

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
3 January 2002 (03.01.2002)

PCT

(10) International Publication Number
WO 02/00686 A3

(51) International Patent Classification⁷: **C07K 14/47**,
14/78, G01N 27/00, C07K 7/06, I/107, B82B 1/00

(72) Inventor: **URRY, Dan, W.**; 2423 Vestaria Drive, Birmingham, AL 35216 (US).

(21) International Application Number: PCT/US01/20045

(74) Agents: **EBERLE, Shelley, P.**; Cooley Godward LLP, Five Palo Alto Square, 3000 El Camino Real, Palo Alto, CA 94306-2155 et al. (US).

(22) International Filing Date: 21 June 2001 (21.06.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/213,364 23 June 2000 (23.06.2000) US

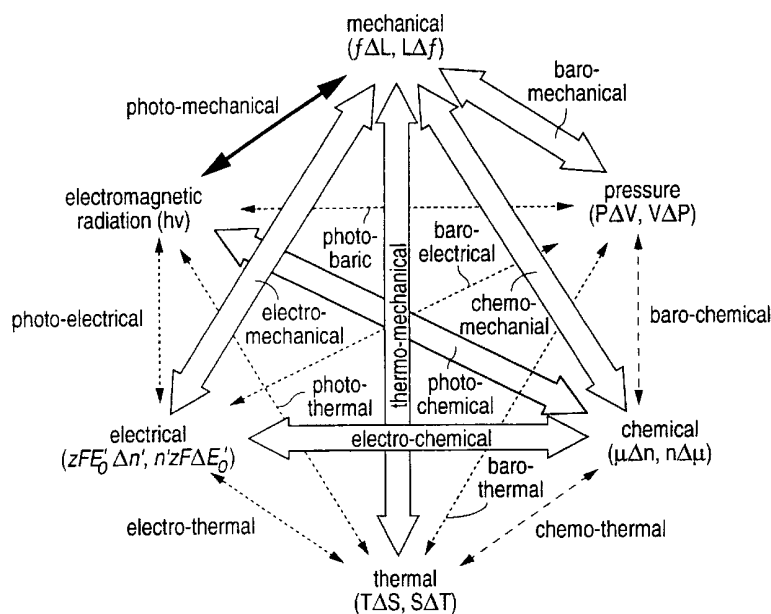
(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU,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

(71) Applicant: **BIOELASTICS RESEARCH, LTD.**
[US/US]; 2800 Milan Court, Suite 386, Birmingham, AL 35211 (US).

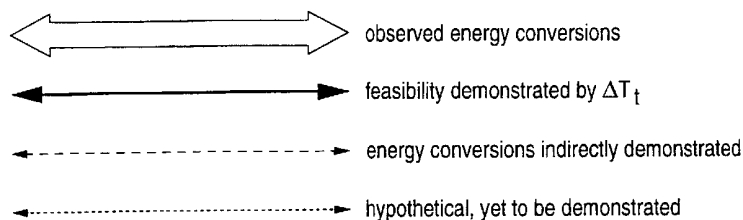
(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,

[Continued on next page]

(54) Title: BIOELASTOMER NANOMACHINES AND BIOSENSORS



(57) Abstract: Bioelastomers, having repeating peptide monomeric units selected from the group consisting of bioelastic nonapeptides, pentapeptides and tetrapeptides, are used to produce nanomachines and biosensors.



WO 02/00686 A3



IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations 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, 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, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG)*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for the following designations 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, 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, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG)

Published:

- *with international search report*
- *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:

2 May 2002

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

Inte. onal Application No

PCT/US 01/20045

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07K14/47 C07K14/78 G01N27/00 C07K7/06 C07K1/107
B82B1/00

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 C07K

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)

INSPEC, EPO-Internal, WPI Data, BIOSIS, PAJ, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 97 23729 A (URRY DAN W) 3 July 1997 (1997-07-03)	1-3, 9-15, 20-56
Y	the whole document	20, 28-31, 42,50-53
	page 8 -page 9 ---	
X	WO 99 11661 A (REES ANTHONY ;REIERSEN HERALD (GB); DYNAL AS (NO); KORSNES LARS (N) 11 March 1999 (1999-03-11)	1-3, 9-15, 20-56
Y	the whole document	20, 28-31, 42,50-53
	page 18; claims --- -/--	



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
- *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.

