

Supplementary materials

Portable, rapid, and sensitive time-resolved fluorescence immunochromatography for on-site detection of dexamethasone in milk and pork

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LC-MS/MS analysis

LC-MS/MS analysis was performed in multiple reaction monitoring (MRM) mode on a Shimadzu (Nexera x2, Japan) LC system coupled with an AB Sciex triple quadrupole EMR (QTRAP®6500, USA). Chromatographic separation was performed on a Kinetex @ C18 column (100×3 mm, 2.6 μm), and the column temperature was maintained at 40 °C. The mobile phase was constituted of ultrapure water (mobile phase A) and acetonitrile (mobile phase B). The gradient elution procedure was as follows: 0~1.0 min, 20% B; 1.1~3.5 min, 50% B; 3.6~6.0 min, 65% B; 6.1~7.0 min, 20%~65% B; 7.1-7.5 min, 20% B. The mobile phase flow rate was 300 μL/min; the injection volume of the sample was 5 μL.

Mass spectra were obtained by an AB Sciex triple quadrupole EMR (QTRAP®6500, USA). The scanning mode is negative ion scanning (ESI-). The MS/MS conditions were set as follows: spray voltage: 5.5 KV; capillary temperature: 500 °C; data analysis software: Analyst 1.7.

Figure Caption

Figure S1 The results of particle size of TRFM

Figure S2 The fluorescence intensity, inhibition effect, and inhibition rate results of the activation pH value. A) Ultraviolet lamp results for milk detection; B) Fluorescence quantitative results for milk detection; C) Ultraviolet lamp results for pork detection; D) Fluorescence quantitative results for pork detection

Figure S3 The fluorescence intensity, inhibition effect, and inhibition rate results of the Ab amount. A) Ultraviolet lamp results for milk detection; B) Fluorescence quantitative results for milk detection; C) Ultraviolet lamp results for pork detection; D) Fluorescence quantitative results for pork detection

Figure S4 The fluorescence intensity, inhibition effect, and inhibition rate results of the surfactant concentration. A) Ultraviolet lamp results for milk detection; B) Ultraviolet lamp results for pork detection; C) Fluorescence quantitative results for milk detection; D) Fluorescence quantitative results for pork detection

