**Table S2. Parameters exclusive to the stochastic model**

| Name | Initial value | Optimized value | Range of LH sampling | Parameter description |
|---|---|---|---|---|
| $k_{tr1}$ | 0.22 | 0.3870 | 0.044–1.1 | Translation rate of [Cln3] |
| $k_{dm1}$ | 0.7 | 2.9459 | 0.14–3.5 | mRNA degradation rate of [Cln3] |
| $m_{min1}$ | 1 | 5 | 0.2–5 | Minimum number of mRNA molecules for [Cln3] |
| $m_{fluc1}$ | 1 | 1 | - | Magnitude of mRNA noise for [Cln3] |
| $k_{tr2}$ | 0.22 | 0.6166 | 0.044–1.1 | Translation rate of [Bck2] |
| $k_{dm2}$ | 0.7 | 0.6033 | 0.14–3.5 | mRNA degradation rate of [Bck2] |
| $m_{min2}$ | 4 | 17 | 0.8–20 | Minimum number of mRNA molecules for [Bck2] |
| $m_{fluc2}$ | 1 | 1 | - | Magnitude of mRNA noise for [Bck2] |
| $k_{tr3}$ | 0.22 | 0.0761 | 0.044–1.1 | Translation rate of [Cln2] |
| $k_{dm3}$ | 0.7 | 2.9502 | 0.14–3.5 | mRNA degradation rate of [Cln2] |
| $m_{min3}$ | 1 | 2 | 0.2–5 | Minimum number of mRNA molecules for [Cln2] |
| $m_{fluc3}$ | 1 | 1 | - | Magnitude of mRNA noise for [Cln2] |
| $k_{tr4}$ | 0.22 | 0.2024 | 0.044–1.1 | Translation rate of [$CKI_T$] |
| $k_{dm4}$ | 0.7 | 1.4652 | 0.14–3.5 | mRNA degradation rate of [$CKI_T$] |
| $m_{min4}$ | 4 | 1 | 0.8–20 | Minimum number of mRNA molecules for [$CKI_T$] |
| $m_{fluc4}$ | 1 | 1 | - | Magnitude of mRNA noise for [$CKI_T$] |
| $k_{tr5}$ | 0.22 | 0.6878 | 0.044–1.1 | Translation rate of [$Clb5_T$] |
| $k_{dm5}$ | 0.7 | 0.1975 | 0.14-3.5 | mRNA degradation rate of [$Clb5_T$] |
| $m_{min5}$ | 4 | 8 | 0.8–20 | Minimum number of mRNA molecules for [$Clb5_T$] |
| $m_{fluc5}$ | 1 | 1 | - | Magnitude of mRNA noise for [$Clb5_T$] |
| $k_{tr6}$ | 0.22 | 0.6974 | 0.044–1.1 | Translation rate of [$Clb2_T$] |
| $k_{dm6}$ | 0.7 | 1.6668 | 0.14–3.5 | mRNA degradation rate of [$Clb2_T$] |
| $m_{min6}$ | 4 | 15 | 0.8–20 | Minimum number of mRNA molecules for [$Clb2_T$] |
| $m_{fluc6}$ | 1 | 1 | - | Magnitude of mRNA noise for [$Clb2_T$] |
| $k_{tr7}$ | 0.22 | 0.8867 | 0.044–1.1 | Translation rate of [$Swi5_T$] |
| $k_{dm7}$ | 0.7 | 2.4182 | 0.14–3.5 | mRNA degradation rate of [$Swi5_T$] |
| $m_{min7}$ | 4 | 16 | 0.8–20 | Minimum number of mRNA molecules for [$Swi5_T$] |
| $m_{fluc7}$ | 1 | 1 | - | Magnitude of mRNA noise for [$Swi5_T$] |
| $k_{tr8}$ | 0.22 | 0.7344 | 0.044–1.1 | Translation rate of [$CDC20_T$] |
| $k_{dm8}$ | 0.7 | 3.4411 | 0.14–3.5 | mRNA degradation rate of [$CDC20_T$] |
| $m_{min8}$ | 4 | 6 | 0.8–20 | Minimum number of mRNA molecules for [$CDC20_T$] |
