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(54) Title: NUCLEIC ACID BIOSENSOR WITH PHOTOELECTROCHEMICAL AMPLIFICATION

(57) Abstract: The present invention relates to electrode systems, methods, apparatus and chips for ultrasensitive detection and quantification of nucleic acids using photoelectrochemical amplification. Upon hybridization of a target nucleic acid to a nucleic acid capture probe, a photoreporter comprising a threading bis-intercalator selectively binds to double-stranded nucleic acid. The stability and reversibility of the photoreporter binding activity provides for ultrasensitive detection of nucleic acid hybridization events.