

Video legends

Video 1. Red cells from a healthy donor suspended at 30% hematocrit and flowing through the microfluidic device. Video recorded at 4000 fps and played at 5 fps.

Video 2. Red cells from a patient with sickle cell disease suspended at 30% hematocrit and flowing through the microfluidic device. Video recorded at 4000 fps and played at 5 fps.

Video 3. Sickle red cells from the low dense fraction suspended at 30% hematocrit and flowing through the microfluidic device. Video recorded at 4000 fps and played at 5fps.

Video 4. Sickle red cells from the high dense fraction suspended at 30% hematocrit and flowing through the microfluidic device. Different flow rates are observed in the 3 channels, with a total blockade of the middle channel. Video recorded at 4000 fps and played at 5 fps.

Video 5. An irreversibly sickled cell aligning horizontally along the centreline of the channel and flowing through the restriction zone without deforming. Video recorded at 4000 fps and played at 5 fps.

Video 6. An irreversibly sickled cell facing the 5 μm restriction and bending to flow through. Video recorded at 4000 fps and played at 5 fps.

Video 7. Trapping of an irreversibly sickled cell in the 10 μm section after reduction of the luminal diameter by adhering leukocytes. Video recorded at 4000 fps and played at 5 fps.