

# Erratum: Hydrodynamics of helical-shaped bacterial motility

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Equation (C15) presented in this paper is generally incorrect. In addition to a change of twist angle about its local tangent  $\hat{\mathbf{e}}_3 = \partial_s \mathbf{r}$ , twist density  $\Omega_3$  also receives a change due to the variations of the filament centerline  $\mathbf{r}(s)$  (i.e., writhe). Therefore, there is no globally defined single function  $\phi(s)$  that can satisfy Eq. (C15) for arbitrary deformations of a filament [1]. When and only when the filament shape change is forbidden, i.e.,  $\delta \mathbf{r}(s) = 0$  for all  $s$  (such as one-dimensional twist diffusion problem in a straight rod [2]), Eq. (C15) is applicable.

A few misprints found in this paper are also corrected here. In the caption of Fig. 10,  $\Delta_{D^4} = 4a^4$  must be  $\Delta_{2D} = 4a^2$ . The formula, Eq. (D18), should appear correctly as

$$\cos(\alpha_i + \gamma_i) = \frac{\hat{\mathbf{e}}_{1,i+1} \hat{\mathbf{e}}_{1,i} + \hat{\mathbf{e}}_{2,i+1} \hat{\mathbf{e}}_{2,i}}{1 + \cos \beta_i}. \quad (1)$$

Finally, correct expressions of Eqs. (D30) and (D31) should be

$$\mathbf{B}_i^+ = \frac{-(T_i)_{23} \hat{\mathbf{e}}_{1,i} + (T_i)_{13} \hat{\mathbf{e}}_{2,i}}{u_i [1 + (T_i)_{33}]}, \quad (2)$$

$$\mathbf{B}_i^- = \frac{(T_i)_{23} \hat{\mathbf{e}}_{1,i} - (T_i)_{13} \hat{\mathbf{e}}_{2,i}}{u_i [1 - (T_i)_{33}]}. \quad (3)$$

We apologize for those mistakes appeared in Appendices. The main body of the paper and all conclusions are unchanged.

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[1] T. R. Powers, Rev. Mod. Phys. **82**, 1607 (2010).

[2] A. Sarkar and J. F. Marko, Phys. Rev. E. **64**, 0061909, (2001).