

Supporting information

Identification of acetaldehyde based on plasmonic patterns of gold nanostructure conjugated with chromophore and H₂O₂: A new platform for the rapid and low-cost analysis of carcinogenic agents by colorimetric affordable test strip (CATS)

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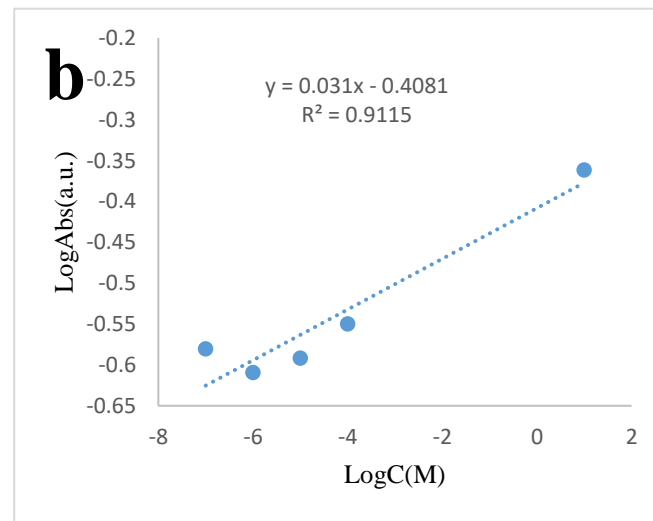
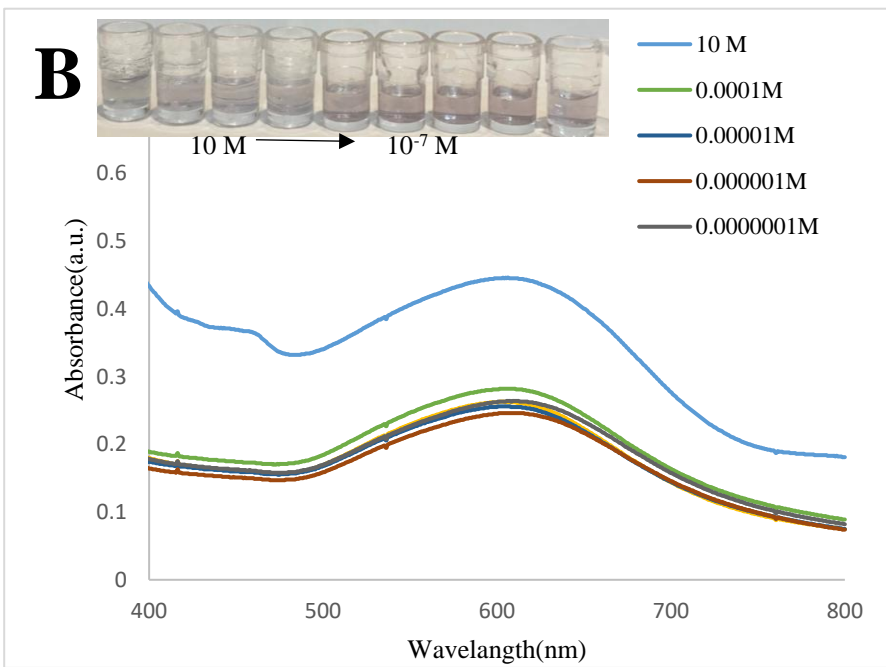
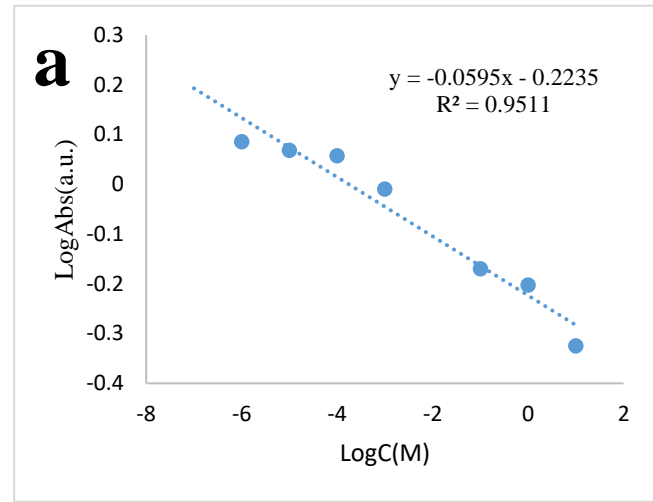
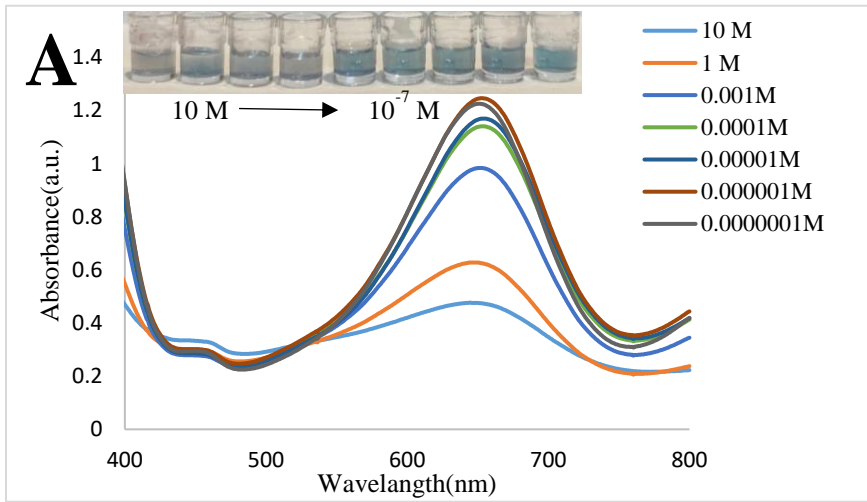
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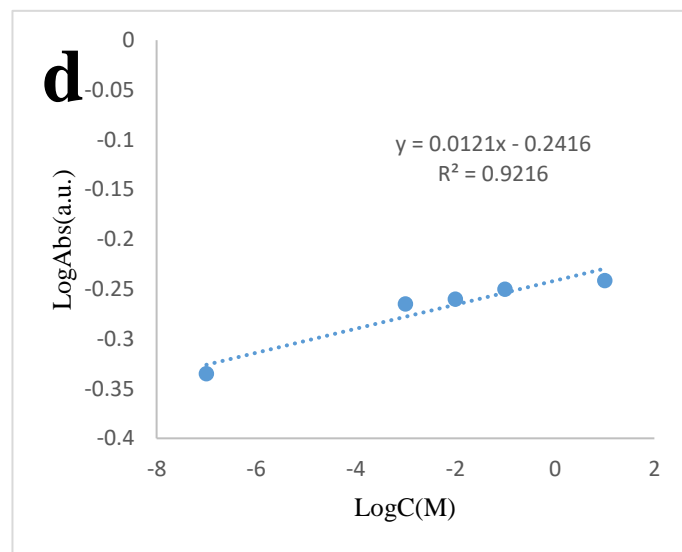
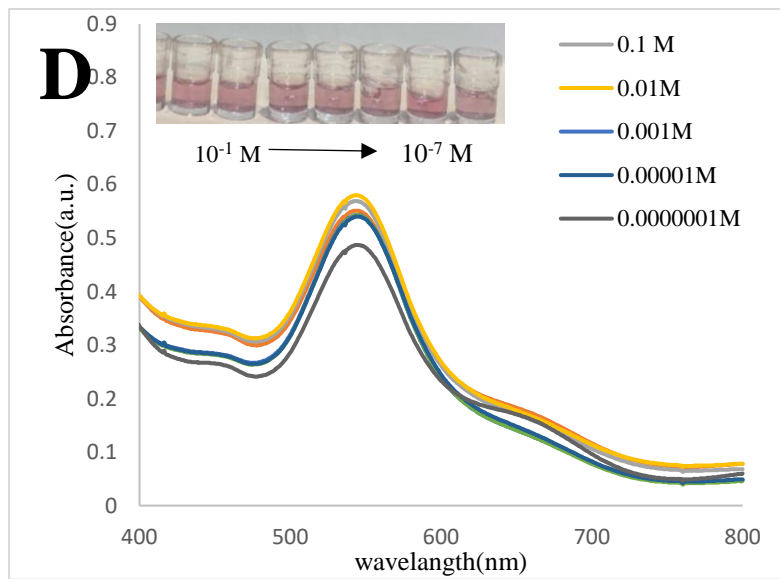
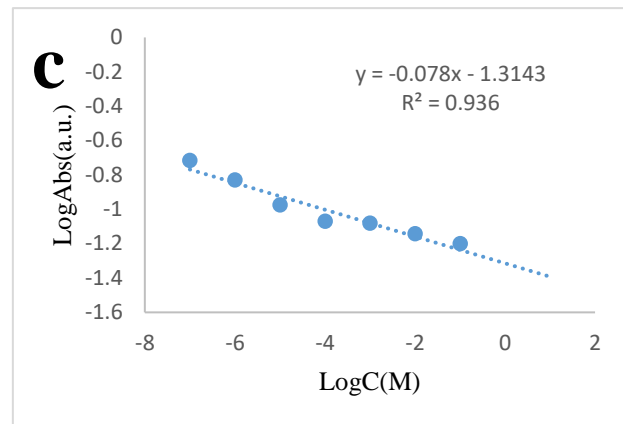
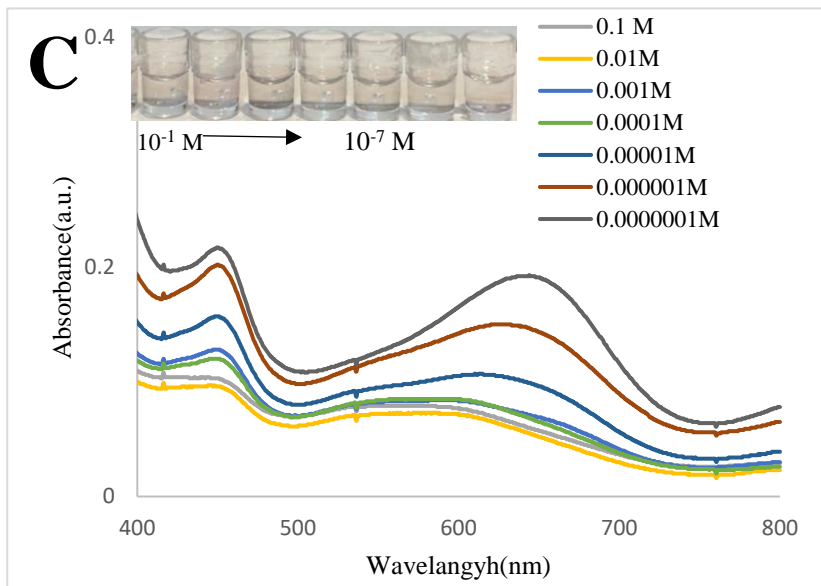
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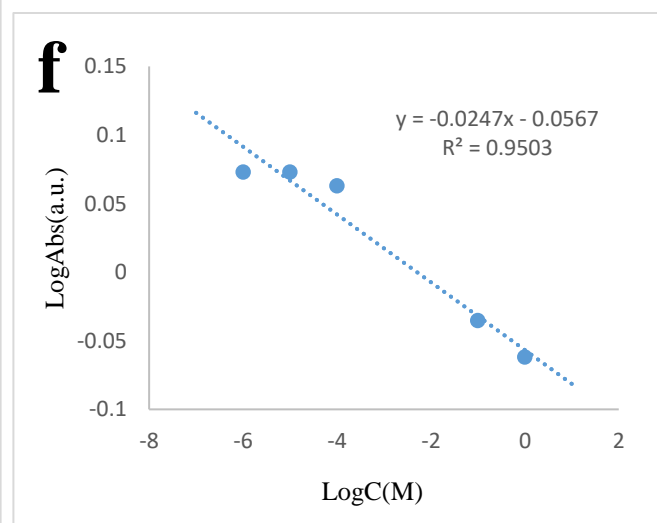
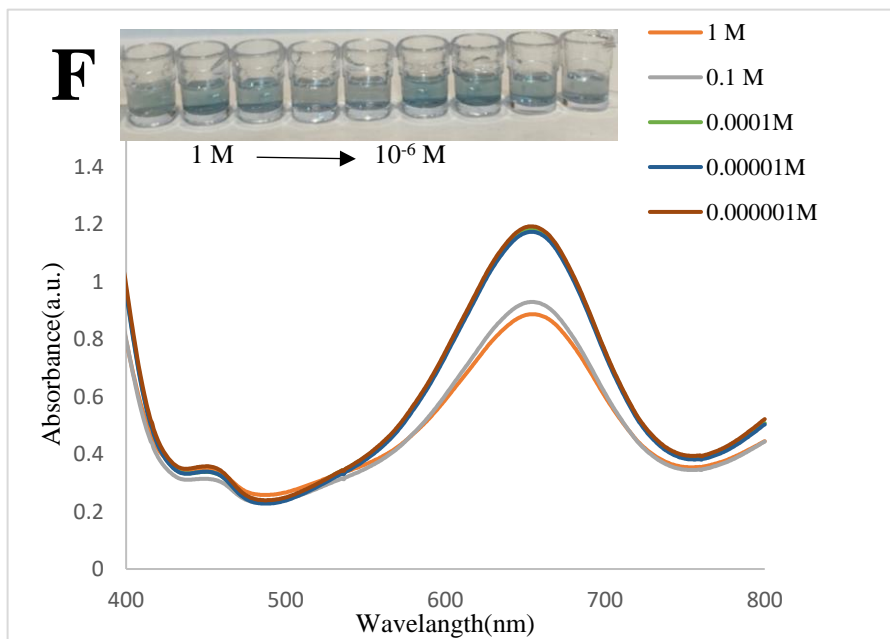
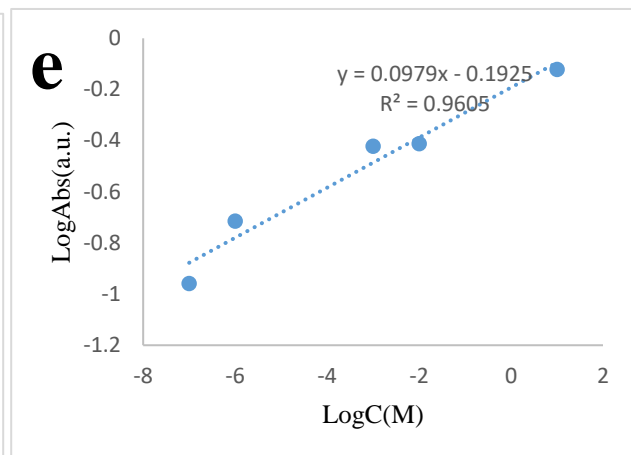
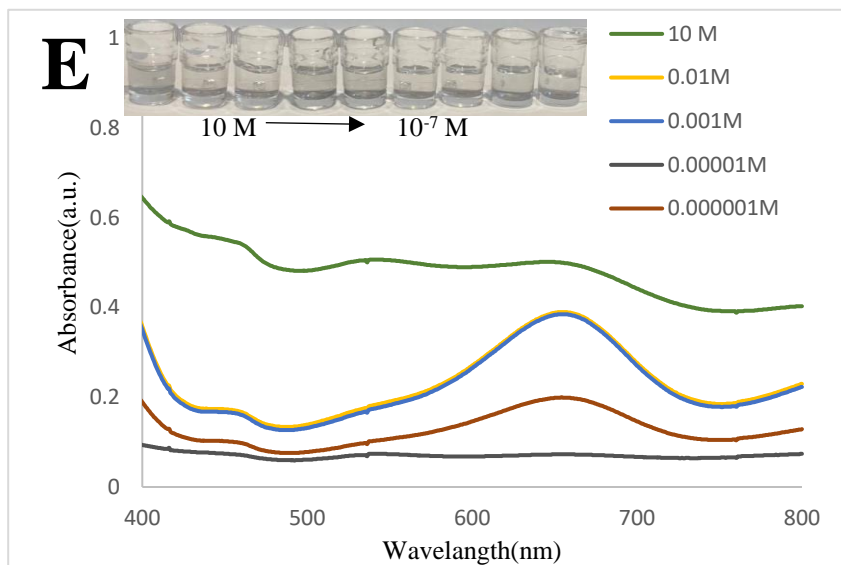
* (Mohammad Hasanzadeh) Pharmaceutical Analysis Research Center, Tabriz University of Medical Sciences, Tabriz, Iran.

