

```

In[1]:= experiments = {
    "EYrainbow_glucose",
    "EYrainbow_glucose_largerBF",
    "EYrainbow_rapamycin_1stTry",
    "EYrainbow_rapamycin_CheckBistability",
    "EYrainbow_1nmpp1_1st",
    "EYrainbow_leucine_large",
    "EYrainbowWhi5Up_betaEstrodiol"
};

data = Import[FileNameJoin[{NotebookDirectory[], "fitCellSizeWithOrganelle.csv"}],
    "Data", "HeaderLines" → 1];
epsilon = 10^(-18);
filled = data /. {0. → epsilon};
washed = Select[data, Function[x, NoneTrue[x, # == 0 &]]];

In[6]:= (* Check data *)
Position[filled, 0.]
Position[washed, 0.]

Out[6]= {}

Out[7]= {}

In[8]:= Length[filled]
Length[washed]

Out[8]= 43108

Out[9]= 29263

In[10]:= fitCellSizeFromOrganelles[dataset_] := Module[
    {expr, a, b, c, alpha, mean, n, nlm, params,
     fittedFunc, fitted, fittedMin, fittedMax, dataMin, dataMax},
    expr = Sum[a[i] × n[i] × mean[i]^alpha[i], {i, 1, 6}] + Sum[n[i] × mean[i]^alpha[i] ×
        b[i, j] × n[j] × mean[j]^alpha[j], {i, 1, 5}, {j, i+1, 6}] + c;
    nlm = NonlinearModelFit[
        dataset[[All, 2 ;;]], expr,
        Join[
            Table[a[i], {i, 1, 6}],
            Flatten[Table[b[i, j], {i, 1, 5}, {j, i+1, 6}]],
            {c},
            Table[alpha[i], {i, 1, 6}]
        ],
        Join[
            Table[mean[i], {i, 1, 6}],
            Table[n[i], {i, 1, 6}]
        ],
        MaxIterations → ∞
    ];
    params = nlm["BestFitParameters"];

```

```
Print["a[i]: ", Table[a[i], {i, 1, 6}] /. params];
Print["b[i,j]: ", Table[b[i, j], {i, 1, 6}, {j, 1, 6}] /. params // MatrixForm];
Print["c: ", c /. params];
Print["alpha[i]: ", Table[alpha[i], {i, 1, 6}] /. params];
Print["Adjusted R Square: ", nlm["AdjustedRSquared"]];
Print["p-values for parameter z-statistics: ", nlm["ParameterPValues"]];
Print["t-statistics for parameter estimates: ", nlm["ParameterTStatistics"]];
fittedFunc = Function[
  vec,
  expr /. params
  /. Table[n[i] → vec[[i]], {i, 1, 6}]
  /. Table[mean[i] → vec[[i + 6]], {i, 1, 6}]
];
fitted = Map[fittedFunc, dataset[[All, 2 ;; -2]]];
fittedMin = Min[fitted];
fittedMax = Max[fitted];
dataMin = Min[dataset[[All, -1]]];
dataMax = Max[dataset[[All, -1]]];
Print[Show[
  ListPlot[
    Transpose[{dataset[[All, -1]], fitted}],
    PlotTheme → "Scientific", AspectRatio → (fittedMax) / (dataMax)
  ],
  Plot[x, {x, 0, dataMax}]
]];
Print[""]
]
In[11]:= Print["All Experiments, Null Organelles filled with 0:"];
fitCellSizeFromOrganelles[filled]
```

All Experiments, Null Organelles filled with 0:

```
a[i]: {6.49774, 0.267067, 0.166206, 0.311544, 1.52843, -5.64473}
```

```
b[i,j]: {{b$6141[1, 1] 0.00465407 -0.00103422 -0.0128998 0.0217947 0.029648,
b$6141[2, 1] b$6141[2, 2] 0.000010672 -0.00123349 -0.00116618 -0.00354855,
b$6141[3, 1] b$6141[3, 2] b$6141[3, 3] 0.000701859 -0.000307819 -0.00179042,
b$6141[4, 1] b$6141[4, 2] b$6141[4, 3] b$6141[4, 4] 0.016488 -0.0700616,
b$6141[5, 1] b$6141[5, 2] b$6141[5, 3] b$6141[5, 4] b$6141[5, 5] 0.202412,
b$6141[6, 1] b$6141[6, 2] b$6141[6, 3] b$6141[6, 4] b$6141[6, 5] b$6141[6, 6]}}

c: 55.2923
```

```
alpha[i]: {0.821002, 1.23737, 1.81746, -0.494198, 0.706441, 0.827913}
```

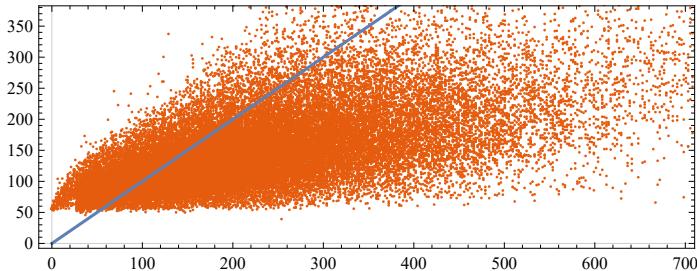
Adjusted R Square: 0.936439

p-values for parameter z-statistics:

```
{7.4503×10-219, 1.16162×10-31, 1.33233×10-31, 0.0000108475, 1.0892×10-66, 1.25516×10-190,
2.23406×10-17, 3.9629×10-14, 0.0261587, 0.0114705, 0.036038, 1.7077×10-6, 1.12297×10-11,
2.67×10-13, 4.13756×10-15, 1.61135×10-16, 9.93064×10-9, 2.76844×10-20, 4.93877×10-7,
9.49005×10-26, 7.46483×10-200, 0., 0., 0., 0., 6.75925×10-20, 0., 3.83922×10-318}
```

t-statistics for parameter estimates:

```
{31.7616, 11.7173, 11.7056, 4.40007, 17.2815, -29.5991, 8.48452, -7.56476, -2.22392,
2.52814, 2.09656, 4.78592, -6.79165, -7.31238, -7.85354, 8.25125, -5.73304, -9.23218,
5.02944, -10.4979, 30.3221, 40.4577, 54.8683, 80.141, 87.1351, -9.13592, 152.345, 38.4558}
```



```
In[13]:= Print["All Experiments, Null Organelles Excluded:"];
fitCellSizeFromOrganelles[washed];
```

