Electronic Supplementary Material (ESI) for Analyst.

Supplementary Information

A Disposable Paper-based Electrochemical Biosensor Decorated by Electrospun Cellulose Acetate Nanofibers for highly Sensitive Bio-detection

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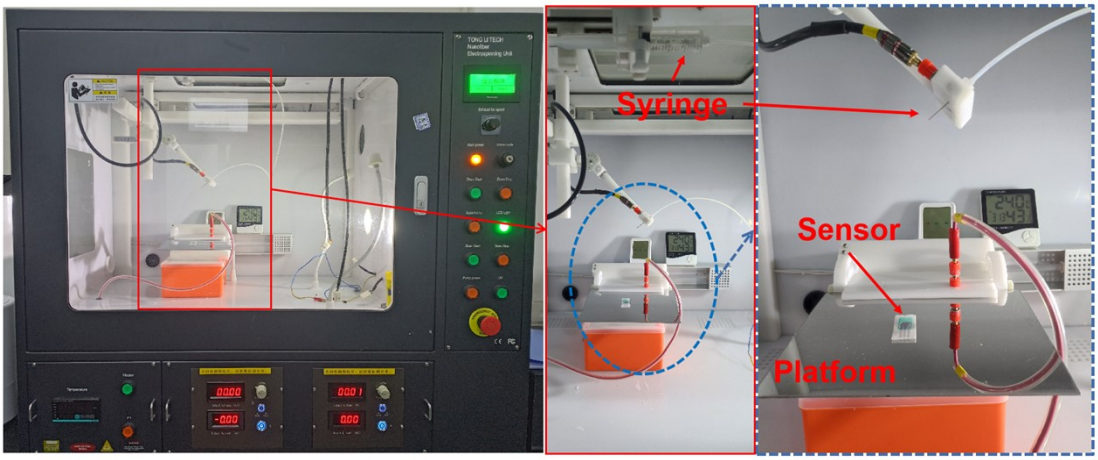

Fig. S1 The details of electrospinning device and the sensor.

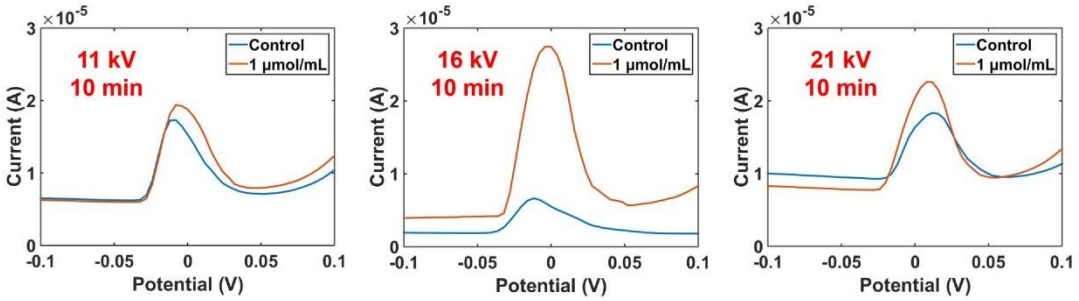

Fig. S2 DPV curves of electrospinning CA nanofibers with different excitation voltage (11, 16, and 21 kV); coating time duration=10 min.

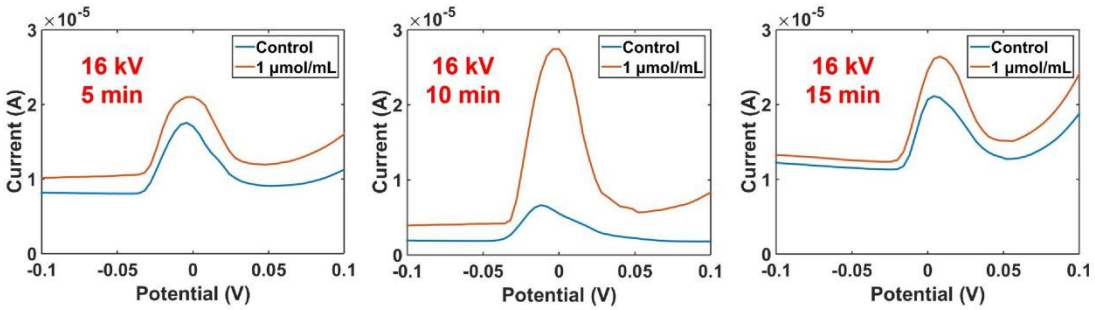

Fig. S3 DPV curves of the CA nanofibers at different electrospinning duration. 5 (a), 10 (b), and 15 min (c) at voltage=16 kV.

