

-Supporting information-

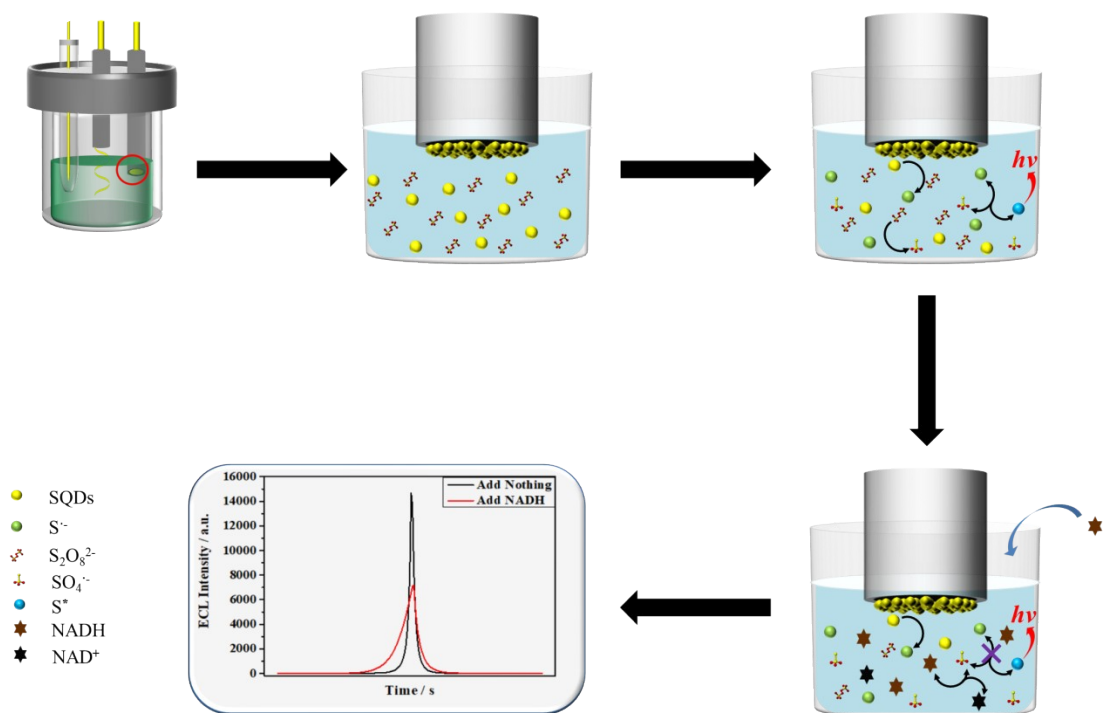
An ultrasensitive electrochemiluminescence biosensor of total bacterial count in environmental and biological samples based on a novel sulfur quantum dots luminophore

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Scheme S1. Mechanism of the SQDs/GCE/K₂S₂O₈ for detecting NADH.

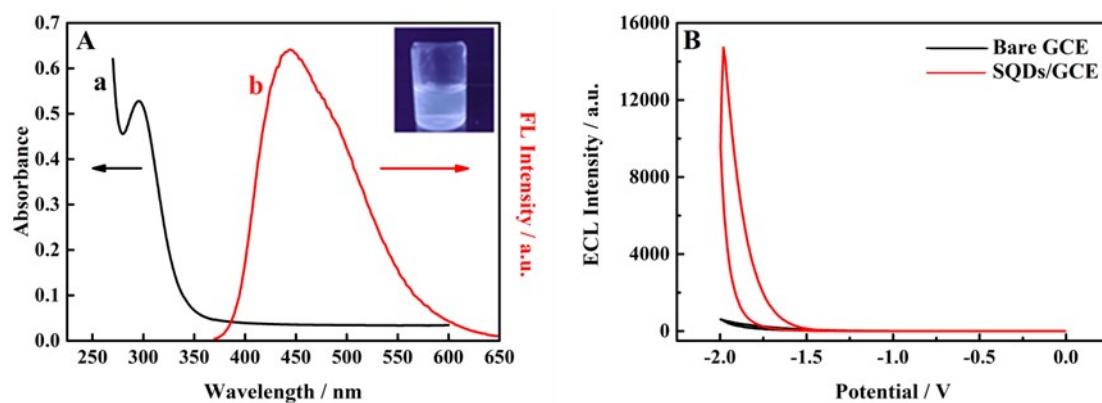


Fig. S1. (A) UV-vis absorption spectra of the SQDs (a). Fluorescence emission ($\lambda_{\text{ex}} = 365 \text{ nm}$) spectra of the SQDs (b). (B) ECL curves of the bare electrode and SQDs electrode.