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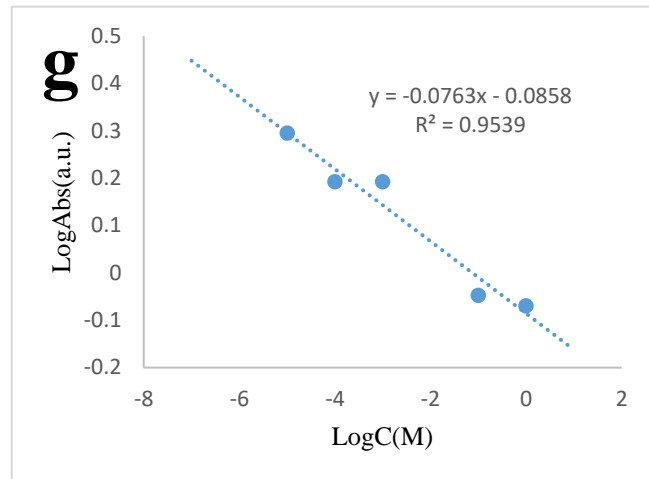
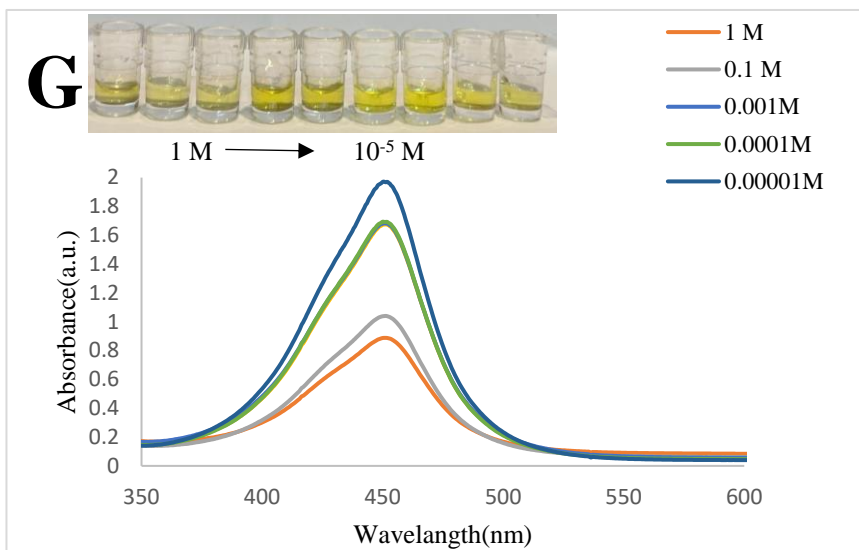
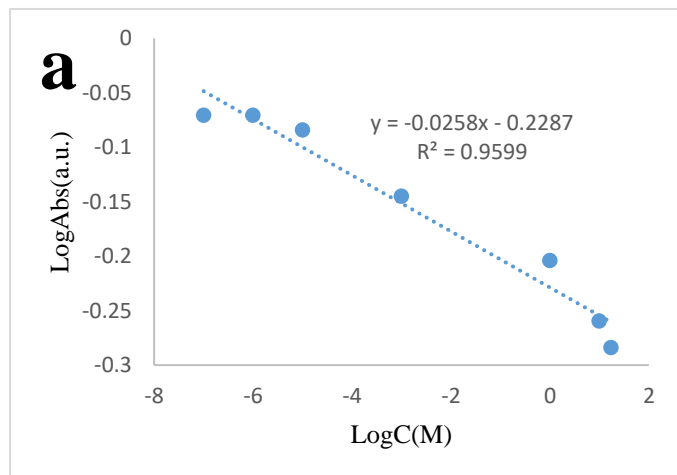
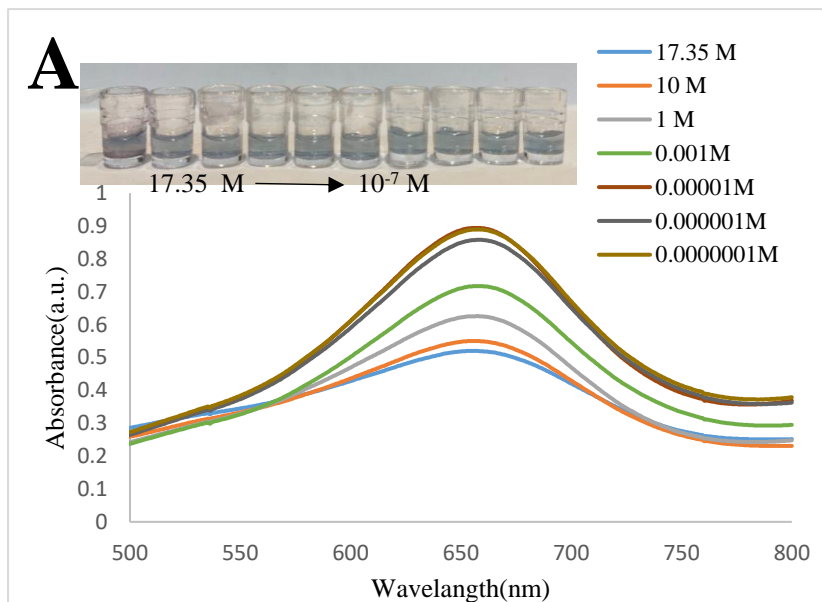
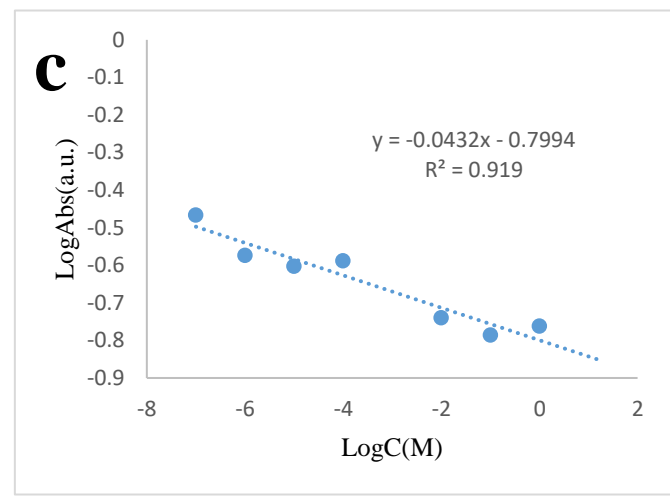
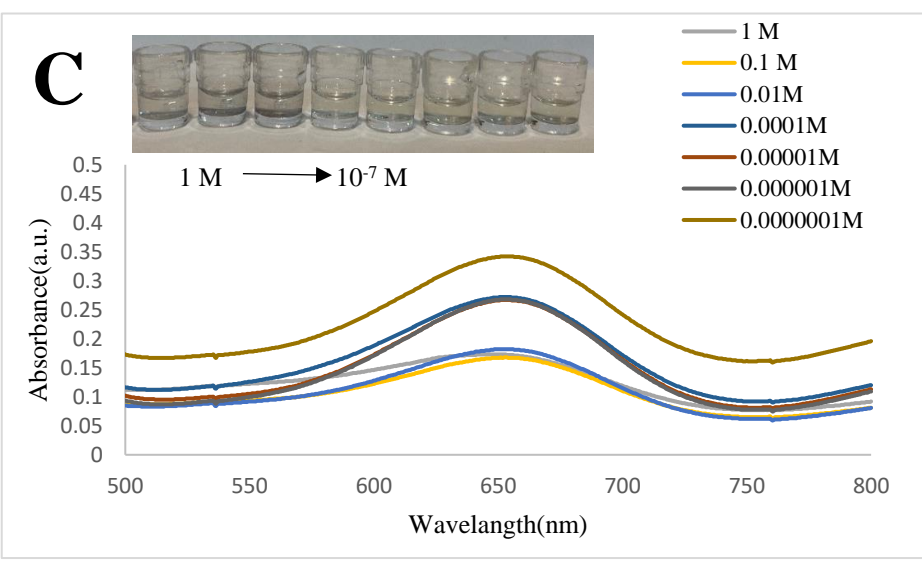
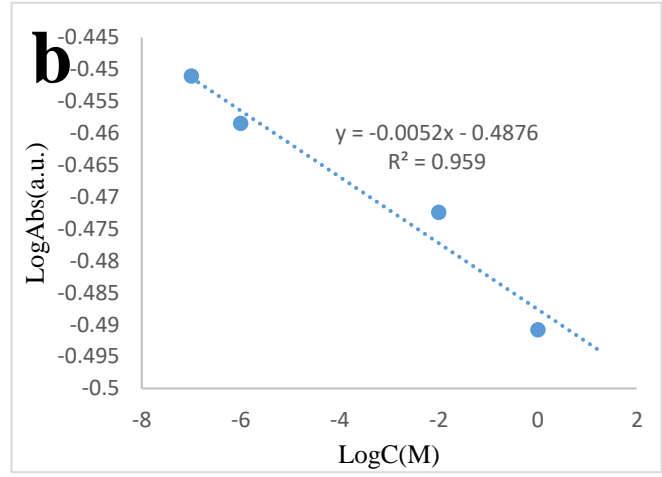
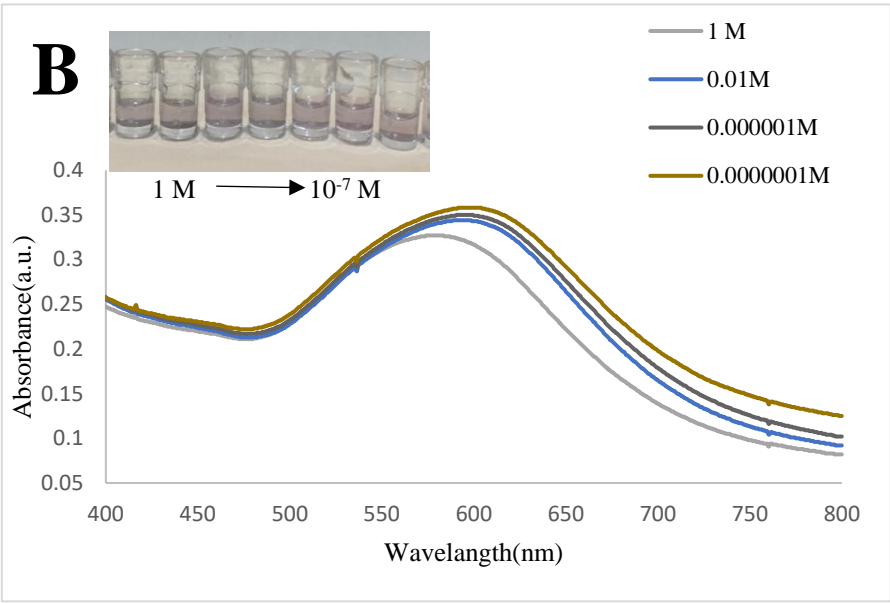
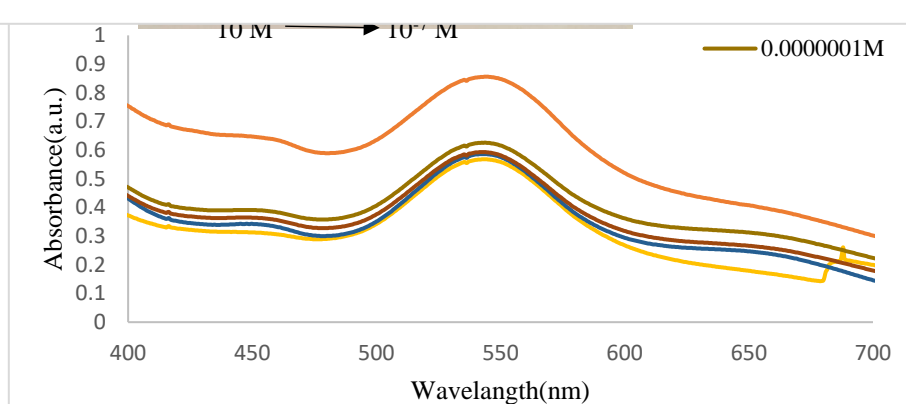
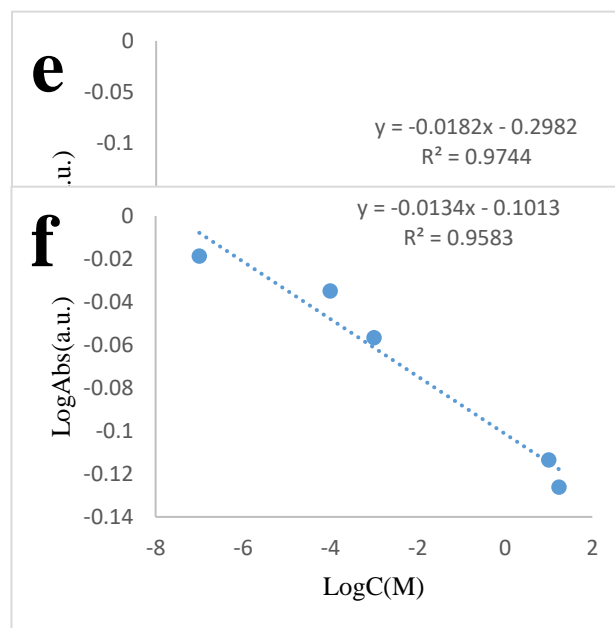
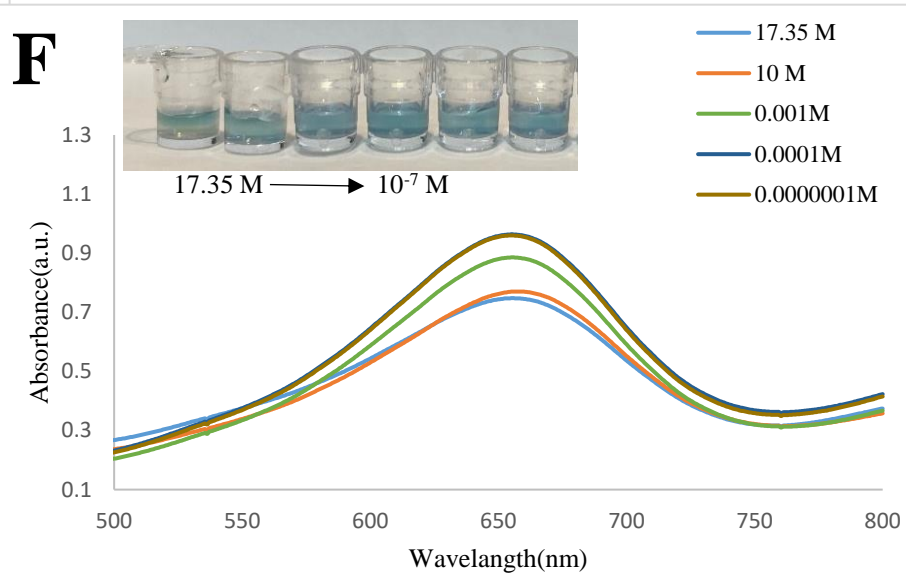
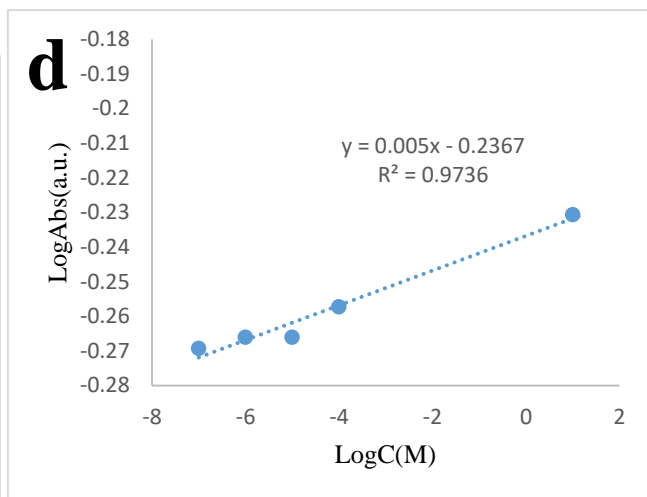
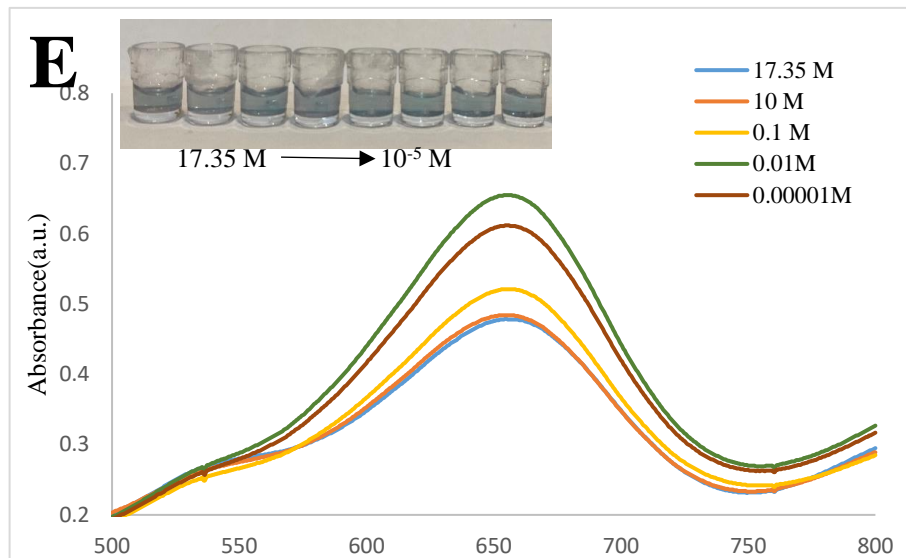


