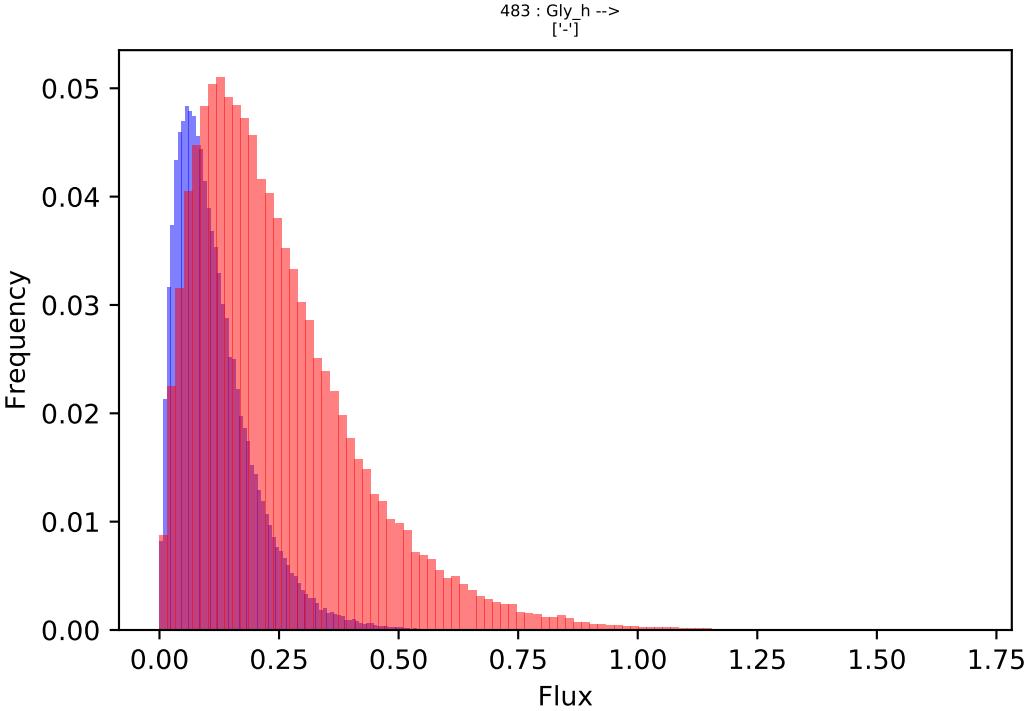
Flux


483 : Gly_h -->
['-']
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0.04
0.03
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0.01
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Frequency
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0.75
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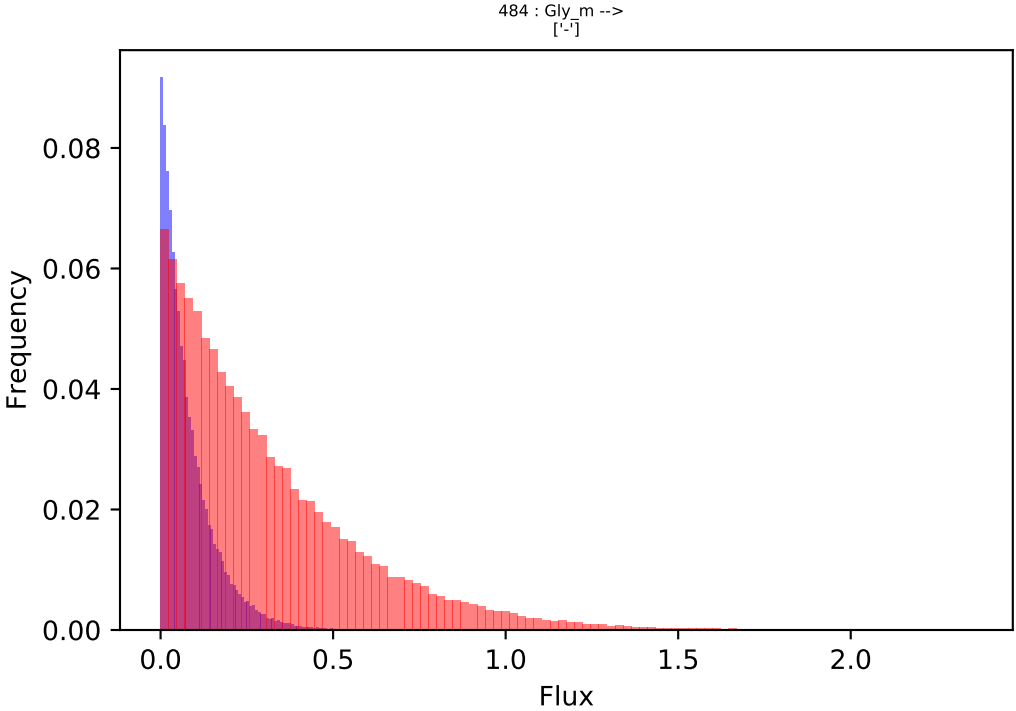
1.50
1.75
Flux


484 : Gly_m -->
['-']
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0.04
0.02
0.00
Frequency
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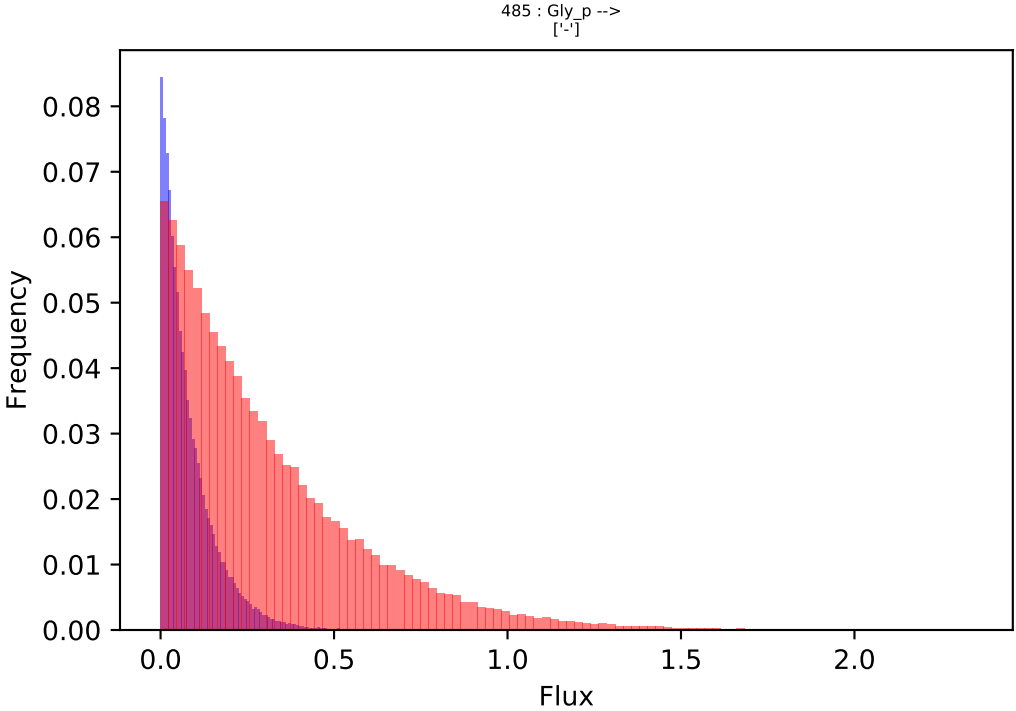
1.5
2.0
Flux


485 : Gly_p -->
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0.02
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Frequency
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1.5
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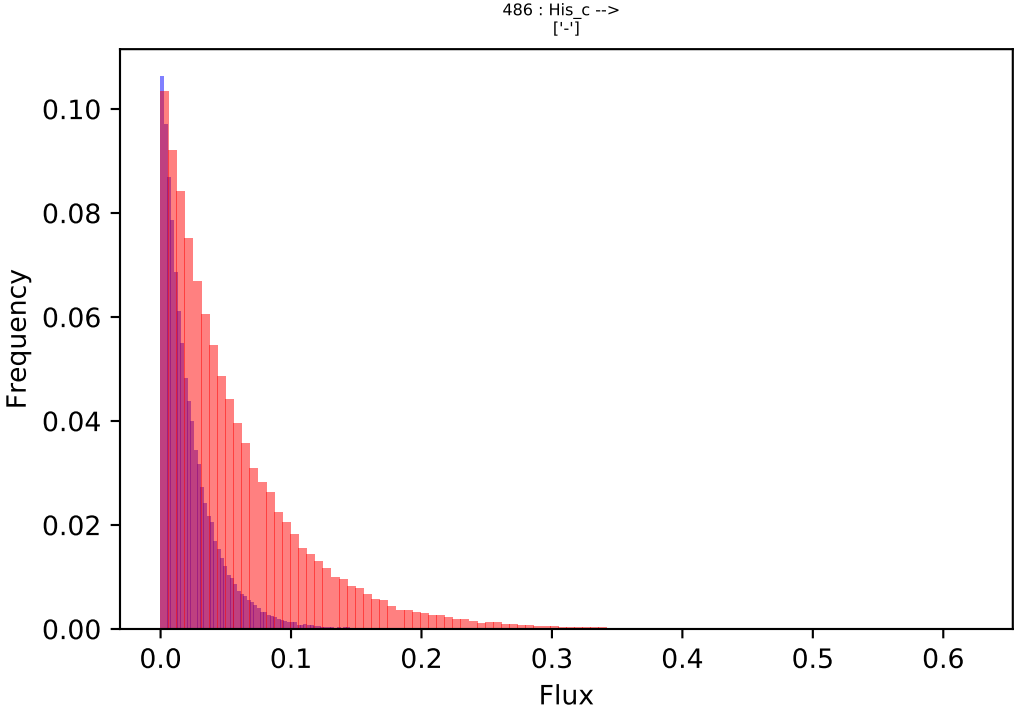
Flux


486 : His_c -->
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0.00
Frequency
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0.3
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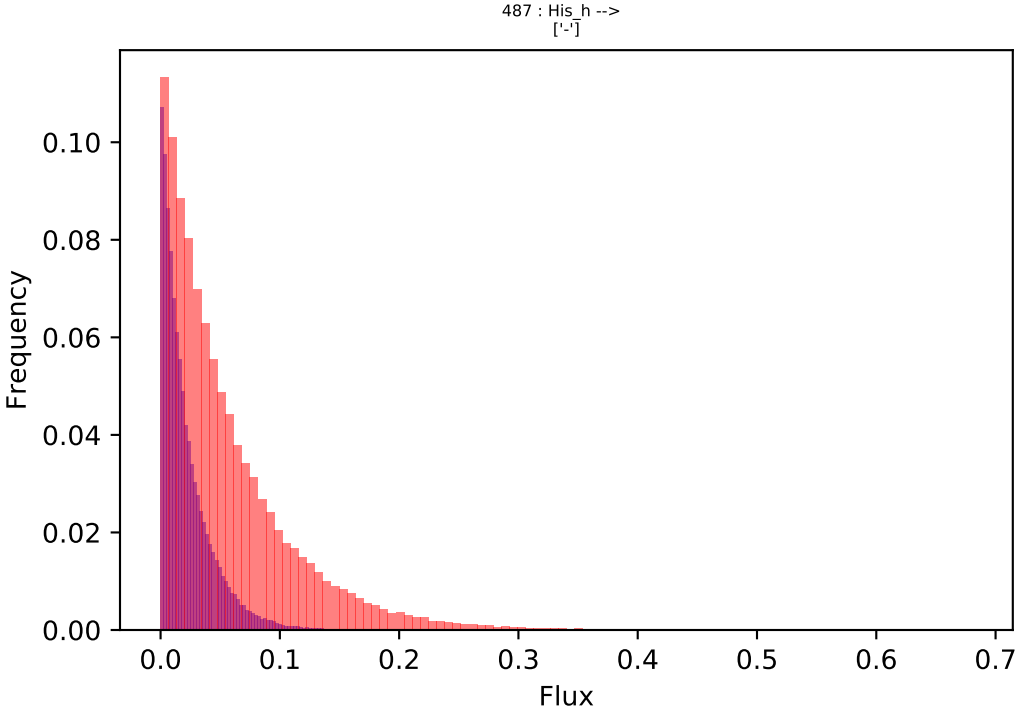
0.5
0.6
Flux


487 : His_h -->
['-']
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0.06
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0.02
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Frequency
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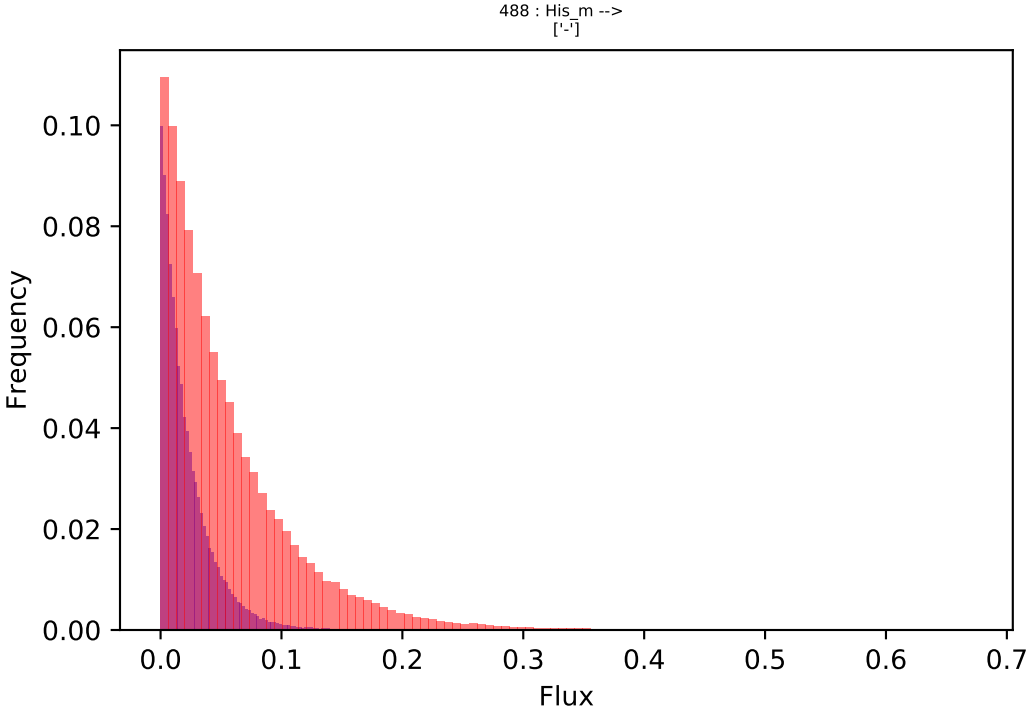
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Flux


488 : His_m -->
['-']
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0.06
0.04
0.02
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Frequency
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0.1
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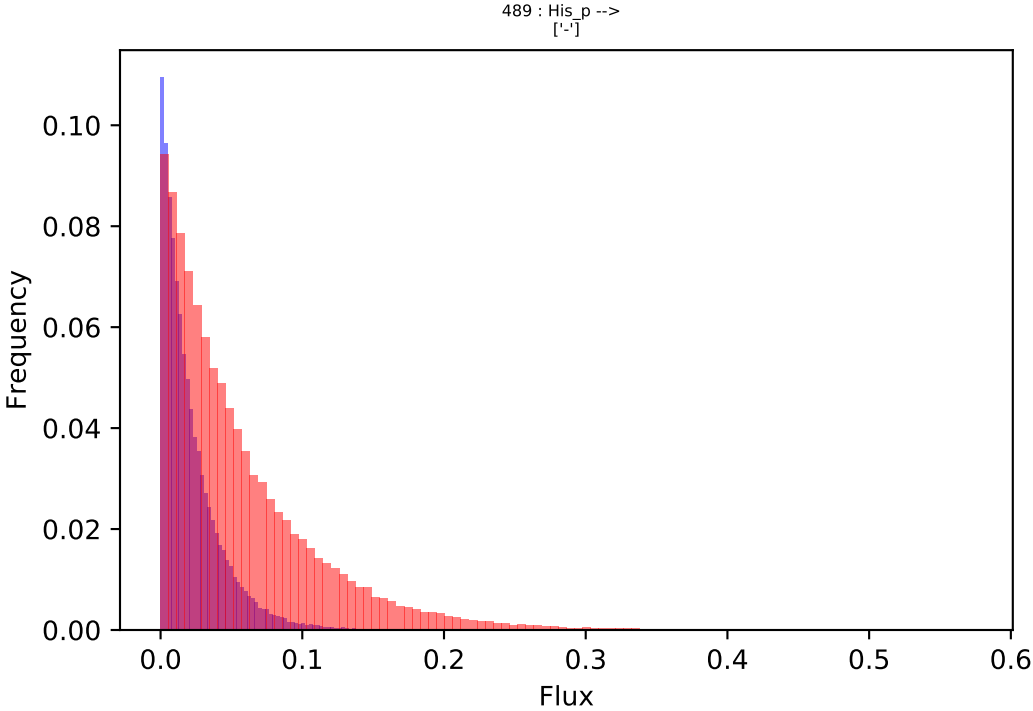
0.3
0.4
0.5
0.6
0.7
Flux


489 : His_p -->
['-']
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0.00
Frequency
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0.3
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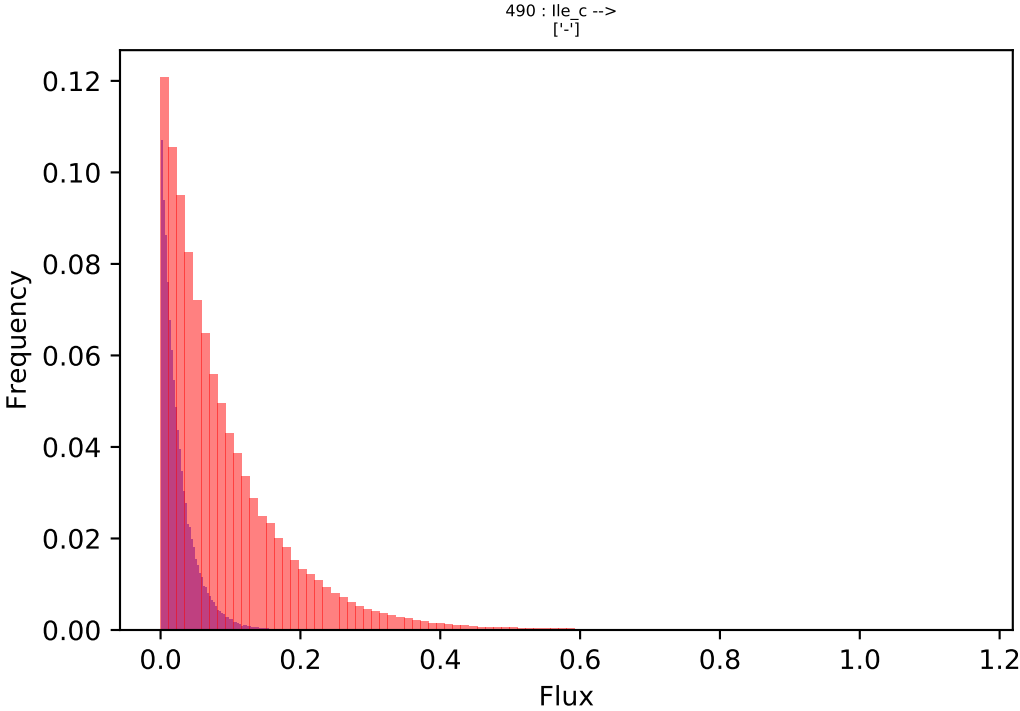
0.5
0.6
Flux


490 : Ile_c -->
['-']
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0.06
0.04
0.02
0.00
Frequency
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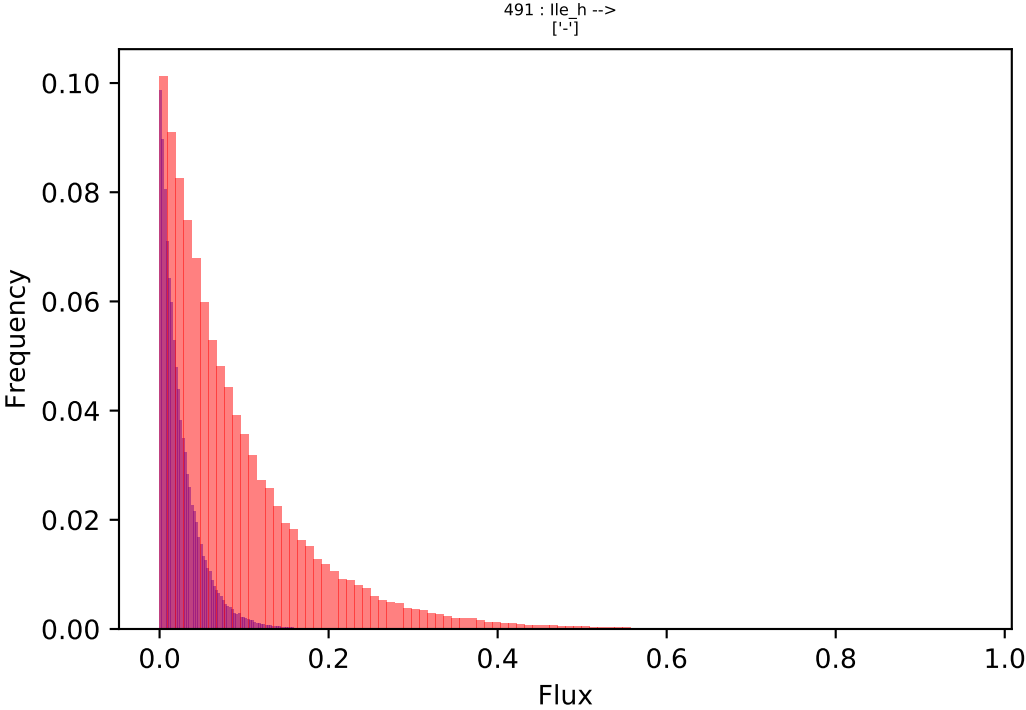
0.4
0.6
0.8
1.0
1.2
Flux


