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(54) Title: METHODS AND COMPOSITIONS FOR CELLULAR IMAGING AND CANCER CELL DETECTION USING LIGHT HARVESTING CONJUGATED POLYMER- BIOMOLECULAR CONJUGATES

(57) Abstract: The present invention relates to conjugated polyelectrolyte (CPE) or oligoelectrolyte (COE) compounds represented by general structural formulae (I) -(IV), or a salt thereof and methods of using these compounds to detect targets in samples. In particular, the methods include: (1) exposing a sample to a compound of structural formula (I), (II) or (IV) or a salt thereof, allowing the compound to bind to a target and detecting a signal produced by the compound; (2) functionalizing a solid support with a ligand, incubating the sample with a charged CPE or COE and detecting the fluorescence of the solid support and thereby detecting the target or (3) functionalizing a surface of a solid support with a charged ligand, thereby creating a charge on the surface of the solid support; incubating the ligand-functionalized solid support with a sample, whereupon binding of the target, the charge on the surface of the solid support switches; incubating the sample with CPE or COE that has a complementary charge to the charge of the target-bound surface; and detecting the fluorescence of the solid support and thereby detecting the target. The compounds of the present invention possess high photoluminescence quantum yields in biological media, low cytotoxicity, and excellent environmental stability and photostability and can be used in biosensor and bioimaging applications.

