Supporting Information

Simultaneous Binding of Carboxyl and Amino Groups to Eutectic Gallium-Indium Nanoparticle Surface for Biosensing

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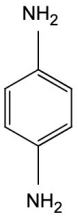
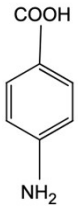
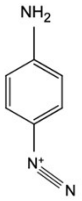
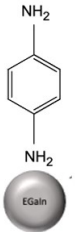
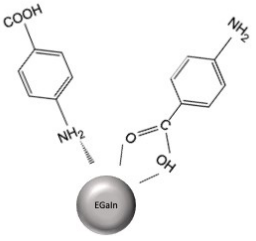
Table S1. Summary information of all EGaIn based nanoparticles used in the study.

Samples	Sample name	Chemical formula	Structure
Pure PPD	*p*-phenylenediamine	$C_6H_8N_2$	
Pure PABA	*p*-aminobenzoic acid	$C_7H_7NO_2$	
Pure TPA	terephthalic acid	$C_8H_6O_4$	
Pure 4CT	4-carboxylbenzene diazonium tetrafluoroborate	$C_7H_5BF_4N_2O_2$	
Pure EGaIn	eutectic gallium-indium	None	
EGaIn-PPD	EGaIn-*p*-phenylenediamine	None	
EGaIn-PABA	EGaIn-*p*-aminobenzoic acid	None	

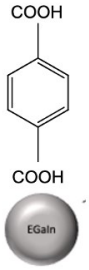
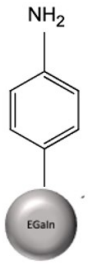
EGaIn-TPA	EGaIn- terephthalic acid	None	
EGaIn-4CT	EGaIn-4-carboxylbenzene diazonium tetrafluoroborate	None	

Table S2. Comparison of the performance of aptasensors for electrochemical detection of IL-6.

Material/Electrode	**LOD**	**References**
Paper biosensors	1.3 pg/mL	[1]
ZnO	2 pg/mL	[2]
Poly(guanine)-functionalized silica NPs	50 pg/mL	[3]
Phosphatase functionalized nanospheres Au working electrode	10 pg/mL	[4]
EGaIn-PABA-Au	1 pg/mL	This work

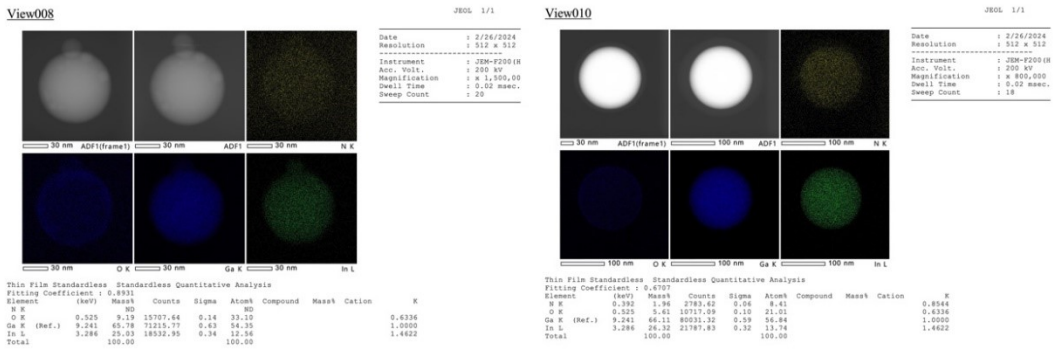


Figure S1. TEM-EDS content of gallium, indium, oxygen, carbon, nitrogen and bromine on EGaIn-PABA-AuNPs (left) and EGaIn-PABA (right) nanoparticles.

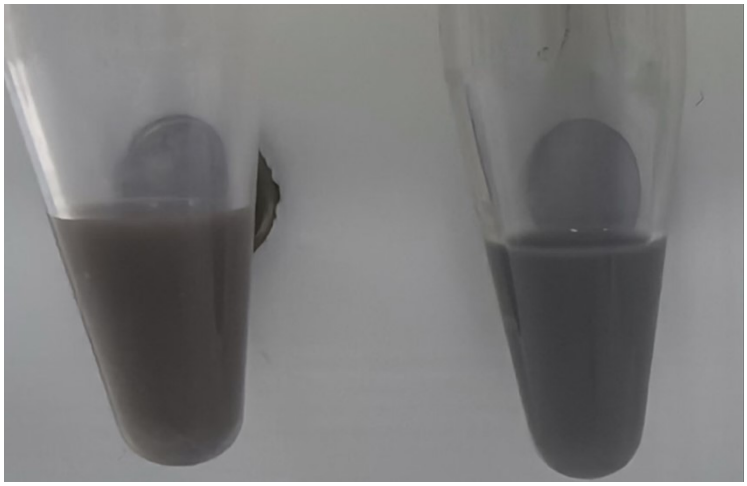


Figure S2. Picture of EGaIn-PABA-AuNPs (left) and EGaIn-PABA (right) nanoparticles dispersed in the MilliQ water in a tube.

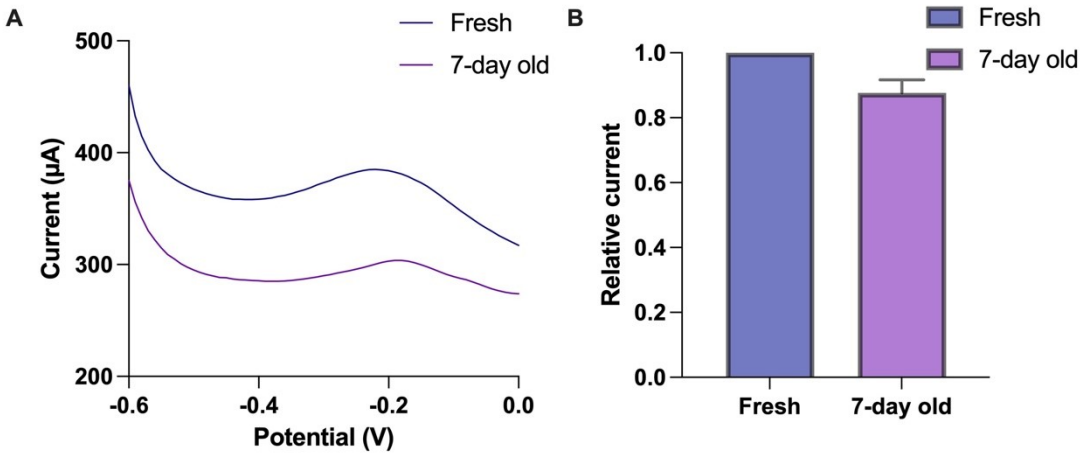


Figure S3. Performance comparison of the EGaIn-PABA-AuNPs-Apt aptasensor prepared by using the fresh and 7-day old EGaIn-PABA-AuNPs. (A) Square wave voltammograms and (B) The relative current of the EGaIn-PABA-AuNPs-Apt for detection of 200 pg/mL IL-6. The peak current is the peak current divided by the peak current of EGaIn-PABA-AuNPs-Apt aptasensor prepared by using the fresh EGaIn-PABA-AuNPs.

References:

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[4] Z. Yin, Y. Liu, L.-P. Jiang, J.-J. Zhu, Electrochemical immunosensor of tumor necrosis factor α based on alkaline phosphatase functionalized nanospheres, Biosensors and Bioelectronics, 26 (2011) 1890-1894.