Modeling tools to guide Asli’s experiments

# TetR module

## Goal

## Model formulation

Write most complex model including all modules measured



## Parameter values and bounds

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Fixed parameters | | | | | |
| name | description | unit | value | Reference or calculation details | |
| d | Dilution by growth | 1/min | 0.0077 | ln(2)/90 | |
|  |  |  |  |  | |
|  |  |  |  |  | |
|  |  |  |  |  | |
| Estimated parameters | | | | | |
| name | description | unit | Best fit value | Min bound used for opt | Max bound |
|  | TetR repression threshold | nM | 35 | 0.1 | 1000 |
|  |  |  |  |  |  |

## Data/experiment description

## Optimization results

### Best fit

Figure with legend

Generated by function/script …

### Parameter space

Figure with legend

Generated by function/script …

## Conclusions

# LacI module

## Goal

## Model formulation

Write most complex model including all modules measured

1. **Circuit (LacI WT)**
2. **Circuit (LacI W220F)**
3. **Circuit (LacI W220F, Q60G, T167A)**
4. **Circuit (pt7\_LacI, P3\_Lacn\_cit, W220F, Q60G, T167A)**
5. **Circuit (pt7\_LacI, P4\_Lacn\_cit, W220F, Q60G, T167A)**

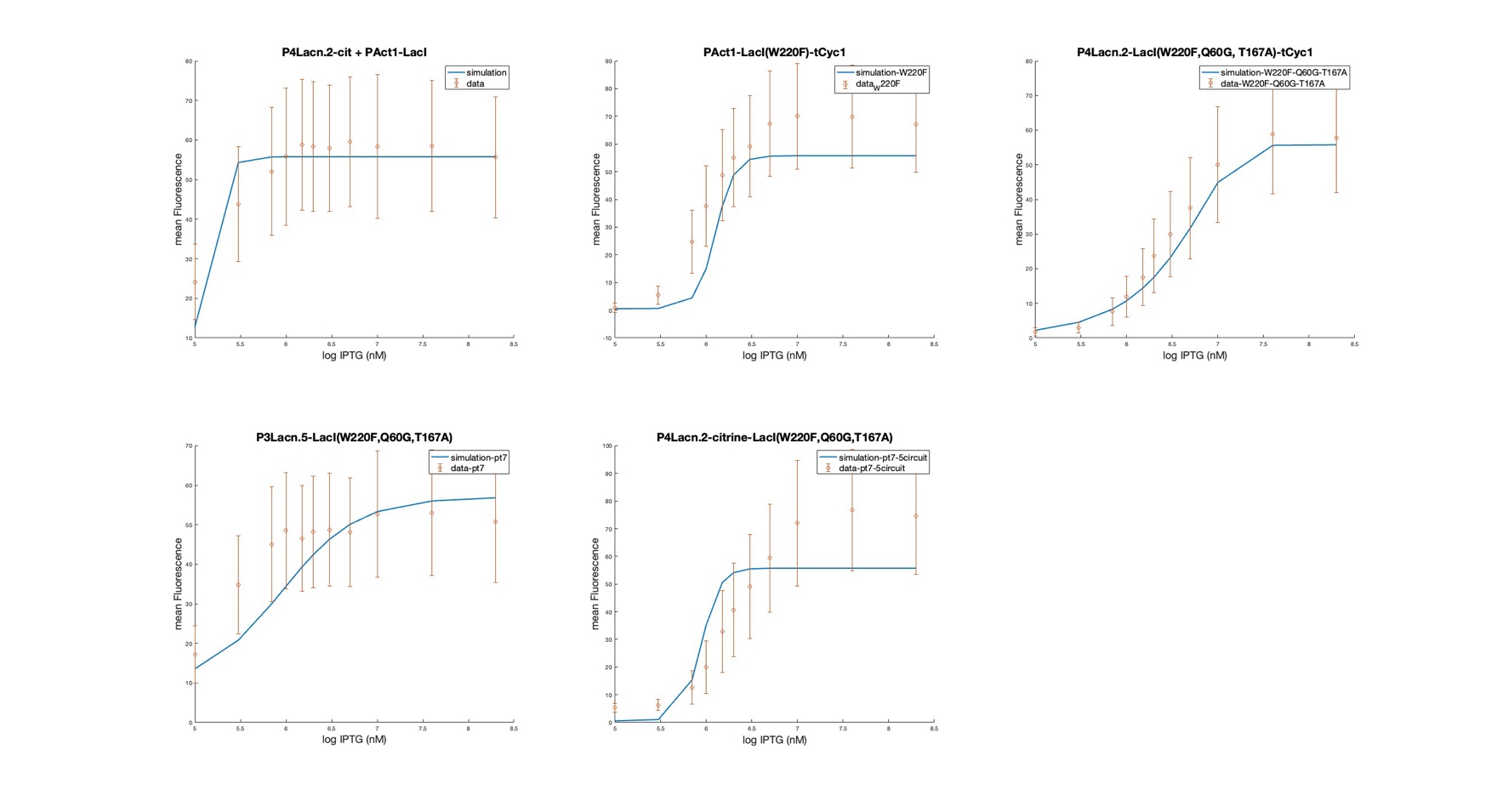
## Parameter values and bounds

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Fixed parameters | | | | | |
| name | description | unit | value | Reference or calculation details | |
| IPTG | Inducer added | nmolar | 0 - 200000000 |  | |
| indTime | Induction time | Min | 0 – 5000 |  | |
| Mu | Basal degredation rate | 1/min | 0.0077 |  | |
| Kmaturation | Citrine maturation coefficient | 1/min | 0.0173 |  | |
| Estimated parameters | | | | | |