491 : Ile_h -->
['-']
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0.02
0.00
Frequency
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0.2
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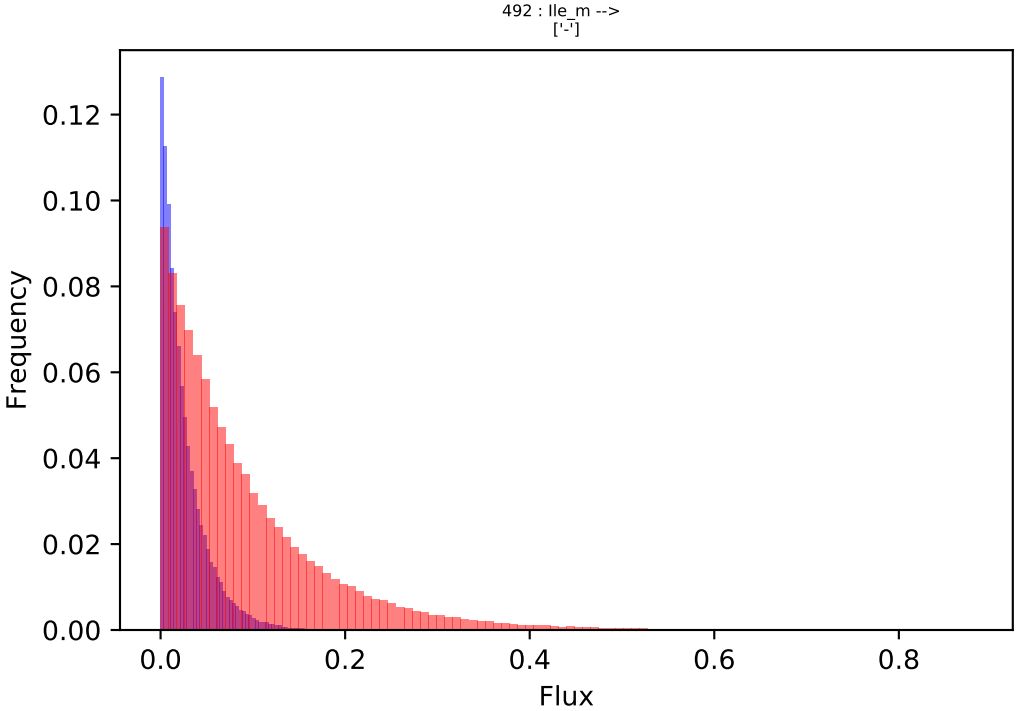
0.6
0.8
1.0
Flux


492 : Ile_m -->
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0.08
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0.02
0.00
Frequency
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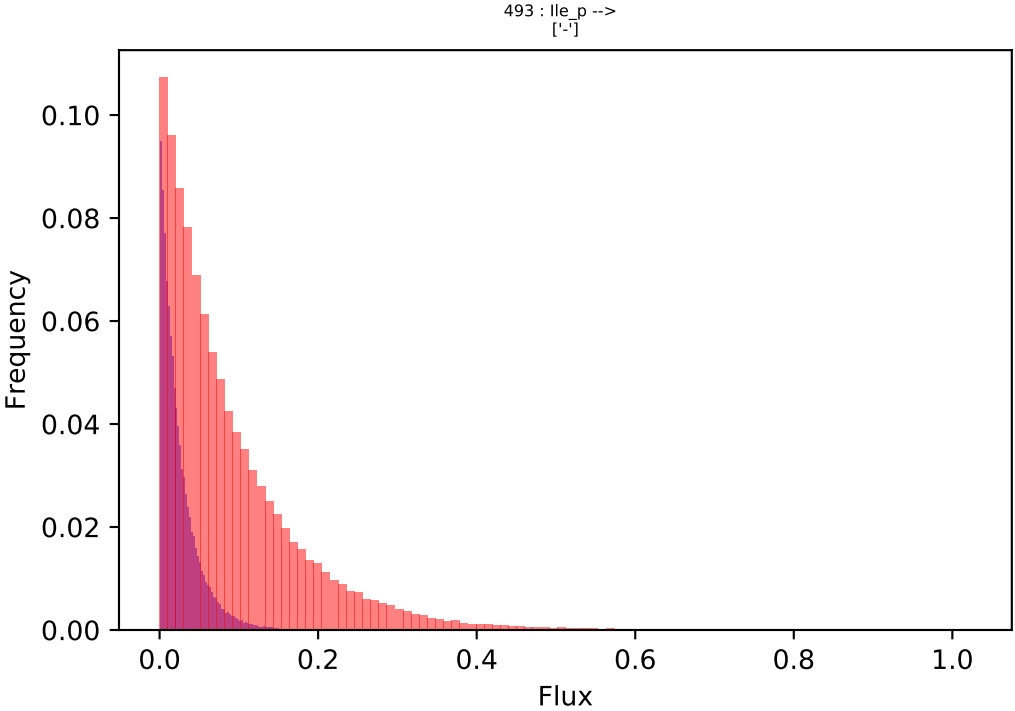
0.4
0.6
0.8
Flux


493 : Ile_p -->
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Frequency
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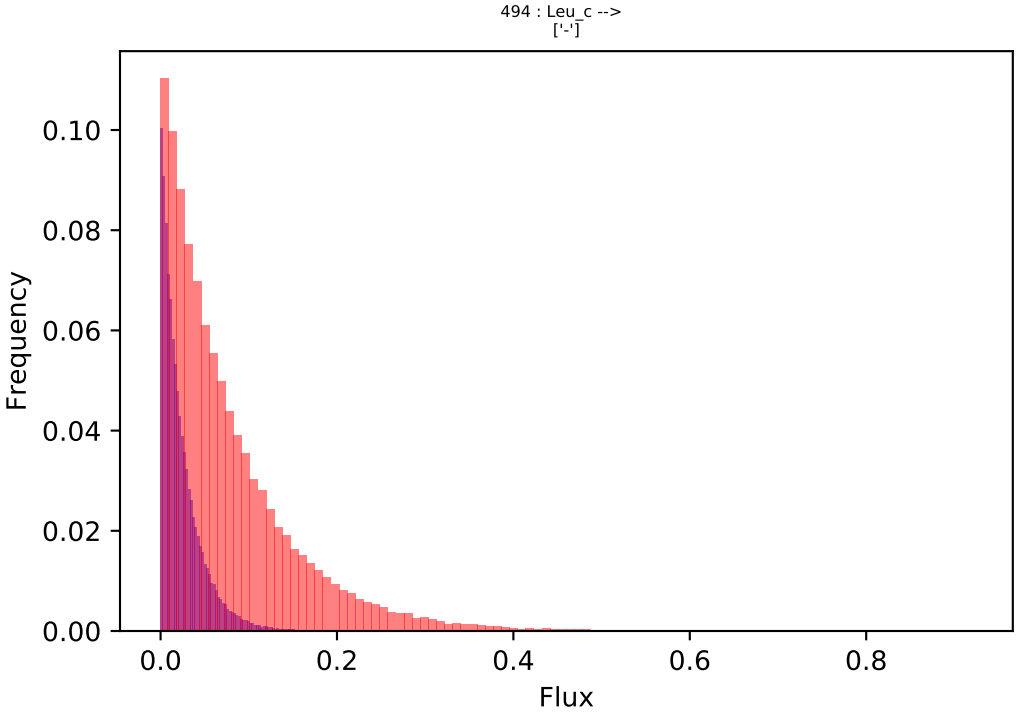
1.0
Flux


494 : Leu_c -->
['-']
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0.04
0.02
0.00
Frequency
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0.2
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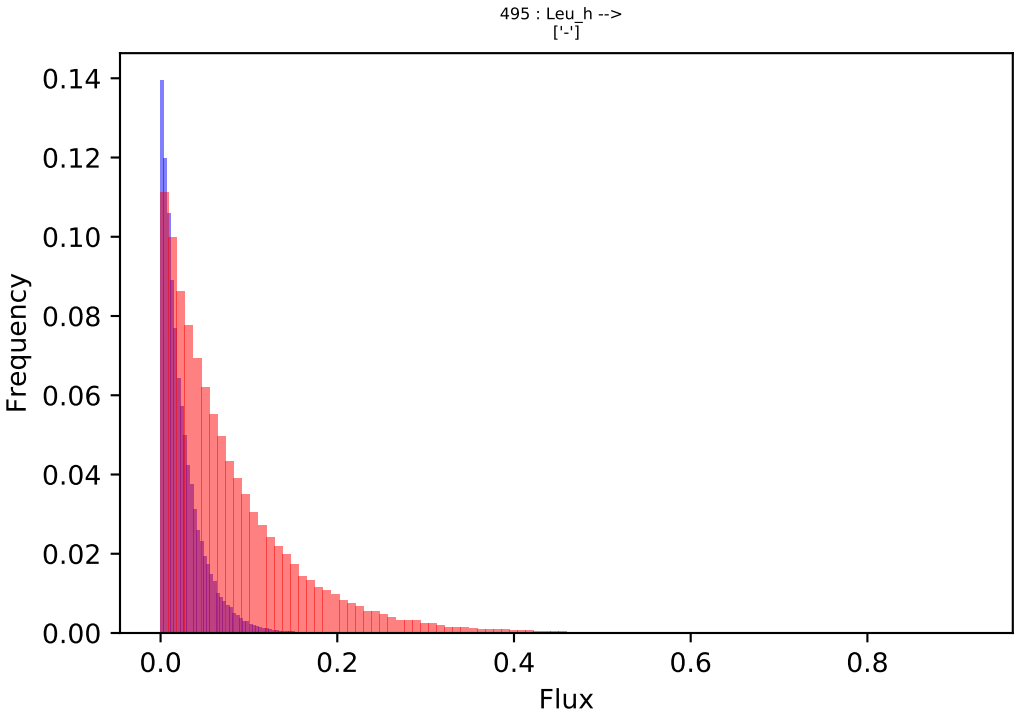
0.6
0.8
Flux


495 : Leu_h -->
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0.02
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Frequency
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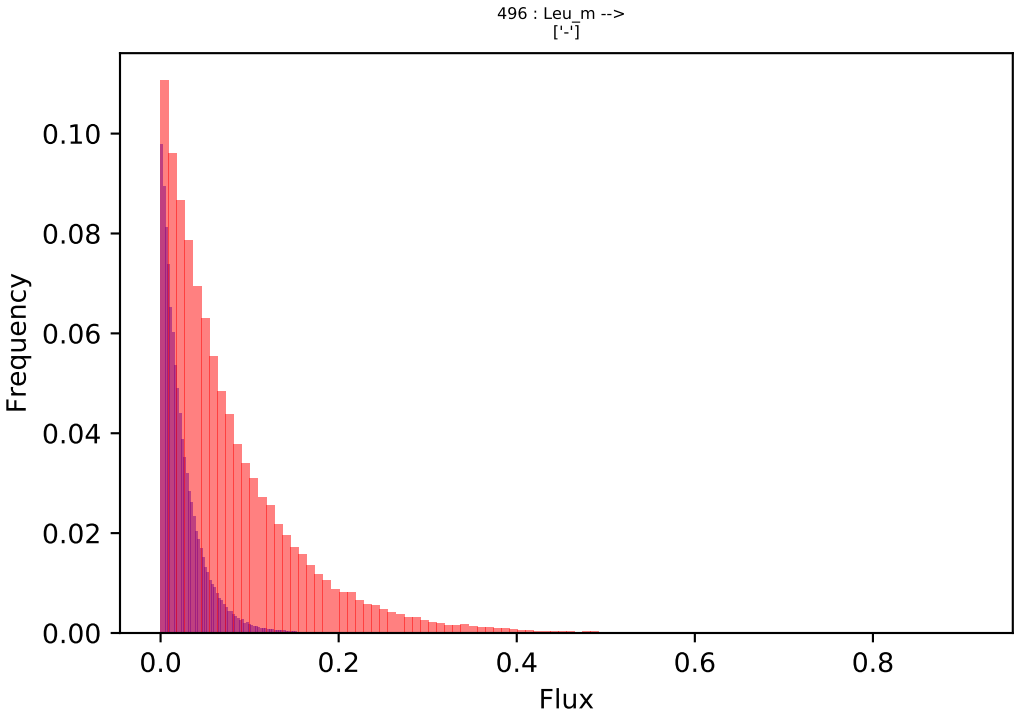
0.8
Flux


496 : Leu_m -->
['-']
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Frequency
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0.6
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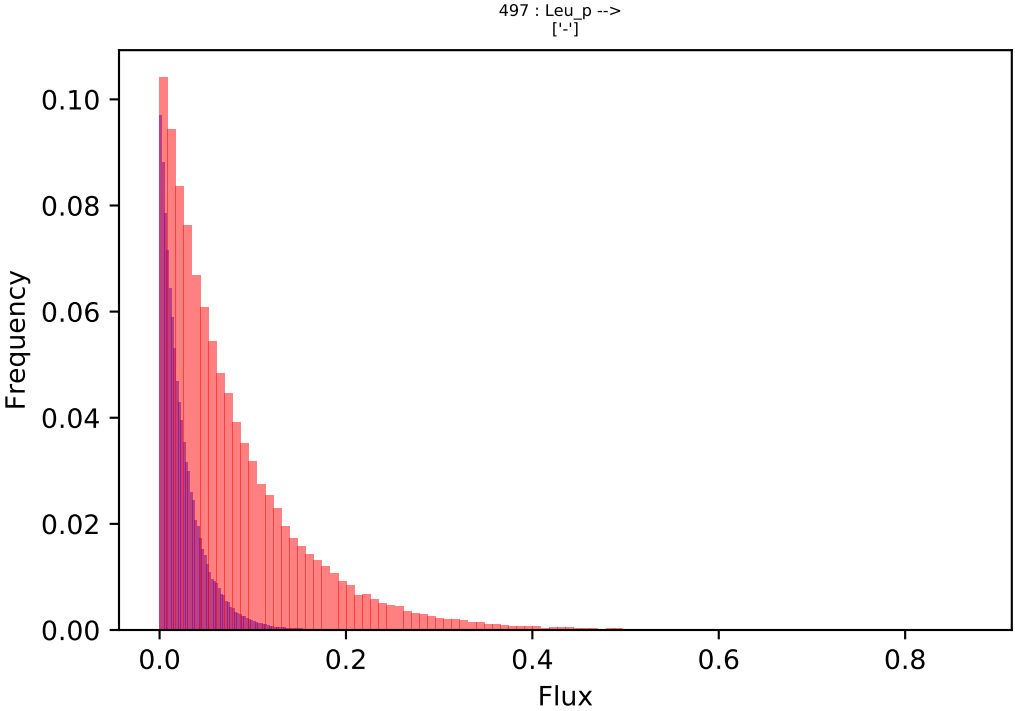
Flux


497 : Leu_p -->
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Frequency
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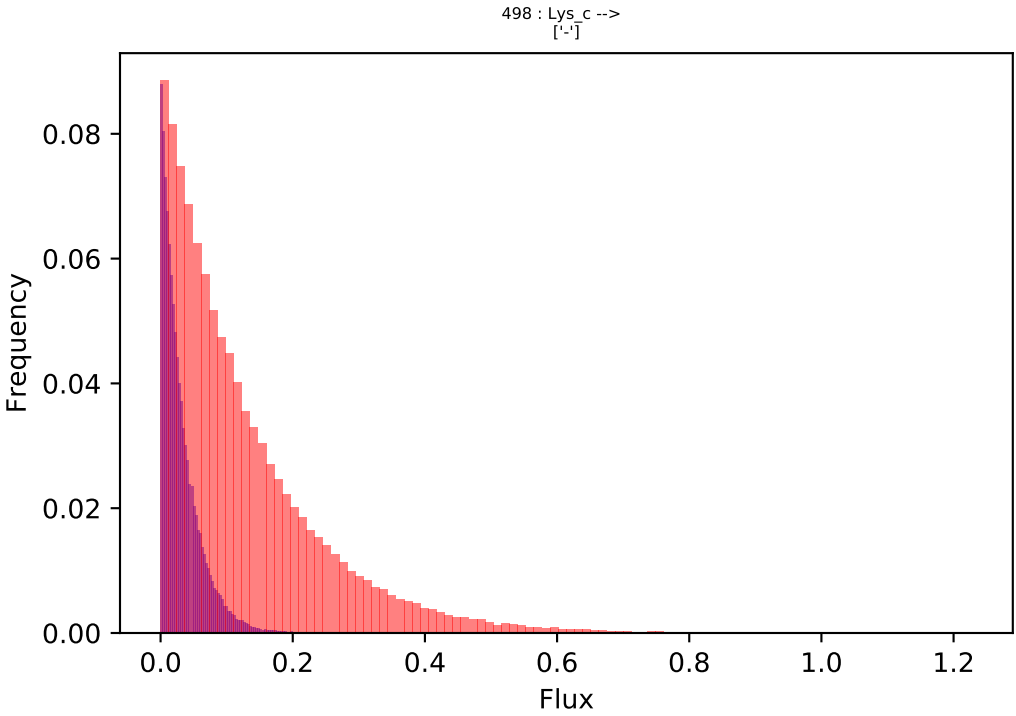
0.6
0.8
Flux


498 : Lys_c -->
['-']
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Frequency
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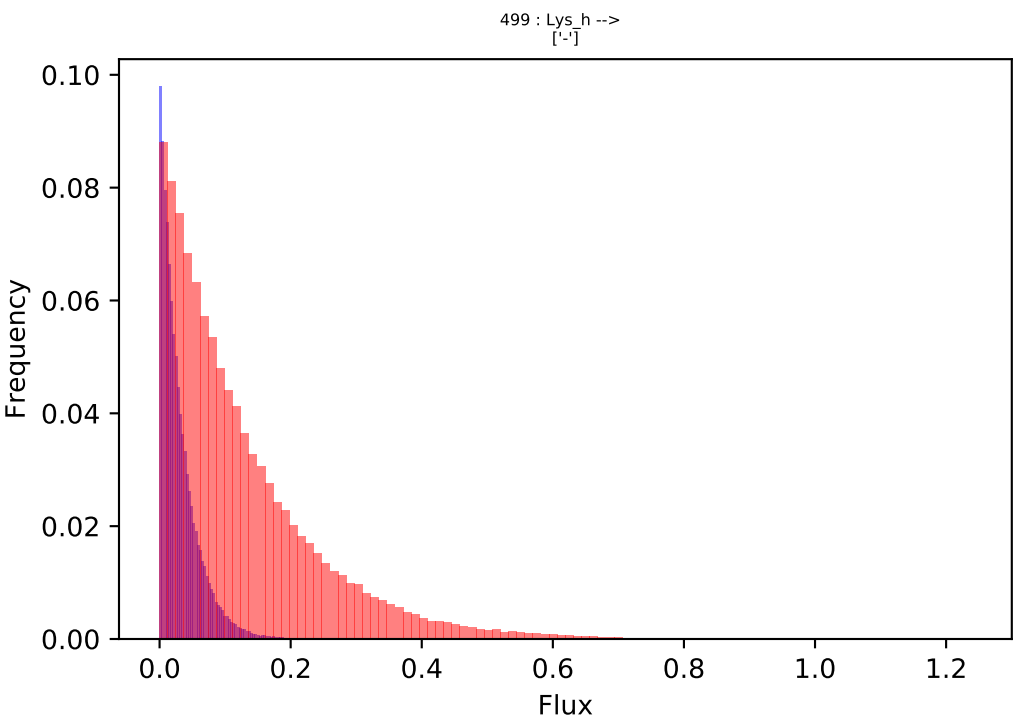
1.2
Flux


