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ERRATUM

Erratum to: Computer model of unstirred layer and intracellular pH changes. Determinants of unstirred layer pH

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Keywords Computer model · Unstirred layer pH · Intracellular pH · Proton transport · Buffer · Carbonic anhydrase · Disequilibrium pH · pH

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The author found an error in the computer program of the multicompartment model (J. Biol. Phys., 2013, 39:515–564). This error did not influence the flux clamp simulations of the extracellular unstirred layer and had thus no effect on Tables 1 to 5 and Figs. 1 to 10. However, this error, affecting the intracellular pH, had a small effect on the results of Figs. 11 and 12 and Table 6. After correction of the program, the simulations of Figs. 11 and 12 and Table 6 were repeated. The correct Figs. 11 and 12 and Table 6 are shown below. Note that the fluxes J_{HA}, J_{CO2} and J_{HCO3} in Fig. 11 are expressed in the SI unit (mole m^{-2} s^{-1}), whereas in its previous version they were expressed accidentally in the c.g.s. unit (mole cm^{-2} s^{-1}). All equations and conclusions of the paper remain unchanged.

The online version of the original article can be found at http://10.1007/s10867-013-9309-9.

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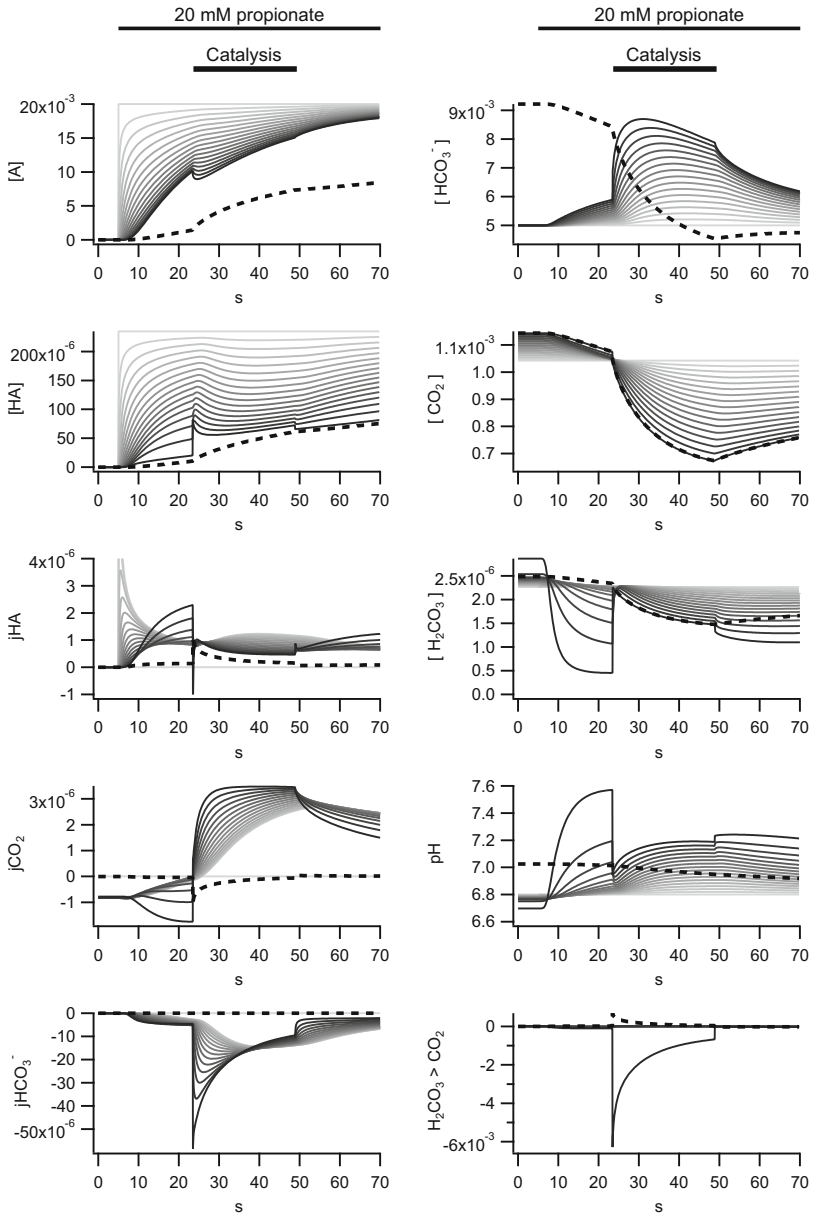

Fig. 11 Transient changes after addition of an anion of a weak acid. The extracellular bulk solution was buffered with 5 mM bicarbonate at pH 6.8. 20 mM Cl^- was replaced by 20 mM propionate (A) in the bulk solution, as indicated with a *horizontal line*. The unstirred layer was subdivided into 16 compartments. The Deh reaction was not catalyzed in the unstirred layer, except during a period indicated with the *thick horizontal line*, wherein the Deh reaction was catalyzed infinitely in compartment 16 (N). The Deh reaction was infinitely catalyzed (in equilibrium) in the intracellular compartment. The graphs display the time course of [A], [HA], [HCO_3^-], [CO_2], [H_2CO_3], pH, the fluxes j_{HA}, j_{CO2}, j_{HCO3} and the rate of the Deh reaction in all compartments during the first 70 s of the simulation. The *darker-grey color* corresponds to a higher compartment number. The *dashed curves* represent the time course of the intracellular concentrations or pH, fluxes through the cell membrane or the time rate of the intracellular Deh reaction

