

Detection of specific DNA sequence using selective gold nanoparticle aggregation

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We tried to detect the mutation DNA using selective aggregations of gold nanoparticles. Mutations were detected by selective aggregation of gold nanoparticles using lung cancer tissues obtained from lung cancer patients. When the probe DNA was perfectly complementary to the target DNA, DNA hybridization occurred, whereas wild type DNA did not occur. Then, probe DNA and sample DNA mixed solution and salt added to gold nanoparticle suspension. Gold nanoparticles were caused to aggregate by DNA hybridization. Hybridized DNA was behavior like additional salt. At an optimized salt concentration, we were able to detect the deletion mutation and point mutation using non-amplified genomic DNA. We found the detection condition of selective aggregation caused by DNA hybridization. Aggregation of the gold nanoparticles changes the color of the colloidal solution to purple. The aggregation detected using quasi-elastic light scattering. The selective aggregation of gold nanoparticles could be applied to detect mutations of non-amplified genomic DNA.