

Advanced Fabrication of miRNA-Based Electrochemical Nanobiosensor for Diagnosis of Breast Cancer

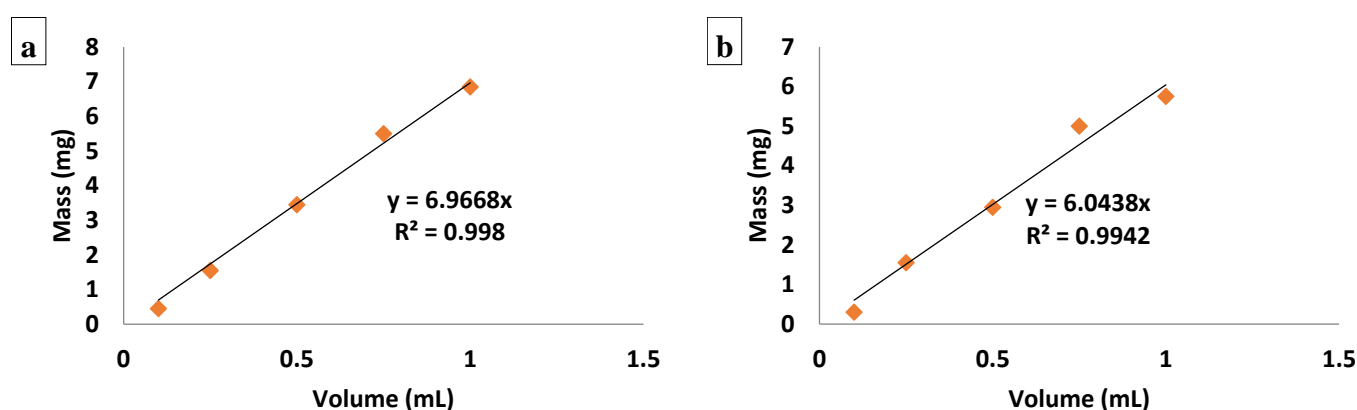
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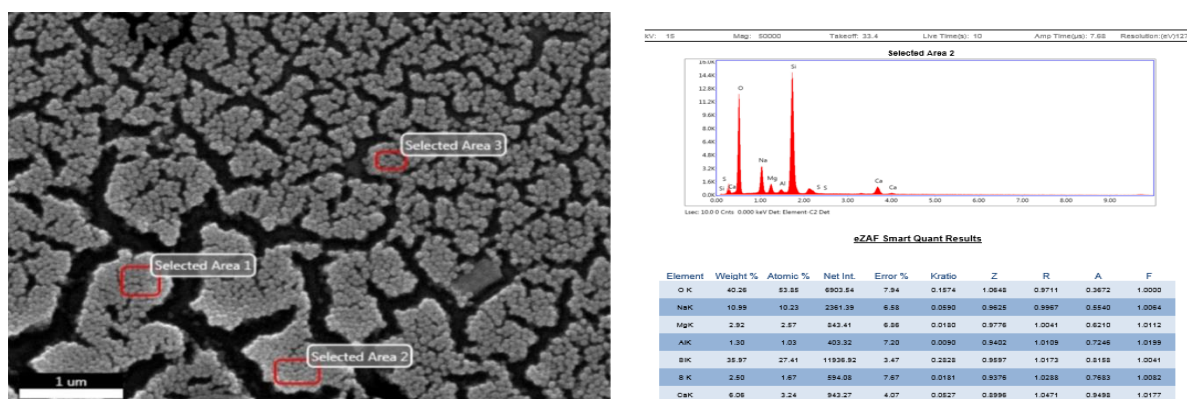
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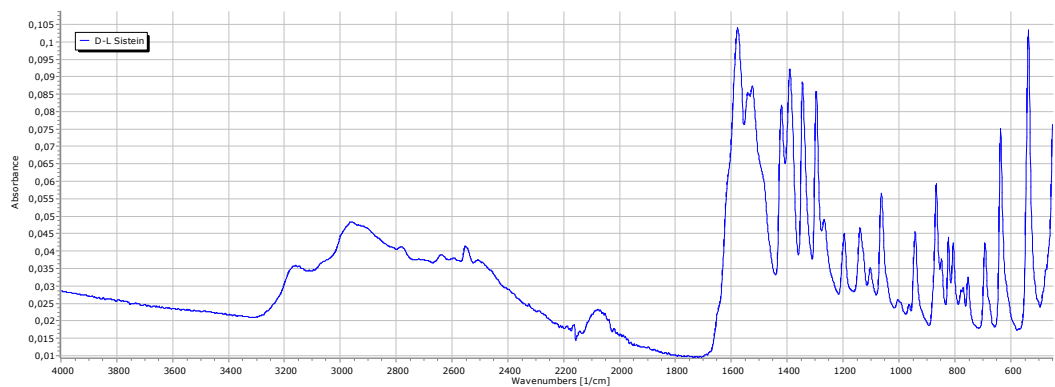
Supplementary Materials



