

Supplementary Information

Rapid and facile colorimetric biosensing of dengue NS1 antigen using gold nanoparticles: Potential for Point-of-Care Testing

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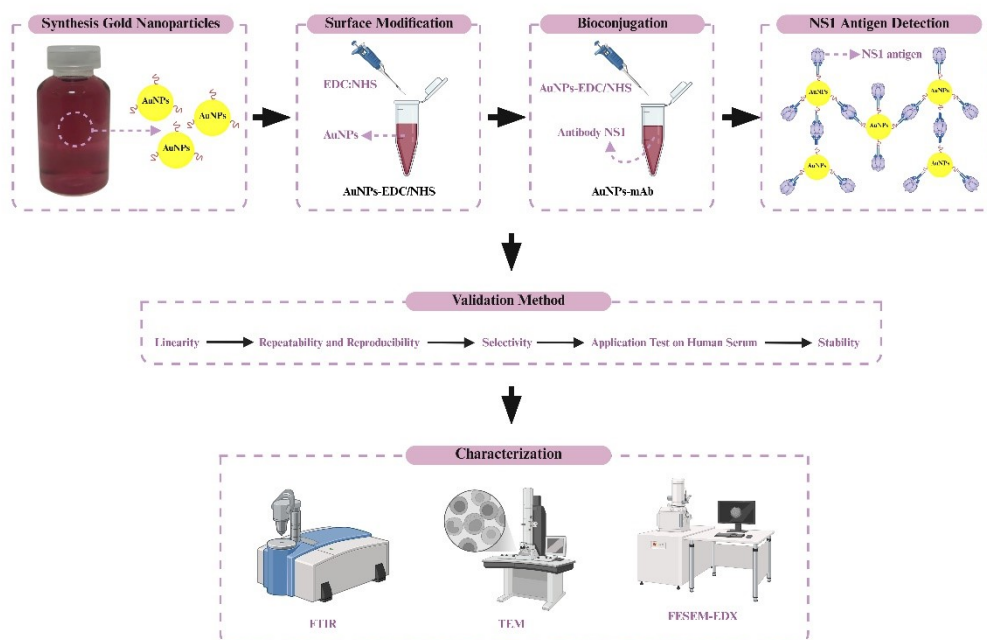


Fig. S1 Schematic depiction of AuNPs synthesis and colorimetric biosensors protocol.

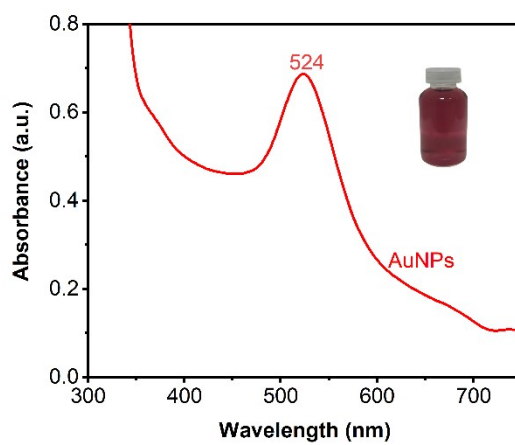


Fig. S2 UV-vis absorption spectrum of synthesized AuNPs using *o*-HBA at optimum conditions.

Table S1 UV-vis data to plot linearity curve.

| Concentration | Abs (524 nm) | del.abs |
|---------------|--------------|-----------|
| Control | 0.0975846 | |
| 75 | 0.0805928 | 0.0169918 |
| 100 | 0.0781599 | 0.0194247 |
| 150 | 0.0703576 | 0.027227 |
| 200 | 0.0668346 | 0.03075 |
| 250 | 0.0621214 | 0.0354632 |

Control: only AuNPs-EDC/NHS (ratio 2:1)

Table S2 UV-vis data to plot LoD and LoQ

| Concentration (ppb) | Abs | Δ Abs | y1 | y-y1 | (y-y1) ² |
|---------------------|-----------|--------------|--------|---------------------------------|---------------------|
| 75 | 0.0805928 | 0.0169918 | 0.0169 | 0.0000918 | 0.00000000842724 |
| 100 | 0.0781599 | 0.0194247 | 0.0194 | 0.0000247 | 0.00000000061009 |
| 150 | 0.0703576 | 0.027227 | 0.0244 | 0.002827 | 0.000007991929 |
| 200 | 0.0668346 | 0.03075 | 0.0294 | 0.00135 | 0.0000018225 |
| 250 | 0.0621214 | 0.0354632 | 0.0344 | 0.0010632 | 0.00000113039424 |
| | | | | Total | 0.00001095386057 |
| | | | | SD | 0.00165483085 |
| | | | | LoD (ng mL⁻¹) | 49.6449255 |
| | | | | LoQ (ng mL⁻¹) | 165.483085 |

