Dynamic Light-activated Control of Local Chemical Concentration in a Fluid

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Fluorescence Intensity Profiles of FITC-dextran

Figure S1. Microscopy pictures and fluorescence intensity profiles (B-B’) of FITC-dextran against the frequency – from 100 kHz to 100 Hz– of the applied ac signal whose amplitude is 10 V. When an ac signal of 1 kHz frequency was applied, FITC-dextran molecules concentrated into the illuminated area with high density, forming a triangular cross-sectional profile of fluorescence intensity. At 10 kHz frequency, the vortex flow around the light pattern becomes much weaker and the concentration of FITC-dextran at the illuminated area was slightly higher than at the frequency of 100 kHz, which is almost the same with the background concentration of the molecules. Interestingly, the fluorescence intensity profiles at 1 kHz and 10 kHz had always triangular and square shape, respectively, although the magnitude of fluorescence signal was changed proportionally to the amplitude of ac signal. This was due to not only the ACEO flow but also the electrostatic interactions among the molecules by their induced dipole must affect the behaviour of the molecules.