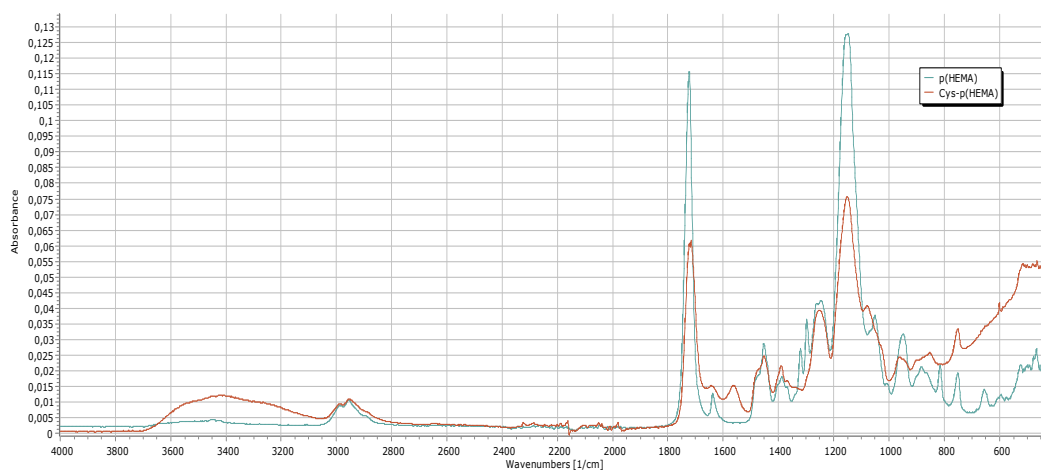
Supplementary Figure S1. Dry-mass graph of a) p(HEMA) and b) Cys-graft-p(HEMA) nanopolymer



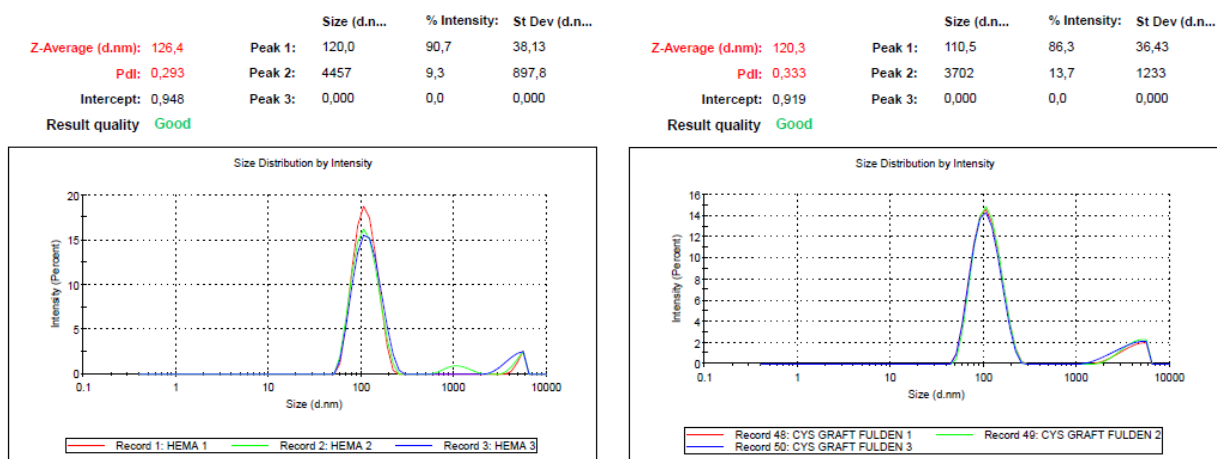
Supplementary Figure S2. EDS Analysis Results of Cys-graft-p(HEMA) nanopolymers



