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(71) Applicant (for all designated States except US): **KECK
GRADUATE INSTITUTE** [US/US]; 535 Watson Drive,
Claremont, CA 91711 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **VAN NESS, Jeffrey**
[US/US]; 535 Watson Drive, Claremont, CA 91711 (US).
GALAS, David, J. [US/US]; 535 Watson Drive, Clare-
mont, CA 91711 (US). **VAN NESS, Lori, K.** [US/US]; 535
Watson Drive, Claremont, CA 91711 (US).

(74) Agents: **PARKER, David, W.** et al.; Seed Intellectual
Property Law Group PLLC, Suite 6300, 701 Fifth Avenue,
Seattle, WA 98104-7092 (US).

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For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: EXPONENTIAL AMPLIFICATION OF NUCLEIC ACIDS USING NICKING AGENTS

(57) Abstract: The present invention provides methods and compositions for exponential amplification of nucleic acid molecules using nicking agents. In certain aspects, the amplification may be performed isothermally. This invention is useful in many areas such as disease diagnosis.



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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/22677

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C12Q 1/68; C12P 19/34; C07H 21/02

US CL : 435/6, 91.2; 536/ 23.1

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)

U.S. : 435/6, 91.2; 536/ 23.1

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)
Please See Continuation Sheet

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 6,191,267 B1 (KONG et al) 20 February 2001 (20.2.2001) entire document, especially column 14, lines 10-67	1-4, 12-15, 208 ----- 5-11, 16-81, 101-126, 204-207, 209-216
X --- Y	US 6,475,736 B1 (STANTON Jr.) 05 November 2002, 5.11.2002, entire document.	1-4, 12-15, 208 ----- 5-11, 16-126, 204-292
X --- Y	WO 00/31300 A2 (LAKEN et al) 02 June 2000 (2.6.2000) entire document, especially page 3, lines 6-30	1-4, 12-15, 208 ----- 5-11, 16-81, 204-207, 209-292
Y	US 6,248,521 B1 (VAN NESS et al) 19 June 2001 (19.6.2001), entire document	82-126, 219-220

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

☐ See patent family annex.

* 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) or which is cited to establish the publication date of another citation 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 person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

19 March 2004 (19.03.2004)

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Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Facsimile No. (703) 305-3230

Authorized officer

Suryaprabha Chunduru

Telephone No. 571/272-1600

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/22677

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

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

1. ☐ Claim Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claim 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. ☐ Claim Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation 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 fee, this Authority did not invite payment of any additional fee.
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.: 1-126, 204-292

Remark on Protest

☐
☐

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

PCT/US02/22677

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim(s) 1-126, 204-292, drawn to a method for amplifying a nucleic acid.

Group II, claim(s) 127-203, drawn to a composition comprising a nucleic acid molecule.

The inventions listed as Groups I-II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The method for amplifying a nucleic acid molecule in Group I and the composition comprising a nucleic acid molecule in Groups II, do not share same special technical feature because each Group is independent to each other group and do not link to each other, for instance the method of Group I itself is independent and do not link to Group II, accordingly the composition of group II is distinctly different from Group I and lacks special technical feature that links both the groups together because the method steps, and the reaction conditions are not required by the claims in Group II.

Continuation of B. FIELDS SEARCHED Item 3:

Biosis, Embase, Medline, Caplus, Lifesci, EAST databases

search terms: nicking agent or enzyme, amplification or PCR, primer extension