| name | description | unit | Best fit value | Min bound used for opt | Max bound |
| Pact1\_LacI | LacI production rate | (molarity)/minute | 9.7648 | 0.1 | 100 |
| P4Lacn\_cit | Citrine production rate | (molarity)/minute | 20.5072 | 0.1 | 100 |
| dLacI | LacI degradation rate | 1/minute | 0.00001 | 0.00001 | 0.1 |
| dCit | Citrine degradation rate | 1/minute | 0.0074 | 0.00001 | 0.1 |
| LacI\_rep\_WT | Repression coefficient WT LacI | Molarity | 0.01 | 0.01 | 10 |
| KdLacI | K LacI | Mole/liter | 1 | 1 | 100 |
| nLacI | Hill constant | Dimensionless | 4.2777 | 0.5 | 20 |
| nMperUnit | Scaling factor | Dimensionless | 4.5864 | 0.001 | 100 |
| LacI\_rep\_W220F | Repression coefficient LacI W220F | Molarity | 0.001 | 0.001 | 1 |
| P\_4Lacn\_LacI | LacI production rate circuit 3 | (Molarity)/minute | 9.8830 | 0.1 | 100 |
| P\_4Lacn\_LacI | Leakage term | Dimensionless | 0.00001 | 0.00001 | 0.01 |
| LacI\_rep\_3mut | Repression coefficient 3 mutations | Molarity | 0.00001 | 0.00001 | 0.1 |
| Pt7\_LacI | Pt7\_LacI production rate | (Molarity)/minute | 0.1 | 0.1 | 100 |
| P3\_Lacn\_5\_cit | Citrine production rate P3 | (molarity)/minute | 17.8362 | 0.1 | 100 |
| P3\_Lacn\_5\_cit\_L | Leakage term P3 | Dimensionless | 0.000001 | 0.000001 | 0.01 |
| dLacI\_pt7 | Degredation rate pt7\_LacI | 1/minute | 0.0036 | 0.001 | 10 |
| nLacI\_P3 | Hill constant P3 | Dimensionless | 1.028 | 0.5 | 20 |
| LacI\_rep\_3mut\_P3 | Repression coefficient 3 mutations P3 | Molarity | 0.00001 | 0.00001 | 0.1 |

## Data/experiment description

## Optimization results

### Best fit



Generated by function/script main\_LacI

### Parameter space

Figure with legend

Generated by function/script …

## Conclusions