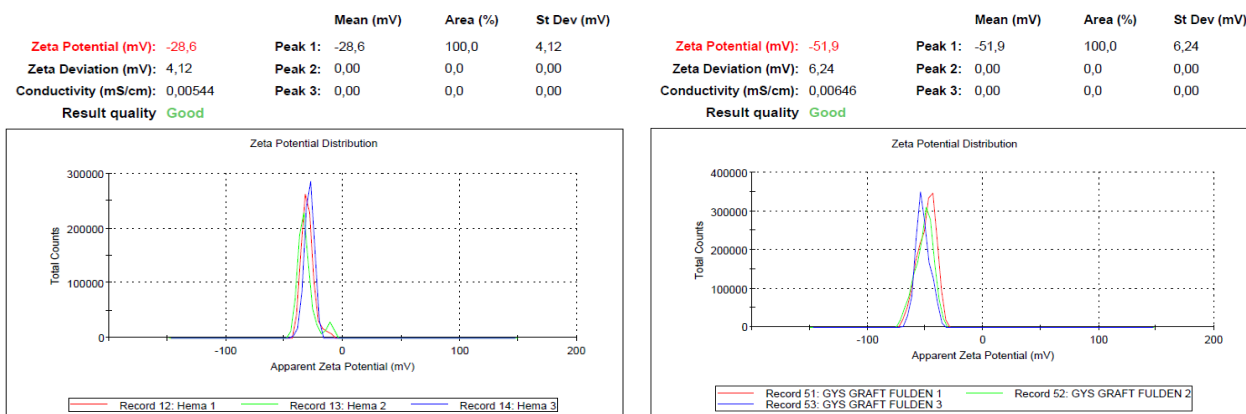
Supplementary Figure S3. D-L Cysteine FTIR Spectrum



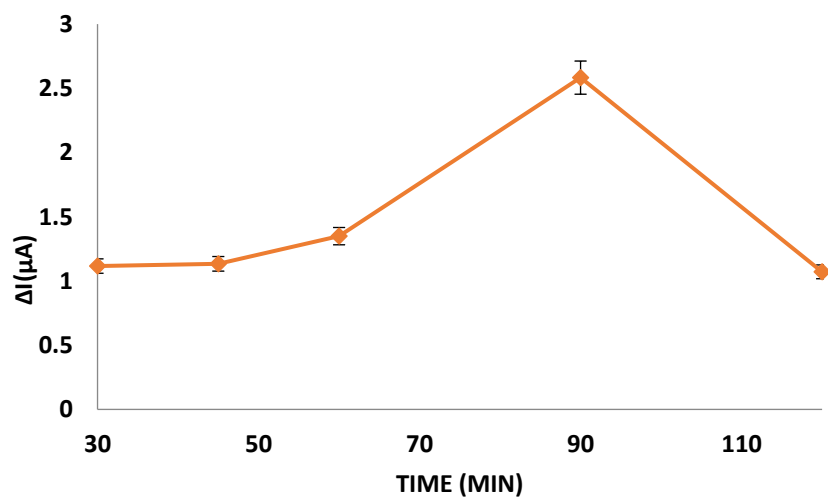
Supplementary Figure S4. p(HEMA) ve Cys-graft-p(HEMA) FTIR Spectrum



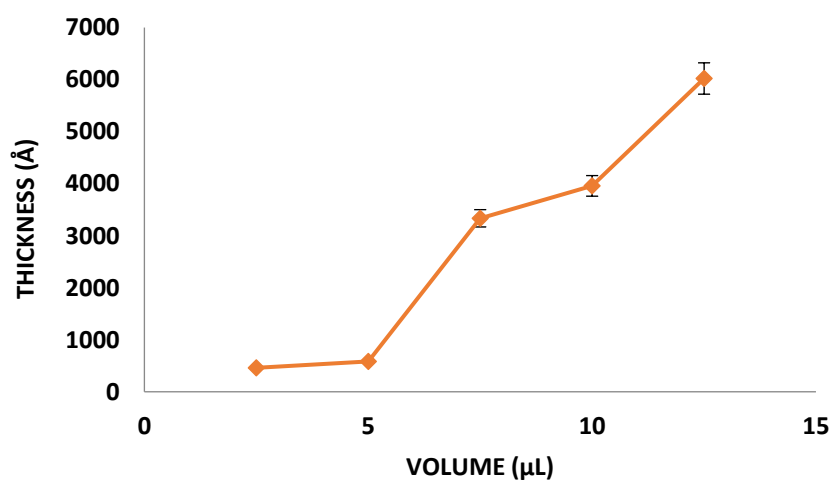
Supplementary Figure S5. p(HEMA) and Cys-graft-p(HEMA) Zeta Size Graph



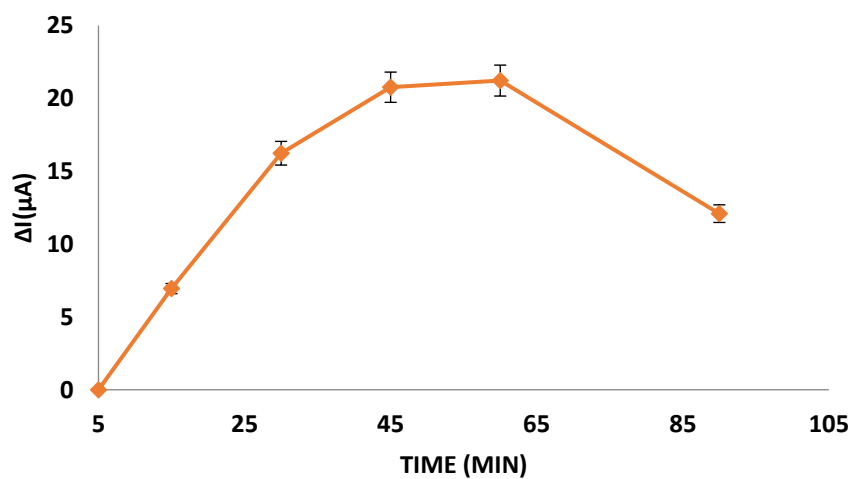
Supplementary Figure S6. p(HEMA) and Cys-graft-p(HEMA) Zeta Potential Graph