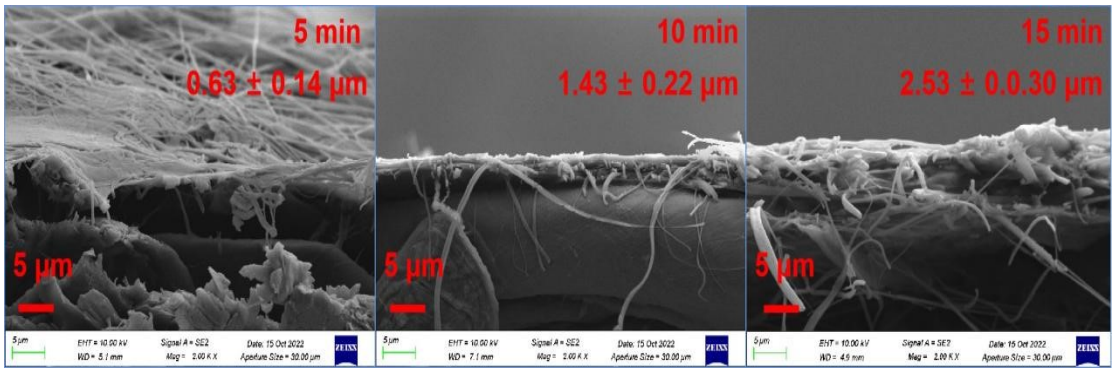

Fig. S4 SEM images of the cross-section and the thickness of the CA nanofibers at different electrospinning duration. 5 (a), 10 (b), and 15 min (c) at voltage=16 kV.

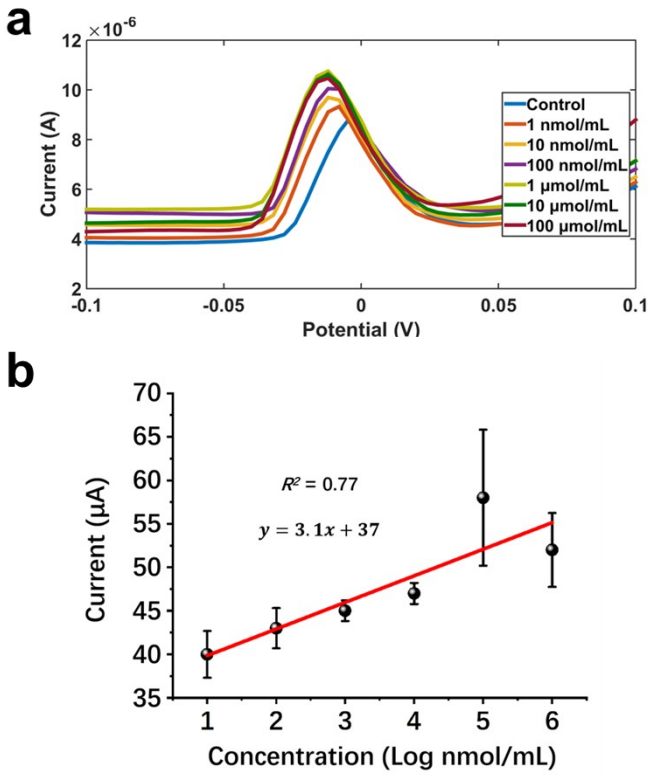

Fig. S5 (a) DPV curves and (b) calibration curve of glucose detection by the bare PBSP electrodes.

