



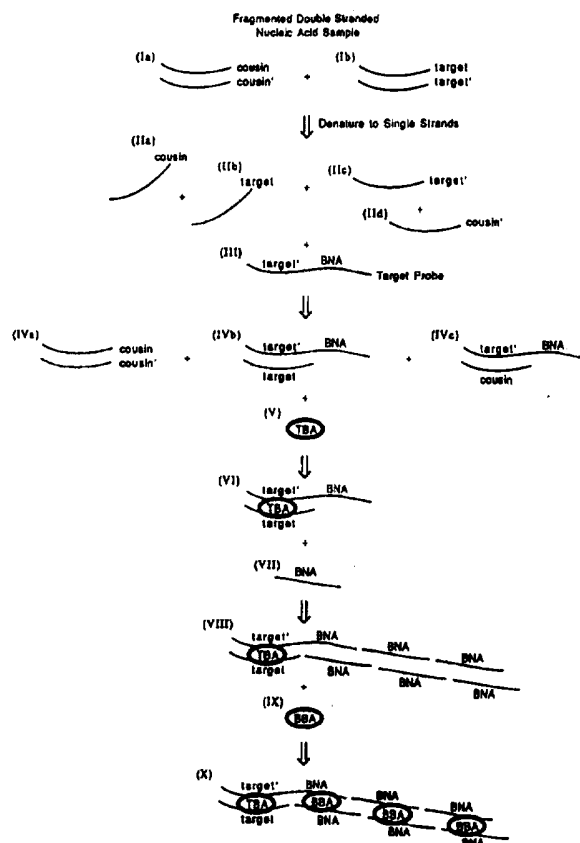
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : C12Q 1/68	A3	(11) International Publication Number: WO 96/17956 (43) International Publication Date: 13 June 1996 (13.06.96)
(21) International Application Number: PCT/US95/15944 (22) International Filing Date: 7 December 1995 (07.12.95) (30) Priority Data: 08/353,476 9 December 1994 (09.12.94) US (71) Applicant (for all designated States except US): THE GENE POOL, INC. [US/US]; Suite 392, 300 Queen Anne Avenue North, Seattle, WA 98109-4599 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): WEININGER, Susan [US/US]; Suite 392, 300 Queen Anne Avenue North, Seattle, WA 98109-4599 (US). WEININGER, Arthur, M. [US/US]; Suite 392, 300 Queen Anne Avenue North, Seattle, WA 98109-4599 (US). (74) Agents: BENCEN, Gerard, H. et al.; Saliwanchik & Saliwanchik, Suite A-1, 2421 N.W. 41st Street, Gainesville, FL 32606-6669 (US).		(81) Designated States: AL, AM, AU, BB, BG, BR, BY, CA, CN, CZ, EE, FI, GE, HU, IS, JP, KG, KP, KR, KZ, LK, LR, LT, LV, MD, MG, MK, MN, MX, NO, NZ, PL, RO, RU, SG, SI, SK, TJ, TM, TT, UA, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, LS, MW, SD, SZ, UG). Published With international search report. (88) Date of publication of the international search report: 24 July 1997 (24.07.97)

(54) Title: METHOD OF DETECTION OF NUCLEIC ACIDS WITH A SPECIFIC SEQUENCE COMPOSITION

(57) Abstract

This invention is a novel method for detecting and localizing specific nucleic acid sequences in a sample with a high degree of sensitivity and specificity. The method and novel compositions used in the method involve the use of Probe Nucleic Acids, the production of nucleic acid binding regions and the use of nucleic acid Target Binding Assemblies to detect and localize specific Target Nucleic Acids. The detection and localization of the Target Nucleic Acid is accomplished even in the presence of nucleic acids which have similar sequences. The method provides for a high degree of amplification of the signal produced by each specific binding event. In particular, methods and compositions are presented for the detection of HIV and HPV nucleic acid in samples. These methods and compositions find use in diagnosis of disease, genetic monitoring, forensics, and analysis of nucleic acid mixtures. Some of the novel compositions used in the detection method are useful in preventing or treating pathogenic conditions.



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INTERNATIONAL SEARCH REPORT

International Application No

PC./US 95/15944

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 C12Q1/68

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 6 C12Q

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.
6 X	EP,A,0 146 039 (MILES LAB) 26 June 1985	1,4,5, 26, 37-41,51
Y	see page 15, line 3 - line 17	2,3, 6-11,27, 31-33,42
	see page 20, line 4 - page 28, line 15; claims 1-7	
6 X	EP,A,0 450 594 (SEGEV DAVID) 9 October 1991	1,4,5, 26, 37-41,51
Y	see page 6, line 47 - page 7, line 3 see page 7, line 10 - page 12, line 55	2,3, 6-11,27, 31-33,42
	see page 8, line 24 - line 43; figures 1,2	

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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
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Date of the actual completion of the international search

27 August 1996

Date of mailing of the international search report

02 September 1996 (02.09.96)

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INTERNATIONAL SEARCH REPORT

International Application No

PC., JS 95/15944

C(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
6	X WO,A,87 03622 (UNIV PRINCETON) 18 June 1987 Y see page 4, line 25 - page 5, line 13 see page 7, line 15 - page 8, line 9 see page 25, line 1 - line 15; claim 21; figure 1	1,4,5, 26, 37-41,51 2,3, 6-11,27, 31-33,42
6	Y WO,A,93 00446 (GENELABS INC) 7 January 1993 see page 7, line 2 - line 10 see page 6, line 4 - line 12	6,32,33
2	A EP,A,0 453 301 (SYNTEX INC) 23 October 1991 cited in the application see page 4, line 25 - line 32 see page 5, line 33 - page 6, line 9	1,4,5, 26, 37-41,51
6	A EP,A,0 147 665 (MOLECULAR DIAGNOSTICS INC) 10 July 1985 see abstract; claims 1-12; figure 1	1,4,5, 26, 37-41,51

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US95/15944

Box I Observations where certain claims were found unsearchable (Continuation of item 1 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 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:

- claims 1 (partly), 4-6 (partly); 26,30,37-41,51
- claims 1 (partly), 2,3; 4-6 (partly); 7-11,27,31-35,42
- claims 12-25,28,29,36,43-50

- see continuation-sheet PCT/ISA/210 -

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.:

1-11,26,27,30-35,37-42,51
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.:

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

International Application No. PCT/US95/15944

FURTHER INFORMATION CONTINUED FROM PCT/ISA/210

1. claims 1(partly), 4-6(partly),26,30,37-41,51:
Probe nucleic acids that have no single stranded booster binding regions and methods of detection using them
2. claims 1(partly),2,3,4-6(partly),7-11,27,31-35,42:
Probe nucleic acids that have one or more single stranded booster binding regions and methods of detection using them
3. claims 12-25,28,29,36,43-50:
Target binding assemblies, booster binding assemblies, therapeutical binding assemblies and methods of assembling them