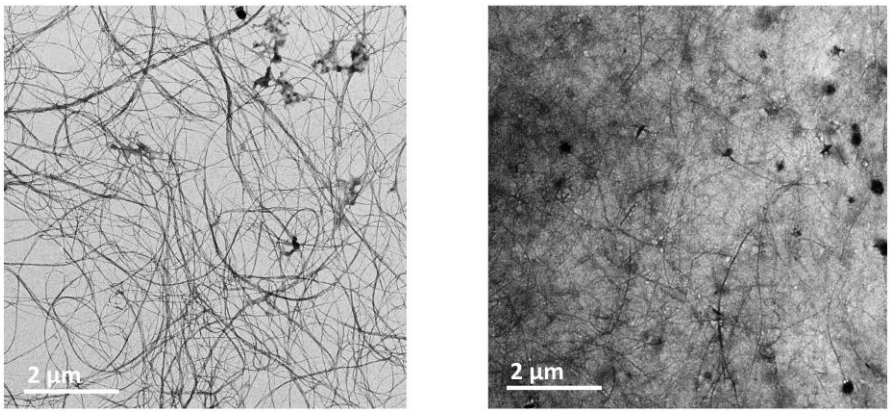
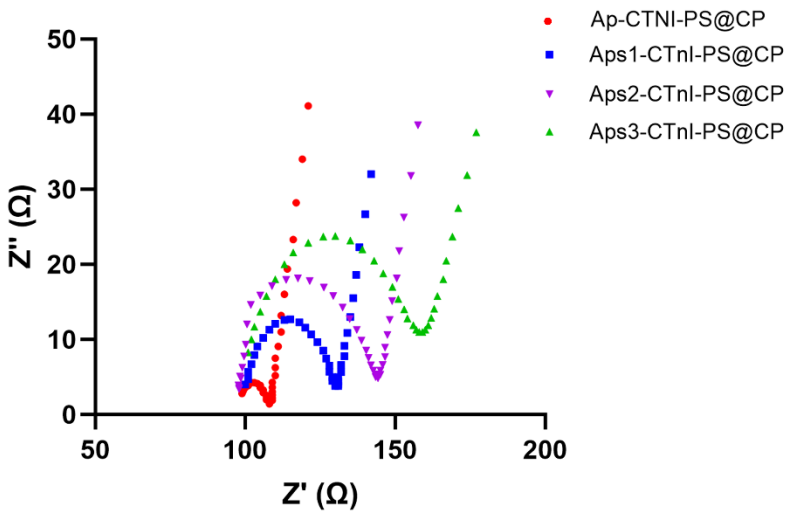


Figure S1. TEM morphology of SWCNTs' dispersibility and integrity in water or PEDOT:PSS.

Name	Sequence (5' to 3')
Ap-CTnI	5'-ATATATATAT CGTGCAGTACGCCAACCTTTCTCATGCGCTGCCCCTCTTA-3'
Api1-CTnI	5'-ATATATATAT/Sp18/CGTGCAGTACGCCAACCTTTCTCATGCGCTGCCCCTCTTA-3'
Api2-CTnI	5'-ATATATATAT/Sp18/Sp18/CGTGCAGTACGCCAACCTTTCTCATGCGCTGCCCCTCTTA-3'
Api3-CTnI	5'-ATATATATAT/Sp18//Sp18/Sp18/CGTGCAGTACGCCAACCTTTCTCATGCGCTGCCCCTCTTA-3'

Figure S2. The sequence of modified CTnI aptamers.



	R_{ct} (Ω)	K_{ct} (cm^2/s)	K_{et} (cm^2/s)
Ap-CTnI-PS@CP	10.48	9.2×10^{-3}	8.3×10^{-3}
Aps1-CTnI-PS@CP	30.15	3.2×10^{-4}	3.2×10^{-4}
Aps2-CTnI-PS@CP	45.25	2.1×10^{-4}	2.1×10^{-4}
Aps3-CTnI-PS@CP	63.15	1.5×10^{-4}	1.5×10^{-4}

Figure S3. The Nyquist plot of modified PS@CP with different aptamers.