Control: 0.0975846

Table S3 Uv-vis data to plot repeatability of AuNPs-NS1 at 523 nm.

| Concentration (ng/mL) | Data | | | | | % AOAC | CV Horwitz |
|----------------------------------|--------------|--------------|--------------|--------------------|---------------------------|---------------|-------------------|
| | Abs 1 | Abs 2 | Abs 3 | Average Abs | Standard Deviation | | |
| 75 | 0.080593 | 0.08097 | 0.080043 | 0.08053533333 | 0.0003806366013 | 0.4726330488 | 1.04425161 |
| 100 | 0.07816 | 0.0784109 | 0.0782496 | 0.0782735 | 0.0001038142893 | 0.1326301869 | 1 |
| 150 | 0.070358 | 0.07113 | 0.071657 | 0.07104833333 | 0.0005334493624 | 0.7508260044 | 0.9407963516 |
| 200 | 0.066835 | 0.06576 | 0.06537 | 0.06598833333 | 0.0006194935207 | 0.9387924947 | 0.9009288013 |
| 250 | 0.062121 | 0.06266 | 0.0633676 | 0.0627162 | 0.0005104714945 | 0.813938814 | 0.8711723049 |

Table S4 UV-vis data to plot reproducibility of AuNPs-NS1 at 523 nm.

| Concentration (ng/mL) | Data | | | | | % AOAC | CV Horwitz |
|----------------------------------|--------------|--------------|--------------|--------------------|---------------------------|---------------|-------------------|
| | Abs 1 | Abs 2 | Abs 3 | Average Abs | Standard Deviation | | |
| 75 | 0.080593 | 0.0818437 | 0.0812961 | 0.08124426667 | 0.0005119099161 | 0.6300874352 | 1.04425161 |
| 100 | 0.07816 | 0.0784109 | 0.0799426 | 0.07883783333 | 0.00078787467 | 0.99936114 | 1 |
| 150 | 0.070358 | 0.0704297 | 0.0708368 | 0.0705415 | 0.00021085 | 0.298902527 | 0.9407963516 |
| 200 | 0.066835 | 0.066358 | 0.0660754 | 0.0664228 | 0.0003134722954 | 0.4719347806 | 0.9009288013 |
| 250 | 0.062121 | 0.062354 | 0.061243 | 0.061906 | 0.0004783645751 | 0.7727273205 | 0.8711723049 |

Table S5 UV-vis data to plot selectivity comparison across different matrices at 523 nm.

| Samples | Abs 1 | Abs 2 | Abs 3 | Average Abs | Δ Absorbansi | Standard Deviation |
|----------------|--------------|--------------|--------------|--------------------|---------------------------------------|---------------------------|
| Aquabidest | 0.124206 | 0.121243 | 0.120979 | 0.1221426667 | -0.01653766667 | 0.001462972393 |
| Antigen NS1 | 0.0945662 | 0.0921104 | 0.0905038 | 0.09239346667 | 0.01321153333 | 0.001670502618 |
| Glucose | 0.113022 | 0.114004 | 0.111553 | 0.1128596667 | -0.007254666667 | 0.001007179009 |
| Cholesterol | 0.127057 | 0.122719 | 0.122551 | 0.124109 | -0.018504 | 0.002085678786 |
| Uric acid | 0.112611 | 0.110445 | 0.108398 | 0.1104846667 | -0.004879666667 | 0.001720178737 |