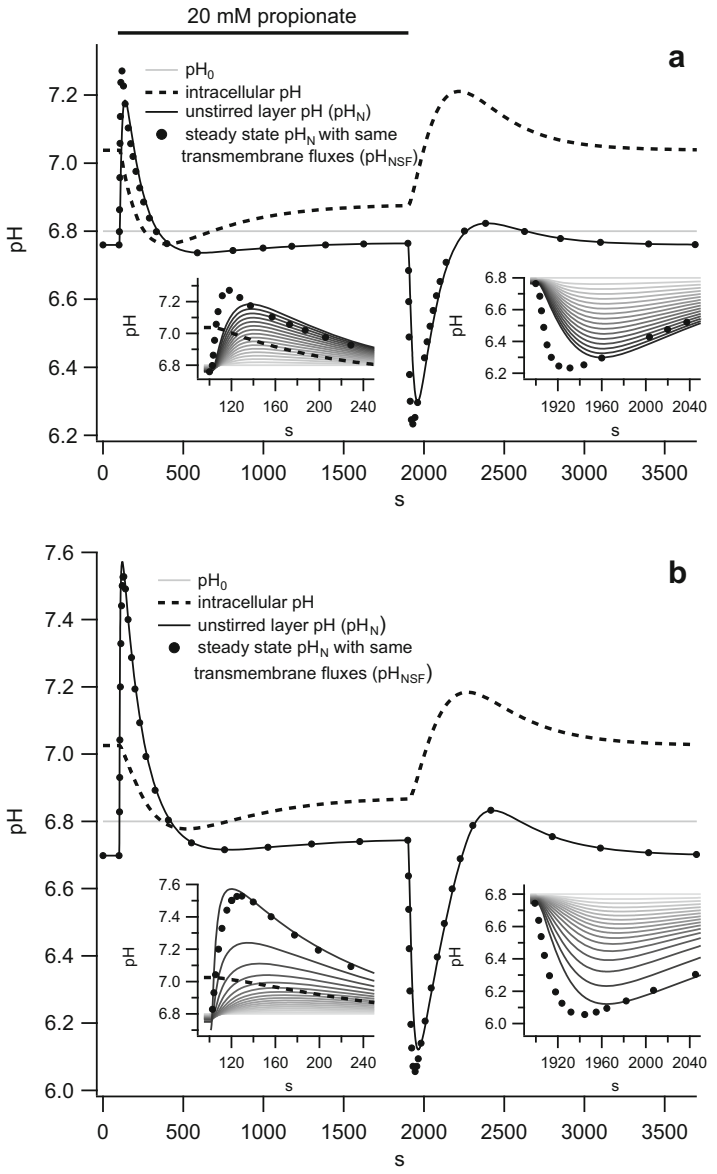

Fig. 12 Interpretation of the unstirred layer pH transients. The extracellular bulk solution was buffered with 5 mM bicarbonate at pH 6.8. 20 mM Cl^- was replaced by 20 mM propionate in the bulk solution during 1800 s, as indicated with a *horizontal line*. The unstirred layer was subdivided into 16 compartments. The graphs display the pH in the extracellular bulk compartment (pH_0, *grey*), the pH in compartment 16 close to the cell membrane (pH_N, *black curve*) and the intracellular pH (*dashed curve*) as a function of time. The pH of compartments 1–15 is not displayed. The *full circles* represent the steady-state pH_N, calculated with the multicompartment model in flux clamp mode with the same transmembrane fluxes and extracellular bulk concentrations as during the simulation at that time point. The *insets* display the same at a more expanded time scale and also the time course of the pH in all unstirred layer compartments. The same simulation parameters were used as in Fig. 11, see also Table 4. The intracellular Deh reaction was catalyzed infinitely. **a** The Deh reaction was catalyzed infinitely in compartment 16 (*N*), but not catalyzed in the other unstirred layer compartments. **b** The Deh reaction was not catalyzed in the unstirred layer

Table 6 Comparison of transient pH_N maximum with steady state pH_N with same transmembrane fluxes

Case	Time	pH_0	pH_{Nmax}	pH_{NSF}	% diff.	β'	$[HCO3^-]_0$	$[T_{HB}]_0$	pK_{HB}	$D_{HB/B}$	Catalysis	Other
1	45.5	7.4	7.491	7.490	1.5	0.01	25	0			*N*	
2	22.3	7.4	7.768	7.763	1.2	0.01	25	0			–	
3	34.6	6.8	6.907	6.910	−2.0	0.01	25	0			*N*	
4	18.2	6.8	7.165	7.150	3.9	0.01	25	0			–	
5	37.4	6.8	7.184	7.174	2.6	0.01	5	0			all	
6	37.4	6.8	7.184	7.174	2.6	0.01	5	0			*N*	
7	20.3	6.8	7.572	7.501	9.2	0.01	5	0			–	
8	39.3	6.8	7.128	7.174	−13.9	3.85	5	0			all	
9	39.4	6.8	7.124	7.171	−14.6	0.01	5	15	6.12	1E-22	all	
10	30.3	6.8	7.052	7.062	−3.8	0.01	5	15	6.12	1.25E-9	all	
11	22.4	6.8	7.486	7.977	−71.6	3.85	5	0			–	
12	26.3	6.8	7.272	7.397	−26.6	0.01	0	10	6.8	6.20E-10	all	
13	23.5	6.8	7.181	7.213	−8.5	0.01	0	10	6.8	1.25E-9	all	
14	48.5	6.8	7.308	7.470	−31.8	3.85	5	0			–	*
15	53.0	6.8	7.193	7.210	−4.4	0.01	0	10	6.8	6.20E-10	all	*