```
final simplex: (array([[6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                                                                                    4.52730903e+03, 3.80531755e+03, 5.88167600e-04, 3.97847129e+00,
                                                                                                                                    6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 5.20706857e+00,
                                                                                                                                    6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                                                                  [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00, 4.52730903e+03, 3.80531758e+03, 5.88167603e-04, 3.97847124e+00,
                                                                                                                                    6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 5.20706857e+00,
                                                                                                                                    6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                                                                   [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                                                                                    4.52730903e+03, 3.80531760e+03, 5.88167610e-04, 3.97847124e+00,
                                                                                                                                    6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 5.20706857e+00,
                                                                                                                                    6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                                                                   [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                                                                                    4.52730903e+03, 3.80531758e+03, 5.88167607e-04, 3.97847132e+00,
                                                                                                                                    6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 5.20706856e+00, \\ 6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00], \\
                                                                                                                                  [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00, 1.09654125e+00]
                                                                                                                                    4.52730903e+03, 3.80531760e+03, 5.88167609e-04, 3.97847123e+00,
                                                                                                                                    6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 5.20706857e+00,
                                                                                                                                    6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                                                                   [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                                                                                    4.52730903e+03, 3.80531758e+03, 5.88167609e-04, 3.97847134e+00,
                                                                                                                                    6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 5.20706856e+00,
                                                                                                                                    6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                                                                   [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                                                                                    4.52730903e+03, 3.80531758e+03, 5.88167609e-04, 3.97847113e+00,
        ['SM data type data plots for mutation', 'Regulator28e+02, 3.24643802e+03 Initial Guess e-04, 5.20706855e+00, ucer -> sensor (GFP output) inducer -> S[6] 1864 7688 24808 1e-01, 9,72768210e-01, 2,72768210e-01, 2,72768210e-0
inducer -> sensor (GFP output)
                                                                                                                                    4.52730904e+03, 3.80531762e+03Converged 14e-04, 3.97847114e+00,
                                                                                                                                    6.83835638e+02, 3.24643802<u>e+0</u>4Converged 5e-04, 5.20706857e+00,
                                                                                                                                  6.32148081e-01, 9.72768210e-01, 2.401796e+00, 1.91933916e+00], [6.18047086e+02, 1.6278856e+0, Converged 79e+03, 1.09654125e+00,
                                                                                 6 \times 10^{3}
                                                                                                                                    4.5<mark>2</mark>730904e+03, 9.$0531757e+03, 5.88167610e-04, 3.97847137e+00,
                                                                                                                                    6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 5.20706856e+00, 6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                 4 \times 10^3
                                                                                                                                   [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                                 3 \times 10^{3}
                                                                                                                                    4.52730904e+03, 3.$0531754e+03, 5.88167601e-04, 3.97847141e+00,
                                                                                                                                     6.83835638e+02, 3.⊉4643802e+04, 4.73376905e-04, 5.20706856e+00,
                                                                                                                                    6.32<del>148081e-01, 9.</del>72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                                                                   [6<u>1</u>804708<u>6</u>e+02<u>1</u>62788566e+04, 1.30065379e+03, 1.09654125e+00, 4052730904e+03, 3.80531752e+03, 5.88167599e-04, 3.97847135e+00,
                                                                                               10-5
                                                  10-2
                                                                                                                 10^{-4}
                                                                                                              Full circuft 83935 6786 602, 3.24643802e+04, 4.73376905e-04, 5.20706858e+00, 6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
    inducer -> S -| Output (GFP)
                                                                                                                                   [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                                 6 \times 10^{3}
                                                                                                                                    4.52730904e+03, 3.$0531759e+03, 5.88167613e-04, 3.97847127e+00,
                                                                                                                                    6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 5.20706856e+00,
                                                                                                                                     6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                                                                    [<del>6.</del>16047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                                 4 \times 10^{3}
                                                                                                                                     4.527<u>30903e</u>+03, 3.80531754e+03, 5.88167604e-04, 3.97847134e+00,
                                                                                                                                    83895638e+02, 3.24643802e+04, 4.73376905e-04, 5.20706857e+00, 6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                 3 \times 10^{3}
                                                                                                                                   [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                                                                                    4.52730903e+03, 3.80531752e+03, 5.88167593e-04, 3.97847139e+00,
