Table S3

| Mutant | Rate constant | Initial concentration |
| :---: | :---: | :---: |
| OE-CLN3 | $k_{6}=100 * 0.00001 \mu \mathrm{M}^{*} \mathrm{~min}^{-1}$ | $\mathrm{cln} 3{ }_{\text {cyt }}[0]=100 * 0.000485 \mu \mathrm{M}$ |
| far14 | $k_{5}=0$ | far $1_{\text {cyt }}[0]=0$ |
| OE-FAR1 | $k_{5}=100 * 0.000042 \mu \mathrm{M}^{*} \mathrm{~min}^{-1}$ | far $1_{\text {cyt }}[0]=100 * 0.0037926 \mu \mathrm{M}$ |
| whi54 | $k_{8}=0$ | $\begin{aligned} & \text { whi5 }_{\text {cyt }}[0]=0 \\ & \operatorname{sbfwhi5~}_{\text {nuc }}[0]=0 \\ & \operatorname{sbf}_{\text {nuc }}[0]=0.025544 \mu \mathrm{M} \end{aligned}$ |
| OE-WHI5 | $k_{8}=100 * 0.00004 \mu \mathrm{M}^{*} \mathrm{~min}^{-1}$ | whi5 cyt $[0]=100 * 0.073564 \mu \mathrm{M}$ |
| $\operatorname{sic} 14$ | $k_{9}=0$ | sic $1_{\text {cyt }}[0]=0$ |
| OE-SIC1 | $k_{9}=100 * 0.00005 \mu \mathrm{M}^{*} \mathrm{~min}^{-1}$ | sic1 $1_{\text {cyt }}[0]=100 * 0.039234 \mu \mathrm{M}$ |
| cdk14 | $k_{7}=0$ | $\begin{aligned} & \operatorname{cdk} 1_{\text {cyt }}[0]=0 \\ & \operatorname{cdk} 1_{\text {nuc }}[0]=0 \end{aligned}$ |
| clb5 4 clb64 cdk14 | $\begin{aligned} & k_{2}=0 \\ & k_{7}=0 \end{aligned}$ | $\begin{aligned} & \operatorname{cdk} 1_{\text {cyt }}[0]=0 \\ & \operatorname{cdk} 1_{\text {nuc }}[0]=0 \end{aligned}$ |
| cln14 cln24 clb5 $\Delta$ clb64 | $\begin{aligned} & k_{1}=0 \\ & k_{2}=0 \end{aligned}$ |  |
| CLB5 stabilized | $k_{13}=0$ |  |
| OE-CLB5 and stabilized | $\begin{aligned} & k_{2}=2 \mathrm{~min}^{-1} \\ & k_{13}=0 \end{aligned}$ | $\mathrm{clb} 5,6_{\text {cyt }}[0]=0.1 \mu \mathrm{M}$ |
| $\begin{aligned} & \operatorname{cln} 1 \Delta c \ln 2 \Delta \\ & \text { OE-SIC1 OE-CLN2 } \end{aligned}$ | $\begin{aligned} & k_{1}=2 \min ^{-1} \\ & k_{9}=100^{*} 0.00005 \mu \mathrm{M}^{*} \min ^{-1} \end{aligned}$ | $\begin{aligned} & \operatorname{sic} 1_{\text {cyt }}[0]=100^{*} 0.039234 \mu \mathrm{M} \\ & \operatorname{cln} 1,2_{\text {cyt }}[0]=0.1 \mu \mathrm{M} \end{aligned}$ |
| $c \ln 14 \operatorname{cln} 2 \Delta$ OE-WHI5 | $\begin{aligned} & k_{1}=0 \\ & k_{8}=100^{*} 0.00004 \mu \mathrm{M}^{*} \min ^{-1} \end{aligned}$ | whi5 ${ }_{\text {cy }}[0]=100 * 0.073564 \mu \mathrm{M}$ |
| $c \ln 1 \Delta \operatorname{cln} 2 \Delta$ OE-CLN2 | $k_{1}=2 \mathrm{~min}^{-1}$ | $\mathrm{cln} 1,2_{\text {cy }}[0]=0.1 \mu \mathrm{M}$ |
| $c \ln 1 \Delta \ln 2 \Delta \ln 3 \Delta$ | $\begin{aligned} & k_{1}=0 \\ & k_{6}=0 \end{aligned}$ | $\mathrm{Cln} 3{ }_{\text {cyt }}[0]=0$ |
| $c \ln 1 \Delta c \ln 2 \Delta c \ln 3 \Delta$ OE-CDK1 | $\begin{aligned} & k_{1}=0 \\ & k_{6}=0 \\ & k_{7}=100 * 0.01 \mu \mathrm{M}^{*} \min ^{-1} \end{aligned}$ | $\begin{aligned} & \operatorname{cln} 3_{\text {cyt }}[0]=0 \\ & \operatorname{cdk} 1_{\text {cyt }}[0]=100^{*} 0.333333 \mu \mathrm{M} \end{aligned}$ |
| $c \ln 1 \Delta c \ln 2 \Delta c \ln 3 \Delta$ OE-CLN2 | $\begin{aligned} & k_{1}=2 \mathrm{~min}^{-1} \\ & k_{6}=0 \end{aligned}$ | $\begin{aligned} & \mathrm{cln} 3_{\text {cyt }}[0]=0 \\ & \operatorname{cln} 1,2_{\text {cyt }}[0]=0.1 \mu \mathrm{M} \end{aligned}$ |
| $c \ln 1 \Delta c \ln 2 \Delta c \ln 3 \Delta$ CLN2 stabilized | $\begin{aligned} & k_{6}=0 \\ & k_{12}=0 \end{aligned}$ | $\mathrm{Cln} 3 \mathrm{cyt}[0]=0$ |
| cln34 OE-WHI5 | $\begin{aligned} & k_{6}=0 \\ & k_{8}=100^{*} 0.00004 \mu \mathrm{M}^{*} \min ^{-1} \end{aligned}$ | $\begin{aligned} & \mathrm{cln} 3_{\text {cyt }}[0]=0 \\ & w h i 5_{\text {cyt }}[0]=100^{*} 0.073564 \mu \mathrm{M} \end{aligned}$ |
| CLN2 stabilized | $k_{12}=0$ |  |
| CLN3 stabilized | $\begin{aligned} & k_{15}=0 \\ & k_{20}=0 \end{aligned}$ |  |


