Electronic Supplementary Material (ESI) for Analyst.

Supporting information

Figure S1. Portable all-fiber evanescent wave fluorescence detection device

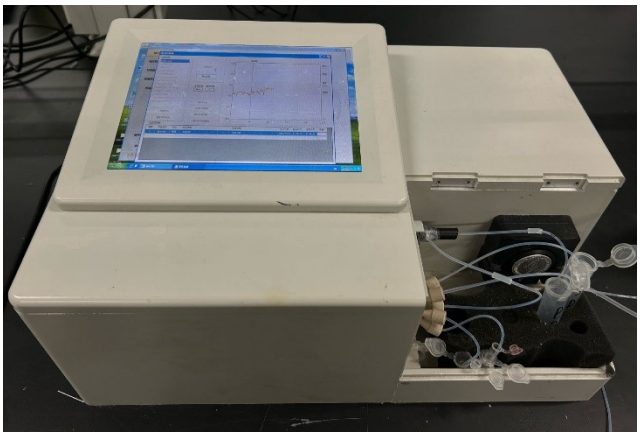


Figure S2. Typical fluorescence signal traces when various antibodies were sequentially introduced in the fiber-embedded microfluidic chip, and the concentration of all antibodies was 0.1 μg/mL.

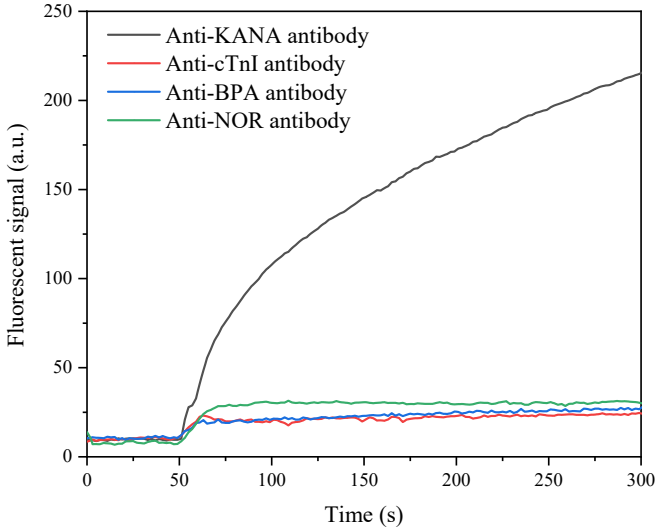
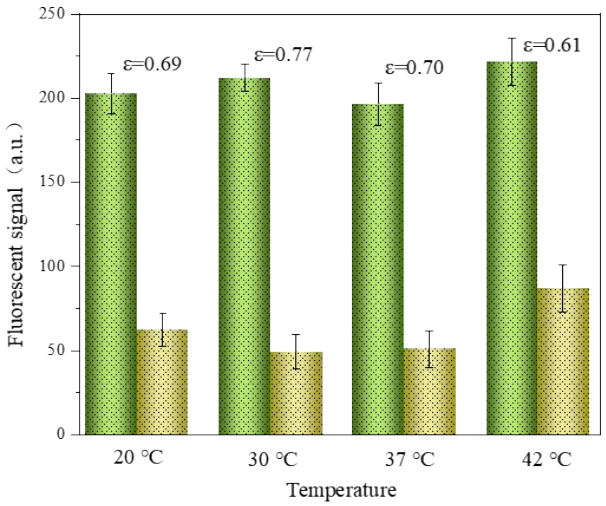
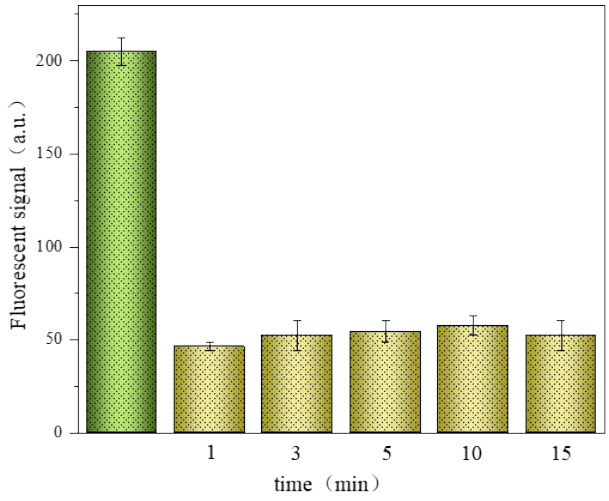


Figure S3. Optimization of detection conditions. (A) Effect of the temperature on KANA detection. Testing conditions: 0.1 μg/mL Cy5.5-anti-KANA antibody, pH=7, 3 min pre-reaction time. (B) Effect of the pre-reaction time on KANA detection. Testing conditions: room temperature, pH = 7, 0.1 μg/mL Cy5.5-anti-KANA antibody. The error bars correspond to the standard deviation of the data points in three repeated experiments (n = 3)



(A)



(B)

Figure S4. Reusability and stability of functionalized fiber-embedded microfluidic chip evaluated using 0.1 μg/mL Cy5.5-anti-KANA antibody.

