Electronic Supplementary Material (ESI) for Materials Chemistry Frontiers.

Gold nanoparticle-based lateral flow immunoassay for the rapid detection of flutriafol residues in food

(Supporting information)

Contents

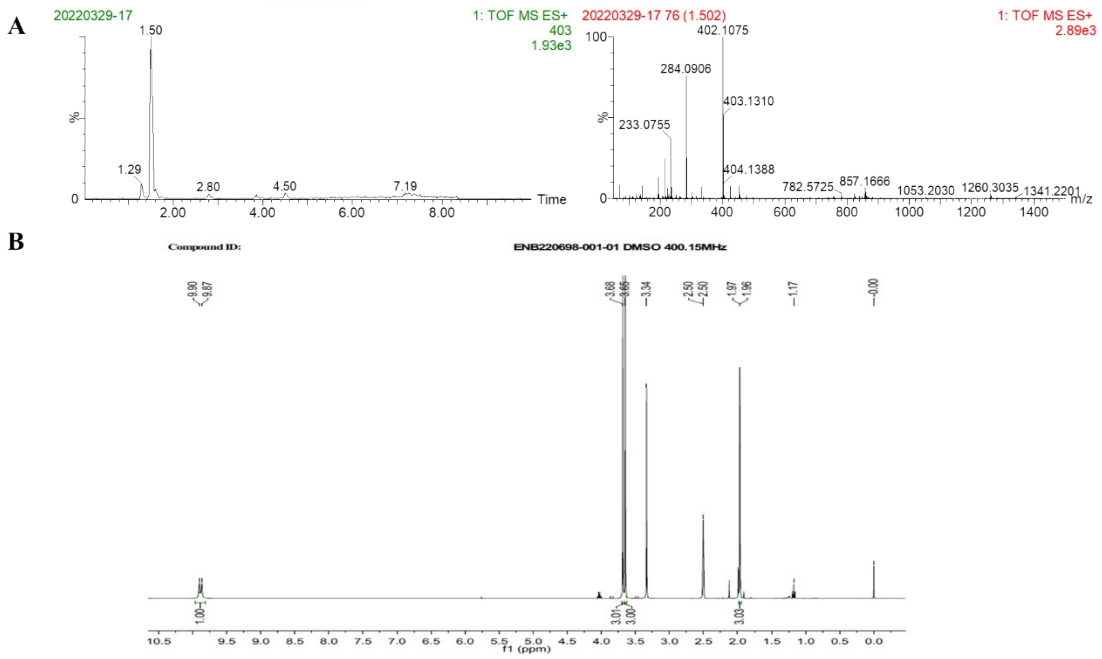


Fig S1. Identification of FTF-hapten. (A) The liquid chromatogram and mass spectrum; (B) 1H NMR.

