(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
5 November 2009 (05.11.2009)

PCT

(10) International Publication Number
WO 2009/133059 A3

(51) International Patent Classification:
D01D 5/00 (2006.01) ***A61Q 19/00*** (2006.01)
D01F 1/10 (2006.01) ***A61L 27/54*** (2006.01)

(21) International Application Number:
PCT/EP2009/055045

(22) International Filing Date:
27 April 2009 (27.04.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/071,521 2 May 2008 (02.05.2008) US

(71) Applicant *(for all designated States except US)*: **EVONIK DEGUSSA GMBH** [DE/DE]; Rellinghauser Straße 1-11, 45128 Essen (DE).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **SEILER, Matthias** [DE/DE]; Beethovenstr. 6, 64347 Griesheim (DE). **KOBUS, Axel** [DE/DE]; Kurt-Schumacher-Str. 89, 63225 Langen (DE). **MCHUGH, Mark A.** [US/US]; 1122 West Avenue, Richmond, Virginia 23220 (US). **BERNHARDT, Stefan** [DE/DE]; Lachwiesen 88, 63075 Offenbach (DE). **GLÖCKLER, Bernd** [DE/DE]; Im Lochseif 49, 63517 Rodenbach (DE). **SCHNEIDER, Rolf** [DE/DE]; John-Wesley-Str. 2, 63584 Gründau-Rothenbergen (DE). **MARCKMANN, Henning** [DE/DE]; Ferner Weg 6b, 83342 Tacherting (DE).

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

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *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))*

(88) Date of publication of the international search report:
30 December 2009

WO 2009/133059 A3

(54) Title: NANOFIBER MATRICES FORMED FROM ELECTROSPUN HYPERBRANCHED POLYMERS

(57) Abstract: A nanofiber matrix comprising an active agent suspended or enmeshed in fibers formed by the electrospinning of one or more hyperbranched polymers can be used in cosmetics, drug delivery and for the growth of cells. The process of electrospinning the hyperbranched polymer solution is carried out without an added solvent or with a solvent and a compressed gas.

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2009/055045

A. CLASSIFICATION OF SUBJECT MATTER
INV. D01D5/00 D01F1/10 A61Q19/00 A61L27/54

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 A61Q D01F C08G

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 Y	US 2006/240110 A1 (KIICK KRISTI L [US] ET AL) 26 October 2006 (2006-10-26) paragraphs [0003], [0048], [0049], [0051], [0052] paragraphs [0054] - [0065] paragraph [0069]; example 1 -----	1-10, 12-34 11
Y	US 2008/018015 A1 (MCHUGH MARK [US] ET AL) 24 January 2008 (2008-01-24) cited in the application paragraphs [0005], [0023] - [0025]; figure 1 the whole document -----	11

-/--

[X] Further documents are listed in the continuation of Box C.

[X] 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	Date of mailing of the international search report
2 November 2009	16/11/2009

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Malik, Jan

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2009/055045

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 379 683 B1 (SIMONNET JEAN-THIERRY [FR] ET AL) 30 April 2002 (2002-04-30) cited in the application column 1, line 4 - column 2, line 48 column 4, line 19 - column 6, line 33	1-34
A	KENNETH E. GONSALVES ET AL.: "Biomedical Nanostructures" 8 October 2007 (2007-10-08), JOHN WILEY & SONS , XP002552143 Chapter 7: Development of nanostructures for Drug Delivery	1-34
A	UHRICH K: "Hyperbranched Polymers for Drug Delivery" 1 December 1997 (1997-12-01), TRENDS IN POLYMER SCIENCE, ELSEVIER SCIENCE PUBLISHERS B.V. AMSTERDAM, NL, PAGE(S) 388 - 393 , XP004098786 ISSN: 0966-4793 the whole document	1-14
A	MCKEE M G ET AL: "Electrospinning of linear and highly branched segmented poly(urethane urea)s" 10 March 2005 (2005-03-10), POLYMER, ELSEVIER SCIENCE PUBLISHERS B.V, GB, PAGE(S) 2011 - 2015 , XP004774409 ISSN: 0032-3861 page 2012, column 1 the whole document	1-34

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2009/055045

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2006240110 A1	26-10-2006	NONE	
US 2008018015 A1	24-01-2008	WO 2005064047 A1	14-07-2005
US 6379683 B1	30-04-2002	AT 207386 T	15-11-2001
		DE 60000020 D1	29-11-2001
		DE 60000020 T2	13-06-2002
		EP 1034839 A1	13-09-2000
		ES 2161675 T3	16-12-2001
		FR 2790405 A1	08-09-2000
		JP 2000256183 A	19-09-2000