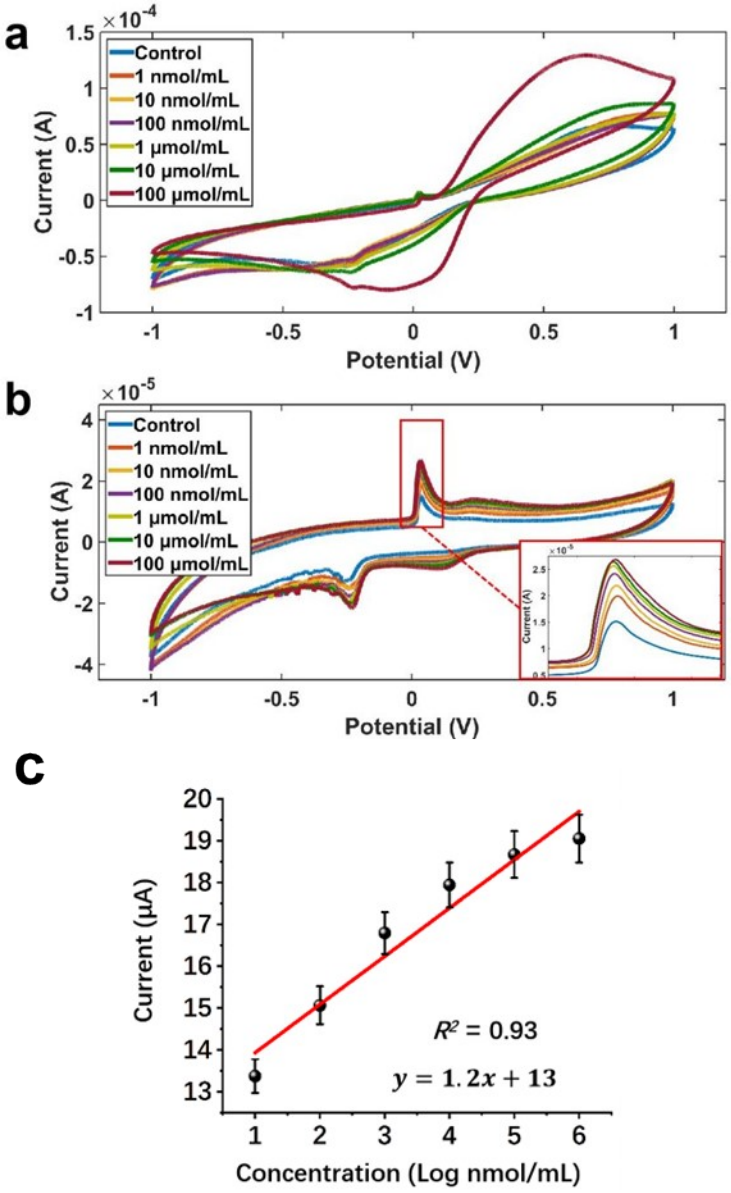

Fig. S6 (a) CV curves of glucose detection by the bare PBSP electrodes; (b) CV curves and (c) calibration curve of glucose detection by CA NFs-decorated PBSP electrodes.

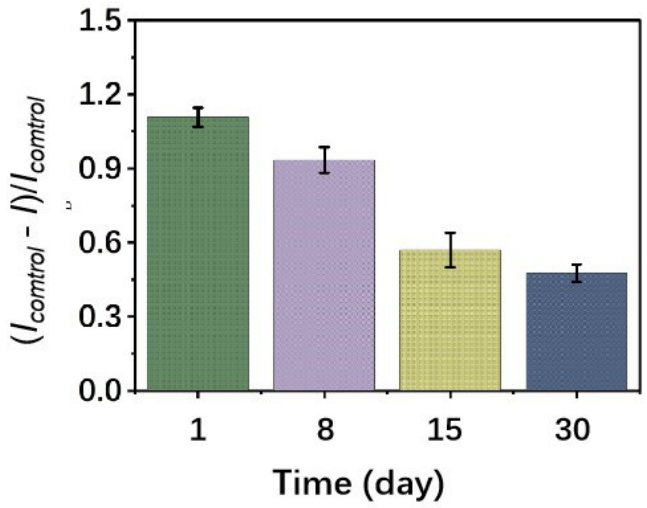

Fig. S7 Stability of CA NFs-decorated PBSP electrodes after modification of glucose oxidase

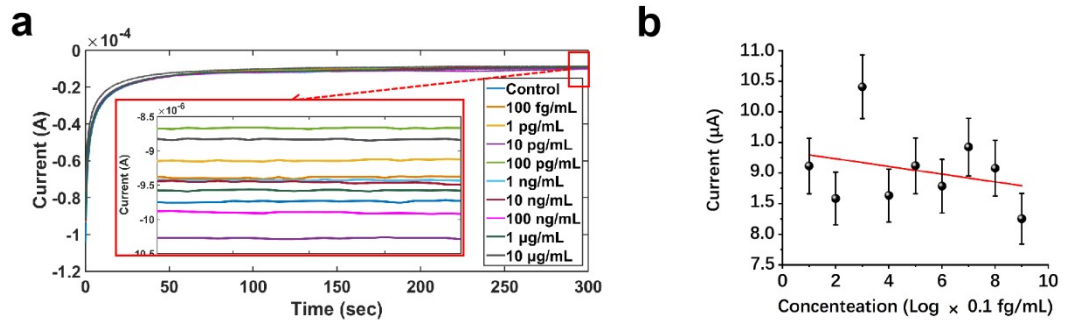

Fig. S8 (a) *I*-t curves and (b) calibration curve of Ag85B protein detection by bare PBSP electrodes.

