# 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. 125, eq. (4.17) $\tau_n(v_0)$ should be $\tau_n(0)$.

2. pg. 183, Table 5.4, units for $p1$ and $q1$ should be $\mu\text{Ms}^{-1}$.

3. pg. 183, eqn. (5.56) is wrong and should read $\frac{dy}{dt} = k_2c(1-y) - k_{-2}y$.

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

5. 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.

# 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 $\rho$ 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 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 $\beta_m$ should be -17.86 and the value for $\alpha_x$ 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 $\mu\mathrm{Ms}^{-1}$.

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

26. pg 183, equation (5.55), $\frac{k_1}{k_{-1}+k_1c}$ should be replaced by $\frac{k_1c}{k_{-1}+k_1c}$.(Noted by Todai med-students)

27. pg 183, equation (5.56), $k_2\left(\frac{k_1c}{k_{-1}+k_1c}\right)$ should be replaced by $k_2c\left(\frac{k_1c}{k_{-1}+k_1c}\right)$.(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 $\beta$ 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, $\tau$ should be $\tau_v$

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.