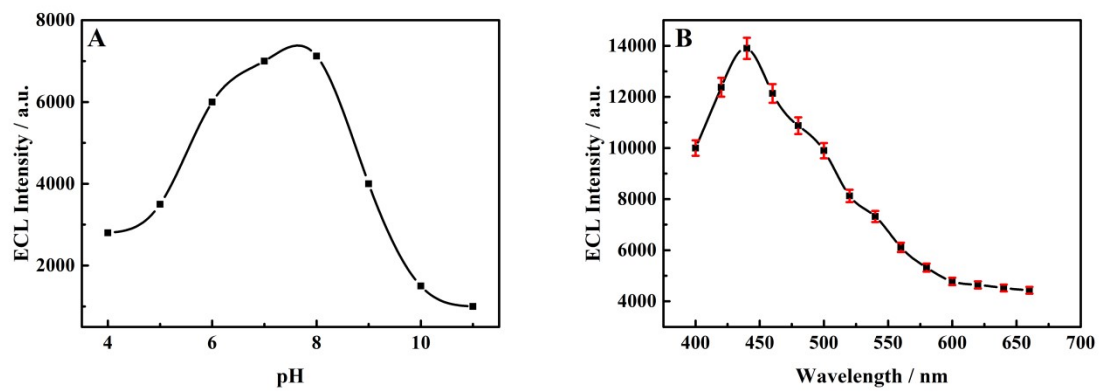


Fig. S2. The optimization about pH of SQDs electrode. (B) The ECL spectrum of the SQDs electrode.

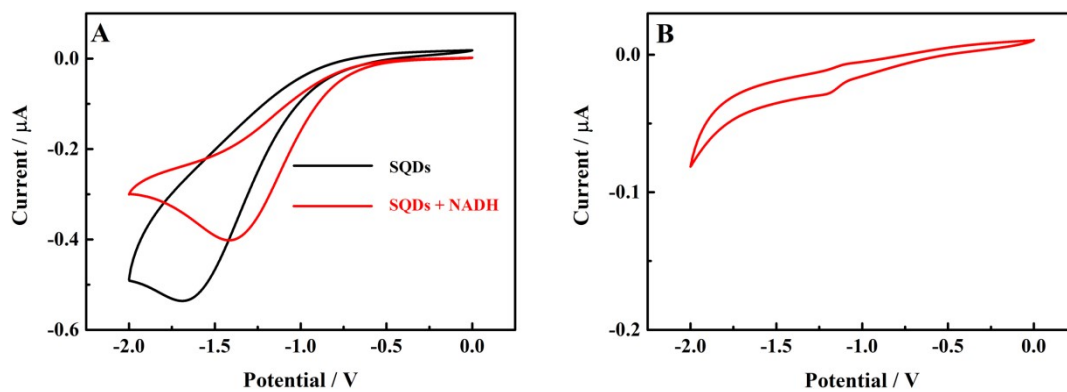


Fig. S3. (A) Cyclic voltammetry curves of the SQDs (black) and the SQDs with NADH (red). (B) Cyclic voltammetry curves of bare GCE with NADH in $\text{K}_2\text{S}_2\text{O}_8$ solution.