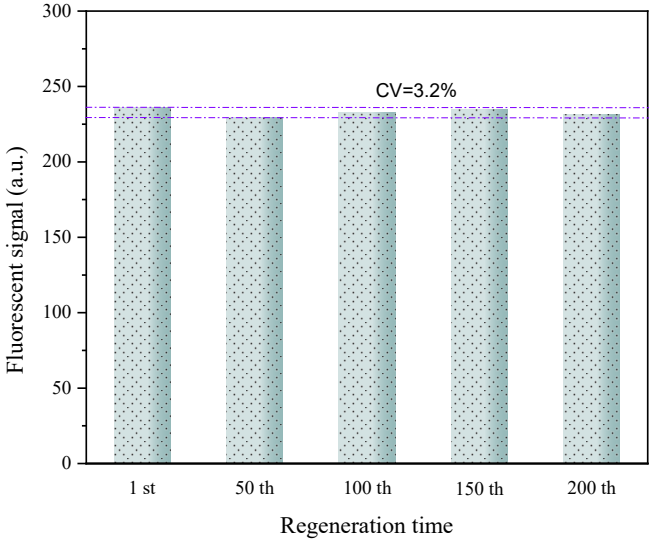


Figure S5. Matrix effect of real water sample on KANA immunoassay. The concentration of anti-KANA antibody is 0.1 μg/mL.

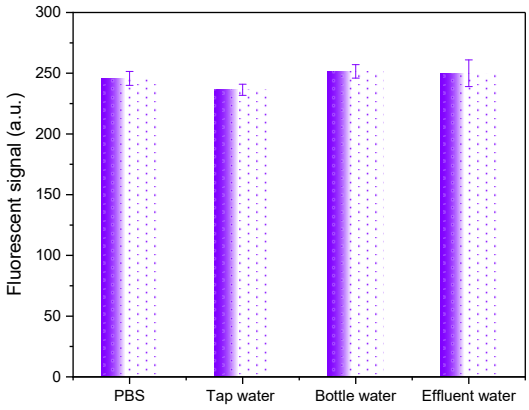


Figure S6. Dose-response curve of KANA detected by ELISA.

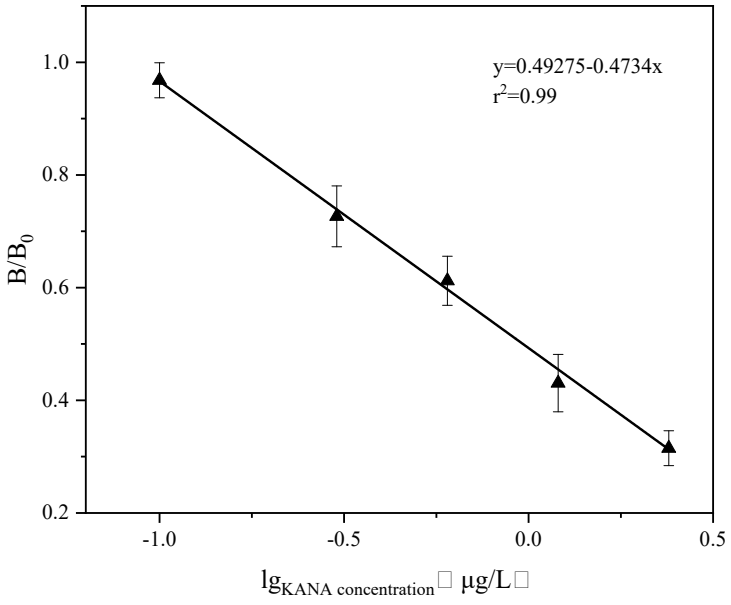


Table S1 Comparison of KANA detection performance using different methods

Method	Detection range (μg/L)	LOD (μg/L)	Detection Time (min)	Reusability	Ref.
Ratiometric fluorescent biosensor	0.60 ~ 48.0	0.2	> 200	NA	1
Tag-free fluorescent aptasensor	2.9 ~ 58.4	1.2	> 300	NA	2
Tag-free fluorescent aptasensor	29.2 ~ 1.2×10^4	11.8	90	NA	3
Label-free fluorescent biosensor	10.0 ~1000.0	7.3	200	NA	4
Nanosheets-based colorimetric aptasensor	58.4 ~ 292.0	35.0	30	NA	5
Photoelectrochemical aptasensors	0.6 ~ 180	0.09	60	NA	6
Fiber-embedded microfluidic chip	0.21-9.11	0.03	25	200 times	This work

Table S2 Recovery rate of KANA spiked in different water samples

Samples	Spiked KANA conc. (μg/L)	KANA conc. detected by fiber-embedded microfluidic chip (μg/L)	Recovery rate (%)	RSD (%)
Tap water	0.3	0.31	103.3	3.68
	1.2	1.32	109.0	9.67
Bottle water	0.3	0.33	109.3	2.83
	1.2	1.21	101.0	4.20
Effluent water	0.3	0.27	94.6	6.52
	1.2	1.28	106.9	6.36

References

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