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MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC,
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European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,
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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: ELECTROPHYSIOLOGY ASSAY METHODS

(57) Abstract: The present invention provides a system that is capable of supplying electric field stimulation to a cell and optically monitoring a physiological response of the stimulated cell. The invention also provides methods of eliciting a physiological response in a cell or characterizing the biological activity of a candidate compound using an electrical field stimulation (EFS) device. Such methods are readily amenable to high throughput screen (HTS).



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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/24381

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C12M 1/00; C12N 1/00, 13/00, 15/87; C12Q 1/00
US CL : 435/29, 173.6, 173.8, 289.1, 298.1, 305.4, 461, 817

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. : 435/29, 173.6, 173.8, 289.1, 298.1, 305.4, 461, 817

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.
Y	US 5,134,070 A (CASNIG, D.R.) 28 July 1992 (28.07.1992), Entire Document, especially, Abstract, Lines 10-15; Column 1, Line 50 to Column 2, Line 5; Column 2 Column 3, Line 33 to Column 5, Line 55.	1-2
Y	US 5,843,741 A (WONG et al.) 01 December 1998 (01.12.1998), Entire document, especially Abstract, Lines 1-6 and Column 2, Lines 28-63.	1-2



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

16 August 2004 (16.08.2004)

Date of mailing of the international search report

14 OCT 2004

Name and mailing address of the ISA/US

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/24381

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 and 2

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/US03/24381

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This International Search Authority has found 3 inventions claimed in the present International Application covered by the claims indicated below:

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) 1-2, drawn to first method, measuring a physiological response in an optically labeled cell to repetitive electric pulses (435/173.8).

Group II, claim(s) 3-33, drawn to second method, measuring the response of an optically labeled cell to a candidate compound (435/29).

Group III, claim(s) 34, drawn to an apparatus for measuring the response of a cell to repetitive electric pulses (204/403.01).

1. This International Searching Authority considers that the present International Application does not comply with the requirements of unity of invention (Rules 13.1, 13.2 and 13.3) for the reasons indicated below:

The inventions listed as Groups I-III 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 alleged special technical feature, a system for providing and measuring the effect of repetitive electric pulses on an optically labeled cell, does not provide a contribution over the art as evidenced by Casnig (US 5,134,070) and Wong et al. (US 5,843,741).

Continuation of B. FIELDS SEARCHED Item 3:

USPT, PGPB, EPAB, JPAB, DWPI, REGISTRY, BIOSIS, BIOTECHNO, EMBASE, ESBIODASE, FEDRIP, FROSTI, JICST-EPLUS, LIFESCI, MEDICONF, MEDLINE, PROMPT, RDISCLOSURE, SCISEARCH, USPATFUL, WPIDS.

Search Strategy:

microb, bacteria, animal, insect, cell, electric field, ion channel, calcium, electric pulse, electroporation, intermittent, pulse