```
final simplex: (array([[9.08998192e+02, 6.13395375e+03, 1.68770453e+03, 1.12471087e+00,
                                                                                                           1.91498270e+01, 4.69491881e+03, 8.01826991e-02, 2.56829178e-01,
                                                                                                           1.00311642e+03, 2.19862831e+04, 7.43576953e-05, 2.23474891e-01,
                                                                                                           1.33969293e+00, 1.59179267e+01, 5.39864951e+00],
                                                                                                           [9.08998192e+02, 6.13395375e+03, 1.68770453e+03, 1.12471087e+00,
                                                                                                           1.91498271e+01, 4.69491881e+03, 8.01826991e-02, 2.56829178e-01,
                                                                                                           1.00311642e+03, 2.19862832e+04, 7.43576953e-05, 2.23474891e-01,
                                                                                                           1.33969293e+00, 1.59179267e+01, 5.39864951e+00],
                                                                                                           [9.08998192e+02, 6.13395375e+03, 1.68770453e+03, 1.12471087e+00,
                                                                                                           1.91498270e+01, 4.69491880e+03, 8.01826991e-02, 2.56829178e-01,
                                                                                                           1.00311642e+03, 2.19862832e+04, 7.43576953e-05, 2.23474890e-01,
                                                                                                           1.33969293e+00, 1.59179267e+01, 5.39864951e+00],
                                                                                                          [9.08998192e+02, 6.13395375e+03, 1.68770453e+03, 1.12471087e+00,
                                                                                                           1.91498271e+01, 4.69491880e+03, 8.01826990e-02, 2.56829178e-01,
                                                                                                           1.00311642e+03, 2.19862832e+04, 7.43576953e-05, 2.23474890e-01,
                                                                                                           1.33969293e+00, 1.59179267e+01, 5.39864951e+00],
                                                                                                           [9.08998192e+02, 6.13395375e+03, 1.68770453e+03, 1.12471087e+00,
                                                                                                           1.91498270e+01, 4.69491880e+03, 8.01826991e-02, 2.56829178e-01,
                                                                                                           1.00311642e+03, 2.19862832e+04, 7.43576953e-05, 2.23474890e-01,
                                                                                                           1.33969293e+00, 1.59179267e+01, 5.39864951e+00],
                                                                                                          [9.08998192e+02, 6.13395375e+03, 1.68770453e+03, 1.12471087e+00,
                                                                                                           1.91498270e+01, 4.69491880e+03, 8.01826990e-02, 2.56829178e-01,
            ['SM data type data plots for mutation', 'Sensor 76] 2e+03, 2.19862832 = 04, 1.14376953 = 0.05, 2.23474890 = 0.01, 1.33969293 = 0.01, 1.33969293 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267 = 0.01, 1.59179267
  inducer -> sensor (GFP output)
                                                                                                           1.91498271e+01, 4.6949188 Converged 91e-02, 2.56829178e-01,
                                                                                                          1.00311642e+03, 2.1986283 e+0 Converged 3e-05, 2.23474890e-01, 1.33969293e+00, 1.59179267e+01 Converged 3e+00], [9.08998192e+02, 6.1339537 e+0 Converged 3e+03, 1.12471087e+00,
                                                                   4 \times 10^{3}
                                                                   3 \times 10^{3}
                                                                                                            1.91498270e+01, 4.69491880e+03, 8.01826991e-02, 2.56829178e-01,
                                                                                                           1.00311642e+03, 2.19862832e+04, 7.43576953e-05, 2.23474890e-01,
                                                                   2 \times 10^{3}
                                                                                                           1.33969293e+00, 1.$9179267e+01, 5.39864951e+00],
                                                                                                           [9.08998192e+02, 6.\pmu3395375e+03, 1.68770453e+03, 1.12471087e+00,
                                                                                                           1.91498270e+01, 4.69491881e+03, 8.01826992e-02, 2.56829178e-01,
                                                                        10<sup>3</sup>
                                                                                                           1.00311642e+03, 2.19862832e+04, 7.43576953e-05, 2.23474891e-01,
                                                                                                            1.3<del>3969293e+00,</del> 1.$9179267e+01, 5.39864951e+00],
                                                                                                           [<u>9.08998192e+02.6.</u>13395375e+03, 1.68770453e+03, 1.12471087e+00, 1.91498290e+01, 4.69491880e+03, 8.01826991e-02, 2.56829178e-01,
              10^{-4}
                            10^{-3}
                                          10^{-2}
                                                        10^{-1}
                                                                              10^{-5}
                                                                                            10^{-4}
                                                                                          Full circult 00 11 642 60 03, 2.19862832e+04, 7.43576953e-05, 2.23474890e-01,
     inducer -> S -| Output (GFP)
                                                                                                                <del>3969293e+00, 1.</del>59179267e+01, 5.39864951e+00],
                                                                                                         [$08988192e+02, 6.13395375e+03, 1.68770453e+03, 1.12471087e+00,
                                                                                                           1.91498270e+01, 4.69491880e+03, 8.01826991e-02, 2.56829178e-01, 1.00311642e+03, 2.19862832e+04, 7.43576953e-05, 2.23474890e-01,
                                                                   4 \times 10^{3}
                                                                                                           1.33969293e+00, 1.59179267e+01, 5.39864951e+00],
$\text{\text{9.08998}\text{192}e+02, 6.13395375e+03, 1.68770453e+03, 1.12471087e+00,}
