

Supporting information

An innovative transportable immune-device for the recognition of α -Synuclein using KCC-1-*nPr*-CS₂ modified silver nano-ink: Integration of pen-on-paper technology with biosensing toward early-stage diagnosis of Parkinson

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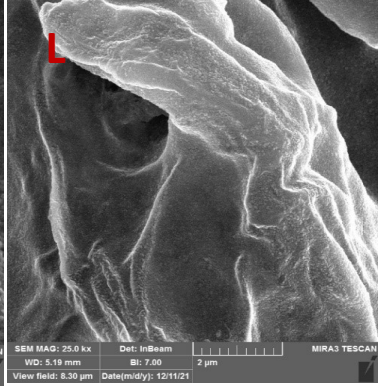
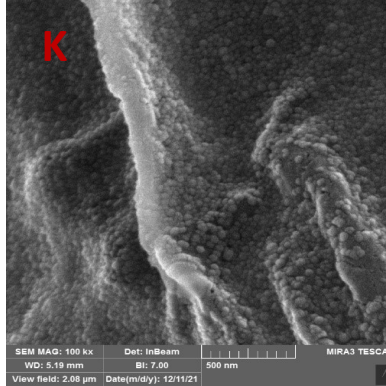
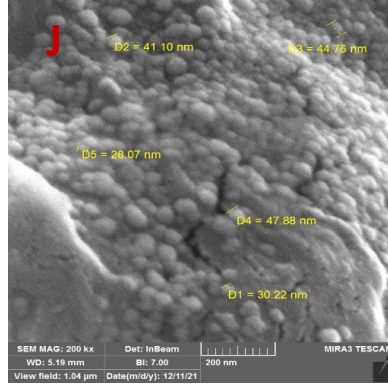
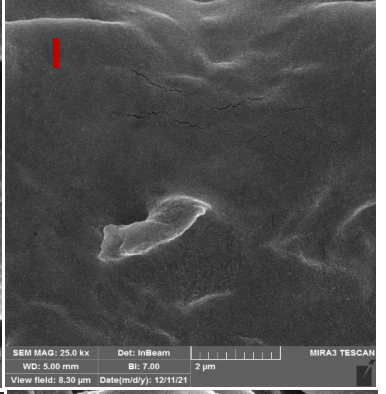
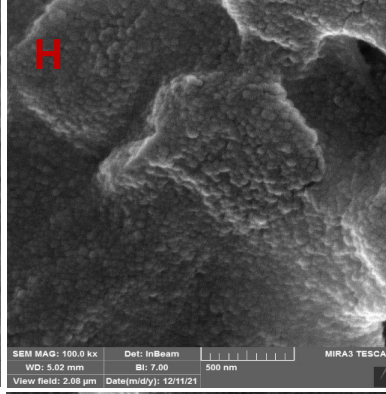
