**Text S1**

**Why the net force is zero in a dynamic moving system?**

We calculated , , and , and compared approximated value of the inertia term ,, with selected external forces terms of  and  in the following:

 (S1)

where is a density of the cell (1040 [kg/m3]),  is a volume of spherical section, which is divided by total number of nodes (*N*=549), and *R* is a radios of spherical cell (8 μm).

Time-averaged  and  for three hours are calculated as 4.24 nm/s and 3.18×10-4 nm/s2 (**Figure S2**) respectively. , =300×10-12 [N], =.

Thus, we found << or <<. In this approach, we assumed . Thereby, the net force is zero in a dynamic moving system.