Fig.S1. A-B-C-D-E-F-G) Photographic image and UV-Vis spectra recorded from the reaction systems containing AuNPs-CysA/AuNPs-DDT/GNSs/GNSs(sediment)/AuNFs (ph.4.)/AuNFs (ph.6.15) and PCAuNPs, respectively with (TMB+H₂O₂) and different concentration of acetaldehyde (0.1-10⁷ μM), **a-b-c-d-e-f-g)** Calibration curve of peak absorption versus concentration of acetaldehyde.







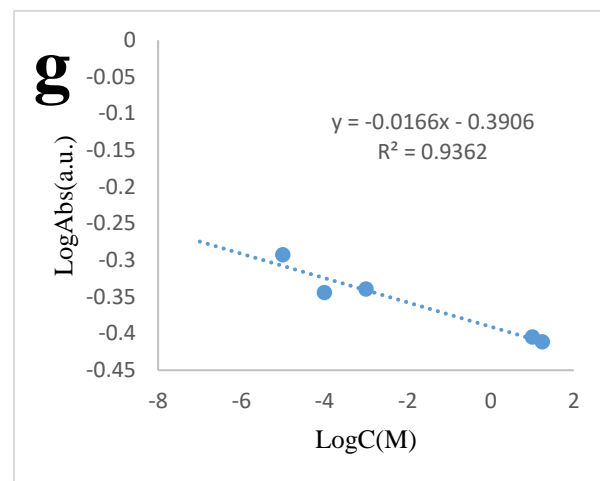
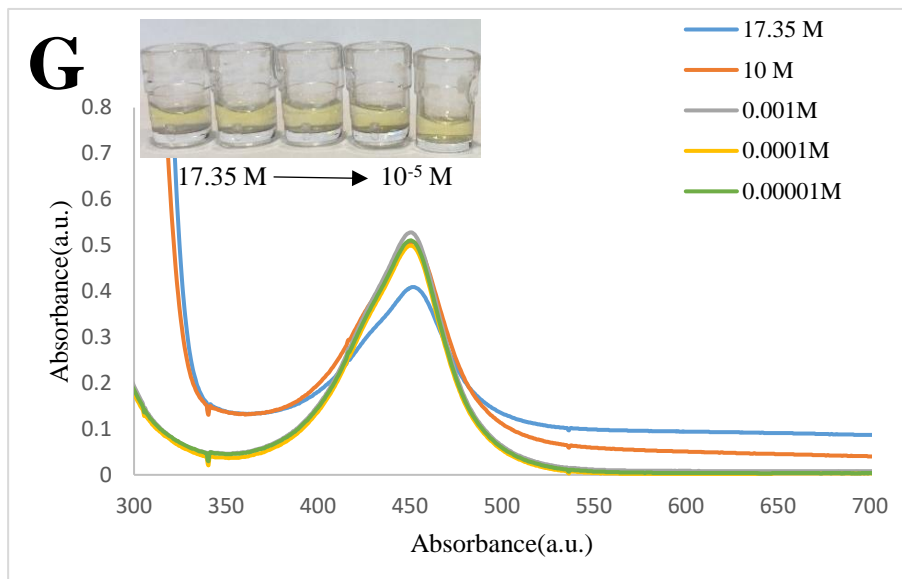
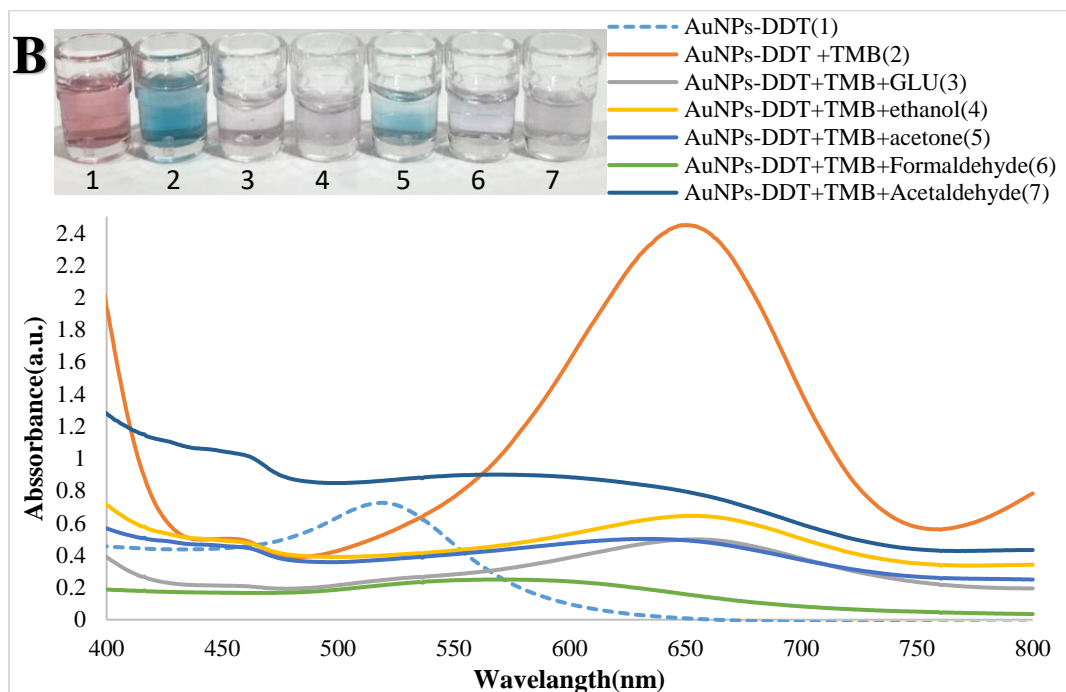
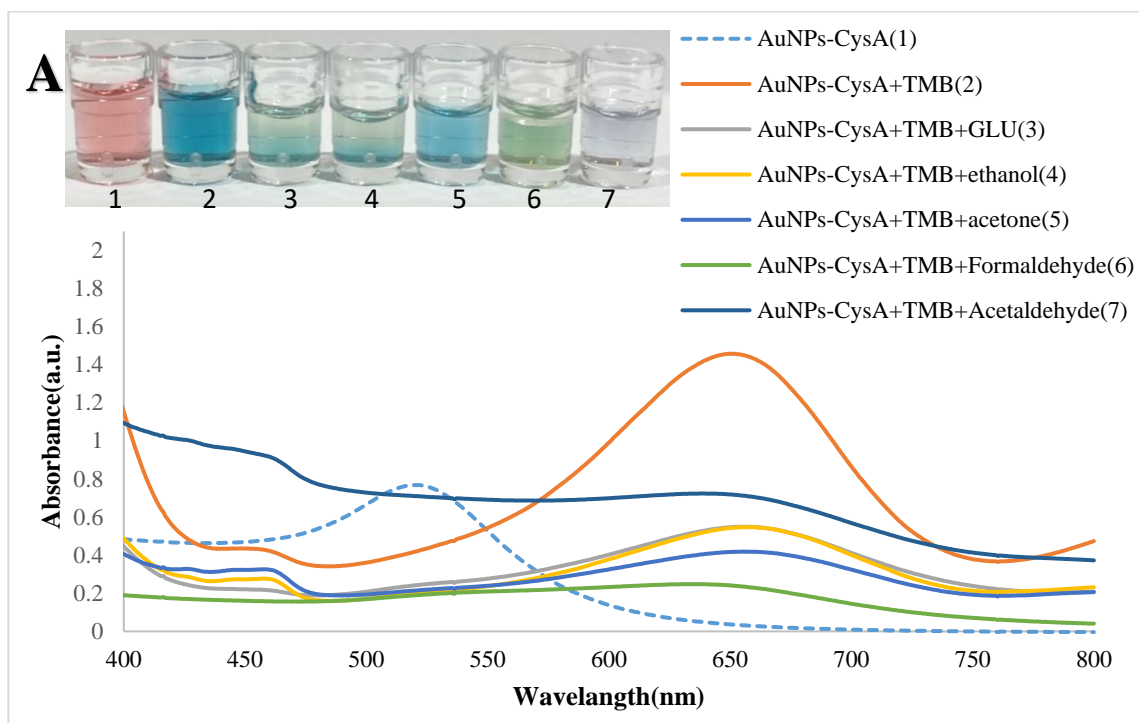
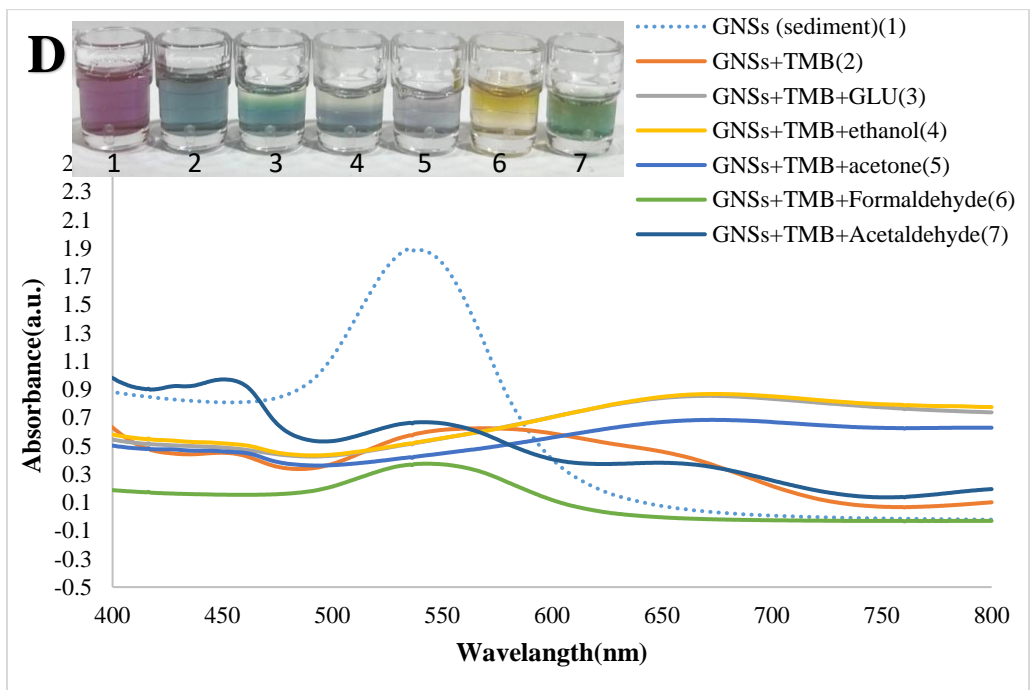