499 : Lys_h -->
['-']
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Frequency
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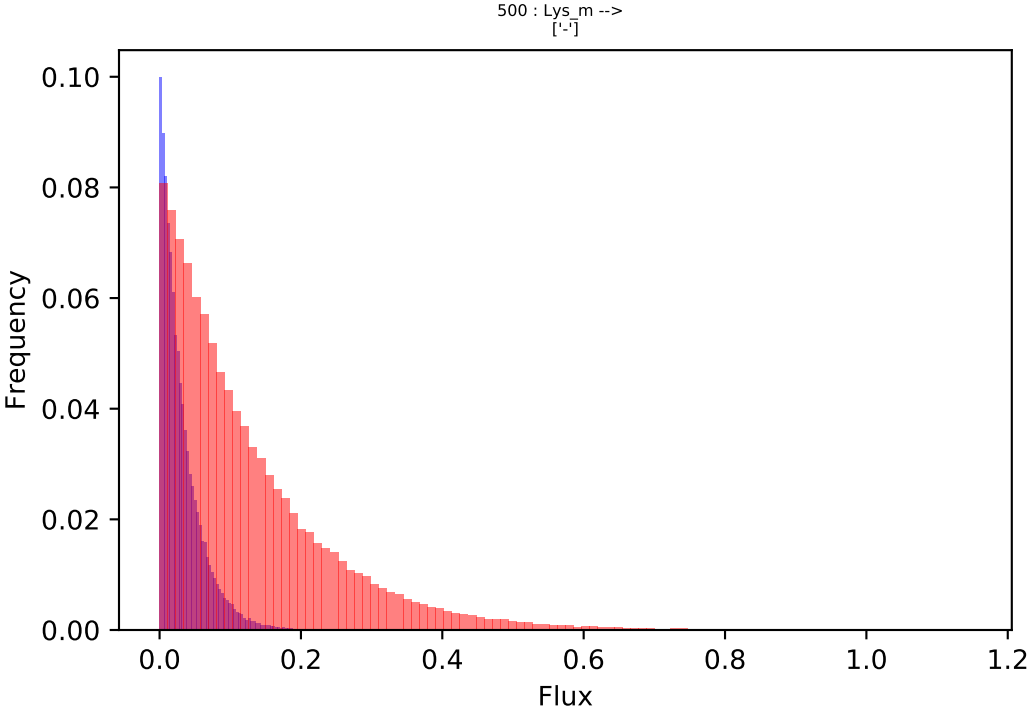
1.2
Flux


500 : Lys_m -->
['-']
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Frequency
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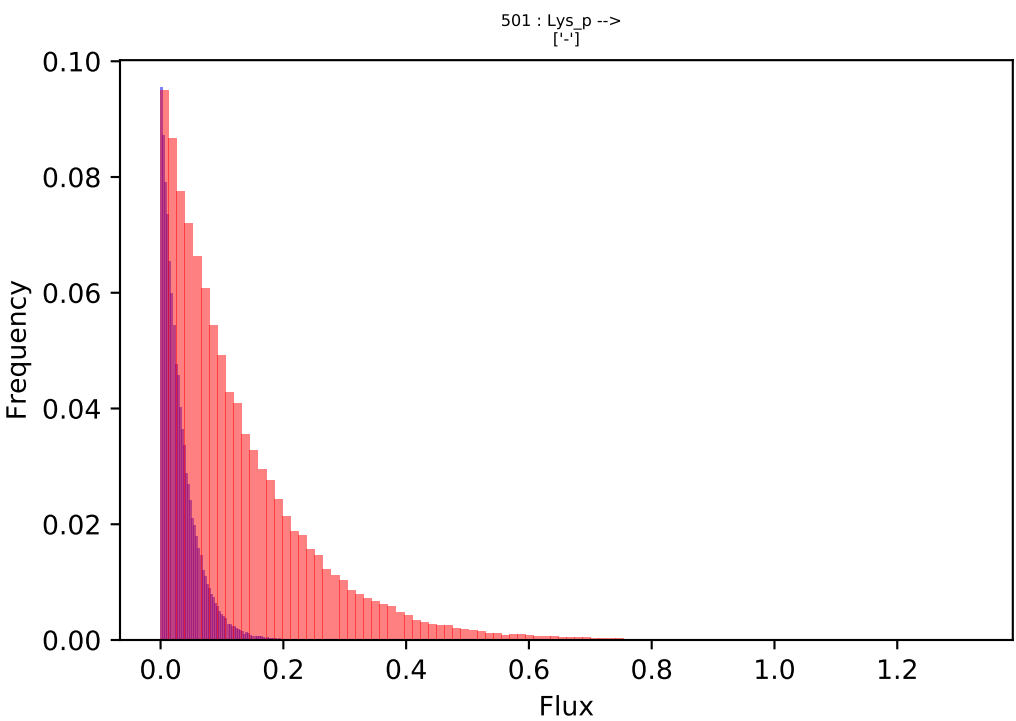
1.2
Flux


501 : Lys_p -->
['-']
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Frequency
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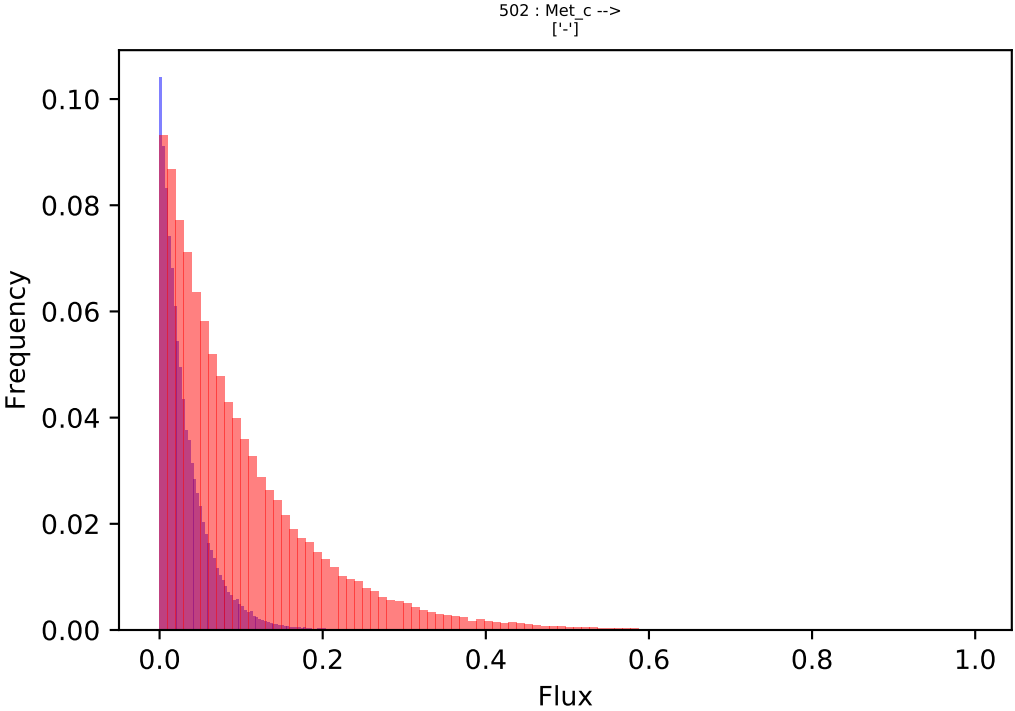
1.2
Flux


502 : Met_c -->
['-']
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Frequency
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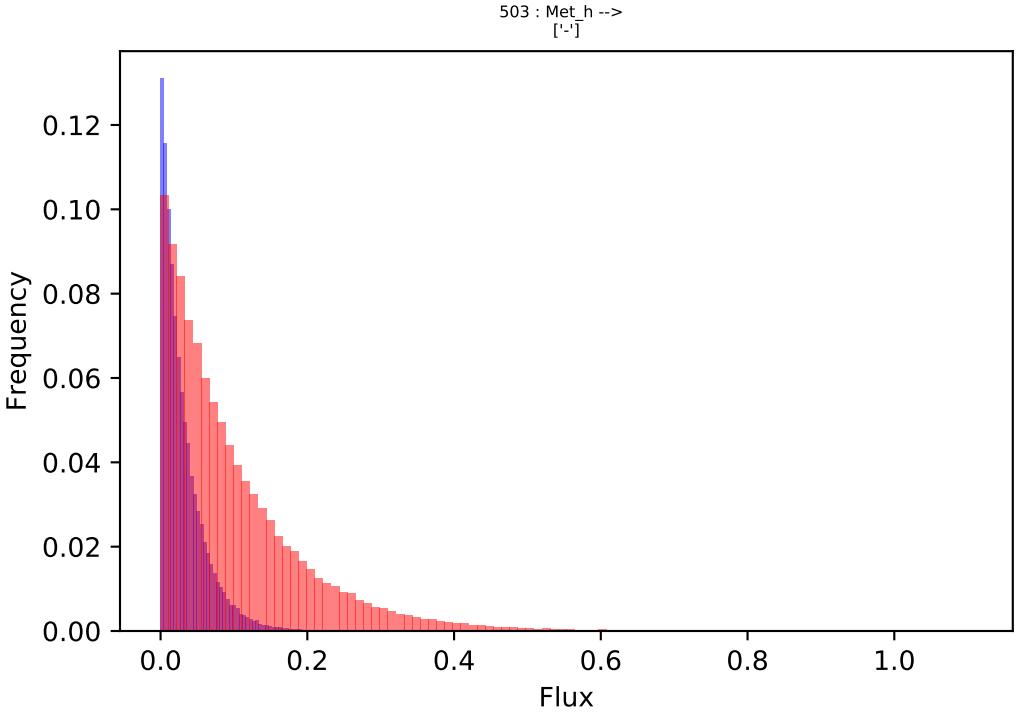
Flux


503 : Met_h -->
['-']
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0.02
0.00
Frequency
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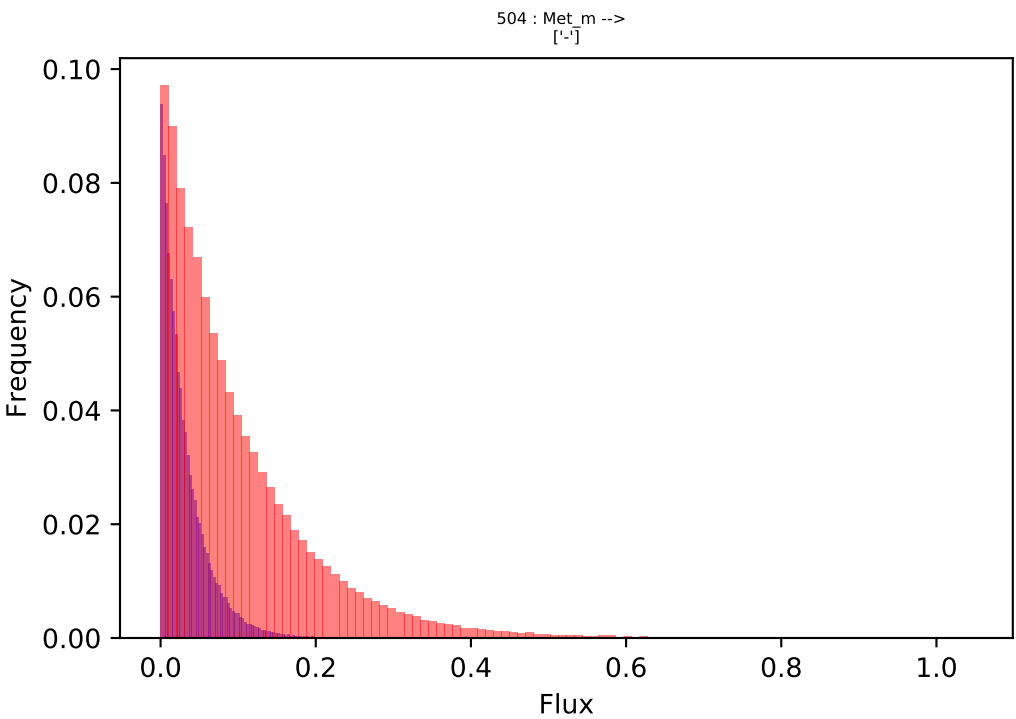
Flux


504 : Met_m -->
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Frequency
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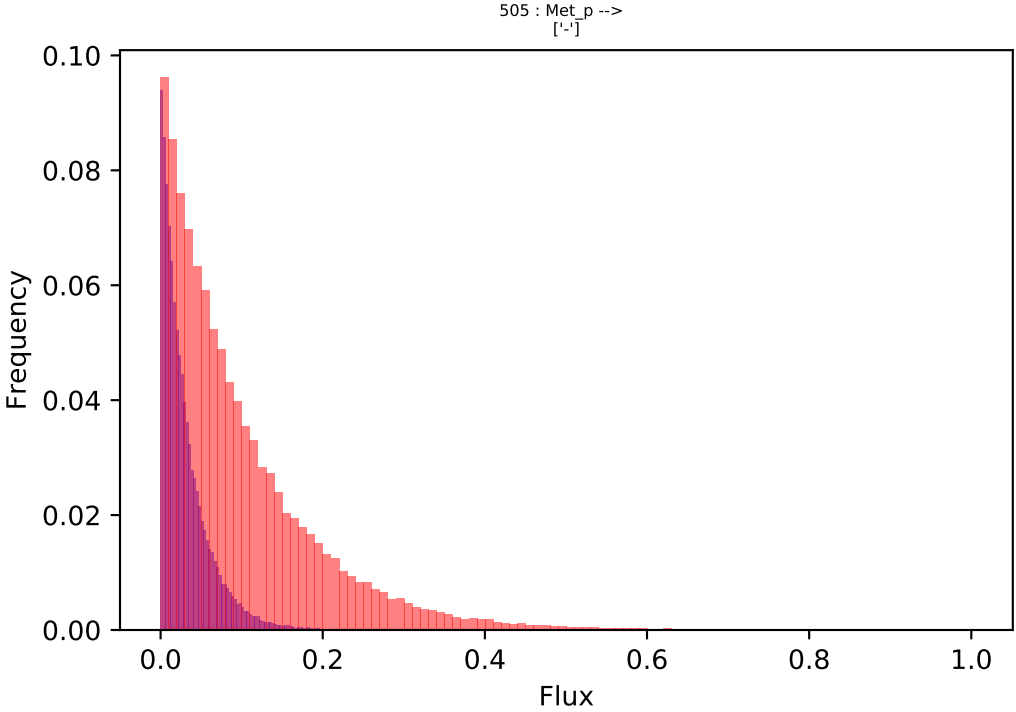
Flux


505 : Met_p -->
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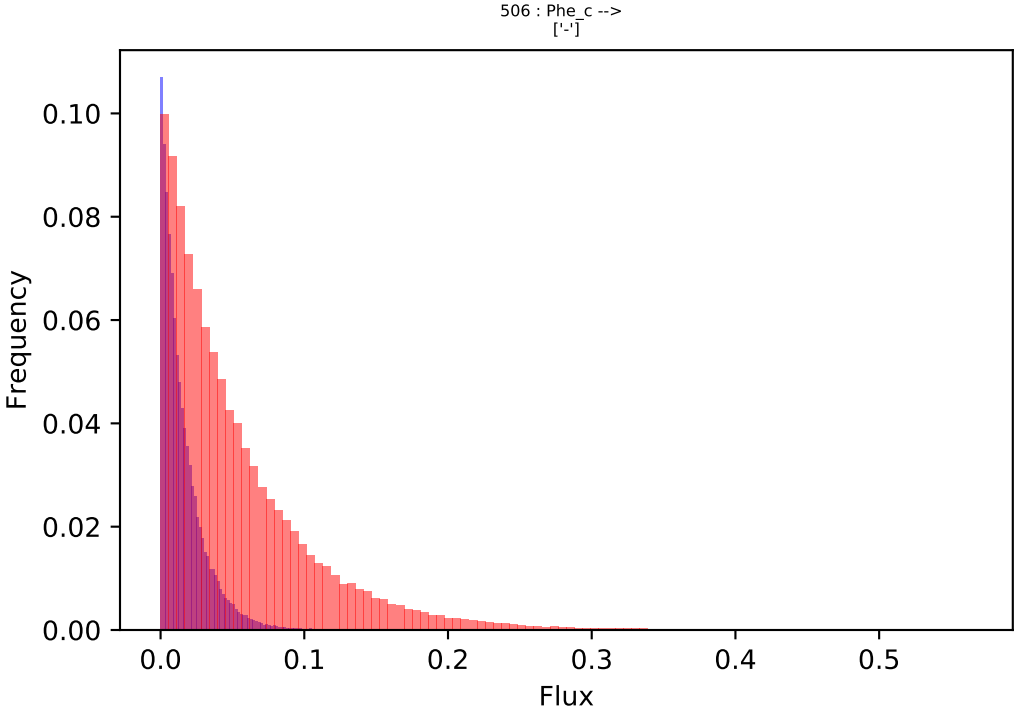
Flux


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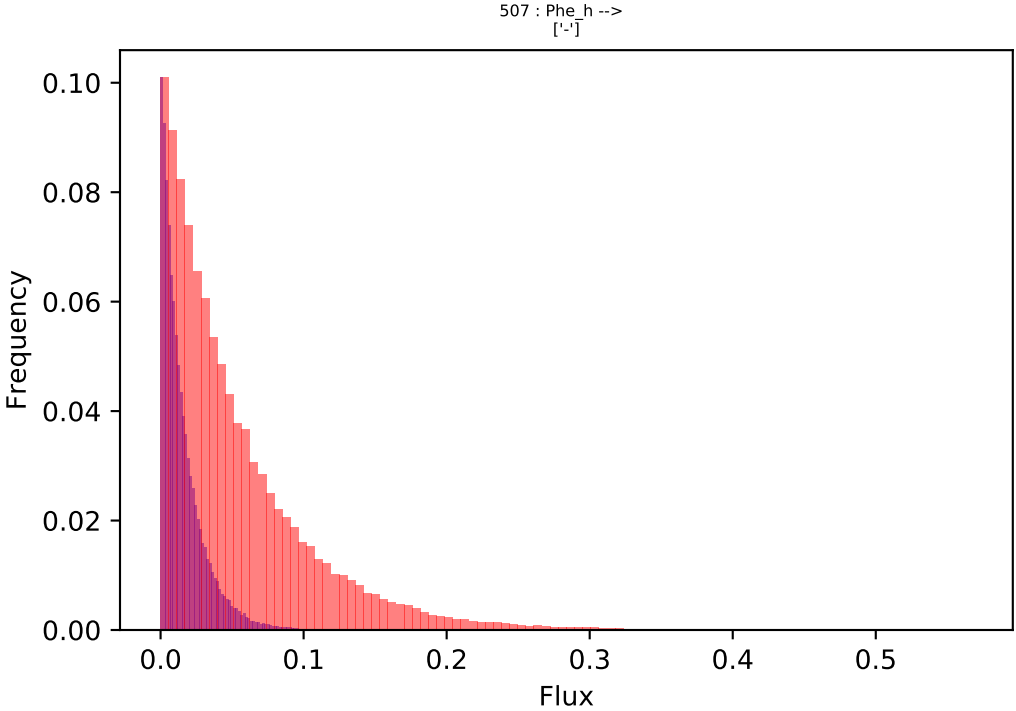
Flux


507 : Phe_h -->
['-']
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Frequency
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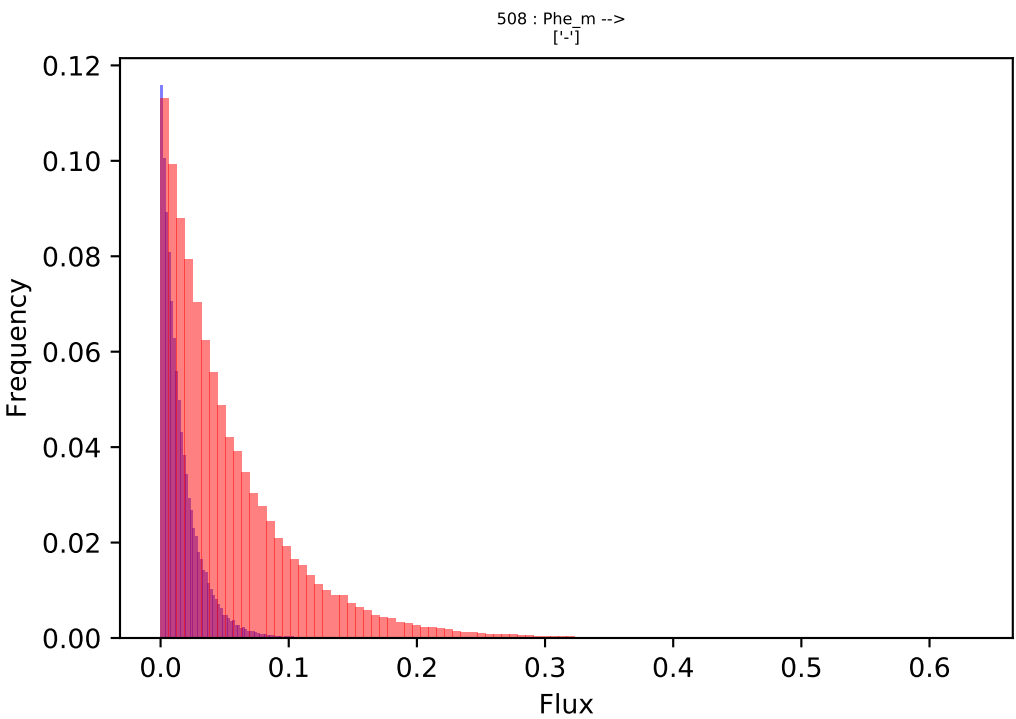
Flux


