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(54) Title: IMMUNOGENICITY OF GLUCAN BINDING PROTEIN

(57) Abstract: Immunogenic compositions and subunit vaccines for dental caries are described which comprise peptide subunits of glucan binding protein-B and peptide subunits of glucan binding protein-B in combination with peptide subunits of glucosyltransferase. Methods of provoking an immune response to *S. mutans* glucan binding protein-B or glucosyltransferase. Methods of immunizing a mammal against dental caries are also described, along with antibodies which bind particular epitopes of glucan binding protein-B or glucosyltransferase.



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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/06962

A. CLASSIFICATION OF SUBJECT MATTER
 IPC: Please See Continuation Sheet

 USPC: Please See Continuation Sheet
 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)
 U.S. : Please See Continuation Sheet

 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)
 Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X, E	NOGUEIRA et al. AgeSpecific Salivary Immunoglobulin A Response to Streptococcus mutans GbpB Clinical and Vaccine Immunology. June 2007, Vol. 14, No. 6, pages 804-807, see entire document.	1-32
X, E	NOGUEIRA et al. Characterization of Salivary Immunoglobulin A Responses in Children Heavily Exposed to the Oral Bacterium Streptococcus mutans: Influence of Specific Antigen Recognition in Infection Infection and Immunity. September 2005, Vol. 73, No. 9, pages 5675-5684, see entire document.	1-32
X, E	SMITH et al. Immunological and Protective Effects of Diepitopic Subunit Dental Caries Vacciness May 2005, Vol. 73, No. 5, pages 2797-2804, see entire document.	1-32
A	ADUSE-OPOK et al. Genetic and Antigenic Comparison of Streptococcus mutans Fructosyltransferase and Glucan-Binding Protein. FEMS Microbiology Letters. 1989, Vol. 59, No. 3, pages 279-282, see entire document.	1-32

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	"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
"E"	earlier application or patent published on or after the international filing date	"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
"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)	"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
"O"	document referring to an oral disclosure, use, exhibition or other means	"&"	document member of the same patent family
"P"	document published prior to the international filing date but later than the priority date claimed		

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Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner of Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Authorized officer N. M. Minnifield <i>Felicia D. Roberts</i> Telephone No. 571-272-0500 <i>for</i>

INTERNATIONAL SEARCH REPORT

C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X, E	CULSHAW et al. Immunogenic and Protective Potential of Mutans Streptococcal Glucosyltransferase Peptide Constructs Selected by MAJOR Histocompatibility Complex Class II Allele Binding Infection and Immunity. February 2007, Vol. 75, No. 2, pages 915-923, see entire document.	1-32
A, E	US 6,827,936 B1 (SMITH et al) 07 December 2004 (07.12.2004), see entire document.	1-32
Y, E	US 7,101,562 B1 (LEE et al) 05 September 2006 (05.09.2006), see entire document.	1-32
A	US 5,686,075 A (TAUBMAN et al) 11 November 1997 (11.11.1997), see entire document.	1-32
A, E	US 7,056,517 B2 (SMITH et al) 06 June 2006 (06.06.2006), see entire document.	1-32
X, E	US 7,163,682 B2 (SMITH et al) 16 January 2007 (16.01.2007), see entire document.	1-32
A	ABO et al. Peptide Sequences for Sucrose Splitting and Glucan Binding within Streptococcus sobrinus Glucosyltransferase (Water-Insoluble Glucan Synthetase Journal Bacteriology. Vol. 173, No. 3, pages 989-996, see entire document.	1-32
X	MATTOS-GRANER et al. Cloning of the Streptococcus mutans Gene Encoding Glucan Binding Protein B and Analysis of Genetic Diversity and Protein Production in Clinical Isolates. Infection and Immunity. November 2001, Vol. 69, No. 11, pages 6934-6941, see entire document.	1-12
X, P, E	SMITH et al. Immunogenicity and Protective Immunity Induced by Synthetic PEPTIDES Associated with Putative Immunodominant Regions of Streptococcus mutans glucan-Binding Protein B Infection and Immunity. March 2003, Vol. 71, No. 3, pages 1179-1184, see entire document.	1-12, 26, 29-31
X	BANAS et al. Sequence Analysis of the Gene for the Glucan-Binding Protein of Streptococcus mutans Ingbritt. Infection and Immunity. March 1990, Vol. 58, No. 3, pages 667-673, see entire document.	13
X	SMITH et al. Purification and Antigenicity of a Novel Glucan-Binding Protein of Streptococcus mutans. Infection and Immunity, June 1994, Vol. 62, No. 6, pages 2545-2552, see entire document.	1-22, 26, 27, 29-31
X	SMITH et al. Experimental Immunization of Rats with a Streptococcus mutans 59-Kilodalton Glucan-Binding Protein Protects against Dental Caries. Infection and Immunity. August 1996, Vol. 64, No. 8, pages 3069-3073, see entire document.	1-22, 26, 27, 29-31
X	DOUGLAS et al. Effect of Specific Antisera on Adherence Properties of the Oral Bacterium Streptococcus mutans. Archives of Oral Biology. 1982, Vol. 27, Issue 12, pages 1039-1045, see entire document.	1-22, 26, 27, 30, 31

INTERNATIONAL SEARCH REPORT

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Continuation of B. FIELDS SEARCHED Item 1:

424/184.1, 193.1, 130.1, 150.1, 165.1, 185.1, 190.1, 244.1, 197.11, 203.1, 234.1; 514/12, 2; 530/300, 324, 325, 326, 327, 328, 350, 387.1, 388.1

Continuation of B. FIELDS SEARCHED Item 3:

WEST, EMBASE, MEDLINE, BIOSIS, BIOTECHDS, CA, CABA, CAPLUS, AGRICOLA, LIFESCI, CONFSCI, SCISEARCH, STIC (sequence search), SCIENCE DIRECT, PUBMED

search terms: inventor names, gpbp, gtf, glucan binding protein, glucosyltransferase, mhc, hla, antigen, antibody, fragment, passive immunization, SEQ ID NO., streptococcus, s. mutans

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Continuation of USPC:

424/184.1,193.1,130.1,150.1,165.1,185.1,190.1,244.1,197.11,203.1,234.1;514/12,2;530/300,324,325,326,327,328,350,387.1,388.1