

# Gold nanorods-based multiplex bioanalytical assay for the detection of CYFRA 21-1 and CA-125: Towards oral cancer diagnostics

Debolina Chakraborty<sup>1</sup>, Amitava Mukherjee<sup>2\*</sup>, K.R. Ethiraj<sup>1\*</sup>,

<sup>1</sup> School of Advanced Sciences, Vellore Institute of Technology, Vellore, India.

<sup>2</sup> Centre for Nanobiotechnology, Vellore Institute of Technology, Vellore, India.

## SUPPLEMENTARY INFORMTION

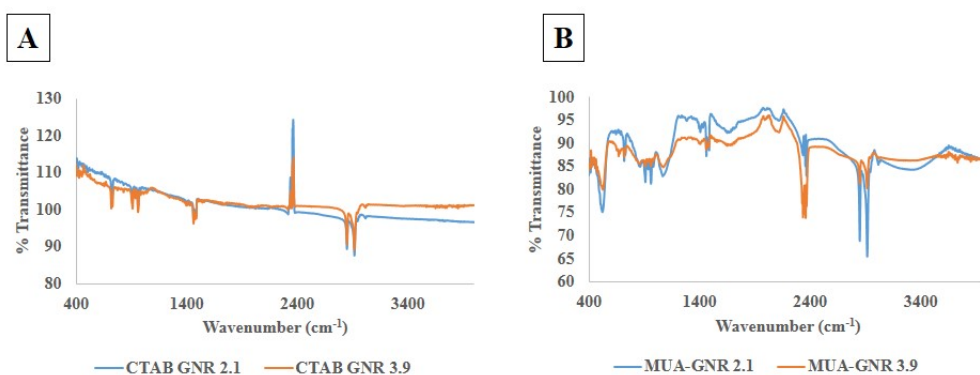
### \*Corresponding authors

**Dr. Amitava Mukherjee**  
Senior Professor & Director  
Centre for Nanobiotechnology  
Vellore Institute of Technology, Vellore – 632014, India.  
Email: [amit.mookerjea@gmail.com](mailto:amit.mookerjea@gmail.com), [amitav@vit.ac.in](mailto:amitav@vit.ac.in)  
Phone: 91 416 2202620  
Fax: 91-416-224309

**K.R. Ethiraj**  
Senior Professor  
School of Advanced Sciences  
Vellore Institute of Technology, Vellore – 632014, India.  
Email: [ethukr@gmail.com](mailto:ethukr@gmail.com)

**Table S1.** Alterations of the physicochemical parameters before and after ligand exchange.

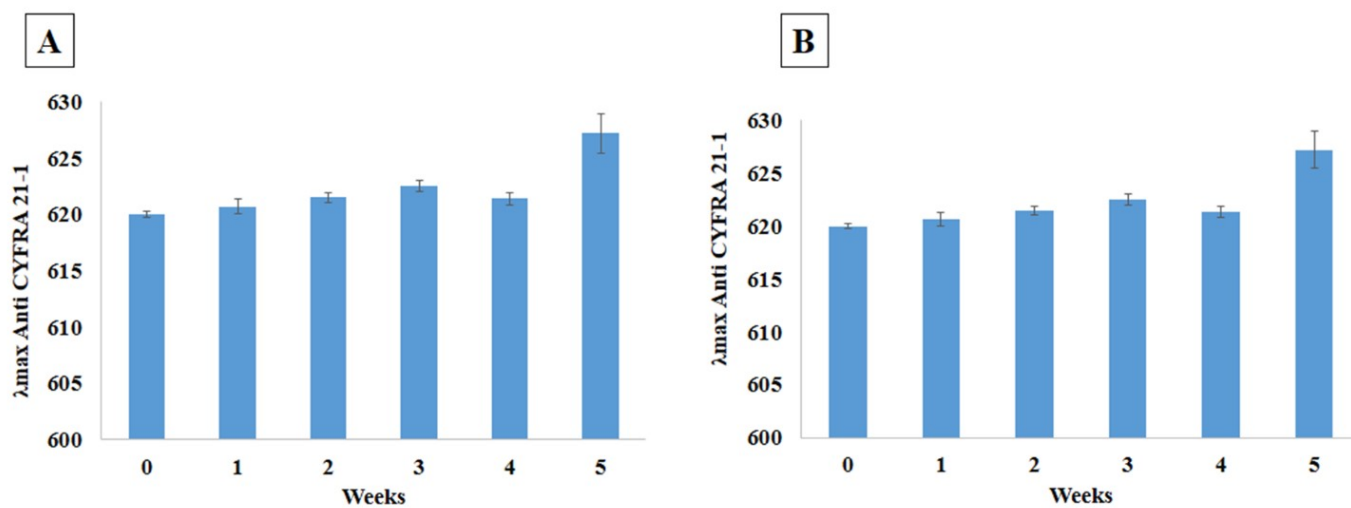
CTAB-GNRs	TSPR (nm)	LSPR (nm)	MHD (nm)	Zeta potential (mV)
AR 2.1	512	609	28.2±0.2	48.5± 1.2
AR 3.9	515	768	32.4±2.2	49.6± 2.4
MUA -GNRs				
AR 2.1	514	609	25.7± 1.5	-39.3± 2.4
AR 3.9	515	769	29.4± 1.1	-32.1± 3.3



**Fig. S1** FTIR spectra of differently sized GNRs (A) CTAB capping (B) MUA capping

**Table S2.** Statistical performance of the sensor for the detection of CYFRA 21-1 and CA-125

CYFRA 21-1 Concentration (ng/mL)	RSD %		
	Run-to-run	Day-to-day	Batch-to-batch
0.496	0.62	1.43	1.82
3.1	0.85	1.33	1.49
7.7	1.06	1.53	1.55
48.4	0.40	1.86	2.27
CA-125 Concentration (U/mL)	RSD %		
	Run-to-run	Day-to-day	Batch-to-batch
5	0.95	1.41	1.63
20	0.63	1.27	1.62
80	0.44	1.88	2.17
320	1.16	0.95	2.62



**Fig. S2.** Shelf-life of (A) Anti CYFRA 21-1 GNRs (B) Anti CA-125 GNRs