| $m_{fluc8}$ | 1 | 1 | - | Magnitude of mRNA noise for [$CDC20_T$] |
| $k_{tr9}$ | 0.22 | 0.6737 | 0.044–1.1 | Translation rate of [$Pds1_T$] |
| $k_{dm9}$ | 0.7 | 1.2706 | 0.14–3.5 | mRNA degradation rate of [$Pds1_T$] |
| $m_{min9}$ | 4 | 9 | 0.8–20 | Minimum number of mRNA molecules for [$Pds1_T$] |
| $m_{fluc9}$ | 1 | 1 | - | Magnitude of mRNA noise for [$Pds1_T$] |
| $k_{tr10}$ | 0.22 | 0.4258 | 0.044–1.1 | Translation rate of [$Polo_T$] |
| $k_{dm10}$ | 0.7 | 0.1369 | 0.14–3.5 | mRNA degradation rate of [$Polo_T$] |
| $m_{min10}$ | 4 | 5 | 0.8–20 | Minimum number of mRNA molecules for [$Polo_T$] |
| $m_{fluc10}$ | 1 | 1 | - | Magnitude of mRNA noise for [$Polo_T$] |
| $c_{cln3}$ | 10 | 9.0957 | 5–20 | Characteristic concentration of Cln3 |
| $c_{bck2}$ | 10 | 16.3317 | 5–20 | Characteristic concentration of Bck2 |
| $c_{whi5}$ | 22 | 21.8688 | 11–44 | Characteristic concentration of Whi5 |
| $c_{sbf}$ | 22 | 21.8688 | 11–44 | Characteristic concentration of SBF |
| $c_{cln2}$ | 45 | 84.2260 | 22.5–90 | Characteristic concentration of Cln2 |
| $c_{cki}$ | 80 | 101.9969 | 40–160 | Characteristic concentration of CKI |
| $c_{clb5}$ | 80 | 101.9969 | 40–160 | Characteristic concentration of Clb5 |
| $c_{clb2}$ | 80 | 101.9969 | 40–160 | Characteristic concentration of Clb2 |
| $c_{swi5}$ | 57.5 | 50.4561 | 28.75–115 | Characteristic concentration of Swi5 |
| $c_{cdc20}$ ($c_{mad2}$) | 100 | 93.1338 | 50–200 | Characteristic concentration of Cdc20 (Mad2) |
| $c_{cdh1}$ | 100 | 59.4664 | 50–200 | Characteristic concentration of Cdh1 |
| $c_{apcp}$ | 100 | 93.1338 | 50–200 | Characteristic concentration of APCP |
| $c_{cdc14}$ | 14 | 20.2049 | 7–28 | Characteristic concentration of Cdc14 |
| $c_{net1}$ | 14 | 20.2049 | 7–28 | Characteristic concentration of Net1 |
| $c_{ppx}$ | 100 | 81.0649 | 50–200 | Characteristic concentration of PPX |
| $c_{pds1}$ | 3.3 | 2.3993 | 1.65–6.6 | Characteristic concentration of Pds1 |
| $c_{esp1}$ | 3.3 | 2.3993 | 1.65–6.6 | Characteristic concentration of Esp1 |
| $c_{cdc15}$ | 8 | 8.7958 | 4–16 | Characteristic concentration of Cdc15 |
| $c_{tem1}$ | 8 | 8.7958 | 4–16 | Characteristic concentration of Tem1 |
| $c_{men}$ | 8 | 8.7958 | 4–16 | Characteristic concentration of MEN |
| $c_{polo}$ | 100 | 155.2614 | 50–200 | Characteristic concentration of Polo |
| $c_{mcm1}$ | 100 | 183.1687 | 50–200 | Characteristic concentration of Mcm1 |
| $c_{vol}$ | 28 | 28 | - | Characteristic volume (in femtoliters) |