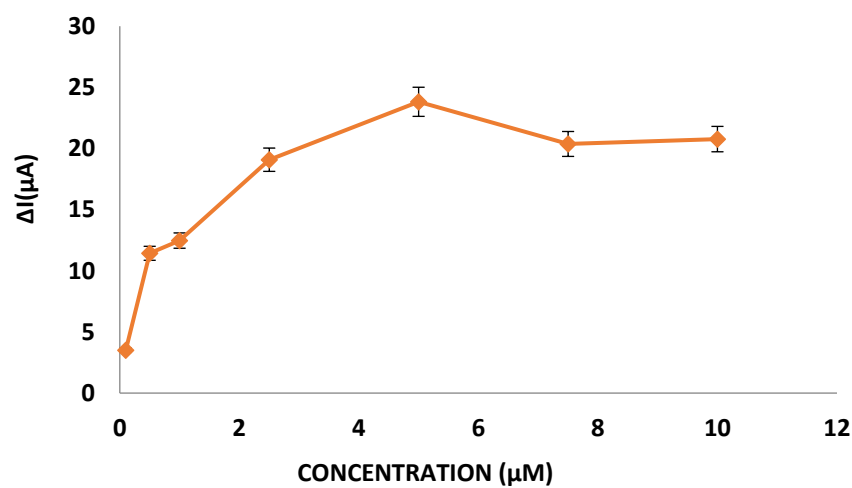
Supplementary Figure S7. Optimization of nanopolymer bonding time to gold electrode surface (V_{np} : 5 μ L)



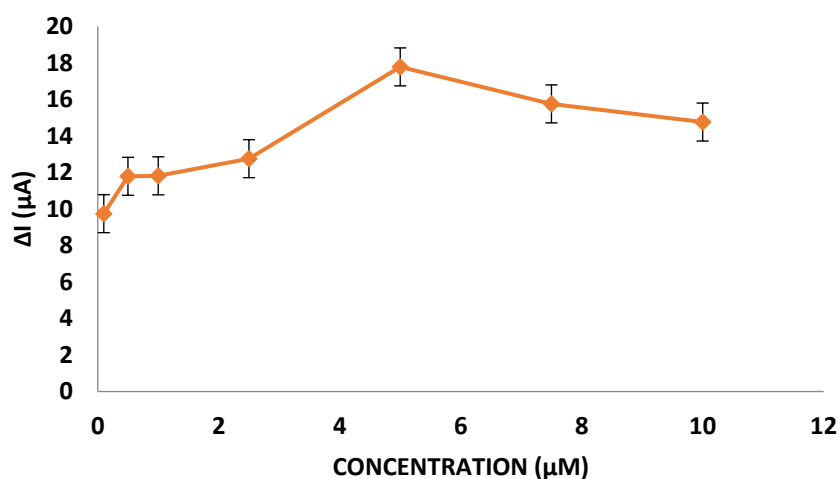
Supplementary Figure S8. Optimization of nanopolymer volume on gold electrode surface (t_{np} : 90min)



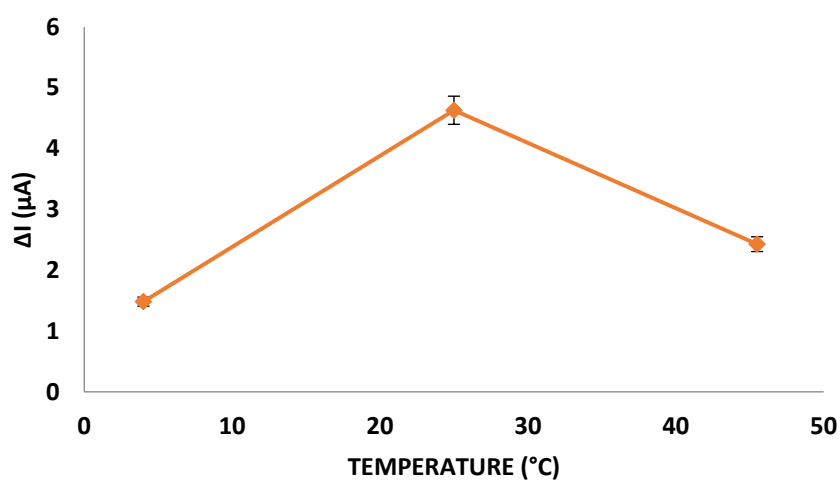
Supplementary Figure S9. Cys-graft p (HEMA) nanopolymer anti-miR-155 probe binding time optimization (V_{np} : 5 μ L, t_{np} : 90 min, C_{prob} : 5 μ M)



