

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
6 May 2004 (06.05.2004)

PCT

(10) International Publication Number
WO 2004/036992 A3

(51) International Patent Classification⁷: **C12N 11/00**

(21) International Application Number:
PCT/US2003/029761

(22) International Filing Date:
24 September 2003 (24.09.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/431,081 24 September 2002 (24.09.2002) US

(71) Applicant (for all designated States except US): **BOARD OF REGENTS, UNIVERSITY OF TEXAS SYSTEM** [US/US]; 201 West 7th Street, Austin, TX 78701 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **BELCHER, Angela, M.** [US/US]; 35 Balfour Street, Lexington, MA

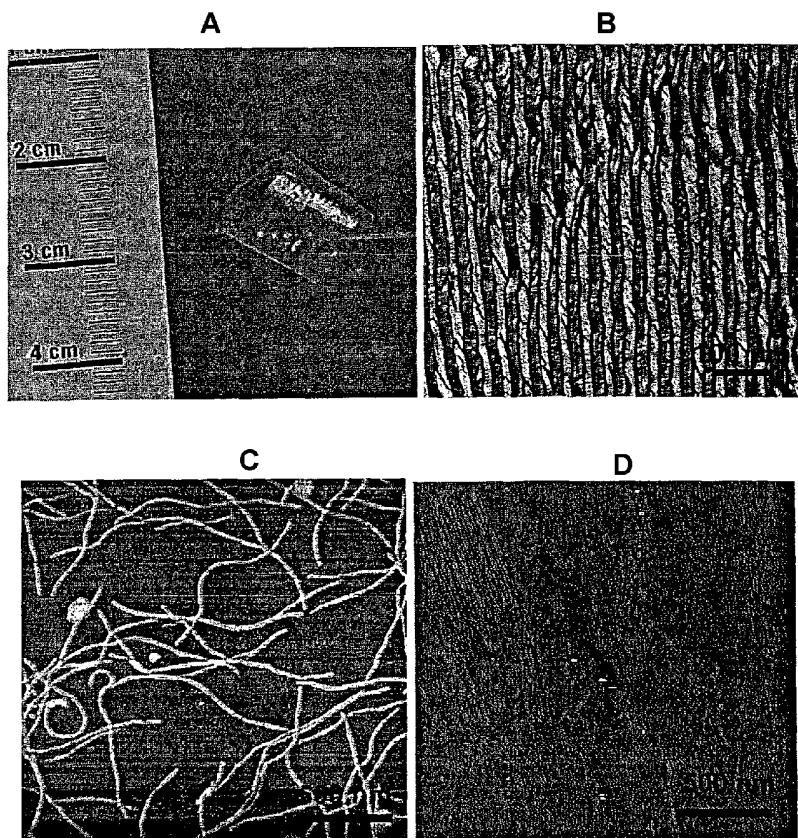
02421 (US). **LEE, Seung-Wuk** [US/US]; University of Texas, 201 West 7th Street, Austin, TX 78701 (US). **IVERSON, Brent, L.** [US/US]; University of Texas, 201 West 7th Street, Austin, TX 78701 (US). **LEE, Soo-Kwan** [US/US]; University of Texas, 201 West 7th Street, Austin, TX 78701 (US).

(74) Agents: **MAEBIUS, Stephen, B.** et al.; Foley & Lardner, Suite 500, 3000 K Street, N.W., Washington, DC 20007-5143 (US).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

[Continued on next page]

(54) Title: **FABRICATED BIOFILM STORAGE DEVICE**



(57) Abstract: The present invention includes a method and composition of storing and preserving biofilms for input and output of high-density information. One form of the present invention is a fabricated biofilm storage device with a biologic material applied to a substrate to form, e.g., a dry thin film stable at room temperature for extended periods of time. Another form of the present invention is a method of fabricating a biofilm storage device in which a biologic material is applied to a substrate under conditions that promote alignment of the biologic material on the substrate. The composition, method, and kit of the present invention have universal application in biologics, magnetics, optics and microelectronics.

WO 2004/036992 A3



(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(88) Date of publication of the international search report:
25 November 2004

Published:

— *with international search report*

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

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 03/29761

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 C12N11/00				
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 7 C12N				
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) EPO-Internal, BIOSIS, WPI Data, PAJ				
C. DOCUMENTS CONSIDERED TO BE RELEVANT				
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
X	LEE SEUNG-WUK ET AL: "Ordering of quantum dots using genetically engineered viruses" 3 May 2002 (2002-05-03), SCIENCE (WASHINGTON D C), VOL. 296, NR. 5569, PAGE(S) 892-895 , XP002298373 ISSN: 0036-8075 the whole document	1-159		
P,X	MAO C ET AL: "viral assembly of oriented quantum dot nanowires" PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF USA, NATIONAL ACADEMY OF SCIENCE. WASHINGTON, US, vol. 100, no. 12, June 2003 (2003-06), pages 6946-6951, XP002288377 ISSN: 0027-8424 the whole document	1-159		
----- -/--				
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C.				
<input checked="" type="checkbox"/> Patent family members are listed in annex.				
° Special categories of cited documents :				
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none; vertical-align: top;"> *A* document defining the general state of the art which is not considered to be of particular relevance *E* earlier document 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 </td> <td style="width: 50%; border: none; vertical-align: top;"> *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 </td> </tr> </table>			*A* document defining the general state of the art which is not considered to be of particular relevance *E* earlier document 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
A document defining the general state of the art which is not considered to be of particular relevance *E* earlier document 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 <p style="text-align: center;">29 September 2004</p>	Date of mailing of the international search report <p style="text-align: center;">11/10/2004</p>			
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer <p style="text-align: center;">Hillenbrand, G</p>			

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 03/29761

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	WO 03/026590 A (UNIV TEXAS) 3 April 2003 (2003-04-03) the whole document -----	1-159
P,X	WO 03/029431 A (UNIV TEXAS) 10 April 2003 (2003-04-10) the whole document -----	1-159
E	WO 2004/033488 A (REISS BRIAN ; MAO CHUANBIN (US); SOLIS DANIEL (US); UNIV TEXAS (US); B) 22 April 2004 (2004-04-22) the whole document -----	1-159
E	WO 2004/035612 A (SCHMIDT CHRISTINE E ; SANGHVI ARCHIT (US); UNIV TEXAS (US); BELCHER AN) 29 April 2004 (2004-04-29) the whole document -----	1-159

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/US 03/29761

Patent document cited in search report	A	Publication date	Patent family member(s)	Publication date
WO 03026590	A	03-04-2003	CA 2461898 A1	03-04-2003
			EP 1432527 A2	30-06-2004
			WO 03026590 A2	03-04-2003
			US 2003068900 A1	10-04-2003
			US 2003113714 A1	19-06-2003
WO 03029431	A	10-04-2003	CA 2462766 A1	10-04-2003
			WO 03029431 A2	10-04-2003
			US 2003028888 A1	06-02-2003
			US 2003073104 A1	17-04-2003
WO 2004033488	A	22-04-2004	WO 2004033488 A2	22-04-2004
WO 2004035612	A	29-04-2004	WO 2004035612 A2	29-04-2004
			US 2004127640 A1	01-07-2004