Supplementary Information (SI) for Analytical Methods.

Tungsten disulphide nanosheet modulated fluorescent gold nanoclusters immunoprobe for the Detection of Tau peptide: Alzheimer's disease Biomarker

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Supporting Information

S1.

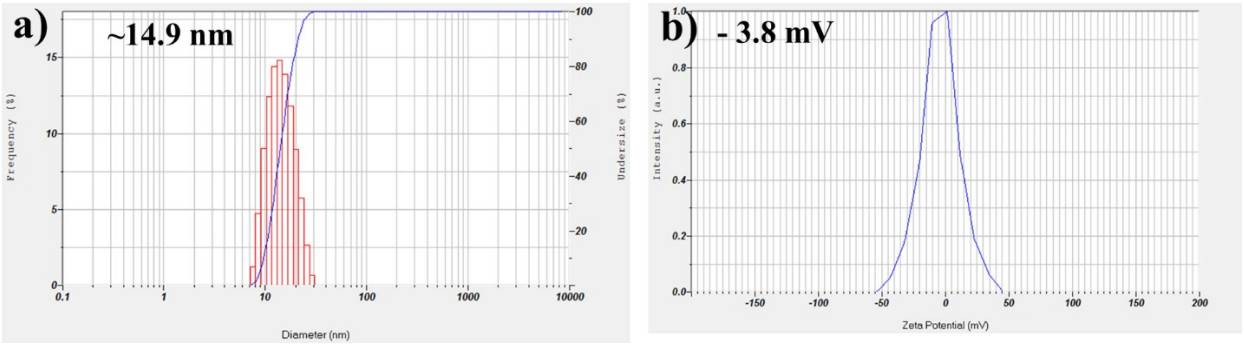

Figure.S1. a) The DLS and zeta potential plot of BSA-AuNCs obtained as ~14.9 nm, b) and -3.8 mV respectively.

S2.

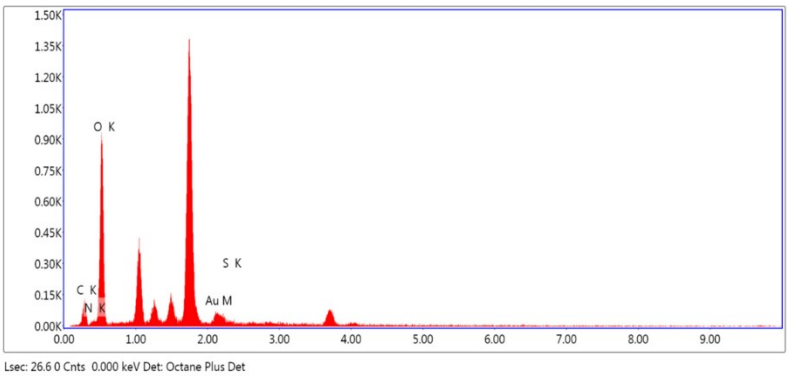

Figure.S2. The EDS spectra of synthesised BSA-AuNCs.

S3.

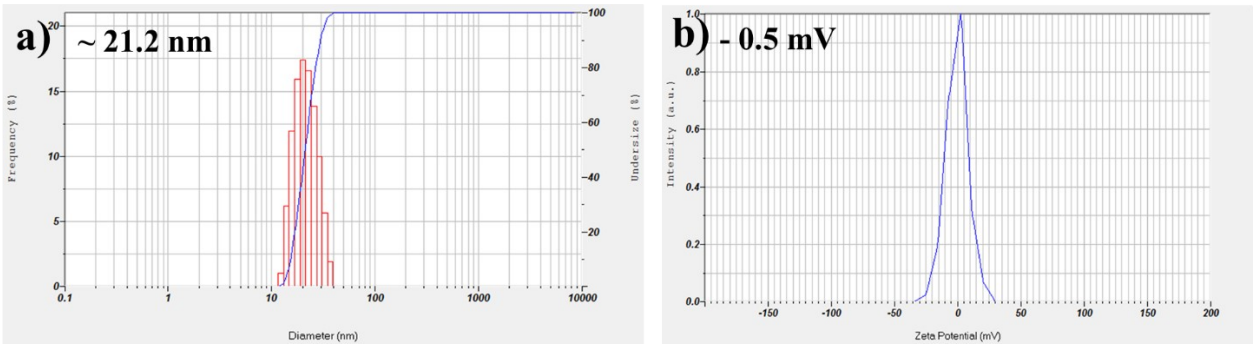

Figure.S3. a) The DLS and zeta potential graph of mAb-Tau conjugated BSA-AuNCs which is obtained as ~21.2 nm, b) and -0.5 mV respectively.