Control: 0.105605

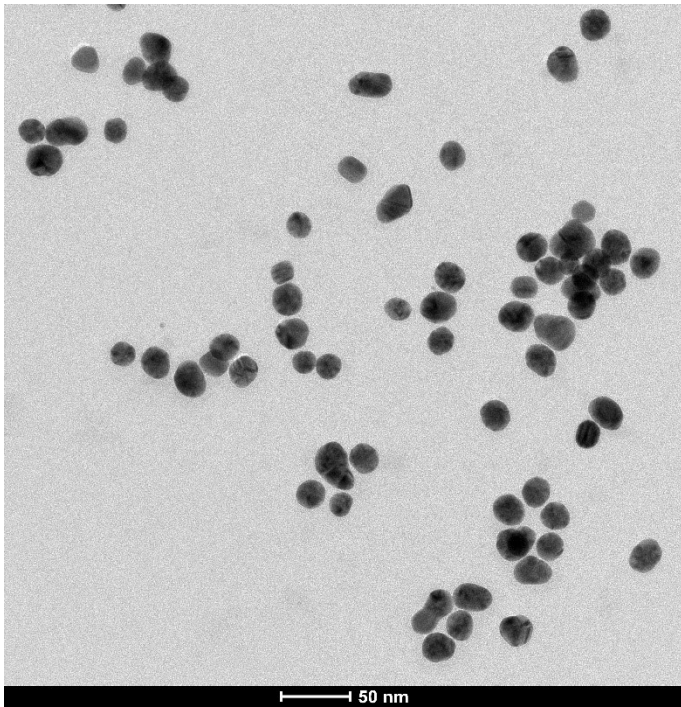
Table S6 UV-vis data to plot stability profile at 523 nm.

| Time | Abs 1 | Abs 2 | Abs 3 | Average Abs | Standard Deviation |
|-------------|--------------|--------------|--------------|--------------------|---------------------------|
| 0 Day | 0.115357 | 0.108908 | 0.104888 | 0.1097176667 | 0.004312127111 |
| 1 Day | 0.0878918 | 0.0875235 | 0.0865881 | 0.08733446667 | 0.0005487614074 |
| 3 Day | 0.0887379 | 0.0828103 | 0.0836319 | 0.08506003333 | 0.002622185355 |
| 1 Week | 0.0831786 | 0.0830726 | 0.0827331 | 0.08299476667 | 0.0001900194434 |
| 2 Week | 0.0869726 | 0.0865779 | 0.0866716 | 0.0867407 | 0.0001683807788 |
| 3 Week | 0.0804819 | 0.0805987 | 0.0801742 | 0.08041826667 | 0.0001790474115 |
| 4 Week | 0.0800271 | 0.0799079 | 0.0797404 | 0.0798918 | 0.0001175971372 |

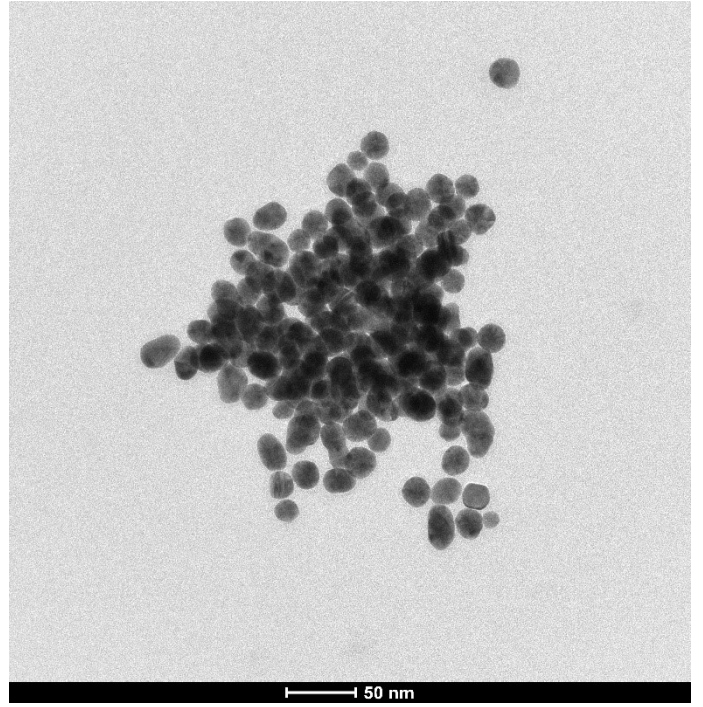
Table S7 UV-vis data to plot the application of AuNPs-mAb on human serum at 523 nm.

