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(54) Title: METHODS AND DEVICES BASED UPON A NOVEL FORM OF NUCLEIC ACID DUPLEX ON A SURFACE

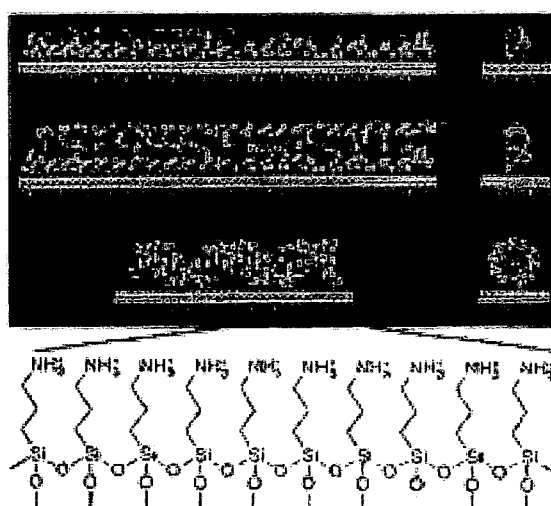


Fig. 3A

Fig. 3B

Fig. 3C

Fig. 3D

(57) **Abstract:** Provided herein are biomolecular hybridization devices comprising a substrate with a permanently and covalently attached surface of functional groups and an adsorbed monolayer of unmodified, single-stranded oligonucleotides all of which are 10 to about 24 bases in length as a saturated film of constrained oligonucleotides on the surface via direct non-covalent phosphate-surface adsorptive contact of substantially all phosphate groups of each oligonucleotide. The constrained oligonucleotides are effective to dissociably hybridize to a complementary single-stranded nucleic acid with asymmetric, non-helical base pairing and without oligonucleotide dissociation from the surface of the device. Also, provided are methods for hybridizing solution-state target nucleic acids to probe nucleic acids and for identifying a nucleotide sequence to which a nucleotide-binding protein binds using the biomolecular hybridization devices.



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