All Experiments, Null Organelles Excluded:

a[i]: {7.27632, 0.637428, 0.111243, -0.0408166, 2.75319, -2.15766}

b[i,j]: $\begin{pmatrix} b\$6839[1, 1] & 0.00872559 & 0.00041607 & 0.0765418 & -0.117424 & -0.0158225 \\ b\$6839[2, 1] & b\$6839[2, 2] & -0.0000762617 & -0.00225043 & -0.00287057 & 0.000057378 \\ b\$6839[3, 1] & b\$6839[3, 2] & b\$6839[3, 3] & -0.000110451 & 0.000833496 & -0.000802602 \\ b\$6839[4, 1] & b\$6839[4, 2] & b\$6839[4, 3] & b\$6839[4, 4] & 0.0327809 & -0.0647805 \\ b\$6839[5, 1] & b\$6839[5, 2] & b\$6839[5, 3] & b\$6839[5, 4] & b\$6839[5, 5] & 0.0691652 \\ b\$6839[6, 1] & b\$6839[6, 2] & b\$6839[6, 3] & b\$6839[6, 4] & b\$6839[6, 5] & b\$6839[6, 6] \end{pmatrix}$

c: 29.0454

alpha[i]: {0.91547, 1.12851, 1.80627, -0.273857, 0.714294, 0.985525}

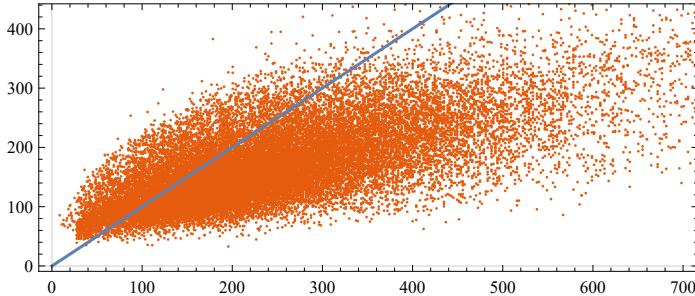
Adjusted R Square: 0.954803

p-values for parameter z-statistics:

{ 2.06651×10^{-163} , 2.8714×10^{-43} , 5.17943×10^{-12} , 0.690175, 7.86805×10^{-121} , 2.10436×10^{-23} ,
 8.08621×10^{-17} , 0.0122275, 1.71779×10^{-18} , 1.03514×10^{-25} , 0.297465, 3.37554×10^{-8} ,
 7.33548×10^{-9} , 3.74157×10^{-16} , 0.919289, 0.119744, 0.0000688879, 6.19121×10^{-6} , 1.39214×10^{-10} ,
 1.57966×10^{-15} , 6.15888×10^{-20} , 1.85115×10^{-43} , 0., 0., 0., 5.48457 $\times 10^{-6}$, 0., 2.33676×10^{-106} }

t-statistics for parameter estimates:

{27.4161, 13.814, 6.90344, -0.398622, 23.4838, -9.97656, 8.33499, 2.50567, 8.78028,
-10.4929, -1.0419, -5.52224, -5.78476, -8.15134, 0.10133, -1.5559, 3.98067, -4.52058,
6.41907, -7.97495, 9.14812, 13.8458, 55.9065, 81.012, 47.6296, -4.54619, 147.712, 21.9952}



In[15]:= Do[

```
Print[experiments[[i]], ", Null Organelles filled with 0:"];
fitCellSizeFromOrganelles[Select[filled, #[[1]] == experiments[[i]] &]];
{i, 1, Length[experiments]}
```

];

EYrainbow_glucose, Null Organelles filled with 0:

a[i]: {1.96285, 0.0613439, 0.0640699, 4.54943, 7.51757, -0.0369611}

b[i,j]: $\begin{pmatrix} b\$7320[1, 1] & -0.000384568 & -0.000968002 & -0.116933 & 0.972618 & -0.0303605 \\ b\$7320[2, 1] & b\$7320[2, 2] & -3.83656 \times 10^{-6} & 0.000910429 & -0.000954013 & 0.0000485664 \\ b\$7320[3, 1] & b\$7320[3, 2] & b\$7320[3, 3] & 0.000891228 & -0.000131898 & -0.0000528637 \\ b\$7320[4, 1] & b\$7320[4, 2] & b\$7320[4, 3] & b\$7320[4, 4] & -0.947297 & 0.0101995 \\ b\$7320[5, 1] & b\$7320[5, 2] & b\$7320[5, 3] & b\$7320[5, 4] & b\$7320[5, 5] & 0.00825635 \\ b\$7320[6, 1] & b\$7320[6, 2] & b\$7320[6, 3] & b\$7320[6, 4] & b\$7320[6, 5] & b\$7320[6, 6] \end{pmatrix}$

c: 11.0702

```

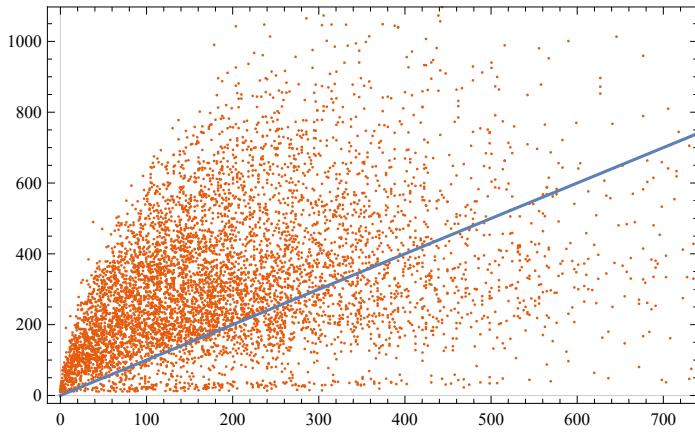
alpha[i]: {0.382693, 1.53313, 2.22198, 0.60163, 0.346872, -0.888535}

Adjusted R Square: 0.9241

p-values for parameter z-statistics:
{0.00121458, 0.000140243, 1.31383×10-9, 1.41021×10-9, 9.87911×10-24, 0.65291, 0.0534273,
0.0000852291, 0.0838691, 1.12048×10-29, 0.00750272, 0.00215092, 0.00323543, 0.000662374,
0.0881014, 0.000057822, 0.467977, 0.0341015, 4.81296×10-19, 0.268258, 0.397075,
0.00162995, 2.74904×10-16, 3.14423×10-202, 0., 1.22704×10-9, 6.08127×10-81, 7.90733×10-12}

t-statistics for parameter estimates:
{3.23684, 3.80998, 6.0744, 6.06296, 10.0818, -0.449744, -1.9318, -3.93165, -1.72893,
11.3694, -2.67449, -3.06977, 2.94552, -3.40632, 1.70575, 4.02415, -0.725816, -2.11931,
-8.94378, 1.10718, 0.846911, 3.1518, 8.205, 31.4346, 54.616, 6.08542, 19.3201, -6.85263}

