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Supporting information:

Anti-IgG-anchored liquid crystal microdroplets for label free detection of IgG

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1-Sensitivity of the LC microdroplets at amount of IgG in the medium

The increase in number of LC microdroplets with bipolar configuration has continued to increase till 800 ng/mL amount of IgG in test solution (Fig.1Sa). This increasing trend was attributable to the increased rate of diffusion of IgG from bulk phase of the test solution to the surface of LC microdroplets, where it was able to bind with AIgG anchored to the LC microdroplets. The LC microdroplets have shown high sensitivity in transforming LC microdroplets from radial to bipolar (2.5 LC microdroplets/ng of IgG) within the concentration range of IgG from 20-800 ng/mL (Table 1). On further increasing the amount of IgG (> 800 ng/mL), the LC microdroplets have shown a deceasing trend in their sensitivity (< 2.5 LC microdroplets /ng of IgG), which might be due to the increase in viscosity of the medium (Fig.1Sb).

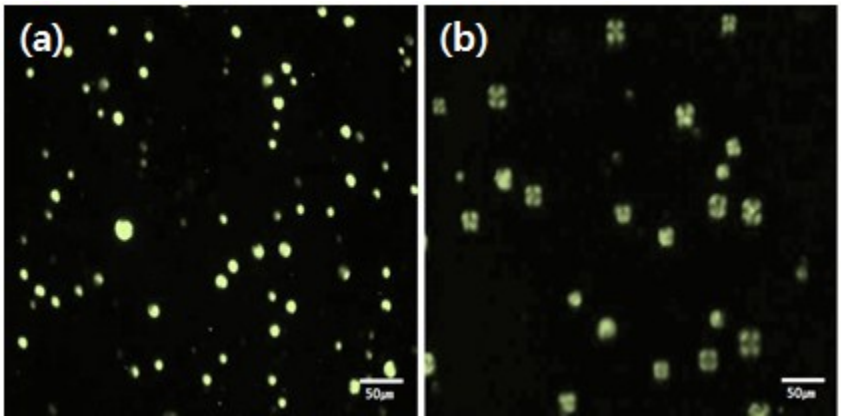

Figure 1S. Polarized light micrographs of AIgG-anchored LC microdroplets showing configurational states of 5CB during concentration variation of IgG in PBS (pH 7.4) at a constant density of LC microdroplets (9×10^3 microdroplets/mL) anchored with 5 μg/mL of AIgG. Contact time = 30 min. Temp. = 30°C, [IgG] = (a) 800 ng/mL, (b) 1000 ng/mL.

On incubating the LC microdroplets in a solution with ≥ 1000 ng/mL IgG, the sensitivity of LC microdroplets has decreased as a significant fraction of LC microdroplets remained with bipolar orientation (Fig 1Sb). This has supported that prepared LC microdroplets were useful for the detection of IgG within the concentration range from 20-800ng/mL. No variation in orientational state of 5CB in LC microdroplets was observed on further increasing the amount of IgG beyond 1000 ng/mL.

2-Sensitivity of LC microdroplets for IgG in 10% FBS and 10% blood plasma medium

In order to analyze the effect of proteins on orientational variation in 5CB in LC microdroplets, the response of AIgG-anchored LC microdroplets containing 5µg of AIgG was studied in 10% FBS and 10% blood plasma at fixed amounts of IgG (20 ng/mL). The polarized optical micrographs of LC microdroplets incubated with 20 ng/mL concentration of IgG in presence of 10% FBS were able to show configrational variation after 90 min in comparison to PBS media (30 min, Fig 2sa). The presence of non-specific protein molecules in 10% FBS and 10% blood plasma has slowed down the rate of diffusion of IgG molecules to LC microdroplets and able to generate optimal signal at 90 minutes for detection of IgG (Fig. 2Sb).

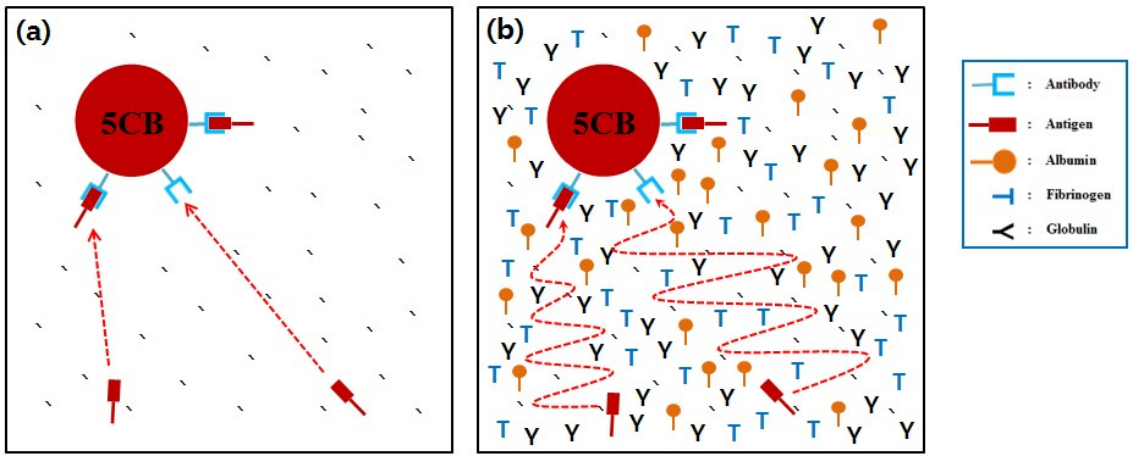

Figure 2S. Scheme showing the effect of medium on response time of LC microdroplets. The IgG antigen is able to interact with LC microdroplet within 30 minutes in PBS (a) and in presence of 10% FBS or 10 % blood plasma within 90 minutes (b).