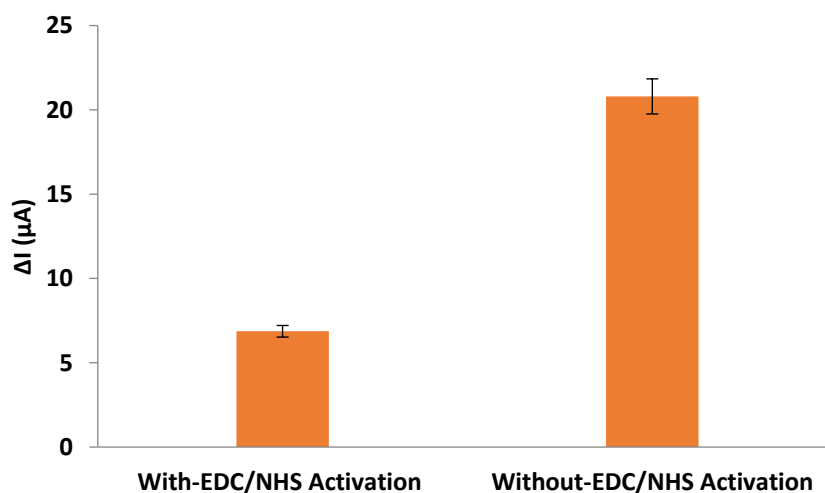
Supplementary Figure S10. Cys-graft p (HEMA) nanopolymer anti-miR-155 probe concentration optimization (V_{np} : 5 μ L, t_{np} : 90 min, t_{prob} : 45 min)



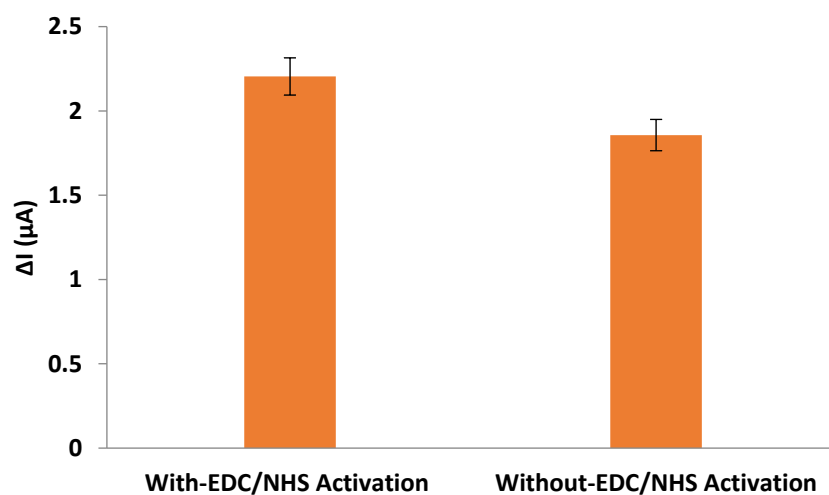
Supplementary Figure S11. Cys-graft p(HEMA) nanopolymer miR-155 binding optimization with different concentrations of anti-miR-155 probe (V_{np} : 5μL, t_{np} : 90 min, t_{prob} : 45min, $C_{miR-155}$: 5μM; $t_{miR-155}$: 30min)