```



EYrainbow_glucose_largerBF, Null Organelles filled with 0:

```

a[i]: {27.7632, 0.209062, -98.9008, -75.1794, 11.8814, -9.2423}

b[i,j]: {b$7467[1, 1] 0.000402422 -17.3051 0.399863 0.00190061 -0.170456
          b$7467[2, 1] b$7467[2, 2] -0.0493004 -0.000269191 -0.00179945 0.000449071
          b$7467[3, 1] b$7467[3, 2] b$7467[3, 3] 59.6647 -5.54589 3.36511
          b$7467[4, 1] b$7467[4, 2] b$7467[4, 3] b$7467[4, 4] 0.158141 -0.268734
          b$7467[5, 1] b$7467[5, 2] b$7467[5, 3] b$7467[5, 4] b$7467[5, 5] 0.087516
          b$7467[6, 1] b$7467[6, 2] b$7467[6, 3] b$7467[6, 4] b$7467[6, 5] b$7467[6, 6]}

c: 158.874

```

```
alpha[i]: {1.26309, 1.57268, 0.0830756, 0.780118, 0.775358, 0.453073}
```

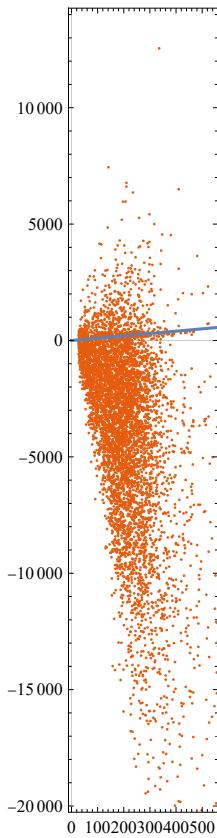
Adjusted R Square: 0.941201

```

p-values for parameter z-statistics:
{1.79899×10-11, 0.0000266879, 5.52483×10-45, 5.26356×10-21, 6.38773×10-17, 0.0000532302, 0.390246,
1.91321×10-6, 0.0000407317, 0.973001, 0.00934973, 0.0146395, 0.443983, 0.0000438192,
0.0302883, 2.03128×10-14, 5.44435×10-6, 0.0707762, 2.64832×10-6, 2.07715×10-12, 5.42001×10-23,
3.03209×10-109, 1.51705×10-43, 2.56639×10-199, 3.16911×10-13, 4.65366×10-68, 0., 1.24325×10-70}

t-statistics for parameter estimates:
{6.73452, 4.20332, -14.1919, -9.43918, 8.38275, -4.04391, 0.859233, -4.76712, 4.10636,
0.0338461, -2.59984, -2.44189, -0.765536, -4.0894, 2.16682, 7.66777, -4.55103, 1.80723,
4.70091, -7.0441, 9.91452, 22.674, 13.9499, 31.3064, 7.30358, 17.6582, 105.155, 18.0071}

```



EYrainbow_rapamycin_1stTry, Null Organelles filled with 0:

a[i]: {5.65461, 0.000175056, 0.183508, -5.66655, 5.39667, -7.14864}

b[i,j]:
$$\begin{pmatrix} b\$7613[1, 1] & -3.87351 \times 10^{-6} & -0.00144402 & -0.110238 & -0.00312312 & 0.060145 \\ b\$7613[2, 1] & b\$7613[2, 2] & -4.74079 \times 10^{-10} & 5.71721 \times 10^{-6} & -2.98542 \times 10^{-6} & 1.10449 \times 10^{-6} \\ b\$7613[3, 1] & b\$7613[3, 2] & b\$7613[3, 3] & 0.0011629 & 0.0000993934 & -0.00121016 \\ b\$7613[4, 1] & b\$7613[4, 2] & b\$7613[4, 3] & b\$7613[4, 4] & -0.0702207 & 0.194071 \\ b\$7613[5, 1] & b\$7613[5, 2] & b\$7613[5, 3] & b\$7613[5, 4] & b\$7613[5, 5] & 0.101518 \\ b\$7613[6, 1] & b\$7613[6, 2] & b\$7613[6, 3] & b\$7613[6, 4] & b\$7613[6, 5] & b\$7613[6, 6] \end{pmatrix}$$

c: 52.8359

alpha[i]: {0.460394, 2.67942, 1.75766, 1.58509, 0.78282, 0.597937}

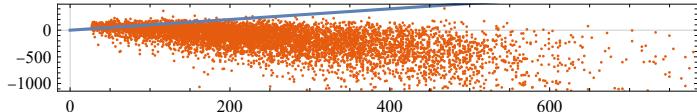
Adjusted R Square: 0.958456

p-values for parameter z-statistics:

{4.45134 $\times 10^{-14}$, 0.210564, 0.0000619644, 2.17203 $\times 10^{-16}$, 1.01978 $\times 10^{-90}$, 1.00516 $\times 10^{-44}$,
0.203217, 0.158517, 0.248284, 0.935731, 0.293148, 0.941586, 0.222922, 0.21896, 0.308426,
0.143421, 0.751483, 0.0395392, 0.0361645, 0.0000664945, 5.98042 $\times 10^{-10}$, 3.48158 $\times 10^{-69}$,
2.91866 $\times 10^{-16}$, 1.44527 $\times 10^{-64}$, 6.83273 $\times 10^{-175}$, 2.74371 $\times 10^{-63}$, 0., 2.49901 $\times 10^{-29}$ }

t-statistics for parameter estimates:

{7.56263, 1.25213, 4.00763, -8.23218, 20.4948, -14.1303, -1.27256, -1.41023, -1.15462,
-0.0806394, 1.05132, -0.0732787, 1.2189, -1.22941, 1.0186, 1.46333, 0.316697, -2.05891,
-2.09547, 3.99089, 6.1996, 17.7757, 8.19638, 17.1423, 29.0103, 16.9632, 108.44, 11.2943}



EYrainbow_rapamycin_CheckBistability, Null Organelles filled with 0:

a[i]: {1.70957, 0.261828, 0.185392, 0.71068, 0.869857, -2.24281}

b[i,j]:
$$\begin{pmatrix} b\$7751[1, 1] & 0.000112127 & -0.00135973 & -0.0203925 & 0.0990519 & 0.0339313 \\ b\$7751[2, 1] & b\$7751[2, 2] & -0.0000850057 & 0.000189132 & -0.00161657 & -0.00145842 \\ b\$7751[3, 1] & b\$7751[3, 2] & b\$7751[3, 3] & 0.000872282 & 0.000591907 & 0.000360483 \\ b\$7751[4, 1] & b\$7751[4, 2] & b\$7751[4, 3] & b\$7751[4, 4] & -0.0204473 & -0.00992882 \\ b\$7751[5, 1] & b\$7751[5, 2] & b\$7751[5, 3] & b\$7751[5, 4] & b\$7751[5, 5] & 0.0470586 \\ b\$7751[6, 1] & b\$7751[6, 2] & b\$7751[6, 3] & b\$7751[6, 4] & b\$7751[6, 5] & b\$7751[6, 6] \end{pmatrix}$$