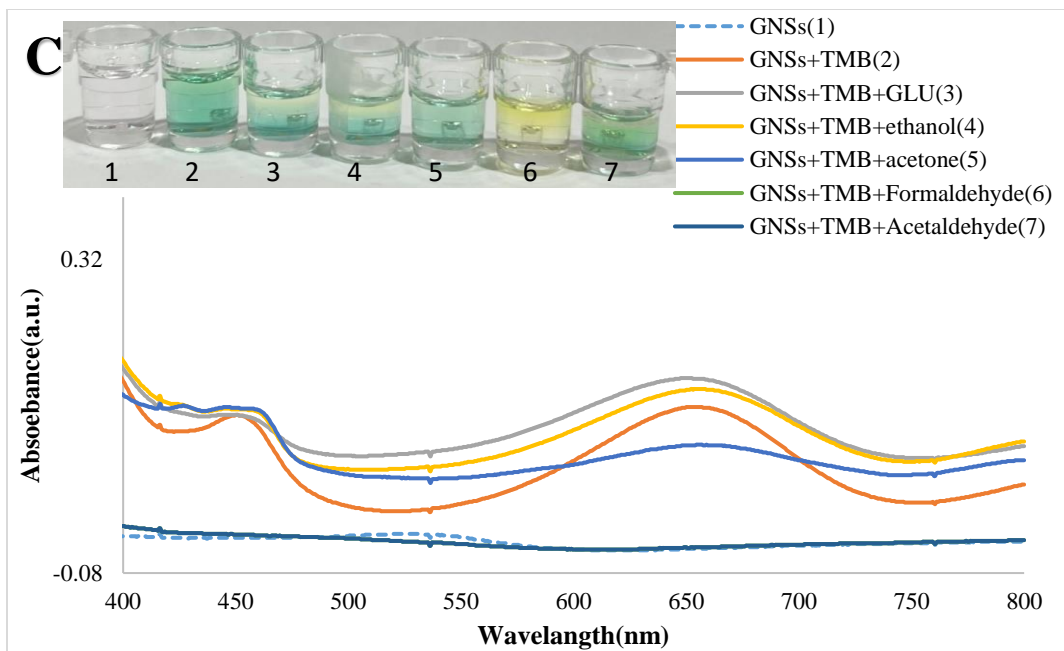
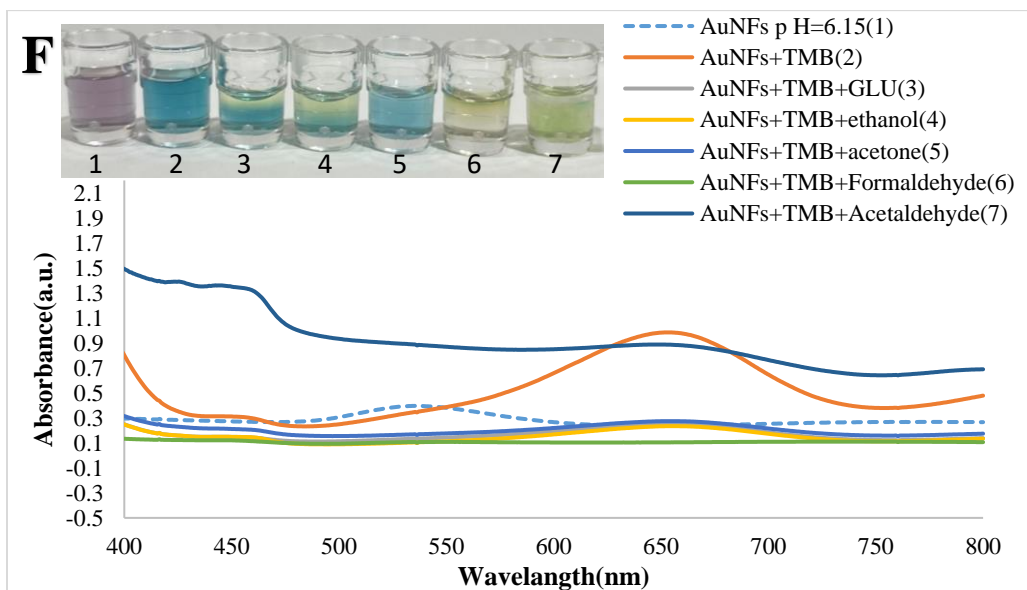
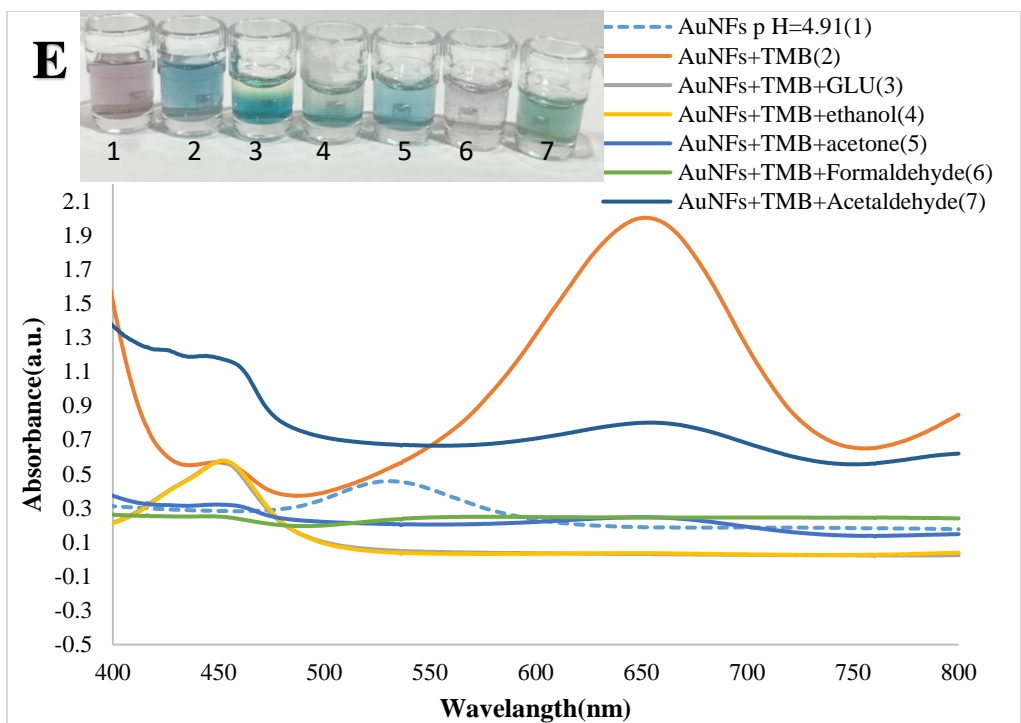
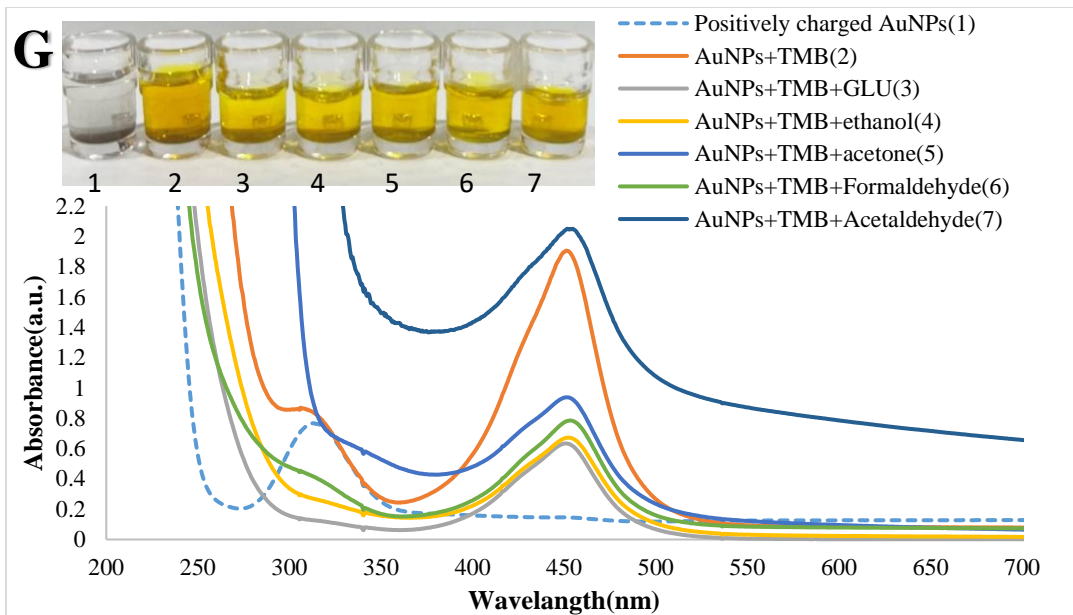


Fig.S2. A-B-C-D-E-F-G) UV-Vis absorption response for formaldehyde in different concentration concentrations (10^{-7} – 12.7M) and AuNPs (AuNPs-CysA/AuNPs-DDT/GNSs/GNSs(sediment)/AuNFs (ph.4.19)/AuNFs (ph.6.15) and Positively charged AuNPs, respectively) in human urine specimens
a-b-c-d-e-f-g) Calibration curve of peak absorption versus concentration of acetaldehyde.









