DYNAMIC LIGHT SCATTERING NANOPLATFORM FOR HIGH-THROUGHPUT TRANSCRIPTION FACTOR-DNA INTERACTION DETERMINATION FOR DRUG AND/OR DISEASE SCREENING

ABSTRACT

[0080] Methods, systems and nanoprobes for identifying sequence-specific transcription factor DNA interactions for drug and/or disease screening are provided. The method includes homogeneously mixing plasmonic metal nanoparticle probes with protein samples as an assay in multi-well plates. The plasmonic metal nanoparticle probes comprise a plurality of plasmonic metal nanoparticles and a specific DNA response element and the protein samples bind with the specific response elements to form an assembly of the plasmonic metal nanoparticle probes. The method further includes measuring particle size distribution of the assembly of the plasmonic metal nanoparticle probes in the solution by dynamic light scattering and determining one or more sequence-specific transcription factor DNA interactions from a curve of the particle size distribution determined from light scattered by the dynamic light scattering. The nanoprobe includes a plurality of plasmonic metal nanoparticles and a DNA linker. The DNA linker forms a link between the two plasmonic metal nanoparticles, the DNA linker including a double stranded region encoding a specific response element.

FIG. 1