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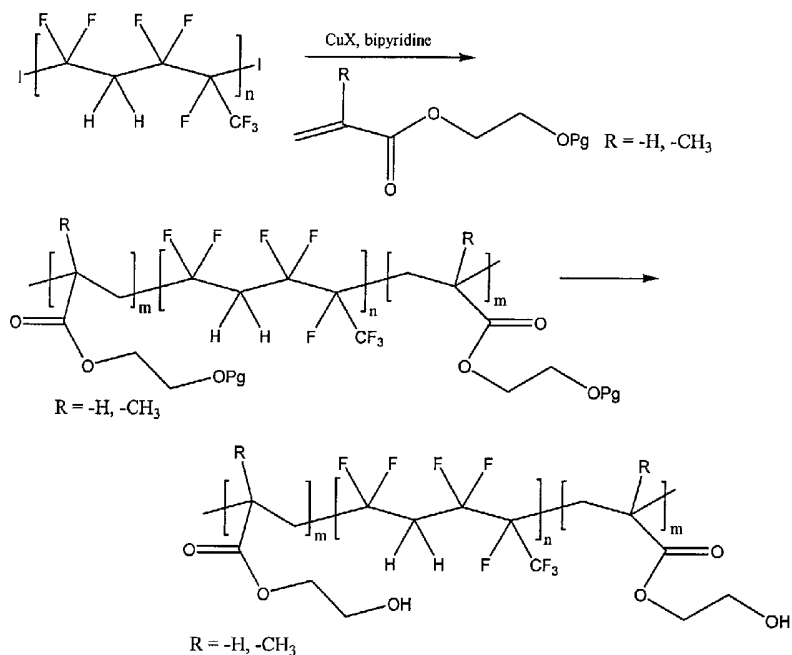
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[Continued on next page]

(54) Title: BLOCK COPOLYMERS OF ACRYLATES AND METHACRYLATES WITH FLUOROALKENES



(57) Abstract: A block copolymer comprising a fluorinated block and a non-fluorinated block and method of making the block copolymer are provided. Also provided herein are a coating on an implantable device comprising the block copolymer and method of using the implantable device.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 C08F293/00 C09D153/00 C08L53/00 A61L31/10 A61L27/34
 A61L29/08

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 C08F C08L C09D C09J A61L C08K

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, 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	US 4 158 678 A (TATEMOTO ET AL) 19 June 1979 (1979-06-19) column 1, lines 5-10 column 9, lines 19-35 column 5, lines 7-20 column 9, line 36 - column 10, line 13	1-4
X	US 4 501 869 A (TATEMOTO ET AL) 26 February 1985 (1985-02-26) claims 6,24 column 2, lines 61-63 column 3, lines 34-40	1,4
X	EP 1 231 239 A (SOLVAY SOLEXIS S.P.A; DAIMLERCHRYSLER AG) 14 August 2002 (2002-08-14)	1
Y	* page 2, line 5-7 ; claim 17(a) ; claims 11,12,18 ; page 5, line 4(a) *	2-4
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Further documents are listed in the continuation of box C. Patent family members are listed in annex.

° Special categories of cited documents :

<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"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</p> <p>"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</p> <p>"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.</p> <p>"&" document member of the same patent family</p>
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Date of the actual completion of the international search 21 February 2005	Date of mailing of the international search report 30 JUN 2005
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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 Hammond, A
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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US2004/037474

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 683 186 A (AUSIMONT S.P.A) 22 November 1995 (1995-11-22)	1
Y	* page 2, line 3-5 ; claim 17 , 11(a) ; page 4, line 20-21 ; page 2, line 41-55 *	2-4
Y	----- US 6 228 943 B1 (MORIKAWA TATSUYA ET AL) 8 May 2001 (2001-05-08) column 3, lines 38-46,52-60 column 2, line 50 column 2, lines 43-50; claim 2	1-4
Y	----- EP 0 489 370 A (DAIKIN INDUSTRIES, LIMITED) 10 June 1992 (1992-06-10) page 5, lines 17-29; claims 5,10	1-4
Y	----- WO 00/59963 A (UNIVERSITEIT GENT; SCHACHT, ETIENNE, HONORE; VERWEIRE, INEKE) 12 October 2000 (2000-10-12) claims 1-3,9,10	2-4
Y	----- EP 0 291 297 A (MITSUBISHI PETROCHEMICAL CO., LTD) 17 November 1988 (1988-11-17) page 9, lines 30-37 page 4, line 41 - page 5, line 26 page 5, line 27 - page 9, line 28	2-4
A	----- EP 0 924 257 A (AUSIMONT S.P.A; SOLVAY SOLEXIS S.P.A) 23 June 1999 (1999-06-23) abstract claims 1-22 page 4, line 14 - page 5, line 57	1-4
A	----- PATENT ABSTRACTS OF JAPAN vol. 008, no. 143 (M-306), 4 July 1984 (1984-07-04) & JP 59 040066 A (DAIKIN KOGYO KK), 5 March 1984 (1984-03-05) abstract	1-4
A	----- EP 1 126 537 A (ASAHI GLASS COMPANY LTD) 22 August 2001 (2001-08-22) claims 1-25	1-4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2004/037474

Box 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 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:

see additional 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.:

1-4

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-4

A block copolymer product comprising a fluorinated block of the structure as described in application claim 1, and at least one non-fluorinated block of the structure as described in the application claim 1.

