```
final simplex: (array([[1.14425325e+03, 3.55698767e+03, 2.12536221e+03, 1.55214310e+00,
                                                                                              1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                               6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 3.83455614e+00,
                                                                                              6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                             [1.14425324e+03, 3.55698769e+03, 2.12536219e+03, 1.55214310e+00, 1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                              6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 3.83455615e+00,
                                                                                              6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                              1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                              6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 3.83455614e+00,
                                                                                              6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                             [1.14425324e+03, 3.55698772e+03, 2.12536216e+03, 1.55214305e+00,
                                                                                              1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                              6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 3.83455612e+00, 6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                             [1.14425325e+03, 3.55698771e+03, 2.12536217e+03, 1.55214309e+00,
                                                                                              1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                               6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 3.83455614e+00,
                                                                                              6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                              [1.14425326e+03, 3.55698766e+03, 2.12536226e+03, 1.55214313e+00,
                                                                                              1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                               6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 3.83455612e+00,
                                                                                              6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                             [1.14425324e+03, 3.55698766e+03, 2.12536227e+03, 1.55214308e+00,
                                                                                              1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
              ['SM data type data plots for mutation', 'Sensor33]8e+02, 3.24643802e+0, Initial Guess 6-04, 3.83455612e+00, 6.32148081e-01, 9.72768210e-01, Initial Guess 6-04, 1.91933916e+00], cer -> sensor (GFP output) inducer -> S[1][14425329410918.5569876e+0 Converged 3e+03, 1.55214310e+00,
      inducer -> sensor (GFP output)
                                                                                               1.91617561e+03, 1.8874240 ---- 4Converged 8e-03, 8.20433340e-01,
                                                                                             6.83835638e+02, 3.2464380 e+0 Converged 5e-04, 3.83455613e+00, 6.32148081e-01, 9.72768210 e-01, Converged 4e+03, 1.55214310e+00, [1.14425325e+03, 3.5569876 e+0 Converged 4e+03, 1.55214310e+00,
                                                            4 \times 10^3
                                                                                              1.91617561e+03, 1.$8742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                              6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 3.83455614e+00, 6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                            3 \times 10^{3}
                                                                                             [1.14425325e+03, 3.$5698767e+03, 2.12536222e+03, 1.55214313e+00,
                                                                                              1.91617561e+03, 1.$8742408e+04, 9.03017988e-03, 8.20433340e-01,
10^{3}
                                                                                               %.83835638e+02, 3.⊉4643802e+04, 4.73376905e-04, 3.83455614e+00,
                                                                                              6.321<del>48081e 01, 9.</del>72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                              <u>1:14425323e+03;3.</u>55698771e+03, 2.12536215e+03, 1.55214300e+00,
1:91617<del>5</del>81e+03;1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                        10-2
                                                                      10<sup>-5</sup>
                10^{-4}
                            10<sup>-3</sup>
                                                                                 10^{-4}
                                                                                inducer -> S -| Output (GFP)
                                                                                             [1.14425324e+03, 3.55698771e+03, 2.12536214e+03, 1.55214306e+00,
                                                                                              1.88742408e+04, 9.03017988e-03, 8.20433340e-01, 6.83835639e+02, 3.24643802e+04, 4.73376905e-04, 3.83455613e+00, 6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                            6 \times 10^{3}
10^{4}
                                                                                              [1.14425324e+03, 3.5698768e+03, 2.12536225e+03, 1.55214313e+00,
                                                                                               1.91617561e+03, 1.$8742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                            4 \times 10^{3}
                                                                                               6.83835638e+02, 3.⊉4643802e+04, 4.73376905e-04, 3.83455613e+00,
                                                                                               6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                            3 \times 10^{3}
                                                                                              [1.14425325e+03, 3.55698770e+03, 2.12536218e+03, 1.55214304e+00,
                                                                                              1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                             \begin{array}{l} 6.83835638e \pm 07.3 \\ 24643802e + 04, 4.73376905e - 04, 3.83455611e + 00, \\ 6032148981e - 01, 19, 72768210e - 01, 2.64017386e + 00, 1.91933916e + 00], \\ [1.14425323e + 03, 3.55698769e + 03, 2.12536219e + 03, 1.55214297e + 00, \\ \end{array}
                                                                      10^{-5}
                                        10^{-2}
                                                    10^{-1}
                                                                                  10^{-4}
    10^{-5}
                10^{-4}
                            10^{-3}
              Across all four plots:
                                                                                              1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                               6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 3.83455614e+00,
                RSS (converged)=0.052
                                                                                              6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                              [1.14425326e+03, 3.55698767e+03, 2.12536217e+03, 1.55214308e+00,
                RSS (initial)=5.036
                                                                                              1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                                                                              6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 3.83455614e+00,
                RSS (% reduction)=0.99
                                                                                              6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00],
                                                                                             [1.14425324e+03, 3.55698771e+03, 2.12536215e+03, 1.55214300e+00,
                         epsilon Initial_guesses Converged
                                                                                              1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                                            618.047086 1144.253250
                   526.206164
                                                                                              6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 3.83455615e+00
             B s -12721.868929
                                           16278.856600 3556.987671
                                                                                              1300.653790 2125.362212
                    824.708422
                                                                                              0.05232097, 0.05232097, 0.05232097, 0.05232097, 0.05232097,
                      0.455602
                                           1.096541 1.552143
             N_s
                                                                                              0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.052320970,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.05232097,\, 0.
                      0.000000
                                        1916.175610 1916.175610
                                                                                              0.05232097, 0.05232097]))
                                        18874.240800 18874.240800
                      0.000000
                                                                                                 fun: 0.0523209738820185
                                           0.009030
                      0.000000
                                                             0.009030
             C r
                                                                                              message: 'Optimization terminated successfully.'
                                           0.820433
             Νr
                      0.000000
                                                             0.820433
                                                                                                nfev: 1547
                       0.000000
                                          683.835638
                                                             683.835638
                                                                                                 nit: 1013
                                        32464.380200 32464.380200
             Βh
                       0.000000
                                                                                              status: 0
                                            0.000473
                       0.000000
                                                              0.000473
             Ch
                                                                                              success: True
                      1.013204
                                           2.821352
                                                              3.834556
             Fο
                                                                                                   x: array([1.14425325e+03, 3.55698767e+03, 2.12536221e+03, 1.55214310e+00,
                                           0.632148
                       0.000000
                                                              0.632148
                                                                                              1.91617561e+03, 1.88742408e+04, 9.03017988e-03, 8.20433340e-01,
                       0.000000
                                           0.972768
                                                              0.972768
             Во
                                                                                              6.83835638e+02, 3.24643802e+04, 4.73376905e-04, 3.83455614e+00,
                       0.000000
                                            2.640174
                                                              2.640174
                                                                                              6.32148081e-01, 9.72768210e-01, 2.64017386e+00, 1.91933916e+00])
             Со
```

 10^{4}

0.000000

1.919339

1.919339