

1 **Supporting Information**

2 **New functional tracers—two dimensional nanosheets based**

3 **immunochematographic assay for *Salmonella enteritidis* detection**

4 Tong Bu,<sup>‡a</sup> Jianlong Wang,<sup>‡a</sup> Lunjie Huang,<sup>b</sup> Leina Dou,<sup>a</sup> Bingxin Zhao,<sup>a</sup> Tao Li<sup>c</sup> and

5 Daohong Zhang<sup>a\*</sup>

6 <sup>a</sup> College of Food Science and Engineering, Northwest A&F University, Yangling  
7 712100, Shaanxi, China

8 <sup>b</sup> School of Food Science and Engineering, South China University of Technology,  
9 Guangzhou 510641, China

10 <sup>c</sup> Shaanxi Institute for Food and Drug Control, Xi'an, 710065, China

11 \*Corresponding author.

E-mail: [zhangdh@nwsuaf.edu.cn](mailto:zhangdh@nwsuaf.edu.cn);

12 Fax: +86 29-8709-2275;

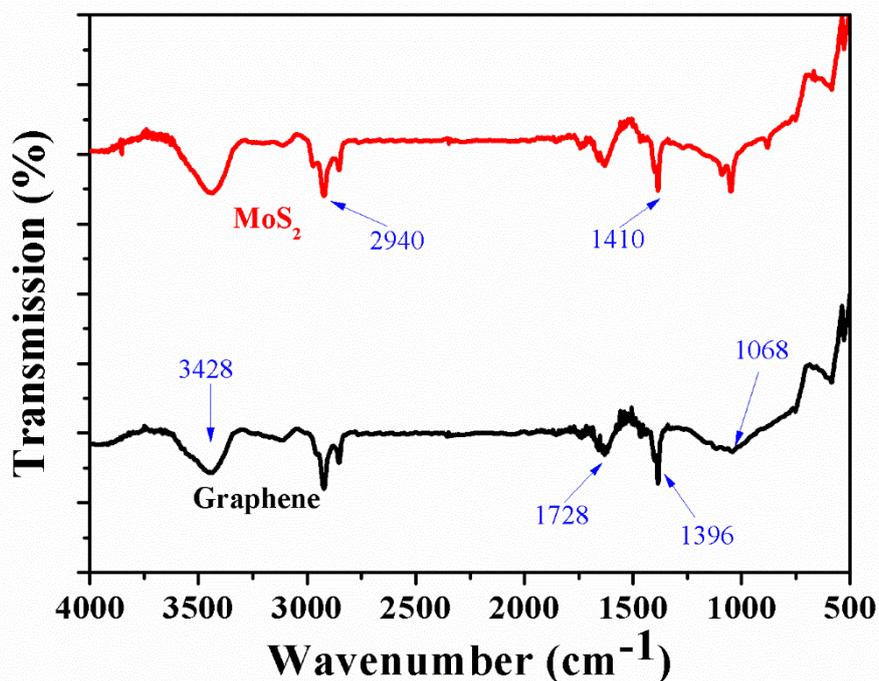
13 Tel: +86 29-8709-2275

14 <sup>‡</sup> These authors contributed equally to this work

15

## Table of contents

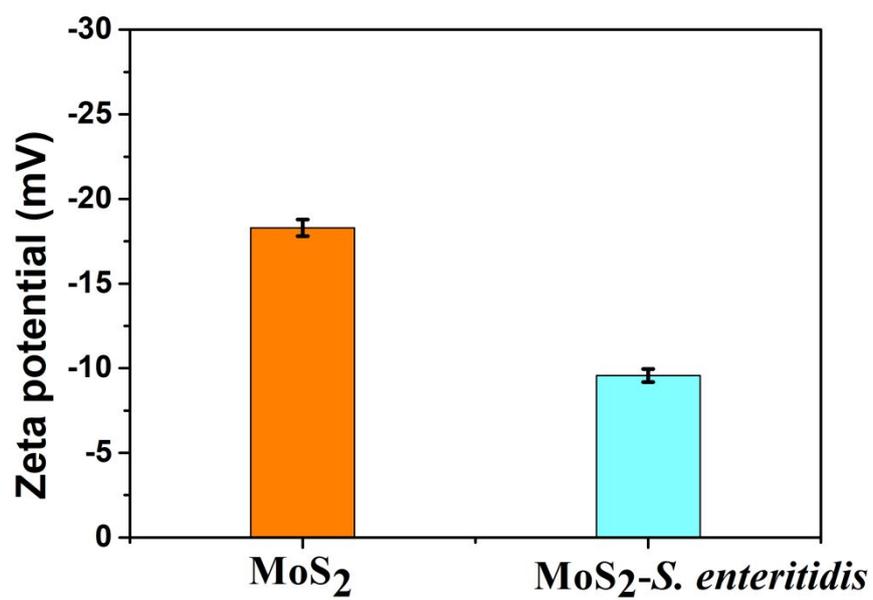
16	Figure S1. FTIR spectra of the MoS <sub>2</sub> and Graphene.....	S-1
17	Figure S2. Zeta potentials of the MoS <sub>2</sub> and MoS <sub>2</sub> - <i>S. enteritidis</i> complex.....	S-2
