(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
5 February 2009 (05.02.2009)

PCT

(10) International Publication Number
WO 2009/018369 A3

(51) International Patent Classification:
G01N 33/554 (2006.01) *G01N 33/569* (2006.01)

(21) International Application Number:
PCT/US2008/071633

(22) International Filing Date: 30 July 2008 (30.07.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/952,786 30 July 2007 (30.07.2007) US
60/974,258 21 September 2007 (21.09.2007) US

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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*
— *with sequence listing part of description published separately in electronic form and available upon request from the International Bureau*

(88) Date of publication of the international search report:
30 April 2009

WO 2009/018369 A3

(54) Title: METHODS AND DEVICES FOR THE DETECTION OF BIOFILM

(57) Abstract: The present invention provides methods and kits for biofilm detection.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 08/71633

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G01N 33/554; G01N 33/569 (2008.04)
USPC - 436/519; 435/7.33
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)
USPC - 436/519; 435/7.33

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC - 435/7.32, 7.33; 424/243.1 (text search, see terms below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PubWEST(PGPB,USPT,EPAB,JPAB); Google/Scholar; PubMed (text search, see terms below)
Search Terms: Quantitate, detect, assay, antibodies, Staphylococcal, biofilm, diagnose, osteomyelitis, marker, SA0486; SAR0056, SA0037, serology.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	Invention 1 (SEQ ID NO:1)	
Y	Rafiq et al. Serological detection of Gram-positive bacterial infection around prosthesis. Journal of Bone and Joint Surgery, 2000, vol 82-B, pp 1156-1161; Abstract, (page 1156, para 2), (page 1157, paras 1, 8).	1-8
Y	Brady et al. Identification of Staphylococcus aureus proteins recognized by the antibody-mediated immune response to a biofilm infection. Infection and Immunity, 2006, vol 74, pp 3415 -3426; Abstract, (page 3416, paras 3, 4).	1-8
Y	NCBI submission YP_039889, September 2004. Retreived from the internet: <URL:http://www.ncbi.nlm.nih.gov/entrez/viewer.fcgi?val=YP_039889.1>.	1-8
	Invention 2 (SEQ ID NO:2)	
A	Rafiq et al., as above.	1-8
A	Brady et al., as above.	1-8
A	NCBI submission YP_039527, September 2004. Retreived from the internet: <URL:http://www.ncbi.nlm.nih.gov/entrez/viewer.fcgi?val=YP_039527.1>.	1-8

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

* 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 but 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	Date of mailing of the international search report
01 January 2009 (01.01.2009)	14 JAN 2009

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Form PCT/ISA/210 (second sheet) (April 2007)

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	Invention 3 (SEQ ID NO:3)	
Y	Rafiq et al., as above.	1-8
Y	Brady et al., as above.	1-8
Y	NCBI submission YP_040441, September 2004. Retreived from the internet: <URL:http://www.ncbi.nlm.nih.gov/entrez/viewer.fcgi?val=YP_040441.1>.	1-8
	Invention 4 (SEQ ID NO:13)	
Y	Rafiq et al., as above.	1-8
Y	Brady et al., as above; Table 2, (page 3423, para 1).	1-8
	Invention 5 (SEQ ID NO:43)	
A	Rafiq et al., as above.	1-8
A	Brady et al., as above.	1-8
A	NCBI submission NP_373277, September 2004. Retreived from the internet: <URL:http://www.ncbi.nlm.nih.gov/entrez/viewer.fcgi?val=NP_373277.1>.	1-8

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 08/71633

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:

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.

Inventions 1 - 5: The different proteins represented by SEQ ID NO: 1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO: 13, and SEQ ID NO: 43

The inventions listed as 1 - 5 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 different proteins represented by SEQ ID NO: 1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO: 13, and SEQ ID NO: 43 are different species because these structures are not common to one another but are different because they are composed of unique amino acid sequences. Thus, sequences lack unity of invention because they do not share a same or corresponding special technical feature.

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 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.:

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.