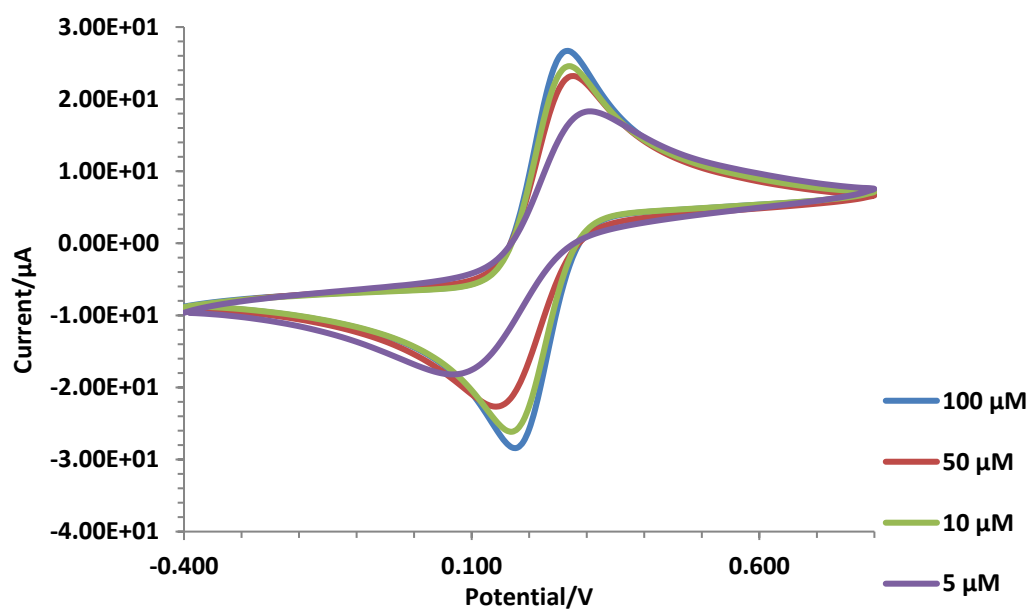
Supplementary Figure S12. Hybridization Temperature Optimization of Anti-miR-155 probe-bound Cys-graft p(HEMA) Nanopolymer and miR-155 Interaction (V_{np} : 5μL, t_{np} : 90 min, C_{prob} : 5μM, t_{prob} : 45 min, $C_{miR-155}$: 5μM, $t_{miR-155}$: 30min)



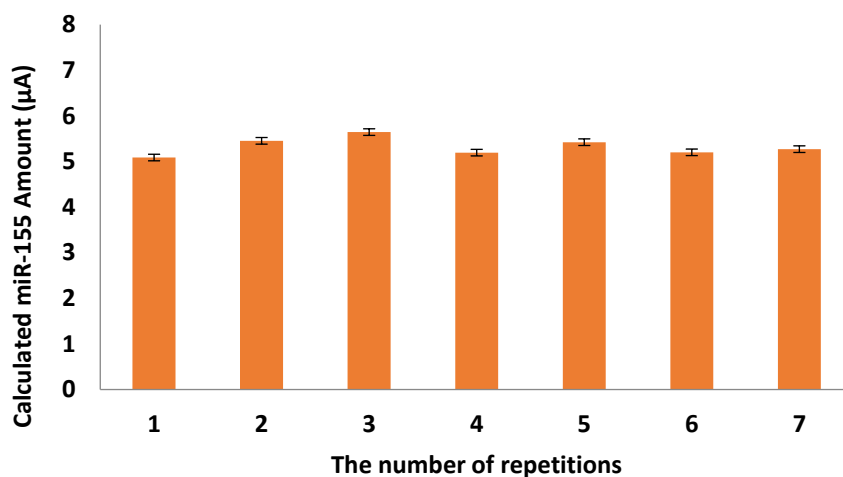
Supplementary Figure S13. Effect of EDC / NHS activation on probe binding on anti-miR-155 probe-bound Cys-graft p (HEMA) nanopolymer and miR-155 interaction (V_{np} : 5μL, t_{np} : 90 min, C_{prob} : 5μM, t_{prob} : 45 min, $C_{miR-155}$: 5μM, $t_{miR-155}$: 30min)



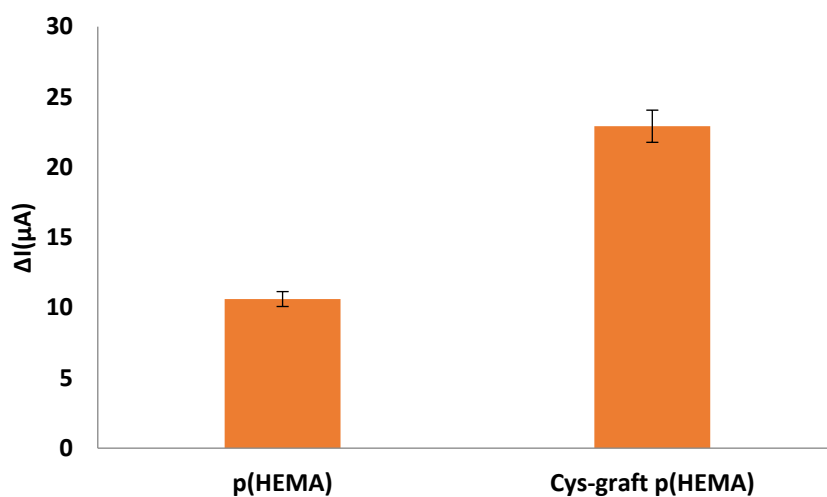
Supplementary Figure S14. Effect of EDC / NHS activation on miR-155 binding on anti-miR-155 probe-bound Cys-graft p (HEMA) nanopolymer and miR-155 interaction (V_{np} : $5\mu L$, t_{np} : 90 min, C_{prob} : $5\mu M$, t_{prob} : 45 min, $C_{miR-155}$: $5\mu M$, $t_{miR-155}$: 30min)