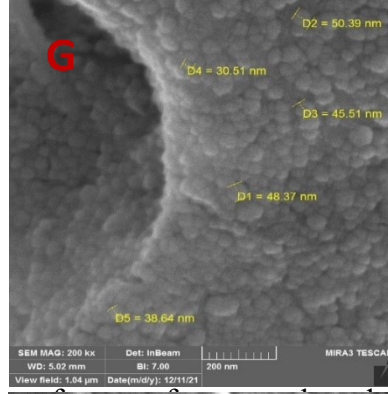
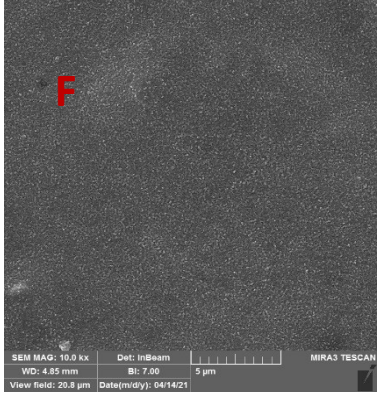
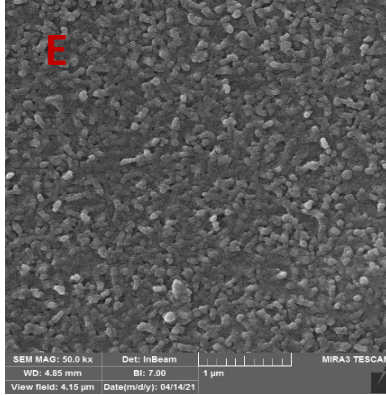
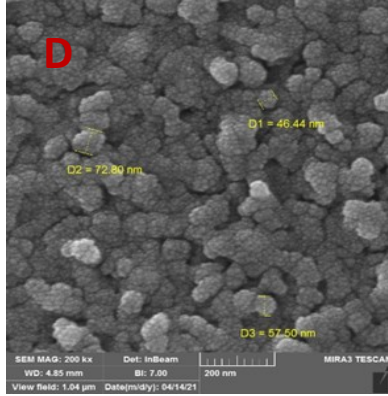
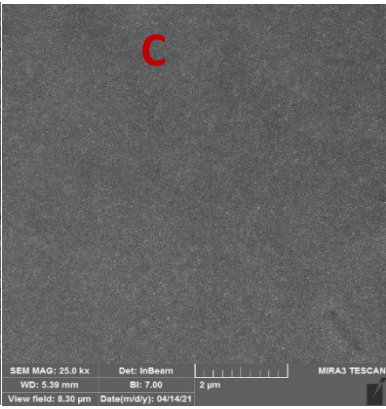
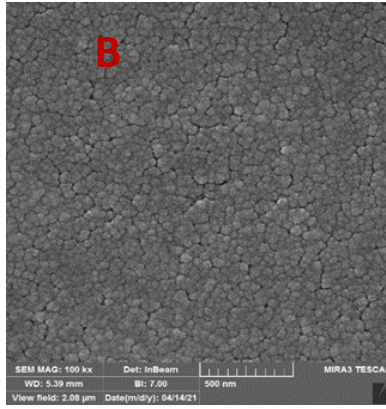
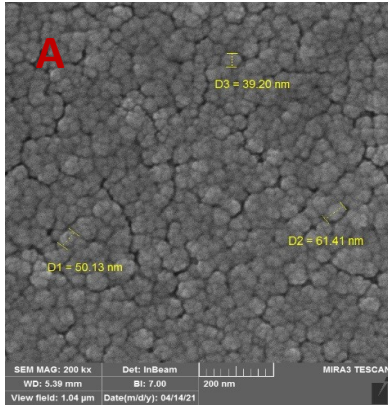
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Scheme S1. Indicates the connection of the designed three-electrode system by conductive Ag-ink (reference, working and counter electrode) to the electrochemical device.



