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A61K 39/00 (2006.01), *A61K 39/395* (2006.01),
A61P 37/08 (2006.01), *C07K 16/00* (2006.01),
C07K 19/00 (2006.01), *C12N 15/62* (2006.01),
C07K 16/42 (2006.01)

(71) Demandeur/Applicant:
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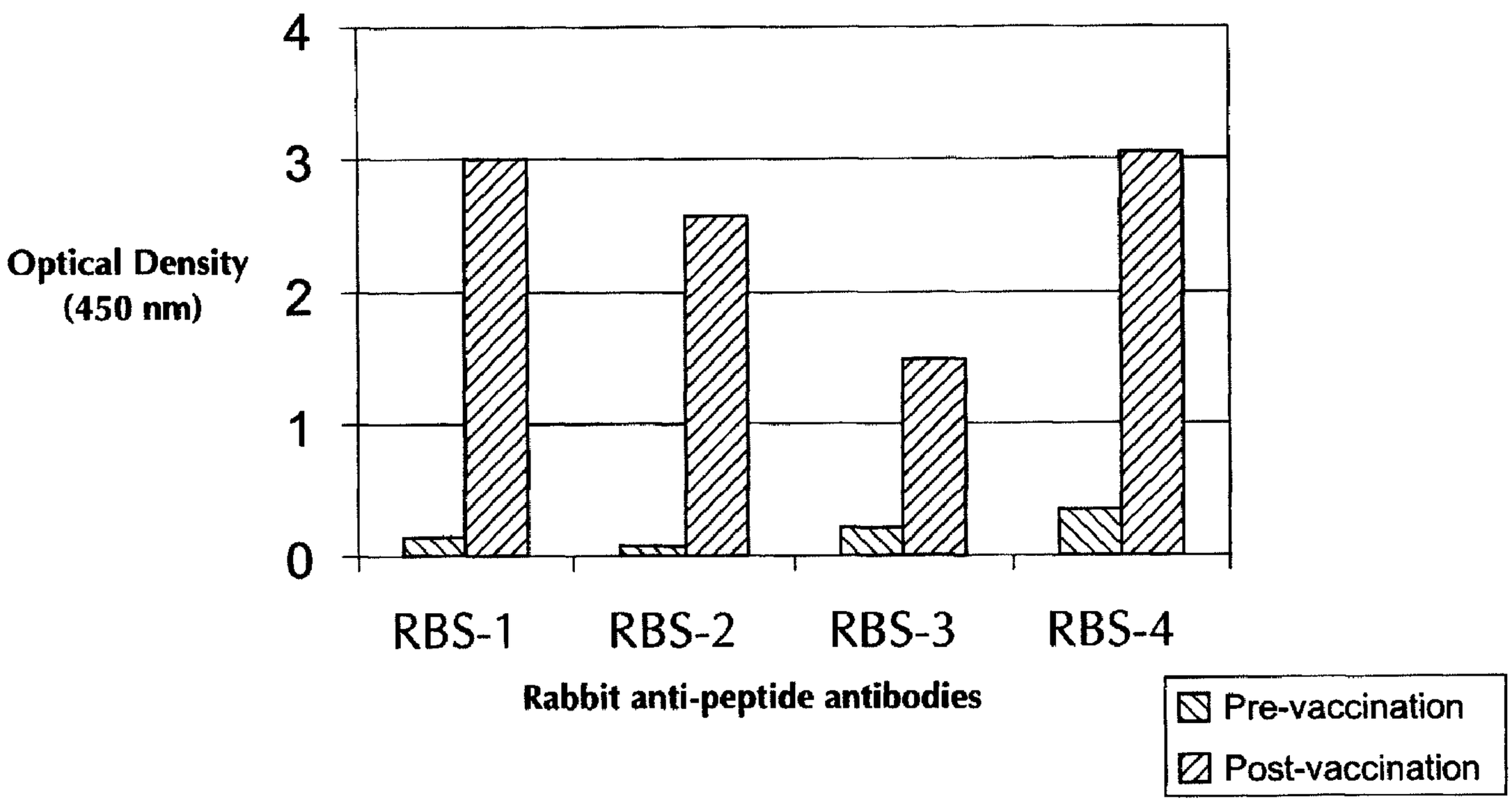
(54) Titre : VACCINS ANTI-IgE
(54) Title: ANTI-IgE VACCINES



(57) Abrégé/Abstract:
The present invention provides compositions and methods for the use of antigenic peptides derived from the Fc portion of the epsilon heavy chain of an IgE molecule as vaccines for the treatment and prevention of IgE-mediated allergic disorders. In particular, the invention provides compositions, methods for the treatment and prevention of IgE-mediated allergic disorders comprising an immunogenic amount of one or more antigenic peptides derived from the CH3 domain or junction of Ch-3/CH4 domain of an IgE molecule and methods for the evaluation of IgE mediated allergies in dogs.

51090-46F

Anti-IgE Vaccines

Abstract

The present invention provides compositions and methods for the use of antigenic peptides derived from the Fc portion of the epsilon heavy chain of an IgE molecule as vaccines for the treatment and prevention of IgE-mediated allergic disorders. In particular, the invention provides compositions, methods for the treatment and prevention of IgE-mediated allergic disorders comprising an immunogenic amount of one or more antigenic peptides derived from the CH3 domain or junction of Ch-3/CH4 domain of an IgE molecule and methods for the evaluation of IgE mediated allergies in dogs.

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THIS IS VOLUME __2___ OF __2___

