# Table S2. Parameters for the transporter module

| **Model /** Parameter Name | **Value** | **Unit** | **Reference** |
|---|---|---|---|
| ***Ena1p*** | | | |
| $k_{Ena1}$* | 1.98*1e-4 | 1e-18 mol/(s*$mM^2$) | Estimated from [27] |
| $Km_{Ena1,Na}$ | 200 | mM | Taken from [58] |
| $Km_{Ena1,K}$ | 300 | mM | Estimated from [58] |
| ***Nha1p*** | | | |
| $k_{Nha1}$* | 1.092*1e+5 | 1e-18 mol /(s*$mM^5$) | Estimated from [12] |
| $Km_{Nha1,Na}$ | 12.7 | mM | Taken from [36] |
| $Km_{Nha1\_high,K}$ | 12.4 | mM | Taken from [36] |
| $Km_{Nha1\_low,K}$ | 1240 | mM | |
| $Km_{Nha1,Hog1}$ | 1e-4 | mM | |
| ***Tok1p*** | | | |
| $P_{s,Tok1}$* | 4.6642 | 1e-18 m/s | Estimated from [59] |
| $\alpha_{Tok1}$ | 231.6 | | Taken from [38] |
| $\beta_{Tok1}$ | 8122.7 | | Taken from [38] |
| $l_{Tok1,ext}$ | 0.0 | | Taken from [38] |
| $l_{Tok1,int}$ | 0.76875 | | Taken from [38] |
| $k_{Tok1,1}$ | 3.4*1e+7 | $s^{-1}$ | Taken from [38] |
| $k_{Tok1,2}$ | 3.4*1e+7 | $s^{-1}$ | Taken from [38] |

| | | | |
|---|---|---|---|
| $k_{Tok1,OR}$ | 1e+4 | $s^{-1}$ | Taken from [38] |
| $k_{Tok1,RO}$ | 1e+4 | $s^{-1}$ | Taken from [38] |
| $Km_{Tok1,Hog1}$ | 2*1e-5 | mM | |
| ***Trk system*** | | | |
| $k_{Trk}$* | 54.0 | 1e-18 mol/(s*$V^2$) | Estimated from [6,55] |
| $Km_{Trk\_high,K}$ | 0.01 | mM | Taken from [39] |
| $Km_{Trk\_high,Na}$ | 100.0 | mM | |
| $Km_{Trk\_medium,K}$ | 0.4 | mM | Taken from [39] |
| $Km_{Trk\_medium,Na}$ | 40.0 | mM | |
| $Km_{Trk,Ppz}$ | 1e-5 | mM | Estimated from [9,55] |
| $Km_{Trk,Cn}$ | 5*1e-4 | mM | Estimated from [9,55] |
| ***Ppz phosphatases*** | | | |
| $Ppz^0$ | 6.607*1e-5 | mM | [60] |
| $Km_{Ppz}$ | 7.94*1e-5 | mM | |
| ***NSC1*** | | | |
| $k_{NHS1}$* | 6*1e-4 | 1e-18 mol/(s*mM) | |
| $Km_{NSC1,K}$ | 60.0 | mM | Taken from [61] |
| $Km_{NSC1,Na}$ | 100.0 | mM | |
| ***$H^+$ production*** | | | |
| $K_{H\_prod}$ | 5 | 1e-18 mol/s | |
| ***$H^+$ uptake*** | | | |
| $k_{H\_uptake}$ | 10.0 | 1e-18 mol/(s*V) | |

| | | | |
|---|---|---|---|
| ***Pma1p*** | | | |
| $k_{Pma1}$* | 4.8*1e+4 | 1e-18 mol/(s*mM$^2$) | Estimated from [45] |

* The values of these parameters were adjusted during the model integration step such that simulation results are consistent with experimental data.