Abstract: Materials and methods are provided for treating dengue infections. Human monoclonal antibodies against all serotypes of dengue virus are also provided. Methods of using human monoclonal antibodies to neutralize all dengue-virus serotypes are provided using patients’ peripheral blood lymphocytes.
Nonthaburi, 11000 (TH). Dhepakson, Panadda
[TH/TH]; c/o Department of Medical Sciences, Ministry of Public Health, Tiwanon Road, Muang, Nonthaburi, 11000 (TH). Prachasuphap, Apichai [TH/TH]; c/o Department of Medical Sciences, Ministry of Public Health, Tiwanon Road, Muang, Nonthaburi, 11000 (TH).

(74) Agents: SHOJI, Takashi et al; #307 Miyuki Bldg., 5-6-13, Nishinakajima, Yodogawa-ku, Osaka-shi, Osaka, 5320011 (JP).


Published:
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A. CLASSIFICATION OF SUBJECT MATTER

INV. C07K16/10

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)

C07K

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)

EPO-Internal, BIOSIS, Sequence Search, EMBASE, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<td>WO 2010/043977 A2 (INST RESEARCH IN BIOMEDICINE [CH]; LANZAVECCCHIA ANTONIO [CH]) 22 April 2010 (2010-04-22) the whole document in particular abstract page 1, line 25 - page 4, line 22 page 5, line 1 - page 6, line 20 page 9, line 24 - page 10, line 23 page 18, line 18 - page 23, line 31 claims 1-46; figures 1, 2; examples 1-3</td>
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Further documents are listed in the continuation of Box C. See patent family annex.

Date of the actual completion of the international search: 13 February 2013

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

Date of mailing of the international search report: 08/07/2013

Authorized officer: Ferrei ra, Roger
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Form PCT/ISA210 (continuation of second sheet) (April 2005)
INTERNATIONAL SEARCH REPORT

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).

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.:

I-II (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: 1-11 (partially)

Subject-matter of claims 1-11 insofar as it relates to a human anti-dengue virus (DENV) anti body designated "D23-1A10H7" which comprises heavy chain variable region (VH) CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 1-3 and light chain variable region (VL) CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 100-102.

2. claims: 1-11 (partially)

As Invent on 1, where n the anti body is a human anti -DENV anti body designated "D23-1B3B9" which comprises VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 4-6 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 103-105.

3. claims: 1-11 (partially)

As Invent on 1, where n the anti body is a human anti -DENV anti body designated "D23-1C1G4" which comprises VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 7-9 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 106-108.

4. claims: 1-11 (partially)

As Invent on 1, where n the anti body is a human anti -DENV anti body designated "D23-1C2D2" which comprises VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 10-12 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 109-111.

5. claims: 1-11 (partially)

As Invent on 1, where n the anti body is a human anti -DENV anti body designated "D23-1G7C2" which comprises VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 13-15 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 112-114.

6. claims: 1-11 (partially)

As Invent on 1, where n the anti body is a human anti -DENV anti body designated "D23-1H5A11" which comprises VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ
ID Nos. 16-18 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 115-117.

---

7. claims: 1-11 (partially)

As Inventor on 1, wherein the anti body is a human anti -DENV anti body designated "D23-3A10G12" which comprises VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 19-21 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 118-120.

---

8. claims: 1-11 (partially)

As Inventor on 1, wherein the anti body is a human anti -DENV anti body designated "D23-4A6F9" which comprises VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 22-24 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 121-123.

---

9. claims: 1-11 (partially)

As Inventor on 1, wherein the anti body is a human anti -DENV anti body designated "D23-4F5E1" which comprises VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 25-27 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 124-126.

---

10. claims: 1-11 (partially)

As Inventor on 1, wherein the anti body is a human anti -DENV anti body designated "D23-4H12C8" which comprises VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 28-30 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 127-129.

---

11. claims: 1-11 (partially)

As Inventor on 1, wherein the anti body is a human anti -DENV anti body designated "D23-5E6B1" which comprises VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 31-33 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 130-132.

---

12. claims: 1-11 (partially)

As Inventor on 1, wherein the anti body is a human anti -DENV anti body designated "D23-5G2D2" which comprises VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 34-36 and VL CDR1, CDR2 and CDR3 sequences as set
FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

13. claims: 1-11 (partially)

As Inventi on 1, where i n the anti body i s a human anti -DENV anti body desi gnated "D23-5G8E3" which com pr i ses VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, i n SEQ ID Nos. 37-39 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, i n SEQ ID Nos. 136-138.