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51090-46F

SEQUENCE LISTING

(1) GENERAL INFORMATION:
(i) APPLICANT: PFIZER PRODUCTS INC.
(ii) TITLE OF INVENTION: ANTI-IGE VACCINES
(iii) NUMBER OF SEQUENCES: 28
(iv) CORRESPONDENCE ADDRESS:
(A) ADDRESSEE: SMART & BIGGAR
(B) STREET: P.O. BOX 2999, STATION D
(C) CITY: OTTAWA
(D) STATE: ONT
(E) COUNTRY: CANADA
(F) ZIP: K1P 5Y6
(v) COMPUTER READABLE FORM:
(A) MEDIUM TYPE: Floppy disk
(B) COMPUTER: IBM PC compatible
(C) OPERATING SYSTEM: PC-DOS/MS-DOS
(D) SOFTWARE: ASCII (text)
(vi) CURRENT APPLICATION DATA:
(A) APPLICATION NUMBER: CA 2,356,124
(B) FILING DATE: 28-AUG-2001
(C) CLASSIFICATION:
(vii) PRIOR APPLICATION DATA:
(A) APPLICATION NUMBER:
(B) FILING DATE:
(viii) ATTORNEY/AGENT INFORMATION:
(A) NAME: SMART & BIGGAR
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(ix) TELECOMMUNICATION INFORMATION:
(A) TELEPHONE: (613)-232-2486
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(2) INFORMATION FOR SEQ ID NO.: 1:
(i) SEQUENCE CHARACTERISTICS
(A) LENGTH: 30
(B) TYPE: amino acid
(C) STRANDEDNESS:
(D) TOPOLOGY:
(ii) MOLECULE TYPE: polypeptide
(vi) ORIGINAL SOURCE:
(A) ORGANISM: DOG CH3/CH4 PEPTIDE SEQUENCE
(xi) SEQUENCE DESCRIPTION: SEQ ID NO.: 1:

```
Cys Ser Glu Ser Asp Pro Arg Gly Val Thr Ser Tyr Leu Ser Pro Pro
 1               5                  10                  15

Ser Pro Leu Asp Leu Tyr Val His Lys Ala Pro Lys Ile Thr
            20                  25                  30
```

(2) INFORMATION FOR SEQ ID NO.: 2:
(i) SEQUENCE CHARACTERISTICS
(A) LENGTH: 31
(B) TYPE: amino acid
(C) STRANDEDNESS:
(D) TOPOLOGY:
(ii) MOLECULE TYPE: polypeptide
(vi) ORIGINAL SOURCE:

(A) ORGANISM: DOG CH3/CH4 PEPTIDE SEQUENCE
(xi) SEQUENCE DESCRIPTION: SEQ ID NO.: 2:

Cys Leu Val Val Asp Leu Ala Thr Met Glu Gly Met Asn Leu Thr Trp
1 5 10 15

Tyr Arg Glu Ser Lys Glu Pro Val Asn Pro Gly Pro Leu Asn Lys
20 25 30

(2) INFORMATION FOR SEQ ID NO.: 3:
(i) SEQUENCE CHARACTERISTICS
(A) LENGTH: 28
(B) TYPE: amino acid
(C) STRANDEDNESS:
(D) TOPOLOGY:
(ii) MOLECULE TYPE: polypeptide
(vi) ORIGINAL SOURCE:
(A) ORGANISM: DOG CH3/CH4 PEPTIDE SEQUENCE
(xi) SEQUENCE DESCRIPTION: SEQ ID NO.: 3:

Lys Asp His Phe Asn Gly Thr Ile Thr Val Thr Ser Thr Leu Pro Val
1 5 10 15

Asn Thr Asn Asp Trp Ile Glu Gly Glu Thr Tyr Tyr
20 25

(2) INFORMATION FOR SEQ ID NO.: 4:
(i) SEQUENCE CHARACTERISTICS
(A) LENGTH: 25
(B) TYPE: amino acid
(C) STRANDEDNESS:
(D) TOPOLOGY:
(ii) MOLECULE TYPE: polypeptide
(vi) ORIGINAL SOURCE:
(A) ORGANISM: DOG CH3/CH4 PEPTIDE SEQUENCE
(xi) SEQUENCE DESCRIPTION: SEQ ID NO.: 4:

Cys Arg Val Thr His Pro His Leu Pro Lys Asp Ile Val Arg Ser Ile
1 5 10 15

Ala Lys Ala Pro Gly Lys Arg Ala Pro
20 25

(2) INFORMATION FOR SEQ ID NO.: 5:
(i) SEQUENCE CHARACTERISTICS
(A) LENGTH: 28
(B) TYPE: amino acid
(C) STRANDEDNESS:
(D) TOPOLOGY:
(ii) MOLECULE TYPE: polypeptide
(vi) ORIGINAL SOURCE:
(A) ORGANISM: DOG CH3/CH4 PEPTIDE SEQUENCE
(xi) SEQUENCE DESCRIPTION: SEQ ID NO.: 5:

Leu Ser Pro Pro Ser Pro Leu Asp Leu Tyr Val His Lys Ala Pro Lys
1 5 10 15

Ile Thr Cys Leu Val Val Asp Leu Ala Thr Met Glu
20 25

(2) INFORMATION FOR SEQ ID NO.: 6:
(i) SEQUENCE CHARACTERISTICS
(A) LENGTH: 34
(B) TYPE: amino acid
(C) STRANDEDNESS:
(D) TOPOLOGY:
(ii) MOLECULE TYPE: polypeptide
(vi) ORIGINAL SOURCE:
(A) ORGANISM: DOG CH3/CH4 PEPTIDE SEQUENCE
(xi) SEQUENCE DESCRIPTION: SEQ ID NO.: 6:

Cys Gly Met Asn Leu Thr Trp Tyr Arg Glu Ser Lys Glu Pro Val Asn
1 5 10 15

Pro Gly Pro Leu Asn Lys Lys Asp His Phe Asn Gly Thr Ile Thr Val
20 25 30

Thr Ser

(2) INFORMATION FOR SEQ ID NO.: 7:
(i) SEQUENCE CHARACTERISTICS
(A) LENGTH: 26
(B) TYPE: amino acid
(C) STRANDEDNESS:
(D) TOPOLOGY:
(ii) MOLECULE TYPE: polypeptide
(vi) ORIGINAL SOURCE:
(A) ORGANISM: DOG CH3/CH4 PEPTIDE SEQUENCE
(xi) SEQUENCE DESCRIPTION: SEQ ID NO.: 7:

Thr Leu Pro Val Asn Thr Asn Asp Trp Ile Glu Gly Glu Thr Tyr Tyr
1 5 10 15

Cys Arg Val Thr His Pro His Leu Pro Lys
20 25

(2) INFORMATION FOR SEQ ID NO.: 8:
(i) SEQUENCE CHARACTERISTICS
(A) LENGTH: 30
(B) TYPE: amino acid
(C) STRANDEDNESS:
(D) TOPOLOGY:
(ii) MOLECULE TYPE: polypeptide
(vi) ORIGINAL SOURCE:
(A) ORGANISM: HUMAN CH3/CH4 PEPTIDE SEQUENCE
(xi) SEQUENCE DESCRIPTION: SEQ ID NO.: 8:

Cys Ala Asp Ser Asn Pro Arg Gly Val Ser Ala Tyr Leu Ser Arg Pro
1 5 10 15

Ser Pro Phe Asp Leu Phe Ile Arg Lys Ser Pro Thr Ile Thr
20 25 30

(2) INFORMATION FOR SEQ ID NO.: 9:
(i) SEQUENCE CHARACTERISTICS
(A) LENGTH: 33
(B) TYPE: amino acid
(C) STRANDEDNESS:
(D) TOPOLOGY:
(ii) MOLECULE TYPE: polypeptide

(vi) ORIGINAL SOURCE:
(A) ORGANISM: HUMAN CH3/CH4 PEPTIDE SEQUENCE
(xi) SEQUENCE DESCRIPTION: SEQ ID NO.: 9:

Cys Leu Val Val Asp Leu Ala Pro Ser Lys Gly Thr Val Asn Leu Thr
1 5 10 15

Trp Ser Arg Ala Ser Gly Lys Pro Val Asn His Ser Thr Arg Lys Glu
20 25 30

Glu

(2) INFORMATION FOR SEQ ID NO.: 10:
(i) SEQUENCE CHARACTERISTICS
(A) LENGTH: 27
(B) TYPE: amino acid
(C) STRANDEDNESS:
(D) TOPOLOGY:
(ii) MOLECULE TYPE: polypeptide
(vi) ORIGINAL SOURCE:
(A) ORGANISM: HUMAN CH3/CH4 PEPTIDE SEQUENCE
(xi) SEQUENCE DESCRIPTION: SEQ ID NO.: 10:

Lys Gln Arg Asn Gly Thr Leu Thr Val Thr Ser Thr Leu Pro Val Gly
1 5 10 15

Thr Arg Asp Trp Ile Glu Gly Glu Thr Tyr Gln
20 25

(2) INFORMATION FOR SEQ ID NO.: 11:
(i) SEQUENCE CHARACTERISTICS
(A) LENGTH: 26
(B) TYPE: amino acid
(C) STRANDEDNESS:
(D) TOPOLOGY:
(ii) MOLECULE TYPE: polypeptide
(vi) ORIGINAL SOURCE:
(A) ORGANISM: HUMAN CH3/CH4 PEPTIDE SEQUENCE
(xi) SEQUENCE DESCRIPTION: SEQ ID NO.: 11:

Cys Arg Val Thr His Pro His Leu Pro Arg Ala Leu Met Arg Ser Thr
1 5 10 15

Thr Lys Thr Ser Gly Pro Arg Ala Ala Pro
20 25

(2) INFORMATION FOR SEQ ID NO.: 12:
(i) SEQUENCE CHARACTERISTICS
(A) LENGTH: 27
(B) TYPE: amino acid
(C) STRANDEDNESS:
(D) TOPOLOGY:
(ii) MOLECULE TYPE: polypeptide
(vi) ORIGINAL SOURCE:
(A) ORGANISM: HUMAN CH3/CH4 PEPTIDE SEQUENCE
(xi) SEQUENCE DESCRIPTION: SEQ ID NO.: 12:

Ser Arg Pro Ser Pro Phe Asp Leu Phe Ile Arg Lys Ser Pro Thr Ile
1 5 10 15

Thr Cys Leu Val Val Asp Leu Ala Pro Ser Lys
20 25

(2) INFORMATION FOR SEQ ID NO.: 13:
(i) SEQUENCE CHARACTERISTICS
(A) LENGTH: 34
(B) TYPE: amino acid
(C) STRANDEDNESS:
(D) TOPOLOGY:
(ii) MOLECULE TYPE: polypeptide
(vi) ORIGINAL SOURCE:
(A) ORGANISM: HUMAN CH3/CH4 PEPTIDE SEQUENCE
(xi) SEQUENCE DESCRIPTION: SEQ ID NO.: 13:

Gly Thr Val Asn Leu Thr Trp Ser Arg Ala Ser Gly Lys Pro Val Asn
1 5 10 15

His Ser Thr Arg Lys Glu Glu Lys Gln Arg Asn Gly Thr Leu Thr Val
20 25 30

Thr Ser

(2) INFORMATION FOR SEQ ID NO.: 14:
(i) SEQUENCE CHARACTERISTICS
(A) LENGTH: 28
(B) TYPE: amino acid
(C) STRANDEDNESS:
(D) TOPOLOGY:
(ii) MOLECULE TYPE: polypeptide
(vi) ORIGINAL SOURCE:
(A) ORGANISM: HUMAN CH3/CH4 PEPTIDE SEQUENCE
(xi) SEQUENCE DESCRIPTION: SEQ ID NO.: 14:

Thr Leu Pro Val Gly Thr Arg Asp Trp Ile Glu Gly Glu Thr Tyr Gln
1 5 10 15

Cys Arg Val Thr His Pro His Leu Pro Arg Cys His
20 25

(2) INFORMATION FOR SEQ ID NO.: 15:
(i) SEQUENCE CHARACTERISTICS
(A) LENGTH: 84
(B) TYPE: nucleic acid
(C) STRANDEDNESS:
(D) TOPOLOGY:
(ii) MOLECULE TYPE: DNA
(vi) ORIGINAL SOURCE:
(A) ORGANISM: DOG CH3/CH4 NUCLEOTIDE SEQUENCE
(xi) SEQUENCE DESCRIPTION: SEQ ID NO.: 15:

TGCTCTGACC CGCGTGGTGT TACCTCTTAC CTGTCTCCGC CGTCTCCGCT GGACCTGTAC 60
GTTCACAAAG CTCCGAAAAT CACC 84

(2) INFORMATION FOR SEQ ID NO.: 16:
(i) SEQUENCE CHARACTERISTICS
(A) LENGTH: 93
(B) TYPE: nucleic acid
(C) STRANDEDNESS:
(D) TOPOLOGY:

(ii) MOLECULE TYPE: DNA
(vi) ORIGINAL SOURCE:
(A) ORGANISM: DOG CH3/CH4 NUCLEOTIDE SEQUENCE
(xi) SEQUENCE DESCRIPTION: SEQ ID NO.: 16:
TGCCTGGTAG TGGACCTGGC CACCATGGAA GGCATGAACC TGACCTGGTA CCGGGAGAGC 60
AAAGAACCCG TGAACCCGGG CCCTTTGAAC AAG 93