| Sample | Abs 1 | Abs 2 | Abs 3 | Average Abs | Δ Absorbance | Standard Deviation |
|-------------------|--------------|--------------|--------------|--------------------|---------------------------------------|---------------------------|
| Human Serum | 0.148148 | 0.147187 | 0.14635 | 0.1472283333 | -0.03077333333 | 0.0007346120669 |
| Human Serum NS1 | 0.10732 | 0.107642 | 0.109672 | 0.1082113333 | 0.008243666667 | 0.001041179246 |
| Antigen NS1 | 0.0980129 | 0.0982826 | 0.0970179 | 0.09777113333 | 0.01868386667 | 0.0005438779663 |
| Control: 0.116455 | | | | | | |

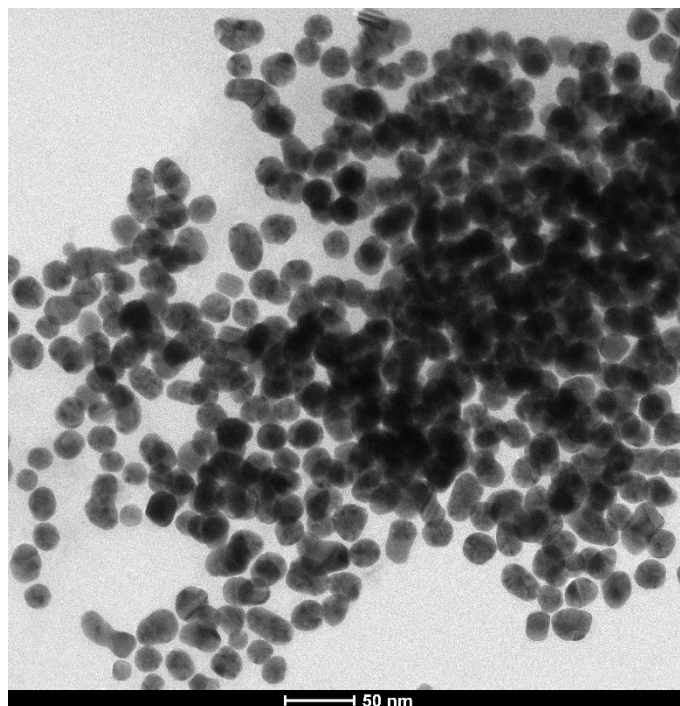
TEM Images



A. TEM for AuNPs

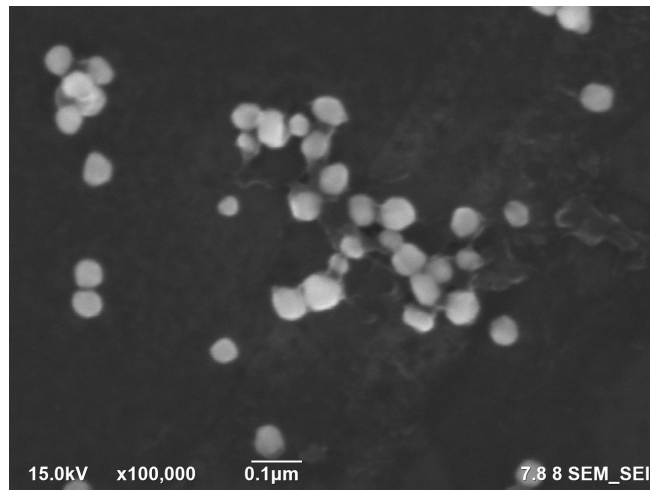


B. TEM for AuNPs-mAb

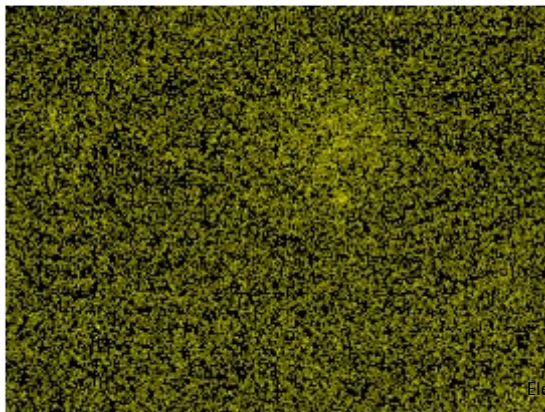


C. TEM for AuNPs-mAb-NS1

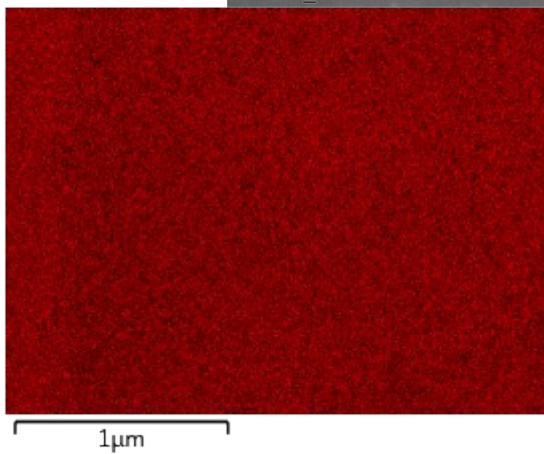
FESEM Images for AuNPs



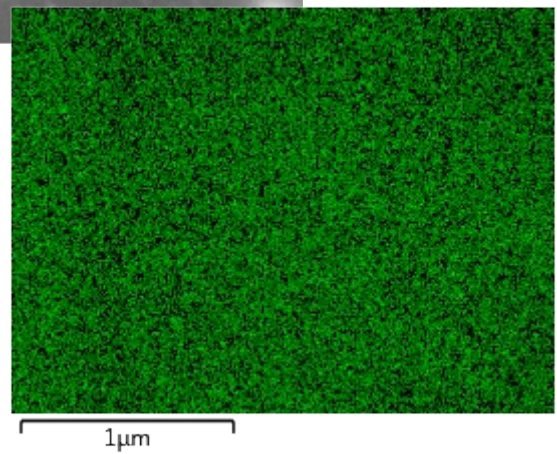
Au Mα1



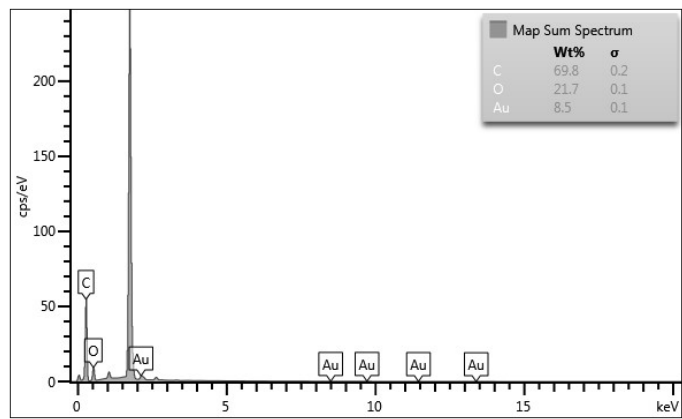
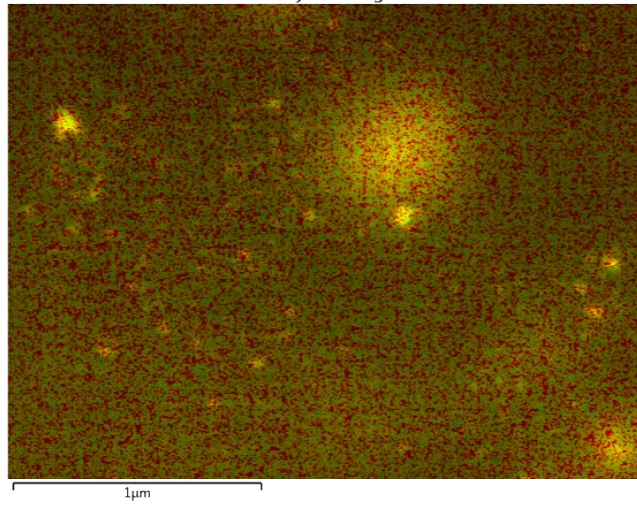
C Kα1_2