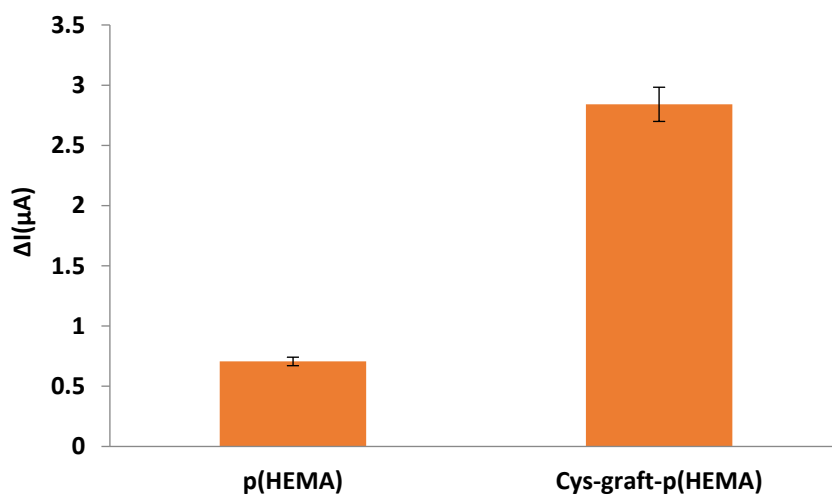
Supplementary Fig 15. CV analysis



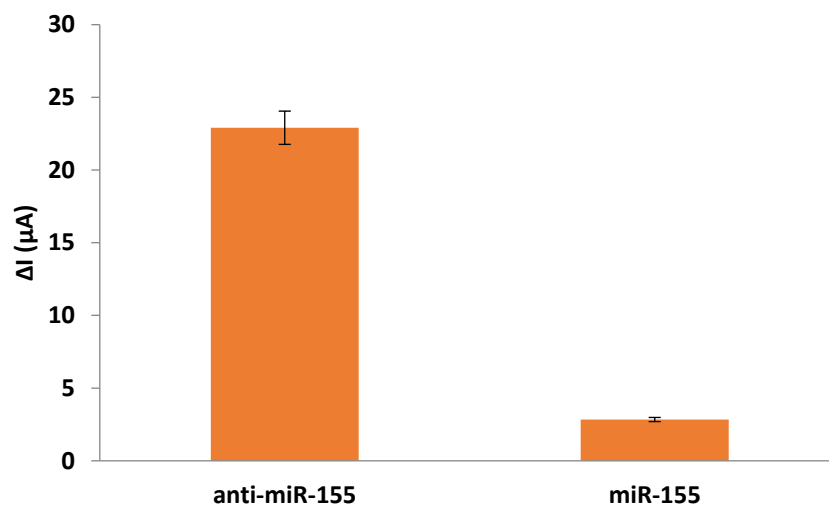
Supplementary Figure S16. anti-miR-155 probe-bound Cys-graft p(HEMA) nanopolymer miR-155 determination reproducibility graph (V_{np} : 5 μ L, t_{np} : 90 min, C_{prob} : 5 μ M, t_{prob} : 45 min, $t_{miR-155}$: 30 min, Number of repetitions: 7)



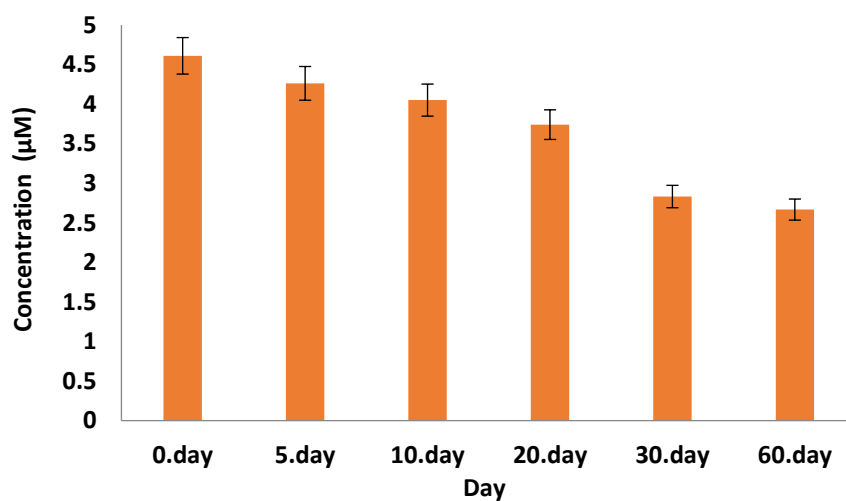
Supplementary Figure S17. Binding of anti-miR-155 on p(HEMA) and Cys-graft p(HEMA) nanopolymer (V_{np} : 5 μ L, t_{np} : 90 min, C_{prob} : 5 μ M, t_{prob} : 45 min)