2. claims: 5-8

An independent polymeric coating composition comprising a block copolymer which is not dependent on any previous claim.

3. claims: 9, 13

A further coating composition comprising a bioactive agent (the specific bioactive agent structures as specifically defined in claim 13 therein), and the claim 5 composition.

4. claims: 10, 14

A further coating composition comprising a bioactive agent (the specific bioactive agent structures as specifically defined in claim 14 therein), and the claim 6 composition.

5. claims: 11, 15

A further coating composition comprising a bioactive agent (the specific bioactive agent structures as specifically defined in claim 15 therein), and the claim 7 composition.

6. claim: 12

A further coating composition comprising a bioactive agent and the claim 8 composition.

7. claims: 16-20

An independent implantable device as described in claim 16.

8. claims: 21, 26

A drug-eluting stent, wherein the coating further comprises a bioactive agent (the specific bioactive structures as defined in claim 26).

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

9. claims: 22, 27

A further drug-eluting stent, wherein the coating further comprises a bioactive agent (the specific bioactive structures as defined in claim 27).

10. claims: 23, 28

A further different drug-eluting stent, wherein the coating further comprises a bioactive agent (the specific bioactive structures as defined in claim 28).

11. claims: 24, 29

A further different drug-eluting stent, wherein the coating further comprises a bioactive agent (the specific bioactive structures as defined in claim 29).

12. claims: 25, 30

A further different drug-eluting stent, wherein the coating further comprises a bioactive agent (the specific bioactive structures as defined in claim 30).

13. claim: 31

A method of treating restenosis or vulnerable plaque as described in application claim 31.

14. claim: 32

A further different method of treating restenosis or vulnerable plaque as described in claim 32.

15. claim: 33

A further different method of treating restenosis or vulnerable plaque as described in claim 33.

16. claim: 34

A further different method of treating restenosis or vulnerable plaque as described in claim 34.

17. claim: 35

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

A further different method of treating restenosis or vulnerable plaque as described in claim 35.

18. claims: 36-39

An independent block copolymer synthesis method as described in claim 36.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US2004/037474

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4158678	A	19-06-1979	JP 1174816 C	28-10-1983
			JP 53003495 A	13-01-1978
			JP 58004728 B	27-01-1983
			DE 2729671 A1	12-01-1978
			FR 2423500 A1	16-11-1979
			GB 1574089 A	03-09-1980

US 4501869	A	26-02-1985	JP 1678483 C	13-07-1992
			JP 3042302 B	26-06-1991
			JP 59020310 A	02-02-1984
			DE 3375398 D1	25-02-1988
			EP 0101930 A2	07-03-1984

EP 1231239	A	14-08-2002	IT MI971468 A1	21-12-1998
			EP 1231239 A1	14-08-2002
			DE 69810013 D1	23-01-2003
			DE 69810013 T2	25-09-2003
			EP 0885928 A1	23-12-1998
			JP 11021360 A	26-01-1999
			US 6107363 A	22-08-2000

EP 0683186	A	22-11-1995	IT 1269513 B	01-04-1997
			AT 158000 T	15-09-1997
			CA 2149581 A1	19-11-1995
			CN 1117502 A ,C	28-02-1996
			DE 69500675 D1	16-10-1997
			DE 69500675 T2	19-02-1998
			EP 0683186 A1	22-11-1995
			ES 2108510 T3	16-12-1997
			JP 3478906 B2	15-12-2003
			JP 7316246 A	05-12-1995
			RU 2158273 C2	27-10-2000
			US 5605971 A	25-02-1997

US 6228943	B1	08-05-2001	JP 10324788 A	08-12-1998
			WO 9854259 A1	03-12-1998

EP 0489370	A	10-06-1992	JP 2100278 C	22-10-1996
			JP 4202303 A	23-07-1992
			JP 8026087 B	13-03-1996
			CN 1062736 A	15-07-1992
			DE 69124583 D1	20-03-1997
			DE 69124583 T2	12-06-1997
			EP 0489370 A1	10-06-1992
			RU 2111974 C1	27-05-1998
			US 5439980 A	08-08-1995

WO 0059963	A	12-10-2000	AU 4112600 A	23-10-2000
			CA 2365460 A1	12-10-2000
			WO 0059963 A1	12-10-2000
			EP 1171490 A1	16-01-2002

EP 0291297	A	17-11-1988	JP 1103666 A	20-04-1989
			DE 3877251 D1	18-02-1993
			DE 3877251 T2	06-05-1993
			EP 0291297 A2	17-11-1988
			US 5162444 A	10-11-1992

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/US2004/037474

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0924257	A	23-06-1999	IT MI972764 A1	15-06-1999
			DE 69819458 D1	11-12-2003
			DE 69819458 T2	09-09-2004
			EP 0924257 A1	23-06-1999
			JP 11240997 A	07-09-1999
			US 6207758 B1	27-03-2001

JP 59040066	A	05-03-1984	NONE	

EP 1126537	A	22-08-2001	CA 2336720 A1	15-08-2001
			CN 1310190 A	29-08-2001
			EP 1126537 A1	22-08-2001
			JP 2002212246 A	31-07-2002
			JP 2002216804 A	02-08-2002
			US 2003198854 A1	23-10-2003
			US 2001018144 A1	30-08-2001