S4.

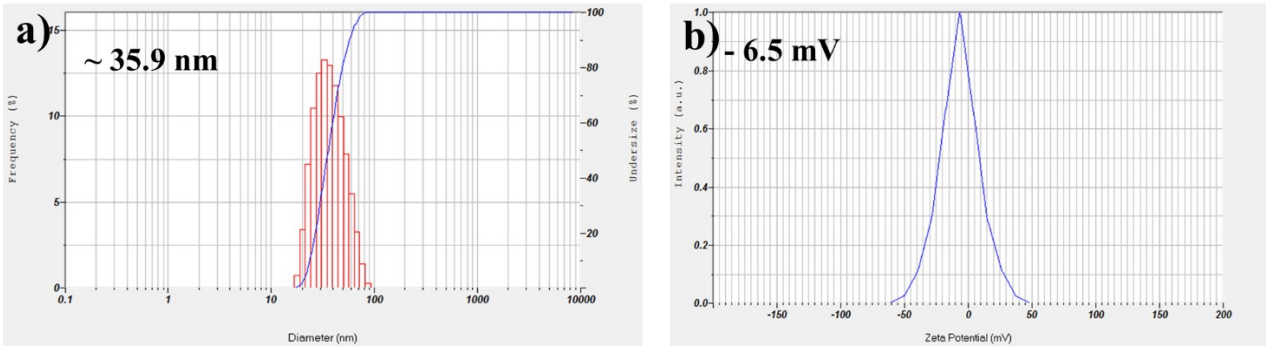

Figure.S4. a) The DLS and zeta potential graph of WS_2 nanosheet quenched mAb-Tau conjugated BSA-AuNCs (WS_2 NS@mAb-Tau@ which is obtained as ~35.9 nm, **b)** and –6.5 mV respectively.

S5.

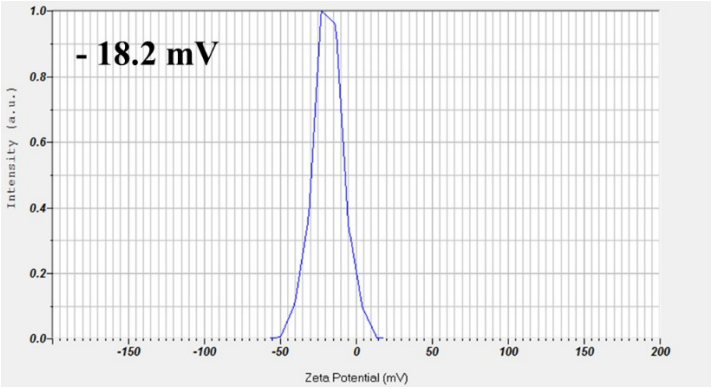

Figure.S5. The zeta potential value of synthesised WS_2 nanosheet is obtained as -18.2 mV.

S6.

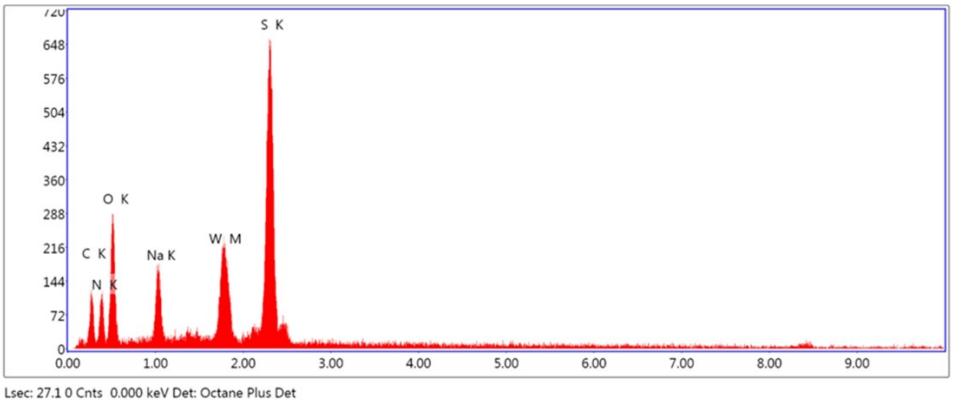

Figure.S6. The EDS spectra of synthesised WS_2 Nanosheets

S7.

