Supporting Information

Detection of SARS-CoV-2 and noroviruses in cold-chain food samples using aptamer-functionalized graphene field-effect transistors

Qingliu Wu [a], Songjia Luo [a], Lu Wang [a], Baolei Dong [a], Hao Qu [a, b,*], Lei Zheng [a, c]

[a] School of Food and Biological Engineering, Hefei University of Technology, Hefei 230009, China

[b] Engineering Research Center of Bioprocess, Ministry of Education, Hefei University of Technology, Hefei, 230009, China

[c] Intelligent Interconnected Systems Laboratory of Anhui Province, Hefei University of Technology, Hefei 230009, China

* Corresponding author.

E-mail: quhao@hfut.edu.cn (H. Qu)

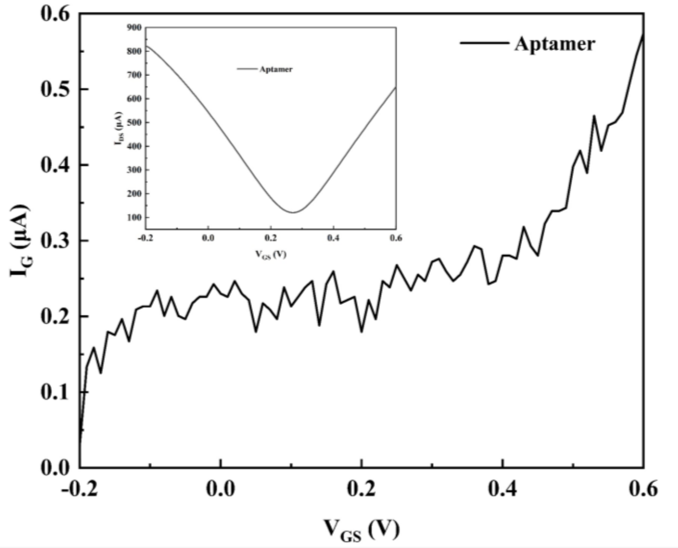

Figure S1. I_{DS} vs. V_{GS} curves and I_G vs. V_{GS} curves obtained by scanning V_{GS} in the range of -0.2 to 0.6 V, with a fixed V_{DS} of 0.05 V and a scanning rate of 0.01 V/s.

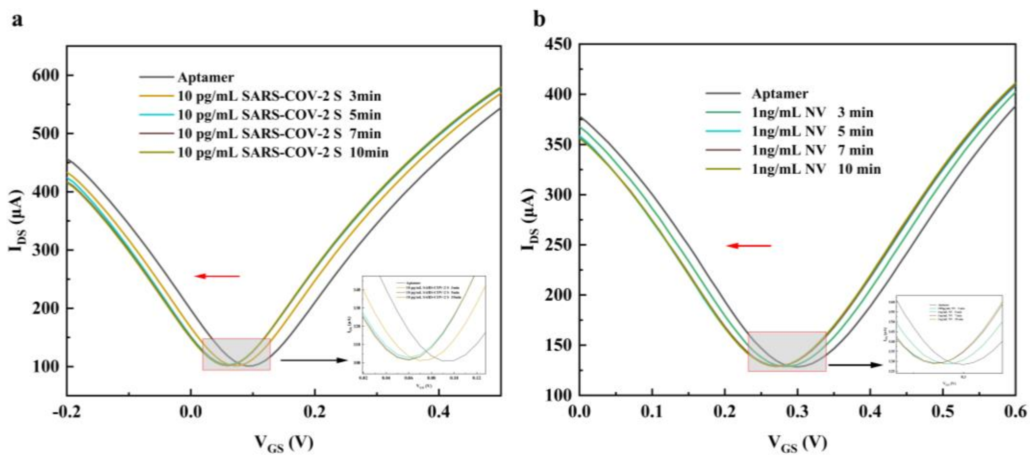

Figure S2. (a) Transfer characteristic curves of the SARS-CoV-2 GFET sensor when incubated with SARS-CoV-2 spike proteins for 3-10 min; (b) Transfer characteristic curves of norovirus GFET sensor when incubated with norovirus-like particles for 3-10 min.

