

# Correction: A Biophysical Model of the Mitochondrial Respiratory System and Oxidative Phosphorylation

Daniel A. Beard

DOI: 10.1371/journal.pcbi.0010036

In *PLoS Computational Biology*, volume 1, issue 4, Table 1 included incorrect values. The corrected table follows.

**Table 1.** Mitochondrial Model Parameter Values

Name	Description	Value without Phosphate Control	Value with Phosphate Control	Units	Sensitivity	Reference	Class <sup>a</sup>	Equation
$r$	Dehydrogenase model parameter	4.2530	4.5807	Unitless	4.92	—	A	1
$k_{Pi,1}$	Dehydrogenase model parameter	0.13890	0.13413	mM	1.41	—	A	1
$k_{Pi,2}$	Dehydrogenase model parameter	0.62396	0.67668	mM	1.01	—	A	1
$X_{DH}$	Dehydrogenase activity	0.10990	0.09183	$\text{mol s}^{-1} \text{M}^{-1}$ (l mito volume) <sup>-1</sup>	2.94	—	A	1
$X_{C1}$	Complex I activity	0.54088	0.36923	$\text{mol s}^{-1} \text{M}^{-1}$ (l mito volume) <sup>-1</sup>	0.033	—	A	3
$X_{C3}$	Complex III activity	0.14483	0.091737	$\text{mol s}^{-1} \text{M}^{-1}$ (l mito volume) <sup>-1</sup>	0.19	—	A	7
$X_{C4}$	Complex IV activity	$2.2669 \times 10^{-5}$	$3.2562 \times 10^{-5}$	$\text{mol s}^{-1} \text{M}^{-1}$ (l mito volume) <sup>-1</sup>	0.33	—	A	9
$X_{F1}$	$F_1F_0$ ATPase activity	154.82	150.93	$\text{mol s}^{-1} \text{M}^{-2}$ (l mito volume) <sup>-1</sup>	0.0005	—	A	11
$X_{ANT}$	ANT activity	0.010723	0.0079204	$\text{mol s}^{-1}$ (l mito volume) <sup>-1</sup>	1.84	—	A	14
$X_{PiHt}$	$H^+/Pi^-$ co-transport activity	$3.7442 \times 10^5$	$3.3943 \times 10^5$	$\text{mol s}^{-1} \text{M}^{-1}$ (l mito volume) <sup>-1</sup>	0.14	—	A	16
$k_{PiHt}$	$H^+/Pi^-$ co-transport parameter	0.72911	0.45082	mM	0.025	—	A	16
$X_{KH}$	$K^+/H^+$ antiporter activity	$3.1775 \times 10^7$	$2.9802 \times 10^7$	$\text{mol s}^{-1} \text{M}^{-2}$ (l mito volume) <sup>-1</sup>	0.0022	—	A	21
$X_K$	Passive potassium transport activity	0	0	$\text{mol s}^{-1} \text{mV}^{-1} \text{M}^{-1}$ (l mito volume) <sup>-1</sup>	0	—	A	20
$X_{Hle}$	Proton leak activity	250.02	250.00	$\text{mol s}^{-1} \text{mV}^{-1} \text{M}^{-1}$ (l mito volume) <sup>-1</sup>	1.08	—	A	19
$k_{Pi,3}$	Complex III/Pi parameter	—	0.19172	mM	0.077	—	A	24
$k_{Pi,4}$	Complex III/Pi parameter	—	25.310	mM	0.002	—	A	24
$n_A$	$H^+$ stoichiometric coefficient for $F_1F_0$ ATPase	3	3	Unitless	[48] <sup>b</sup>	—	B	11, 22
$K_{Mg-ATP}$	Mg-ATP binding constant	$24.0 \times 10^{-6}$	$24.0 \times 10^{-6}$	M	—	[32]	B	11, 12
$K_{Mg-ADP}$	Mg-ADP binding constant	$347.0 \times 10^{-6}$	$347.0 \times 10^{-6}$	M	—	[32]	B	11, 12
$k_{dH}$	$H_2PO_4^-$ proton dissociate constant	$1.7783 \times 10^{-7}$	$1.7783 \times 10^{-7}$	M	—	[49]	B	15
$p_{Pi}$	Mitochondrial membrane permeability to inorganic phosphate	327	327	$\mu\text{m s}^{-1}$	—	[8]	B	13
$p_A$	Mitochondrial outer membrane permeability to nucleotides	85.0	85.0	$\mu\text{m s}^{-1}$	—	[33]	B	13
$K_{AK}$	AK equilibrium constant	0.4331	0.4331	Unitless	—	[49] <sup>c</sup>	B	18
$k_{m,ADP}$	ANT Michaelis–Menten constant	$3.5 \times 10^{-6}$	$3.5 \times 10^{-6}$	M	—	[6,8] <sup>d</sup>	B	14
$k_{O_2}$	Saturation constant for oxygen consumption	$1.20 \times 10^{-4}$	$1.20 \times 10^{-4}$	M	—	[6,8] <sup>d</sup>	B	9
$NAD_{tot}$	Total matrix NAD(H) concentration	2.97	2.97	mM	—	[6,8] <sup>d</sup>	B	23
$Q_{tot}$	Total matrix ubiquinol concentration	1.35	1.35	mM	—	[6,8] <sup>d</sup>	B	23
$cytC_{tot}$	Total IM cytochrome c concentration	2.70	2.70	mM	—	[6,8] <sup>e</sup>	B	9, 23
$A_{tot}$	Total matrix ATP + ADP concentration	10	10	mM	—	[6,8] <sup>d</sup>	B	23
$V_x$	Matrix water volume per total mito volume	0.6435	0.6435	Unitless	—	[50] <sup>f</sup>	B	22
$V_i$	IM water fraction per total cell volume	0.0715	0.0715	Unitless	—	[50] <sup>f</sup>	B	22
$\gamma$	Outer membrane area per mito volume	5.99	5.99	$\mu\text{m}^{-1}$	—	[35]	B	13
$C_{IM}$	Capacitance of inner membrane	$6.75 \times 10^{-6}$	$6.75 \times 10^{-6}$	$\text{mol (l mito volume)}^{-1} \text{mV}^{-1}$	—	[34]	B	22
$X_{AK}$	AK activity	$1.0 \times 10^6$	$1.0 \times 10^6$	$\text{mol s}^{-1} \text{M}^{-2}$ (l mito volume) <sup>-1</sup>	—	—	C	18
$X_{MgA}$	$Mg^{2+}$ binding activity	$1.0 \times 10^6$	$1.0 \times 10^6$	$\text{mol s}^{-1} \text{M}^{-2}$ (l mito volume) <sup>-1</sup>	—	—	C	12

<sup>a</sup>See text for explanation of parameter classes.

<sup>b</sup>Value consistent with accepted range.

<sup>c</sup>Computed from thermodynamic data tabulated in cited reference.

<sup>d</sup>Value used is taken from previous modeling studies, not direct experimental measure.

<sup>e</sup>Value used is ten times the value used in cited references. See text for explanation.

<sup>f</sup>Matrix volume is taken as 90% of total mitochondrial volume; IM space volume as 10%.

DOI: 10.1371/journal.pcbi.0020008.t001

This correction note may be found online at DOI: 10.1371/journal.pcbi.0020008.

Published January 27, 2006.

Citation: Correction: A biophysical model of the mitochondrial respiratory system and oxidative phosphorylation. PLoS Comput Biol 2(1): e8.

