Photographs of CSCu and CSCuCNT gels on the SPGE.

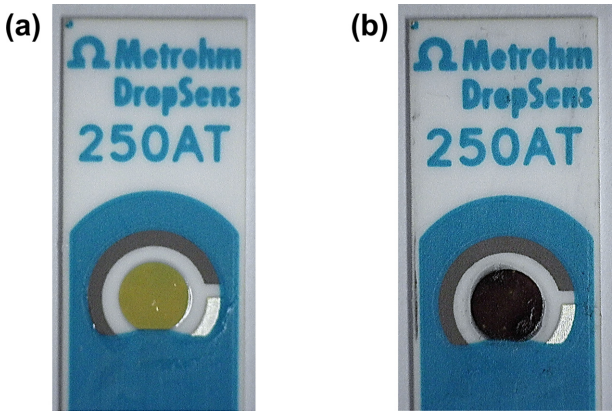

Fig. S9. Optical images of (a) CSCu gel and (b) CSCuCNT gel on the working electrode area of a SPGE.

Selectivity performance of the Cu^{2+}–Chitosan/SWCNT hydrogel platform toward glucose detection.

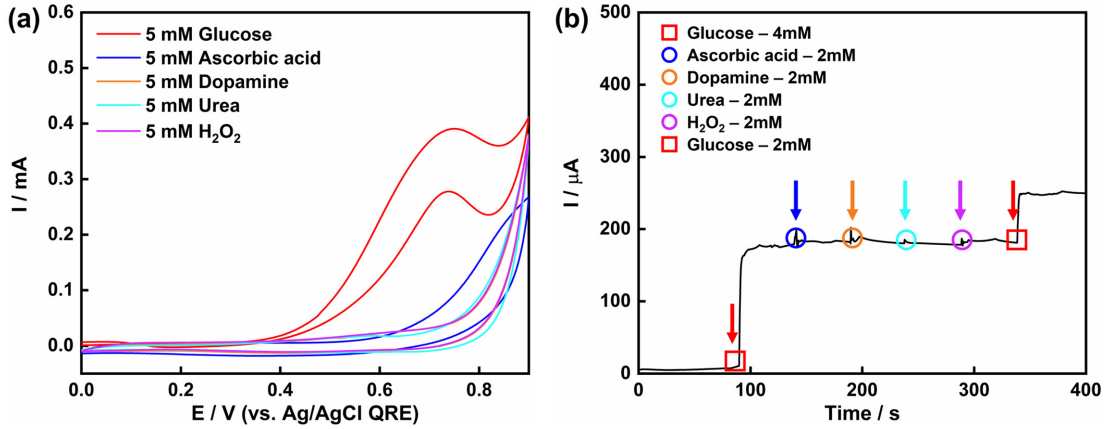

Fig. S10. Selectivity evaluation of the as-prepared Cu^{2+}-chitosan/SWCNT hydrogel sensing platform. (a) Cyclic voltammograms (CVs) recorded in 0.1 M NaOH containing 5 mM glucose and 5 mM of common interfering species (ascorbic acid, dopamine, urea, and H_2O_2). (b) Chronoamperometric (CA) responses at an applied potential of 0.7 V (vs. Ag/AgCl) upon successive additions of glucose and the interfering species.

The selectivity of the Cu^{2+}-chitosan/SWCNT hydrogel sensing platform is a critical parameter for practical non-enzymatic glucose detection. We investigated the sensor's response to glucose against several common interfering species typically found in physiological samples, including Ascorbic Acid (AA), Dopamine (DA), Urea, and Hydrogen Peroxide (H_2O_2) (Fig. S7).

Cyclic voltammograms (Fig. S7a) demonstrated a pronounced catalytic oxidation current exclusively for 5 mM Glucose. In contrast, 5 mM concentrations of DA, Urea, and H_2O_2 exhibited only negligible charging currents. A minor oxidation peak was observed for 5 mM AA, but its magnitude was significantly smaller than that of glucose.

Chronoamperometric (CA) measurements (Fig. S7b) further confirmed this selectivity. Clear, step-wise current increases were recorded upon the successive additions of 4 mM and 2 mM Glucose. Conversely, the subsequent additions of 2 mM AA, DA, Urea, and H_2O_2 produced no significant steady-state current response, apart from minor transient spikes upon injection.

These findings indicate that common interfering species are not significantly oxidized at 0.7 V, confirming the excellent selectivity of the Cu^{2+}-chitosan/SWCNT hydrogel platform for glucose sensing.