                                                                                                                                  \begin{array}{l} 6.83835638e \pm 0.7, 3.24643802e \pm 0.4, 4.73376905e \pm 0.4, 5.20706856e \pm 0.6, \\ 6.83835638e \pm 0.7, 3.24643802e \pm 0.4, 4.73376905e \pm 0.4, 5.20706856e \pm 0.6, \\ 6.32148981e \pm 0.1, 19, 72.768210e \pm 0.1, 2.64017386e \pm 0.0, 1.91933916e \pm 0.0, \\ [6.18047086e \pm 0.2, 1.62788566e \pm 0.4, 1.30065379e \pm 0.3, 1.09654125e \pm 0.0, \\ [6.18047086e \pm 0.2, 1.62788566e \pm 0.4, 1.30065379e \pm 0.3, 1.09654125e \pm 0.0, \\ [6.18047086e \pm 0.2, 1.62788566e \pm 0.4, 1.30065379e \pm 0.3, 1.09654125e \pm 0.0, \\ [6.18047086e \pm 0.2, 1.62788566e \pm 0.4, 1.30065379e \pm 0.3, 1.09654125e \pm 0.0, \\ [6.18047086e \pm 0.2, 1.62788566e \pm 0.4, 1.30065379e \pm 0.3, 1.09654125e \pm 0.0, \\ [6.18047086e \pm 0.2, 1.62788566e \pm 0.4, 1.30065379e \pm 0.3, 1.09654125e \pm 0.0, \\ [6.18047086e \pm 0.2, 1.62788566e \pm 0.4, 1.30065379e \pm 0.3, 1.09654125e \pm 0.0, \\ [6.18047086e \pm 0.2, 1.62788566e \pm 0.4, 1.30065379e \pm 0.3, 1.09654125e \pm 0.0, \\ [6.18047086e \pm 0.2, 1.62788566e \pm 0.4, 1.30065379e \pm 0.3, 1.09654125e \pm 0.0, \\ [6.18047086e \pm 0.2, 1.62788566e \pm 0.4, 1.30065379e \pm 0.3, 1.09654125e \pm 0.0, \\ [6.18047086e \pm 0.2, 1.62788566e \pm 0.4, 1.30065379e \pm 0.3, 1.09654125e \pm 0.0, \\ [6.18047086e \pm 0.2, 1.62788566e \pm 0.4, 1.30065379e \pm 0.3, 1.09654125e \pm 0.0, \\ [6.18047086e \pm 0.2, 1.62788566e \pm 0.4, 1.30065379e \pm 0.3, 1.09654125e \pm 0.0, \\ [6.18047086e \pm 0.2, 1.62788566e \pm 0.4, 1.30065379e \pm 0.3, 1.09654125e \pm 0.0, \\ [6.18047086e \pm 0.2, 1.62788566e \pm 0.4, 1.30065379e \pm 0.3, 1.09654125e \pm 0.0, \\ [6.18047086e \pm 0.2, 1.62788566e \pm 0.4, 1.30065379e \pm 0.3, 1.09654125e \pm 0.0, \\ [6.18047086e \pm 0.2, 1.20886e \pm 0.2, 1.20886e \pm 0.0, 1.00886e \pm 0.0, \\ [6.18047086e \pm 0.2, 1.20886e \pm 0.0, 1.20886e \pm 0.0, 1.00886e \pm 0.0, \\ [6.18047086e \pm 0.2, 1.20886e \pm 0.0, 1.00886e \pm 0.0, 1.00886e \pm 0.0, \\ [6.18047086e \pm 0.2, 1.20886e \pm 0.0, 1.00886e \pm 0.0, 1.00886e \pm 0.0, \\ [6.18047086e \pm 0.00886e \pm 0.00886e \pm 0.00886e \pm 0.0, \\ [6.18047086e \pm 0.00886e \pm 0
                                                                                               10^{-5}
                                                  10^{-2}
                                                                    10^{-1}
                                                                                                                 10^{-4}
                                                                                                                                    4.52730903e+03, 3.80531756e+03, 5.88167605e-04, 3.97847125e+00,
                                                                                                                                    6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 5.20706857e+00,
               RSS (converged)=0.085
                                                                                                                                    6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                                                                   [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                                                                                    4.52730903e+03, 3.80531758e+03, 5.88167604e-04, 3.97847132e+00,
                                                                                                                                    6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 5.20706857e+00,
              RSS (% reduction)=0.943
                                                                                                                                    6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                                                                   [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                            epsilon Initial guesses
                                                                                 Converged
                                                                                                                                    4.52730904e+03, 3.80531752e+03, 5.88167600e-04, 3.97847129e+00,
                                                    618.047086 618.047086
                                                                                                                                    6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 5.20706857e+00,
                                                  16278.856600 16278.856600
                                                                                                                                    6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00]), array([0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472
                                                   1300.653790 1300.653790
                                                                                                                                   0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944,
                                                       1.096541
                                                                                1.096541
                                                                                                                                   0.08472944, 0.08472944, 0.08472944, 0.08472944, 0.08472944,
                                                       1916.175610 4527.309034
                                                                                                                                   0.08472944, 0.08472944]))
                                                       18874.240800 3805.317554
                                                                                                                                       fun: 0.08472944292250377
                                                                                  0.000588
                                                       0.009030
                                                                                                                                   message: 'Optimization terminated successfully.'
                                                       0.820433
                                                                                  3.978471
                                                                                                                                      nfev: 2938
                                                      683.835638
                                                                                  683.835638
                                                                                                                                       nit: 2090
                                                  32464.380200 32464.380200
                                                                                                                                    status: 0
                                                        0.000473
                                                                                   0.000473
                                                                                                                                   success: True
                                                       2.821352
                                                                                   5.207069
                                                                                                                                          x: array([6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                       0.632148
                                                                                   0.632148
                                                                                                                                   4.52730903e+03, 3.80531755e+03, 5.88167600e-04, 3.97847129e+00,
                                                       0.972768
                                                                                   0.972768
                                                                                                                                  6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 5.20706857e+00,
                                                        2.640174
                                                                                   2.640174
                                                                                                                                   6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00])
```

 10^{4}

 10^{3}

 10^{4}

 10^{3}

 10^{-5}

 10^{-4}

 10^{-4}

Вs

C s

 N_s

Сr

Νr

Αh

Βh

C h

Fο

Во

Со

10-3

 10^{-3}

Across all four plots:

RSS (initial)=1.398

0.000000

0.000000

0.000000

0.000000

2611.133424

-0.008442

3.158038

0.000000

0.000000

0.000000

2.385717

0.000000

0.000000

0.000000

0.000000

1.919339

1.919339

B r -15068.923246