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(71) Applicants (for all designated States except US):

UNIVERSITY OF CONNECTICUT [US/US]; 263 Farmington Avenue, Farmington, Connecticut 06030 (US). **BIORASIS INCORPORATED** [US/US]; 23 Fellen Road, Storrs, Connecticut 06268 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only):

PAPADIMITRAKOPOULOS, Fotios [GR/US]; 16 High Ridge Road, West Hartford, Connecticut 06117 (US). **VAD-**

DIRAJU, Santhisagar [IN/US]; 258C Foster Drive, Willimantic, Connecticut 06226 (US).

(74) Agent: **RODRIGUES, David E.**; Cantor Colburn LLP, 20 Church Street, 22nd Floor, Hartford, Connecticut 06103 (US).

(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, BN, BR, BW, BY, BZ, CA, CH, CL, 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, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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[Continued on nextpage]

(54) Title: CONTROL OF BIOFOULING IN IMPLANTABLE BIOSENSORS

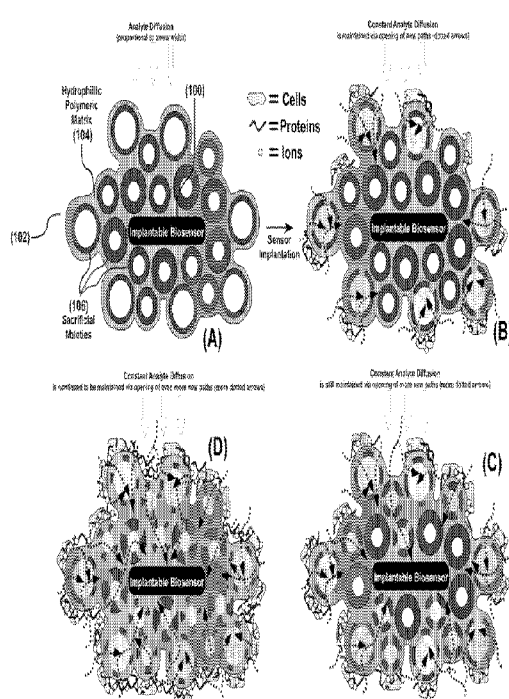


Figure 2

(57) Abstract: Disclosed herein is a device comprising a biosensor having disposed upon it a coating; the coating comprising a polymer matrix; where the polymer matrix is operative to facilitate the inwards and outwards diffusion of analytes and byproducts to and from the sensing element of the biosensor; and a sacrificial moiety; the sacrificial moiety being dispersed in the polymer matrix, where the sacrificial moiety erodes with time and increases the porosity of the polymer matrix thus offsetting decreases in analyte permeability as a result of biofouling.



EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU,
LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK,
SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

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13 June 2013

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(H))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(ii))

(15) Information about Correction:**Previous Correction:**

see Notice of 25 April 2013

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/050939**A. CLASSIFICATION OF SUBJECT MATTER****A61B 5/00(2006.01)i, A61F 2/00(2006.01)1, GOIN 33/50(2006.01)i, A61L 27/14(2006.01)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)

A61B 5/00, B01D 69/14, A61F 2/02

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & keywords: implantable biosensor, polymer matrix, sacrificial moiety, coating

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	(UPKAR BHARDWAJ et al.) "A Review of the development of a Vehicle for Localized and Controlled Drug Delivery for Implantable Biosensors", Journal of Diabetes Science and Technology, Volume 2, Issue 6, November 2008, pages 1016-1027.	1-24
A	US 7828728 B2 (ROBERT B00CK et al.) 09 November 2010 See abstract, column 22, line 17 - line 29, claim 1 and figures 2B, 2C.	1-24
A	W0 2006-018425 A2 (NOVONORDISK A/S) 23 February 2006 See abstract, page 20, line 8 - line 15, claim 1 and figure 1.	1-24
A	US 2009-0280155 A1 (RALPH A. CHAPPA et al.) 12 November 2009 See abstract, paragraphs [0027], [0047], claim 1 and figure 1.	1-24



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 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 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

22 FEBRUARY 2013 (22.02.2013)

Date of mailing of the international search report

28 FEBRUARY 2013 (28.02.2013)

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Authorized officer

KIM, Tae Hoon

Telephone No. 82-42-481-8407



INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2012/050939

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.: 25
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:

Claim 25 does not meet the requirements of PCT Article 6 in that the matter for which protection is sought is not clearly defined. Because some of the features in the method claim 25 relate to an apparatus rather than clearly defining the method in terms of its technical features.
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:

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.:

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.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2012/050939

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 7828728 B2	09 . 11, 20 10	US 2007-0197890 A1 Wo 2007- 120381 A2 wo 2007- 120381 A3	23,08 ,2007 25 , 10 ,2007 27 ,03 ,2008
Wo 2006-0 18425 A2	23 .02 ,2006	EP 1784249 A2 JP 2008-510 154 A wo 2006-018425 A3	16 ,05 ,2007 03 ,04 ,2008 08 ,06 ,2006
us 2009-0280 155 A1	12 . 11, 2009	EP 2265293 A2 wo 2009- 128944 A2 wo 2009- 128944 A3	29 , 12 ,20 10 22 , 10 ,2009 05 ,08 ,20 10