(2) INFORMATION FOR SEQ ID NO.: 17:
(i) SEQUENCE CHARACTERISTICS
(A) LENGTH: 87
(B) TYPE: nucleic acid
(C) STRANDEDNESS:
(D) TOPOLOGY:
(ii) MOLECULE TYPE: DNA
(vi) ORIGINAL SOURCE:
(A) ORGANISM: DOG CH3/CH4 NUCLEOTIDE SEQUENCE
(xi) SEQUENCE DESCRIPTION: SEQ ID NO.: 17:
TGCAAGGATC ACTTCAATGG GACGATCACA GTCACGTCTA CCCTGCCAGT GAACACCAAT 60
GACTGGATCG AGGGCGAGAC CTACTAT 87

(2) INFORMATION FOR SEQ ID NO.: 18:
(i) SEQUENCE CHARACTERISTICS
(A) LENGTH: 75
(B) TYPE: nucleic acid
(C) STRANDEDNESS:
(D) TOPOLOGY:
(ii) MOLECULE TYPE: DNA
(vi) ORIGINAL SOURCE:
(A) ORGANISM: DOG CH3/CH4 NUCLEOTIDE SEQUENCE
(xi) SEQUENCE DESCRIPTION: SEQ ID NO.: 18:
TGCAGGGTGA CCCACCCGCA CCTGCCCAAG GACATCGTGC GCTCCATTGC CAAGGCCCCT 60
GGTAAGCGTG CCCCC 75

(2) INFORMATION FOR SEQ ID NO.: 19:
(i) SEQUENCE CHARACTERISTICS
(A) LENGTH: 84
(B) TYPE: nucleic acid
(C) STRANDEDNESS:
(D) TOPOLOGY:
(ii) MOLECULE TYPE: DNA
(vi) ORIGINAL SOURCE:
(A) ORGANISM: DOG CH3/CH4 NUCLEOTIDE SEQUENCE
(xi) SEQUENCE DESCRIPTION: SEQ ID NO.: 19:
CTGTCTCCGC CGTCTCCGCT GGACCTGTAC GTTCACAAAG CTCCGAAAAT CACCTGCCTG 60
GTAGTGGACC TGGCCACCAT GGAA 84

(2) INFORMATION FOR SEQ ID NO.: 20:
(i) SEQUENCE CHARACTERISTICS
(A) LENGTH: 102
(B) TYPE: nucleic acid
(C) STRANDEDNESS:
(D) TOPOLOGY:
(ii) MOLECULE TYPE: DNA
(vi) ORIGINAL SOURCE:
(A) ORGANISM: DOG CH3/CH4 NUCLEOTIDE SEQUENCE

(xi) SEQUENCE DESCRIPTION: SEQ ID NO.: 20:
TGCGGCATGA ACCTGACCTG GTACCGGGAG AGCAAAGAAC CCGTGAACCC GGGCCCTTTG 60
AACAAGAAGG ATCACTTCAA TGGGACGATC ACAGTCACGT CT 102

(2) INFORMATION FOR SEQ ID NO.: 21:
(i) SEQUENCE CHARACTERISTICS
(A) LENGTH: 78
(B) TYPE: nucleic acid
(C) STRANDEDNESS:
(D) TOPOLOGY:
(ii) MOLECULE TYPE: DNA
(vi) ORIGINAL SOURCE:
(A) ORGANISM: DOG CH3/CH4 NUCLEOTIDE SEQUENCE
(xi) SEQUENCE DESCRIPTION: SEQ ID NO.: 21:
ACCCTGCCAG TGAACACCAA TGACTGGATC GAGGGCGAGA CCTACTATTG CAGGGTGACC 60
CACCCGCACC TGCCCAAG 78

(2) INFORMATION FOR SEQ ID NO.: 22:
(i) SEQUENCE CHARACTERISTICS
(A) LENGTH: 90
(B) TYPE: nucleic acid
(C) STRANDEDNESS:
(D) TOPOLOGY:
(ii) MOLECULE TYPE: DNA
(vi) ORIGINAL SOURCE:
(A) ORGANISM: DOG CH3/CH4 NUCLEOTIDE SEQUENCE
(xi) SEQUENCE DESCRIPTION: SEQ ID NO.: 22:
TGCGCGGACA GCAACCCGAG AGGGGTGAGC GCCTACCTAA GCCGGCCCAG CCCGTTCGAC 60
CTGTTCATCC GCAAGTCGCC CACGATCACC 90

(2) INFORMATION FOR SEQ ID NO.: 23:
(i) SEQUENCE CHARACTERISTICS
(A) LENGTH: 99
(B) TYPE: nucleic acid
(C) STRANDEDNESS:
(D) TOPOLOGY:
(ii) MOLECULE TYPE: DNA
(vi) ORIGINAL SOURCE:
(A) ORGANISM: DOG CH3/CH4 NUCLEOTIDE SEQUENCE
(xi) SEQUENCE DESCRIPTION: SEQ ID NO.: 23:
TGTCTGGTGG TGGACCTGGC ACCCAGCAAG GGGACCGTGA ACCTGACCTG GTCCCGGGCC 60
AGTGGGAAGC CTGTGAACCA CTCCACCAGA AAGGAGGAG 99

(2) INFORMATION FOR SEQ ID NO.: 24:
(i) SEQUENCE CHARACTERISTICS
(A) LENGTH: 81
(B) TYPE: nucleic acid
(C) STRANDEDNESS:
(D) TOPOLOGY:
(ii) MOLECULE TYPE: DNA
(vi) ORIGINAL SOURCE:
(A) ORGANISM: DOG CH3/CH4 NUCLEOTIDE SEQUENCE
(xi) SEQUENCE DESCRIPTION: SEQ ID NO.: 24:
AAGCAGCGCA ATGGCACGTT AACCGTCACG TCCACCCTGC CGGTGGGCAC CCGAGACTGG 60
ATCGAGGGGG AGACCTACCA G 81

(2) INFORMATION FOR SEQ ID NO.: 25:
(i) SEQUENCE CHARACTERISTICS
(A) LENGTH: 78
(B) TYPE: nucleic acid
(C) STRANDEDNESS:
(D) TOPOLOGY:
(ii) MOLECULE TYPE: DNA
(vi) ORIGINAL SOURCE:
(A) ORGANISM: DOG CH3/CH4 NUCLEOTIDE SEQUENCE
(xi) SEQUENCE DESCRIPTION: SEQ ID NO.: 25:
TGCAGGGTGA CCCACCCCCA CCTGCCCAGG GCCCTCATGC GGTCCACGAC CAAGACCAGC 60
GGCCCGCGTG CTGCCCCG 78

