Electronic Supplementary Material (ESI) for Lab on a Chip.

Supplementary Information

Inertial focusing of ellipsoid *Euglena gracilis* cells in a stepped microchannel

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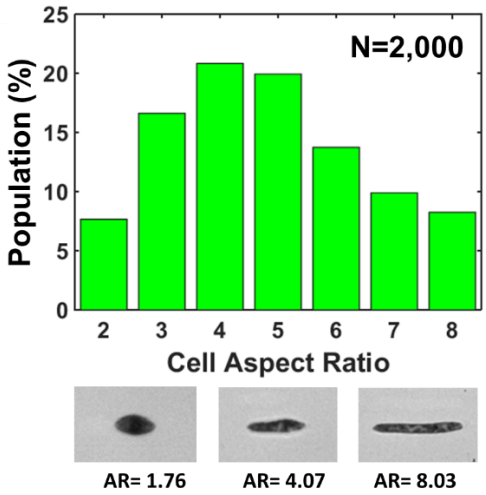

Figure S1 Histogram distribution of aspect ratios of *E. gracilis* cells (N=2,000) grown autotrophically under continuous light.

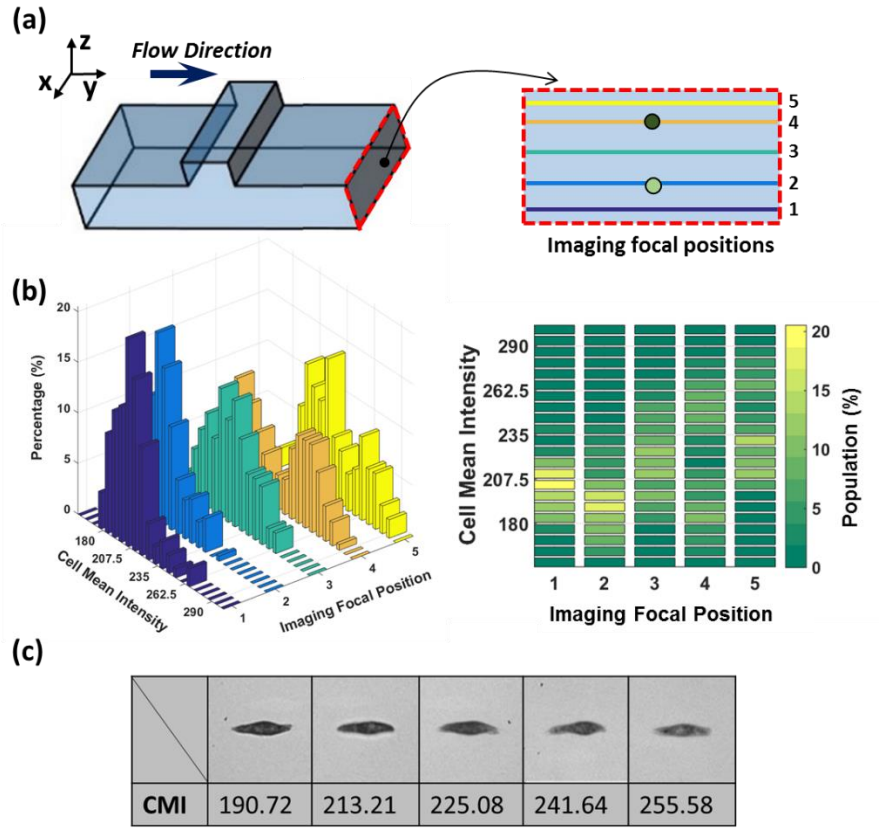

Figure S2 Characterization and measurement of cell mean intensity (CMI). (a) Schematic Illustration of 5 different imaging focal positions in vertical direction. (b) Histograms of cell mean intensity values obtained from 5 different imaging focal positions at *Re*= 18.5. (b) Images of *E. gracilis* cells with aspect ratio of 4 at the 4^{th} imaging focal position. The variation of the mean intensity value is due to different vertical positions of cells.