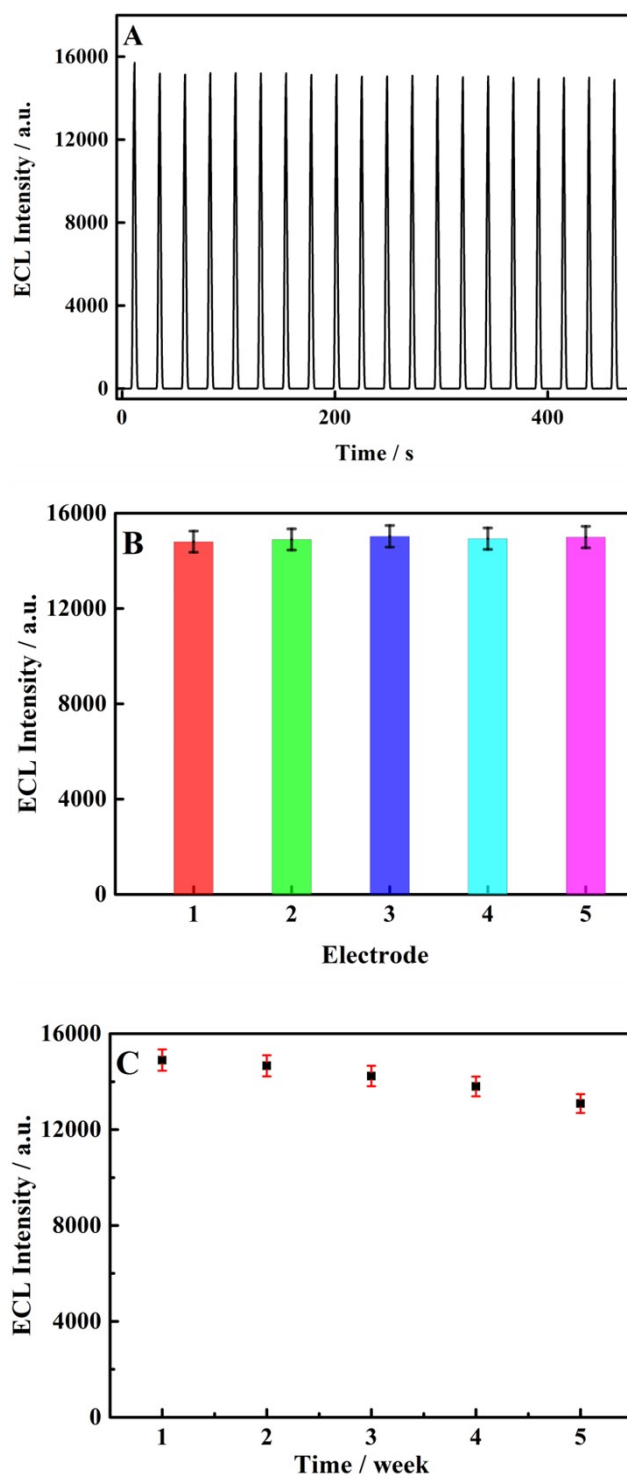


Fig. S4. (A) ECL behaviors of the SQDs under 20 continuously cyclic scans in PBS (0.1 M, pH = 7.4) containing 0.05 M $K_2S_2O_8$. (B) Repeatability of 5 different SQDs electrodes. (C) The stability of the same SQDs electrode over 5 weeks.

Table S1. Comparison of the limit of detection (LOD) of this method introduced here with other reported methods.

Modified electrode materials	Linear range / μM	LOD / μM	Ref.
WS ₂ nanosheets ^a	2 to 2048	5.7×10^{-2}	[1]
L1- ONP ^b	0.1 to 0.6	8.4×10^{-2}	[2]
PPD/GCE ^c	10^{-1} to 10^{-3}	8.1×10^{-5}	[3]
[Ru(bpy) ₂ PVP ₁₀] _n (ClO ₄) ₂ ^d	10^{-8} to 10^1	5×10^{-9}	[4]
DDF/MWCNT ^e	10^{-3} to 8×10^{-2}	7×10^{-4}	[5]
G-DNA tetrahedron-AuNPs ^f	10^{-9} to 10^{-5}	10^{-9}	[6]
SQDs	10^{-6} to 10^1	10^{-6}	This work

^a WS₂ nanosheets

^b Imine linked dipodal receptor (L1) was synthesized and its organic nanoparticles

^c Carbon paste electrodes coated with poly(o-phenylenediamine) (PPD) and poly(o-aminophenol) conducting films

^d Metallopolymer–nanoparticle composites, bpy is 2,2'-bipyridyl and PVP is poly (4-vinylpyridine)

^e 6,7-dihydroxy-3-methyl-9-thia-4,4a-diazafluoren-2-one/multi-wall carbon nanotubes

^f Graphene-DNA tetrahedron-AuNPs modified gold disk electrode

References

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