---

14. claims: 1-11 (partially)

As Inventi on 1, where i n the anti body i s a human anti -DENV anti body desi gnated "D30-1E7B8" which com pr i ses VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, i n SEQ ID Nos. 40-42 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, i n SEQ ID Nos. 139-141.

---

15. claims: 1-11 (partially)

As Inventi on 1, where i n the anti body i s a human anti -DENV anti body desi gnated "D30-3A1E2" which com pr i ses VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, i n SEQ ID Nos. 43-45 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, i n SEQ ID Nos. 142-144.

---

16. claims: 1-11 (partially)

As Inventi on 1, where i n the anti body i s a human anti -DENV anti body desi gnated "D30-3B6C7" which com pr i ses VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, i n SEQ ID Nos. 46-48 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, i n SEQ ID Nos. 145-147.

---

17. claims: 1-11 (partially)

As Inventi on 1, where i n the anti body i s a human anti -DENV anti body desi gnated "D32-2D1G5" which com pr i ses VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, i n SEQ ID Nos. 49-51 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, i n SEQ ID Nos. 148-150.

---

18. claims: 1-11 (partially)

As Inventi on 1, where i n the anti body i s a human anti -DENV anti body desi gnated "D32-2H8G1" which com pr i ses VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, i n SEQ ID Nos. 52-54 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, i n SEQ ID Nos. 151-153.
19. claims: 1-11 (partially)

As invented on 1, wherein the anti body is a human anti-<i>DENV</i> anti body designated "DMSC-4" which comprises VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 55-57 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 154-156.

---

20. claims: 1-11 (partially)

As invented on 1, wherein the anti body is a human anti-<i>DENV</i> anti body designated "DMSC-5" which comprises VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 58-60 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 157-159.

---

21. claims: 1-11 (partially)

As invented on 1, wherein the anti body is a human anti-<i>DENV</i> anti body designated "DMSC-14" which comprises VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 61-63 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 160-162.

---

22. claims: 1-11 (partially)

As invented on 1, wherein the anti body is a human anti-<i>DENV</i> anti body designated "DMSC-24" which comprises VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 64-66 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 163-165.

---

23. claims: 1-11 (partially)

As invented on 1, wherein the anti body is a human anti-<i>DENV</i> anti body designated "DMSC-31" which comprises VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 70-72 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 169-171.

---

24. claims: 1-11 (partially)

As invented on 1, wherein the anti body is a human anti-<i>DENV</i> anti body designated "DMSC-36" which comprises VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 73-75 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 172-174.

---
25. claims: 1-11 (partially)

As inventions 1, wherein the anti body is a human anti-DENV anti body designated "DMSC-38" which comprises VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 76-78 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 175-177.

---

26. claims: 1-11 (partially)

As inventions 1, wherein the anti body is a human anti-DENV anti body designated "DMSC-37" which comprises VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 79-81 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 178-180.

---

27. claims: 1-11 (partially)

As inventions 1, wherein the anti body is a human anti-DENV anti body designated "DMSC-8" which comprises VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 82-84 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 181-183.

---

28. claims: 1-11 (partially)

As inventions 1, wherein the anti body is a human anti-DENV anti body designated "DMSC-13" which comprises VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 85-87 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 184-186.

---

29. claims: 1-11 (partially)

As inventions 1, wherein the anti body is a human anti-DENV anti body designated "DMSC-17" which comprises VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 88-90 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 187-189.

---

30. claims: 1-11 (partially)

As inventions 1, wherein the anti body is a human anti-DENV anti body designated "DMSC-30" which comprises VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 91-93 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 190-192.
31. claims: 1-11 (partially)

As invention 1, wherein the antibody is a human anti-DENV antibody designated "DMSC-2" which comprises VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 94-96 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 193-195.

---

32. claims: 1-11 (partially)

As invention 1, wherein the antibody is a human anti-DENV antibody designated "DMSC-1" which comprises VH CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 97-99 and VL CDR1, CDR2 and CDR3 sequences as set forth, respectively, in SEQ ID Nos. 196-198.

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