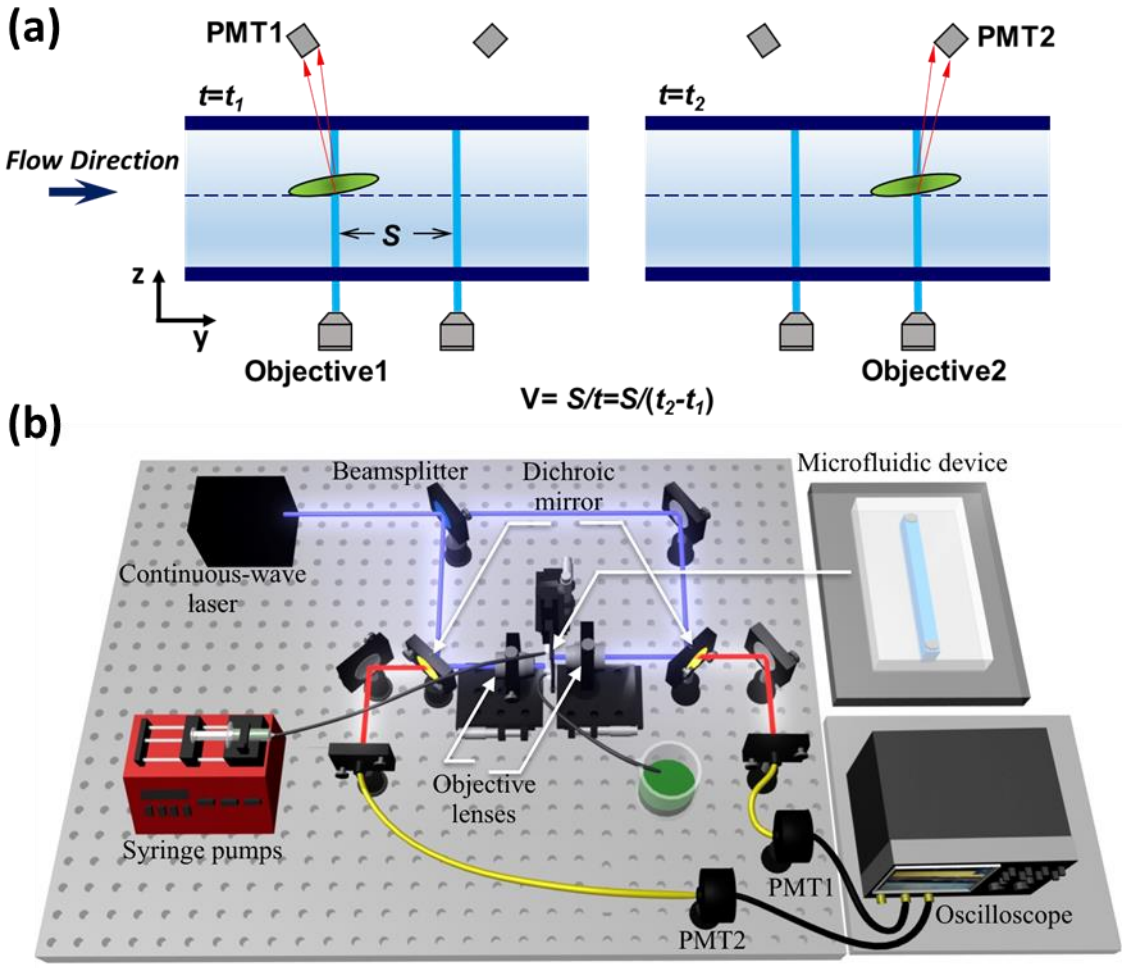

Figure S3 Laser-two-focus (L2F) system. (a) Schematic showing L2F principles. (b) Experimental setup of integrating the stepped microchannel with L2F for applications in flow cytometry.

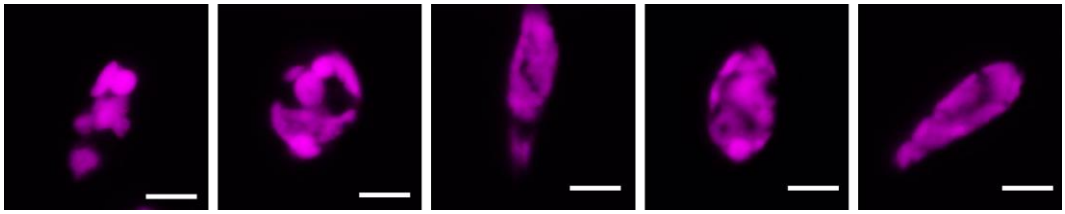

Figure S4 Fluorescence microscopic images in FITC channel showing chlorophyll autofluorescence in *E. gracilis* cells. Scale bars represent 20 µm.

Supporting Movie Captions

Supplemental Movie S1

E. gracilis single-stream focusing. A high speed microscopic video of *E. gracilis* flowing through the stepped channel at inlet, #20 step and outlet at *Re*= 92.6.