Supplementary information

Smartphone based LSPR sensing platform for bio-conjugation detection and quantification

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Table: wavelength of the standard laser sources with their corresponding pixel positions

Table S1 Pixel positions of the standard laser sources

Lasers	Wavelength	Pixel position
Blue Laser	405 nm	695
Green laser	533 nm	1078
Red laser	655 nm	1439

Tables: Comparison of smartphone sensor versus spectrophotometer in measurement of resonance wave length of AuNPs under different conditions:

Table S2 Comparison of smartphone and standard spectrophotometer results in determination of average diameter of AuNPs of different size

Gold nanoparticle size (nm)	LSPR wavelength (Smartphone)	LSPR wavelength (Spectrophotometer)
5	514.52 ± 0.286 nm	512.54 nm
20	524.04 ± 0.367 nm	524.22 nm
30	527.29 ± 0.341 nm	527.45 nm
40	531.12 ± 0.483 nm	532.70 nm

Table S3 Comparison of smartphone and standard spectrophotometer results in measurement of spectral red-shift of AuNPs (20 nm) upon conjugation with BSA protein.

BSA conjugated AuNP samples	LSPR wavelength (Smartphone)	LSPR wavelength (Spectrophotometer)
Bare AuNPs	524.04 nm	524.22 nm
0.1 mg/mL BSA	526.14 ± 0.075 nm	525.31 nm
0.2 mg/mL BSA	527.29 ± 0.184 nm	526.27 nm
0.3 mg/mL BSA	528.46 ± 0.214 nm	528.41 nm

Table S4 Comparison of smartphone and standard spectrophotometer results in measurement of spectral red-shift of AuNPs (20 nm) upon conjugation with Trypsin enzyme.

Trypsin conjugated AuNP samples	LSPR wavelength (Smartphone)	LSPR wavelength (Spectrophotometer)
Bare AuNPs	524.04 nm	524.22 nm
0.1 mg/mL Trypsin	525.62 ± 0.159 nm	525.02 nm
0.2 mg/mL Trypsin	527.12 ± 0.106 nm	527.24 nm
0.3 mg/mL Trypsin	527.50 ± 0.122 nm	528.30 nm

Figures: Accuracy in resonance wavelength of AuNPs under different conditions as measured with the designed smartphone sensor and standard spectrophotometer:

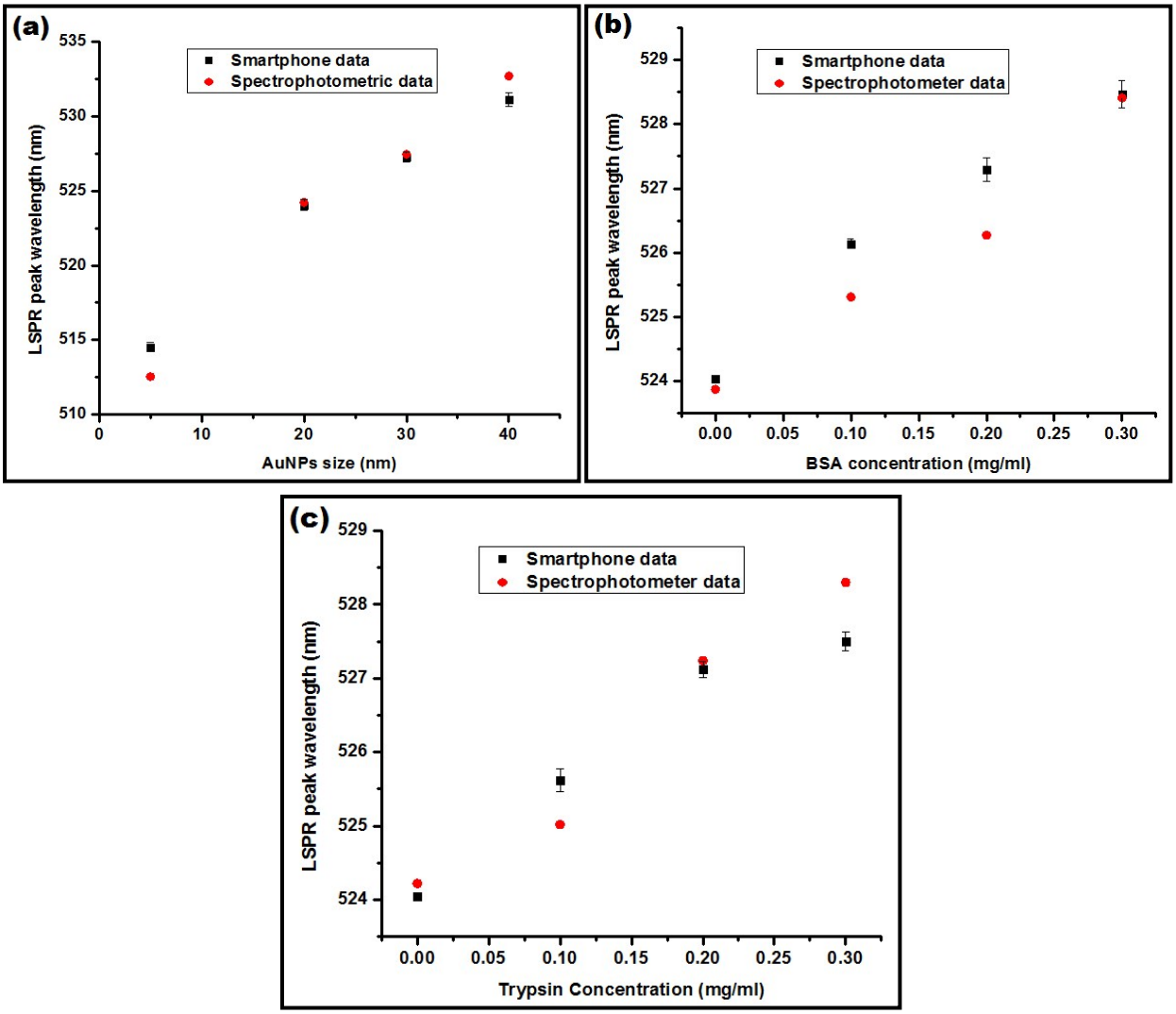

Fig. S1. Accuracy between (a) spectral red-shift corresponding to size variation of AuNPs as obtained with smartphone sensor and standard spectrophotometer (b) spectral red-shift for BSA-AuNPs conjugates for different concentration of BSA (0- 0.3 mg/mL) as measured by smartphone spectrophotometer w.r.t standard spectrophotometer and (c) spectral red-shift of Trypsin-AuNPs conjugates for different concentration of Trypsin (0- 0.3 mg/mL) as obtained with smartphone sensor and standard spectrometer.

Smartphone sensor response for BSA conjugation with AuNPs (40 nm):

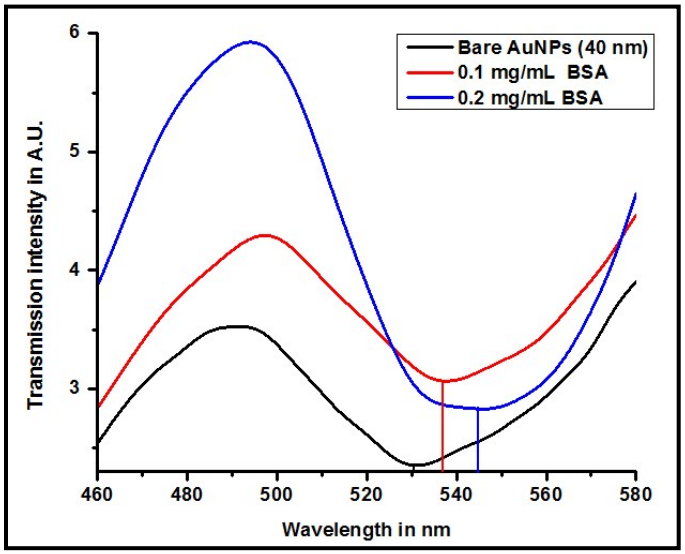

Fig. S2 Characteristic transmission plot of BSA-AuNPs conjugates (BSA concentration : 0 to 0.2mg/mL) for 40 nm AuNPs as obtained from the smartphone based LSPR biosensor.

Price of optical components (All from Edmund Optics)

Sl. No.	Optical components	Specifications	Item No.	Cost ($)
1	**Pinhole**	50 µm	NT36-391	47.00
2.	**Plano-convex lens**	FL: 75 mm and Diameter: 10 mm	NT63-491	36.00
3.	**Cylindrical lens**	FL: 50 mm and Diameter: 12.5	NT48-354	56.50
4.	**Transmission Grating**	1200 lines/mm	NT49-578	85.00
			Total:	**224.50**

All optical components were purchased from EO ® Edmund Optics, USA