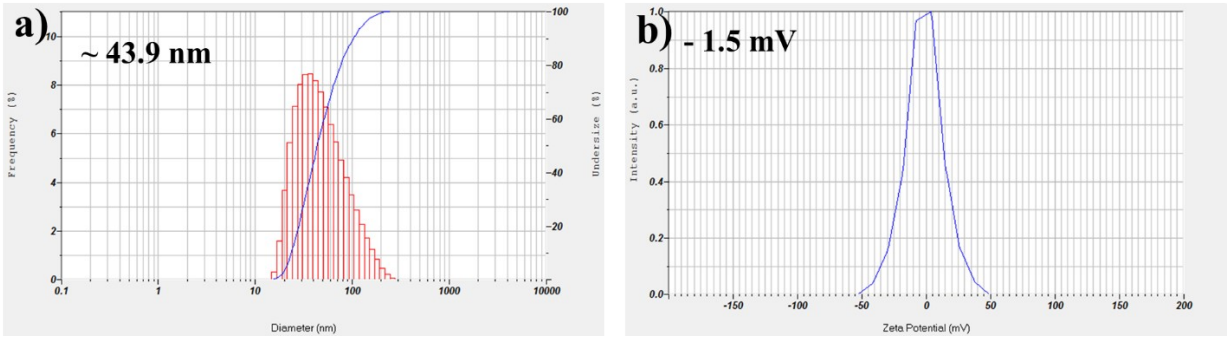

Figure.S7. a) The DLS and zeta potential plot of tau peptide added WS_2 nanosheet quenched mAb-Tau conjugated BSA-AuNCs (Tau@WS_2 NS@mAb-Tau@ which is obtained as ~43.9 nm, **b)** and –1.5 mV respectively.

Table.S1. The comparison table depicting the previous works for the sensing of Tau peptide

SL. No	Sensing platform	Method	LOD	Reference
1.	ECL three electrode system	ECL	0.034 ng/mL	[1]
2.	Sandwich assay	SERS	25 fM	[2]
3.	3D-SERS platform	SERS	0.15 ng/mL	[3]
4.	Biosensor based array	SPR	1 pM	[4]
5.	GO-FITC immunoassay	Fluorescence	6.4 ng/mL	[5]
6.	InP QDs/Rhodamine	Fluorescence	70-120 nM	[6]
7.	$CuInS_2$/ZnS core/shell QDs	Fluorescence	9.3 pM	[7]
8.	WS_2 NS@mAb-tau@AuNCs	Fluorescence	6.54 pg/mL	**This work**

Table.S2. The recovery percentage calculation tabulated for spiked Tau peptide in human serum samples.

SL. No	Tau peptide Spiked human serum	Observed concentration (pg/mL)	Found concentration (pg/mL)	Recovery percentage (%)
1.	Sample 1	63.29	54.74	115.6
2.	Sample 2	188.67	199.90	94.37
3.	Sample 3	373.83	345.65	108.15
4.	Sample 4	495.35	480.22	103.15
5.	Sample 5	555.55	563.21	98.63
6.	Sample 6	585.41	577.44	101.37

S8.

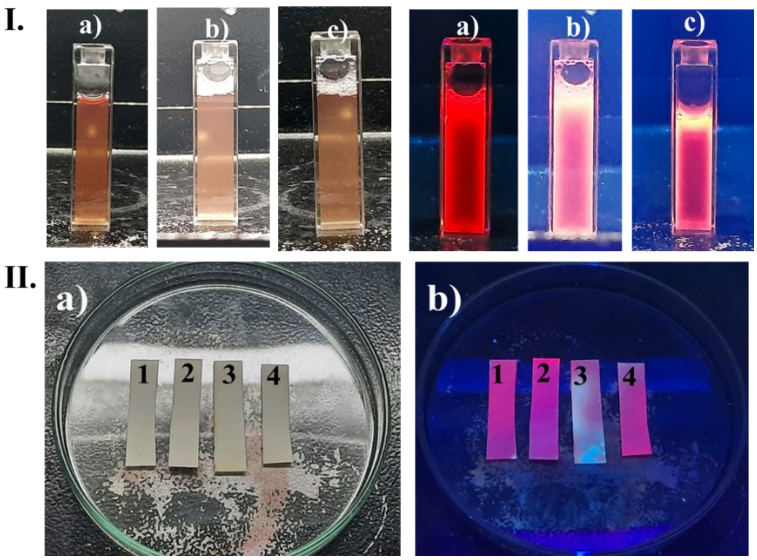

Figure.S8. I. Photographs of a) mAb-tau@AuNCs, b) WS_2NS@mAb-tau@AuNCs, c) Tau@WS_2NS@mAb-tau@AuNCs., **II.** Portable Paper strip assay, where 1.BSA-AuNCs, 2. mAb-tau@AuNCs, 3. WS_2NS@mAb-tau@AuNCs and 4. Tau@WS_2NS@mAb-tau@AuNCs. (left-day light, right-UV illumination)

References

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