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Publisher Correction to: Three-dimensional tumor growth in time-varying chemical fields: a modeling framework and theoretical study

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Following publication of the original article [1], the authors noticed that the following errors were introduced by pdf/html formatting issues. The original article has been corrected. The publisher apologizes to the authors and readers for these errors.

Page 9, first column:

The paragraph

"- $o\ b_t(A)$: sec) by the local vascular network within/sec) by the local vascular network within A during the previous time interval $t - \Delta\tau \rightarrow t$"

Should be replaced with

"- $o\_b_t(A)$: Oxygen supply rate (pmols/sec) by the local vascular network within A *during* the previous time interval $t - \Delta\tau \rightarrow t$ "

In the subsequent paragraph, i.e. the paragraph starting starting with the phrase " - $gl\_b_t(A)$: Glucose supply rate … " ,

the phrase " interval$-\Delta\tau \rightarrow t$ " should be replaced with " interval $t - \Delta\tau \rightarrow t$ "

Page 11, second column:

The equation $\beta \geq 1 - \frac{6O_{av}}{l_t(A)K_{ATP}\Delta\tau} \equiv \beta_-$ should be $\beta \geq 1 - \frac{6O_{av}}{l_t(A)K_{ATP}\Delta\tau} \equiv \underline{\beta}$.

In the subsequent sentence, i.e. "Since $a_o(\beta)$ is increasing, $\beta\_$ is actually … " the "$\beta\_$ " should be " $\underline{\beta}$ ".

In the subsequent paragraph (first bullet point), in the sentence " If $\beta\_ > \beta_2$, we have that … " the " $\beta\_$ " should be " $\underline{\beta}$ ".

In the subsequent paragraph (second bullet point), i.e. " If $\beta\_ \leq \beta_2$, we have that for each $\beta \in [max(\beta\_, \beta_1), \beta_2]$ it holds that $a_o(\beta) \geq 0$. " all occurences of " $\beta\_$ " should be " $\underline{\beta}$ ".

In paragraph 11a, first line, " $a_o(\beta)$ " should be " $a_{gl}(\beta)$ ".

Page 12, first column:

In the sentence " Case 2.2.1. If $\beta > \beta_2$ or $\overline{\beta} < \beta_1$ or $min(\overline{\beta}, \beta_2) < max(\beta_-, \beta_1)$, the analysis above implies that … " the inequality $\beta > \beta_2$ should be $\underline{\beta} > \beta_2$ and the inequality $min(\overline{\beta}, \beta_2) < max(\beta_-, \beta_1)$ should be $min(\overline{\beta}, \beta_2) < max(\underline{\beta}, \beta_1)$.

In the sentence " Case 2.2.2. If $\beta \leq \beta_2$, $\overline{\beta} \geq \beta_1$ and $min(\overline{\beta}, \beta_2) \geq max(\beta_-, \beta_1)$… " the inequality $\beta \leq \beta_2$ should be $\underline{\beta} \leq \beta_2$ and the inequality $min(\overline{\beta}, \beta_2) \geq max(\beta_-, \beta_1)$ should be $min(\overline{\beta}, \beta_2) \geq max(\underline{\beta}, \beta_1)$.

In the same paragraph, the mathematical expression $\beta \in [\ max(\beta_-, \beta_1),\ min(\overline{\beta}, \beta_2)]$ should be $\beta \in [\ max(\underline{\beta}, \beta_1),\ min(\overline{\beta}, \beta_2)]$

Page 12, second column:

In the sentence " Again, we pick a random $\tilde{\beta}$ in $[\ max(\beta_-, \beta_1),\ min(\overline{\beta}, \beta_2)]$. " the mathematical expression $[\ max(\beta_-, \beta_1),\ min(\overline{\beta}, \beta_2)]$ should be $[\ max(\underline{\beta}, \beta_1),\ min(\overline{\beta}, \beta_2)]$

Page 14, second column:

The equations

$$ob\ \ max_{t+\Delta\tau}(A) = (1 - f_r(l_t(A), nc_t(A))v_r + sw_t(A)\ f_e(l_t(A), nc_t(A), nn_t(A))v_e) \cdot ob\ \ max_t(A)$$

$$glb\ \ max_{t+\Delta\tau}(A) = (1 - f_r(l_t(A), nc_t(A))v_r + sw_t(A) f_e(l_t(A), nc_t(A), nn_t(A))v_e) \cdot glb\ \ max_t(A)$$

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should be

$$o\_b\_max_{t+\Delta\tau}(A) = (1-f_r(l_t(A), nc_t(A))v_r + sw_t(A)\, f_e(l_t(A), nc_t(A), nn_t(A))v_e)\cdot o\_b\_max_t(A)$$

$$gl\_b\_max_{t+\Delta\tau}(A) = (1-f_r(l_t(A), nc_t(A))v_r + sw_t(A) f_e(l_t(A), nc_t(A), nn_t(A))v_e)\cdot gl\_b\_max_t(A).$$

