```
final simplex: (array([[6.74845803e+02, 1.62314155e+04, 1.30837725e+03, 1.19831459e+00,
                                                                                    1.88864708e+03, 2.34392838e+04, 1.46096741e-02, 7.72499886e-01,
                                                                                    6.00825887e+02, 4.83771153e+04, 6.65231269e-04, 4.38966693e-01,
                                                                                    3.07491227e+00, 3.21565652e+00, 1.39965522e+00],
                                                                                    [6.74845803e+02, 1.62314155e+04, 1.30837725e+03, 1.19831459e+00,
                                                                                    1.88864708e+03, 2.34392838e+04, 1.46096741e-02, 7.72499886e-01,
                                                                                    6.00825885e+02, 4.83771154e+04, 6.65231270e-04, 4.38966694e-01,
                                                                                    3.07491227e+00, 3.21565652e+00, 1.39965522e+00],
                                                                                    [6.74845803e+02, 1.62314155e+04, 1.30837725e+03, 1.19831459e+00,
                                                                                    1.88864708e+03, 2.34392837e+04, 1.46096741e-02, 7.72499886e-01,
                                                                                    6.00825886e+02, 4.83771153e+04, 6.65231269e-04, 4.38966693e-01,
                                                                                    3.07491227e+00, 3.21565652e+00, 1.39965522e+00],
                                                                                    [6.74845803e+02, 1.62314155e+04, 1.30837725e+03, 1.19831459e+00,
                                                                                    1.88864708e+03, 2.34392838e+04, 1.46096741e-02, 7.72499886e-01,
                                                                                    6.00825886e+02, 4.83771153e+04, 6.65231270e-04, 4.38966694e-01,
                                                                                    3.07491227e+00, 3.21565652e+00, 1.39965522e+00],
                                                                                    [6.74845803e+02, 1.62314155e+04, 1.30837725e+03, 1.19831459e+00,
                                                                                    1.88864708e+03, 2.34392838e+04, 1.46096741e-02, 7.72499886e-01,
                                                                                    6.00825886e+02, 4.83771153e+04, 6.65231270e-04, 4.38966694e-01,
                                                                                    3.07491227e+00, 3.21565652e+00, 1.39965522e+00],
                                                                                    [6.74845803e+02, 1.62314155e+04, 1.30837725e+03, 1.19831459e+00,
                                                                                    1.88864708e+03, 2.34392838e+04, 1.46096741e-02, 7.72499886e-01,
         ['SM data type data plots for mutation', 'Output 7837e+02, 4.8377115 \frac{1}{2} inducer -> \frac{3.0749127}{1.6231415} representation', 'Output inducer -> \frac{3.0749127}{1.6231415} representation', 'Output inducer -> \frac{3.0749127}{1.6231415} representation inducer -> \frac{3.074912
  inducer -> sensor (GFP output)
                                                                                    1.88864708e+03, 2.3439283 -+ 4Converged 41e-02, 7.72499886e-01,
                                                                                    6.00825884e+02, 4.83771154e+04Converged
                                                                                                                                                 70e-04, 4.38966694e-01,
                                                                                   3.07491227e+00, 3.21565652e+0
[6.74845803e+02, 1.62314155e+0
                                                                                                                                                   2e+00],
                                                                                                                              Converged 25e+03, 1.19831459e+00,
                                                    4 \times 10^{3}
                                                                                    1.88864708e+03, 2.$4392838e+04, 1.46096741e-02, 7.72499886e-01,
                                                                                    6.00825885e+02, 4.$3771154e+04, 6.65231270e-04, 4.38966694e-01,
                                                    3 \times 10^3
                                                                                    3.07491227e+00, 3.21565652e+00, 1.39965522e+00],
                                                                                       74845803e+02, 1.62314155e+04, 1.39965522e+00], 88864708e+03, 2.84392838e+04, 1.46006741, 000, 1.19831459e+00,
                                                                                      ..8<mark>8864708e+03, 2.</mark>34392838e+04, 1.46096741e-02, 7.72499886e-01, 00825886e-02, 4.83771153e+04, 6.65231269e-04, 4.38966694e-01,
                                                    2 \times 10^{3}
                                                                                    3.07491227e+00, 3.21565652e+00, 1.39965522e+00],
                                                                                    6.74845803e+02.1.62314155e+04, 1.30837725e+03, 1.19831459e+00, 1.88864708e+03, 2.34392838e+04, 1.46096741e-02, 7.72499886e-01,
           10^{-4}
                      10^{-3}
                                 10^{-2}
                                            10^{-1}
                                                             10^{-5}
                                                                        10^{-4}
                                                                       inducer -> S -| Output (GFP)
                                                                                                   <del>/ẽ+00, 3.2</del>1565652e+00, 1.39965522e+00],
                                                                                    [6.74845803e+02, 1.62314155e+04, 1.30837725e+03, 1.19831459e+00,
                                                                                    .1.88864708e+03, 2.$4392838e+04, 1.46096742e-02, 7.72499886e-01,
                                                    6 \times 10^{3}
                                                                                     🖣00825885e+02, 4.$3771154e+04, 6.65231270e-04, 4.38966695e-01,