18	Figure S3. Sensitivity analysis curve of the McAb for <i>Salmonella</i> detection.....	S-3
19	Figure S4. Specificity test results of anti- <i>S. enteritidis</i> McAb with different pathogens as	
20	interfering bacteria.. ..	S-4
21	References .....	S-5



22

23 **Fig. S1** FTIR spectra of the MoS<sub>2</sub> (red curve) and Graphene (black curve).

24 FT-IR spectra of the MoS<sub>2</sub> and Graphene were recorded between 4000 and 400  
 25 cm<sup>-1</sup>. The peaks at 1410 and 2940 cm<sup>-1</sup> were assigned to the -CH<sub>2</sub> and -CH bendings,  
 26 respectively, while a series of overlapping peaks located in the region of 1180-953  
 27 cm<sup>-1</sup> resulted from vibration modes such as the stretchings of C-C and C-O, and the  
 28 bending mode of C-H bonds.<sup>1</sup> As for the Graphene (Fig. S1), absorption peak at 3428  
 29 cm<sup>-1</sup> was attributed to O-H stretching vibration. The absorption at 1728 cm<sup>-1</sup>  
 30 corresponded to the stretching band of C=O in carboxylic acid. The peaks at 1396  
 31 cm<sup>-1</sup> and 1068 cm<sup>-1</sup> corresponded to the stretching vibrations of C-OH and C-O-C,  
 32 respectively.<sup>2</sup>