c: 49.262

alpha[i]: {0.860968, 1.42371, 1.74564, -0.862589, 0.851399, 1.5064}

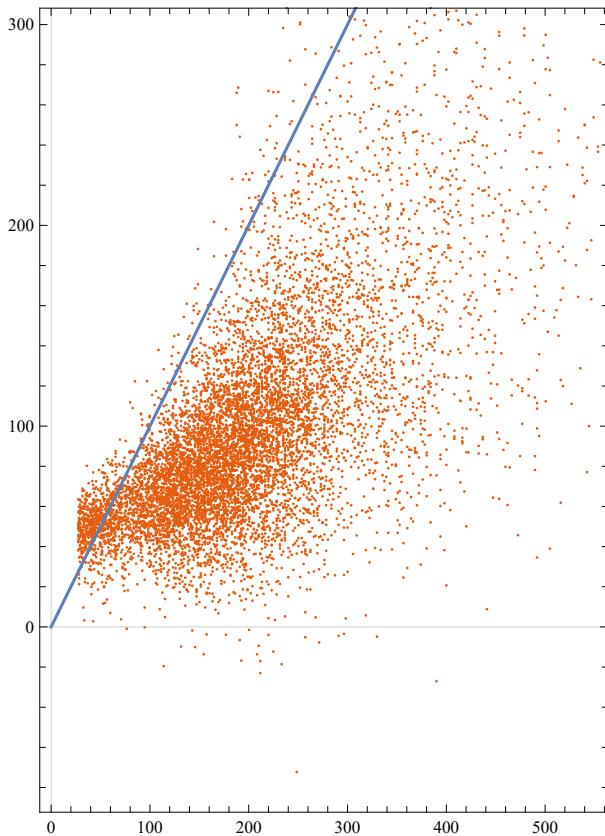
Adjusted R Square: 0.963717

p-values for parameter z-statistics:

{0.000034518, 4.25424×10^{-9} , 0.0000680773, 1.2893×10^{-9} , 2.66615×10^{-8} , 1.01258×10^{-10} , 0.801888, 0.0329196, 0.00865992, 3.66071×10^{-8} , 0.173467, 0.00357657, 0.184429, 0.0000133868, 0.007426, 0.0191808, 0.0854975, 0.555358, 5.60758×10^{-6} , 0.0933503, 0.000256487, 3.61022×10^{-84} , 1.44556×10^{-171} , 1.41939×10^{-305} , 5.42247×10^{-128} , 4.7558×10^{-30} , 0., 3.02381×10^{-9} }

t-statistics for parameter estimates:

{4.14343, 5.8796, 3.98471, 6.07489, 5.56683, -6.4725, 0.250911, -2.13338, -2.62575, 5.51112, 1.36125, -2.91402, 1.32734, -4.35602, -2.6777, 2.34241, 1.71983, 0.589772, -4.54331, -1.67816, 3.6571, 19.6385, 28.5176, 38.8123, 24.4478, -11.4289, 55.8445, 5.93607}



EYrainbow_1nmpp1_1st, Null Organelles filled with 0:

a[i]: {1.35383, 0.895031, 0.010772, 0.93278, 4.50069, -4.00156}

b[i,j]: $\begin{pmatrix} b\$7889[1, 1] & -0.0130187 & -0.0000369418 & -0.045353 & 0.118343 & -0.0121475 \\ b\$7889[2, 1] & b\$7889[2, 2] & -9.70274 \times 10^{-8} & 0.00916101 & -0.011858 & -0.00106126 \\ b\$7889[3, 1] & b\$7889[3, 2] & b\$7889[3, 3] & 0.0000210028 & -0.0000573007 & -0.0000583569 \\ b\$7889[4, 1] & b\$7889[4, 2] & b\$7889[4, 3] & b\$7889[4, 4] & -0.154453 & 0.306154 \\ b\$7889[5, 1] & b\$7889[5, 2] & b\$7889[5, 3] & b\$7889[5, 4] & b\$7889[5, 5] & 0.00317923 \\ b\$7889[6, 1] & b\$7889[6, 2] & b\$7889[6, 3] & b\$7889[6, 4] & b\$7889[6, 5] & b\$7889[6, 6] \end{pmatrix}$

c: 18.0136

alpha[i]: {0.69029, 1.25182, 2.46067, 0.297652, 0.756884, 1.42732}

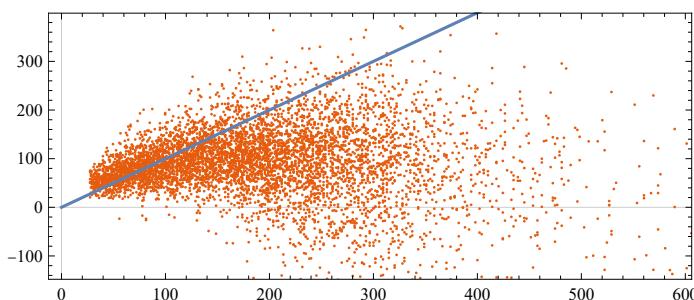
Adjusted R Square: 0.971855

p-values for parameter z-statistics:

{0.0575489, 0.0000175937, 0.00109341, 0.0827488, 1.57306×10^{-90} , 4.56194×10^{-17} ,
0.0454119, 0.256448, 0.448039, 0.0000439038, 0.77817, 0.95966, 0.108349, 0.00611051,
0.806644, 0.454729, 0.00141141, 0.0384308, 3.93259×10^{-8} , 9.01872×10^{-15} , 0.865822,
 3.83904×10^{-9} , 1.17213×10^{-41} , 1.19479×10^{-95} , 3.01961×10^{-200} , 0., 3.39779×10^{-59} }

t-statistics for parameter estimates:

{1.89948, 4.29689, 3.2669, 1.73524, 20.5233, -8.42247, -2.00123, -1.13493, -0.758738,
4.08892, -0.281718, -0.0505823, 1.6059, -2.74276, -0.244769, 0.747602, -3.19379, -2.07068,
-5.50097, 7.77209, 0.168975, 5.89973, 13.6251, 21.1288, 31.373, 2.92626, 83.2517, 16.4039}



EYrainbow_leucine_large, Null Organelles filled with 0:

a[i]: {4.74747, 0.0300866, 2.14756, 2.09294, -0.43913, -2.59391}

b[i,j]:
$$\begin{pmatrix} b\$8027[1, 1] & 0.000528761 & -0.0309222 & 0.105527 & -0.135775 & 0.356824 \\ b\$8027[2, 1] & b\$8027[2, 2] & -9.37263 \times 10^{-6} & 0.00023642 & -0.000178432 & -0.000415691 \\ b\$8027[3, 1] & b\$8027[3, 2] & b\$8027[3, 3] & -0.000573964 & 0.0303048 & -0.0937904 \\ b\$8027[4, 1] & b\$8027[4, 2] & b\$8027[4, 3] & b\$8027[4, 4] & -0.147657 & 0.121681 \\ b\$8027[5, 1] & b\$8027[5, 2] & b\$8027[5, 3] & b\$8027[5, 4] & b\$8027[5, 5] & 0.276239 \\ b\$8027[6, 1] & b\$8027[6, 2] & b\$8027[6, 3] & b\$8027[6, 4] & b\$8027[6, 5] & b\$8027[6, 6] \end{pmatrix}$$

c: 12.3106

alpha[i]: {1.24914, 1.58184, 1.18872, 0.130618, 0.814796, 1.27764}

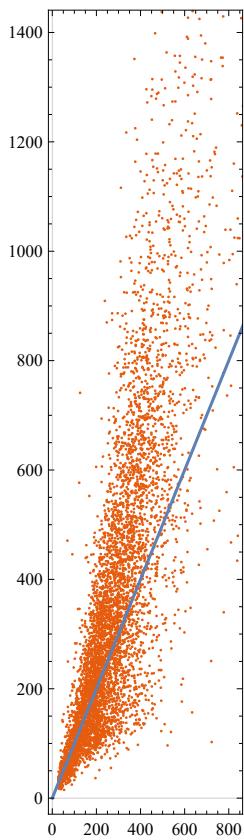
Adjusted R Square: 0.968589

p-values for parameter z-statistics:

{1.54759 $\times 10^{-8}$, 0.000158917, 0.000775627, 7.18411 $\times 10^{-7}$, 0.302935, 0.0324913, 0.00232493, 0.0248199, 0.0203001, 7.04021 $\times 10^{-7}$, 0.000111473, 0.413799, 0.00919273, 0.00298718, 0.00176219, 0.918122, 0.0264774, 0.00825009, 4.09365 $\times 10^{-16}$, 0.0220016, 5.87396 $\times 10^{-18}$, 0.0165406, 1.0369 $\times 10^{-15}$, 1.60555 $\times 10^{-270}$, 1.49203 $\times 10^{-53}$, 0.0728028, 0., 7.00889 $\times 10^{-32}$ }

t-statistics for parameter estimates:

{5.66402, 3.77912, 3.36308, 4.96163, -1.03025, -2.13881, 3.04655, -2.24476, 2.32137, -4.96557, 3.86674, -0.817284, 2.60565, -2.97028, -3.12905, -0.102804, 2.21969, -2.64254, -8.1587, 2.29094, 8.66237, 2.39744, 8.04442, 37.0402, 15.561, 1.79438, 104.098, 11.8194}



EYrainbowWhi5Up_betaEstrodiol, Null Organelles filled with 0:

a[i]: {12.106, 0.0845389, 1.55923, -7.55762, 12.9478, -16.1061}

b[i,j]: $\begin{pmatrix} b\$8165[1, 1] & -0.00210892 & 0.0443686 & -0.162705 & 0.100668 & -0.434281 \\ b\$8165[2, 1] & b\$8165[2, 2] & -0.0000960308 & 0.00137258 & 0.000417528 & 0.000628599 \\ b\$8165[3, 1] & b\$8165[3, 2] & b\$8165[3, 3] & 0.122781 & -0.0898402 & 0.0665143 \\ b\$8165[4, 1] & b\$8165[4, 2] & b\$8165[4, 3] & b\$8165[4, 4] & -0.0787673 & -0.19798 \\ b\$8165[5, 1] & b\$8165[5, 2] & b\$8165[5, 3] & b\$8165[5, 4] & b\$8165[5, 5] & 0.336742 \\ b\$8165[6, 1] & b\$8165[6, 2] & b\$8165[6, 3] & b\$8165[6, 4] & b\$8165[6, 5] & b\$8165[6, 6] \end{pmatrix}$

c: -47.615

alpha[i]: {0.919734, 1.49619, 1.16733, 0.4949, 0.762509, 1.03383}

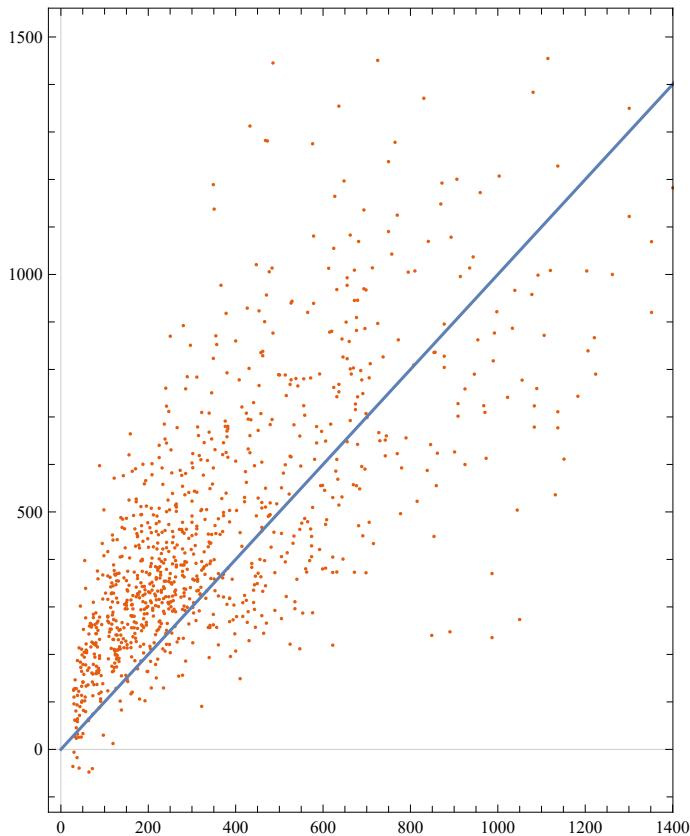
Adjusted R Square: 0.961277

p-values for parameter z-statistics:

$\{7.55208 \times 10^{-7}, 0.0374871, 0.226763, 0.014959, 8.74764 \times 10^{-8}, 1.70699 \times 10^{-8}, 0.0498375,$
 $0.460012, 0.41569, 0.0058755, 0.00481603, 0.48758, 0.134661, 0.149153, 0.0875092,$
 $0.39245, 0.340383, 0.420422, 0.562932, 0.30092, 0.0234291, 0.00773737,$
 $5.38313 \times 10^{-51}, 4.23392 \times 10^{-71}, 9.88646 \times 10^{-8}, 0.0199457, 6.26172 \times 10^{-188}, 8.81226 \times 10^{-11}\}$

t-statistics for parameter estimates:

{4.97905, 2.08326, 1.2095, -2.43769, 5.39187, -5.68707, -1.96379, 0.739119, -0.814268,
 2.76072, -2.82556, -0.694427, 1.49721, 1.44367, 1.7104, 0.855563, -0.953876, 0.80603,
 -0.578691, -1.03501, 2.26993, -2.66885, 15.9364, 19.3894, 5.36919, 2.3312, 36.9923, 6.55827}



```
In[16]:= Do[
  Print[experiments[[i]], ", Null Organelles Excluded:"];
  fitCellSizeFromOrganelles[Select[washed, #[[1]] == experiments[[i]] &]],
  {i, 1, Length[experiments]}
]

EYrainbow_glucose, Null Organelles Excluded:

a[i]: {6.3196, 0.316155, 0.252434, 0.944634, -0.00943759, 0.175869}

b[i,j]: {{b$8632[1, 1] -0.000256905 -0.00304458 0.0130287 -0.000484938 0.111297,
  b$8632[2, 1] b$8632[2, 2] -0.0000856186 0.00100695 -6.16329×10-6 -0.00221553,
  b$8632[3, 1] b$8632[3, 2] b$8632[3, 3] 0.00277741 0.000010159 -0.000664366,
  b$8632[4, 1] b$8632[4, 2] b$8632[4, 3] b$8632[4, 4] -0.000396582 -0.153746,
  b$8632[5, 1] b$8632[5, 2] b$8632[5, 3] b$8632[5, 4] b$8632[5, 5] 0.00037071,
  b$8632[6, 1] b$8632[6, 2] b$8632[6, 3] b$8632[6, 4] b$8632[6, 5] b$8632[6, 6]}}

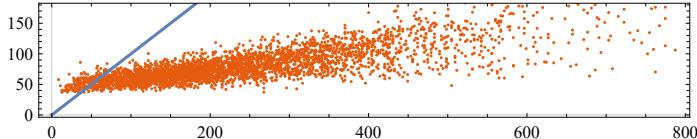
c: 34.5562

alpha[i]: {0.812447, 1.29339, 1.84135, 0.204561, 1.89087, 0.229374}

Adjusted R Square: 0.939031
```

```
p-values for parameter z-statistics:
{2.53243×10-9, 2.76181×10-6, 0.0101533, 0.222582, 0.432661, 0.79444, 0.803923,
 0.0484024, 0.885893, 0.460602, 0.177168, 0.0310798, 0.212095, 0.457224, 0.0279802,
 0.0898915, 0.487444, 0.46253, 0.473551, 0.0217046, 0.457855, 3.25396×10-8,
 5.79013×10-22, 2.23774×10-201, 1.5034×10-68, 0.282208, 1.139×10-12, 0.278907}

t-statistics for parameter estimates:
{5.97443, 4.69524, 2.57192, 1.2199, -0.784734, 0.260569, -0.248291, -1.97449, 0.143513,
 -0.737934, 1.34979, -2.15689, 1.24805, -0.743506, -2.19845, 1.69642, 0.694452, -0.734765,
 -0.716788, -2.29649, 0.742464, 5.53927, 9.69601, 32.3048, 17.8755, 1.07553, 7.13802, 1.08294}
```



EYrainbow_glucose_largerBF, Null Organelles Excluded:

```
a[i]: {6.82819, 0.215318, 0.0648138, 2.21496, 4.13243, -4.10368}
```

```
b[i,j]: {(b$8770[1, 1] -0.0029774 -0.0014265 0.164387 0.159232 -0.302679,
            b$8770[2, 1] b$8770[2, 2] -0.0000591979 0.00230451 -0.00194773 0.000943707,
            b$8770[3, 1] b$8770[3, 2] b$8770[3, 3] 0.0098963 -0.00119951 0.000931009,
            b$8770[4, 1] b$8770[4, 2] b$8770[4, 3] b$8770[4, 4] 0.0271166 -0.216819,
            b$8770[5, 1] b$8770[5, 2] b$8770[5, 3] b$8770[5, 4] b$8770[5, 5] 0.0712457
            b$8770[6, 1] b$8770[6, 2] b$8770[6, 3] b$8770[6, 4] b$8770[6, 5] b$8770[6, 6])}
```

```
c: 33.2388
```

```
alpha[i]: {1.27374, 1.48705, 1.73785, 0.846453, 0.778396, 0.402141}
```

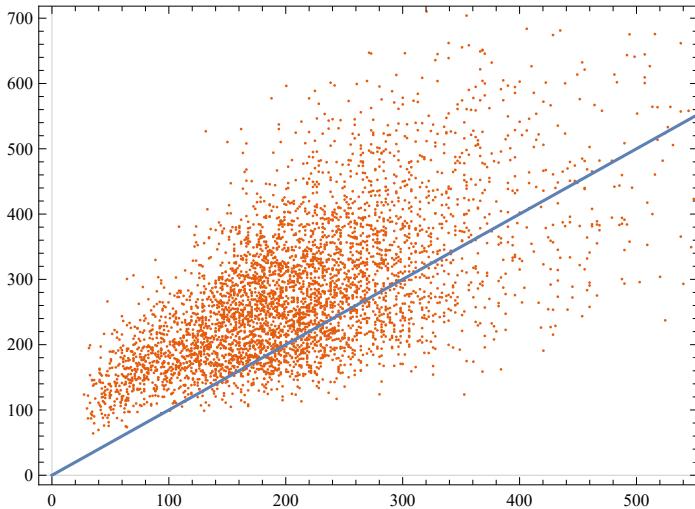
Adjusted R Square: 0.952294

p-values for parameter z-statistics:

```
{0.000082931, 0.0000188967, 0.0857354, 0.0358257, 9.38213×10-30, 3.89388×10-16, 0.00440274,
 0.617854, 0.196921, 0.0137652, 0.000013296, 0.346224, 0.00576443, 0.0000908945,
 0.00770451, 0.360358, 0.25475, 0.468983, 0.578416, 5.76052×10-6, 3.25937×10-10,
 5.63551×10-6, 5.8414×10-55, 1.54124×10-171, 3.00485×10-13, 3.42971×10-28, 0., 2.0404×10-52}
```

t-statistics for parameter estimates:

```
{3.93931, 4.28205, 1.71871, 2.09952, 11.4098, -8.17178, -2.84918, -0.498928, 1.29056,
 2.46428, -4.35992, -0.942037, 2.76219, -3.91718, 2.66593, 0.914775, -1.13903, 0.724196,
 0.555739, -4.54033, 6.29982, 4.54498, 15.8248, 29.1509, 7.31579, 11.0835, 79.5807, 15.4317}
```



EYrainbow_rapamycin_1stTry, Null Organelles Excluded:

a[i]: {4.14411, 0.0151606, 0.107653, -3.59949, 3.80154, -4.44978}

b[i,j]:
$$\begin{pmatrix} b\$8916[1, 1] & -0.000299597 & -0.000230678 & -0.137095 & 0.0648808 & -0.0287444 \\ b\$8916[2, 1] & b\$8916[2, 2] & 2.58892 \times 10^{-7} & 0.000327561 & -0.000214523 & 0.0000409419 \\ b\$8916[3, 1] & b\$8916[3, 2] & b\$8916[3, 3] & 0.000773329 & 0.000231008 & -0.000930741 \\ b\$8916[4, 1] & b\$8916[4, 2] & b\$8916[4, 3] & b\$8916[4, 4] & -0.0421119 & 0.0937011 \\ b\$8916[5, 1] & b\$8916[5, 2] & b\$8916[5, 3] & b\$8916[5, 4] & b\$8916[5, 5] & 0.101406 \\ b\$8916[6, 1] & b\$8916[6, 2] & b\$8916[6, 3] & b\$8916[6, 4] & b\$8916[6, 5] & b\$8916[6, 6] \end{pmatrix}$$

c: 59.0319

alpha[i]: {0.469907, 1.87639, 1.84197, 1.88972, 0.769455, 0.630096}

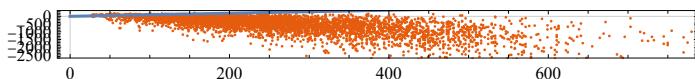
Adjusted R Square: 0.968734

p-values for parameter z-statistics:

$\{8.19544 \times 10^{-6}, 0.0298722, 0.0037815, 0.0000359578, 1.27213 \times 10^{-32}, 6.74417 \times 10^{-14}, 0.0401436, 0.745897, 0.191569, 0.160175, 0.649184, 0.468999, 0.0402852, 0.0379749, 0.387399, 0.219935, 0.385642, 0.0641315, 0.294845, 0.0845495, 2.33291 \times 10^{-7}, 1.58602 \times 10^{-35}, 6.93898 \times 10^{-13}, 9.8902 \times 10^{-88}, 2.63107 \times 10^{-101}, 7.78738 \times 10^{-21}, 0., 9.88165 \times 10^{-11}\}$

t-statistics for parameter estimates:

{4.46523, 2.17247, 2.89736, -4.1362, 11.9893, -7.51675, -2.05287, -0.324075, -1.30615, 1.40472, -0.454926, 0.724171, 2.05141, -2.07574, 0.864428, 1.22687, 0.867633, -1.85172, -1.04768, 1.72526, 5.17867, 12.549, 7.20178, 20.3023, 21.9268, 9.40908, 79.1882, 6.48427}



EYrainbow_rapamycin_CheckBistability, Null Organelles Excluded:

a[i]: {3.22976, 1.0393, 0.122677, 2.16553, 0.640097, -1.27546}

```

b[i,j]: 
$$\begin{pmatrix} b\$9062[1, 1] & 0.00510531 & 0.000752387 & -0.0256533 & 0.0236889 & -0.0368686 \\ b\$9062[2, 1] & b\$9062[2, 2] & -0.000330785 & -0.000712059 & -0.000512885 & -0.0081238 \\ b\$9062[3, 1] & b\$9062[3, 2] & b\$9062[3, 3] & 0.00139073 & 0.000155323 & 0.00016925 \\ b\$9062[4, 1] & b\$9062[4, 2] & b\$9062[4, 3] & b\$9062[4, 4] & -0.0487781 & -0.00907953 \\ b\$9062[5, 1] & b\$9062[5, 2] & b\$9062[5, 3] & b\$9062[5, 4] & b\$9062[5, 5] & 0.0470124 \\ b\$9062[6, 1] & b\$9062[6, 2] & b\$9062[6, 3] & b\$9062[6, 4] & b\$9062[6, 5] & b\$9062[6, 6] \end{pmatrix}$$

c: 44.017
alpha[i]: {0.89885, 1.13373, 1.81989, 0.109923, 0.914888, 0.521854}
Adjusted R Square: 0.97296
p-values for parameter z-statistics:
{1.62042×10-11, 2.76636×10-11, 0.00399452, 2.79108×10-12, 0.000695732, 0.000130321,
 0.0734404, 0.315556, 0.184871, 0.193599, 0.174893, 0.0220754, 0.614308, 0.611534,
 0.00097476, 0.0461138, 0.493438, 0.710649, 4.9513×10-6, 0.548547, 2.2094×10-6,
 2.88091×10-32, 3.24463×10-166, 1.50155×10-216, 6.00732×10-72, 0.352899, 0., 0.000392999}

t-statistics for parameter estimates:
{6.74841, 6.66983, 2.8796, 7.00093, 3.39284, -3.82809, 1.79037, 1.00371, -1.32604, 1.30014,
 -1.35679, -2.2896, -0.503957, -0.507909, -3.29918, 1.99472, 0.684889, 0.371, -4.57058,
 -0.59997, 4.73742, 11.8882, 28.2747, 32.6083, 18.1566, 0.929046, 41.9712, 3.54654}



```

EYrainbow_1nmpp1_1st, Null Organelles Excluded:

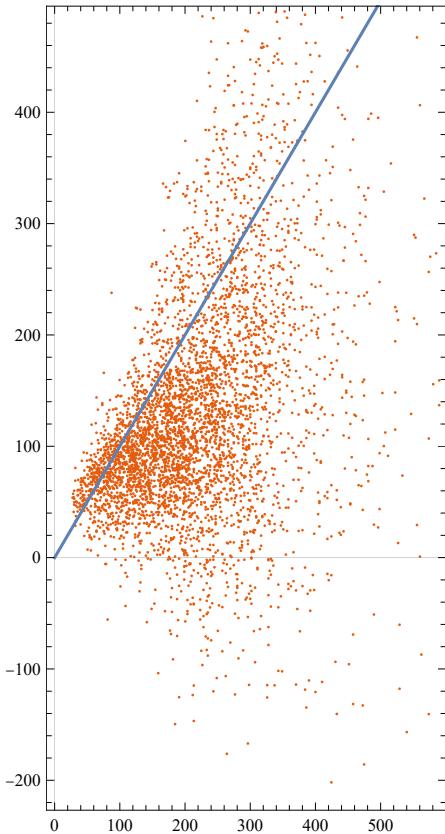
```

a[i]: {2.82073, 1.57771, 0.00400205, 0.180546, 2.99271, -4.30469}
b[i,j]: 
$$\begin{pmatrix} b\$9200[1, 1] & -0.0526544 & 0.0000322023 & 0.0467944 & -0.0209793 & 0.0520156 \\ b\$9200[2, 1] & b\$9200[2, 2] & -1.9303×10-6 & 0.016366 & -0.00475775 & -0.0258409 \\ b\$9200[3, 1] & b\$9200[3, 2] & b\$9200[3, 3] & -0.0000260599 & -0.0000182998 & -0.0000281541 \\ b\$9200[4, 1] & b\$9200[4, 2] & b\$9200[4, 3] & b\$9200[4, 4] & -0.0250363 & 0.107767 \\ b\$9200[5, 1] & b\$9200[5, 2] & b\$9200[5, 3] & b\$9200[5, 4] & b\$9200[5, 5] & 0.0571036 \\ b\$9200[6, 1] & b\$9200[6, 2] & b\$9200[6, 3] & b\$9200[6, 4] & b\$9200[6, 5] & b\$9200[6, 6] \end{pmatrix}$$

c: 35.4649
alpha[i]: {0.72322, 1.11896, 2.70262, -0.0366288, 0.803261, 1.56827}
Adjusted R Square: 0.976581
p-values for parameter z-statistics:
{0.00172515, 4.6202×10-6, 0.0064543, 0.701529, 2.57011×10-33, 4.45937×10-16,
 0.000126289, 0.119296, 0.343138, 0.511385, 0.251397, 0.137185, 0.0454353, 0.438455,
 0.0208479, 0.0473238, 0.00506486, 0.0421151, 0.163379, 0.000468873, 0.000732846,
 2.37752×10-15, 2.89127×10-33, 9.30279×10-94, 1.47151×10-173, 0.819856, 0., 5.94871×10-39}

t-statistics for parameter estimates:
{3.13575, 4.58692, 2.72503, 0.383281, 12.1245, -8.15566, -3.83692, 1.55803, 0.948083,
 -0.656735, 1.14711, -1.48662, 2.00116, -0.774874, -2.31154, -1.98393, -2.80426, -2.03296,
 -1.39402, 3.5005, 3.37931, 7.94793, 12.1145, 21.0318, 29.361, -0.227744, 76.4054, 13.1801}