                                                                                    3.\Q7491227e+00, 3.\21565652e+00, 1.39965522e+00],
                                                                                   [6.78845803e+02, 1.62314155e+04, 1.30837725e+03, 1.19831459e+00, 1.88864708e+03, 2.34392838e+04, 1.46096741e-02, 7.72499886e-01,
                                                    4 \times 10^{3}
                                                                                    6.0082584e+02, 4.83771154e+04, 6.65231270e-04, 4.38966695e-01, 3.07491227e+00, 3.21565652e+00, 1.39965522e+00],
                                                    3 \times 10^{3}
                                                                                    [6.74845803e+02, 1.62314155e+04, 1.30837725e+03, 1.19831459e+00,
                                                                                    1.88864708e+03, 2.$4392838e+04, 1.46096741e-02, 7.72499886e-01,
                                                                                    <u>6.00825886e+02, 4</u>.$3771153e+04, 6.65231270e-04, 4.38966694e-01,
                                                                                    10^{-2}
                                                                        10^{-4}
10^{-5}
                      10^{-3}
                                            10^{-1}
                                                             10^{-5}
           10^{-4}
                                                                                    [6.74845803e+02, 1.62314155e+04, 1.30837725e+03, 1.19831459e+00,
                                                                                    1.88864708e+03, 2.34392838e+04, 1.46096741e-02, 7.72499885e-01,
        Across all four plots:
                                                                                    6.00825886e+02, 4.83771153e+04, 6.65231270e-04, 4.38966695e-01,
                                                                                    3.07491227e+00, 3.21565652e+00, 1.39965522e+00],
           RSS (converged)=0.058
                                                                                    [6.74845803e+02, 1.62314155e+04, 1.30837725e+03, 1.19831459e+00,
                                                                                    1.88864708e+03, 2.34392838e+04, 1.46096741e-02, 7.72499885e-01,
           RSS (initial)=1.118
                                                                                    6.00825886e+02, 4.83771153e+04, 6.65231269e-04, 4.38966694e-01,
                                                                                    3.07491227e+00, 3.21565652e+00, 1.39965522e+00],
           RSS (% reduction)=0.951
                                                                                    [6.74845803e+02, 1.62314155e+04, 1.30837725e+03, 1.19831459e+00,
                                                                                    1.88864708e+03, 2.34392838e+04, 1.46096741e-02, 7.72499885e-01,
                   epsilon Initial guesses Converged
                                                                                    6.00825886e+02, 4.83771153e+04, 6.65231269e-04, 4.38966694e-01,
                66.448700
                                    608.397103 674.845803
                                                                                    3.07491227e+00, 3.21565653e+00, 1.39965522e+00]]), array([0.05821099, 0.05821099, 0.05821099, 0.05821099, 0.05821099,
               980.957770
                                   15250.457700 16231.415470
                                                                                   0.05821099, 0.05821099, 0.05821099, 0.05821099, 0.05821099,
             -359.681804
                                    1668.059050 1308.377246
                                                                                    0.05821099, 0.05821099, 0.05821099, 0.05821099, 0.05821099,
                -0.000619
                                    1.198934
                                                   1.198315
                                                                                   0.05821099]))
                                     687.964693 1888.647077
        A r 1200.682384
                                                                                      fun: 0.058210993163161105
                                 23497.611400 23439.283752
        Βr
               -58.327648
                                                                                    message: 'Optimization terminated successfully.'
                                                     0.014610
                -0.047757
                                    0.062367
        Сr
                                                                                     nfev: 12451
                0.380769
                                    0.391731
        Νr
                                                     0.772500
                                                                                      nit: 9436
        Ah
                10.219339
                                    590.606548 600.825887
                                                                                    status: 0
        B h 13089.989638
                                    35287.125700 48377.115338
                                                                                    success: True
        C h
                 0.000135
                                     0.000530
                                                      0.000665
                                                                                        x: array([6.74845803e+02, 1.62314155e+04, 1.30837725e+03, 1.19831459e+00,
                                                                                   1.88864708e+03, 2.34392838e+04, 1.46096741e-02, 7.72499886e-01,
        Αо
                -0.390863
                                     0.829830
                                                      0.438967
                -1.213258
                                     4.288170
                                                      3.074912
                                                                                   6.00825887e+02, 4.83771153e+04, 6.65231269e-04, 4.38966693e-01,
        Со
                 0.082435
                                     3.133222
                                                      3.215657
                                                                                   3.07491227e+00, 3.21565652e+00, 1.39965522e+00])
                -0.409363
                                     1.809018
                                                      1.399655
        N_o
```

 10^{4}

 10^{3}

 10^{4}