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

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(54) Title: CHROMATOGRAPHIC PURIFICATION OF VIRUS PREPARATIONS WITH NEGATIVELY CHARGED PARTICLES

(57) Abstract: A method of purifying a sample that includes a desired virus includes the steps of (i) providing a packed chromatographic column having negatively charged porous particles, (ii) equilibrating the column to the conditions to which the desired virus in the sample is to elute, (iii) contacting the sample with the packed chromatographic column such that the sample volume applied to the packed chromatographic column is less than or equal to the interparticle space of the negatively charged porous particles within the packed chromatographic column, (iv) eluting the desired virus from the packed chromatographic column, where the desired virus is in a purer state and in the conditions to which the packed chromatographic column was equilibrated.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SG2013/000070

A. CLASSIFICATION OF SUBJECT MATTER

C12N 7/02 (2006.01) B01J 39/26 (2006.01) B01D 15/04 (2006.01)

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)

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 practicable, search terms used)

MEDLINE, HCAPLUS, BIOSIS, EMBASE: virus, bacteriophage, pseudovirus, vlp, phage, cation exchange chromatography, ion exchange chromatography, negative charge, cex, purify, isolate, separate, extract, refine, clearance, elute, recover, nuvia cprime, capto mmc, unosphere s, unosphere rapid s

WPI, EPODOC: C12N7/02, B01J39, B01D15, cation exchange, cex, ion exchange, chromatography, negative charge, virus, bacteriophage, pseudovirus, vlp, phage

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	Documents are listed in the continuation of Box C	

[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

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Date of the actual completion of the international search	Date of mailing of the international search report
10 May 2013	10 May 2013

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INTERNATIONAL SEARCH REPORT C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		International application No. **PCT/SG2013/000070**
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	BRUMENT, N. et al. 'A Versatile and Scalable Two-Step Ion-Exchange Chromatography Process for the Purification of Recombinant Adeno-associated Virus Serotypes-2 and -5' Molecular Therapy 2002, vol. 6, pages 678-686 page 680 column 1 paragraph 2, page 681 column 1 paragraph 2, page 685 column 1 paragraph 3	1-32
X	WO 2008/113011 A2 (LIGOCYTE PHARMACEUTICALS, INC.) 18 September 2008 page 35 lines 5-14, page 37 lines 13-14, claim 87	1-32
X	GAO, G. et al. 'Purification of Recombinant Adeno-Associated Virus Vectors by Column Chromatography and Its Performance in Vivo' Human Gene Therapy 2000, vol. 11, pages 2079-2091 page 2080 column 2 paragraph 2	1-32
X	UNOsphereTM Q and S Ion Exchange Media, Instruction Manual [retrieved on 1 May 2013] Retrieved from internet <URL: http://web.archive.org/web/20110702105031/http://www.bio-rad.com/webroot/web/pdf/lsr/literature/4110109C.pdf> published on 2 July 2011 as per Wayback Engine pages 1 and 7	33

INTERNATIONAL SEARCH REPORT Information on patent family members	International application No. **PCT/SG2013/000070**

This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document/s Cited in Search Report		Patent Family Member/s	
Publication Number	**Publication Date**	**Publication Number**	**Publication Date**
WO 2008/113011 A2	18 Sep 2008	AU 2008224877 A1	18 Sep 2008
		CA 2683977 A1	18 Sep 2008
		EP 2134360 A2	23 Dec 2009
		JP 2010530734 A	16 Sep 2010
		KR 20100015562 A	12 Feb 2010
		SG 179488 A1	27 Apr 2012
		US 2010150961 A1	17 Jun 2010
		WO 2008113011 A2	18 Sep 2008

End of Annex

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.