Electronic Supplementary Material (ESI) for Sensors & Diagnostics.

Supplementary Information

Optical & Electrochemical Fiber-Optic Sensor: *In Situ* Detection of Antibiotics With fM Detection Limit

Xiaoling Peng,[a,b,‡] Bo Peng,[c,‡] Xicheng Wang,[a,‡] Zhicong Ren,[a] Zhiyong Yang,[a] Lei Liu,[a] Jiahai Li,[a] Liang Chen,[a] Daotong You,[a] Jianqing Li,[b,*] Minghui Du[a,*] and Tuan Guo[a,*]

[a]Institute of Photonics Technology, Jinan University, Guangzhou 511443, China

[b]School of Computer Science and Engineering, Macau University of Science and Technology, Macau 999078, China

[c]Institute for Environmental and Climate Research, Jinan University, Guangzhou 511443, China

‡ These authors contributed equally to this work

*Corresponding author.

E-mail: jqli@must.edu.mo, duminghui@jnu.edu.cn, tuanguo@jnu.edu.cn

Table S1 Comparative results of electrochemical and optical responses of OFL and CIP

Results / Category	ΔCurrent change (μA)	ΔWavelength shift (nm)	ΔTransmission change (%)
OFL	0.629	0.127	0.041
CIP	1.300	0.391	0.116

Under the same conditions (concentration: 10^{-9} M), the electrochemical and optical response results of OFL and CIP are shown in Table S1. Interfering antibiotics OFL and CIP both belong to the quinolone antibiotics, and it can be found that this interference effect remains within an acceptable range.

Table S2 Comparative results of electrochemical and optical responses of standard and seawater buffers

Concentration (M)	ΔCurrent change (μA)			ΔWavelength shift (nm)			ΔTransmission change (%)		
	Standard buffer	Seawater buffer	RSD	Standard buffer	Seawater buffer	RSD	Standard buffer	Seawater buffer	RSD
10^{-11}	0.635	0.667	2.3%	0.201	0.193	0.6%	0.063	0.061	0.1%
10^{-10}	0.989	0.992	0.2%	0.326	0.325	0.1%	0.097	0.096	0.1%
10^{-9}	1.300	1.256	3.1%	0.391	0.408	1.2%	0.116	0.122	0.4%

The CIP concentration of the seawater sample detected by the spiking method is 10^{-11}, 10^{-10} and 10^{-9} M. To directly demonstrate the reliability of the proposed sensor, the comparison results of laboratory clean buffer (standard buffer) and seawater buffer are shown in Table S2. It can be seen from the comparison results that all RSDs are less than 5%, and the proposed plasmonic fiber electrode sensor has great potential application in practical applications.