                                                                                                              .91498270e+01, 4.69491880e+03, 8.01826991e-02, 2.56829178e-01,
                                                                                                          1.00311642e+03, 2.19862832e+04, 7.43576953e-05, 2.23474890e-01, 1.38969293e+00, 1.59179267e+01, 5.39864951e+00], [9.08998192e+02, 6.13395375e+03, 1.68770453e+03, 1.12471087e+00,
                                                                  3 \times 10^{3}
                                                                                                           1.91498270e+01, 4.69491881e+03, 8.01826991e-02, 2.56829178e-01,
                                                                                                            <u>1.00311642e+03...</u>2.19862832e+04, 7.43576953e-05, 2.23474890e-01,
                                                                                                           1_033969193e+001d-59179267e+01, 5.39864951e+00],
                                          10^{-2}
10^{-5}
                            10^{-3}
                                                        10^{-1}
                                                                              10^{-5}
                                                                                            10^{-4}
              10^{-4}
                                                                                                           [9.08998192e+02, 6.13395375e+03, 1.68770453e+03, 1.12471087e+00,
                                                                                                           1.91498270e+01, 4.69491880e+03, 8.01826991e-02, 2.56829178e-01,
           Across all four plots:
                                                                                                           1.00311642e+03, 2.19862832e+04, 7.43576953e-05, 2.23474890e-01,
                                                                                                           1.33969293e+00, 1.59179267e+01, 5.39864951e+00],
              RSS (converged)=0.047
                                                                                                           [9.08998192e+02, 6.13395375e+03, 1.68770453e+03, 1.12471087e+00,
                                                                                                           1.91498270e+01, 4.69491881e+03, 8.01826991e-02, 2.56829178e-01,
              RSS (initial) = 2.022
                                                                                                           1.00311642e+03, 2.19862831e+04, 7.43576953e-05, 2.23474891e-01,
                                                                                                           1.33969293e+00, 1.59179267e+01, 5.39864951e+00],
              RSS (% reduction)=0.977
                                                                                                          [9.08998192e+02, 6.13395375e+03, 1.68770453e+03, 1.12471087e+00,
                                                                                                           1.91498271e+01, 4.69491881e+03, 8.01826991e-02, 2.56829178e-01,
                        epsilon Initial guesses Converged
                                                                                                           1.00311642e+03, 2.19862832e+04, 7.43576953e-05, 2.23474891e-01
          A s 300.601089
                                              608.397103 908.998192
                                                                                                           1.33969293e+00, 1.59179267e+01, 5.39864951e+00]), array([0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021, 0
          B s -9116.503946
                                             15250.457700 6133.953754
                                                                                                          0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021,
                  19.645484
                                             1668.059050 1687.704534
                                                                                                           0.04687021, 0.04687021, 0.04687021, 0.04687021, 0.04687021,
                    -0.074223
                                               1.198934
                                                                 1.124711
                                                                                                          0.04687021]))
                 -668.814866
                                              687.964693 19.149827
                                                                                                              fun: 0.046870212210800684
          Br-18802.692594
                                              23497.611400 4694.918806
                                                                                                           message: 'Optimization terminated successfully.'
                     0.017816
                                              0.062367
                                                                   0.080183
          Сr
                                                                                                             nfev: 29743
                                              0.391731
                                                                    0.256829
          Νr
                    -0.134902
                                                                                                              nit: 22517
                   412.509876
                                               590.606548 1003.116424
          Αh
                                                                                                           status: 0
                                               35287.125700 21986.283148
          B h -13300.842552
                                                                                                           success: True
          C h
                     -0.000456
                                               0.000530
                                                                    0.000074
                                                                                                                x: array([9.08998192e+02, 6.13395375e+03, 1.68770453e+03, 1.12471087e+00,
          Αо
                     -0.606355
                                               0.829830
                                                                     0.223475
                                                                                                          1.91498270e+01, 4.69491881e+03, 8.01826991e-02, 2.56829178e-01,
                     -2.948477
                                               4.288170
                                                                     1.339693
                                                                                                          1.00311642e+03, 2.19862831e+04, 7.43576953e-05, 2.23474891e-01,
          Со
                     12.784705
                                                3.133222
                                                                    15.917927
                                                                                                          1.33969293e+00, 1.59179267e+01, 5.39864951e+00])
                      3.589631
                                               1.809018
                                                                     5.398650
          N_o
```

 10^{4}

10³

 10^{4}