Plasmonic sensors for the competitive detection of testosterone

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Electronic supporting information:

Table S1. Analytical parameters for different testosterone biosensing technology

Technique	Assay format	LOD (pM)	Dynamic range (nM) *	Ref.
Colorimetric	Immunofiltration	346	0.3 - 3.5	1
Electrochemical	Direct with cobalt oxide	1.6×10^5	330 - 2000	2
Electrochemical	Inhibition competition assay	312	1 - 139	3
Electrochemical	Inhibition competition assay	90	0.1 - 139	4
Electrochemical	Immunoassay	346	4 - 289	5
Fluorescence	Inhibition competition assay	0.7	2 - 277	6
Interference spec.	Inhibition competition assay	243	1.1 - 12	7
Interference spec.	MIP	N/A	high nanomolar	8
Radioassay	MIP competition assay		10^3 - 10^5	9
SPR	Inhibition competition assay	13	0.1 - 1	10
SPR	MIP	0.0035	10^{-6} - 10^2	11
SPR	MIP	N/A	10^{-6} - 0.1	12
SPR	MIP	N/A	100 - 5×10^5	13
Stochastic	Graphene with maltodextrin	0.0026	10^{-5} - 10^{-2}	14
Stochastic	Diamond paste with maltodextrin	0.001	0.001 – 0.1	15
SPR	Competition assay	170	0.17 - 34	This work

Figure S1

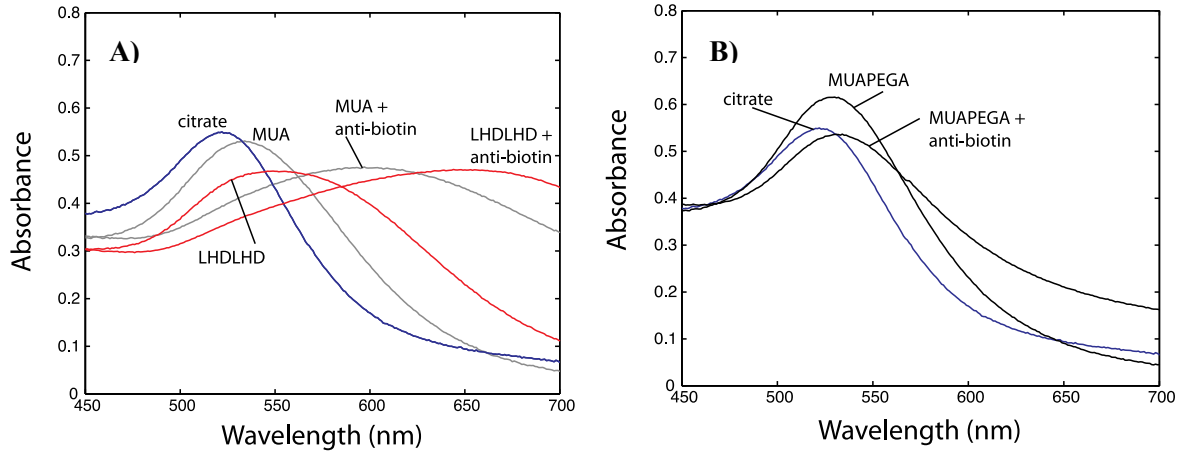
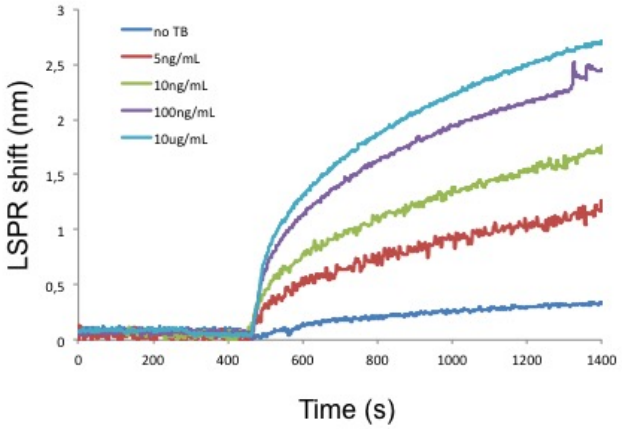


Figure S1: Extinction spectrum of the 15 nm citrate capped gold nanoparticle competitor with varying surface chemistries. A) The addition of an alkyl thiol and peptide SAM followed by the anti-biotin for testosterone binding. B) The addition of a MUAPEG SAM and anti-biotin for testosterone binding.

Figure S2: Optimization of the testosterone-biotin concentration. The LSPR response was measured by reacting 10 ng/mL testosterone with the LSPR sensor modified with anti-testosterone. Then, testosterone-biotin was reacted at different concentrations, followed by Au nanoparticles-MUPEGA-anti-biotin, and the shift was monitored over time for each concentration of testosterone-biotin.



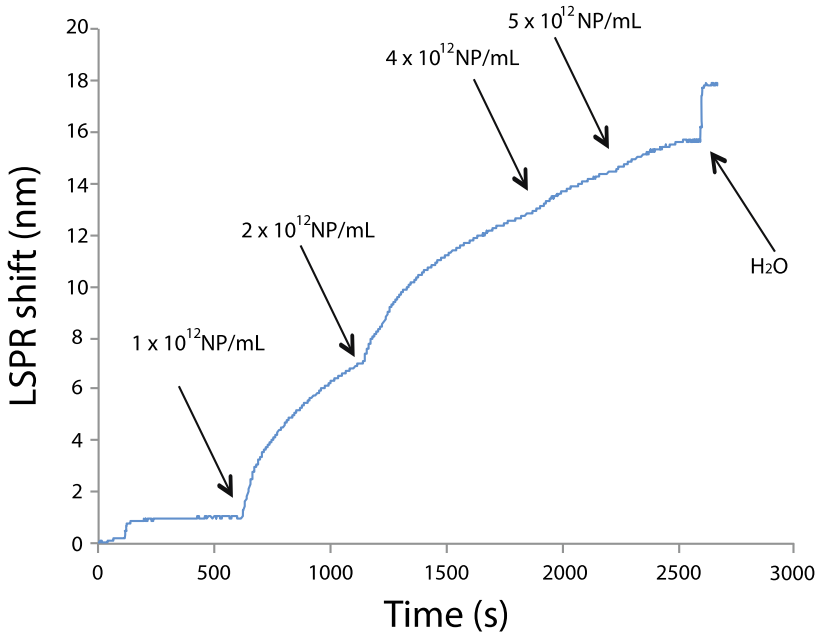


Figure S3: Optimization of the concentration of the detection Au nanoparticles-MUPEGA-anti-biotin. The LSPR response was measured in absence of testosterone with the LSPR sensor modified with anti-testosterone. Then, testosterone-biotin was reacted at saturating concentration, followed by Au nanoparticles-MUPEGA-anti-biotin.

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