508 : Phe_m -->
['-']
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Frequency
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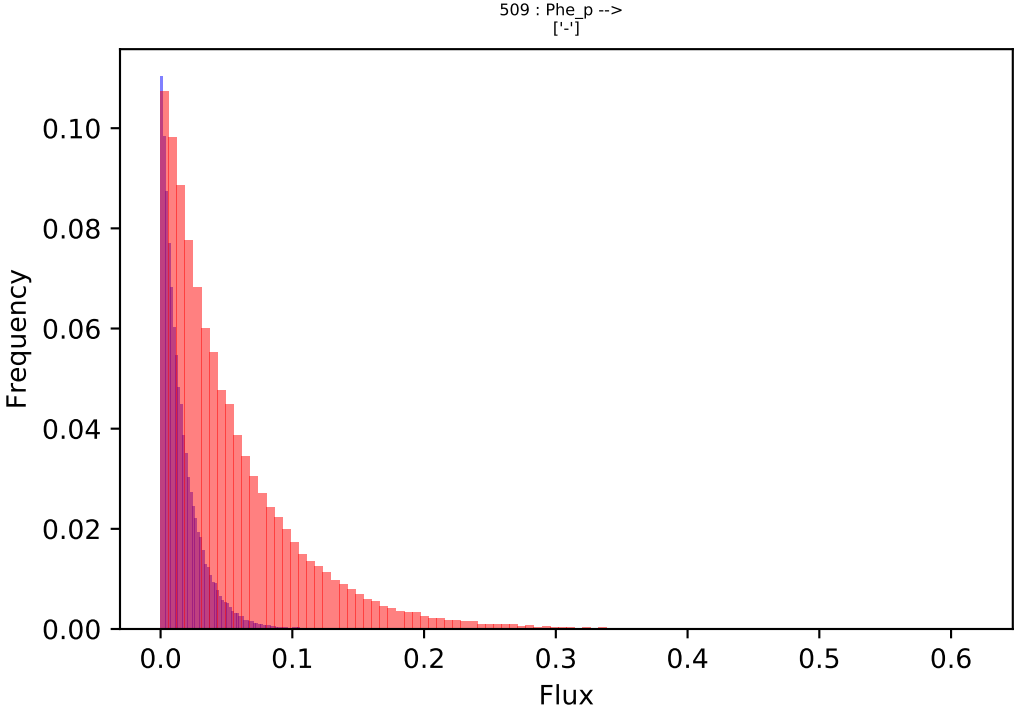
Flux


509 : Phe_p -->
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Frequency
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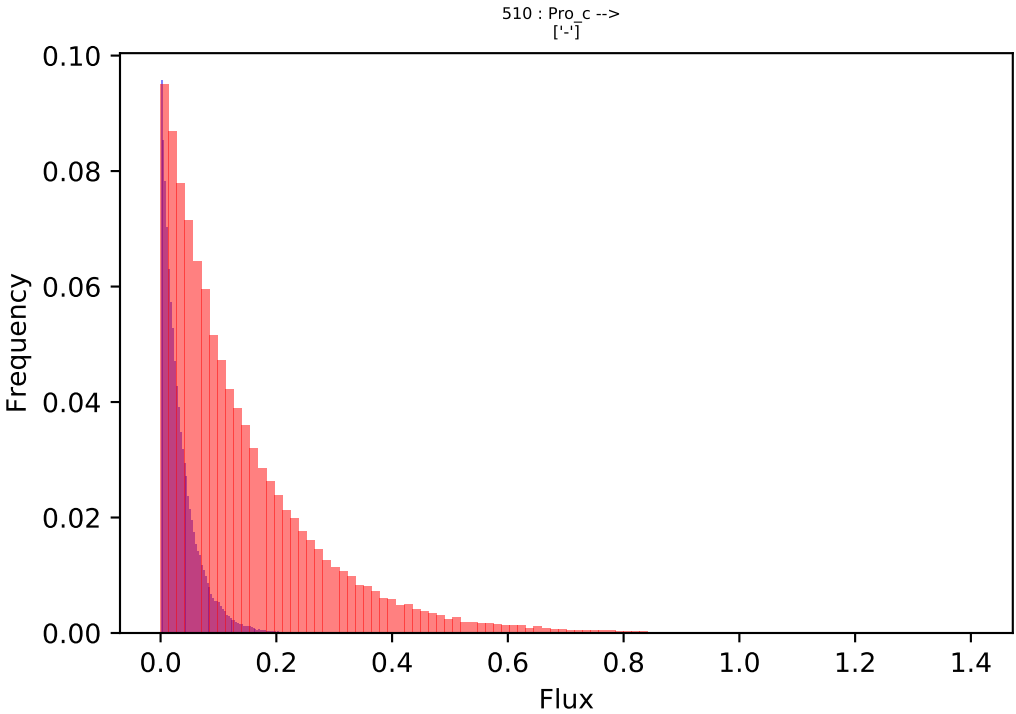
Flux


510 : Pro_c -->
['-']
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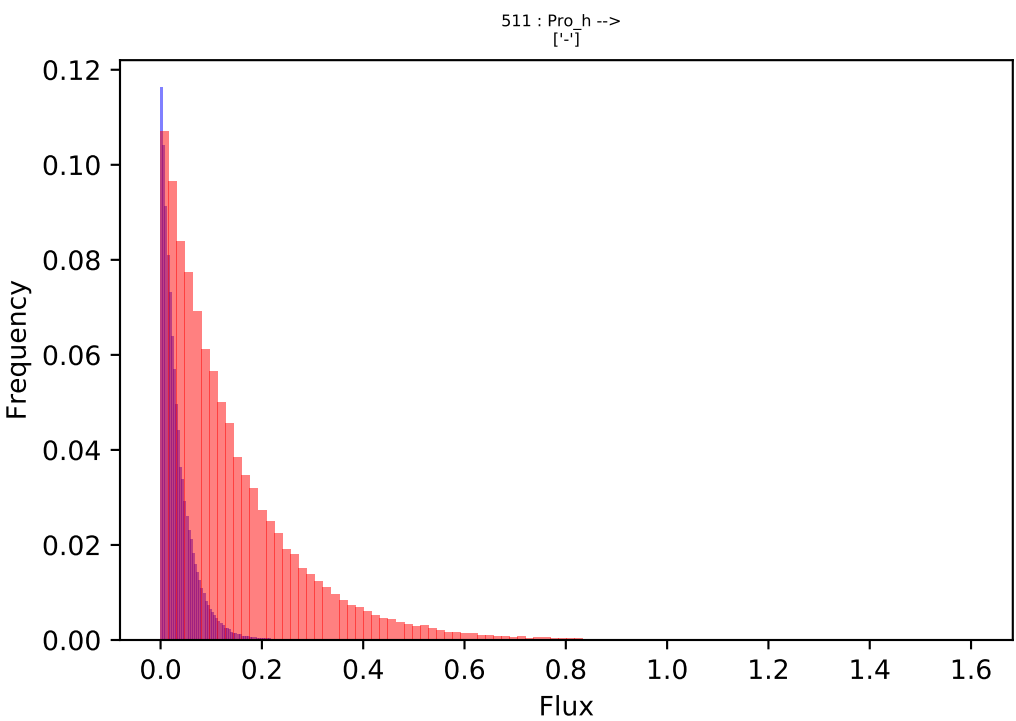
0.8
1.0
1.2
1.4
Flux


511 : Pro_h -->
['-']
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0.02
0.00
Frequency
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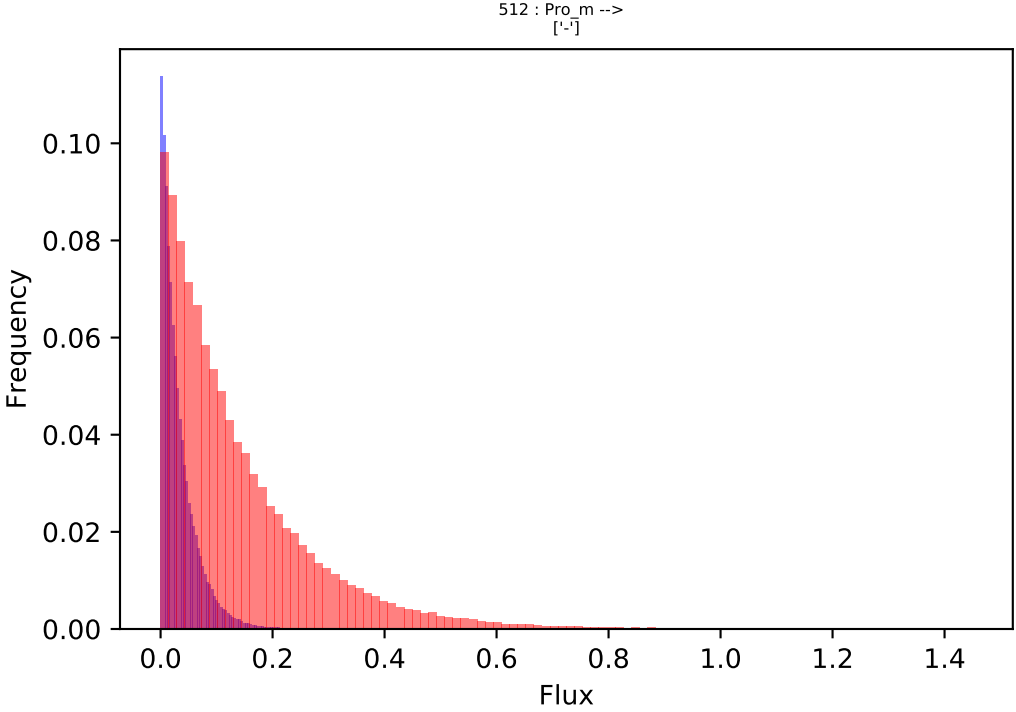
0.6
0.8
1.0
1.2
1.4
1.6
Flux


512 : Pro_m -->
['-']
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Frequency
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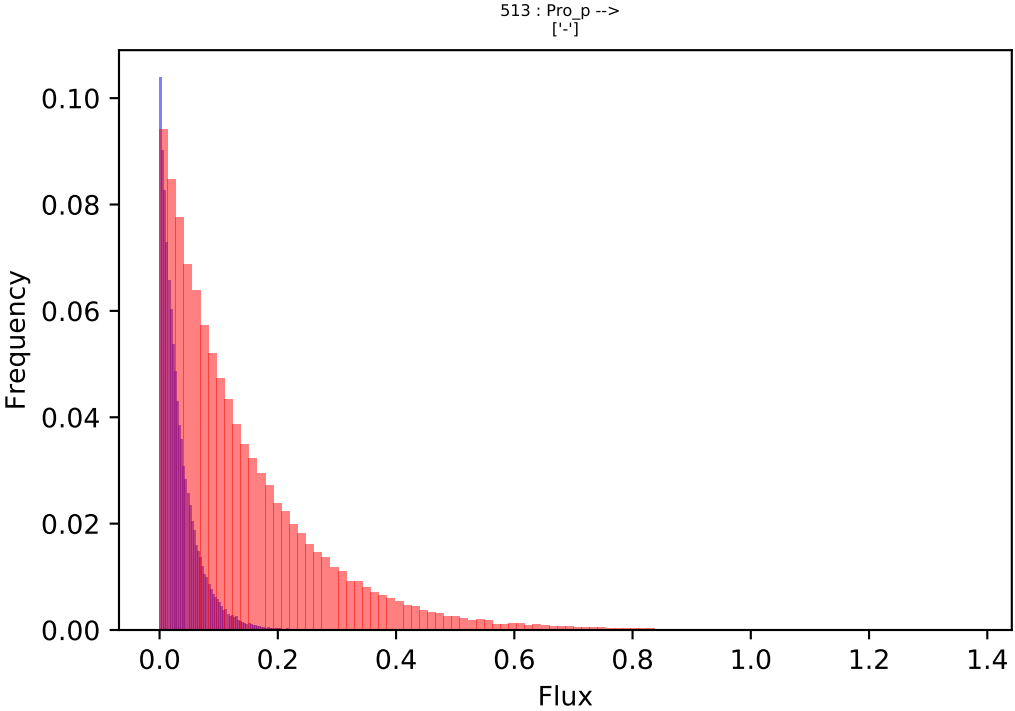
0.6
0.8
1.0
1.2
1.4
Flux


513 : Pro_p -->
['-']
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0.04
0.02
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Frequency
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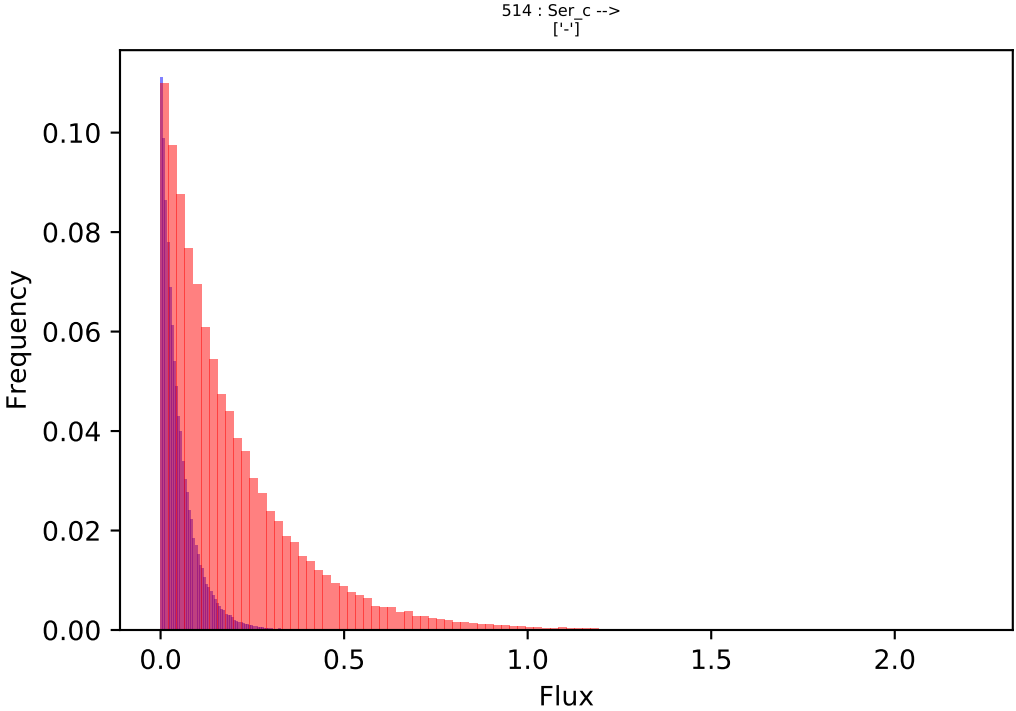
0.8
1.0
1.2
1.4
Flux


514 : Ser_c -->
['-']
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0.00
Frequency
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1.5
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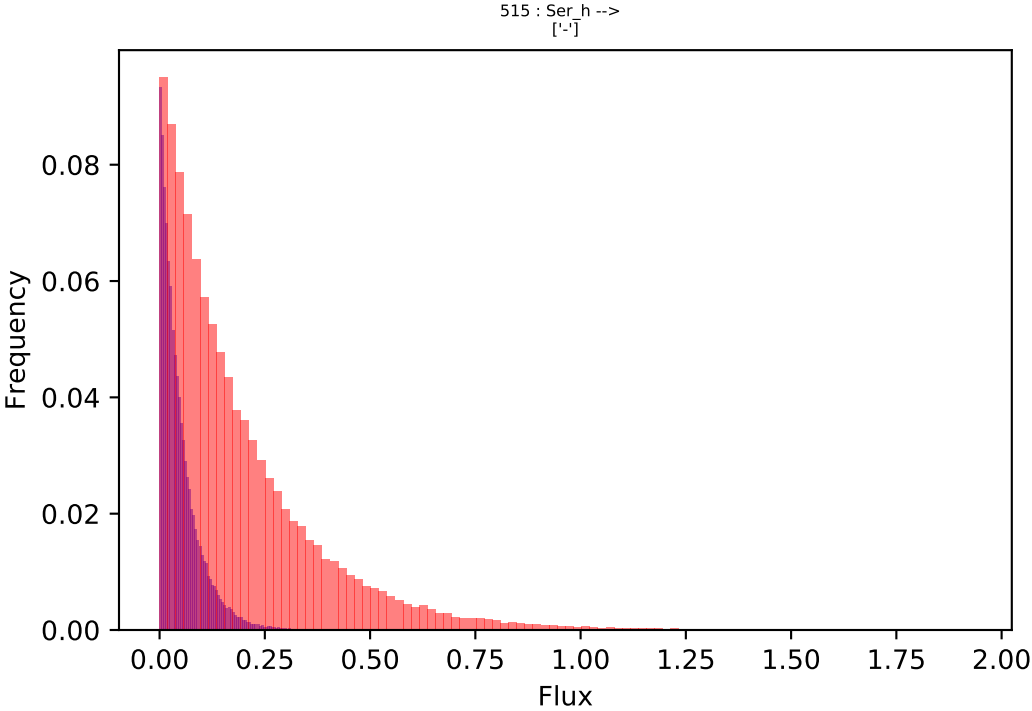
Flux


515 : Ser_h -->
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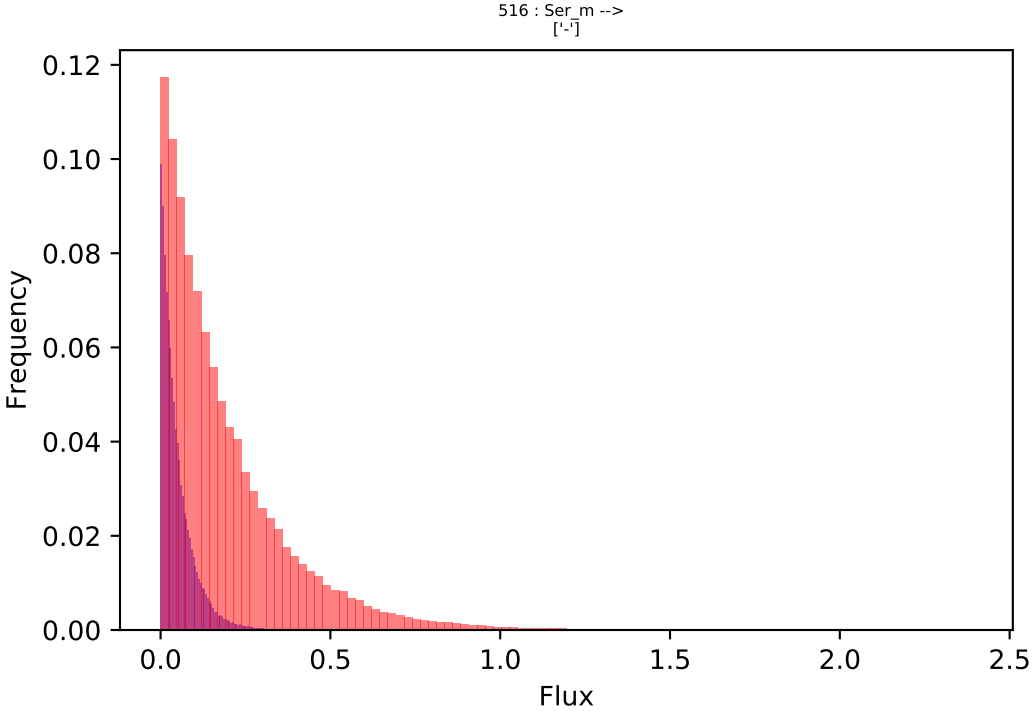
1.75
2.00
Flux