```



EYrainbow_leucine_large, Null Organelles Excluded:

a[i]: {6.5014, 0.0336701, 2.97678, 1.84013, -1.47872, -0.325097}

b[i,j]: $\begin{pmatrix} b\$9338[1, 1] & 0.000654457 & -0.0565323 & 0.0700491 & -0.189782 & 0.387011 \\ b\$9338[2, 1] & b\$9338[2, 2] & -0.0000772435 & 0.000266788 & -0.000161842 & -0.00027435 \\ b\$9338[3, 1] & b\$9338[3, 2] & b\$9338[3, 3] & 0.00661489 & 0.0568028 & -0.103317 \\ b\$9338[4, 1] & b\$9338[4, 2] & b\$9338[4, 3] & b\$9338[4, 4] & -0.124738 & -0.00380945 \\ b\$9338[5, 1] & b\$9338[5, 2] & b\$9338[5, 3] & b\$9338[5, 4] & b\$9338[5, 5] & 0.199646 \\ b\$9338[6, 1] & b\$9338[6, 2] & b\$9338[6, 3] & b\$9338[6, 4] & b\$9338[6, 5] & b\$9338[6, 6] \end{pmatrix}$

c: 18.007

alpha[i]: {1.23062, 1.59724, 1.08985, 0.127126, 0.800504, 0.999744}

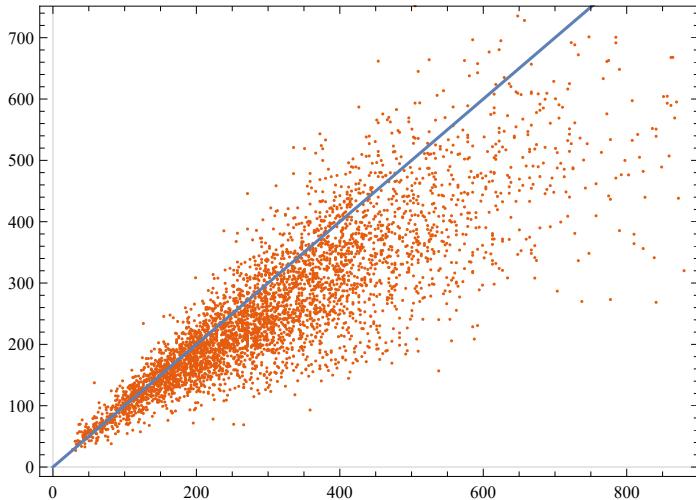
Adjusted R Square: 0.969829

p-values for parameter z-statistics:

{ 1.70083×10^{-6} , 0.00253323, 0.0483182, 0.00162777, 0.0890722, 0.829951, 0.0144819, 0.149142, 0.1944, 0.0000181656, 0.000125469, 0.216055, 0.0227832, 0.0204702, 0.0927689, 0.608548, 0.190992, 0.115574, 3.07786×10^{-7} , 0.943611, 2.05516×10^{-9} , 0.0400712, 1.6206×10^{-13} , 1.93912×10^{-154} , 1.70937×10^{-16} , 0.172217, 0., 5.26194×10^{-15} }

t-statistics for parameter estimates:

{4.79268, 3.02111, 1.97512, 3.15287, -1.70069, -0.214777, 2.44607, -1.44283, 1.29787, -4.29112, 3.83867, -1.23727, 2.27786, -2.31847, -1.68134, 0.512185, 1.30786, -1.57394, -5.12667, -0.0707367, 6.00619, 2.05363, 7.40055, 27.5847, 8.27381, 1.36534, 79.2662, 7.84866}



EYrainbowWhi5Up_betaEstrodiol, Null Organelles Excluded:

a[i]: {11.0457, 0.226281, 0.737605, -0.623217, 10.4347, -8.24383}

b[i,j]: $\begin{pmatrix} b\$9476[1, 1] & -0.00278813 & -0.00960378 & -0.413423 & 0.487942 & -0.98258 \\ b\$9476[2, 1] & b\$9476[2, 2] & -0.0000952229 & 0.00147635 & -0.00227362 & 0.00715673 \\ b\$9476[3, 1] & b\$9476[3, 2] & b\$9476[3, 3] & 0.129065 & -0.0335371 & 0.102256 \\ b\$9476[4, 1] & b\$9476[4, 2] & b\$9476[4, 3] & b\$9476[4, 4] & -0.595446 & 0.328885 \\ b\$9476[5, 1] & b\$9476[5, 2] & b\$9476[5, 3] & b\$9476[5, 4] & b\$9476[5, 5] & -0.0734471 \\ b\$9476[6, 1] & b\$9476[6, 2] & b\$9476[6, 3] & b\$9476[6, 4] & b\$9476[6, 5] & b\$9476[6, 6] \end{pmatrix}$

c: -55.356

alpha[i]: {0.893499, 1.31743, 1.24987, 0.883607, 0.744186, 1.12757}

Adjusted R Square: 0.961843

p-values for parameter z-statistics:

{ 2.60904×10^{-6} , 0.0635114, 0.150454, 0.88596, 5.1747×10^{-7} , 0.02952, 0.113441, 0.690404, 0.111504, 2.0461×10^{-6} , 4.14954×10^{-6} , 0.645742, 0.482943, 0.197954, 0.115325, 0.396614, 0.35521, 0.388573, 0.0210105, 0.272646, 0.6877, 0.00198911, 2.98132×10^{-48} , 2.00365×10^{-43} , 1.52421×10^{-8} , 0.000653526, 2.19823×10^{-144} , 5.58067×10^{-14} }

t-statistics for parameter estimates:

{4.73038, 1.85794, 1.43918, -0.143459, 5.05728, -2.18002, -1.58449, -0.398437, -1.59307, 4.78074, -4.6329, -0.459844, 0.701875, -1.28837, 1.57626, 0.848098, -0.925018, 0.862635, -2.31195, 1.09768, -0.402111, -3.10114, 15.5293, 14.6054, 5.71227, 3.42061, 31.1753, 7.64197}

