

Supporting information for
Electrochemical detection of Hepatitis C Viral NS3-4A Protease

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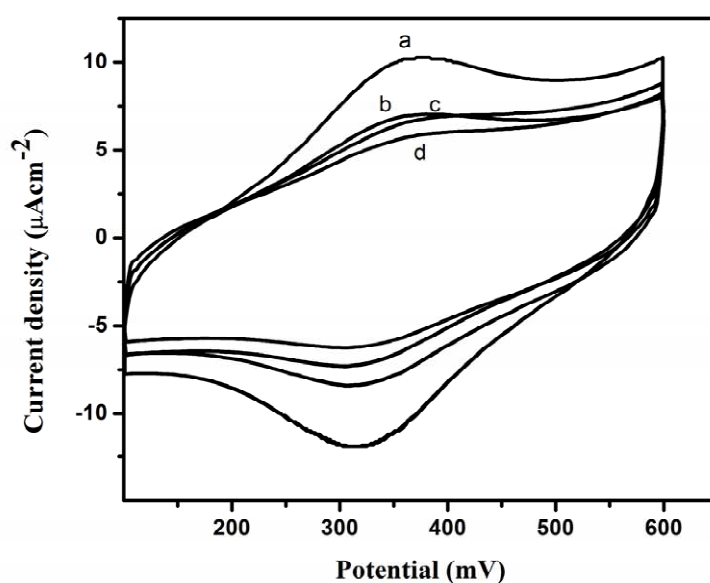


Figure S1: Cyclic voltammograms of the Hep CV NS3-4A protease biosensor after immobilization in (a) thioctic acid ferrocene derivative (b) hexanethiol (c) activation with NHS/EDC and (d) NS3-4A specific peptide. in 20 mM Tris-HCl buffer (pH 8.0) containing 0.1 mM NaClO₄. CV was recorded at a scan rate of 100 mVs⁻¹. Reference electrode is Ag/AgCl (3M KCl) and platinum electrode was used as the counter electrode.

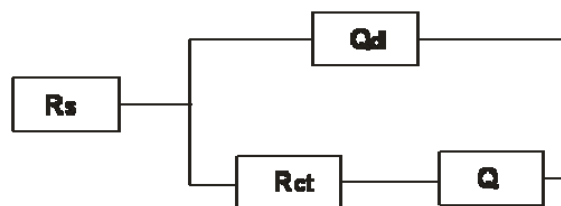
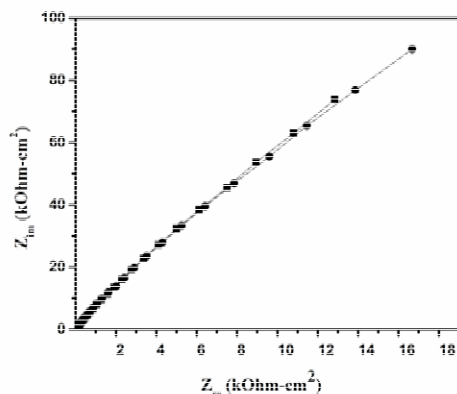


Figure S2: Nyquist plot (Z_{im} vs Z_{re}) of the peptide modified surface [●] before NS3-4A addition and [◆] after NS3-4A addition and the equivalent circuit used in fitting the data. Impedance measurements recorded in Tris- ClO_4 (pH 8) buffered solution at an applied potential of 250mV, modulation amplitude of 5mV and frequency range 0.1Hz-100 kHz, using Fittings to the equivalent circuit are represented by solid lines.

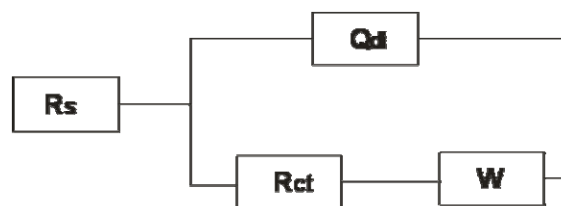
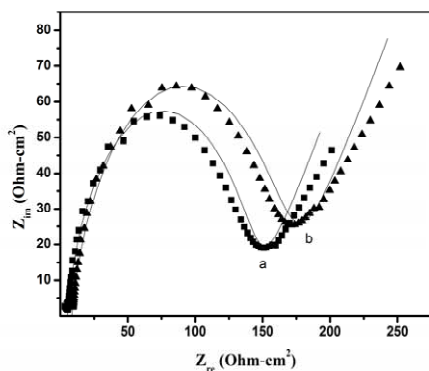


Figure S3: A Nyquist plot showing the surface modified with the HCV NS3-4A specific peptide [▲] and after the addition of 5 pM [■] of the NS3-4A protease. The impedance experiments were recorded in Tris- ClO_4 solution (20mM, pH 8) at an applied potential of 250mV, modulation amplitude of 5mV and frequency range 0.1Hz-100 kHz, using $\text{K}_4[\text{Fe}(\text{CN})_6]/\text{K}_3[\text{Fe}(\text{CN})_6]$ as a solution based redox probe. Fittings to the equivalent circuit are represented by solid lines

