Supporting Information

In Vivo Imaging of Single Tumor Cells in Fast-Flowing Bloodstream Using Near Infrared Quantum Dots and Time-Gated Imaging

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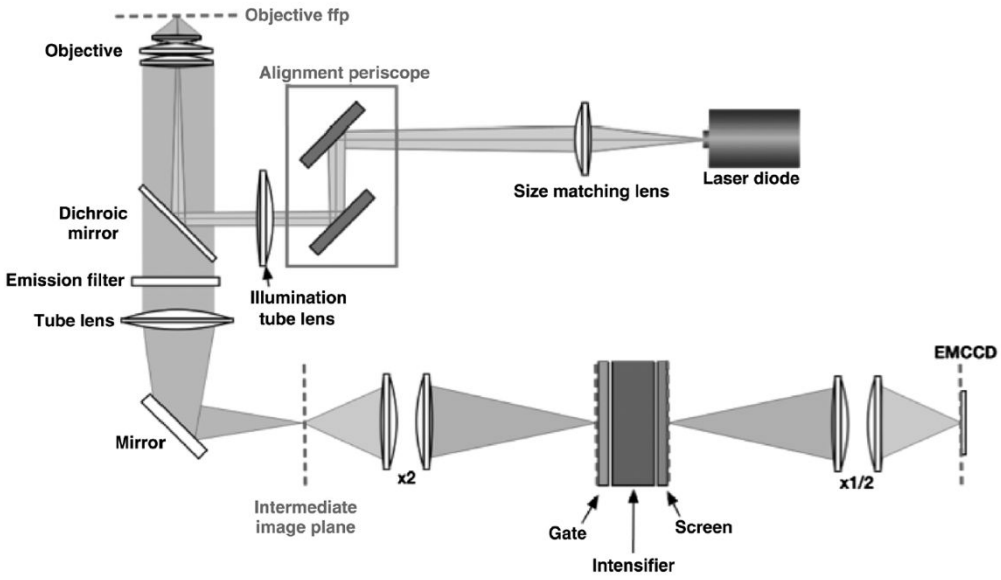

Figure S1 : Fluorescence time-gated imaging is realized thanks to a home-built optical set-up based on a commercial microscope body combined to an intensified gated modulated image intensifier system.

Movie S1: NIR-QDs labeled RBC re-injected in the blood stream of a rat and observed in a ear blood vessel.

Movie S2: NIR-QDs labeled A20 cells re-injected in the blood stream of a rat and observed in a ear blood vessel.

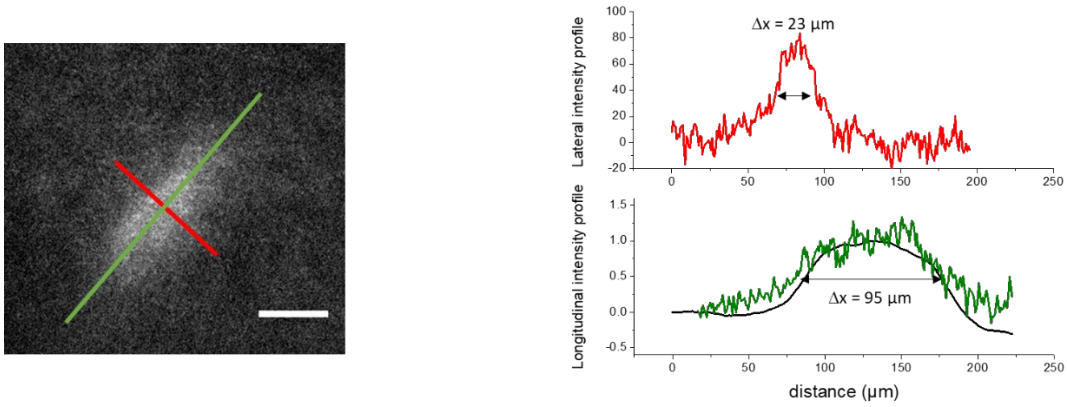

Figure S2. Fluorescence intensity profile of a flowing cell in the lateral (red) and longitudinal (green) directions, as determined from the time-gated fluorescence image shown on the left (scale bar: 50 µm, acquisition time: 100 ms). The black line is the expected longitudinal profile from a convolution between the above experimental lateral profile and a trajectory corresponding to a cell flowing at a constant velocity of 950 µm·s^{-1}

The cell velocity can be estimated from the shape of its image. The fluorescence image is blurred due to diffusion by superficial tissues. Assuming that this diffusion is isotropic (ie. the image of an immobile cell appears isotropic on the CCD) and that the broadening of lateral profile is mainly due to this diffusion, we can estimate that the longitudinal profile is the convolution of the lateral profile with the trajectory of the cell during the acquisition period. Assuming Gaussian profiles for the lateral intensity profile, the cell velocity can then be easily determined from the full width half maximum (FWHM) of each profile. The error on the cell velocity depends on the accuracy with which the FWHM can be determined, and is typically on the order of 10-20%.