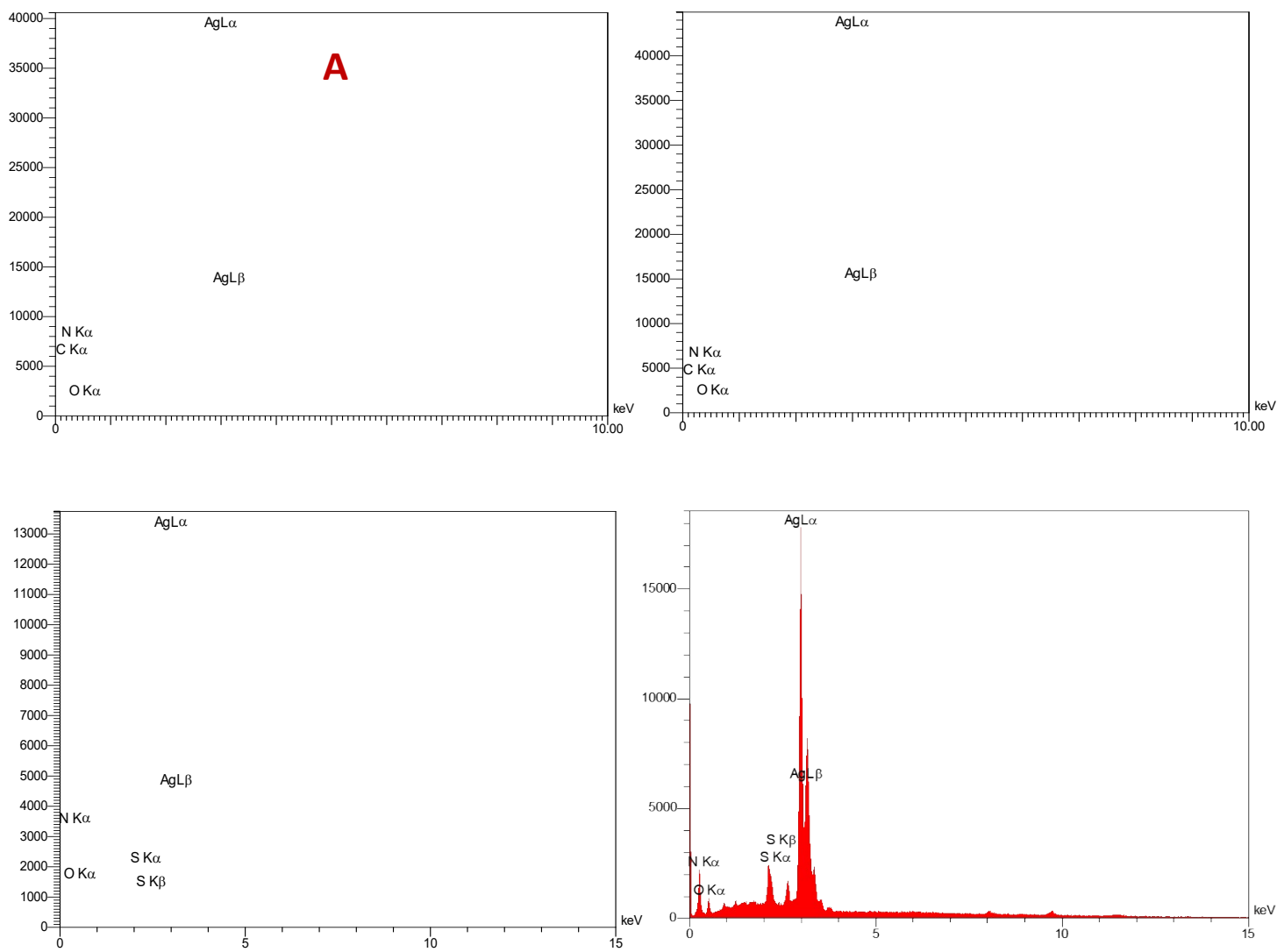


Figure S2. EDS results of **A:** bulk Ag ink (41), **B:** Ag ink/(KCC-1-NH-CS₂)-Ab, and **C:** Ag ink/(KCC-1-NH-CS₂)-Ab/BSA/Ag.

