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(54) **Title: CORTISOL SENSOR AND METHODS OF THEIR USE**

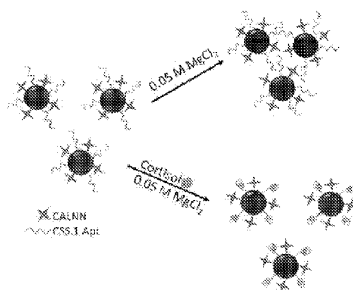


FIG. 3

(57) **Abstract:** Disclosed herein is a cortisol sensor, comprising or consisting of: i) a metal nanoparticle; ii) a plurality of cortisol binding ligands conjugated to the surface of the metal nanoparticle; and iii) a plurality of peptides conjugated to the surface of the metal nanoparticle, for reducing non-specific binding of the cortisol binding ligands and/or improving stability of the metal nanoparticle in solution. In particular, the metal nanoparticle is a gold nanoparticle, the cortisol binding ligand is a cortisol DNA aptamer, and the peptide is CALNN. Also disclosed is a method of detecting the presence or quantity of cortisol in a sample, comprising or consisting the steps of: a) providing the cortisol sensor; b) contacting the cortisol sensor to the sample in a saline environment; and c) determining the degree of aggregation of the cortisol sensor. In particular, the degree of aggregation is measured by UV-visible spectroscopy.