O Kα1

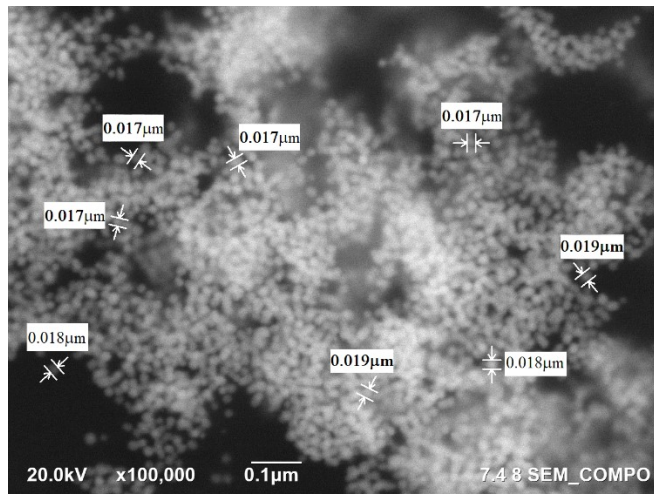


EDS Layered Image 1

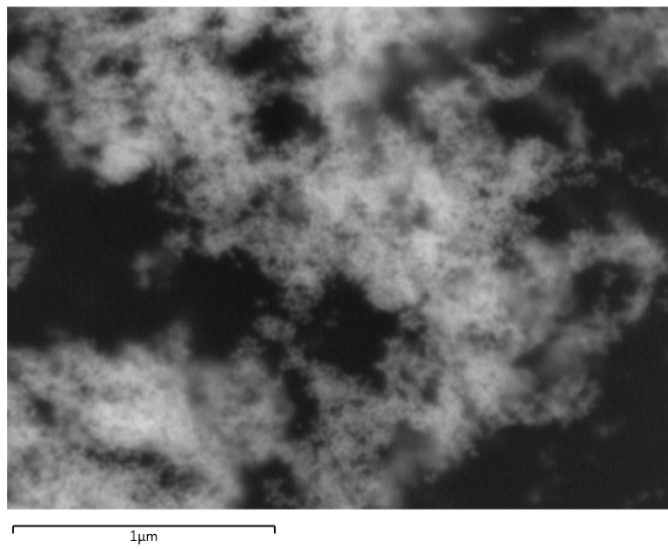


EDX for AuNPs.

