

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
9 June 2011 (09.06.2011)

(10) International Publication Number
WO 2011/069042 A3

PCT

(51) International Patent Classification:
A23L 1/305 (2006.01) *A61K 38/01* (2006.01)

(21) International Application Number:
PCT/US2010/058852

(22) International Filing Date:
3 December 2010 (03.12.2010)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09015087.1 4 December 2009 (04.12.2009) EP

(71) Applicant (for all designated States except US): **MEAD JOHNSON NUTRITION COMPANY** [US/US]; 2400 W. Lloyd Expressway, Evansville, IN 47721-0001 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **VALENTA, Rudolph** [AT/AT]; University of Vienna, Medical School, Waehringer Guertel 18-20, A-1090 Vienna (AT). **VAN TOL, Eric** [NL/NL]; Roemer Visscherstraat 62, 6824 MZ Arnhem (NL). **HERZ, Udo** [DE/DE]; Auf der Roete 14, D-35274 Kirchhain (DE). **HOCHWALLNER, Heidrun** [AT/AT]; Romerweg 4, A3243 St. Leonhard/Forst (AT). **FOCKE-TEJKL, Margarete** [AT/AT]; Utendorfsgasse 22, A1140 Wein (AT). **SWOBODA, Ines** [AT/AT]; Grobe Sperlgasse 7/4, 1020 Wien (AT). **SCHULMEISTER, Ulrike** [AT/AT]; Waldhausen 10, A3914 Waldhausen (AT).

(74) Agent: **SHOUSE, Emily A.**; Waddey & Patterson, Roundabout Plaza, 1600 Division Street, Suite 500, Nashville, TN 37203 (US).

(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, 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, PE, PG, PH, PL, PT, RO, RS, RU, 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.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, 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, RS, SE, SI, SK, SM, 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))
- with sequence listing part of description (Rule 5.2(a))

(88) Date of publication of the international search report:
6 October 2011

(54) Title: NUTRITIONAL FORMULATION COMPRISING A COW'S MILK PEPTIDE-CONTAINING HYDROLYSATE AND/OR PEPTIDES DERIVED THEREOF FOR TOLERANCE INDUCTION

(57) Abstract: The present invention relates to a nutritional formulation or supplement comprising a cow's milk peptide-containing hydrolysate and/or peptide-containing fraction of the hydrolysate and/or one or more peptides derived from a protein present in cow's milk for use in the induction of tolerance in a human subject, wherein said peptides contained in the hydrolysate or fraction of hydrolysate comprise T cell epitope-containing peptides or wherein said one or more peptides are T cell epitope-containing peptides, and wherein said T cell epitope-containing peptides are capable of driving the immune reaction upon intake of the nutritional formulation towards tolerance.



WO 2011/069042 A3

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2010/058852

A. CLASSIFICATION OF SUBJECT MATTER

INV. A23L1/305 A61K38/01
ADD.

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)

A23L 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, COMPENDEX, FSTA, IBM-TDB, 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 A	US 6 077 558 A (EUBER JOHN [US]) 20 June 2000 (2000-06-20) example 1	1,6-9, 11,12 2,4,5,10
X Y	----- WO 2008/056983 A1 (FRIESLAND BRANDS BV [NL]; GLAS CORNELIS [NL]; TE BIESEBEKE ROB [NL]; K) 15 May 2008 (2008-05-15) page 9, line 27 - page 10, line 7; example 2 page 11, line 15 - line 19 page 13, line 16 - line 20 ----- -/-	1,2,6-11 4,5

☒ 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

18 March 2011

Date of mailing of the international search report

08/08/2011

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Granet, Nicolas

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2010/058852

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	RUITER B ET AL.: "Characterization of T cell epitopes in alpha s1-casein in cow's milk allergic, atopic and non-atopic children", CLINICAL AND EXPERIMENTAL ALLERGY, vol. 36, 2006, pages 303-310, XP002582387, DOI: 10.1111/j.1365-2222.2006.02436.x cited in the application	4,5
A	page 307, left-hand column, last paragraph; figures 1,3 -----	1,2,6-12
A	KAZUKI HIRAHARA ET AL.: "Profound immunological tolerance in the antibody response against bovine alpha s1-casein induced by intradermal administration of a dominant T cell determinant", CLINICAL IMMUNOLOGY AND IMMUNOPATHOLOGY, vol. 76, no. 1, 1995, pages 12-18, XP002582388, DOI: 10.1006/clin.1995.1082 the whole document -----	1,2,4-12
A	DE 10 2004 040452 A1 (NUTRICIA NV [NL]) 23 February 2006 (2006-02-23) paragraph [0008]; examples 1,2 -----	1,2,4-12
A	SCHULMEISTER ULRIKE ET AL: "Cloning, Expression, and Mapping of Allergenic Determinants of alpha S1-Casein, a Major Cow's Milk Allergen", JOURNAL OF IMMUNOLOGY, vol. 182, no. 11, 1 June 2009 (2009-06-01), pages 7019-7029, XP002563141, AMERICAN ASSOCIATION OF IMMUNOLOGISTS, US ISSN: 0022-1767, DOI: 10.4049/JIMMUNOL.0712366 the whole document -----	1,2,4-12

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2010/058852

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 all searchable 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 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, 2, 12(completely); 4-11(partially)

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/ISA/ 210

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

1. claims: 1, 2, 12(completely); 4-11(partially)

A nutritional formulation or supplement comprising a cow's milk peptide-containing hydrolysate and/or a peptide-containing fraction of the hydrolysate and/or one or more peptides derived from a protein present in cow's milk for use in the induction of tolerance in a human subject, wherein said peptides contained in the hydrolysate or fraction of hydrolysate comprise T cell epitope-containing peptides or wherein said one or more peptides are T cell epitope-containing peptides, wherein said tolerance is optionally tolerance induced to cow's milk, a protein contained in cow's milk or an allergen contained in cow's milk and, and wherein tolerance is optionally induced transiently.

2. claims: 3(completely); 4-11(partially)

A nutritional formulation or supplement comprising a cow's milk peptide-containing hydrolysate and/or a peptide-containing fraction of the hydrolysate and/or one or more peptides derived from a protein present in cow's milk for use in treating or preventing inflammatory bowel disease, wherein said peptides contained in the hydrolysate or fraction of hydrolysate comprise T cell epitope-containing peptides or wherein said one or more peptides are T cell epitope-containing peptides

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2010/058852

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6077558 A	20-06-2000	US 6436464 B1	20-08-2002
-----	-----	-----	-----
WO 2008056983 A1	15-05-2008	CN 101594789 A	02-12-2009
		EP 2094114 A1	02-09-2009
		NL 1032840 C2	13-05-2008
		RU 2009121781 A	20-12-2010
		US 2010047393 A1	25-02-2010
-----	-----	-----	-----
DE 102004040452 A1	23-02-2006	CN 101043900 A	26-09-2007
		EP 1799053 A2	27-06-2007
		WO 2006021335 A2	02-03-2006
		US 2008096794 A1	24-04-2008
-----	-----	-----	-----