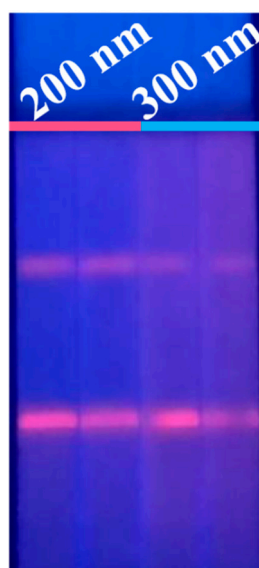


Figure S1

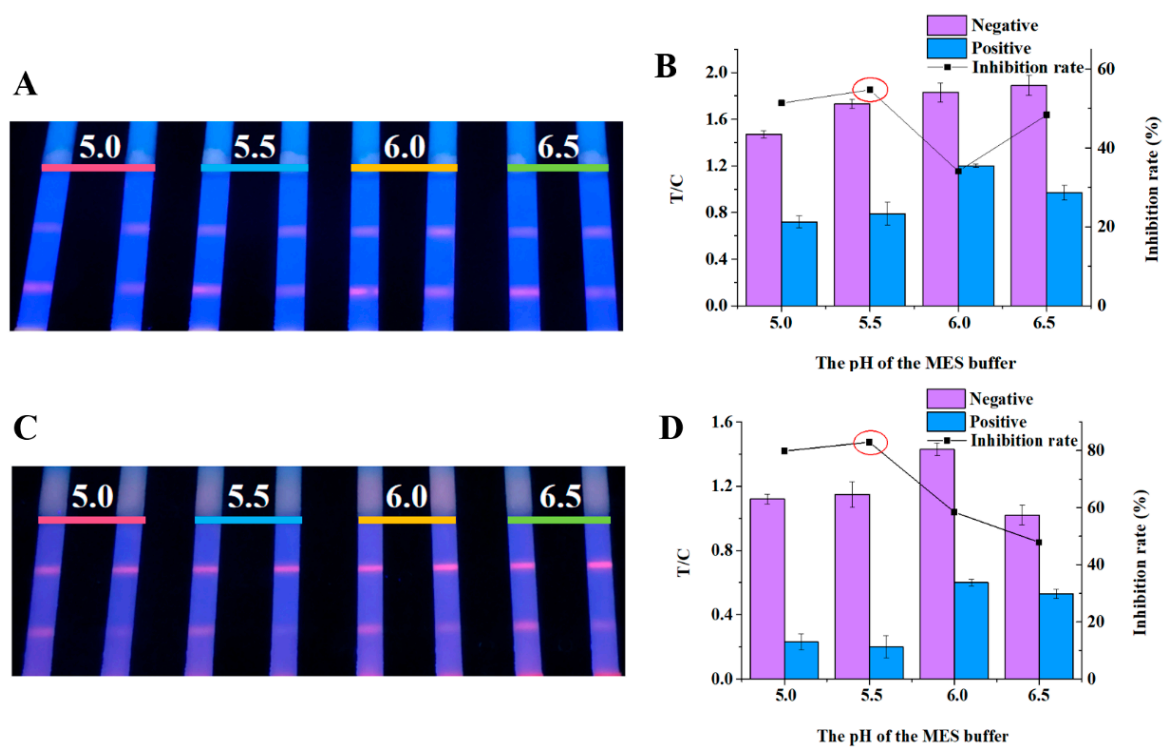


Figure S2

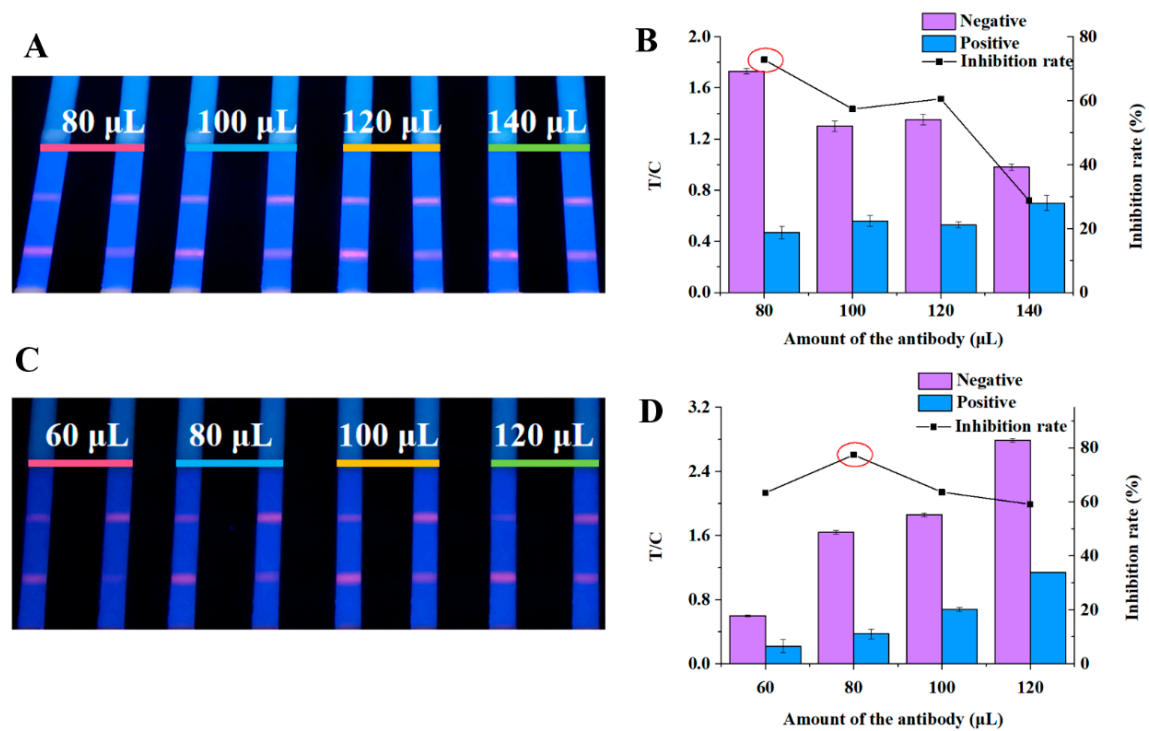


Figure S3

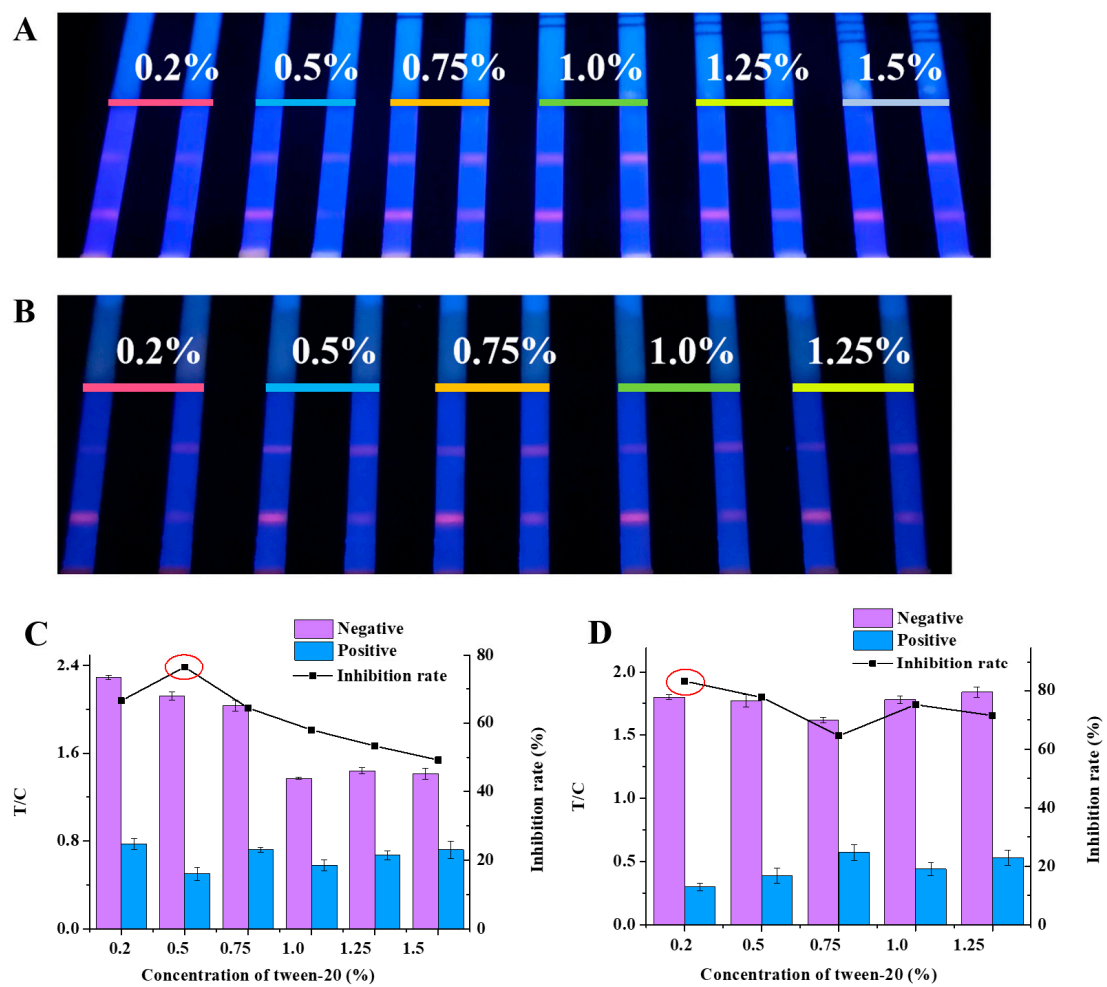


Figure S4

Table S1 Working parameters of the TRFM-ICG for milk and pork detection

| Working parameters | milk | pork |
|--|---|---|
| Particle size and color of nanoparticles | 200 nm, red | |
| Concentration of coating Ag (mg/mL) | 0.17 | |
| Concentration of goat anti-mouse IgG (mg/mL) | 0.22 | 0.44 |
| Coating buffer | 0.02 M PB (pH 7.4, 0.15 M NaCl) | |
| Activated pH value (0.05 M MES) | pH 5.5 | |
| Coupling buffer | 0.05 M BB (pH 8.0) | |
| Abs amount (mg/per strip) | 1.5×10^{-5} | |
| Abs dilution buffer | 0.002M BB (pH 8.0) | |
| Sample pad pretreatment solution | 0.05 M PB (pH 7.4, 0.5% tween-20, 0.3% PVP) | 0.05 M PB (pH 7.4, 0.2% tween-20, 0.3% PVP) |
| Abs probe resuspension | 0.02 M PB (pH 7.4, 0.5% BSA, 0.5% tween-20, 5% trehalose, 0.2% PVP, and 0.03% procline-300) | |
| Sample pad material | GF-2 | |
| Abs probe resuspension | 0.02 M PB (pH 7.4, 0.5% BSA, 0.5% Tween-20, 5 % trehalose, 0.2 % PVP, and 0.03% procline-300) | |

Table S2 The IC₅₀ and CR values of anti-DEX Ab determined by icELISA, and TRFM-ICG

| Analytes | icELISA | | TRFM-ICG | |
|----------------|-------------------------|-------|-------------------------|-------|
| | IC ₅₀ (μg/L) | CR% | IC ₅₀ (μg/L) | CR% |
| Dexamethasone | 0.06 | 100.0 | 0.05 | 100.0 |
| Triamcinolone | 0.11 | 54.5 | 0.08 | 62.5 |
| Betamethasone | 0.25 | 24.0 | 0.16 | 31.3 |
| Prednisolone | 0.43 | 14.0 | 0.24 | 20.8 |
| Hydrocortisone | 4.00 | 1.5 | 1.20 | 4.2 |