(2) INFORMATION FOR SEQ ID NO.: 26:
(i) SEQUENCE CHARACTERISTICS
(A) LENGTH: 81
(B) TYPE: nucleic acid
(C) STRANDEDNESS:
(D) TOPOLOGY:
(ii) MOLECULE TYPE: DNA
(vi) ORIGINAL SOURCE:
(A) ORGANISM: DOG CH3/CH4 NUCLEOTIDE SEQUENCE
(xi) SEQUENCE DESCRIPTION: SEQ ID NO.: 26:
AGCCGGCCCA GCCCGTTCGA CCTGTTCATC CGCAAGTCGC CCACGATCAC CTGTCTGGTG 60
GTGGACCTGG CACCCAGCAA G 81

(2) INFORMATION FOR SEQ ID NO.: 27:
(i) SEQUENCE CHARACTERISTICS
(A) LENGTH: 102
(B) TYPE: nucleic acid
(C) STRANDEDNESS:
(D) TOPOLOGY:
(ii) MOLECULE TYPE: DNA
(vi) ORIGINAL SOURCE:
(A) ORGANISM: DOG CH3/CH4 NUCLEOTIDE SEQUENCE
(xi) SEQUENCE DESCRIPTION: SEQ ID NO.: 27:
GGGACCGTGA ACCTGACCTG GTCCCGGGCC AGTGGGAAGC CTGTGAACCA CTCCACCAGA 60
AAGGAGGAGA AGCAGCGCAA TGGCACGTTA ACCGTCACGT CC 102

(2) INFORMATION FOR SEQ ID NO.: 28:
(i) SEQUENCE CHARACTERISTICS
(A) LENGTH: 78
(B) TYPE: nucleic acid
(C) STRANDEDNESS:
(D) TOPOLOGY:
(ii) MOLECULE TYPE: DNA
(vi) ORIGINAL SOURCE:
(A) ORGANISM: DOG CH3/CH4 NUCLEOTIDE SEQUENCE
(xi) SEQUENCE DESCRIPTION: SEQ ID NO.: 28:
ACCCTGCCGG TGGGCACCCG AGACTGGATC GAGGGGGAGA CCTACCAGTG CAGGGTGACC 60
CACCCCCACC TGCCCAGG 78

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LA PRÉSENTE PARTIE DE CETTE DEMANDE OU CE BREVETS COMPREND PLUS D'UN TOME.

CECI EST LE TOME __2___ DE __2___

NOTE: Pour les tomes additionels, veillez contacter le Bureau Canadien des Brevets.

JUMBO APPLICATIONS / PATENTS

THIS SECTION OF THE APPLICATION / PATENT CONTAINS MORE THAN ONE VOLUME.

THIS IS VOLUME __2___ OF __2___

NOTE: For additional volumes please contact the Canadian Patent Office.

CLAIMS:

1. An isolated antigenic peptide comprising an amino acid sequence of SEQ ID NO: 2 that induces an anti-IgE immune response that does not cause anaphylaxis when administered to an animal.

2. An isolated antigenic fusion protein comprising an amino acid sequence of SEQ ID NO: 2 that induces an anti-IgE immune response that does not cause anaphylaxis when administered to an animal.

3. An isolated polynucleotide encoding an antigenic peptide comprising an amino acid sequence of SEQ ID NO: 2, wherein said antigenic peptide induces an anti-IgE immune response that does not cause anaphylaxis when administered to an animal.

4. An isolated polynucleotide encoding an antigenic fusion protein comprising an amino acid sequence of SEQ ID NO: 2, wherein said antigenic fusion protein induces an anti-IgE immune response that does not cause anaphylaxis when administered to an animal.

5. A genetically engineered host cell that contains the polynucleotide as defined in claim 3 or 4.

6. A genetically engineered host cell that contains the polynucleotide as defined in claim 3 or 4 in operative association with a regulatory nucleotide that controls expression of the polynucleotide in the host cell.

7. A pharmaceutical composition for inducing an anti-IgE immune response that does not cause anaphylaxis, comprising one or more antigenic peptides having an amino acid sequence comprising amino acid residues of a CH3 domain of an IgE molecule or a fragment thereof, and a

pharmaceutically acceptable diluent or carrier, wherein one antigenic peptide has the amino acid sequence of SEQ ID NO: 2.

8. A pharmaceutical composition for inducing an anti-IgE immune response that does not cause anaphylaxis comprising one or more antigenic fusion proteins having an amino acid sequence comprising amino acid residues of a CH3 domain of an IgE molecule or a fragment thereof and a heterologous carrier protein, and wherein one antigenic fusion protein has the amino acid sequence of SEQ ID NO: 2.

9. The pharmaceutical composition of claim 8, wherein the heterologous carrier protein is KLH, PhoE, rmLT, TraT, or gD from BhV-1 virus.

10. The pharmaceutical composition of claim 7 or 8, wherein the anti-IgE immune response is the production of anti-IgE antibodies which bind to soluble IgE in serum and other bodily fluids, prevent IgE from binding to its high affinity receptors on mast cells and basophils, and do not cross-link receptor-bound IgE.

11. The pharmaceutical composition of claim 7 or 8 further comprising an adjuvant.

12. A pharmaceutical composition for inducing an anti-IgE immune response that does not cause anaphylaxis comprising one or more polynucleotides encoding an antigenic peptide having an amino acid sequence comprising amino acid residues of a CH3 domain of an IgE molecule or a fragment thereof, and a pharmaceutically acceptable diluent or carrier, and wherein one polynucleotide encodes an antigenic peptide having the amino acid sequence of SEQ ID NO: 2.

13. A pharmaceutical composition for inducing an anti-IgE immune response that does not cause anaphylaxis comprising one or more polynucleotides encoding an antigenic fusion protein having an amino acid sequence comprising amino acid residues of a CH3 domain of an IgE molecule or a fragment thereof and a heterologous carrier protein, and wherein one polynucleotide encodes an antigenic fusion protein having the amino acid sequence of SEQ ID NO: 2.

14. The pharmaceutical composition of claim 13, wherein the heterologous carrier protein is KLH, PhoE, rmLT, TraT, or gD from BhV-1 virus.