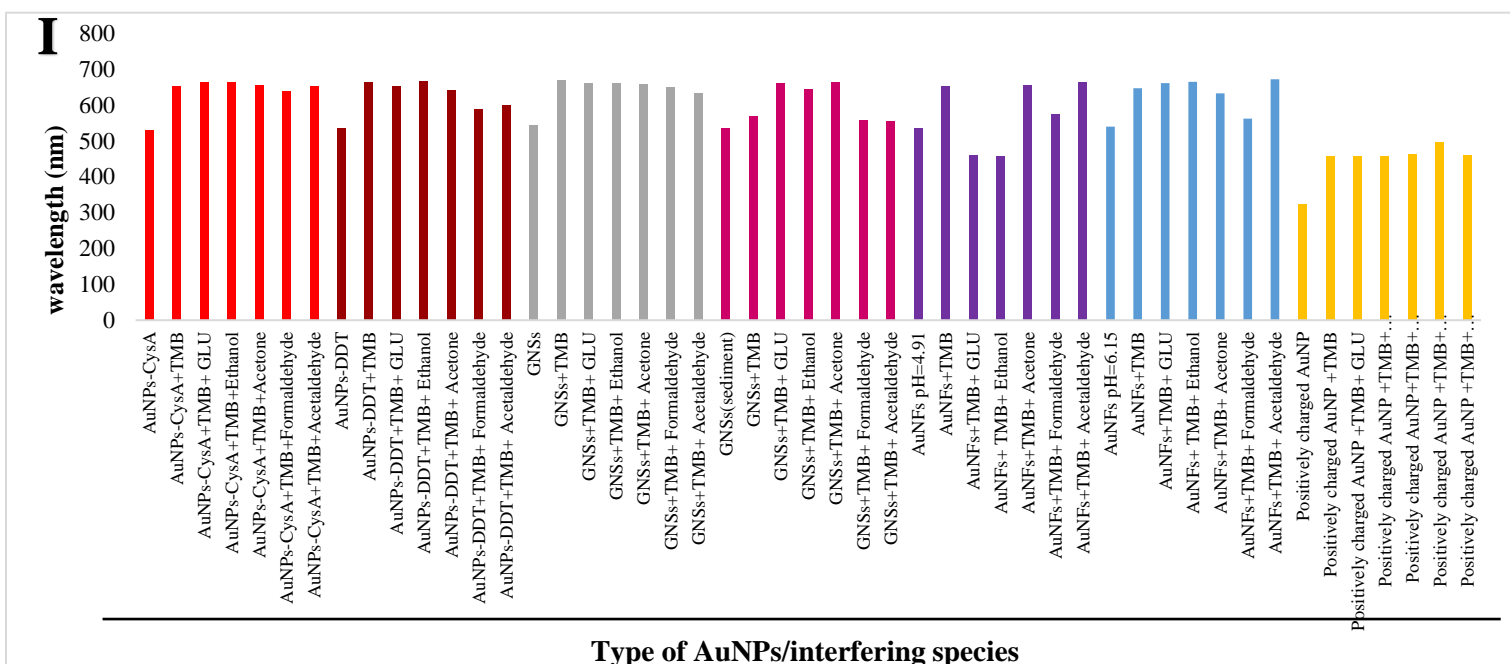
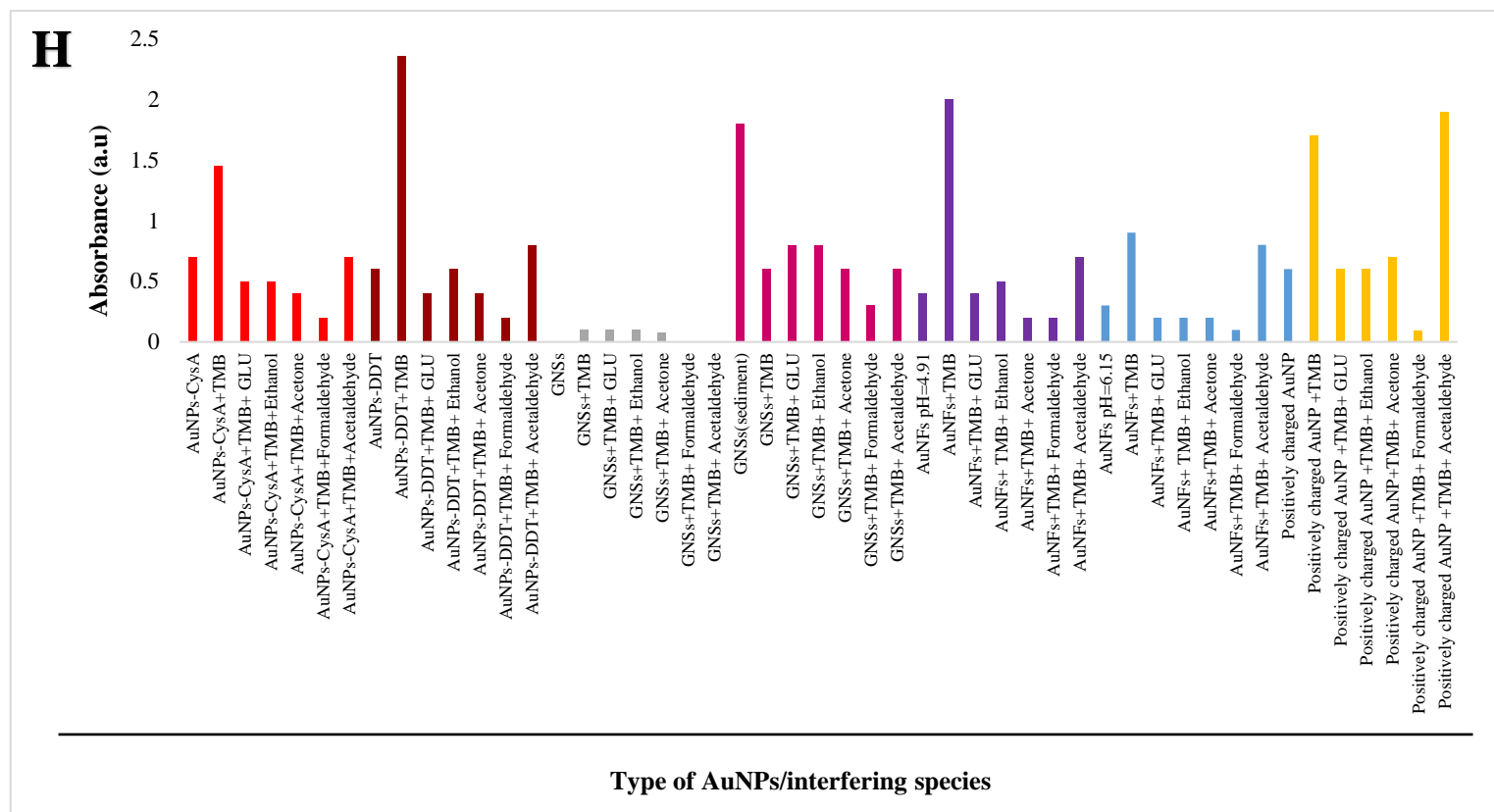
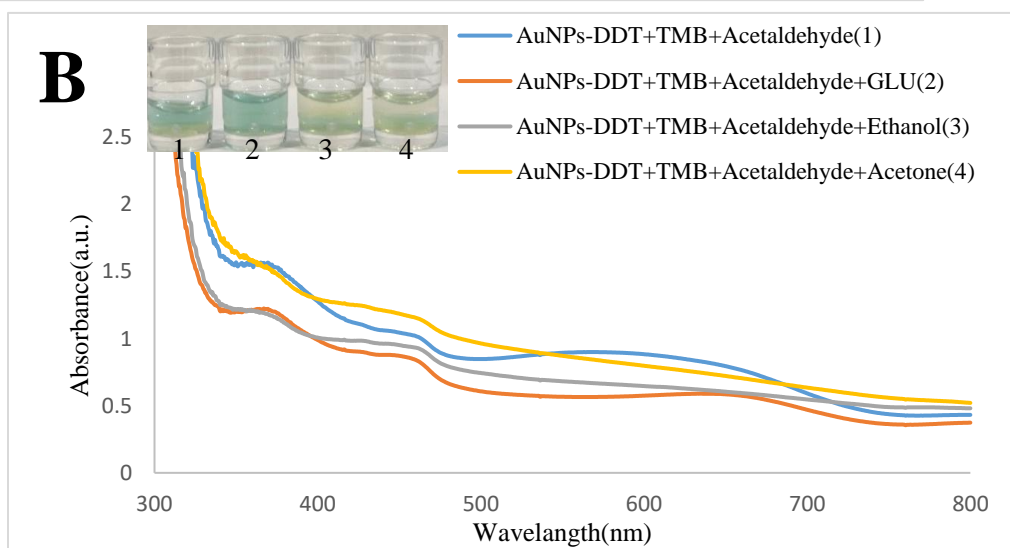
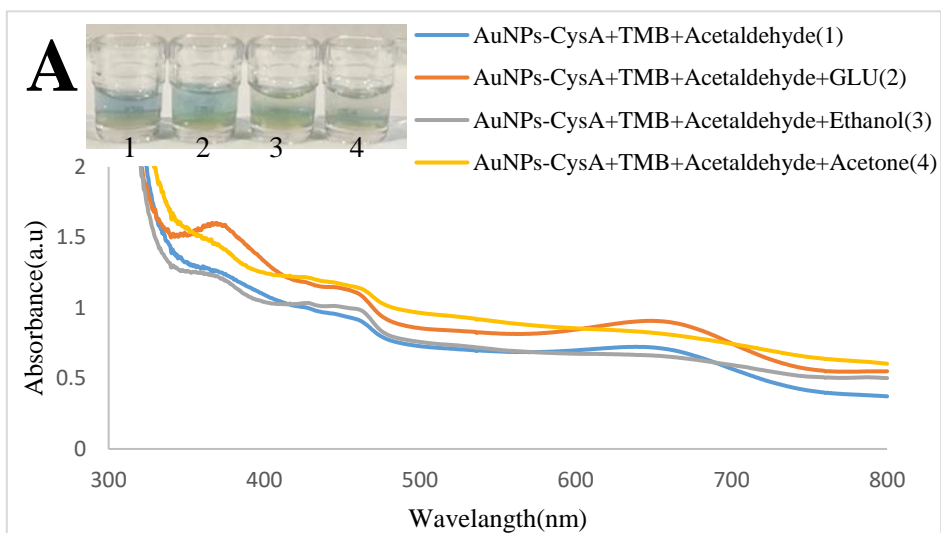
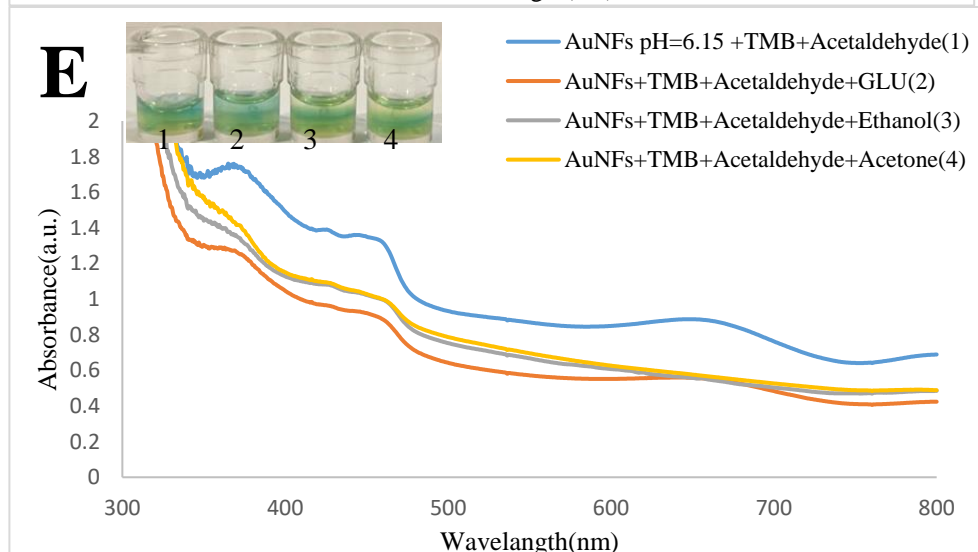
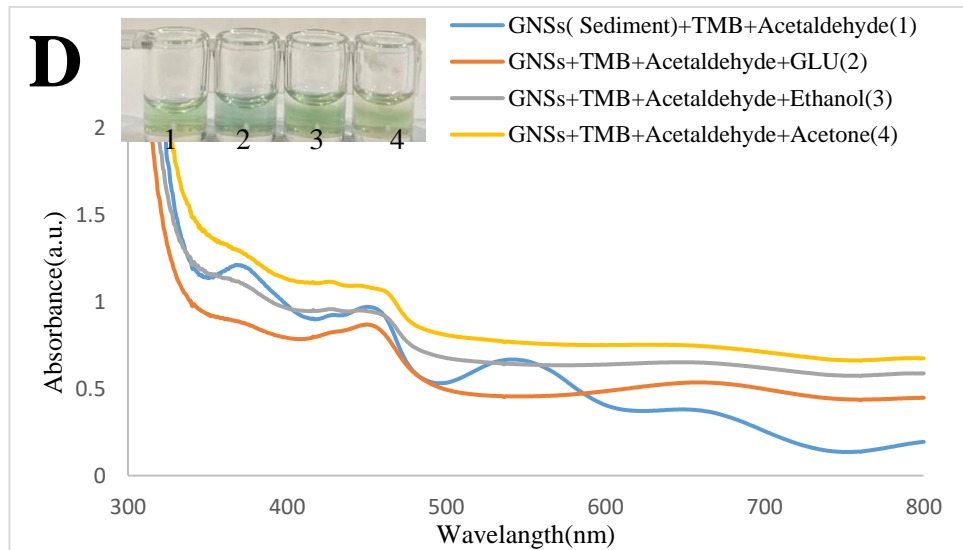
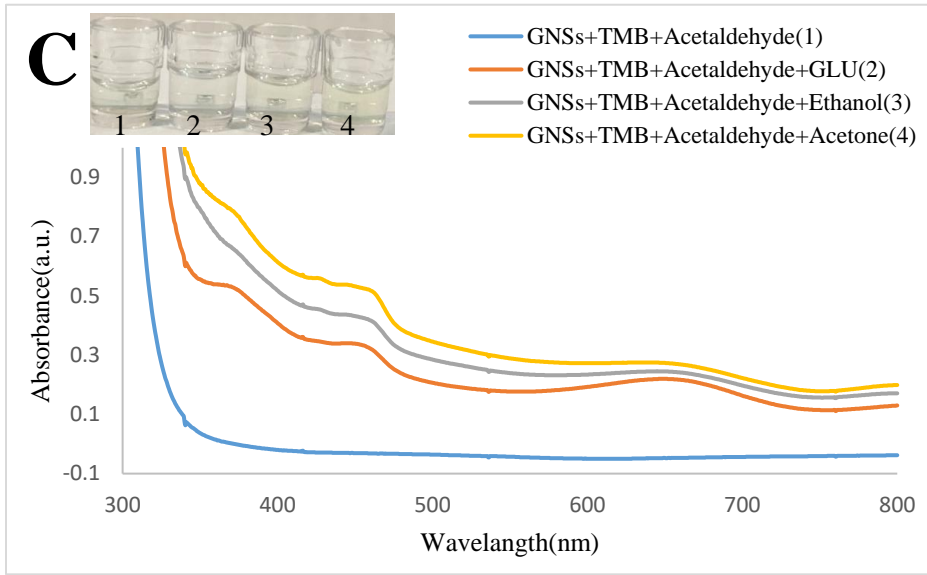
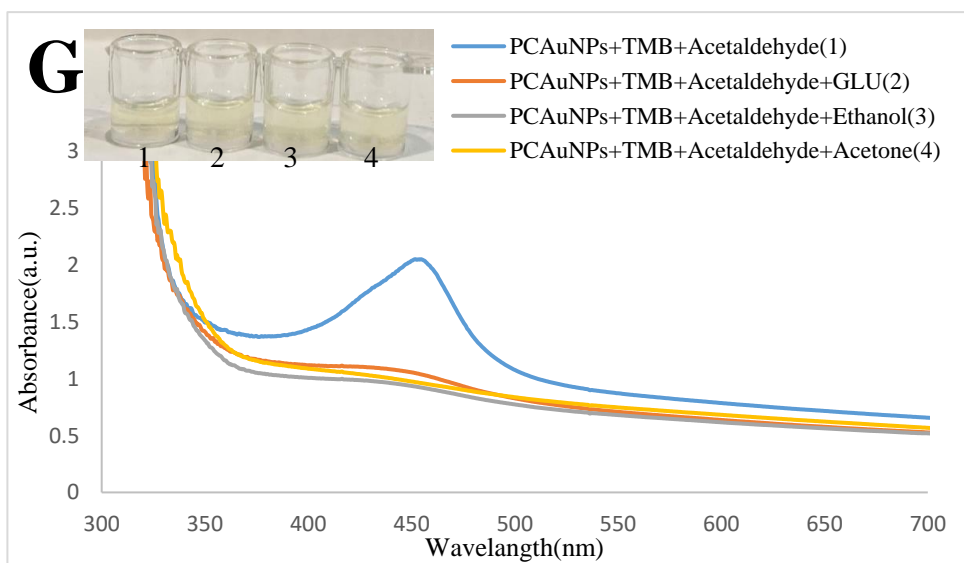
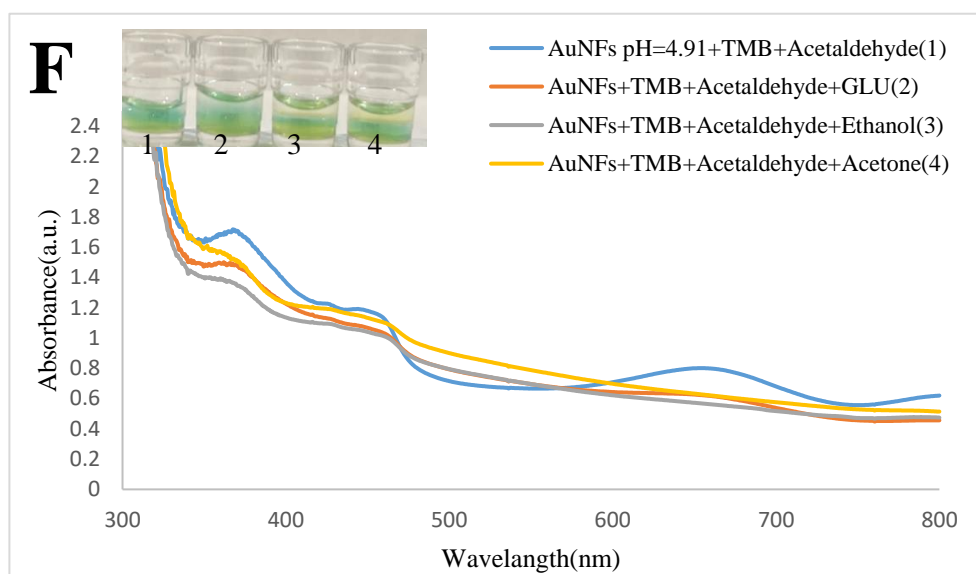


