

innovations

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TITLE: METHODS AND COMPOSITIONS FOR OPTICAL DETECTION OF SINGLE-STRANDED POLYNUCLEOTIDES

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DESCRIPTION: A conjugated, fluorescent molecule has been conjugated that bind to single strand polynucleotides in a way that is unique to current commercially available fluorescent stains. The fluorescence properties of Gp32F protein make it useful as a coupling system for monitoring DNA and RNA reactions that involve conversions between single- and double-stranded states. The Gp32F probes have proven to be highly sensitive, with assays conducted at or below the nanomolar threshold. The Gp32F protein binds to single-stranded polynucleotides including single-stranded gaps, tails, flaps, loops, or bubbles within double-stranded DNA or RNA molecules, allowing detection and localization by fluorescence microscopy. Biomedical research applications of this detection system include analyses of nucleic acid intermediates: DNA replication, DNA repair pathways including mismatch of repair, double-strand break repair, and nucleotide excision repair, homologous recombination, transcription, translation, and RNA processing.

ADVANTAGES: This invention is a highly sensitive research tool for the fluorescent detection of DNA and RNA reactions previously unattainable with current commercially available methods. Single and double stranded polynucleotides are typically both stained, and therefore undifferentiated. This invention overcomes this limitation.

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