15. Use of the pharmaceutical composition as defined in any one of claims 7 to 14 for treating or preventing an IgE-mediated allergic disorder.

16. Use of the pharmaceutical composition as defined in any one of claims 7 to 14 in the preparation of a medicament for treating or preventing an IgE-mediated allergic disorder.

17. The use of claim 15 or 16 in which the animal is human.

18. The use of claim 15 or 16 in which the animal is a dog.

19. The use of any one of claims 15 to 18, wherein the IgE-mediated allergic disorder is asthma, allergic rhinitis, gastrointestinal allergies, eosinophilia, conjunctivitis, or glomerular nephritis.

20. An isolated polynucleotide comprising the polynucleotide sequence of SEQ ID NO: 16.

21. An isolated antigenic peptide comprising an amino acid sequence of SEQ ID NO: 2 or a fragment thereof, that induces an anti-IgE immune response that does not cause anaphylaxis when administered to an animal.

22. An isolated antigenic fusion protein comprising an amino acid sequence of SEQ ID NO: 2 or a fragment thereof that induces an anti-IgE immune response that does not cause anaphylaxis when administered to an animal.

23. A pharmaceutical kit comprising one or more containers filled with one or more of the ingredients of the pharmaceutical composition as defined in any one of claims 7, 8, 12 and 13, together with instructions for its use for inducing an anti-IgE immune response that does not cause anaphylaxis.

SMART & BIGGAR

OTTAWA, CANADA

PATENT AGENTS

FIG. 1

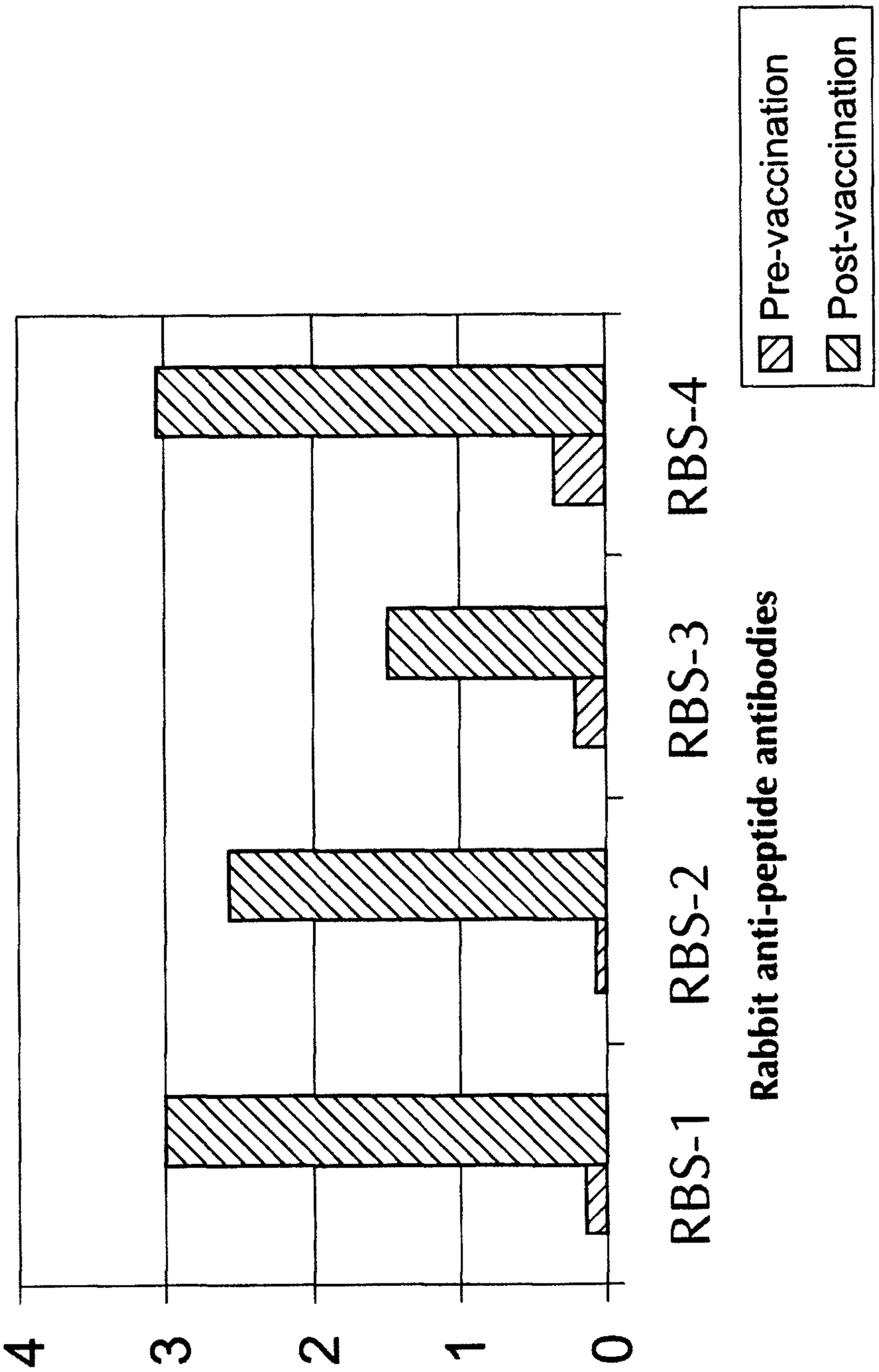
Pre-vaccination
Post-vaccination
Rabbit anti-peptide antibodies
Optical Density (450 nm)
0
1
2
3
4
RBS-1
RBS-2
RBS-3
RBS-4

