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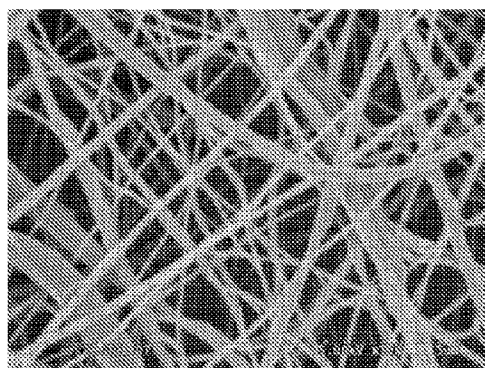
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[Continued on next page]

(54) Title: STIMULI RESPONSIVE NANOFIBERS



SEM image of PCL nanofiber showing bead free non defect nanofibers

Fig. 1

(57) Abstract: A stimuli responsive nanofiber that includes a stimuli responsive polymer, such as a thermally responsive polymer, and a cross-linking agent having at least two latent reactive activatable groups. The nanofiber may also include a biologically active material or a functional polymer. The stimuli responsive nanofiber can be used to modify the surface of a substrate. When the nanofiber includes a thermally responsive polymer, the physical properties of the surface can be controlled by controlling the temperature of the system, thus controlling the ability of the surface to bind to a biologically active material of interest.

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27 August 2009

- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2008/067708

A. CLASSIFICATION OF SUBJECT MATTER

INV. D01D5/00 D01F1/10 D01F6/22 D01F6/26 D01F6/62
D06M15/285 A61L27/34 A61L29/08 A61L31/10 C12M3/00
C08F8/00

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)

D01D D01F D06M A61L C08F C12M

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2007/012050 A (SURMODICS INC [US]; DONALDSON CO INC [US]; LODHI MUHAMMAD [US]; NAQVI) 25 January 2007 (2007-01-25) page 4, line 13 - line 25 page 35, line 3 - page 36, line 7 examples claims page 6, line 1 - line 3	1-5, 7, 8
X	WO 01/26702 A (UNIV AKRON [US]) 19 April 2001 (2001-04-19) page 8, line 1 - line 34 ----- -/--	1-5, 7-9, 11-14, 16-21, 23-25, 27-32, 34

☒ 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 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

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22/07/2009

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2008/067708

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2004/044281 A (UNIV CALIFORNIA [US]; HSIEH YOU-LO [US]; XIE JIANGBING [US]; WANG YUHO) 27 May 2004 (2004-05-27) page 12, line 1 - line 26 page 16, line 3 - page 18, line 2 page 20, line 18 - page 21, line 2 examples	1-5, 7-10, 20, 21, 23, 25, 28-32, 34, 36
X	LIU H ET AL: "Ionic-Strength- and pH-Responsive Poly[acrylamide-co-(maleic acid)] Hydrogel Nanofibers" MACROMOLECULAR CHEMISTRY AND PHYSICS, WILEY-VCH VERLAG, WEINHEIM, DE, vol. 208, no. 8, 19 April 2007 (2007-04-19), pages 874-880, XP002525882 ISSN: 1022-1352 page 875, column 2	1-5, 7-9
A	GIL E S ET AL: "Stimuli-reponsive polymers and their bioconjugates" PROGRESS IN POLYMER SCIENCE, PERGAMON PRESS, OXFORD, GB, vol. 29, no. 12, 1 December 2004 (2004-12-01), pages 1173-1222, XP004638224 ISSN: 0079-6700 cited in the application the whole document	
A	US 2005/095695 A1 (SCHINDLER MELVIN S [US] ET AL) 5 May 2005 (2005-05-05) the whole document	
T	YU JIN ET AL: "Photocrosslinked Electrospun Chitosan-Based Biocompatible Nanofibers" JOURNAL OF APPLIED POLYMER SCIENCE, JOHN WILEY AND SONS INC. NEW YORK, US, vol. 109, no. 5, 5 September 2008 (2008-09-05), pages 3337-3343, XP002525883 ISSN: 0021-8995 the whole document	

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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2008/067708

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
T	SHENGGUANG CAO ET AL: "Synthesis of pH-responsive crosslinked poly[styrene-co-(maleic sodium anhydride)] and cellulose composite hydrogel nanofibers by electrospinning" POLYMER INTERNATIONAL, SOCIETY OF CHEMICAL INDUSTRY, vol. 58, no. 5, May 2009 (2009-05), pages 545-551, XP002525884 ISSN: 0959-8103 the whole document -----	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2008/067708

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:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers allsearchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an 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 reportcovers 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.:

1-34

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.

FURTHER INFORMATION CONTINUED FROM PCT/SA/ 210

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

1. claims: 1-34

Nanofibre, coated surface, corresponding production method
and coating method, surface coating.

2. claims: 35-52

Cross-linking agents.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2008/067708

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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