Errata for "Mathematical Physiology"

Second Printing

In the second printing of the book, several errors were corrected. Some of those that remain are as follows:

1. pg. 31 Eqn (1.114), change α to γ.
2. pg. 32 (exercise 10) "phosphorylate"
3. pg. 52 line -6 change "charge on" to "valence of"
4. pg. 55, eq. 2.66 delete "-" sign on right side of "=".
5. pg. 61 line 15, X represents the number (in moles)
6. pg. 72, problem 1, $k_- = 1.7 \times 10^{-2}/\text{s}$.
7. pg. 86, following (3.39) should read " Subtracting (3.36) from (3.35) gives"
8. pg. 125, eq. (4.17) $\tau_n(v_0)$ should be $\tau_n(0)$.
9. pg. 138, line 14, "Krinsky"
10. pg. 168, line 6 "Goldbeter (1996)"
11. pg. 183, Table 5.4, units for $p1$ and $q1$ should be μMs^{-1}.

12. pg. 183, eqn. (5.56) is wrong and should read $\frac{dy}{dt} = k_2 c(1-y) - k_{-2} y$.

13. pg. 222, Fig. 7.5, label for x-axis should be "Time (msec)"

14. pg. 256, line just after (8.26) should read "subject to the boundary condition (8.26)"

15. pg. 298, exercise 13(c) should read "positive, there is..."

16. pg. 406, eqn. (14.44) should have $e^{-\gamma T \Delta k_n}$, rather than $e^{\gamma T \Delta k_n}$.

17. pg. 457, Item 2 in Section 15.5 should read "overall vascular resistance"

18. pg. 460,

    (a) eqn 15.91 should read

    $$A = \frac{Q^*}{3M^* - Q^*[\mathrm{O}_2]_a^*}$$

    (b) eqn 15.92 should read

    $$R_0 = P^* \frac{3M^* - Q^*[\mathrm{O}_2]_a^*}{2Q^*M^*}$$

    (c) eqn 15.93 should read

    $$\frac{Q}{Q^*} = \frac{\frac{M}{M^*} + 2\frac{P_a}{P^*}}{3 + \frac{13}{8}(\frac{[\mathrm{O}_2]_a}{[\mathrm{O}_2]_a^*} - 1)}$$

19. pg. 519, end of eqn 17.3 should read

    $$+p \int_0^L q(x,t)dx$$

20. pg. 526, line 5, $\beta = \frac{K_{O_2}}{K_{CO}}$

21. pg. 547, caption to Fig. 18.5 delete "M denotes myosin, A denotes actin".

22. pg. 599, caption to figure 19.12 is incomplete. It should read: A: Oscillations of insulin release in perifused islets. The data indicates a slow time scale decreasing trend (the thin smooth line) upon which are superimposed faster time scale oscillations. B: when the slow decrease is removed from the data, the residuals exhibit oscillations around 0. C: spectral analysis of the residuals shows a frequency peak at about 0.07 min^{-1}, corresponding to oscillations with a period of 14.5 minutes. The dashed and continuous lines correspond to two different filters used in the spectral analysis. Bergstrom et al. (1989) Figs. 1A,C and 3.

23. pg. 706, line -2, should read "from the bending stiffness".

24. pg. 711, eq (23.30) -$\frac{2}{Z}$ should be +$\frac{2}{Z}$

25. pg. 715, eq (23.51), fourth term should be $\epsilon^2 \frac{\partial^2 p}{\partial \sigma^2}$.

26. pg. 722, line 11 should read "Homogeneous solutions of (23.83)..."

First Printing

Here is a list of the errors that were in the first printing. Some of these are corrected in the second printing.

1. pg. 13, line 7; $K = \frac{k_- + k_2}{k_+}$.

2. pg. 13, last line, delete "maximum". (Noted by Todai med-students)

3. page 29, 3 lines above (1.100) $\eta = \epsilon\tau$ should be $\eta = \tau/\epsilon$ (Noted by Todai med-students)

4. pg. 29, last line $e^{(1+\kappa)\eta}$ should be $e^{-(1+\kappa)\eta}$ (Noted by Todai med-students)

5. pg. 35 A) "closed parenthesis" is missing in the table caption following Table 1-1.