| far14 sic14 | $\begin{aligned} & k_{5}=0 \\ & k_{9}=0 \end{aligned}$ | $\begin{aligned} & \text { far1 } 1_{\text {cyt }}[0]=0 \\ & \operatorname{sic} 1_{\text {cyt }}[0]=0 \end{aligned}$ |
| :---: | :---: | :---: |
| OE-SIC1 and stabilized | $\begin{aligned} & k_{9}=100^{*} 0.00005 \mu \mathrm{M}^{*} \mathrm{~min}^{-1} \\ & k_{18}=0 \end{aligned}$ | sic1 ${ }_{\text {cyt }}[0]=100 * 0.039234 \mu \mathrm{M}$ |
| OE-SIC1 OE-CLN2 | $\begin{aligned} & k_{9}=100^{*} 0.00005 \mu \mathrm{M}^{*} \min ^{-1} \\ & k_{1}=2 \mathrm{~min}^{-1} \end{aligned}$ | $\begin{aligned} & \operatorname{sic} 1_{\text {cy }}[0]=100^{*} 0.039234 \mu \mathrm{M} \\ & \operatorname{cln} 1,2_{\text {cyt }}[0]=0.1 \mu \mathrm{M} \end{aligned}$ |
| sbf 4 mbf $\triangle$ | $\begin{aligned} & k_{1}=0 \\ & k_{2}=0 \end{aligned}$ | sbfwhi5 ${ }_{\text {nuc }}[0]=0$ |
| sbf $\triangle$ mbf $\Delta$ OE-CLN2 | $\begin{aligned} & k_{2}=0 \\ & k_{1}=2 \mathrm{~min}^{-1} \end{aligned}$ | $\begin{aligned} & \operatorname{sbfwhi} 5_{\text {nuc }}[0]=0 \\ & \operatorname{cln} 1,2_{\text {cyt }}[0]=0.1 \mu \mathrm{M} \end{aligned}$ |
| OE-SBF | $k_{1}=2 \mathrm{~min}^{-1}$ | sbfwhi5 ${ }_{\text {nuc }}[0]=100 * 0.025544 \mu \mathrm{M}$ |
| sbf 4 mbf 4 sic1 4 | $\begin{aligned} & k_{1}=0 \\ & k_{2}=0 \\ & k_{9}=0 \end{aligned}$ | $\begin{aligned} & \text { sbfwhi5 }{ }_{\text {nuc }}[0]=0 \\ & \text { sic } 1_{\text {cyt }}[0]=0 \end{aligned}$ |
| sbf $\Delta$ mbf $\Delta$ sic1 $\Delta$ OE-CLN2 | $\begin{aligned} & k_{2}=0 \\ & k_{9}=0 \\ & k_{1}=2 \mathrm{~min}^{-1} \end{aligned}$ | $\begin{aligned} & \operatorname{sbfwhi} 5_{\text {nuc }}[0]=0 \\ & \operatorname{sic} 1_{\text {cyt }}[0]=0 \\ & \operatorname{cln} 1,2_{\text {cyt }}[0]=0.1 \mu \mathrm{M} \end{aligned}$ |
| OE-MBF | $k_{2}=2 \mathrm{~min}^{-1}$ | sbfwhi5 nuc $[0]=100 * 0.025544 \mu \mathrm{M}$ |


| External signals | Rate constant | Initial concentration |
| :--- | :--- | :--- |
| Pheromones | $k_{5}=5^{*} 0.000042 \mu \mathrm{M}^{*} \mathrm{~min}^{-1}$ <br> $k_{14}=0$ <br> $k_{19}=0$ | far1 $1_{\mathrm{cyt}}[0]=5^{*} 0.0037926 \mu \mathrm{M}$ |
| Hog1 cascade | $k_{18}=0$ <br> $k_{1}=0.003523 \mathrm{~min}^{-1}$ |  |