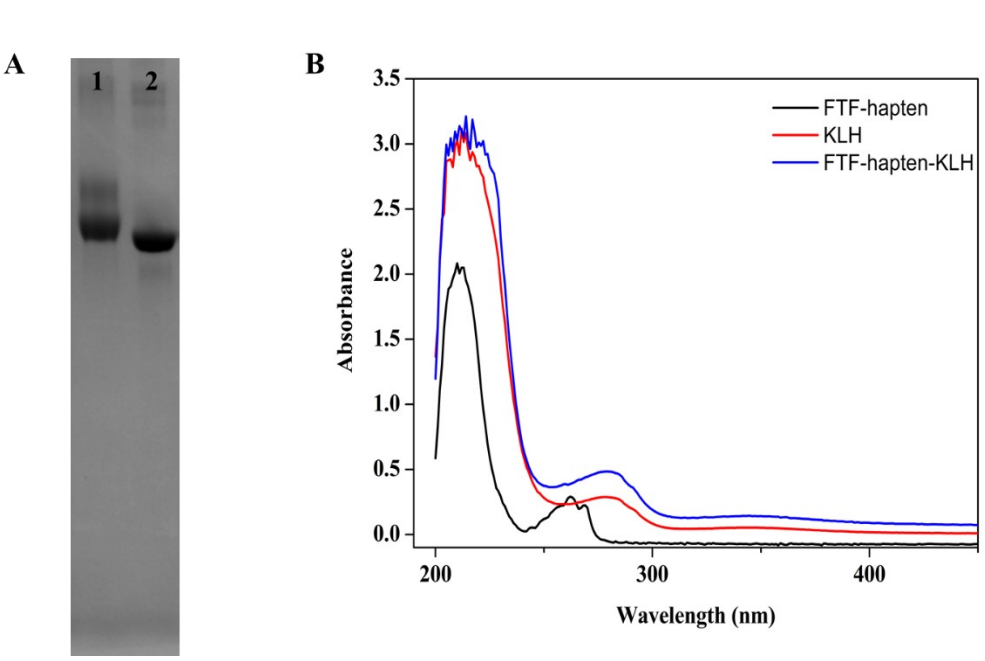


Fig S2. (A) The image of gel electropherogram (1 represent FTF-hapten-BSA and 2 represent BSA).

(B) The UV–Vis spectroscopy of FTF-hapten, proteins and conjugates.

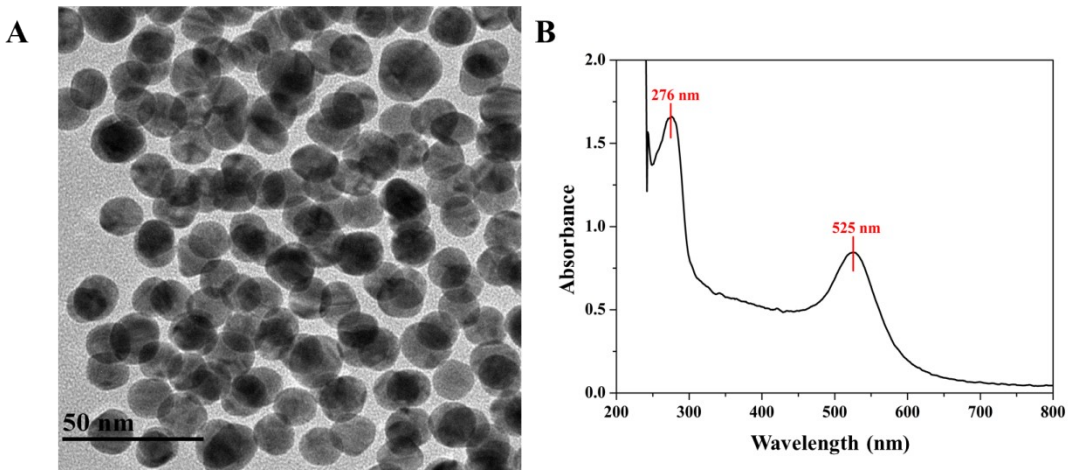


Fig S3. (A) TEM image of GNPs-labeled anti-FTF mAb. (B) UV-Vis spectrum of GNPs-labeled anti-FTT mAb.