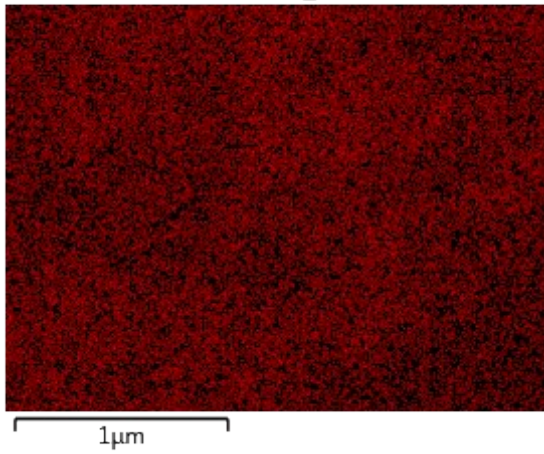
FESEM Images for AuNPs-mAb



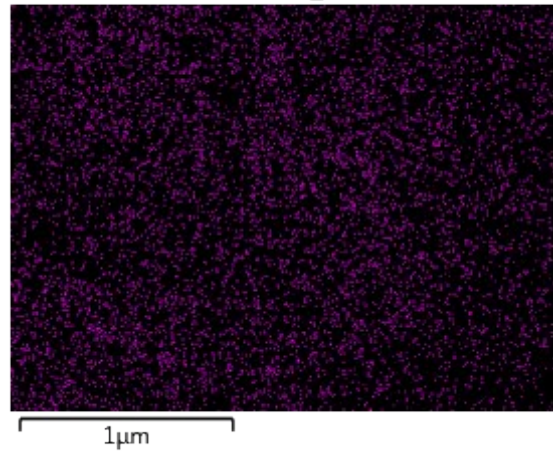
Electron Image 1



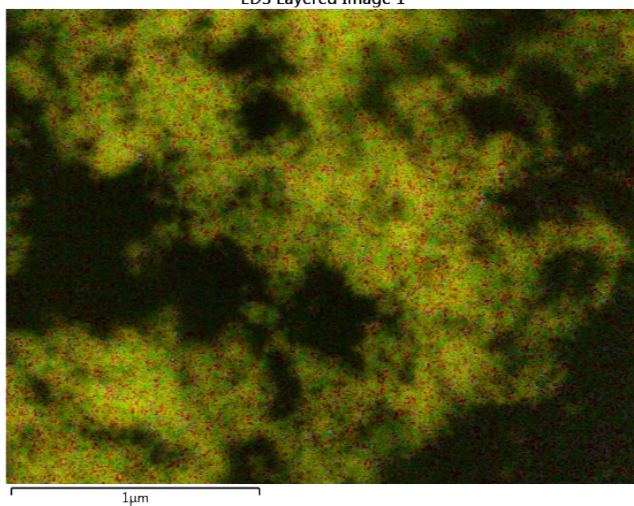
C K α 1_2



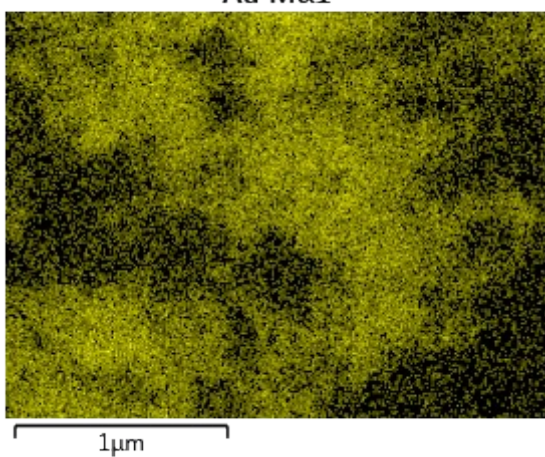
N K α 1_2



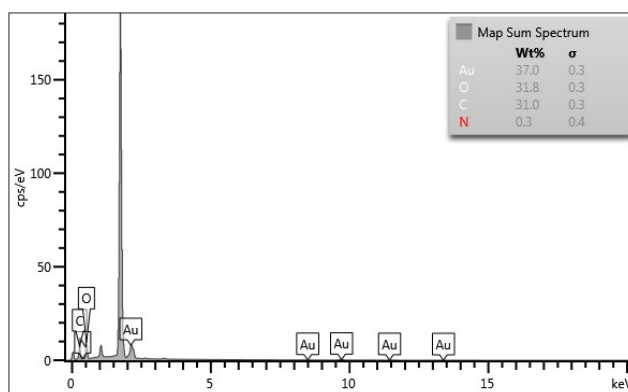
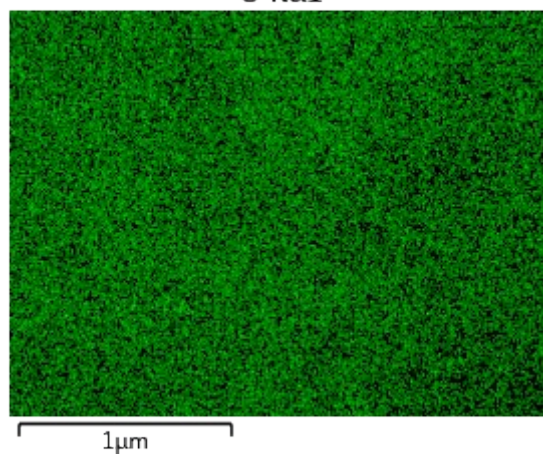
EDS Layered Image 1