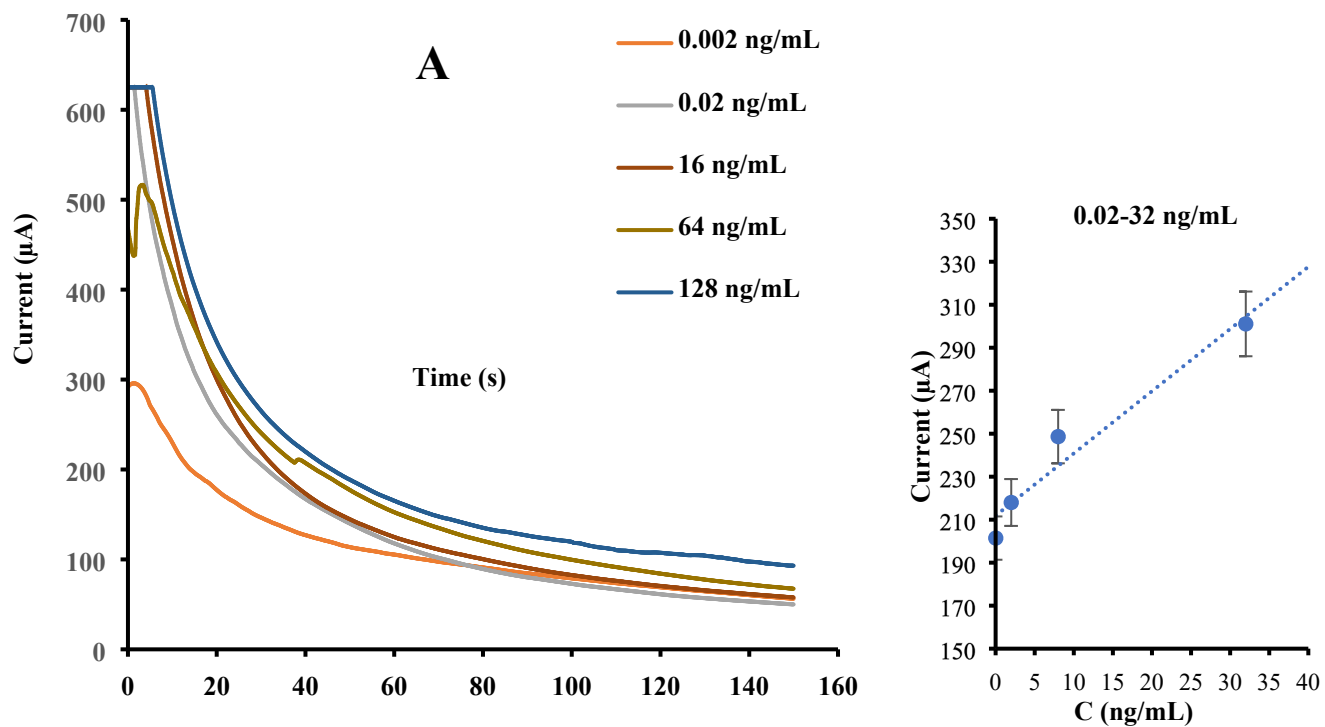
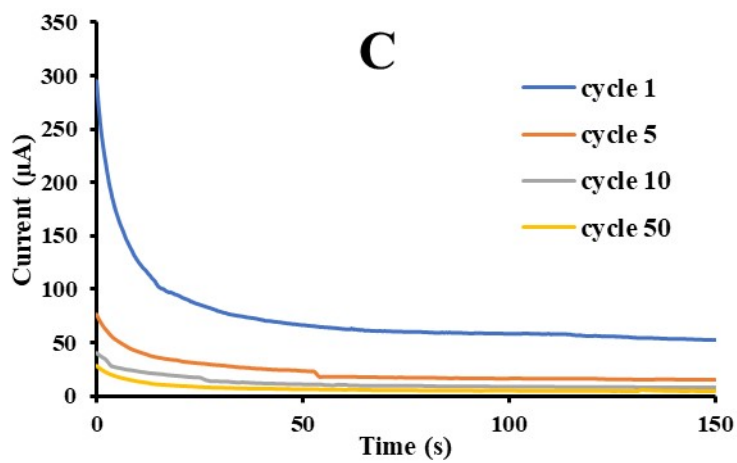
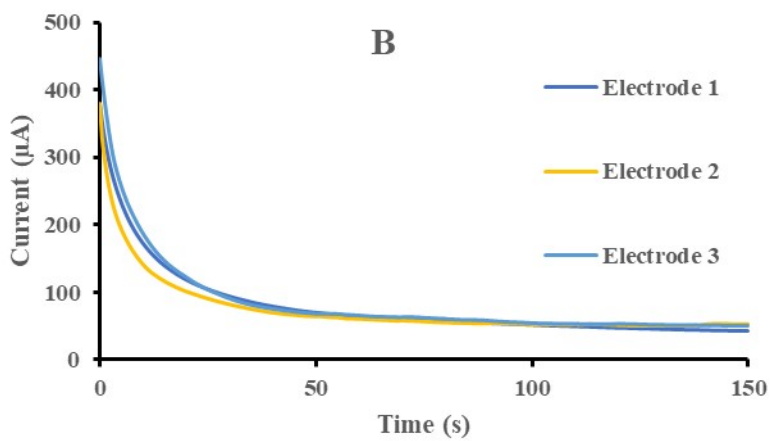
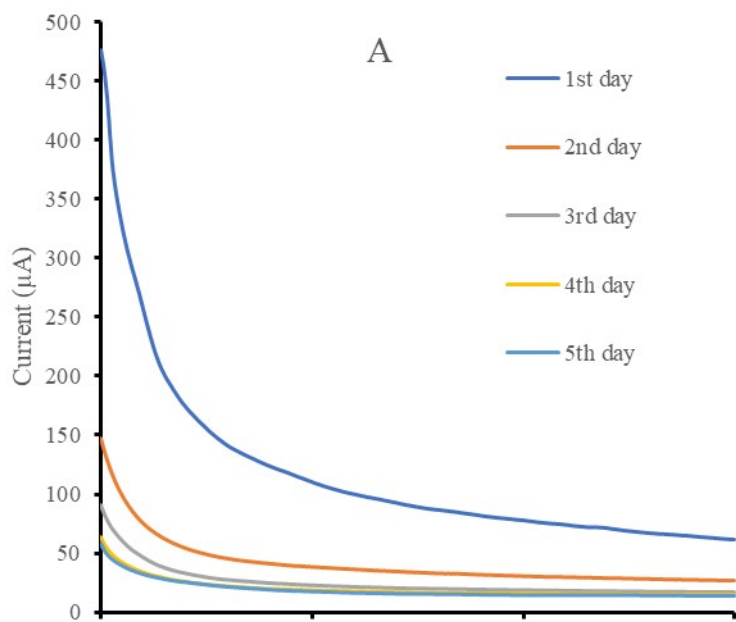
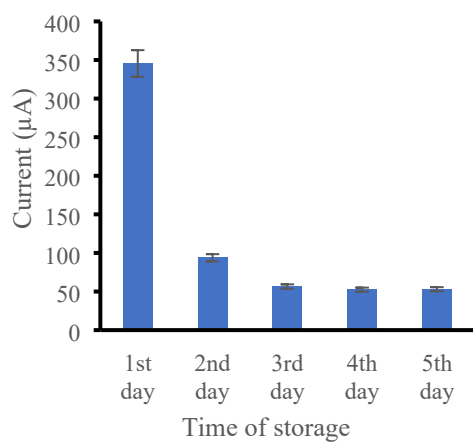
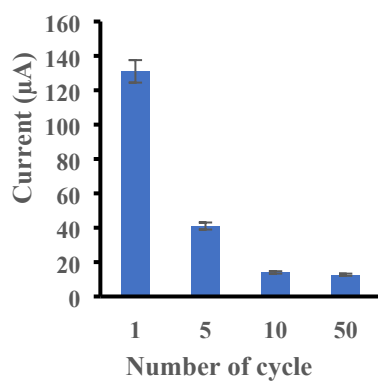


Figure S3. A) ChAs of immunosensor in the presence of various concentrations of α -syn antigen (0.002, 0.02, 16, 64, and 128 ng/ml) spiked with human plasma samples in 0.01M $[\text{Fe}(\text{CN})_6]^{3-/4-}$ /KCl solution as electrochemical probe in $E=0.6$ V, duration time=150, **B)** Calibration curve of current intensity changes against α -synuclein antigen concentrations spiked with human plasma samples.





a



c

Figure S4. ChAs related to stability analysis of prepared sensor in the presence of 0.01M $[\text{Fe}(\text{CN})_6]^{3-/4-}/\text{KCl}$ solution as electrochemical probe in $E=0.25$ V, duration time=150: **A)** Inter-day stability and its histogram, **B)** Repeatability, and **C)** Cyclic stability and its histogram (c).

Table S1. The repeatability of α -Syn immunosensor.

Concentration(ng/ml)	I ₁ /μA	I ₂ /μA	I ₂ /μA	SD	AVE _{STDV}
2	278	276	270	3.59	2.26
8	299	295	297	2.66	
32	372	369	368	2.82	
128	610	612	608	1.41	