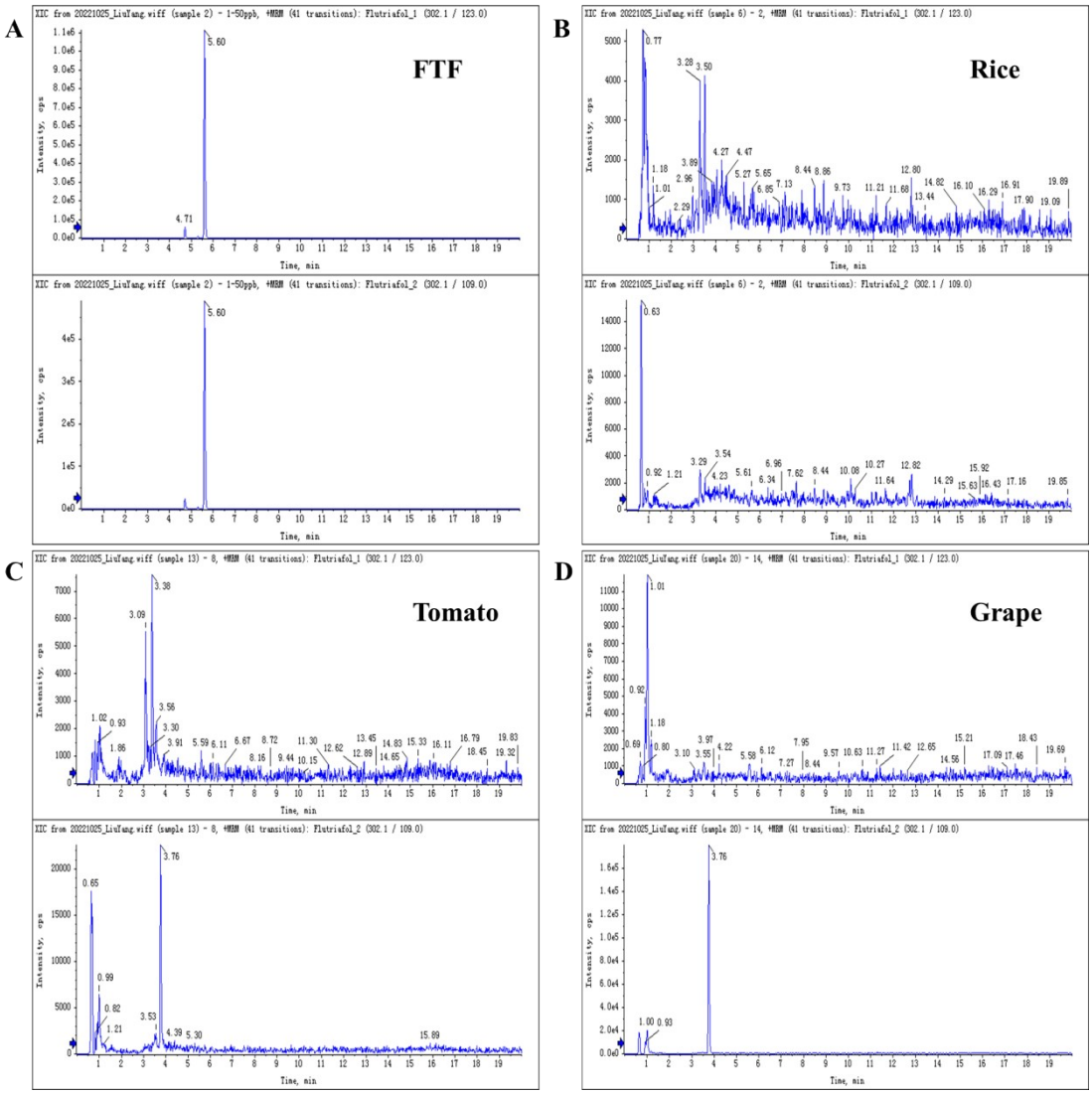


Fig S4. LC-MS/MS analysis of FTF standard solution and real food samples. (A) The FTF standard solution. (B-D) The samples of rice, tomato and grape, respectively.

