Figure S1. Cell transit velocities are normalized against the average uRBC velocity. A. Histogram with normal fit for both infected (red curve) and co-cultured uninfected (black curve) RBCs at 37 ^{o}C. For the uninfected RBCs, their normalized mean velocity and standard deviation were 1.00 and 0.20. For the infected RBCs, their mean normalized velocity and standard deviation were 0.71 and 0.20. **B.** Normalized velocity histogram with normal fit for both infected (pink curve) and co-cultured uninfected (blue curve) RBCs after ART treatment. For the uninfected RBCs, their mean normalized velocity and standard deviation were 0.82 and 0.15. For the infected RBCs, their mean velocity and standard deviation were 0.39 and 0.15. **C.** The normal fit graphs with and without ART treatment were overlaid.

Figure S2. Deoxyartemisinin effect on iRBC/uRBC dynamic deformabilities. Deoxyartemisinin was added to RPMI cell culture medium containing 0.1% hematocrit. The drug concentration was 1 μg/ml. After 4 and 6h drug incubation, the velocities of both uRBCs and iRBCs remained unaffected by the drug ($p>0.05$).

Figure S3. Artesunate effect on iRBC/uRBC size. 0.1 μg/ml Artesunate was added to RPMI cell culture medium containing 0.1% hematocrit with 1% parasitemia. After 6h drug incubation, no significant change in the effective RBC diameter was observed. (Kolmogov- Smirnov test, $p=0.14$). Effective RBC diameter is calculated by assuming it is a perfect sphere.