516 : Ser_m -->
['-']
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0.06
0.04
0.02
0.00
Frequency
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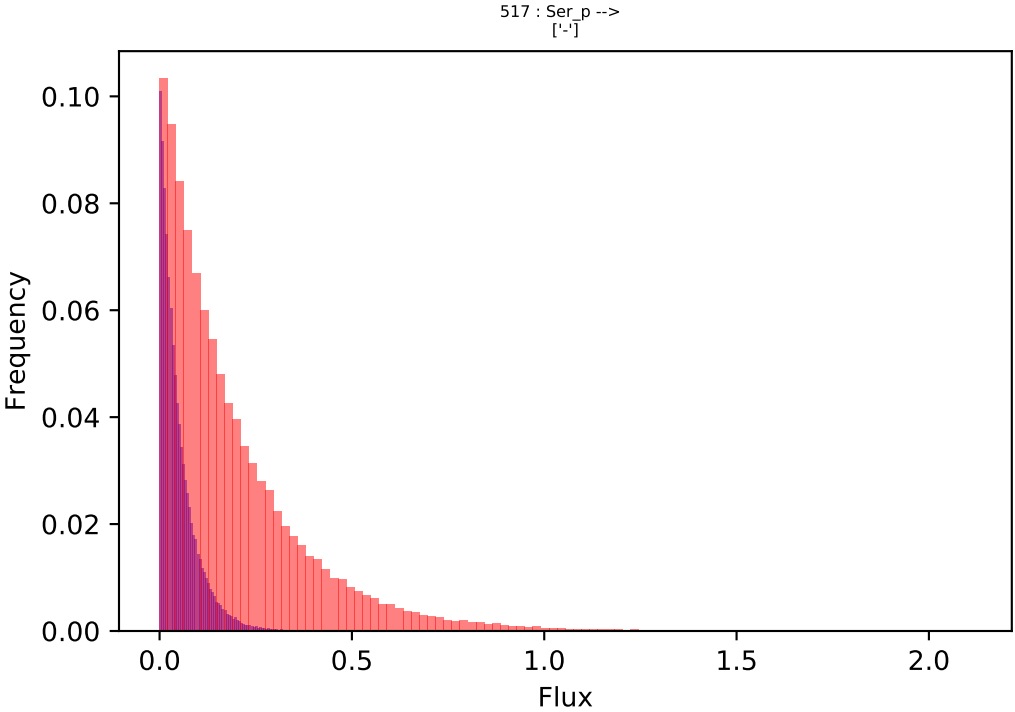
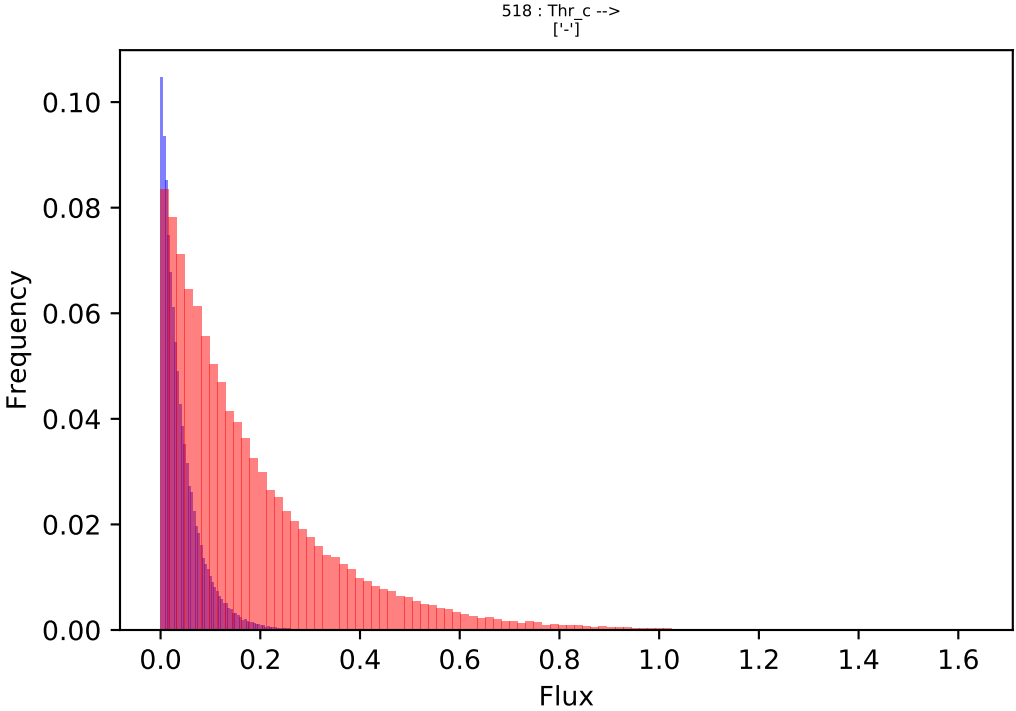
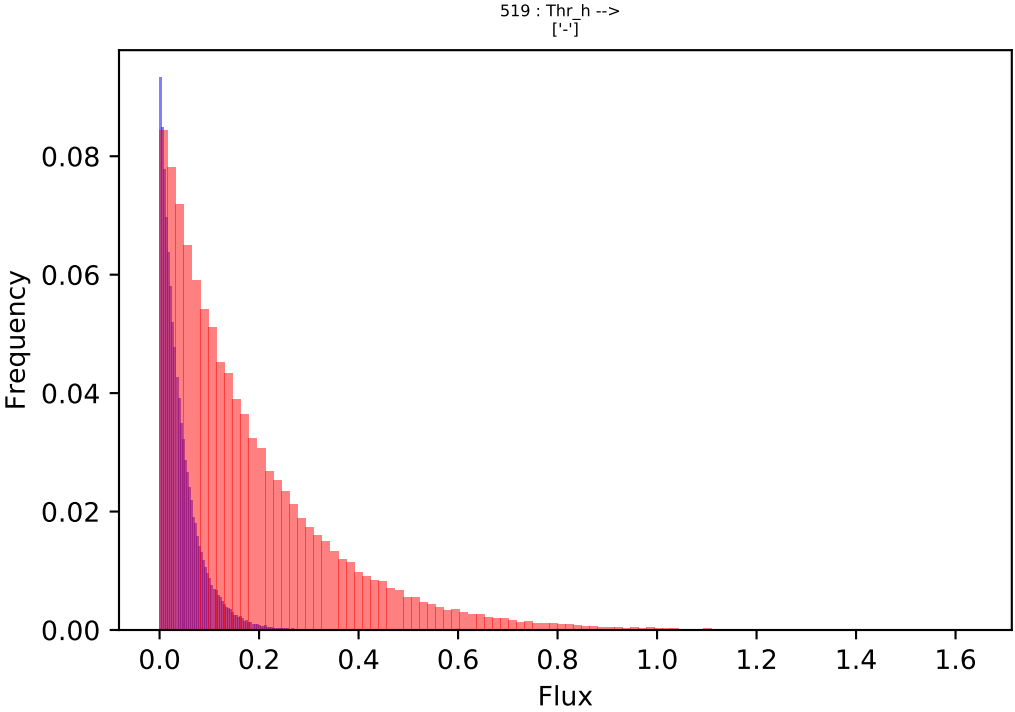
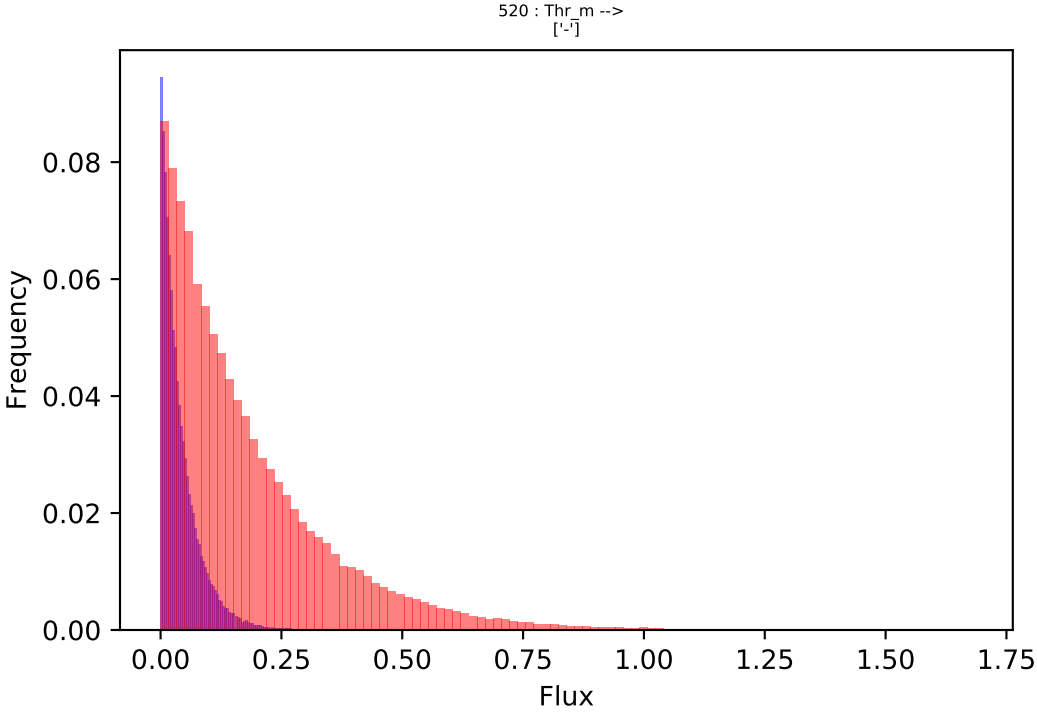
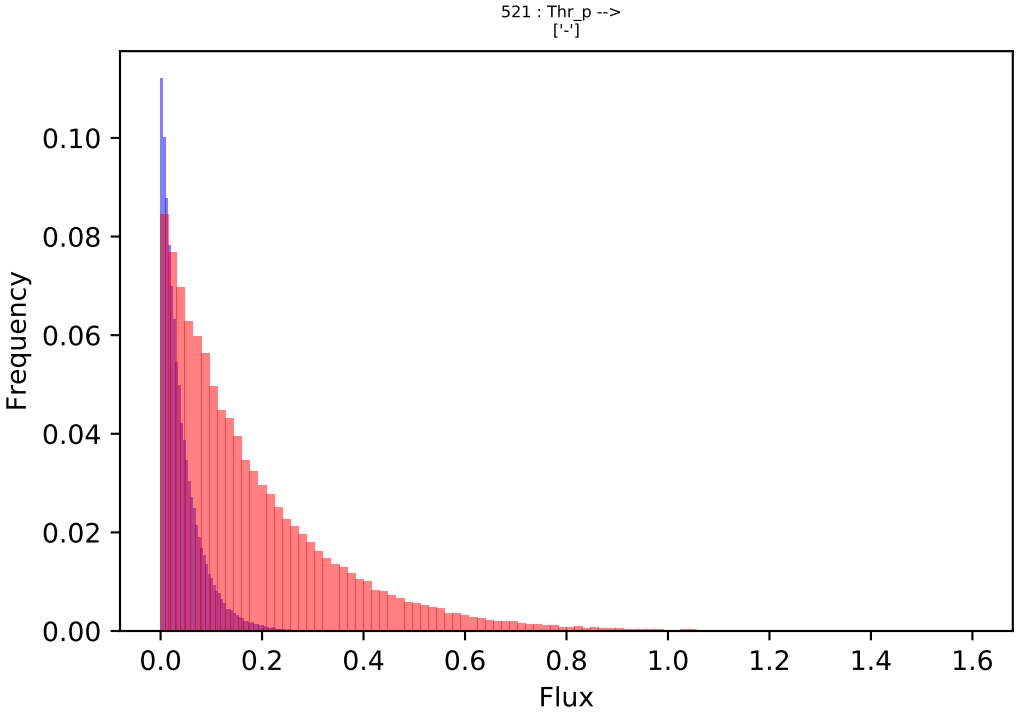
1.0
1.5
2.0
2.5
Flux

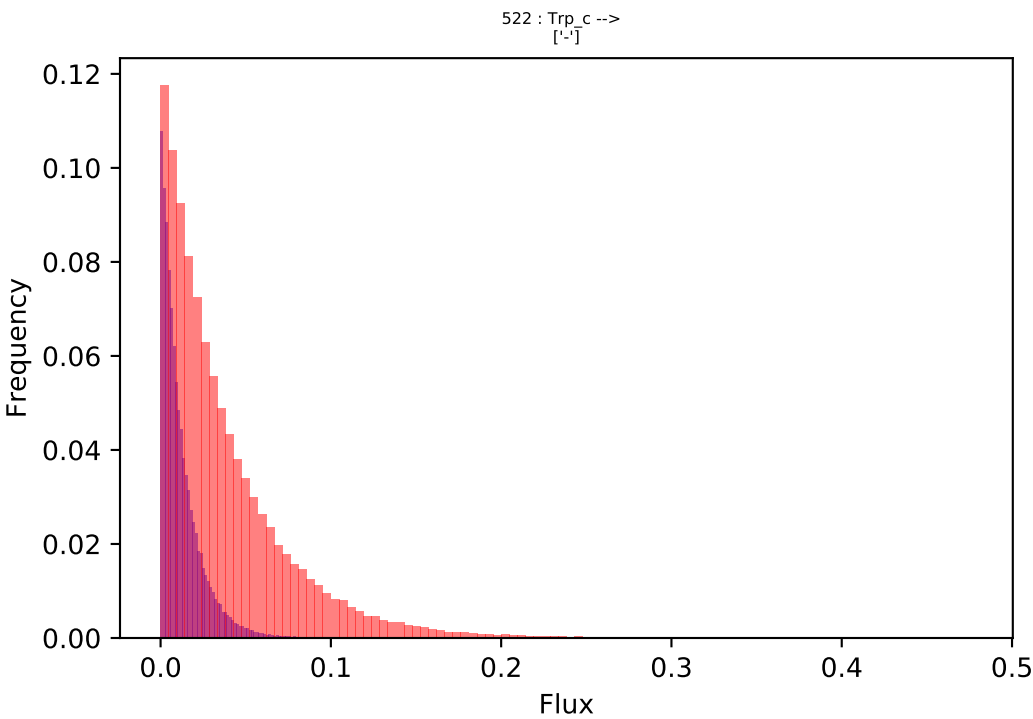

517 : Ser_p -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.5
1.0
1.5
2.0
Flux