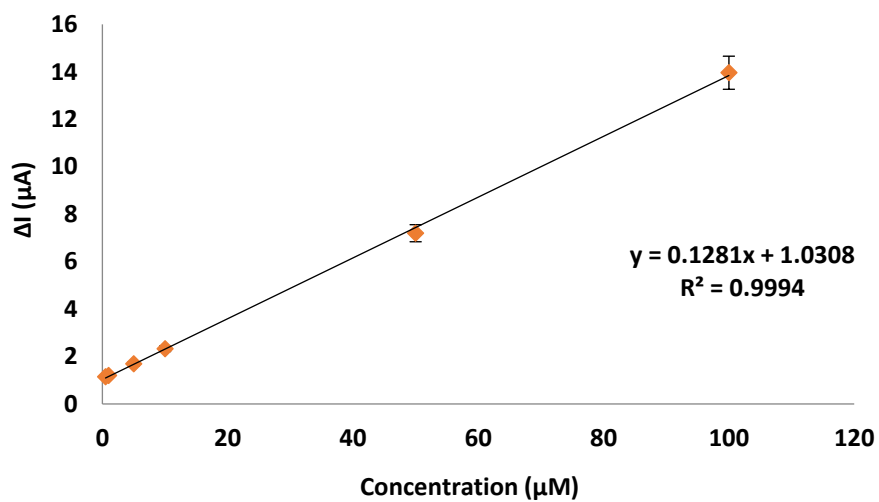
Supplementary Figure S18. miR-155 specificity of anti-miR-155 probe-bound p (HEMA) and Cys-graft p (HEMA) nanopolymer (V_{np} : 5 μ L, t_{np} : 90 min, C_{prob} : 5 μ M, t_{prob} : 45 min, $C_{miR-155}$: 5 μ M, $t_{miR-155}$: 30min)



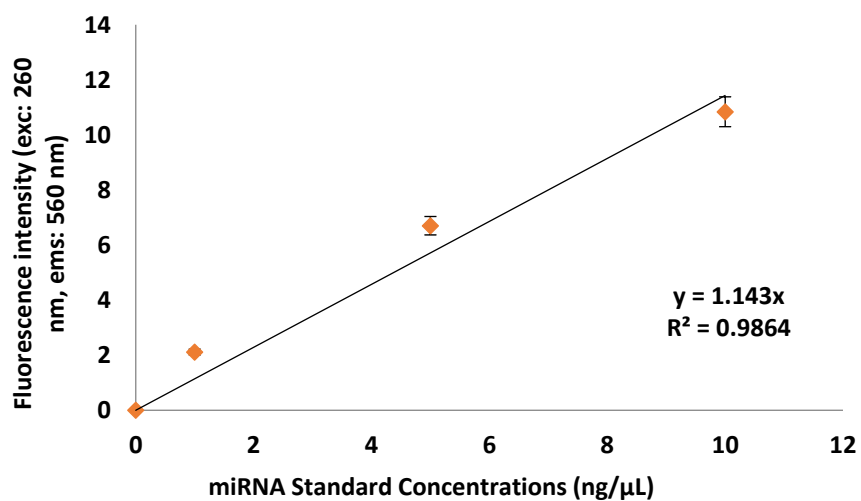
Supplementary Figure S19. Anti-miR-155 and miR-155 specificity of Cys-graft p (HEMA) nanopolymer (V_{np} : 5 μ L, t_{np} : 90 min, C_{prob} : 5 μ M, t_{prob} : 45 min, $C_{miR-155}$: 5 μ M, $t_{miR-155}$: 30min)



Supplementary Figure S20. Storage stability of the miR-155 diagnosis of anti-miR-155 probe-bound Cys-graft p (HEMA) nanopolymer (V_{np} : 5 μ L, t_{np} : 90 min, C_{prob} : 5 μ M, t_{prob} : 45 min, $C_{miR-155}$: 5 μ M, $t_{miR-155}$: 0, 5, 10, 20, 30, 60 days)



Supplementary Figure S21. miR-155 binding assay prepared in blood serum to anti-miR-155 probe-bound Cys-graft p(HEMA) nanopolymer (V_{np} : 5 μL , t_{np} : 90 min, C_{prob} : 5 μM , t_{prob} : 45 min, $t_{miR-155}$: 30min)



Supplementary Figure S22. Qbit miRNA Assay Calibration Chart