G document member of the same patent family

Date of the actual completion of the international search

26 February 2002

Date of mailing of the international search report

15/03/2002

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

Cervigni, S

INTERNATIONAL SEARCH REPORT

Inte. onal Application No

PCT/US 01/20045

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	NICOL A ET AL: "CELL ADHESION AND GROWTH ON SYNTHETIC ELASTOMERIC MATRICES CONTAINING ARG-GLY-ASP-SER" JOURNAL OF BIOMEDICAL MATERIALS RESEARCH, WILEY, NEW YORK, NY, US, vol. 26, no. 3, 1992, pages 393-413, XP001010509 ISSN: 0021-9304 abstract ---	28,29, 50,51
Y	DATABASE BIOSIS 'Online! BIOSCIENCES INFORMATION SERVICE, PHILADELPHIA, PA, US; 1991 PATTANAIK A ET AL: "PHOSPHORYLATION AND DEPHOSPHORYLATION MODULATION OF AN INVERSE TEMPERATURE TRANSITION" Database accession no. PREV199192086666 XP002191313 abstract & BIOCHEMICAL AND BIOPHYSICAL RESEARCH COMMUNICATIONS, vol. 178, no. 2, 1991, pages 539-545, ISSN: 0006-291X ---	20,30, 31,42, 52,53
A	WO 98 52620 A (GRIESSER HANS JOERG ;JOHNSON GRAHAM (AU); COMMW SCIENT IND RES ORG) 26 November 1998 (1998-11-26) ---	
A	WO 99 60169 A (MOLECULAR MACHINES INC) 25 November 1999 (1999-11-25) ---	
A	WO 98 50773 A (UNIV MINNESOTA) 12 November 1998 (1998-11-12) ---	
A	FRITZ J ET AL: "TRANSLATING BIOMOLECULAR RECOGNITION INTO NANOMECHANICS" SCIENCE, AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE,, US, vol. 288, 14 April 2000 (2000-04-14), pages 316-319, XP000971747 ISSN: 0036-8075 -----	

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 1-3,6,9-15,20-56 (all partially)

Present claims 1-3, 6,9-15, 20-56 relate to an extremely large number of possible products. In fact, the term "nanomachine" has been defined so broadly, that a lack of clarity within the meaning of Article 6 PCT arises to such an extent as to render a meaningful search of the claims impossible.

Consequently, the search has been carried out for the general concept underlying the application, and in particular for claims 4-5,7-8,16-19, which do appear to be clear and are directed to specific structural features (e.g.: a di-, tri or tetraacid-containing linker connecting the bioelastomer to a cantilever) which would allow the skilled person to reproduce the claimed invention without an undue burden. Claims 1-3,6,9-15,20-56 have been searched insofar they relate to the searched subject-matter.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 01/20045

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9723729	A	03-07-1997	US 5900405 A	04-05-1999
			AU 6266596 A	17-07-1997
			DE 69615179 D1	18-10-2001
			EP 0830509 A1	25-03-1998
			JP 11508274 T	21-07-1999
			WO 9723729 A1	03-07-1997
WO 9911661	A	11-03-1999	AU 8875598 A	22-03-1999
			BR 9811421 A	22-08-2000
			CN 1276796 T	13-12-2000
			EP 1009761 A1	21-06-2000
			WO 9911661 A1	11-03-1999
			JP 2001514263 T	11-09-2001
WO 9852620	A	26-11-1998	AU 8017498 A	11-12-1998
			WO 9852620 A2	26-11-1998
			EP 0983096 A2	08-03-2000
			JP 2001527451 T	25-12-2001
WO 9960169	A	25-11-1999	US 6287765 B1	11-09-2001
			AU 4194799 A	06-12-1999
			EP 1080231 A1	07-03-2001
			WO 9960169 A1	25-11-1999
WO 9850773	A	12-11-1998	WO 9850773 A2	12-11-1998