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(54) Title: QUADRUPLEX DNA AND DUPLEX PROBE SYSTEMS

(57) Abstract: A multiplex structure, such as a nucleic acid quadruplex, includes: a first strand containing a first sequence of nucleobases; a second strand containing a second sequence of nucleobases, wherein the second strand is associated with the first strand by Watson-Crick bonding; a third strand containing a third sequence of nucleobases; and a fourth strand containing a fourth sequence of nucleobases, wherein the fourth strand is associated with the second strand and the third strand by Watson-Crick bonding. Formation of the multiplex structure is promoted by monovalent cations (e.g., sodium and potassium), divalent cations, multivalent cations, intercalating agents and/or molecules known to bind within the minor grooves of nucleic acids. The multiplex structure and the process of forming it have diagnostic, therapeutic, prophylactic and nanoengineering applications.

INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C12Q1/68 G01N27/447

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 7 C12Q G01N

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 practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 00 43543 A (DADE BEHRING INC. (US); KURN NURITH; LIU YEN PING; LISHANSKI ALLA) 27 July 2000 (2000-07-27) the whole document ---	1-7, 11-21, 23, 25-34, 37, 39, 40, 50, 52
X	LISHANSKI A. ET AL.: "Branch migration inhibition in PCR-amplified DNA: homogeneous mutation detection" NUCLEIC ACIDS RESEARCH, vol. 28, no. 9, 1 May 2000 (2000-05-01), pages e42 i-e42 vii, XP002224005 the whole document ---	1-7, 11-14, 16-19, 23, 25-34, 37, 39, 40, 50, 52
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Further documents are listed in the continuation of box C. Patent family members are listed in annex.

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A document defining the general state of the art which is not considered to be of particular relevance	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
O document referring to an oral disclosure, use, exhibition or other means	*&* document member of the same patent family
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	ECKHART L. ET AL.: "Reverse transcription-polymerase chain reaction products of alternatively spliced mRNAs form DNA heteroduplexes and heteroduplex complexes" THE JOURNAL OF BIOLOGICAL CHEMISTRY, vol. 274, no. 5, 29 January 1999 (1999-01-29), pages 2613-2615, XP002224006 abstract page 2614; figure 3C ---	1-7, 11-15, 18,19, 25-28
A	DENG H. AND BRAUNLIN W.H.: "Duplex to quadruplex equilibrium of the self-complementary oligonucleotide d(GGGGCCCC)" BIOPOLYMERS, vol. 35, no. 6, 1995, pages 677-681, XP001127483 -----	

INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 0043543	A	WO 0043543 A1	27-07-2000