Fig. S3. A-G) UV-visible spectroscopy and colorimetric detection of the interaction of AuNPs with acetaldehyde in the presence of the TMB+H₂O₂ solution and various interfering species. Histogram of **H)** absorbance intensity and **I)** absorbance wavelength.







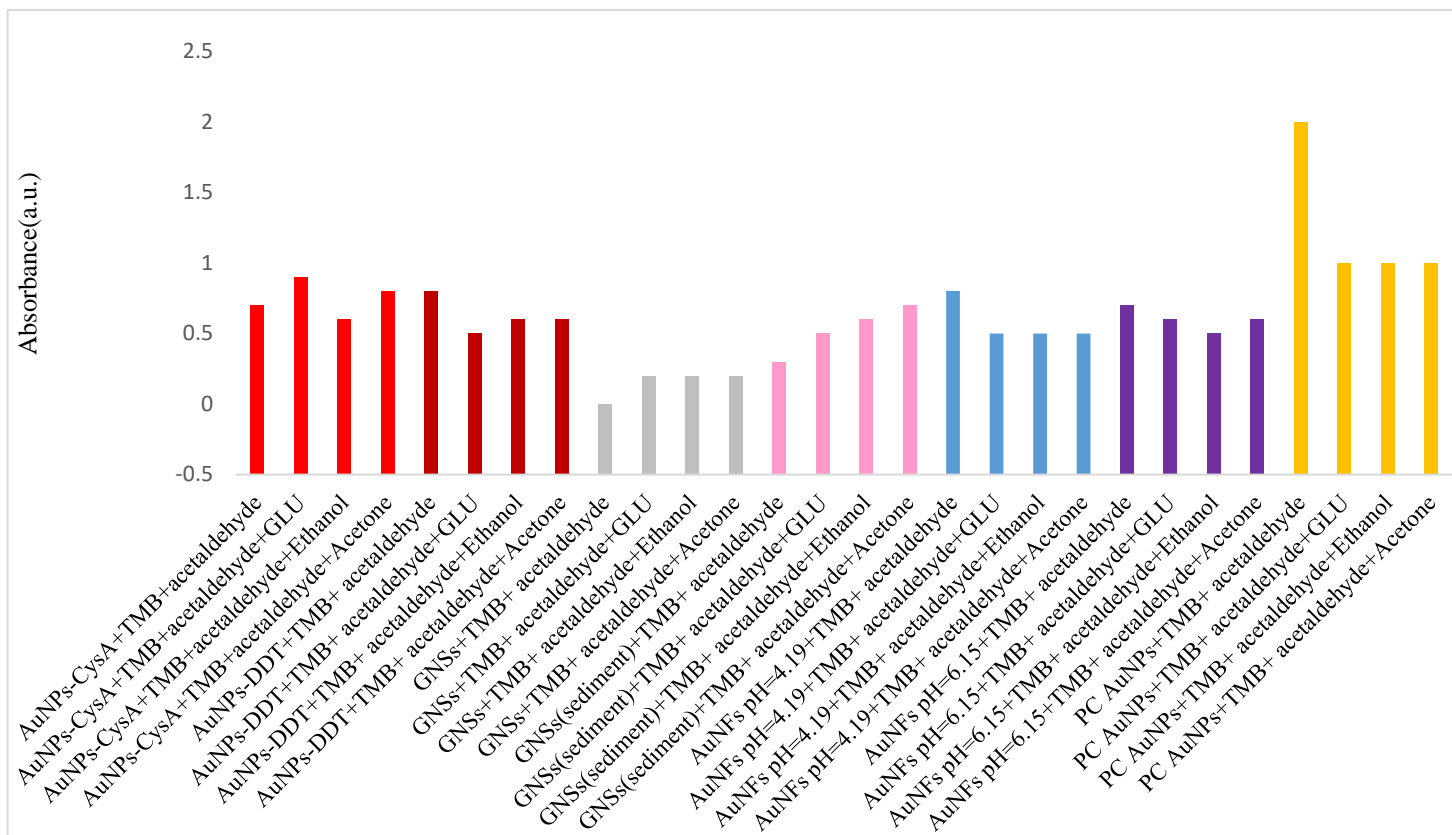
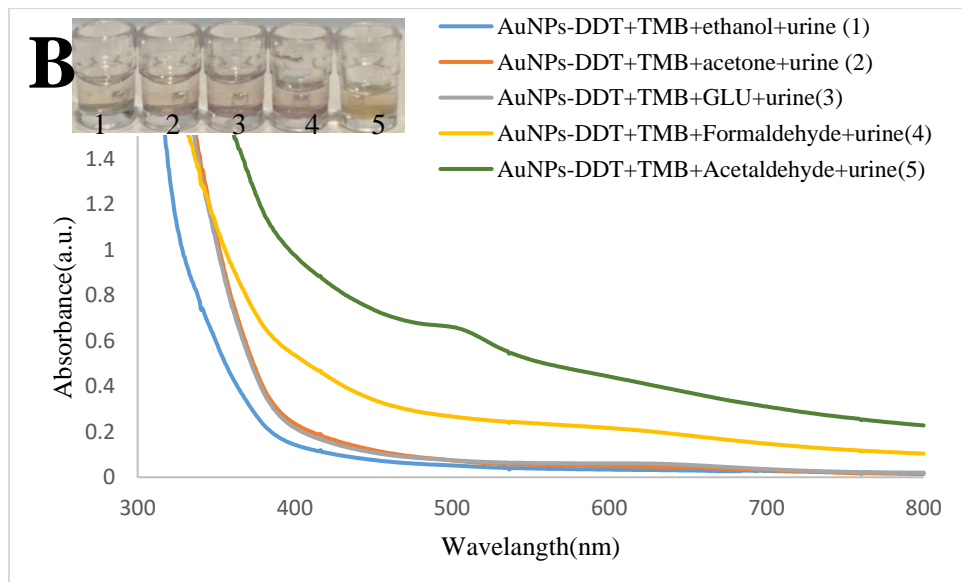
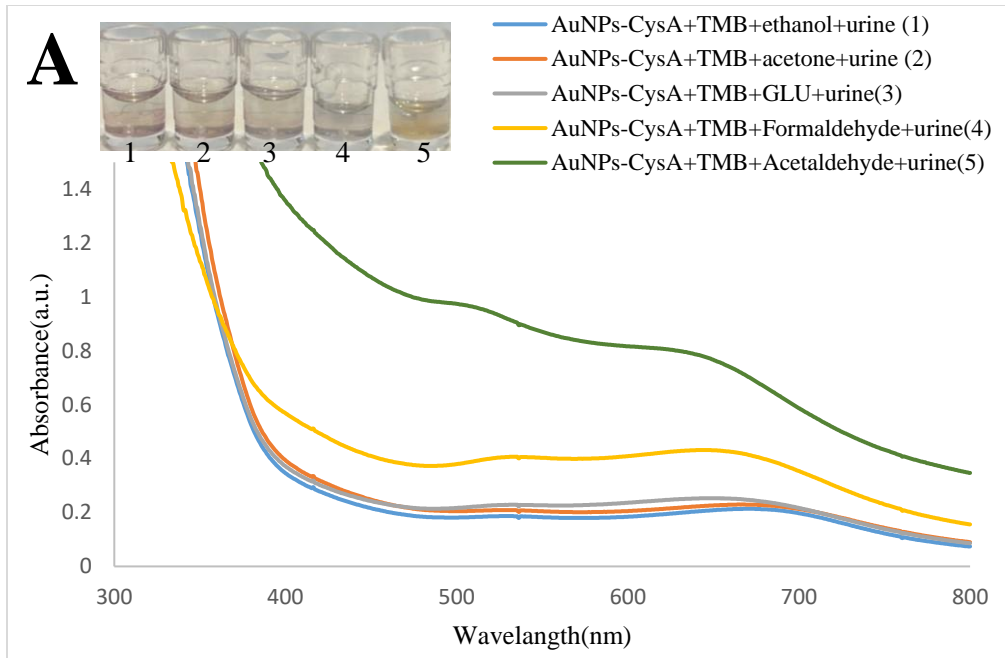
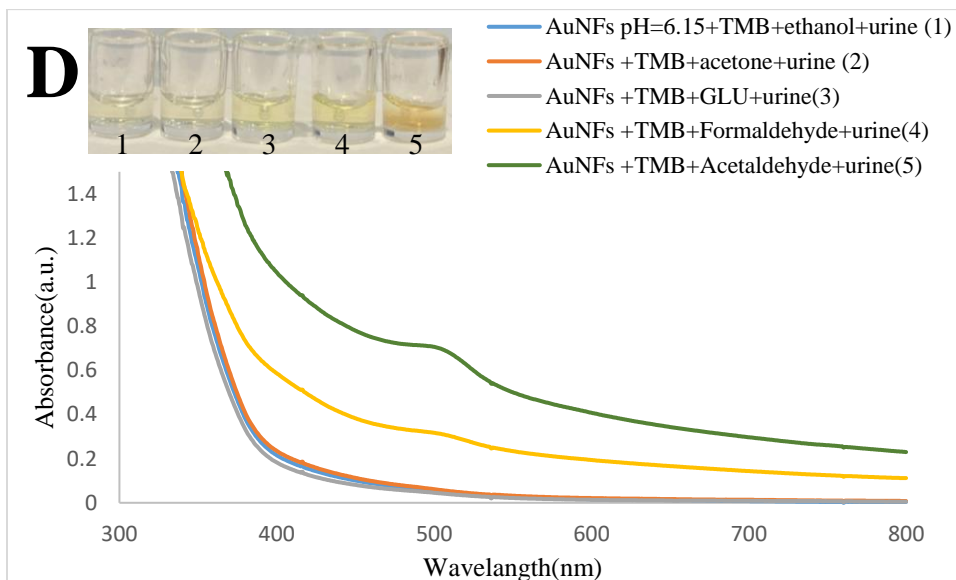
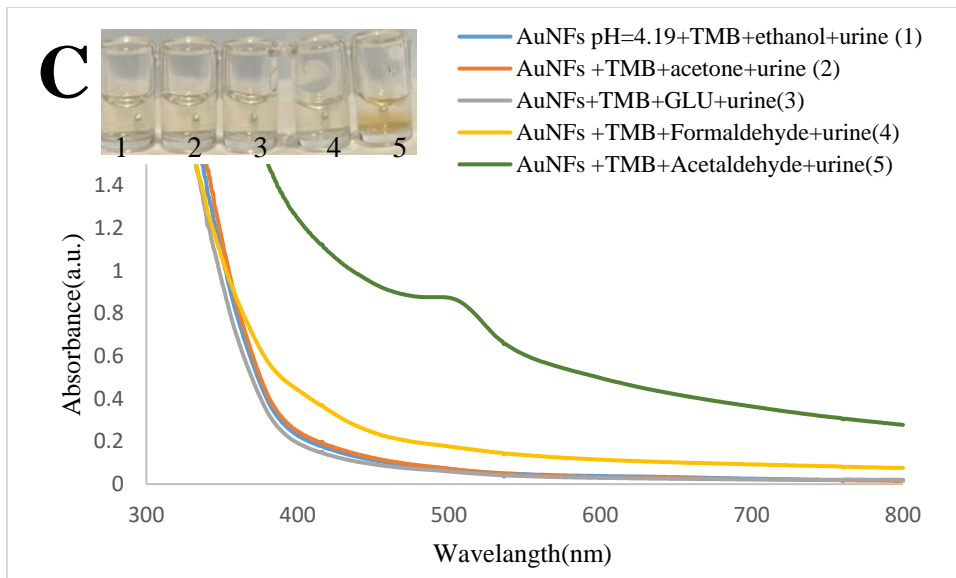
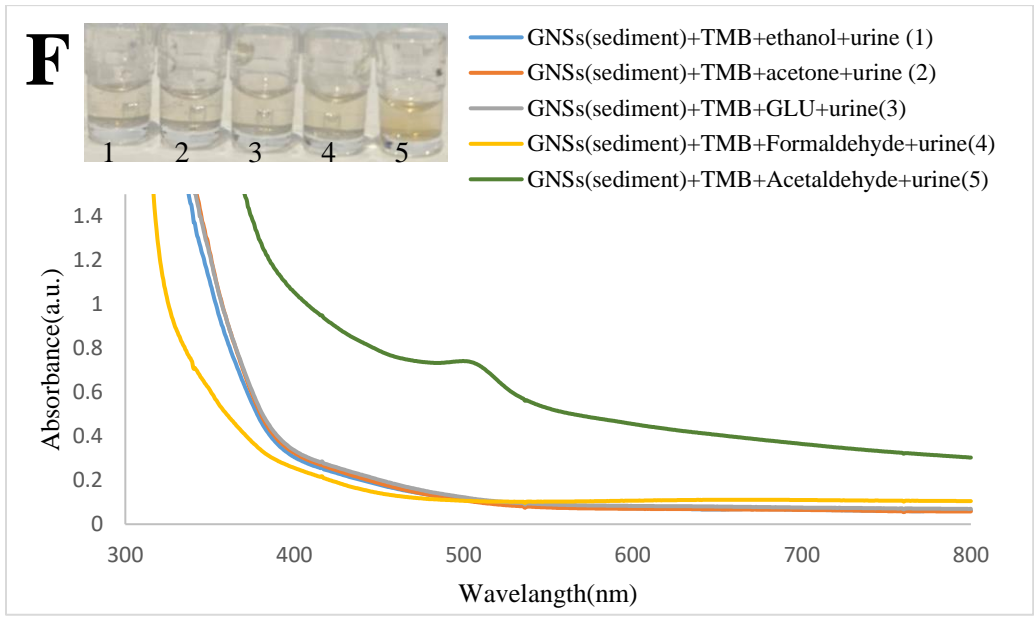
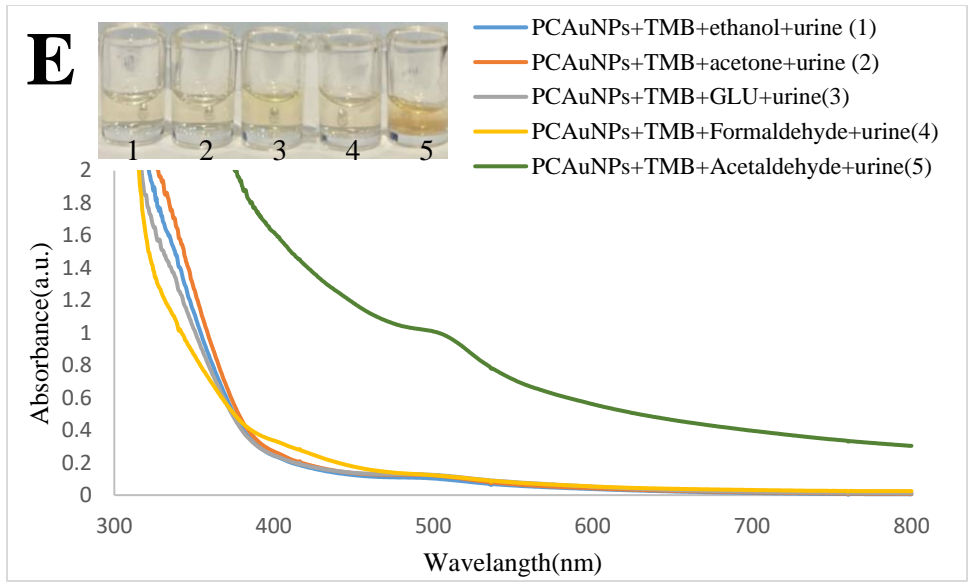