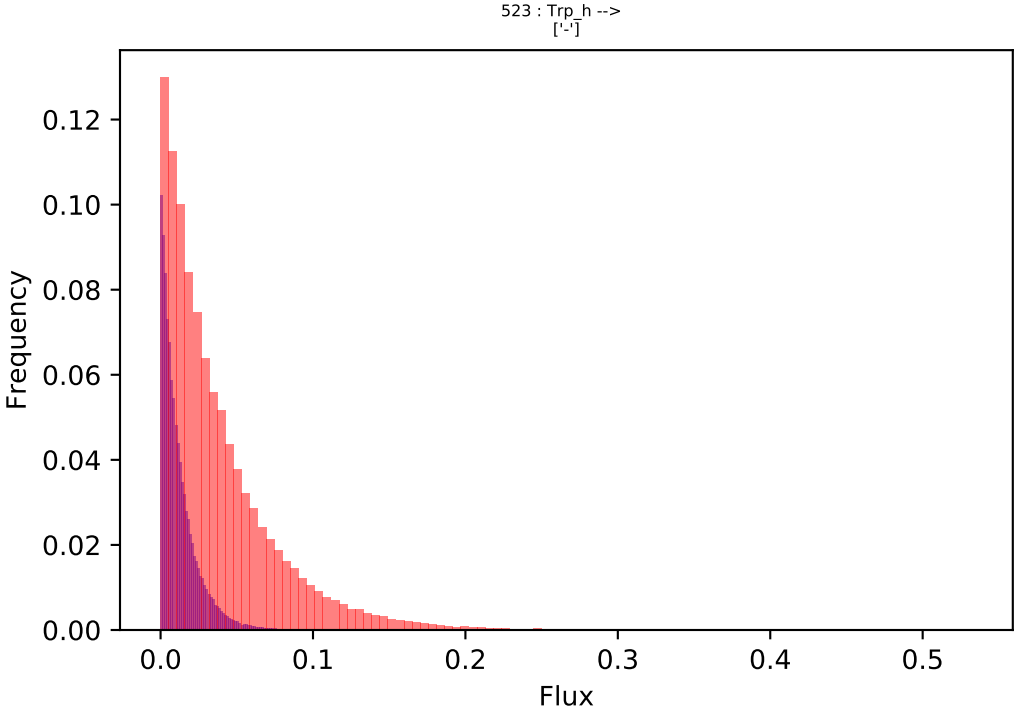

518 : Thr_c -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Flux

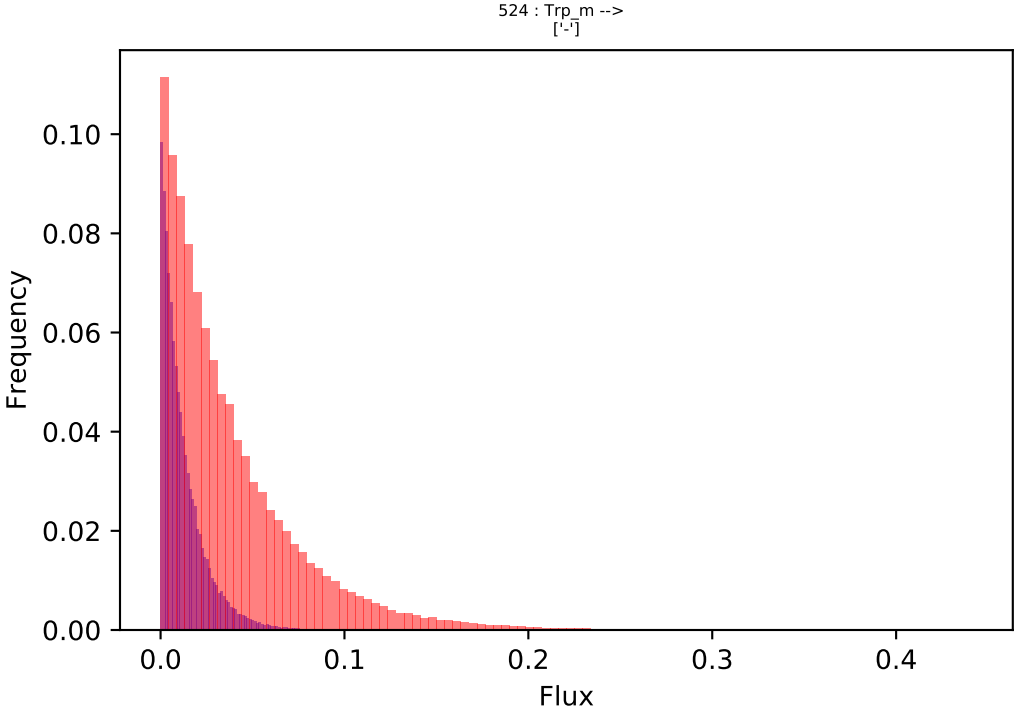

519 : Thr_h -->
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Flux

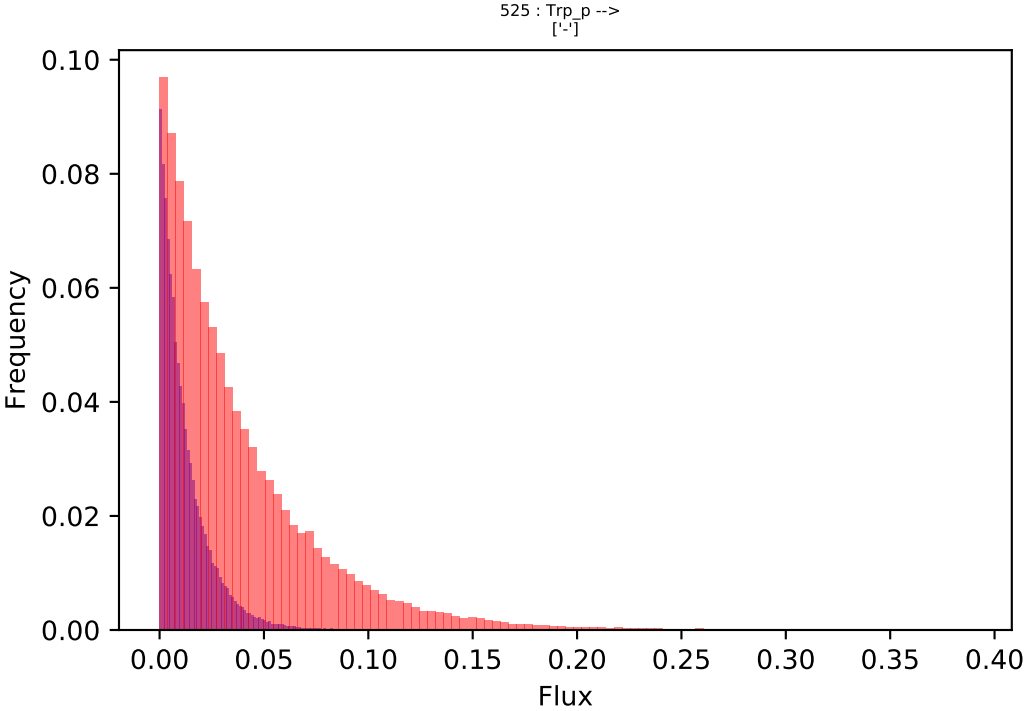

520 : Thr_m -->
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Flux

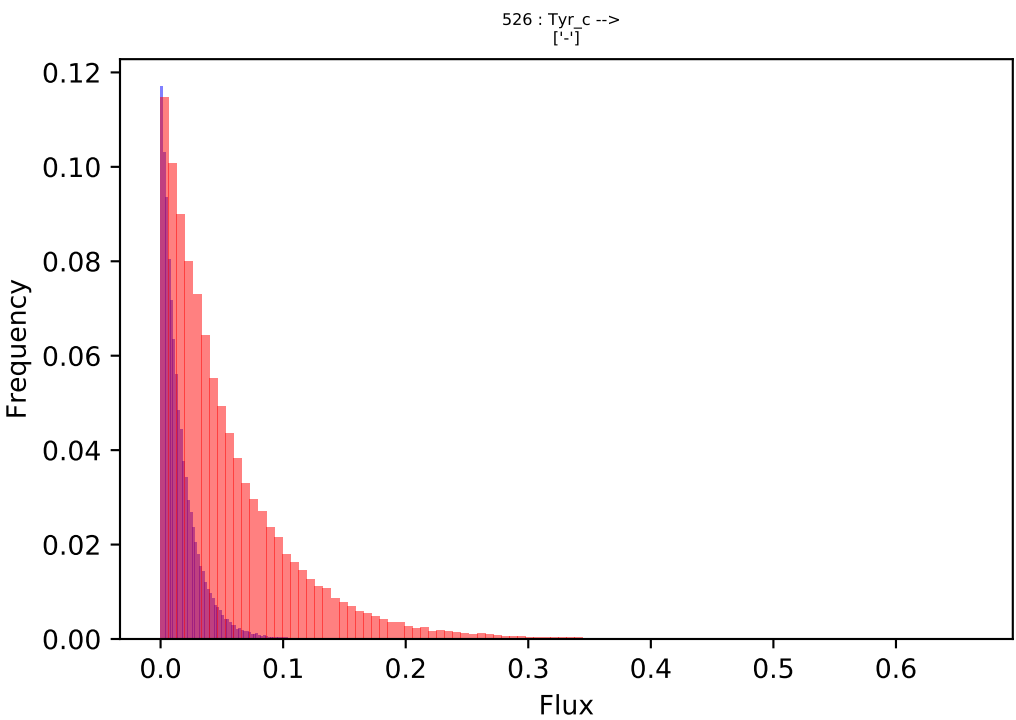

521 : Thr_p -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Flux

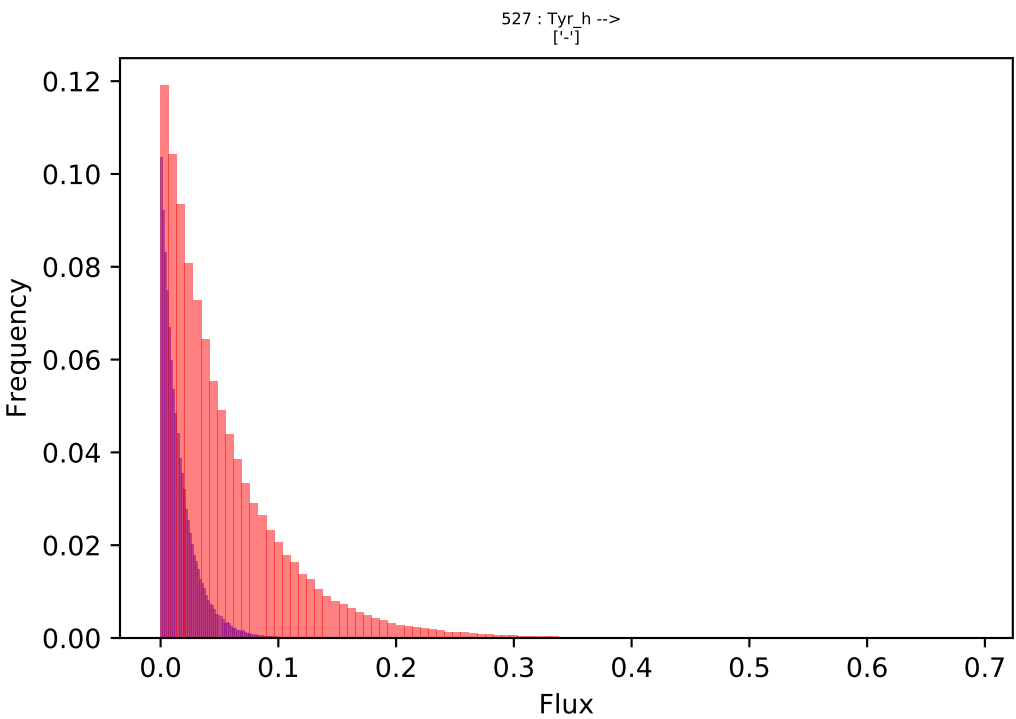

522 : Trp_c -->
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
Flux

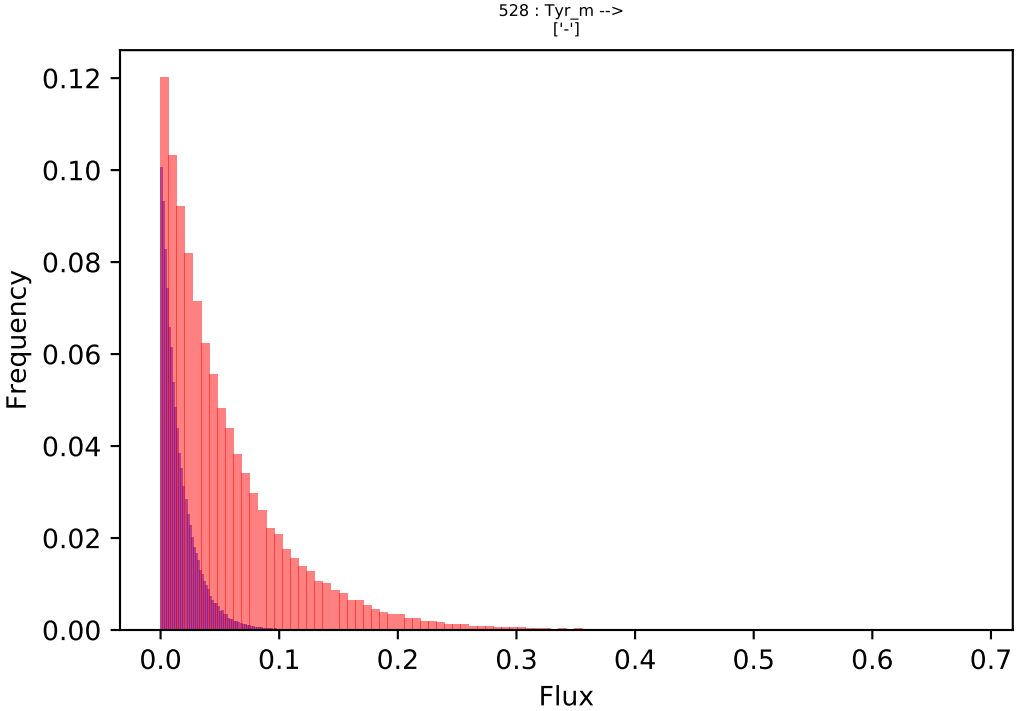

523 : Trp_h -->
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
Flux

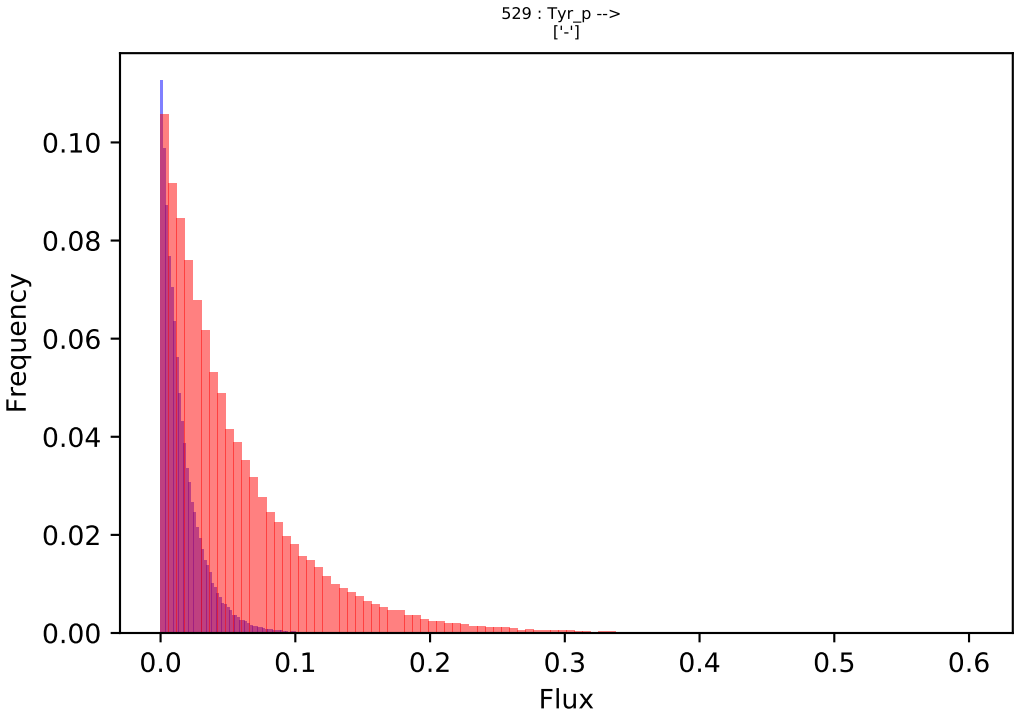

524 : Trp_m -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
Flux

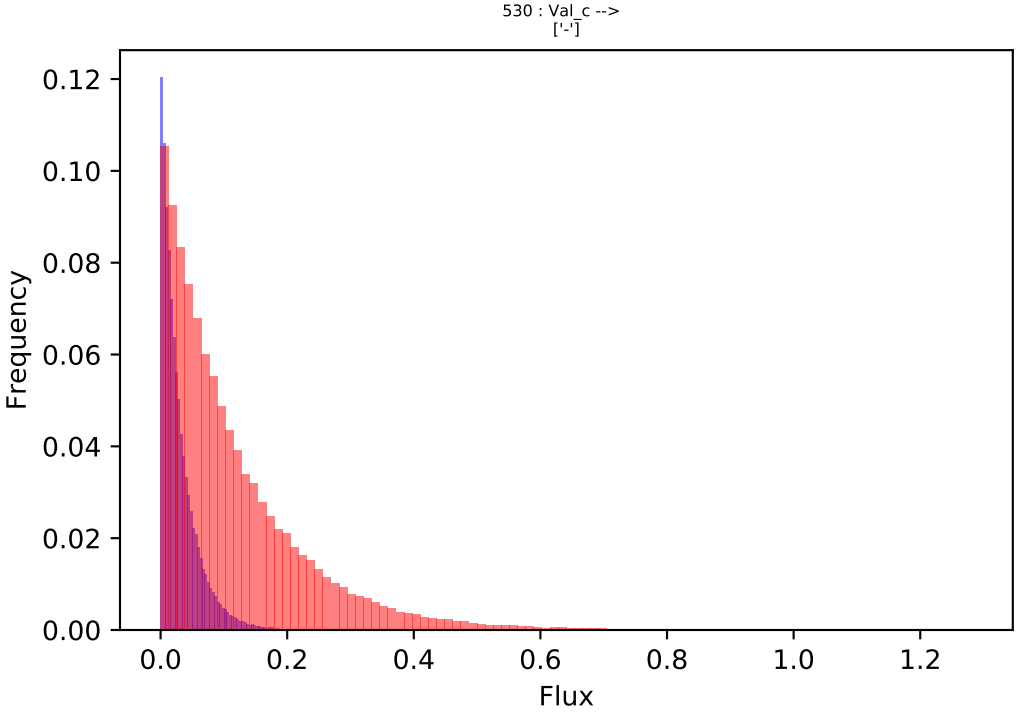

525 : Trp_p -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
Flux

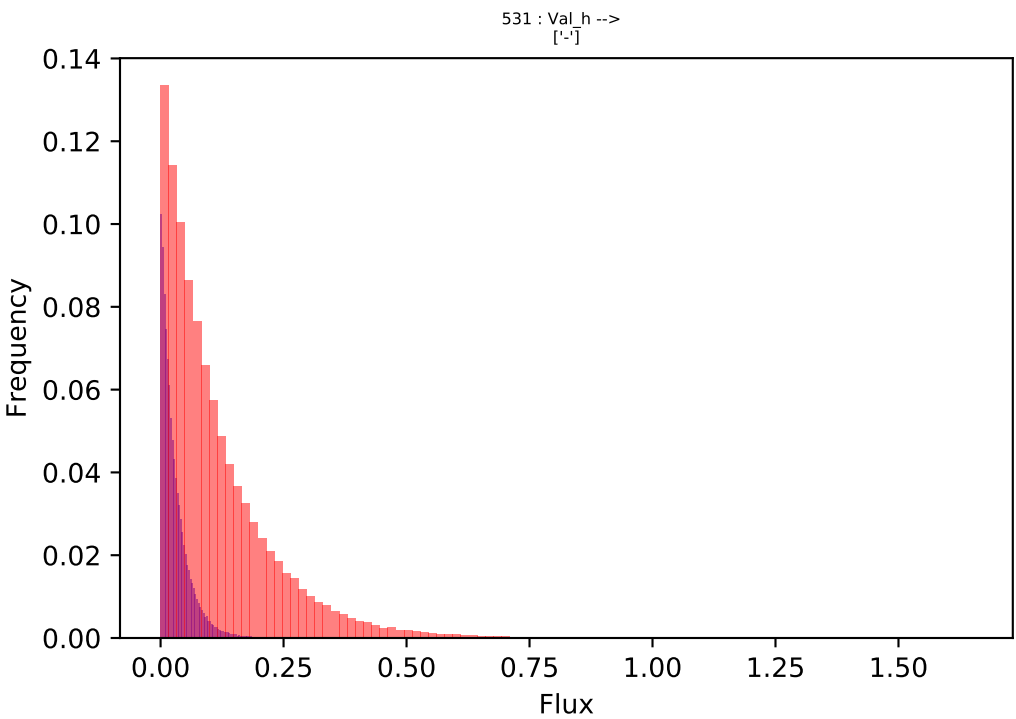

526 : Tyr_c -->
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Flux

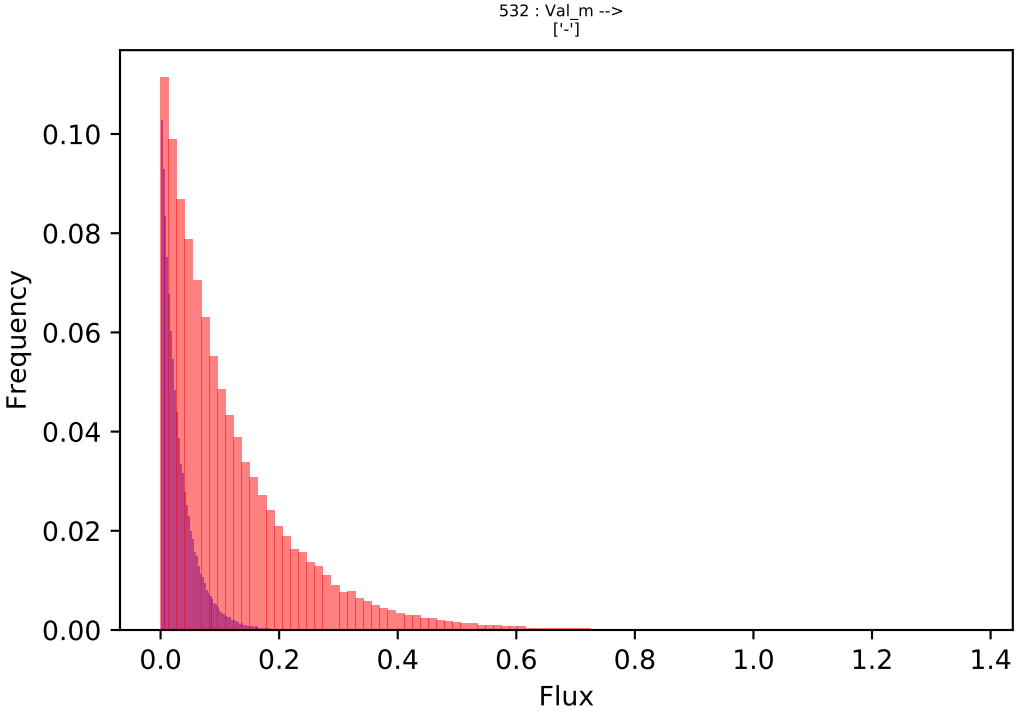

527 : Tyr_h -->
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Flux

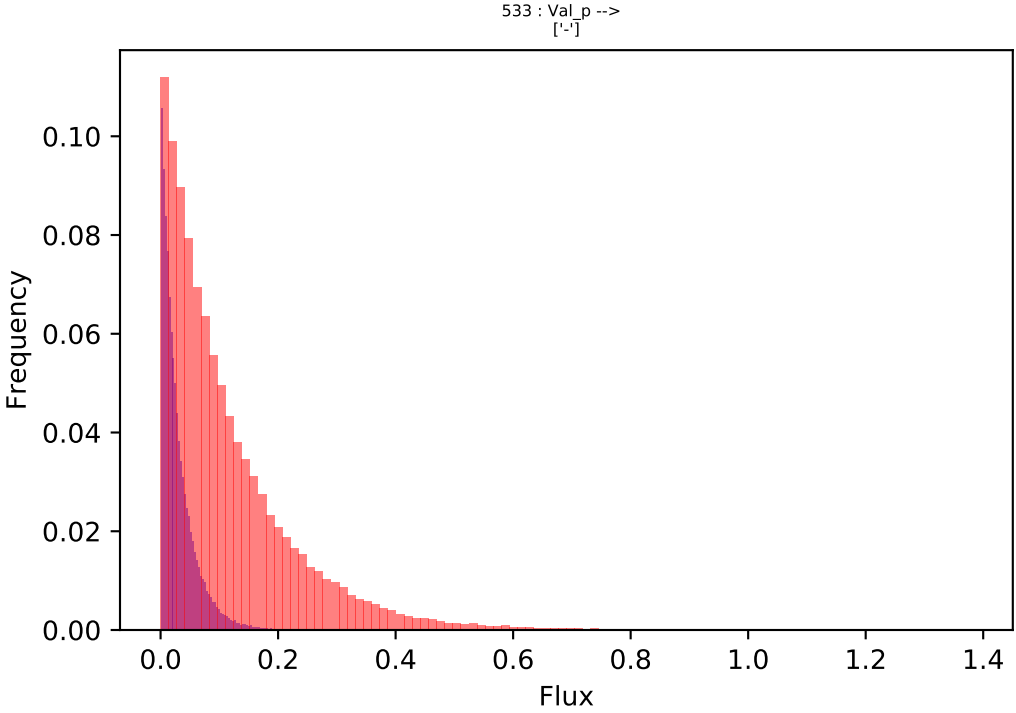

528 : Tyr_m -->
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Flux

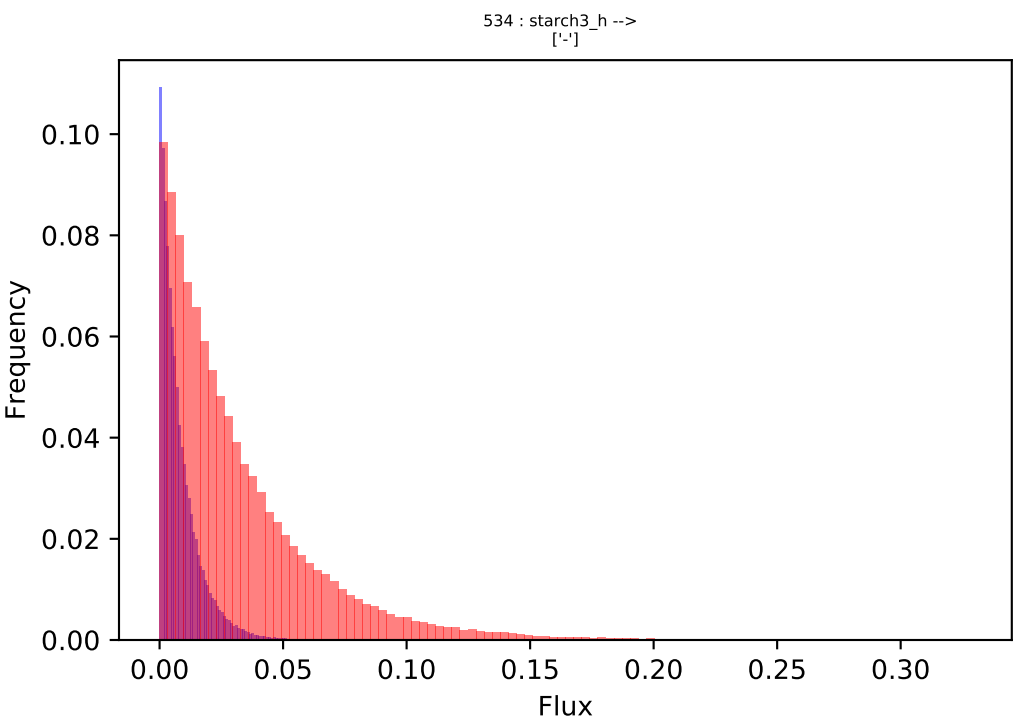

529 : Tyr_p -->
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0.10
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Flux