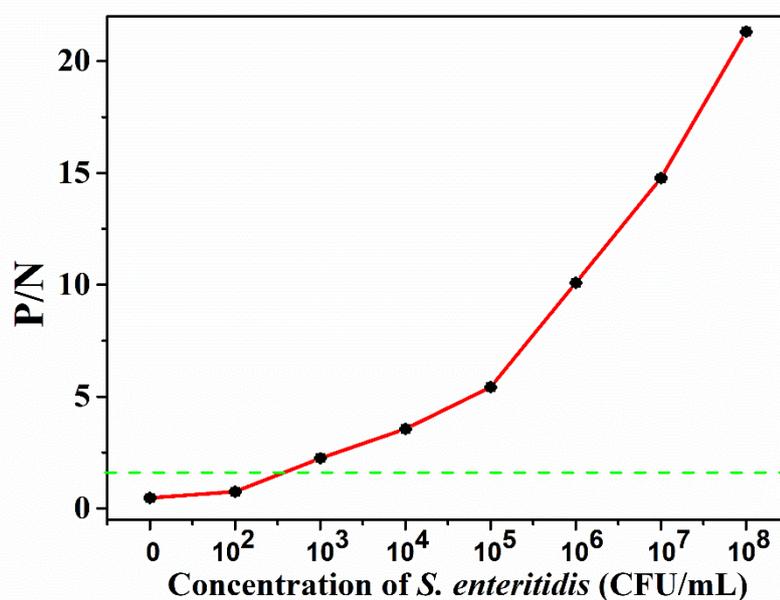


33

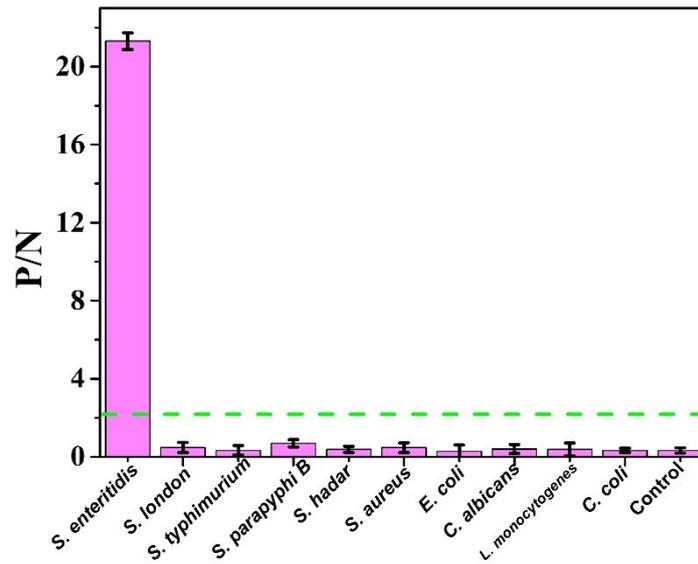
34 **Fig. S2** Zeta potentials of the MoS<sub>2</sub> and MoS<sub>2</sub>-*S. enteritidis* complex.

35 Characterization of McAb by ELISA

36 The sensitivity and specificity of the McAb used in this work were characterized  
37 by an in-ELISA. According to the criterion,<sup>3</sup>  $P/N \geq 2.1$  was positive and  $P/N < 2.1$   
38 was negative results. As shown in Fig. S3, the sensitivities of McAb for *S. enteritidis*  
39 was  $10^3$  CFU/mL. Moreover, ELISA results (Fig. S4) showed that except for *S.*  
40 *enteritidis*, the P/N values of McAb for other bacteria were all below 2.1. In summary,  
41 the prepared antibodies used in this work performed high sensitivity and specificity.



42  
43 **Fig. S3** Sensitivity analysis curve of the McAb for *Salmonella* detection. The green  
44 dash line indicates the criterion (2.1) for results judgement of positive and negative.



45

46 **Fig. S4** Specificity test results of anti-*S. enteritidis* McAb with different pathogens as  
 47 interfering bacteria. The green dash line indicates the criterion (2.1) for results  
 48 judgement of positive and negative.

49 **References**

- 50 1. Chen, K.; Zhang, W.; Pan, X.; Huang, L.; Wang, J.; Yang, Q.; Hu, N.; Suo, Y.;  
51 Zhang, D.; Wang, J., Natural sugar: A green assistance to efficiently exfoliate  
52 inorganic layered nanomaterials. *Inorganic Chemistry* **2018**, *57*, 5560-5566.
- 53 2. Huang, B.; Liu, Y.; Li, B.; Liu, S.; Zeng, G.; Zeng, Z.; Wang, X.; Ning, Q.;  
54 Zheng, B.; Yang, C., Effect of Cu(II) ions on the enhancement of tetracycline  
55 adsorption by Fe<sub>3</sub>O<sub>4</sub>@SiO<sub>2</sub>-Chitosan/graphene oxide nanocomposite. *Carbohydrate*  
56 *Polymers* **2017**, *157*, 576-585.
- 57 3. Li, N. L.; Feng, J. J.; Jing, C.; Fu, G. Y.; Zhong, Q. W., Detection of circulating  
58 antigen in serum of mice infected with *Trichinella spiralis* by an IgY-IgM mAb  
59 sandwich ELISA. *Experimental Parasitology* **2013**, *133*, 150-155.