

Characterization of post-probe attachment process in hydrogel particle and utilization in miRNA detection

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Encoded hydrogel particles have received much attention as high-performance multiplexed assays can be achieved by using these particles. However, due to the low conversion of particle synthesis step, current hydrogel particles only can utilize ~10% of input ssDNA probes. Here, we presented a novel post-probe attached hydrogel particles which overcame the limitation of current methods. Noting that the hydrogel particles contain the unconverted, yet reactive double bonds inside the network, we covalently anchored the ssDNA probes after the particle synthesis. As all the probes can interact with the particles, density of probe increased about 8.2 times compared to that of conventional particles. We demonstrated that the increased probe density leads to better assay capability in terms of assay time, sensitivity and specificity.