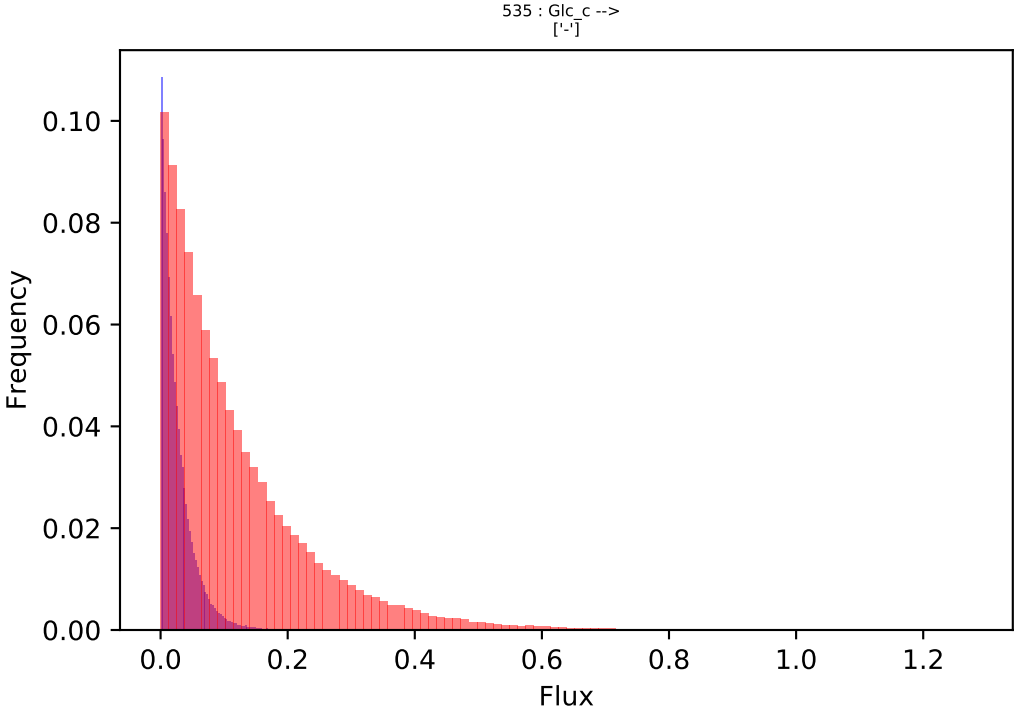

530 : Val_c -->
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Flux

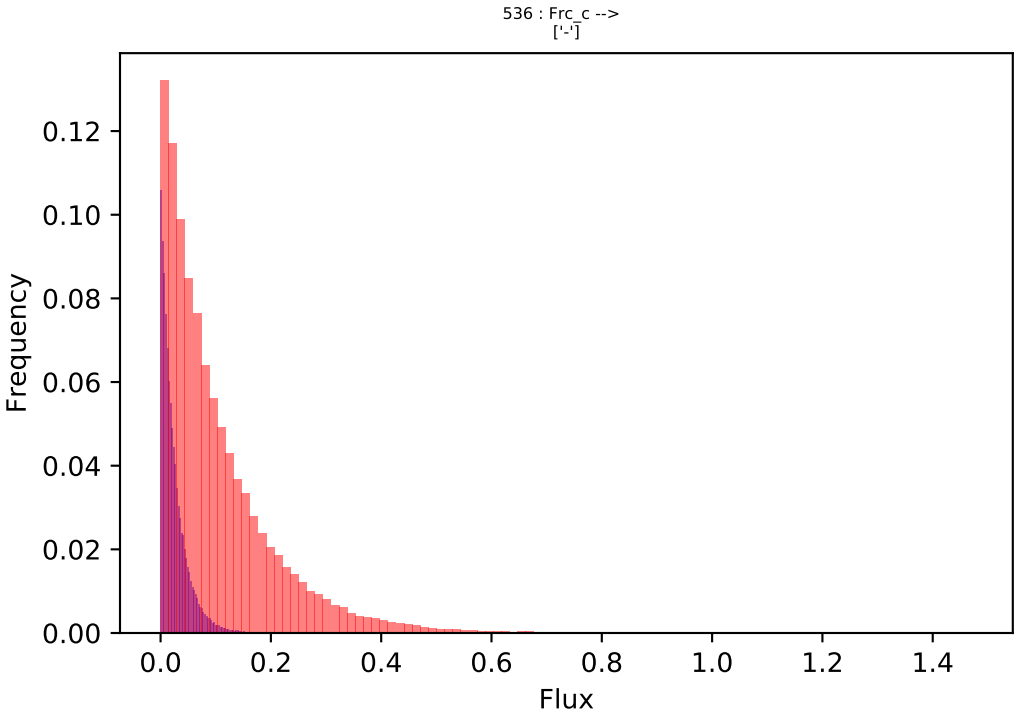

531 : Val_h -->
['-']
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.25
0.50
0.75
1.00
1.25
1.50
Flux

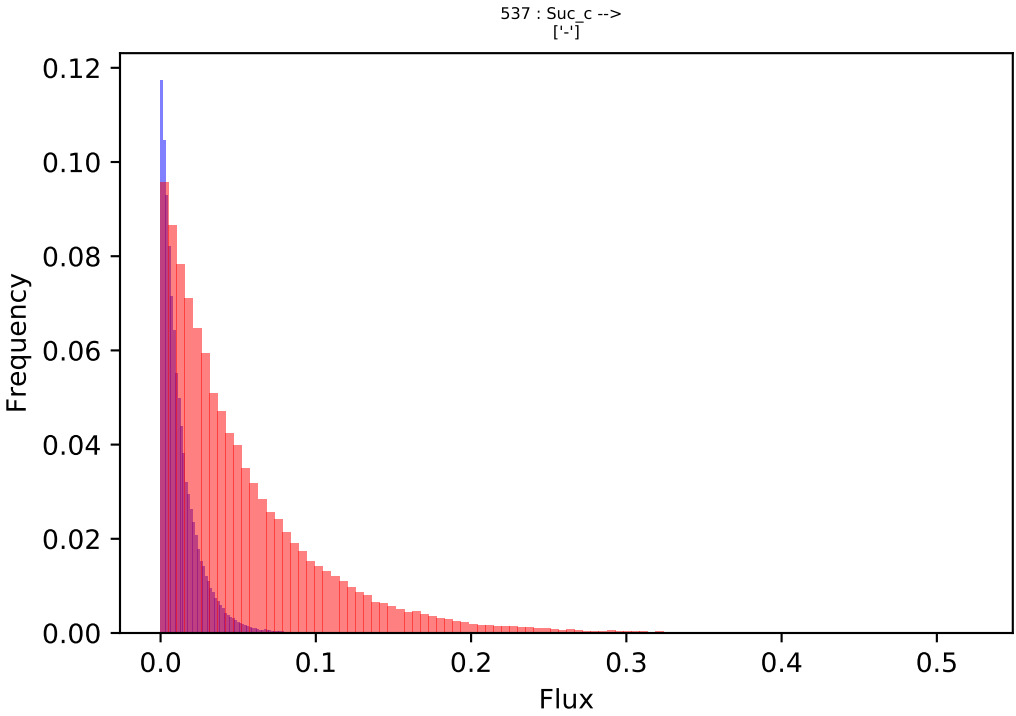

532 : Val_m -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

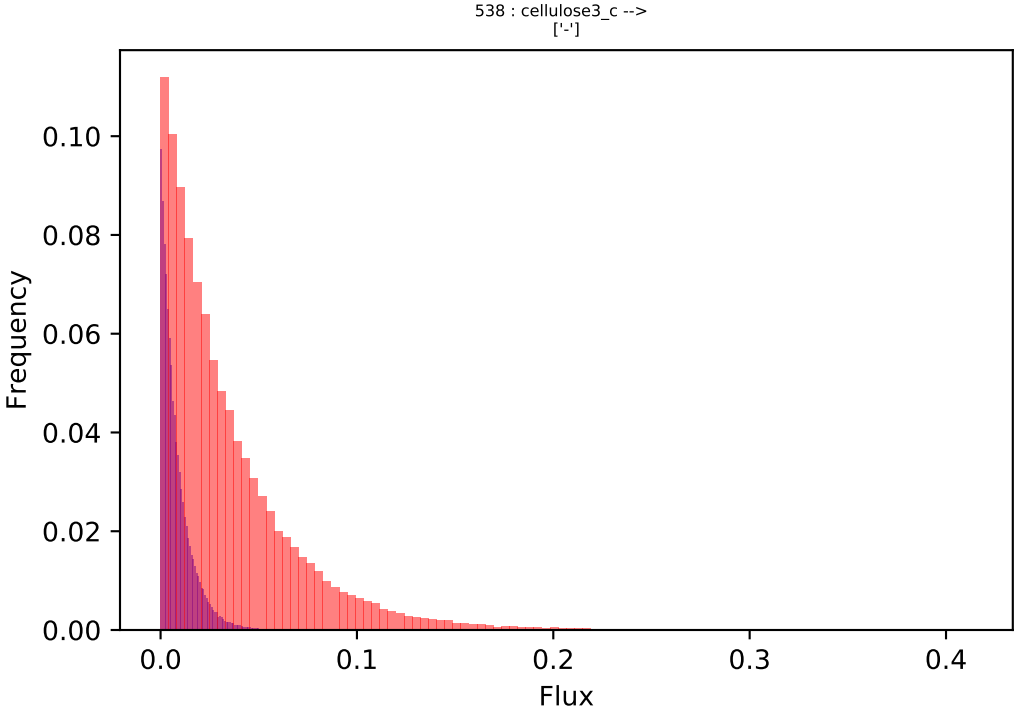

533 : Val_p -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

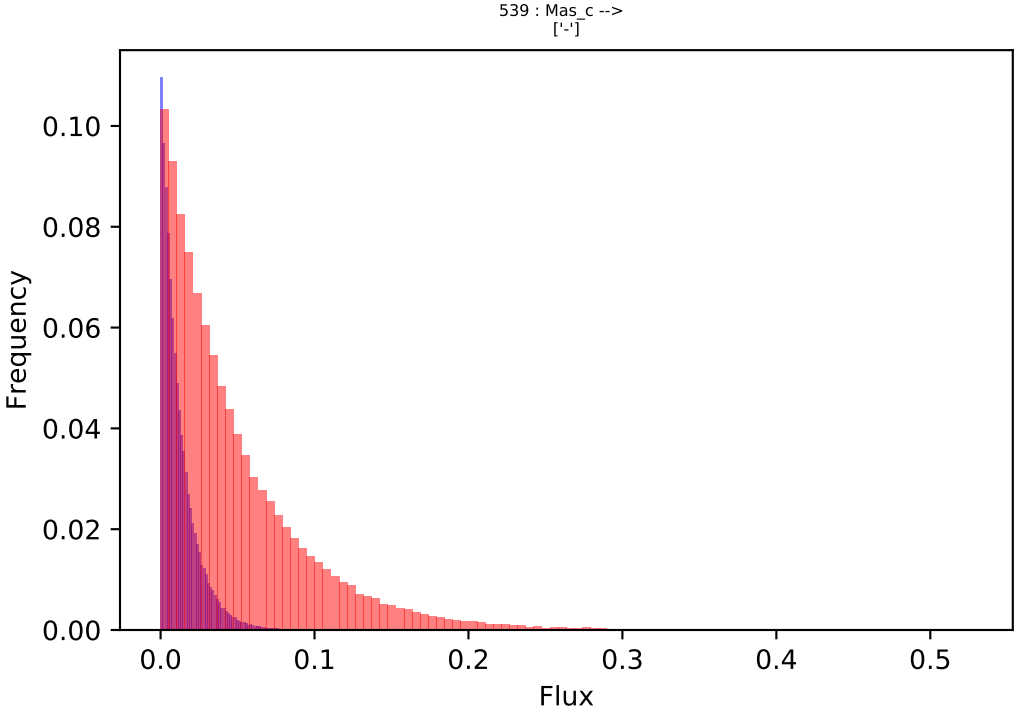

534 : starch3_h -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.05
0.10
0.15
0.20
0.25
0.30
Flux