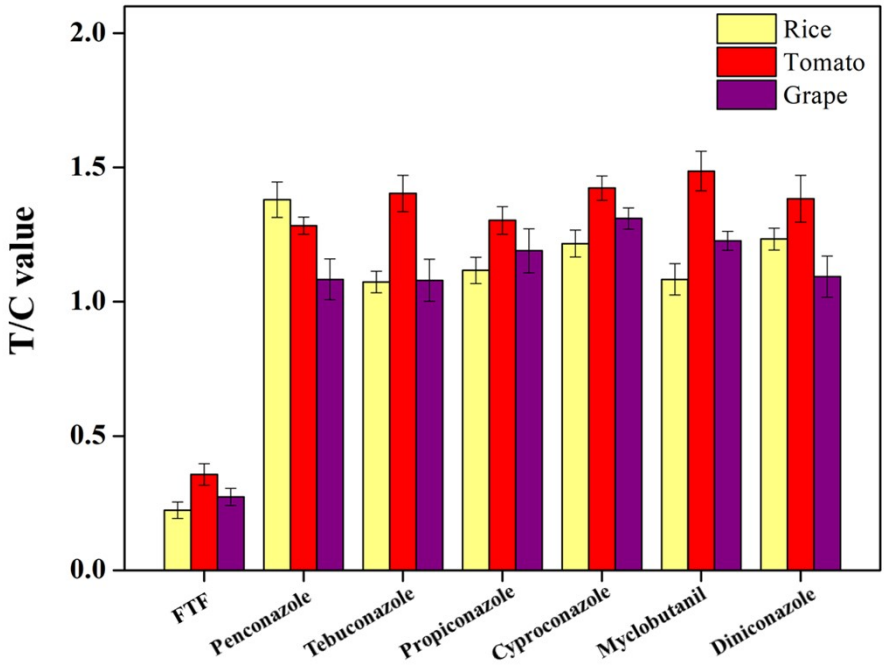


Fig S5. The specificity of the GNP based lateral flow immunoassay by comparing FTF and other structural analogs.

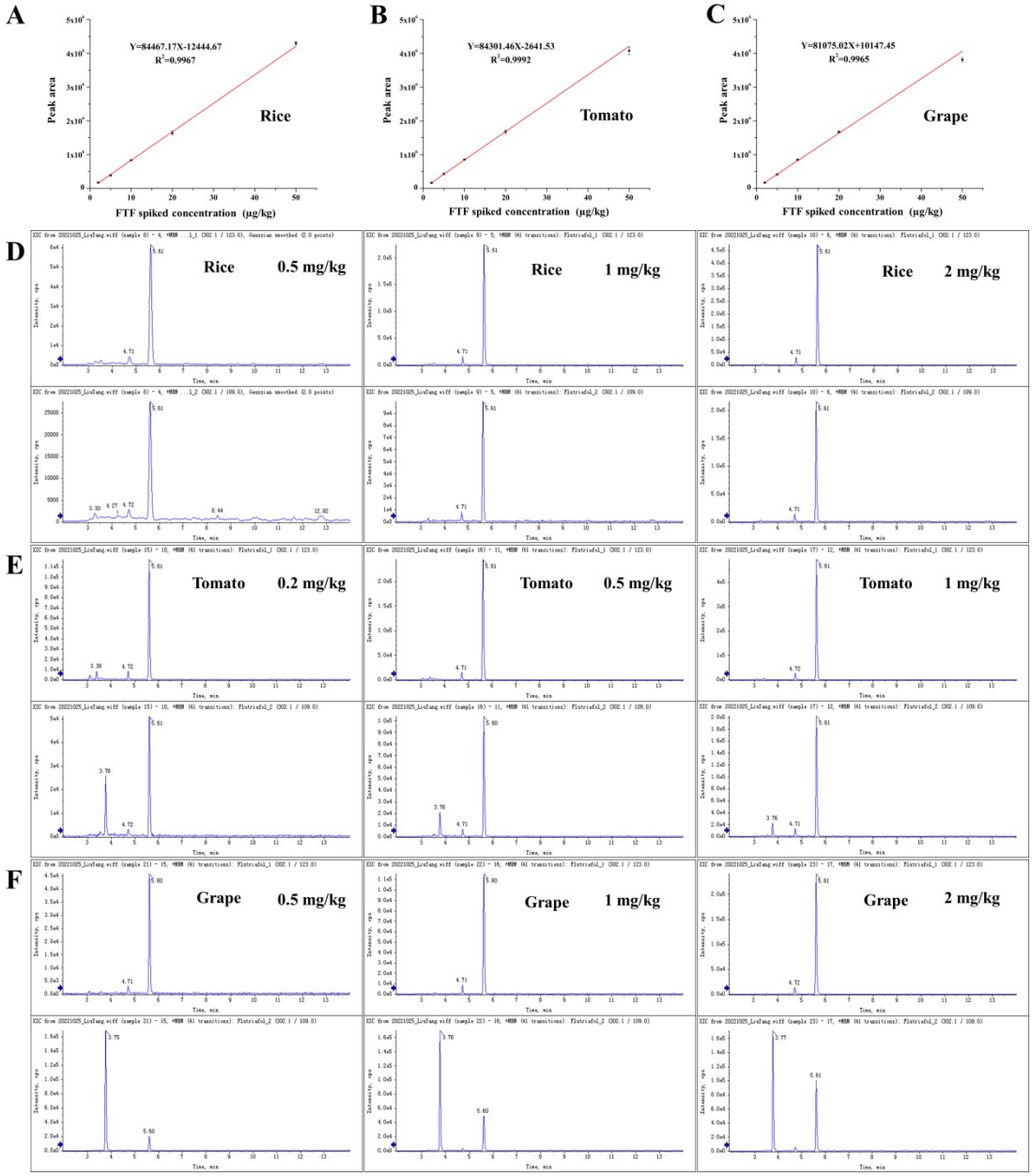
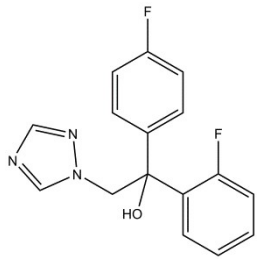
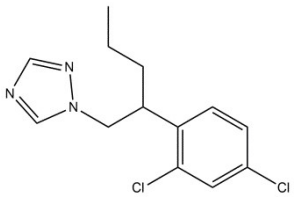
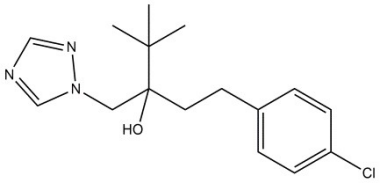
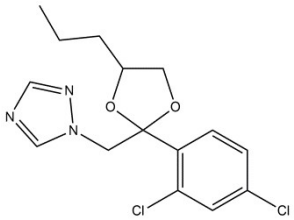
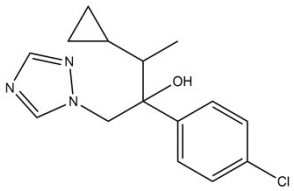
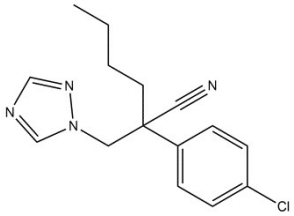
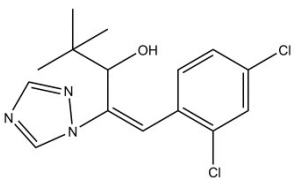