Au Mα1

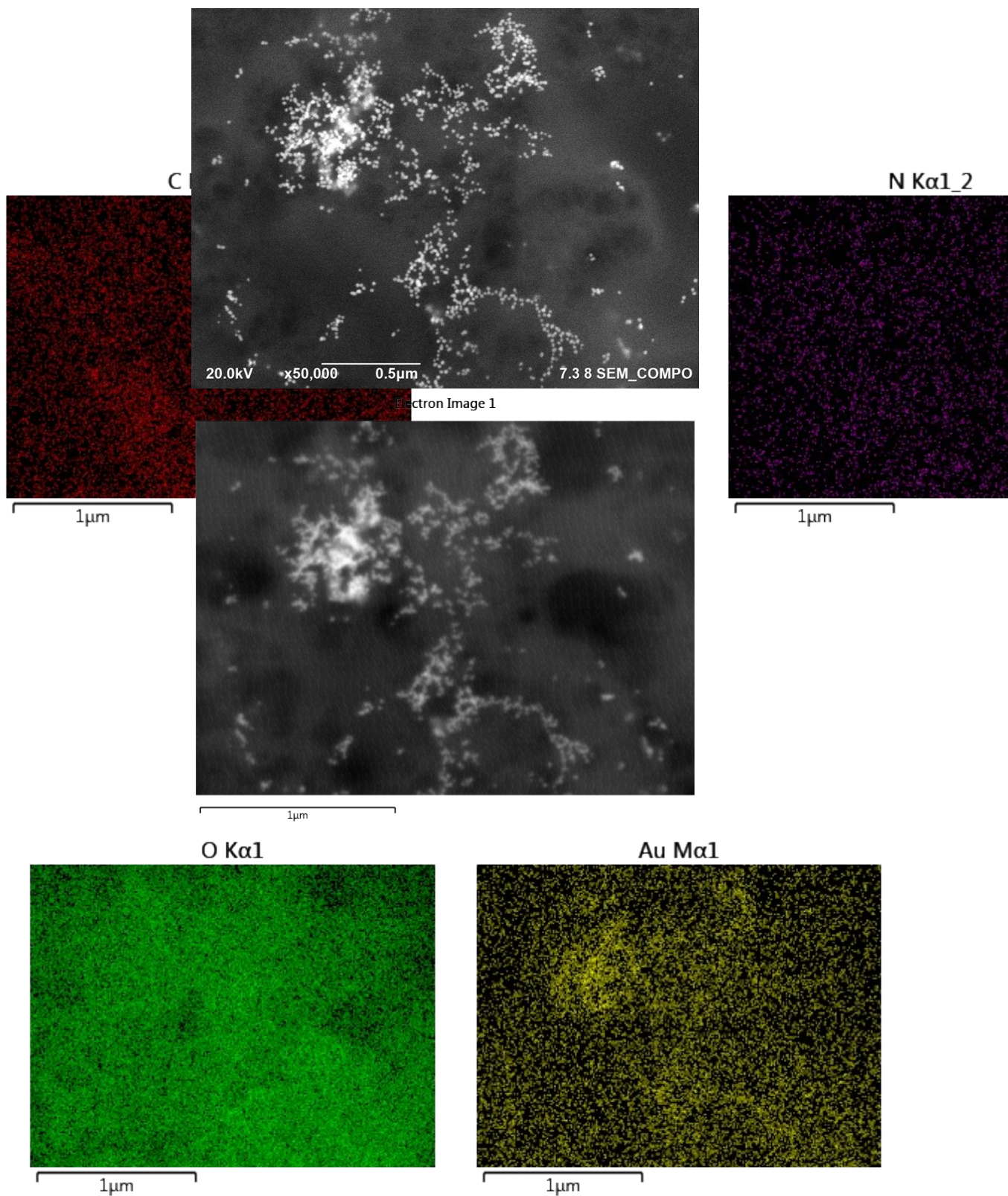


O Kα1

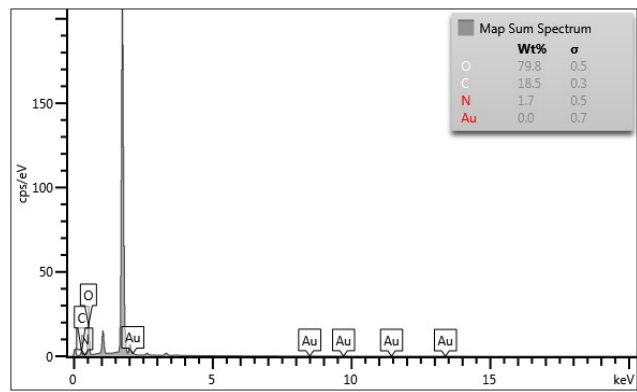
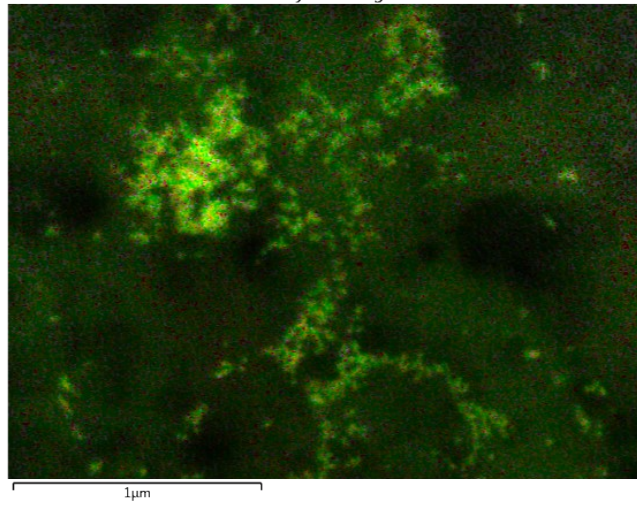


EDX for AuNPs-mAb.

FESEM Images for AuNPs-mAb-NS1



EDS Layered Image 1



EDX for AuNPs-mAb-NS1.