The present invention provides DNA polymerases and their use in various applications. The present invention also relates to uses and methods utilizing the DNA polymerase of the present invention for discriminating between matched and mismatched primers or detecting SNP or methylated cytosine. The present invention also relates to kits comprising such DNA polymerases.
A. CLASSIFICATION OF SUBJECT MATTER

INVENTION C12Q1/68 C12N9/10

ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

C12Q  C12N

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)

EPO-Internal, BIOSIS, EMBASE, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
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<tr>
<th>Category</th>
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<th>Relevant to claim No.</th>
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<td>abstract paragraphs [0013] - [0015], [0033], [0036], [0037], [0040], [0047], [0048], [0054], [0071]</td>
<td>1/1</td>
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[Special categories of cited documents:]

*A* document defining the general state of the art which is not considered to be of particular relevance

*E* earlier application or patent published on or after the international filing date

*L* document which may throw doubts on priority claim(s) on which is cited to establish the publication date of another application or other special reason (as specified)

*O* document referring to an oral disclosure, use, exhibition or other means

*P* document published prior to the international filing date but later than the priority date claimed

*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

*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

*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 skilled person in the art

*Z* document member of the same patent family

Date of the actual completion of the international search

17 April 2015

Date of mailing of the international search report

14/07/2015

Name and mailing address of the ISA/
European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Chavanne, Franz

Form PCT/ISA/210 (second sheet) (April 2005)
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<td>6 December 2007 (2007-12-06) abstract page 4, lines 1-11 page 6, line 28 - page 7, line 24 claims 1,2,5,9-15</td>
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**INTERNATIONAL SEARCH REPORT**

**Box No. II  Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. □ Claims Nos.:
   because they relate to subject matter not required to be searched by this Authority, namely:

2. □ Claims Nos.:
   because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. □ Claims Nos.:
   because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box No. III  Observations where unity of invention is lacking (Continuation of item 3 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

```markdown
see additional sheet
```

1. □ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. □ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. □ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. □ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

   l-41 (partially)

**Remark on Protest**

- □ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

- □ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

- □ No protest accompanied the payment of additional search fees.
This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. **Claims:** l-41 (partially)

   A DNA polymerase having at least 80% identity to the Taq polymerase of SEQ ID No.1 or its Klenow fragment of SEQ ID No.2, and comprising an amino acid substitution at position 487 of the Taq polymerase or at position 210 of the Klenow fragment; DNA polymerase of SEQ ID No. 3, 4, 14 or 15; K'ts comprising said DNA polymerase; use of said DNA polymerase, said DNA polymerase for use in vitro diagnostic s.

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2-5. **Claims:** l-41 (partially)

   A DNA polymerase having at least 80% identity to the Taq polymerase of SEQ ID No.1 or its Klenow fragment of SEQ ID No.2, and comprising an amino acid substitution at position 508, 536, 587 or 660, respectively, of the Taq polymerase or at position 231, 259, 310 or 383, respectively, of the Klenow fragment; DNA polymerase of SEQ ID No. 1, 2, 5-13, 16-24; K'ts comprising said DNA polymerase; use of said DNA polymerase, said DNA polymerase for use in vitro diagnostic s.

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