Fig S6. (A-C) The regression equation of FTF in rice, tomato and grape by LC-MS/MS. (D-F) LC-MS/MS spectra of different concentrations of FTF in rice, tomato and grape (Due to the high FTF MRLs requirements, considering the detection limit of the instrument method, rice, tomato and grape sample were diluted 50 times).

Table S1. Instrument conditions for the analysis of FTF by LC-MS/MS.

Instrument conditions	AB SCIEX QTRAP 5500 system		
Spectrum Column	beh-C18 column (Agilent Zorbax Eclipse Plus) (2.1×100 mm, 1.7 μm)		
	Column temperature: 60 ℃		
Mobile Phase	A: 0.1% formic acid in water		
	B: Acetonitrile		
Gradient Profile	Time (min)	Percentage A (%)	Percentage B (%)
	0	97	3
	1	97	3
	2.5	65	35
	16	2	98
	20	2	98
	20.1	97	3
	23	97	3
Injection Volume	2 μL		
Flow rate	0.3 mL/min		
Mass Parameters	Ion Source: Electrospray ion source		
	Atomizing gas: 50 psi		
	Auxiliary heating gas: 50 psi		
	Source Temperature: 350 ℃		
	Polarity: Positive		
	Ionspray voltage: 5500 V		

Table. S2 The specificity of the FTF-mAb was determined by ic-ELISA.

Analogs	Structure	IC_{50}（ng/mL）	CR（%）
Flutriafol		1.77	100
Penconazole		>500	<5
Tebuconazole		>500	<5
Propiconazole		>500	<5
Cyproconazole		>500	<5
Myclobutanil		>500	<5
Diniconazole		>500	<5