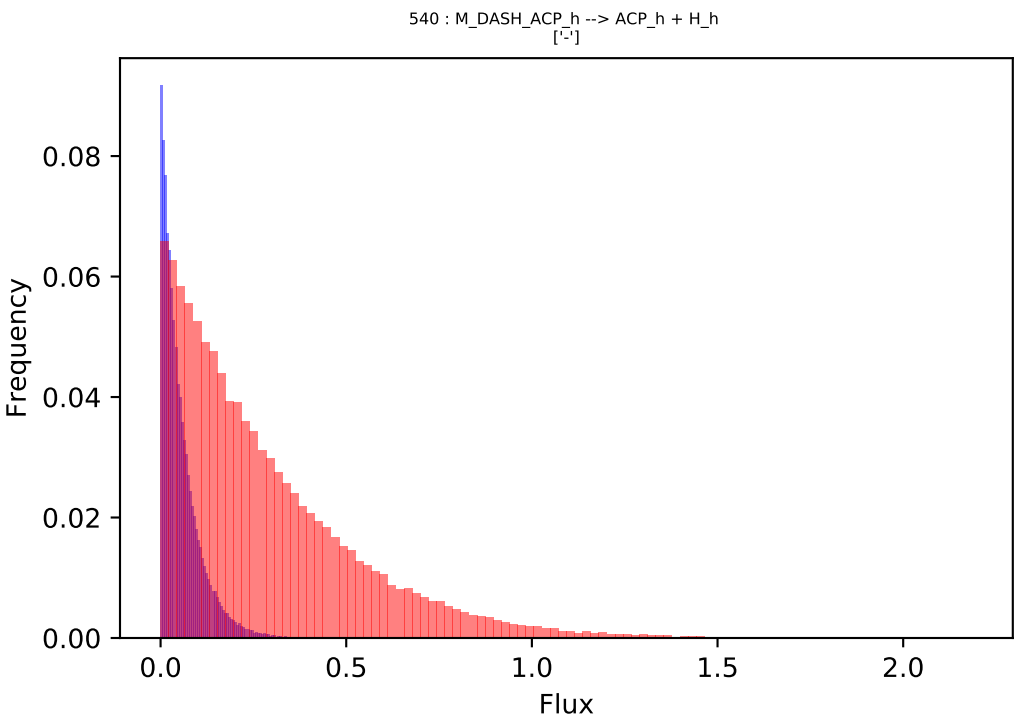

535 : Glc_c -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Flux

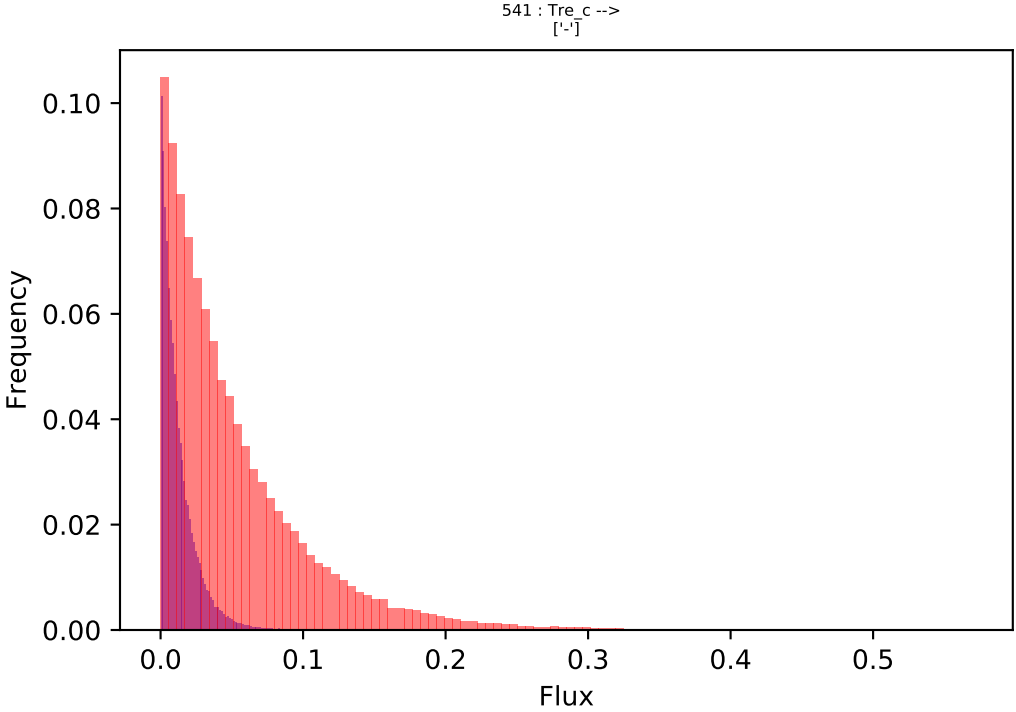

536 : Frc_c -->
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Flux

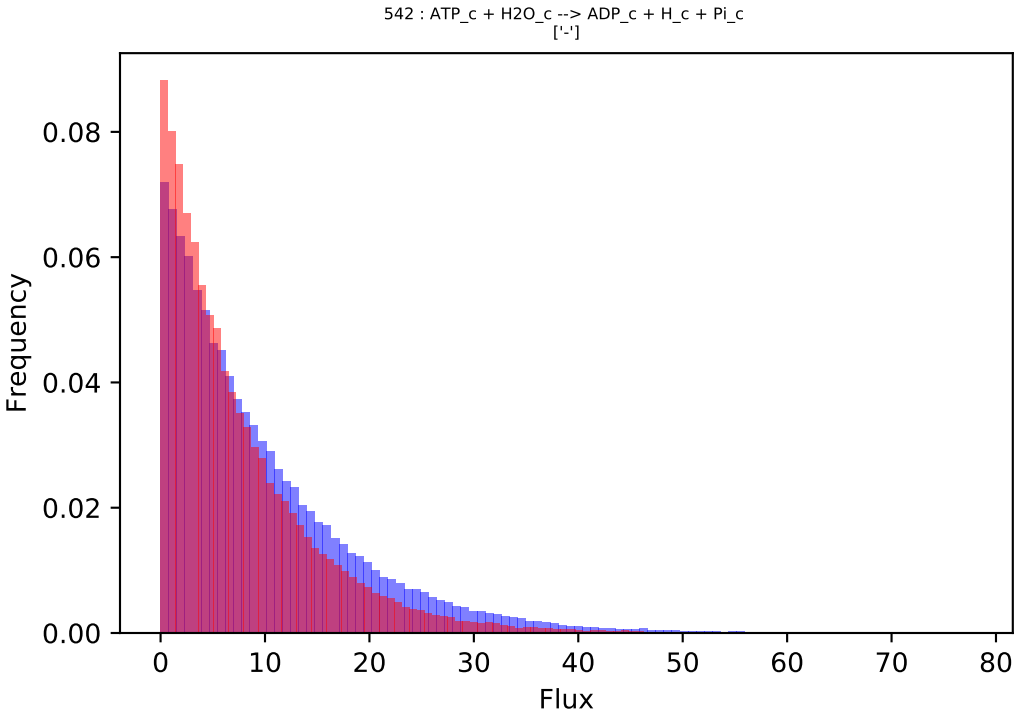

537 : Suc_c -->
['-']
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
Flux

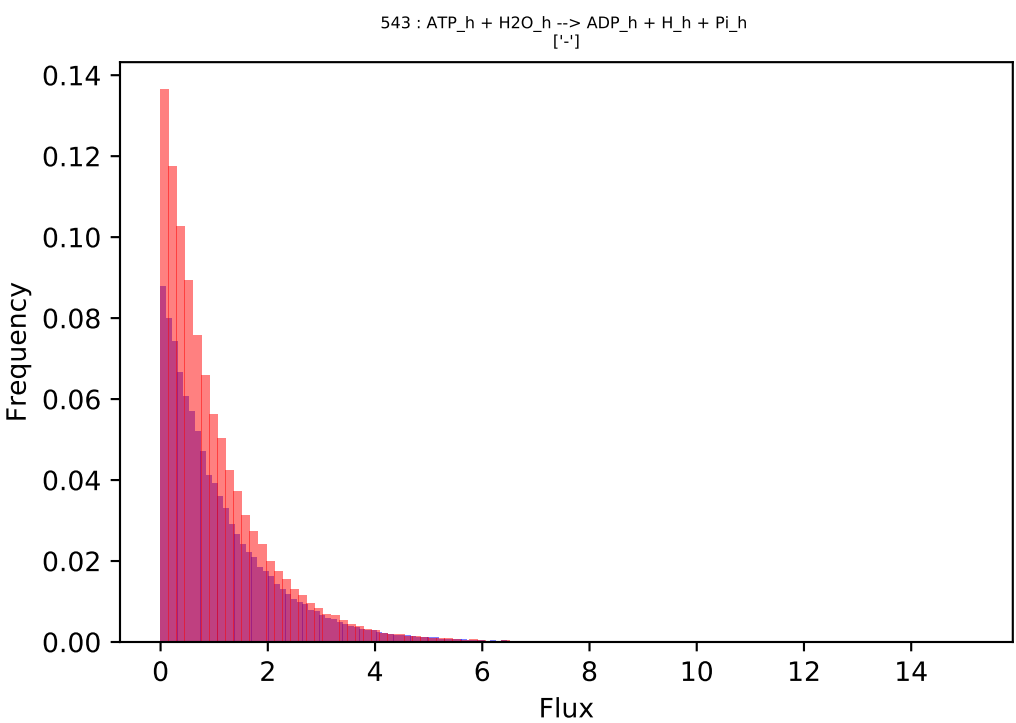

538 : cellulose3_c -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
Flux

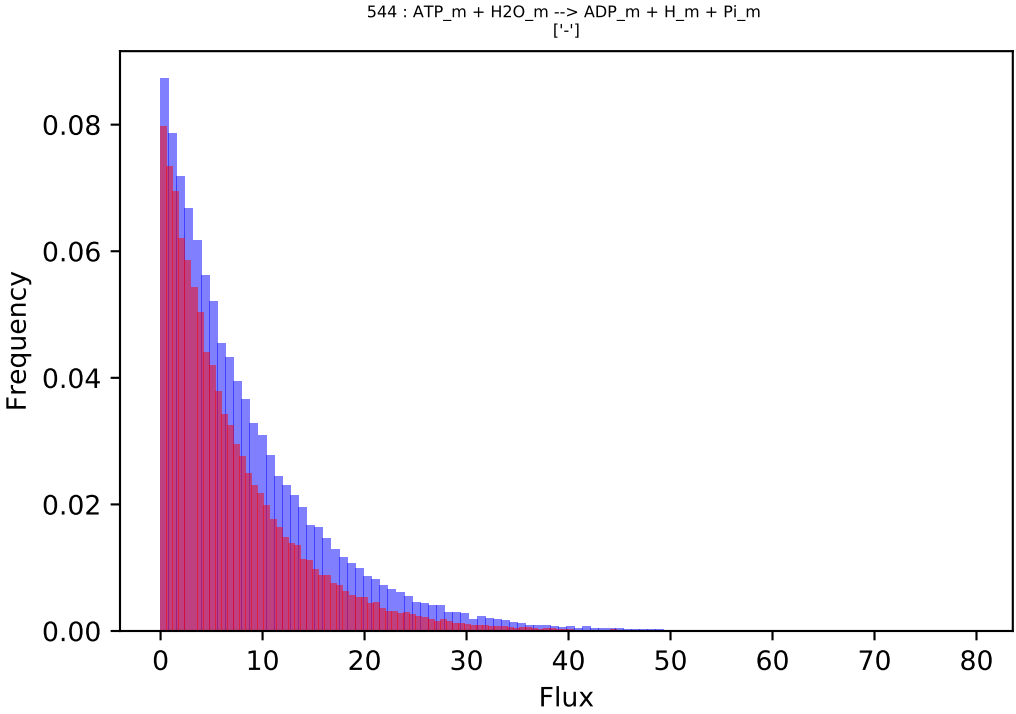

539 : Mas_c -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
Flux

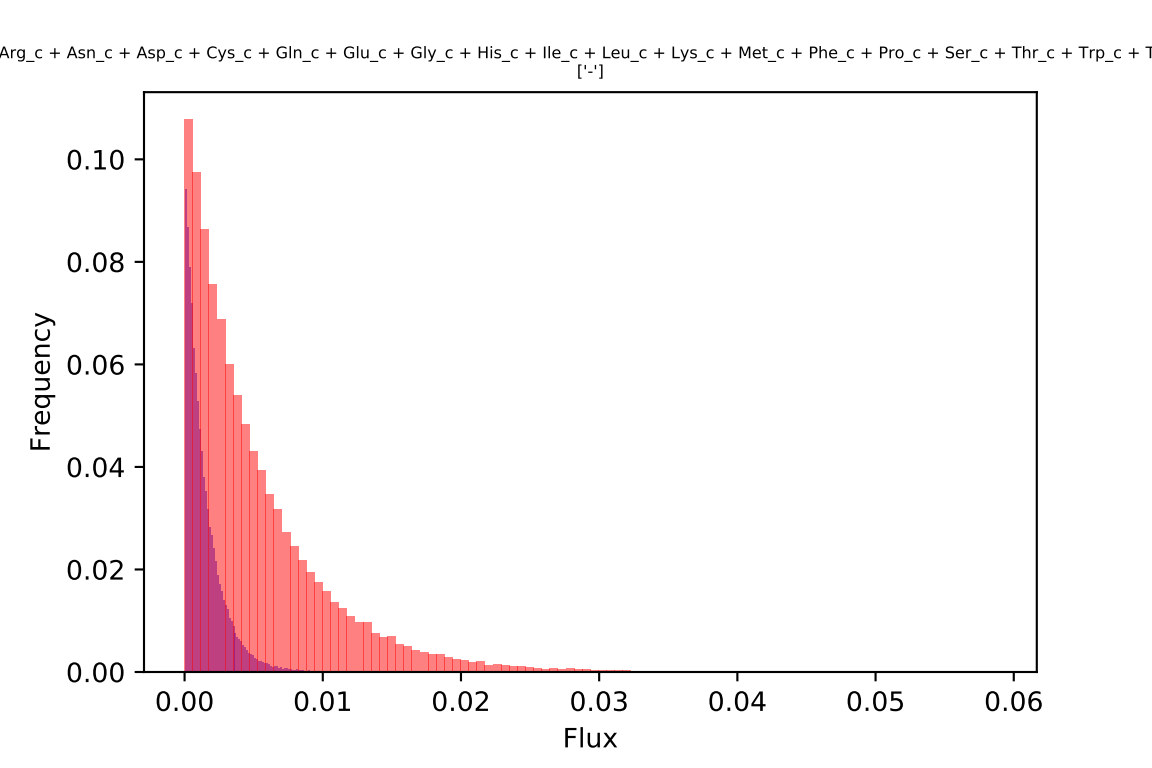

540 : M_DASH_ACP_h --> ACP_h + H_h
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0.0
0.5
1.0
1.5
2.0
Flux

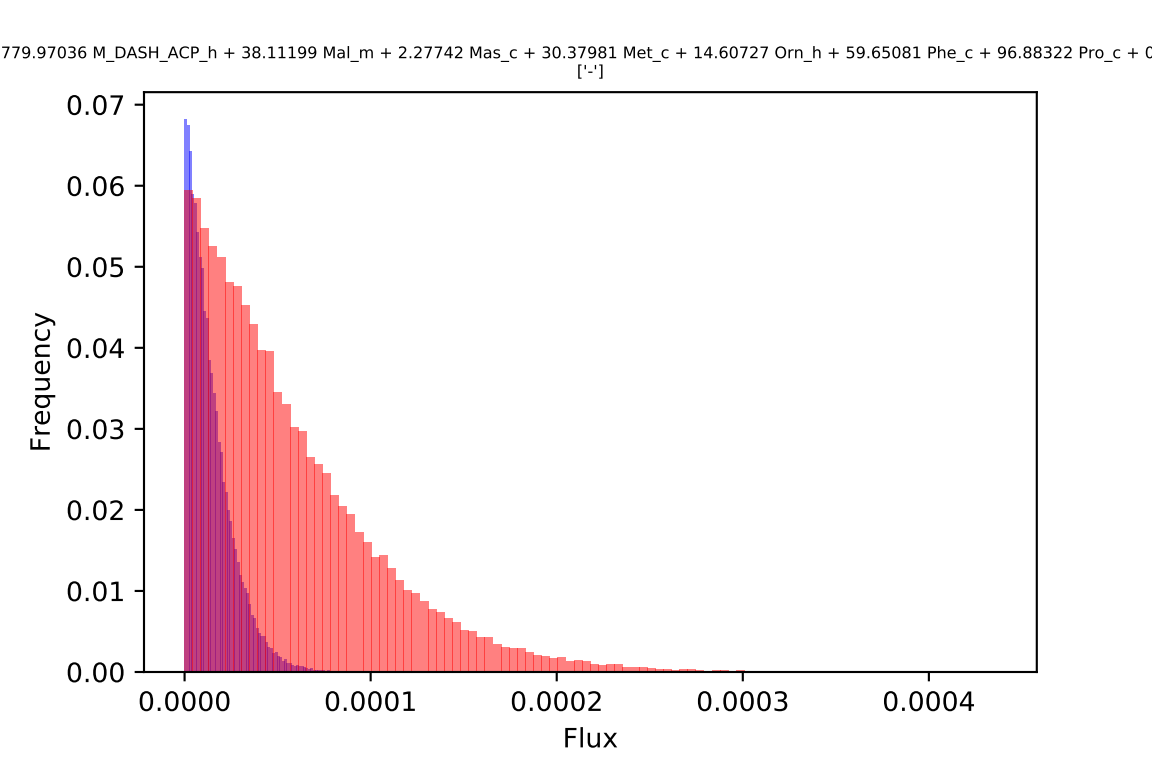

541 : Tre_c -->
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.0
0.1
0.2
0.3
0.4
0.5
Flux

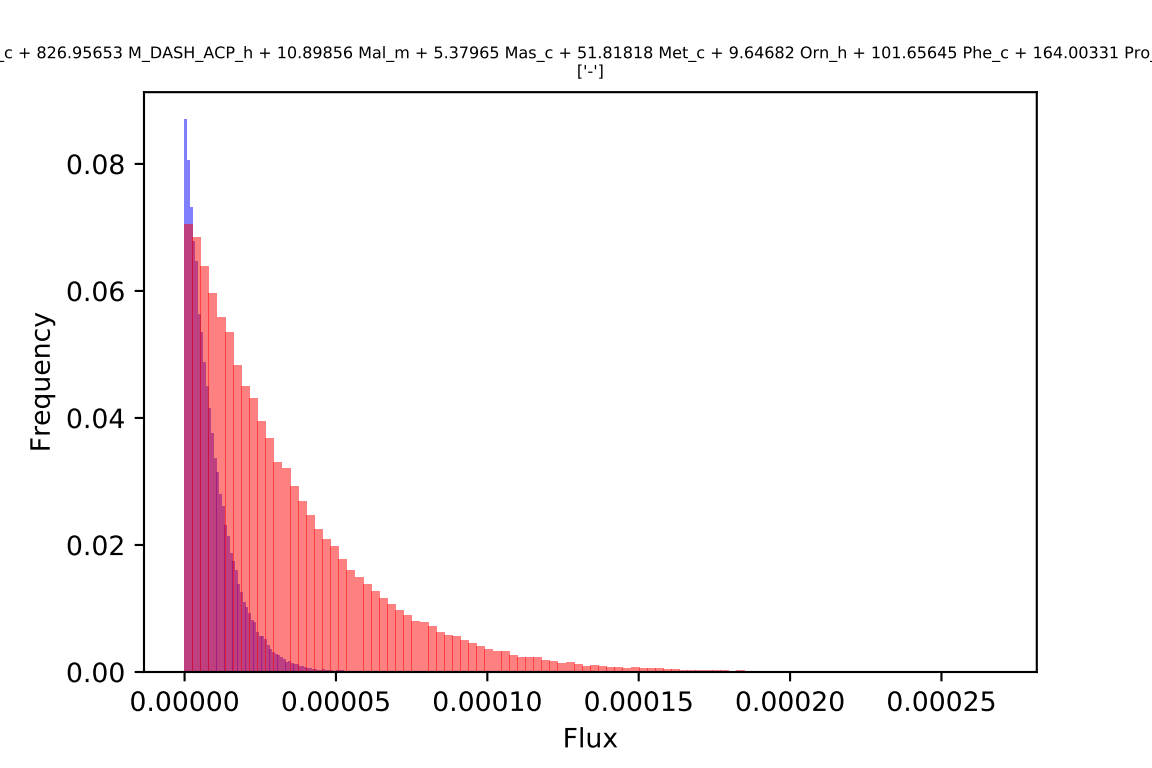

542 : ATP_c + H2O_c --> ADP_c + H_c + Pi_c
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0
10
20
30
40
50
60
70
80
Flux

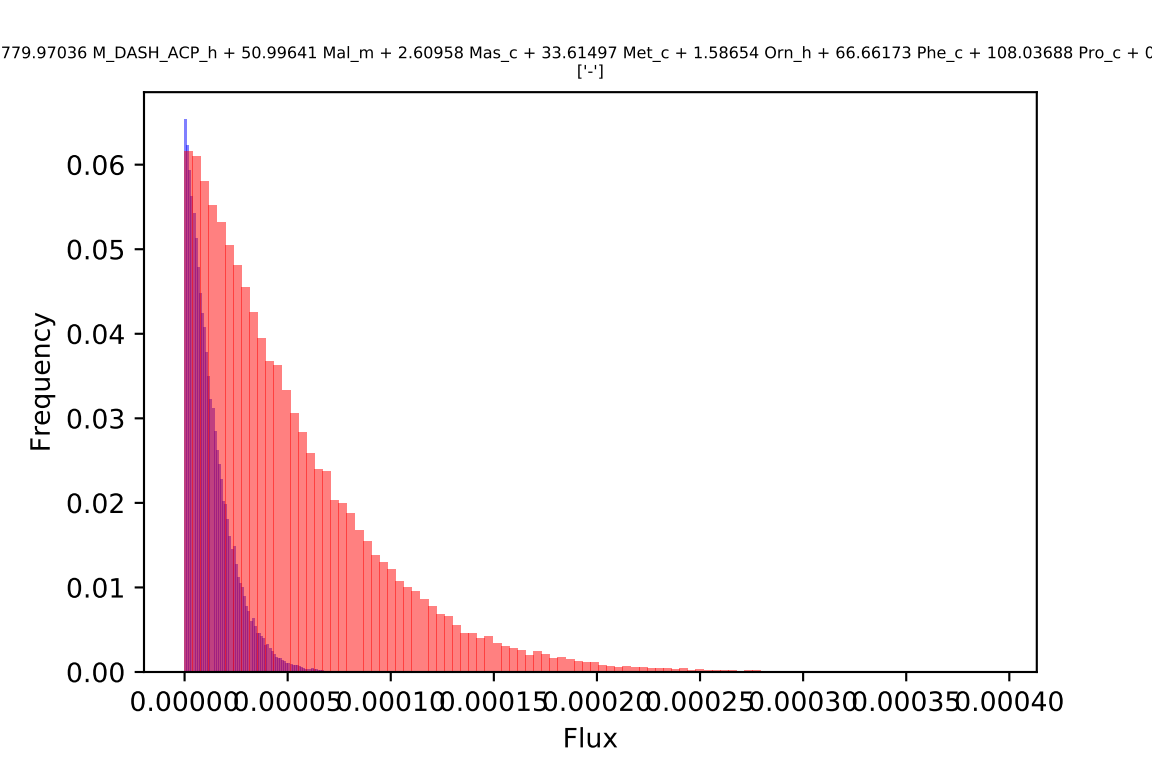

543 : ATP_h + H2O_h --> ADP_h + H_h + Pi_h
['-']
Frequency
Flux
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0
2
4
6
8
10
12
14

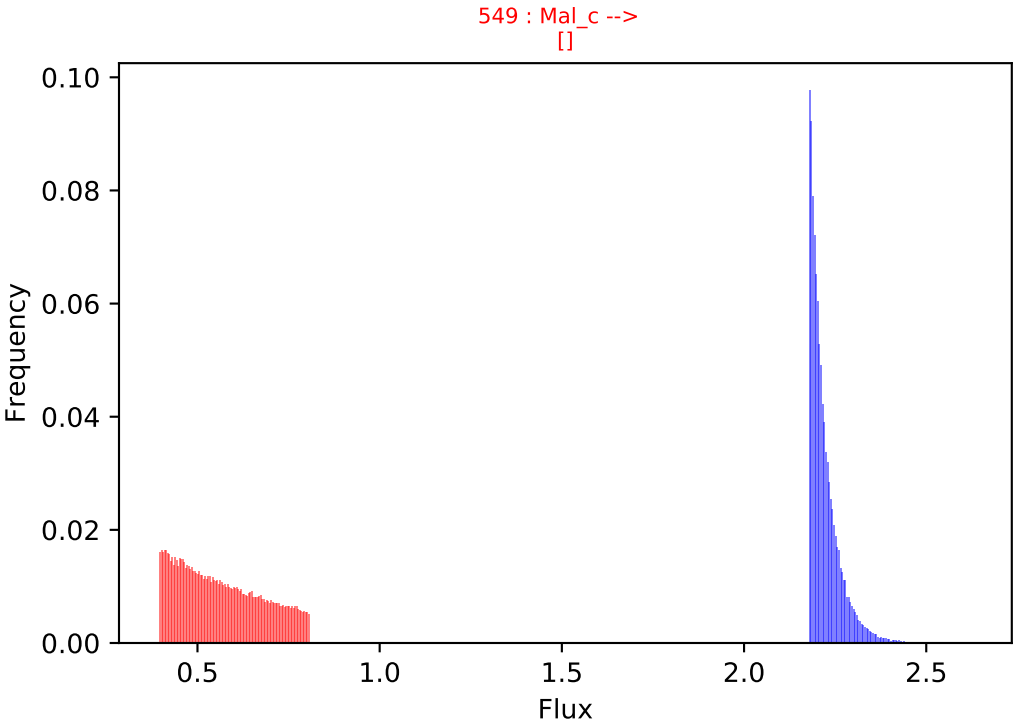

544 : ATP_m + H2O_m --> ADP_m + H_m + Pi_m
['-']
Frequency
0.00
0.02
0.04
0.06
0.08
0
10
20
30
40
50
60
70
80
Flux

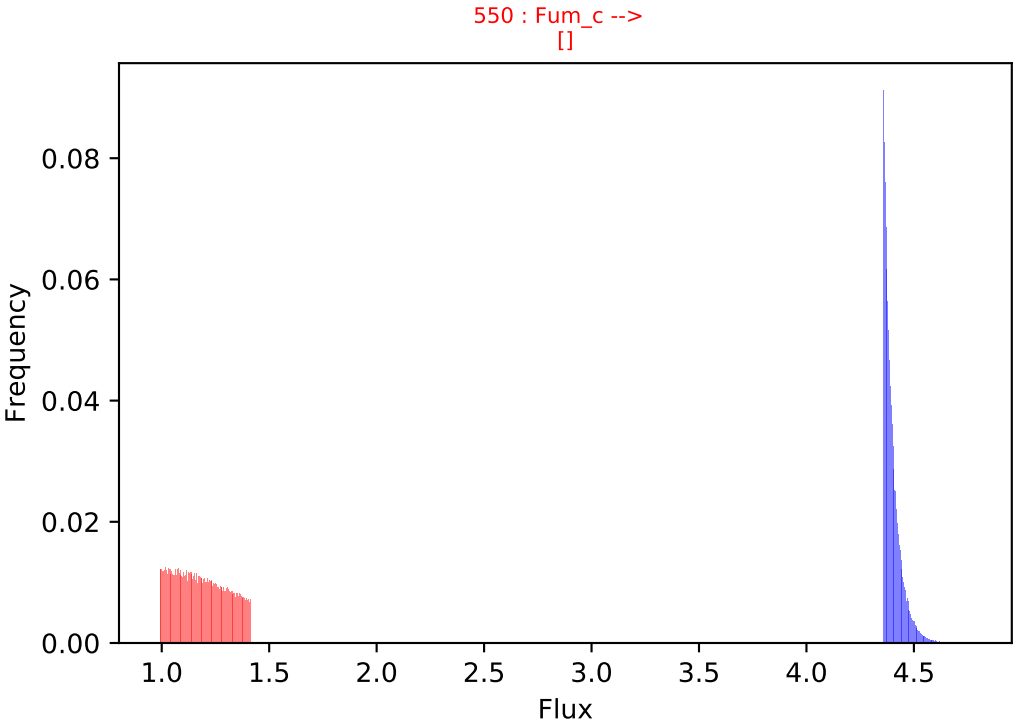

Arg_c + Asn_c + Asp_c + Cys_c + Gln_c + Glu_c + Gly_c + His_c + Ile_c + Leu_c + Lys_c + Met_c + Phe_c + Pro_c + Ser_c + Thr_c + Trp_c + T
['-']
0.10
0.08
0.06
0.04
0.02
0.00
Frequency
0.00
0.01
0.02
0.03
0.04
0.05
0.06
Flux

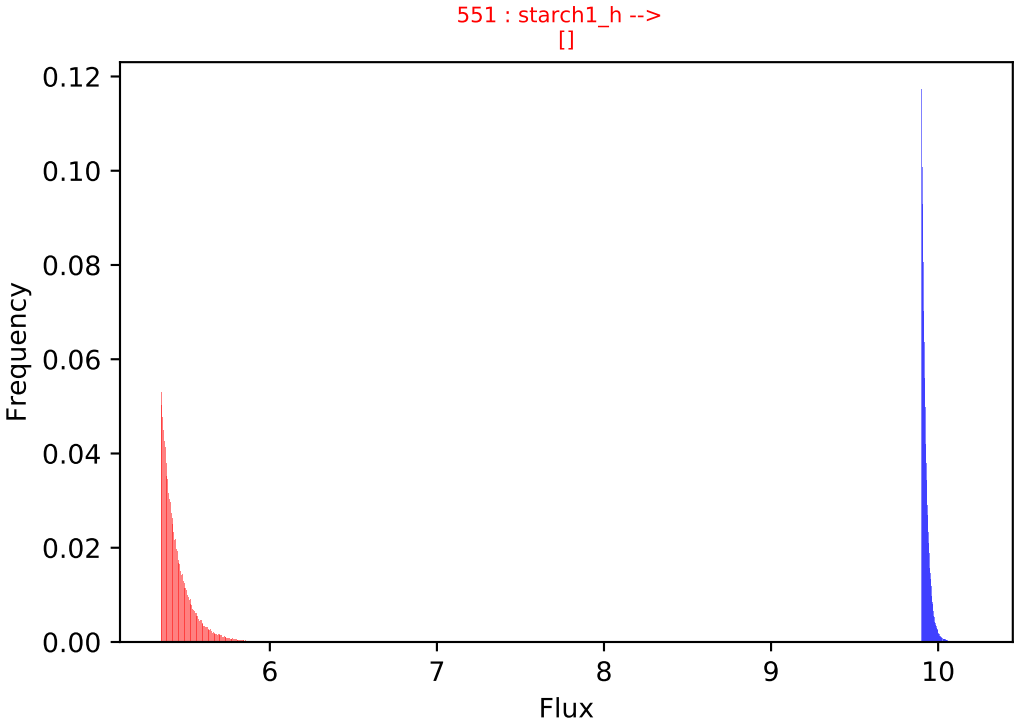

779.97036 M_DASH_ACP_h + 38.11199 Mal_m + 2.27742 Mas_c + 30.37981 Met_c + 14.60727 Orn_h + 59.65081 Phe_c + 96.88322 Pro_c + 0
['-']
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Frequency
0.0000
0.0001
0.0002
0.0003
0.0004
Flux


_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_
['-']
0.08
0.06
0.04
0.02
0.00
Frequency
0.00000
0.00005
0.00010
0.00015
0.00020
0.00025
Flux


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 + C
['-']
Frequency
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0.00000
0.00005
0.00010
0.00015
0.00020
0.00025
0.00030
0.00035
0.00040
Flux


549 : Mal_c -->
[]
0.10
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 -->
[]
0.08
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
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