```
final simplex: (array([[6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                                             3.46358938e+03, 3.97965857e+03, 5.83941725e-04, 3.20544375e+00,
                                                                                             6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 4.98134686e+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, 3.46358938e+03, 3.97965853e+03, 5.83941718e-04, 3.20544377e+00,
                                                                                             6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 4.98134687e+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,
                                                                                             3.46358938e+03, 3.97965852e+03, 5.83941722e-04, 3.20544390e+00,
                                                                                             6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 4.98134686e+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,
                                                                                             3.46358939e+03, 3.97965848e+03, 5.83941722e-04, 3.20544387e+00,
                                                                                            \begin{array}{l} 6.83835638e+02,\ 3.24643802e+04,\ 4.73376905e-04,\ 4.98134685e+00,\\ 6.32148081e-01,\ 9.72768210e-01,\ 2.64017386e+00,\ 1.91933916e+00], \end{array}
                                                                                            [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                                             3.46358939e+03, 3.97965852e+03, 5.83941722e-04, 3.20544382e+00,
                                                                                             6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 4.98134685e+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,
                                                                                             3.46358938e+03, 3.97965857e+03, 5.83941729e-04, 3.20544375e+00,
                                                                                             6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 4.98134686e+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,
                                                                                             3.46358938e+03, 3.97965851e+03, 5.83941721e-04, 3.20544380e+00,
        ['SM data type data plots for mutation', 'Regulato678]e+02, 3.24643802_e+03 Initial Guess e-04, 4.98134685e+00, ucer -> sensor (GFP output) inducer -> S[6] 18647688 e +09, 1.6278856 e+0 Converged 79e+03, 1.09654125e+00,
  inducer -> sensor (GFP output)
                                                                                             3.46358939e+03, 3.9796584 --- Converged 2e-04, 3.20544391e+00, 6.83835638e+02, 3.2464380 --- Converged 5e-04, 4.98134687e+00, 6.33148081e-01, 0.78768316
                                                         6 \times 10^{3}
                                                                                            6.32148081e-01, 9.72768210e-01, 2.441796e+00, 1.91933916e+00], [6.18047086e+02, 1.6278856e+0 Converged 79e+03, 1.09654125e+00,
                                                                                             3.46358939e+03, 3.$7965857e+03, 5.83941731e-04, 3.20544374e+00,
                                                                                           6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 4.98134686e+00, 6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00], [6.18047089e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00, 3.46358938e+03, 3.97965851e+03, 5.83941720e-04, 3.20544390e+00,
                                                         4 \times 10^{3}
                                                         3 \times 10^{3}
                                                                                             6.83835638e+02, 3.⊉4643802e+04, 4.73376905e-04, 4.98134686e+00,
                                                                                             6.32148081e 01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                            [6<u>'18047086e+'02''1.6</u>2788566e+04, 1.30065379e+03, 1.09654125e+00, 3.46358938e+03, 3.97965855e+03, 5.83941733e-04, 3.20544377e+00,
                                    10-2
                                                                   10<sup>-5</sup>
            10^{-4}
                        10-3
                                                                               10^{-4}
                                                                              Full circunt 83035 6780 6.321480816-01, 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}
                                                                                             3.46358939e+03, 3.$7965850e+03, 5.83941718e-04, 3.20544385e+00,
                                                                                           683835638e+02, 3.24643802e+04, 4.73376905e-04, 4.98134686e+00,
                                                                                             6,32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                            [6.10047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                         4 \times 10^3
                                                                                            3.46398938e+03, 3.97965849e+03, 5.83941722e-04, 3.20544396e+00, 838835638e+02, 3.24643802e+04, 4.73376905e-04, 4.98134685e+00, 6.32148081e-016, 9972768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                         3 \times 10^{3}
                                                                                            [6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                                                                                             3.46358938e+03, 3.97965860e+03, 5.83941736e-04, 3.20544366e+00,
                                                                                            \begin{array}{l} 6.83835638e \pm 0.2, 3.24643802e + 0.4, 4.73376905e - 0.4, 4.98134685e + 0.0, \\ 6032148981e - 0.0, 1.9072768210e - 0.0, 2.64017386e + 0.0, 1.91933916e + 0.0, \\ [6.18047086e + 0.2, 1.62788566e + 0.4, 1.30065379e + 0.3, 1.09654125e + 0.0, \\ \end{array}
                                                                   10^{-5}
10^{-5}
                                    10^{-2}
                                                 10^{-1}
            10^{-4}
                        10^{-3}
                                                                               10^{-4}
          Across all four plots:
                                                                                             3.46358937e+03, 3.97965856e+03, 5.83941725e-04, 3.20544370e+00,
                                                                                             6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 4.98134686e+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,
            RSS (initial)=0.866
                                                                                             3.46358938e+03, 3.97965850e+03, 5.83941724e-04, 3.20544391e+00,
                                                                                             6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 4.98134686e+00,
            RSS (% reduction)=0.911
                                                                                             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
                                                                                             3.46358938e+03, 3.97965847e+03, 5.83941709e-04, 3.20544390e+00,
                   0.000000
                                      618.047086 618.047086
                                                                                             6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 4.98134686e+00,
         Вs
                   0.000000
                                     16278.856600 16278.856600
                                                                                             6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00]), array([0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08464844, 0.0846444, 0.0846444, 0.0846444, 0.08464444, 0.08464444, 0.08464444, 0.08464444, 0.08464444, 0.08464444, 0.0846444, 0.0846444, 0.0846444, 0
                   0.000000
                                     1300.653790 1300.653790
         C s
                                                                                            0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842,
                   0.000000
                                        1.096541
                                                         1.096541
         N_s
                                                                                            0.08463842, 0.08463842, 0.08463842, 0.08463842, 0.08463842,
               1547.413767
                                        1916.175610 3463.589377
                                                                                            0.08463842, 0.08463842]))
                                        18874.240800 3979.658565
         B r -14894.582235
                                                                                               fun: 0.08463841573339925
                  -0.008446
                                        0.009030
                                                           0.000584
         Сr
                                                                                            message: 'Optimization terminated successfully.'
                                        0.820433
        Νr
                  2.385010
                                                           3.205444
                                                                                              nfev: 2834
                   0.000000
                                       683.835638
                                                          683.835638
                                                                                               nit: 1990
                                     32464.380200 32464.380200
                   0.000000
         Βh
                                                                                             status: 0
                                        0.000473
                   0.000000
                                                           0.000473
         C h
                                                                                            success: True
                   2.159995
                                        2.821352
                                                           4.981347
         Fο
                                                                                                 x: array([6.18047086e+02, 1.62788566e+04, 1.30065379e+03, 1.09654125e+00,
                   0.000000
                                        0.632148
                                                           0.632148
                                                                                            3.46358938e+03, 3.97965857e+03, 5.83941725e-04, 3.20544375e+00,
        Во
                   0.000000
                                        0.972768
                                                           0.972768
                                                                                            6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 4.98134686e+00,
                   0.000000
                                         2.640174
                                                           2.640174
                                                                                            6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00])
         Со
```

 10^{4}

 10^{3}

 10^{4}

 10^{3}

0.000000

1.919339

1.919339