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(54) Title: THERAPEUTIC CALCIUM PHOSPHATE PARTICLES AND METHODS OF MANUFACTURE AND USE

(57) Abstract: Novel calcium phosphate core particles, methods of making them, and methods of using them as vaccine adjuvants, as cores, as carriers of biologically active material, and as controlled release matrices for biologically active material are disclosed. The core particles may have a surface modifying agent and/or biologically active material, such as antigenic material or natural immunoenhancing factor, polynucleotide material, or therapeutic proteins or peptides, partially coating the particle or impregnated therein. The core particles have a diameter between about 300 nm and about 4000 nm, more particularly between about 300 nm and about 2000 nm, and even more particularly between about 300 nm and about 1000 nm, are substantially spherical in shape, and have a substantially smooth surface.



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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

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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 A61K

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, BIOSIS, MEDLINE, EMBASE, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 595 762 A (DERRIEU G ET AL) 21 January 1997 (1997-01-21) the whole document ---	1-77
A	WO 98 35562 A (MERCK & CO) 20 August 1998 (1998-08-20) the whole document ---	1-77
A	US 5 648 097 A (NUWAYSER E.S.) 15 July 1997 (1997-07-15) the whole document ---	1-77
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GOTO N ET AL: "Local tissue irritating effects and adjuvant activities of calcium phosphate and aluminium hydroxide with different physical properties" VACCINE,GB,BUTTERWORTH SCIENTIFIC. GUILDFORD, vol. 15, no. 12-13, 1 August 1997 (1997-08-01), pages 1364-1371, XP004089483 ISSN: 0264-410X cited in the application the whole document -----	1-77
E	WO 00 15194 A (ETEX CORPORATION) 23 March 2000 (2000-03-23) page 50 -page 53 -----	1-77

INTERNATIONAL SEARCH REPORT

Information on patent family members

Inten Application No

PCT/US 00/02742

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5595762 A	21-01-1997	FR 2698560 A	03-06-1994
		AT 152617 T	15-05-1997
		AU 667588 B	28-03-1996
		AU 5197193 A	09-06-1994
		CA 2110370 A	31-05-1994
		DE 69310484 D	12-06-1997
		DE 69310484 T	11-12-1997
		DE 600775 T	06-04-1995
		DK 600775 T	13-10-1997
		EP 0600775 A	08-06-1994
		ES 2060563 T	01-12-1994
		GR 94300063 T	30-09-1994
		GR 3024231 T	31-10-1997
		JP 6292825 A	21-10-1994
		NZ 250331 A	26-05-1997
		ZA 9308938 A	28-09-1994
WO 9835562 A	20-08-1998	AU 722326 B	27-07-2000
		AU 6150998 A	08-09-1998
		EP 1017283 A	12-07-2000
US 5648097 A	15-07-1997	NONE	
WO 0015194 A	23-03-2000	AU 6145699 A	03-04-2000