FIG. 2

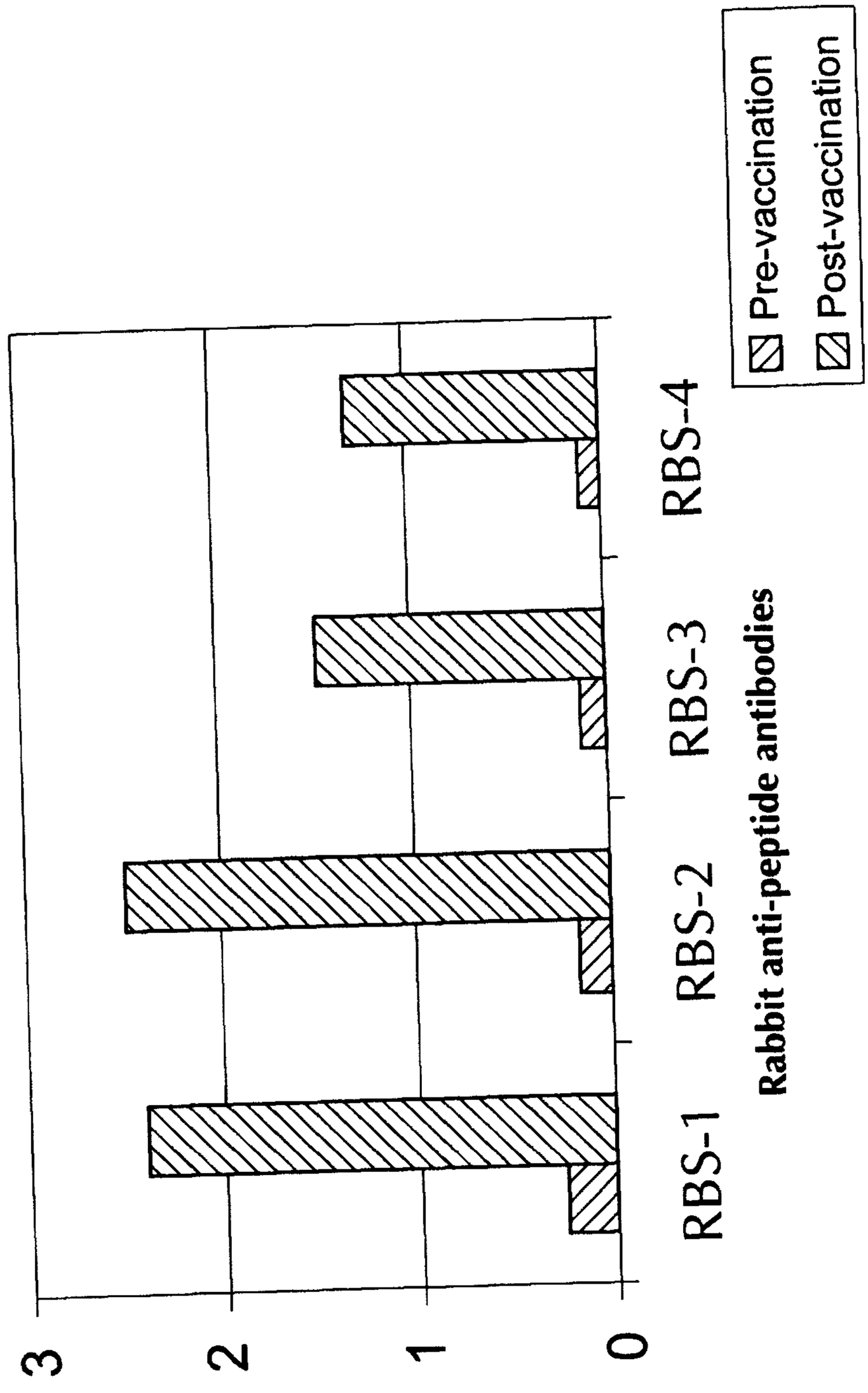
Pre-vaccination
Post-vaccination
RBS-1
RBS-2
RBS-3
RBS-4
Rabbit anti-peptide antibodies
Optical Density (450 nm)
0
1
2
3

FIG. 3

SEQ ID NO 1:

NH_2-CSESDPRGVTSYLSPPSPLDLYVHKAPKIT-COOH

FIG. 4

SEQ ID NO 2 :

NH_2-CLVVDLATMEGMNLTWYRESKEPVNPGPLNK-COOH

FIG. 5

SEQ ID NO 3:

NH_2-KDHFNGTITVTSTLPVNTNDWIEGETYY-COOH

FIG. 6

SEQ ID NO 4:

NH_2-CRVTHPHLPKDIVRSIAKAPGKRAP-COOH

FIG. 7

SEQ ID NO 5:

NH_2-LSPPSPLDLYVHKAPKITCLVVDLATME-COOH

FIG. 8

SEQ ID NO 6:

NH_2-CGMNLTWYRESKEPVNPGPLNKKDHFNGTITVTS-COOH

FIG. 9

SEQ ID NO 7:

NH_2-TLPVNTNDWIEGETYYCRVTHPHLPK-COOH

FIG. 10

SEQ ID NO 8:

NH_2-CADSNPRGVSAYLSRPSPFDLFIRKSPTIT-COOH

FIG. 11

SEQ ID NO 9:

NH_2-CLVVDLAPSKGTVNLTWSRASGKPVNHSTRKEE-COOH

FIG. 12

SEQ ID NO: 10:
NH_2-KQRNGTLTVTSTLPVGTRDWIEGETYQ-COOH

FIG. 13

SEQ ID NO: 11:
NH_2-CRVTHPHLPRALMRSTTKTSGPRAAP-COOH

FIG. 14

SEQ ID 12:
NH_2-SRPSPFDLFIRKSPTITCLVVDLAPSK-COOH

FIG. 15

SEQ ID NO: 13:

NH_2-GTVNLTWSRASGKPVNHSTRKEEKQRNGTLTVTS-COOH

FIG. 16

SEQ ID NO: 14:

NH_2-TLPVGTRDWIEGETYQCRVTHPHLPR-COOH

FIG. 17

SEQ ID NO 15:

TGCTCTGACCCGCGTGGTGTTACCTCTTACCTGTCTCCGCCGTCTCCGCTGGACCT
GTACGTTCACAAAGCTCCGAAAATCACC

FIG. 18

SEQ ID NO 16:
TGCCTGGTAGTGGACCTGGCCACCATGGAAGGCATGAACCTGACCTGGTACCG
GGAGAGCAAAGAACCCGTGAACCCGGGCCCTTTGAACAAG

FIG. 19

SEQ ID NO 17:
TGCAAGGATCACTTCAATGGGACGATCACAGTCACGTCTACCCTGCCAGTGAAC
ACCAATGACTGGATCGAGGGCGAGACCTACTAT

FIG. 20

SEQ ID NO 18:
TGCAGGGTGACCCACCCGCACCTGCCCAAGGACATCGTGCGCTCCATTGCCAA
GGCCCCTGGTAAGCGTGCCCCC

FIG. 21

SEQ ID NO 19:
CTGTCTCCGCCGTCTCCGCTGGACCTGTACGTTCACAAAGCTCCGAAAATCACC
TGCCTGGTAGTGGACCTGGCCACCATGGAA

FIG. 22

SEQ ID NO 20:
TGCGGCATGAACCTGACCTGGTACCGGGAGAGCAAAGAACCCGTGAACCCGG
GCCCTTTGAACAAGAAGGATCACTTCAATGGGACGATCACAGTCACGTCT

FIG. 23

SEQ ID NO 21:
ACCCTGCCAGTGAACACCAATGACTGGATCGAGGGCGAGACCTACTATTGCAG
GGTGACCCACCCGCACCTGCCCAAG

FIG. 24

SEQ ID NO 22:
TGCGCGGACAGCAACCCGAGAGGGGTGAGCGCCTACCTAAGCCGGCCCAGCC
CGTTCGACCTGTTCATCCGCAAGTCGCCCACGATCACC

FIG. 25

SEQ ID NO 23:
TGTCTGGTGGTGGACCTGGCACCCAGCAAGGGGACCGTGAACCTGACCTGGTC
CCGGGCCAGTGGGAAGCCTGTGAACCACTCCACCAGAAAGGAGGAG

FIG. 26

SEQ ID NO 24:
AAGCAGCGCAATGGCACGTTAACCGTCACGTCCACCCTGCCGGTGGGCACCCG
AGACTGGATCGAGGGGGAGACCTACCAG

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FIG. 27

SEQ ID NO 25:
TGCAGGGTGACCCACCCCCACCTGCCCAGGGCCCTCATGCGGTCCACGACCA
AGACCAGCGGCCCGCGTGCTGCCCCG

FIG. 28

SEQ ID NO 26:
AGCCGGCCCAGCCCGTTCGACCTGTTCATCCGCAAGTCGCCCACGATCACCTG
TCTGGTGGTGGACCTGGCACCCAGCAAG

FIG. 29

SEQ ID NO 27:
GGGACCGTGAACCTGACCTGGTCCCGGGCCAGTGGGAAGCCTGTGAACCACT
CCACCAGAAAGGAGGAGAAGCAGCGCAATGGCACGTTAACCGTCACGTCC

FIG. 30

SEQ ID NO 28:
ACCCTGCCGGTGGGCACCCGAGACTGGATCGAGGGGGAGACCTACCAGTGCA
GGGTGACCCACCCCCACCTGCCCAGG

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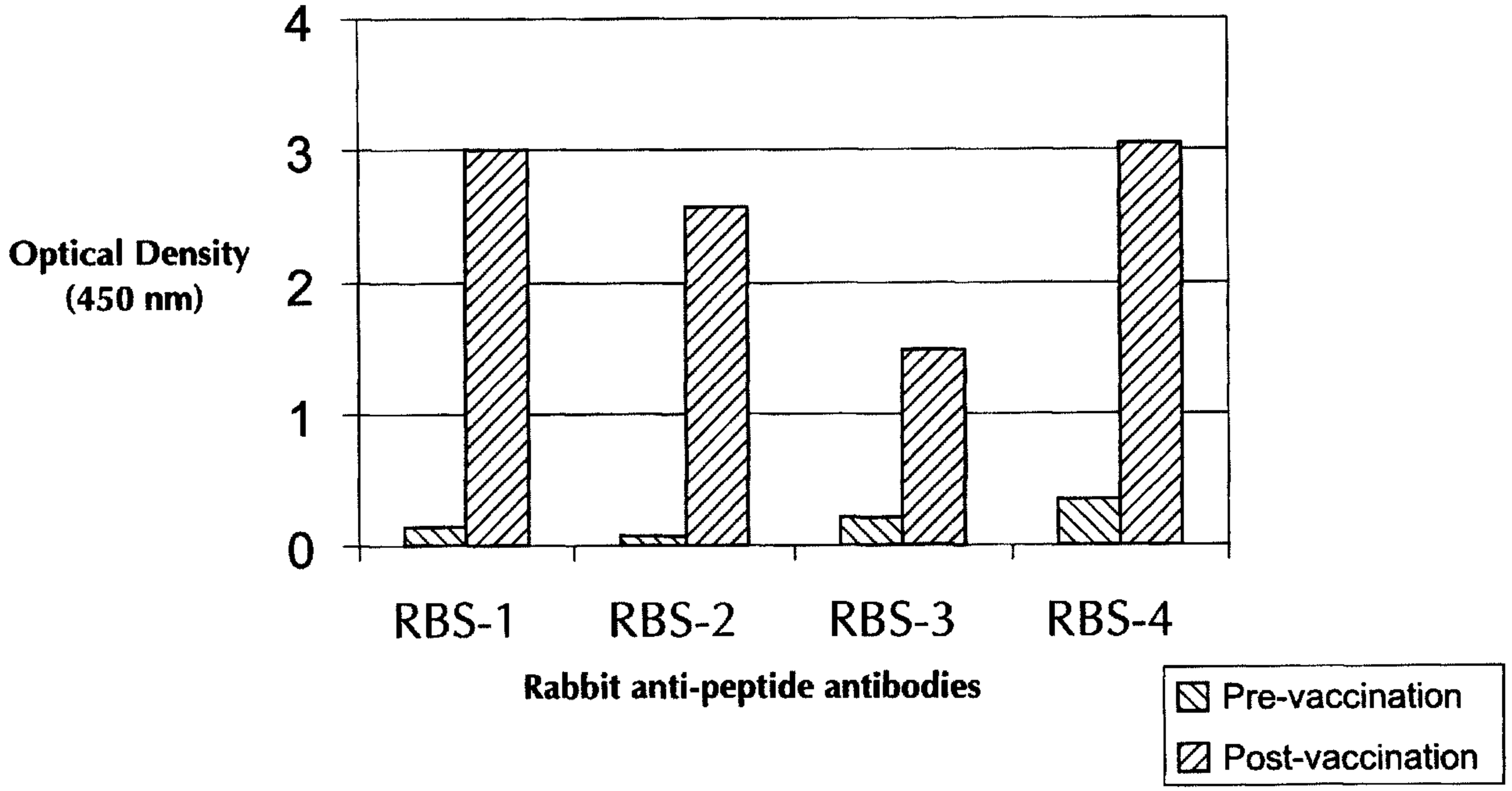
Optical Density
(450 nm)
4
3
2
1
0
RBS-1
RBS-2
RBS-3
RBS-4
Rabbit anti-peptide antibodies
Pre-vaccination
Post-vaccination