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Erratum

Erratum to: Dynamical diagram and scaling in polymer driven translocation

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In this erratum, we make a correction of steady-state ansatz $V(t) \equiv v(t, x = -R)$ used in ref. [1]. The same ansatz was also adopted in our earlier publications [2,3], where the basic framework for the driven translocation was proposed. However, as discussed in [4], one should instead set the steady-state velocity $V(t) \equiv v(t, x = 0)$ for the steady-state approximation to be self-consistent.

With this modification only in mind, the following procedure remains almost intact. To be more precise, we here provide a rough sketch of the analysis (see ref. [5] for detailed discussion). From the definition of the current at the pore

$$\frac{\mathrm{d}M}{\mathrm{d}t} = \sigma(x = 0)V(t), \tag{1}$$

one can construct the dynamical scaling of the tension front propagation in the driven translocation process in the following way. Essential ingredients are: i) the dynamical equations of state [6] for the moving domain

$$V(t)R(t) \simeq f^{p_z}, \tag{2}$$

$$N(t) - M(t) \simeq R(t)f^{-p_\nu}, \tag{3}$$

where $(p_z, p_\nu) = (z - 2, (1 - \nu)/\nu)$ in the trumpet regime $k_BT/R_0 < f < k_BT/a$ and $(p_z, p_\nu) = (1, 0)$ for stronger force, and ii) the average initial configuration

$$N(t)^\nu \simeq R(t). \tag{4}$$

From eqs. (1)–(4), one can obtain the differential equation for $R(t)$, which leads to the asymptotic scaling for the tension propagation time

$$\tau_{\mathrm{p}} \simeq N_0^{1+\nu} f^{-(p_z - p_\nu)} = \begin{cases} N_0^{1+\nu} f^{1+(1/\nu)-z}, & (N_0^{-\nu} \lesssim f \lesssim 1), \\ N_0^{1+\nu} f^{-1}, & (1 \lesssim f). \end{cases}$$

As the tension propagation stage dominates the post-propagation stage in the scaling limit, this is identified with the translocation time scaling $\tau \simeq \tau_{\mathrm{p}}$.

The modified ansatz is compatible with the iso-flux model proposed by Rowghanian and Grosberg [7], which is discussed in ref. [5] in detail. A recent work by Dubbeldam *et al.* has also adopted the same ansatz, thus, ended up with essentially the same result [8]. The asymptotic scaling $\tau \sim N_0^{1+\nu}$ has recently been verified by Ikonen *et al.*, using the Brownian dynamics tension propagation model [9].

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