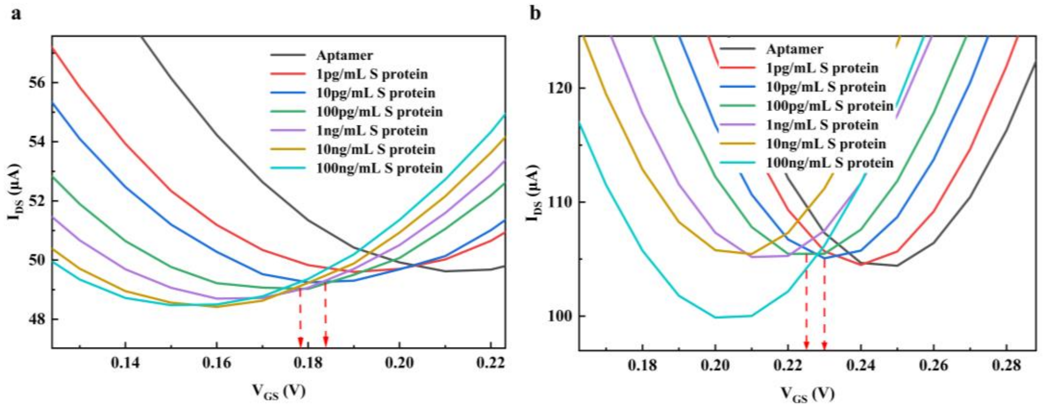

Figure S3. (a) Zoomed-in view of the transfer characteristic curves of the SARS-CoV-2 GFET at various concentrations of SARS-CoV-2 spiking proteins (diluted with 0.1× PBS). (b) Zoomed-in view of the transfer characteristic curves of the norovirus GFET at different concentrations of norovirus-like particles.

Table 1. Comparison of SARS-CoV-2 analytical performance of the SARS-CoV-2 GFET sensor with other sensitive sensors in the same field.

Comparison of the proposed SARS-CoV-2 GFET sensor with other sensitive sensors in the same field					
Methods	**Target**	**LOD**	**Linear range**	**Assay time**	**Refs.**
DNA aptamer-conjugated GFET	spike proteins	33 fg/mL	1 pg/mL-100 ng/mL	5 min	this work
Electrochemical aptamer-based	spike proteins	35.4±11.7 pM	760 pg/mL-76 ng/mL	5 min	S1
DNA aptamer-conjugated GFET	spike proteins	1.28（PFU）/mL	100 fM-100 nM	<20 min	S2
GO/Gr FET	spike proteins	8 fg/mL	10 fg/mL-100 pg/mL	20 min	S3
(BN-GO gel) FET	nucleocapsid protein	10 ag/mL	10 ag/mL-1 μg/mL	4 min	S4
Eptamer FET	RNA	0.01 copy/μL	0.025-0.05 copy/μL	5 min	S5
DNA probes PGFET	RNA	1 fM	1fM-100 pM	20 min	S6
TDN-LG FETs	RNA	1-2 copies /100 μL	0.5-500 copy/μL	14 min	S7

Table 2 Comparison of norovirus analysis performance of the Norovirus GFET sensor with other sensitive sensors in the same field.

Comparison of the proposed norovirus GFET sensor with other sensitive sensors in the same field.					
Methods	**Target**	**LOD**	**Linear range**	**Assay time**	**Refs.**
Aptamer-conjugated GFET	NoV VLP	6.17 pg/mL	10 pg/mL-100 ng/mL	5 min	this work
3D electrochemical Aptasensor	NoV VLP	0.28 ng/mL	1 ng/mL-10 μg/mL	30 min	S8
Electrochemical biosensor	NoV VLP	60 ag/mL	1 fg/mL-1 ng/mL	5 min	S9
Aptasensor	NoV VLP	100 pM	100 pM-3.5 nM	35 min	S10
Aptasensor	NoV VLP	80 ng/ml	0.16-10 μg/mL	30 min	S11
Electrochemical biosensor	HuNoV	0.003 copies/mL	$0.01–10^5$ copies/mL	2 h	S12
Electrochemical biosensor	HuNoV	0.84 copy/mL	$2.5-2.5\times10^5$ copies/mL	1.5 h	S13
Electrochemical biosensor	HuNoV	2.37 copies/mL	$10-10^4$ copies/mL	1 h	S14

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