Fig.S4. A-G) UV-visible spectroscopy photographs examining the effects of interfering substances in solutions containing AuNPs, TMB, and acetaldehyde. **H)** Absorption using histogram.







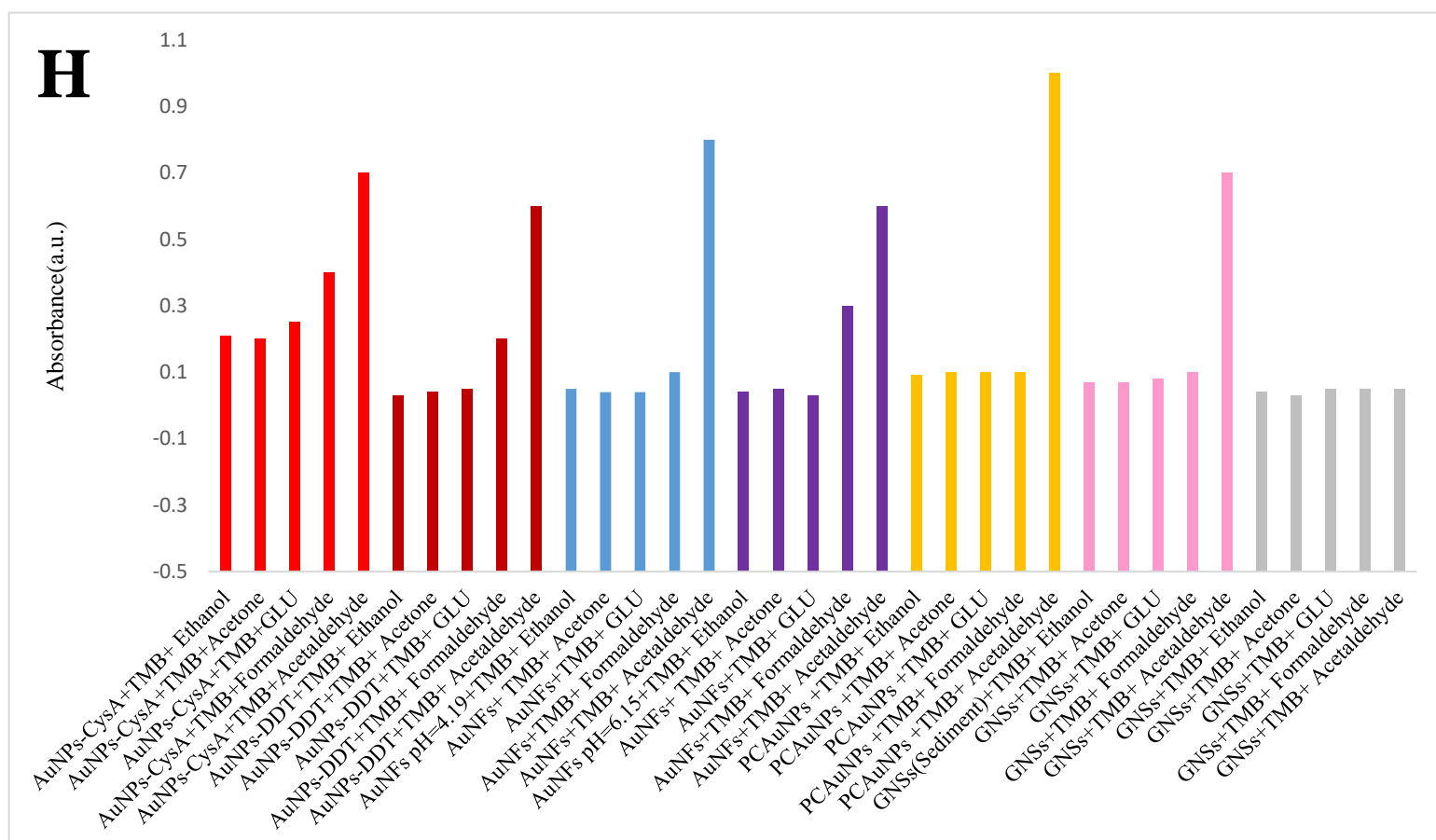
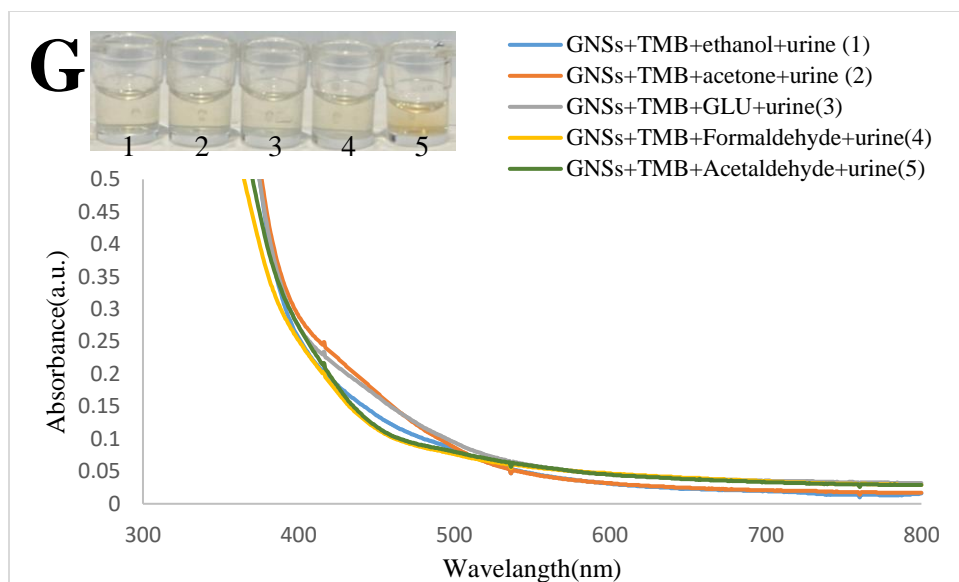
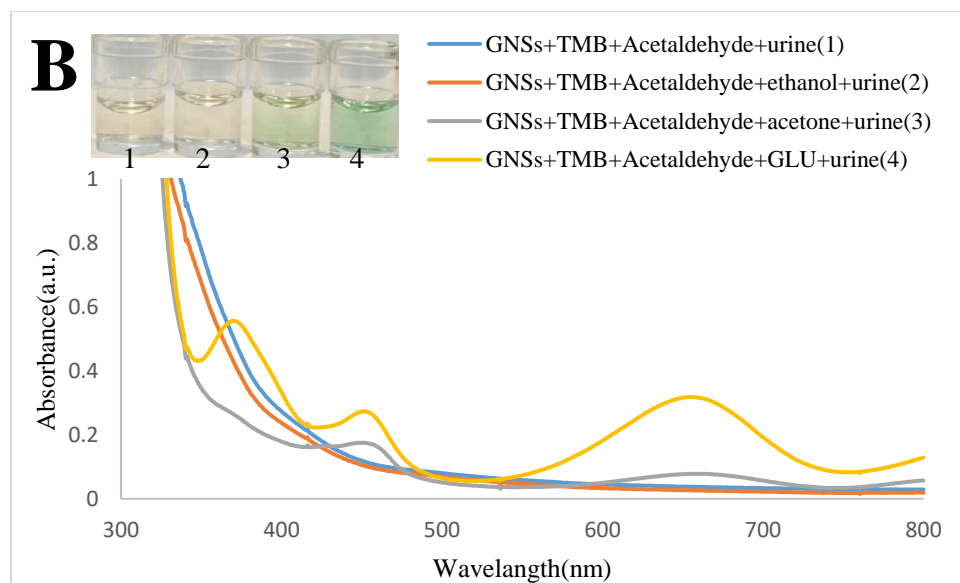
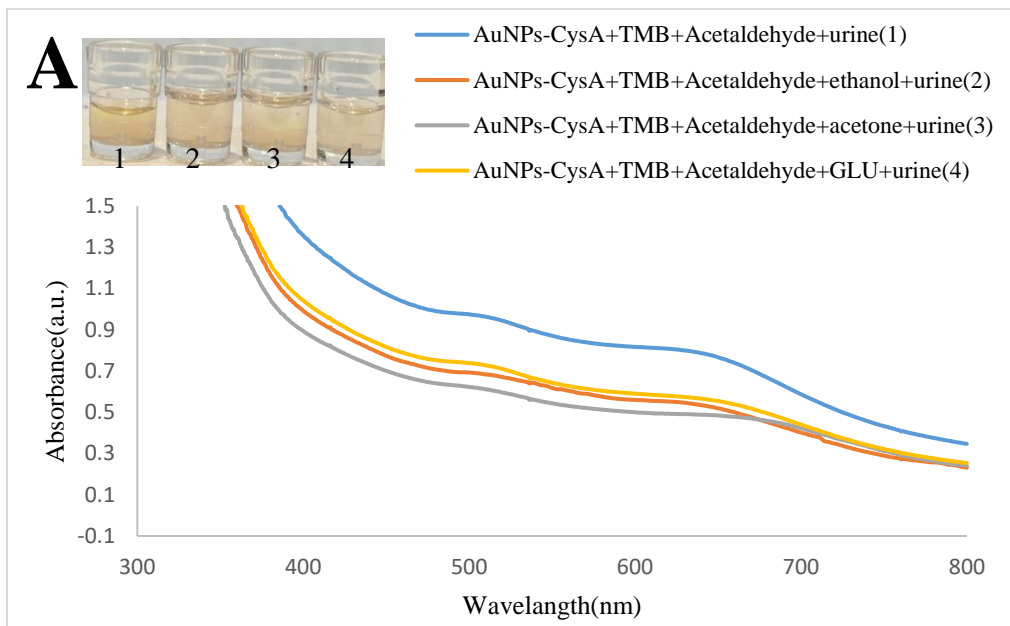
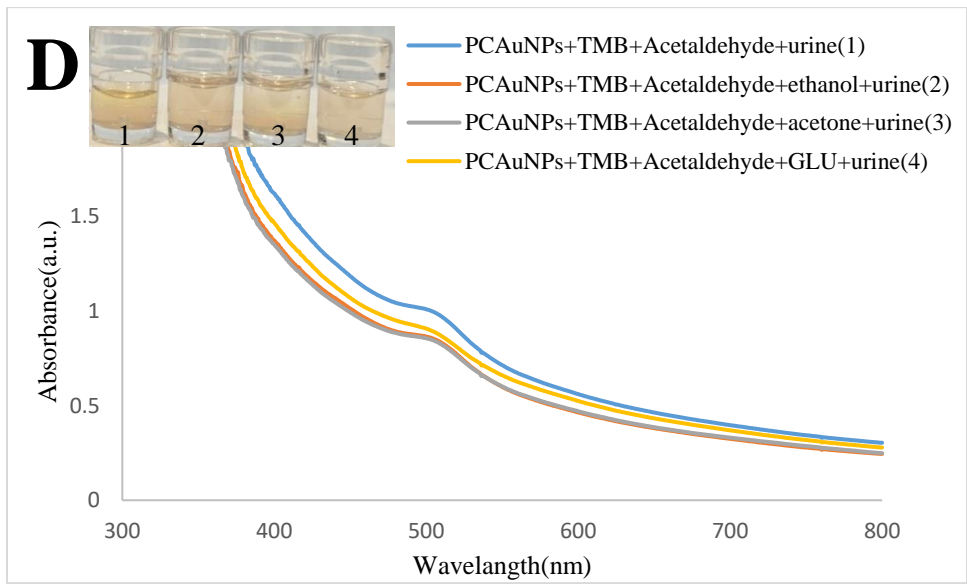
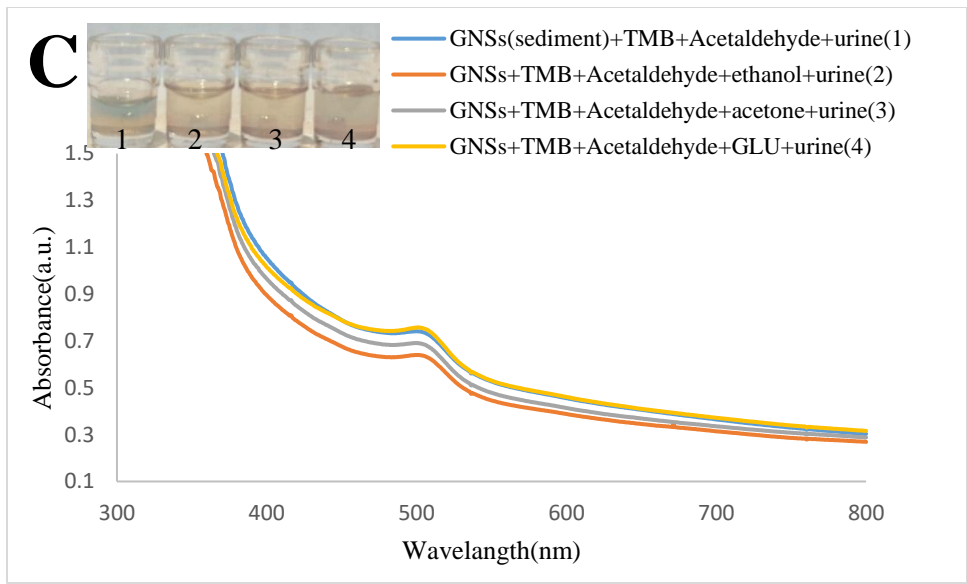
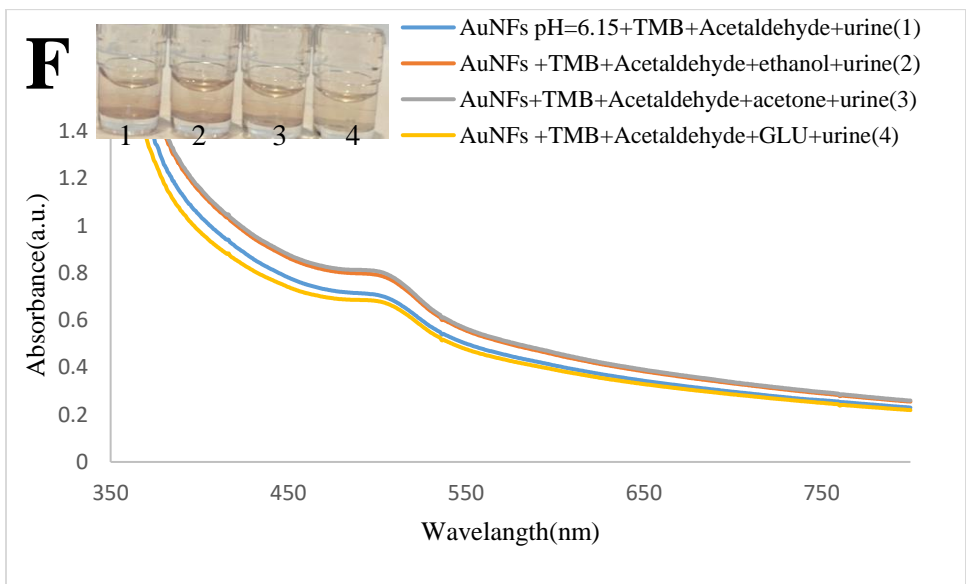
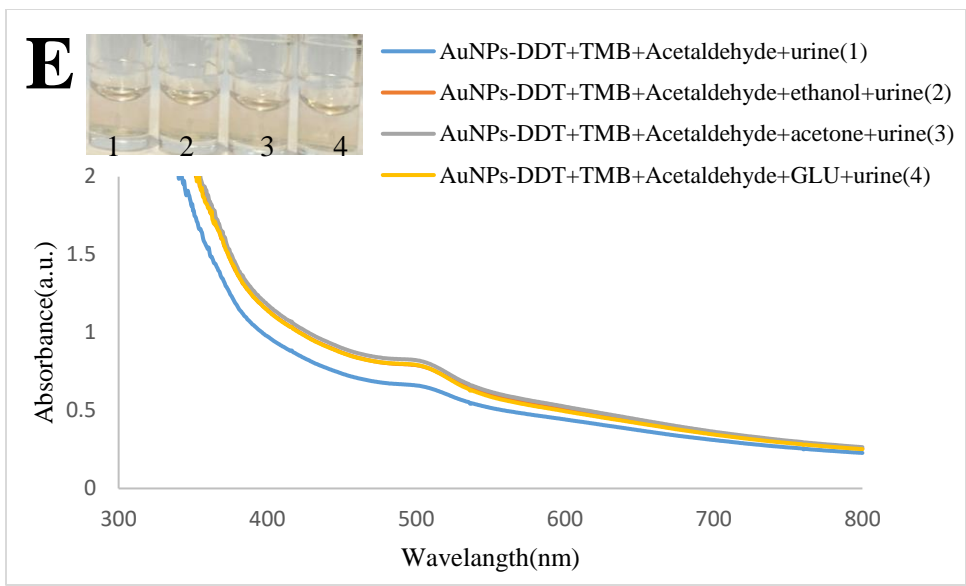