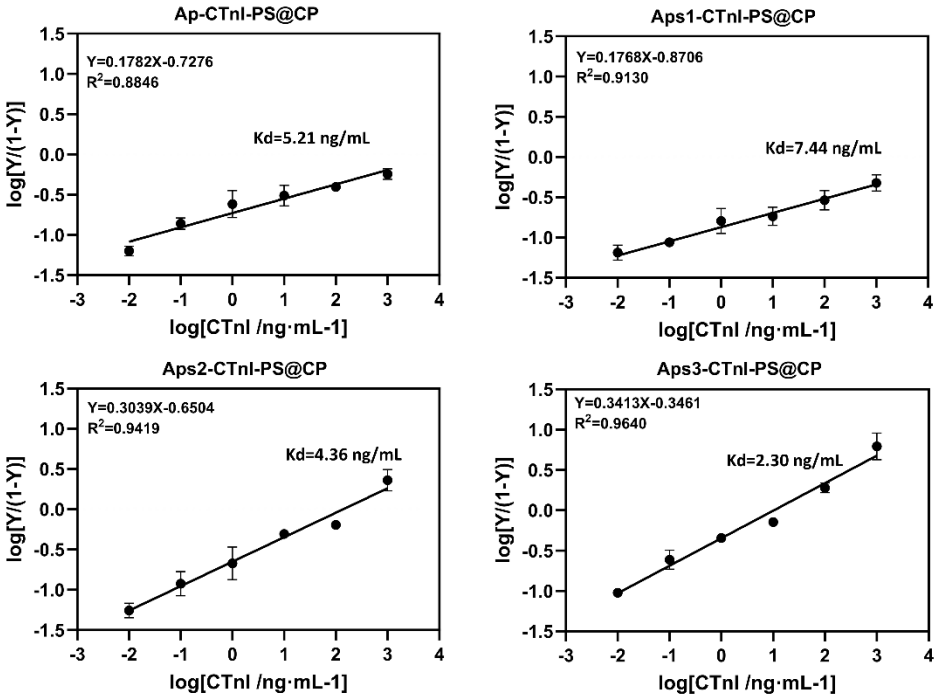


Figure S4. Hil plot, log Y/(1-Y) as a function of log [aptamers] where Y = $\Delta R_{ct}/\Delta R_{ct(max)}$, ΔR_{ct} and $\Delta R_{ct(max)}$ is changing in charge transfer resistance.

Table S1. CTnI of different concentrations detection by the Aps3-CTnI-PS@CP.

CTnI added (ng/mL)	CTnI founded (Mean±SD)	Recovery %	RSD%	Student's t-test
0	No detection	-	-	-
0.01	0.00982±0.0002	98.20	2.34	P >0.05
0.1	0.0992±0.0019	99.20	1.81	P >0.05
1	0.977±0.03	97.70	3.07	P >0.05
10	9.81±0.38	98.10	3.88	P >0.05

Table S2. The repeatability the Aps3-CTnI-PS@CP to assess the interday, during 3 days in the presence of 10ng/mL CTnI.

day	CTnI-Known (ng/mL)	CTnI-Obtained (ng/mL)	Average	SD	RSD (%)	$t_{calculated}$	$t_{critical}$
day 1	10	9.754	9.917	0.156	1.570	0.531	4.303
day 2	10	10.064					
day 3	10	9.934					

Table S3. The repeatability the Aps3-CTnI-PS@CP to assess the intraday 3 times in the presence of 10ng/mL CTnI.

day	CTnI-Known (ng/mL)	CTnI-Obtained (ng/mL)	Average	SD	RSD (%)	$t_{calculated}$	$t_{critical}$
day 1	10	9.583	9.821	0.297	3.027	0.713	4.105
	10	10.154					
	10	9.725					