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(54) **METHODS AND COMPOSITIONS RELATED TO NUCLEIC ACID BINDING ASSAYS**

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(58) **Field of Classification Search**

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See application file for complete search history.

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(57) **ABSTRACT**

Small molecule fluorescent probes for established drug targets such as nucleic acids including DNA and RNA has been developed and disclosed herein. These nucleic acid probes bind to multiple DNA and RNA structures, and to sites crucial for nucleic acid function, such as DNA and RNA major grooves. Displacement of the probes by other binders such as small molecule compounds and/or proteins illicits a fluorescence change in the probe that once detected and analyzed provide binding information of these other binders of interest. Similarly, changes in fluorescence upon binding of the probes to nucleic acid have been applied to screen nucleic acid of different sequence and conformation. The nucleic acid probes and method of uses disclosed herein are advantageously suitable for high-through put screening of libraries of small molecule compounds, proteins, and nucleic acids.

15 Claims, 13 Drawing Sheets