6. pg. 40 delete k_+ from equation (2.21) (Noted by Todai med-students)

7. pg. 50 line following (2.52) replace $K_n = k_{-1}k_p$ with $K_n = k_{-1}k_{-p}$ (Noted by Todai med-students)

8. pg. 56 eqs (2.71) and (2.72): Change the sign of V. (Noted by Glenn Lines)

9. pg 62, two lines above (2.98) should be $\nu = \frac{FV}{RT}$ instead of $\frac{qV}{RT}$ (Noted by Todai med-students)

10. pg. 63 eq. (2.103) replace z by z_x and $4\alpha\mu$ by $4\alpha\mu^2$ (Noted by Todai med-students)

11. pg. 63, just above (2.106), the condition on ρ is $\rho'(0) < 0$. (Noted by John Tyson)

12. pg. 71 line 6, replace $P_{Na}N_i/20$ by $P_{Na}20/N_i$ (Noted by Todai med-students)

13. page 93 eq. (3.68) c should be c_1 (Noted by Todai med-students)

14. pg. 102, line -2 at the end of the line $k_- + p$ should be k_-^p.

15. page 108 eq. (3.132): Note that this equation is valid only approximately and for small dt, since for large dt and k_{ij} fixed, this probability will exceed 1. (Noted by Glenn Lines)

16. page 112 the first reaction in (3.143) is reversed and should be CB $\longrightarrow$ C + D (Noted by Glenn Lines)

17. page 140, line -7; the change of variables should be $t = \epsilon\tau$.

18. pg. 150, equation (4.86) is missing the term $+0.07\frac{V+23}{1.0-\exp(-0.04(V+23))}$.

19. pg. 150, eq. (4.88) 66.18 is the wrong number; it should be 82.3.

20. pg. 151, Table 4.5 has two incorrect values for C_2. The value for β_m should be -17.86 and the value for α_x should be 12.

21. pg. 157, equation (4.112), $F(v)$ should be replaced by $\frac{F(v)}{R_3}$.(Noted by Todai med-students)

22. pg. 157, equation (4.113), C should be replaced by C_2.(Noted by Todai med-students)

23. pg. 174 in eq. 5.30 the first k_{-2} should be k_{-4}.

24. pg. 183, Table 5.4, units for $p1$ and $q1$ should be μMs^{-1}.

25. pg. 183, line -6 "larger than" instead of "larger then".

26. pg 183, equation (5.55), $\frac{k_1}{k_{-1}+k_1 c}$ should be replaced by $\frac{k_1 c}{k_{-1}+k_1 c}$.(Noted by Todai med-students)

27. pg 183, equation (5.56), $k_2\left(\frac{k_1 c}{k_{-1}+k_1 c}\right)$ should be replaced by $k_2 c\left(\frac{k_1 c}{k_{-1}+k_1 c}\right)$.(Noted by Todai med-students)

28. page 257, the fraction in (8.33) is $1/r_i\lambda_m$ is inverted. It should have the same form as in (8.26). (Noted by Glenn Lines)

29. pg. 285, line 8, references to Fig. 9.7 and Fig 9.8 are reversed. The sentence should read: Note that the amplitude of the slow pulse in Fig. 9.8 is substantially smaller than that of the fast pulse in Fig. 9.7.

30. page 348. The equation (12.56) is wrong. The paragraph should read as follows.

    Now we solve (12.54) to obtain

$$c(x) = (c_{n+1} - c_n \cosh\beta)\frac{\sinh(\frac{\beta x}{L})}{\sinh\beta} + c_n \cosh(\frac{\beta x}{L}) \tag{12.56}$$

    where $c_n = c(nL)$, $\beta^2 = \frac{kL^2}{D}$, so that

$$c_x(nL^+) = (c_{n+1} - c_n \cosh\beta)\frac{\beta}{L\sinh\beta}. \tag{12.57}$$

    Similarly,

$$c_x(nL^-) = -(c_{n-1} - c_n \cosh\beta)\frac{\beta}{L\sinh\beta}. \tag{12.58}$$

    It follows that (12.55) is the difference equation

$$\frac{k}{\beta\sinh\beta}(c_{n+1} - 2c_n\cosh\beta + c_{n-1}) + f(c_n) = 0, \tag{12.59}$$

    which is a difference equation for c_n that has standing wavelike solutions if β is sufficiently large.

31. page 385, Figure 14.4; the labels for leads II and III are reversed.

32. pg. 433, Exercise 17, $f(v) = v(v-1)(\alpha - v)$.

33. pg. 541 eq. 17.65, τ should be τ_v

34. pg. 641, Equation (21.11) should read $\lim_{g\to\infty} = Q(\frac{n_0}{n_l} - 1) + \frac{f(n_i)}{n_l}$ (noted by Chris Dugaw)

35. page 731, The reference for the article by Aronson and Weinberger is incomplete. The article is on pages 5-49 of the book "Lecture Notes in Mathematics", Vol. 446.

36. pg. 740 Reference to Keizer, Smith, Ponce-Dawson. Delete word "Singlespace" from title.

Feel free to let me know about any other errors you may find. I'll add them to this list.