

Supporting Information

Single electrode genosensor for simultaneous determination of sequences encoding hemagglutinin and neuraminidase of Avian Influenza Virus (AIV) type H5N1

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Figure S-1

The calculation of energy of ssDNA-Fc- ssDNA-Fc dimer formation in solution.

Oligo sequence: ATTTGGAGCTATAGCAGGTT

Number of bases : 20

Description: ferrocene

Properties of Anti-sense Primer:

Rating	76
Molecular Wt	6,187.11
T _m	51.41 °C
GC%	40
nmol/A260	5.02

μg/A260	31.06
ΔG	-31.84 kcal/mol
3' end Stability	-7.95 kcal/mol
ΔH	-155.6 kcal/mol
ΔS	-0.42 kcal/mol
5' end Stability	-7.32 kcal/mol

Secondary structures of anti-sense primer:

Hairpins:

Hairpins not found

Dimers:

1. ΔG = -12.87 kcal/mol



2. ΔG = -6.34 kcal/mol



The calculation of energy of ssDNA-MB-ssDNA-MB dimer formation in solution.

Number of bases : 20

Description: methylene blue

Rating	83
Molecular Wt	6,199.13
T _m	51.87 °C
GC%	45
nmol/A ₂₆₀	4.78

$\mu\text{g}/\text{A}_{260}$	29.63
ΔG	-30.31 kcal/mol
3' end Stability	-6.47 kcal/mol
ΔH	-140.8 kcal/mol
ΔS	-0.37 kcal/mol
5' end Stability	-8.44 kcal/mol

Hairpins:

┌ ACTGTCAGGGTAA 5'
 A │ │ │ │ │
 └ AGACAG 3'

1. $\Delta G = -7.47 \text{ kcal/mol}$ (3' Dimer)

5' AATGGGACTGTCAAAGACAG 3'
||||| |||||
3' GACAGAAACTGTCAGGGTAA 5'

Figure S-3

Representative Osteryoung Square Wave voltammograms recorded with electrode modified with SH-ssDNA-Fc and SH-ssDNA-MB probe –black line and after hybridization (30 minutes) with:

- (1) 1 μM of target oligonucleotide complementary to SH- ssDNA- Fc – red line
- (2) 1 μM target oligonucleotide complementary to SH-ssDNA-MB – blue line

Measuring conditions: in 0.1 M NaClO_4 and 2.5 mM Na_2HPO_4 , pH 7.0; frequency: 100 Hz; step potential: 0.105 V/s; amplitude: 0.025 V.

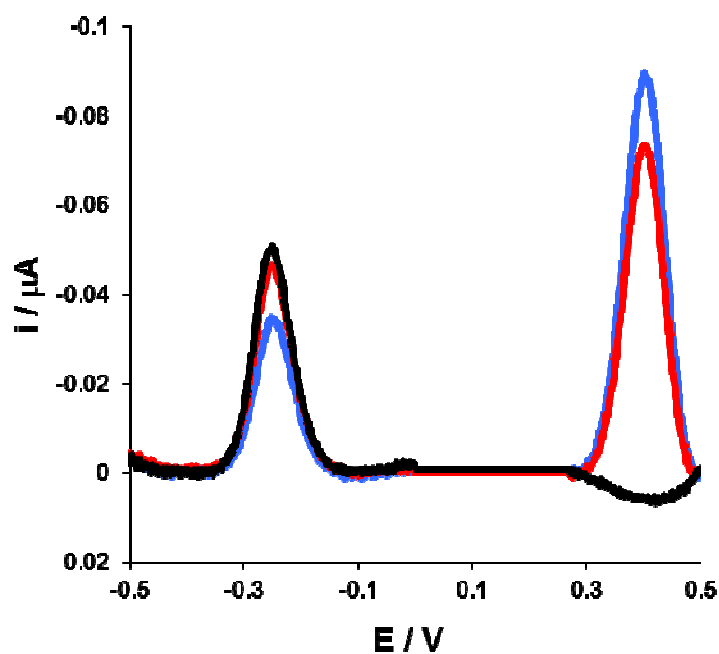


Figure S-4

Representative Osteryoung Square Wave voltammograms recorded with electrode modified with SH-ssDNA-Fc and SH-ssDNA-MB probe –black line and after hybridization (30 minutes) with:

- (1) 1 μM target oligonucleotide complementary to SH-ssDNA-MB – blue line
- (2) 1 μM target oligonucleotide complementary to SH-ssDNA- Fc – red line

Measuring conditions: in 0.1 M NaClO_4 and 2.5 mM Na_2HPO_4 , pH 7.0; frequency: 100 Hz; step potential: 0.105 V/s; amplitude: 0.025 V.

