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| **S1 Table. Parameters used in both size-control models.** | | | |
| **Parameter** | **Description** | **Value** | **Unit**a |
|  | gene copy number (ploidy) | 1b | molecules |
|  | copy number of Cln3 gene | 1b | molecules |
|  | total number of size-dependent genes | 500b | molecules |
|  | copy number of Whi5 gene () | 1b | molecules |
|  | binary variable for daughter cell growth | 0 or 1 | − |
|  | binary variable for mother cell growth | 0 or 1 | − |
|  | Michaelis-Menten constant for Cdc20 (in-)activation | 10-3 | AU/AV |
|  | Michaelis-Menten constant for Cdh1 (in-)activation | 10-3 | AU/AV |
|  | Michaelis-Menten constant for Clb1/2 synthesis | 0.3 | AU/AV |
|  | Clb1/2-dependent Cdc20 activation | 0.5 | 1/min |
|  | constitutive Cdh1 activation | 0.01 | AU/(AVmin) |
|  | Cdc20-dependent Cdh1 activation | 2 | 1/min |
|  | association of size-dependent genes and TM | 1 | AV/(moleculemin) |
|  | association of size-independent genes and TM | 10 | AV/(moleculemin) |
|  | constitutive Clb1/2 degradation | 0.01 | 1/min |
|  | Cdh1-dependent Clb1/2 degradation | 2 | AV/(AUmin) |
|  | constitutive Cln1/2 degradation | 1 | 1/min |
|  | Cln3 degradation | 1 | 1/min |
|  | dephosphorylation of SBF | 0.2 | 1/min |
|  | dephosphorylation of Whi5 | 1 | 1/min |
|  | dissociation of TM from size-dependent genes | 1 | 1/min |
|  | dissociation of TM from size-independent genes | 0.1 | 1/min |
|  | constitutive Cdc20 inactivation | 0.25 | AU/(AVmin) |
|  | Clb1/2-dependent Cdh1 inactivation | 2 | 1/min |
|  | Cln1/2-dependent Cdh1 inactivation | 0.125 | 1/min |
|  | Clb1/2-dependent SBF phosphorylation | 5 | AV/(AUmin) |
|  | constitutive Clb1/2 synthesis | 0.01 | AU/(moleculemin) |
|  | Clb1/2-dependent Clb1/2 synthesis | 0.3 | AU/(moleculemin) |
|  | Cln1/2 synthesis | 8 | AU/(moleculemin) |
|  | synthesis of transcription machinery | 2.1 | 1/min |
|  | cell volume growth | 0.042 | AV/(moleculemin) |
|  | Cln1/2 threshold for Start transition | 0.3 | AU/AV |
|  | Cln1/2 + Clb1/2 threshold for cell division | 0.2 | AU/AV |

aAU, arbitrary unit of number of molecules; AV, arbitrary unit of cell volume.

bParameters corresponding to a haploid cell. Changes made for ploidy mutants are listed in S5 Table.