The equations

$$ob\ \ max_{t+\Delta\tau}(A) = (1-f_r(l_t(A), nc_t(A))r_3v_r + sw_t(A)\ f_e(l_t(A), nc_t(A), nn_t(A))r_4v_e)\cdot ob\ \ max_t(A)$$

$$glb\ \ max_{t+\Delta\tau}(A) = (1-f_r(l_t(A), nc_t(A))r_3v_r + sw_t(A) f_e(l_t(A), nc_t(A), nn_t(A))r_4v_e)\cdot glb\ \ max_t(A)$$

should be

$$o\_b\_max_{t+\Delta\tau}(A) = (1-f_r(l_t(A), nc_t(A))r_3v_r + sw_t(A)\ f_e(l_t(A), nc_t(A), nn_t(A))r_4v_e)\cdot o\_b\_max_t(A)$$

$$gl\_b\_max_{t+\Delta\tau}(A) = (1-f_r(l_t(A), nc_t(A))r_3v_r + sw_t(A) f_e(l_t(A), nc_t(A), nn_t(A))r_4v_e)\cdot gl\_b\_max_t(A)$$

Page 15, first column:

The equations

$$ob\ \ max_{t+\Delta\tau}(A) = \left(1-\frac{l_t(A)+nc_t(A)}{M}r_3v_r + sw_t(A)\ \frac{M-l_t(A)-nc_t(A)-nn_t(A)}{M}r_4v_e\right)\cdot ob\ \ max_t(A)$$

$$glb\ \ max_{t+\Delta\tau}(A) = \left(1-\frac{l_t(A)+nc_t(A)}{M}r_3v_r + sw_t(A)\frac{M-l_t(A)-nc_t(A)-nn_t(A)}{M}r_4v_e\right)\cdot glb\ \ max_t(A)$$

should be

$$o\_b\_max_{t+\Delta\tau}(A) = \left(1-\frac{l_t(A)+nc_t(A)}{M}r_3v_r + sw_t(A)\ \frac{M-l_t(A)-nc_t(A)-nn_t(A)}{M}r_4v_e\right)\cdot o\_b\_max_t(A)$$

$$gl\_b\_max_{t+\Delta\tau}(A) = \left(1-\frac{l_t(A)+nc_t(A)}{M}r_3v_r + sw_t(A)\frac{M-l_t(A)-nc_t(A)-nn_t(A)}{M}r_4v_e\right)\cdot gl\_b\_max_t(A)$$

Page 15, second column:

The equations

$$ob\ \ max_{t+\Delta\tau}(A) = \left(1-\frac{l_t(A)+nc_t(A)}{M}r_3v_r + sw_t(A)\ \frac{M-l_t(A)-nc_t(A)-nn_t(A)}{M}r_4v_e\right)\cdot ob\ \ max_t(A)$$

$$glb\ \ max_{t+\Delta\tau}(A) = \left(1-\frac{l_t(A)+nc_t(A)}{M}r_3v_r + sw_t(A)\frac{M-l_t(A)-nc_t(A)-nn_t(A)}{M}r_4v_e\right)\cdot glb\ \ max_t(A)$$

Should be

$$o\_b\_max_{t+\Delta\tau}(A) = \left(1-\frac{l_t(A)+nc_t(A)}{M}r_3v_r + sw_t(A)\ \frac{M-l_t(A)-nc_t(A)-nn_t(A)}{M}r_4v_e\right)\cdot o\_b\_max_t(A)$$

$$gl\_b\_max_{t+\Delta\tau}(A) = \left(1-\frac{l_t(A)+nc_t(A)}{M}r_3v_r + sw_t(A)\frac{M-l_t(A)-nc_t(A)-nn_t(A)}{M}r_4v_e\right)\cdot gl\_b\_max_t(A)$$

The second equation appearing in this column, i.e.

$$gl\_b_{t+\Delta\tau}(A) = B_{o\_b\_\ max_{t+\Delta\tau}(A)}\left(\ gl\_b_t(A) + r_2\left(\left(\overline{gl}_0 - gl_t(A)\ \right)/\Delta\tau\right)\ \right)$$

Should be

$$gl\_b_{t+\Delta\tau}(A) = B_{gl\_b\_\ max_{t+\Delta\tau}(A)}\left(\ gl\_b_t(A) + r_2\left(\left(\overline{gl}_0 - gl_t(A)\ \right)/\Delta\tau\right)\ \right)$$

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Reference

1. Antonopoulos M, Dionysiou D, Stamatakos G, Uzunoglu N. Three-dimensional tumor growth in time-varying chemical fields: a modeling framework and theoretical study. BMC Bioinformatics. 2019;20:Article number: 442.