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(54) **Title:** SYSTEMS AND METHODS FOR DETECTING AND QUANTIFYING A SEQUENCE OF NUCLEOTIDES

(57) **Abstract:** Methods and systems of quantifying a target material in solution include detection of a size change of a hybridized nanoparticle. In particular, the examples include functionalizing a plurality of nanoparticles to adapt the nanoparticles to hybridize with a species-specific target material, measuring the size of the functionalized nanoparticles to predetermine a standard distribution of non-hybridized nanoparticles, introducing the functionalized nanoparticles in a solution containing species-specific target materials and/or non-target materials, and hybridizing the functionalized nanoparticles with the species-specific target material if present in the solution. The size of the nanoparticles in solution are then measured after hybridization, and the presence or non-presence of the species-specific target material is detected and/or quantified by comparing the measured size of the nanoparticles after hybridization to the standard distribution of non-hybridized nanoparticles.



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 12/34899

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G01N 33/53, 21/59, 21/47 (2012.01)
USPC - 436/501, 164

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(8) - G01N 33/53, 21/59, 21/47 (2012.01)
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PubWest (PGPB,USPT,USOC,EPAB,JPAB); PubMed (MEDLINE)
light, laser, transmission, spectroscopy, scatter, size, *particle, DNA, RNA, nucleic

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X — Y	US 2010/0285989 A1 (HUO et al.) 11 November 2010 (11.11.2010) para [0003], [0030], [0033], [0034], [0047], [0057], [0068], [0073], [0078]-[0080], [0084]	1-3, 5, 11-12 4, 6-10, 13
Y	Li et al., High-precision sizing of nanoparticles by laser transmission spectroscopy. Appl. Opt. (01 December 2010), Vol 49, No 34; pp 6602-11; pg 6602, col 1, para 2	4
Y	US 2010/0035243 A1 (MULLER et al.) 11 February 2010 (11.02.2010) para [0004], [0011], [0023], [0082], [0114], [0115], [0117], [0118]; Example 7; Example 8	6, 7
Y	WO 2010/048512 A1 (RUGGIERO et al.) 29 April 2010 (29.04.2010) para [0016], [0055], [0057], Fig 7a; Fig 8; abstract; claim 1	8-10, 13

☐ Further documents are listed in the continuation of Box C.

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