Table S1: Equivalent circuit element values for the impedance spectroscopy with R_s and R_{ct} in Ohmcm^2 , Q in $\mu\text{Sec}^n\text{cm}^{-2}$ and W in $\text{mSsec}^5\text{cm}^{-2}$

	R_s	Q	N	R_{ct}	W
Peptide	8(2)	61 (3)	0.76(0.2)	124(18)	10(6)
5 pM	9(6)	37(3)	0.81(0.1)	157(3)	11(8)
10 pM	9(2)	29(1)	0.84(0.04)	160(10)	11(1)
25 pM	9(1)	27(5)	0.87(0.01)	215(15)	9(1)
50 pM	9(2)	28(4)	0.89(0.02)	312(7)	10(1)
100 pM	9(2)	26(4)	0.91(0.02)	609(33)	12(2)

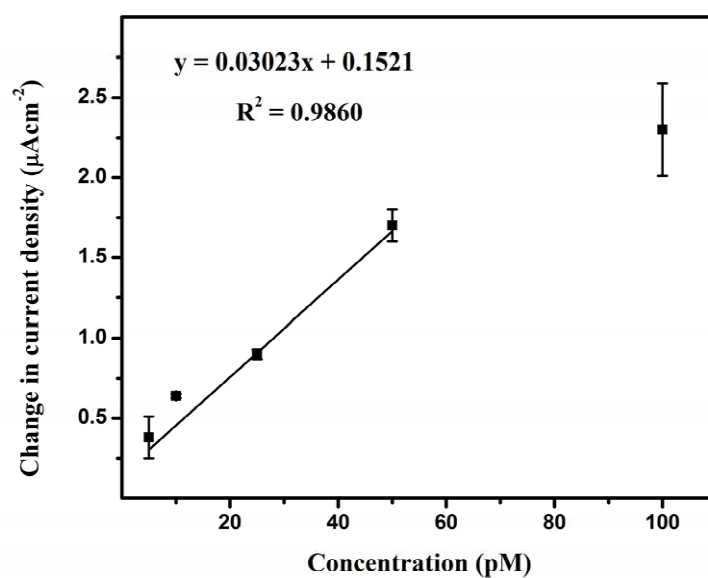


Figure S4: Plot of the change in current density against concentration. Error bars represent standard deviations

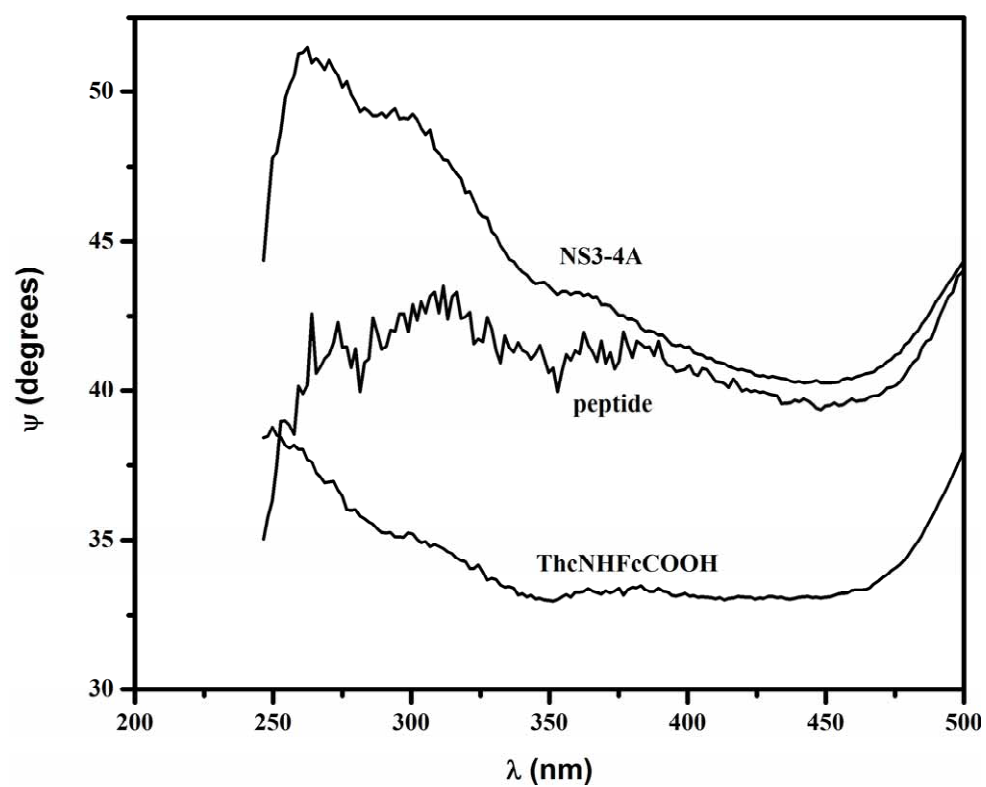


Figure S5: Characteristic ellipsometric scan from the gold surface after modification with the thioctic acid modified ferrocene compound, NS3-4A specific peptide and NS3-4A (100pM)