Fig.S5. A-G) UV-visible spectroscopy photographs examining the effects of interfering substances in solutions

containing AuNPs, TMB, and formaldehyde. **H)** Absorption using histogram







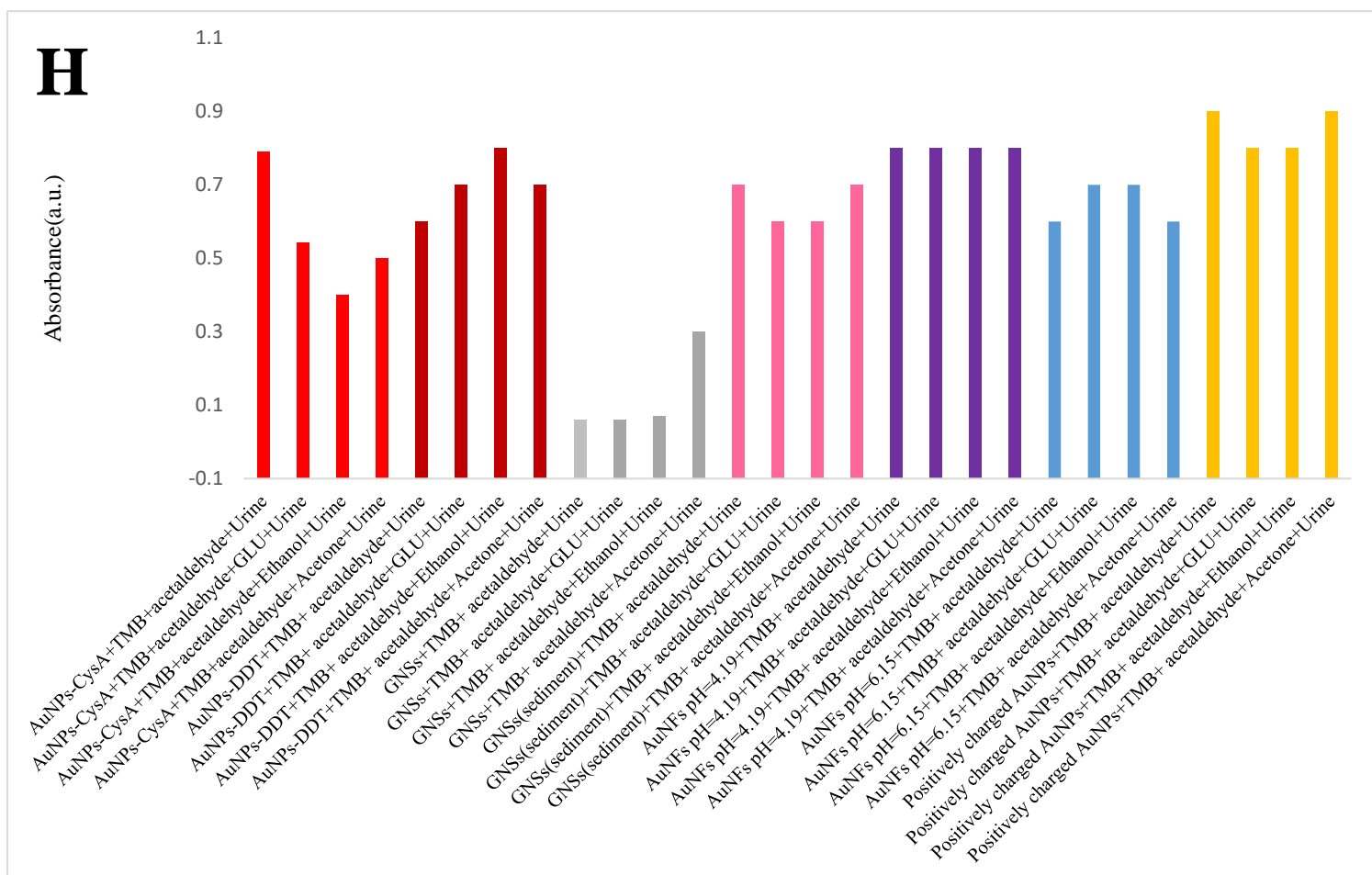
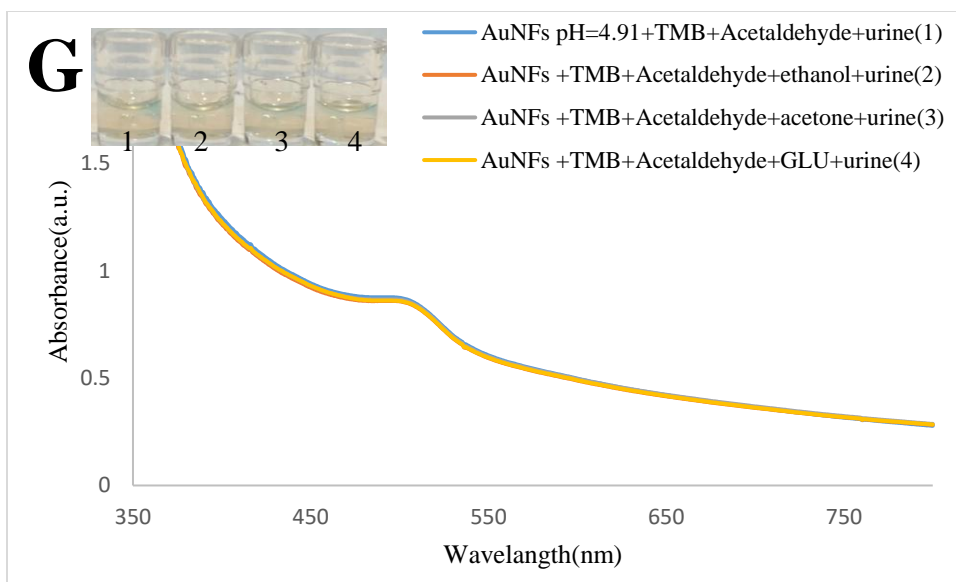


Fig.S6. A-G UV-visible spectroscopy photographs examining the effect of interfering substances in real samples

in solutions containing AuNPs, TMB, and acetaldehyde. **H**) Absorption using histogram.

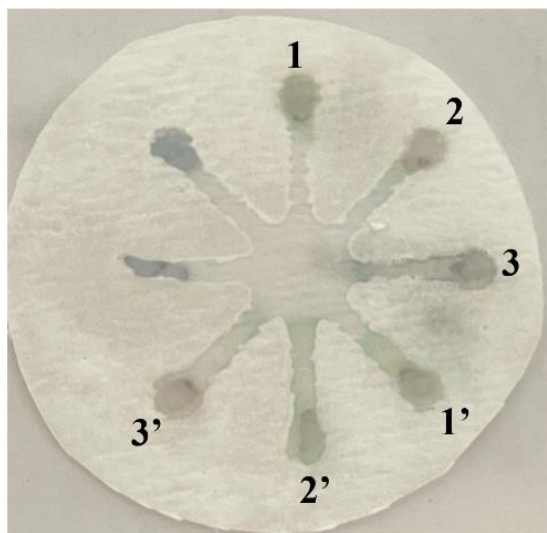


Figure S7. Photographic images demonstrating selectivity of prepared fiberglass microfluidic paper-based calorimetric chemosensor with AuNFs (pH 6.15) against various interferers: **1)** AuNFs + TMB + ethanol + acetaldehyde, **2)** AuNFs+ TMB + acetone + acetaldehyde, **3)** AuNFs + TMB + GLU + acetaldehyde, **1')** AuNFs + TMB + ethanol + acetaldehyde + Urine, **2')** AuNFs + TMB + acetone + acetaldehyde + Urine, **3')** AuNFs + TMB + GLU + acetaldehyde + Urine.