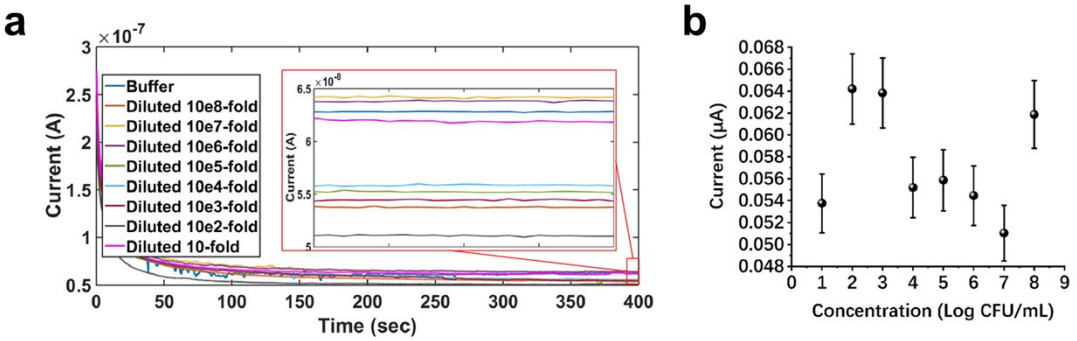

Fig. S9 (a) I-t curves and (b) calibration curve of *E. Coli O157:H7* detection by the CA NFs-decorated PBSP electrodes without the E. coli O157:H7 monoclonal antibody.

Table S1. Comparison of different electrochemical sensors for detecting glucose.

Electrode	Paper Structure	Technique	Range & LOD	Reference
CA/ZIF-8@enzyme/MWCNTs/AuNPs	No	-	1 − 10 µmol/mL LOD: 5.347 nmol/mL	Xin L., et al.[1]
PVA-SbQ-MWCNTCOOHs	No	-	5 nmol/mL - 4 µmol/mL LOD: 2 nmol/mL	Eleni S., et al.[2]
Graphene/polyaniline/AuNPs/glucose oxidase SPCE	Yes	DPV	0.2 - 11.2 µmol/mL LOD: 100 nmol/mL	Fen-Ying K., et al.[3]
PERs using a 3D printed BIA cell/SPEs	Yes	DPV	1 - 10 µmol/mL LOD: 110 nmol/mL	Anderson A D., et al.[4]
CA NFs/paper-based SPEs	Yes	CV/DPV	1 nmol/mL - 100 µmol/mL LOD: 0.71 nmol/mL	**Present work**

Table S2. Comparison of different electrochemical sensors for detecting protein.

Electrode	Paper Structure	Technique	Range&LOD	Reference
Ab-25OHD/SPE/FMTAD	Yes	SPR	10 - 100 ng/mL LOD: 10 ng/mL	Chauhan D., et al.[5]
MWCNTs-doped Chitosan NFs	No	-	1 pg/mL - 1 ng/mL LOD: 0.05 pg/mL	Wang X., et al.[6]
PMPC-S/AuNPs-SPCE PADs	Yes	DPV	5 - 5000 ng/mL LOD: 1.6 ng/mL	Chanika P., et al.[7]
SPEs/rGO-TEPA/Au and simple paper-based microfluidic devices	Yes	SWV	0.01 - 100.0 ng/mL LOD: 0.005 ng/mL	Liangli C., et al.[8]
CA NFs/paper-based SPEs	Yes	Chronoampero metry	100 fg/mL - 10 µg/mL LOD: 89.1 fg/mL	**Present work**

Table S3. Comparison of different electrochemical sensors for detecting bacteria.

Electrode	Paper Structure	Technique	Range&LOD	Reference
Silica NPs on polyelectrolyte multilayer on Au electrode	No	CV	8×10^4 - 8×10^6 CFU/mL LOD: 2×10^3 CFU/mL	Mathelie G., et al.[9]
Fluoride-doped tin oxide electrode	No	DPV	10^3 - 10^7 CFU/mL LOD: 10^3 CFU/mL	Divagar M., et al.[10]
Carbon paste, a mixture of multi-walled carbon nanotube (MWCNT)	Yes	DPV	6.9×10^2 - 10^6 CFU/mL LOD: 690 CFU/mL	Chanhwi P., et al.[11]
CA NFs/paper-based SPEs	Yes	Chronoampero metry	1.5×10^2 - 1.5×10^6 CFU/mL, LOD: 30 CFU/mL	**Present work**

References

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