Integrated microfluidic device for serum biomarker quantitation using either standard addition or a calibration curve

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SUPPORTING INFORMATION

Supporting Movie. Fluorescence video image of a microchannel after an anti-AFP column (the column is located to the right of the illuminated region), showing loading, rinsing and elution steps with FITC-AFP. Loading step: from 0:00 to 1:20. The fluorescence signal gradually increases, indicative of unretained florescent compounds (e.g., unconjugated FITC) exiting the column. Rinsing step: from 1:21 to 3:02. A fluorescent band leaves the column in the first 25 s of this step, indicating non-bound fluorescent material being rinsed from the column. From 1:50 to 3:02, the remaining rinsed fluorescent material flows out from the detection window. Elution step: from 3:03 to 3:21; a narrow fluorescent band of FITC-AFP elutes from the affinity column from right to left and passes through the detection window. The low pH (~2) of the eluting solution decreases the fluorescence signal relative to the previous steps.

Table S1. Peak heights of AFP in dynamic labeling with Alexa Fluor 488 TFP Ester at room temperature (derived from Figure S3).

Labeling time (min)	AFP Peak Height (arb. units)
5	0.0060
10	0.0116
15	0.0174
20	0.0209
30	0.0244
60	0.0258
120	0.0258

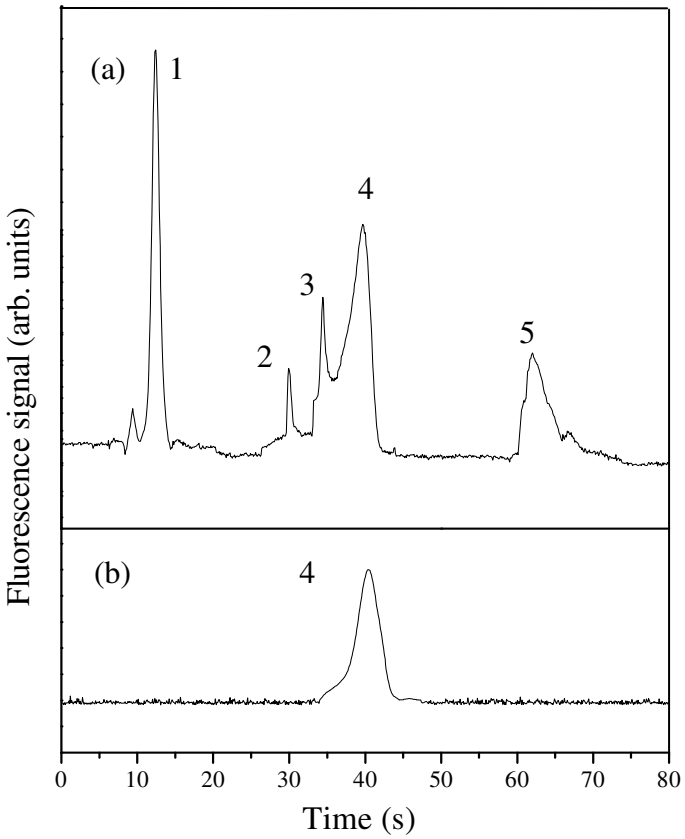

Figure S1. Microchip CE of a mixture (a) before and (b) after affinity column extraction. Peaks 1-5 are FITC-Gly, GFP, FITC-BSA, FITC-AFP, and FITC-IgG, respectively. These runs were carried out on a separate device with a different detection position compared to the runs in Fig. 4, where the AFP peak migrated closer to 30 s.

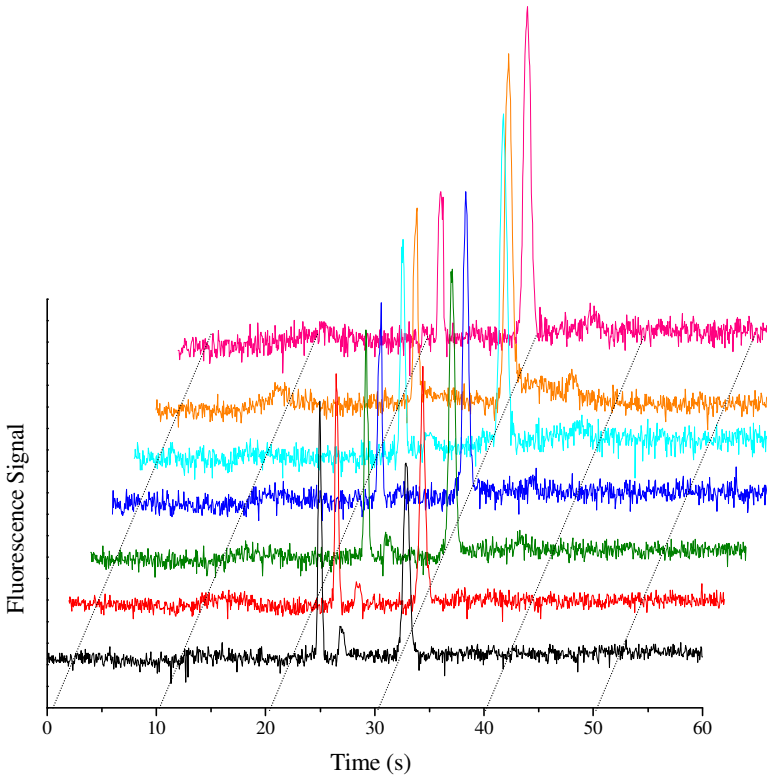

Figure S2. Dynamic labeling of AFP with Alexa Fluor 488 TFP Ester at room temperature. Traces are black: labeling 5 min, red: 10 min, green: 15 min, blue: 20 min, light blue: 30 min, orange: 60 min, and pink: 120 min. The unattached label migrates at ~23 s, and the AFP peak is at ~32 s.