[CLAIMS]

[Claim 1]

An anti dengue virus (DENV) monoclonal antibody or an antigen-binding fragment thereof, the monoclonal antibody or the antigen-binding fragment thereof comprising a neutralization activity against serotypes of DENV-1, DENV-2, DENV-3 and DENV-4, wherein the monoclonal antibody comprises a human monoclonal antibody or a humanized monoclonal antibody.

[Claim 2]

An antiDENV human monoclonal antibody according to claim 1, wherein the human monoclonal antibody is produced by a hybridoma made by fusing a peripheral blood mononuclear cell (PBMC) from a patient in an acute phase of DENV infection with a fusion partner cell capable of efficient cell fusion.

[Claim 3]

The antiDENV human monoclonal antibody according to claim 2, wherein the fusion partner cell is a SPYMEG cell.

[Claim 4]

The anti-DENV monoclonal antibody or antigen-binding fragment thereof according to claim 1 comprising an IgG, a Fab, a Fab', a F(ab')2, a scFv, or a dsFv.

[Claim 5]

An antidengue virus(DENV) monoclonal antibody or antigen-binding fragment thereof, comprising a heavy chain variable region and a light chain variable region of (a) to (gg):

(a) a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:13 of CDR1, SEQ ID NO:14 of CDR2, and SEQ ID NO:15 of CDR3; and

a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:112 of CDR1, SEQ ID NO:113 of CDR2, and SEQ ID NO:114 of CDR3;

(~~a~~b)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:1 of CDR1, SEQ ID NO:2 of CDR2, and SEQ ID NO:3 of CDR3; and

a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:100 of CDR1, SEQ ID NO:101 of CDR2, and SEQ ID NO:102 of CDR3;

(~~b~~c)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:4 of CDR1, SEQ ID NO:5 of CDR2, and SEQ ID NO:6 of CDR3; and

a second amino acid sequence of a CDR of the light chain variable region comprising

SEQ ID NO:103 of CDR1, SEQ ID NO:104 of CDR2, and SEQ ID NO:105 of CDR3;

(~~d~~e)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:7 of CDR1, SEQ ID NO:8 of CDR2, and SEQ ID NO:9 of CDR3; and

a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:106 of CDR1, SEQ ID NO:107 of CDR2, and SEQ ID NO:108 of CDR3;

(~~e~~d)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:10 of CDR1, SEQ ID NO:11 of CDR2, and SEQ ID NO:12 of CDR3; and

a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:109 of CDR1, SEQ ID NO:110 of CDR2, and SEQ ID NO:111 of CDR3;

~~(c)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:13 of CDR1, SEQ ID NO:14 of CDR2, and SEQ ID NO:15 of CDR3; and~~

~~a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:112 of CDR1, SEQ ID NO:113 of CDR2, and SEQ ID NO:114 of CDR3;~~

(f)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:16 of CDR1, SEQ ID NO:17 of CDR2, and SEQ ID NO:18 of CDR3; and

a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:115 of CDR1, SEQ ID NO:116 of CDR2, and SEQ ID NO:117 of CDR3;

(g)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:19 of CDR1, SEQ ID NO:20 of CDR2, and SEQ ID NO:21 of CDR3; and

a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:118 of CDR1, SEQ ID NO:119 of CDR2, and SEQ ID NO:120 of CDR3;

(h)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:22 of CDR1, SEQ ID NO:23 of CDR2, and SEQ ID NO:24 of CDR3; and

a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:121 of CDR1, SEQ ID NO:122 of CDR2, and SEQ ID NO:123 of CDR3;

(i)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:25 of CDR1, SEQ ID NO:26 of CDR2, and SEQ ID NO:27 of CDR3; and

a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:124 of CDR1, SEQ ID NO:125 of CDR2, and SEQ ID NO:126 of CDR3;

(j)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:28 of CDR1, SEQ ID NO:29 of CDR2, and SEQ ID NO:30 of CDR3; and
a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:127 of CDR1, SEQ ID NO:128 of CDR2, and SEQ ID NO:129 of CDR3;
(k)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:31 of CDR1, SEQ ID NO:32 of CDR2, and SEQ ID NO:33 of CDR3; and
a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:130 of CDR1, SEQ ID NO:131 of CDR2, and SEQ ID NO:132 of CDR3;
(l)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:34 of CDR1, SEQ ID NO:35 of CDR2, and SEQ ID NO:36 of CDR3; and
a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:133 of CDR1, SEQ ID NO:134 of CDR2, and SEQ ID NO:135 of CDR3;
(m)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:37 of CDR1, SEQ ID NO:38 of CDR2, and SEQ ID NO:39 of CDR3; and
a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:136 of CDR1, SEQ ID NO:137 of CDR2, and SEQ ID NO:138 of CDR3;
(n)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:40 of CDR1, SEQ ID NO:41 of CDR2, and SEQ ID NO:42 of CDR3; and
a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:139 of CDR1, SEQ ID NO:140 of CDR2, and SEQ ID NO:141 of CDR3;
(o)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:43 of CDR1, SEQ ID NO:44 of CDR2, and SEQ ID NO:45 of CDR3; and
a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:142 of CDR1, SEQ ID NO:143 of CDR2, and SEQ ID NO:144 of CDR3;
(p)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:46 of CDR1, SEQ ID NO:47 of CDR2, and SEQ ID NO:48 of CDR3; and
a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:145 of CDR1, SEQ ID NO:146 of CDR2, and SEQ ID NO:147 of CDR3;
(q)a first amino acid sequence of a complementarity-determining region (CDR) of the

heavy chain variable region comprising SEQ ID NO:49 of CDR1, SEQ ID NO:50 of CDR2, and SEQ ID NO:51 of CDR3; and

a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:148 of CDR1, SEQ ID NO:149 of CDR2, and SEQ ID NO:150 of CDR3;

(r)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:52 of CDR1, SEQ ID NO:53 of CDR2, and SEQ ID NO:54 of CDR3; and

a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:151 of CDR1, SEQ ID NO:152 of CDR2, and SEQ ID NO:153 of CDR3;

(s)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:55 of CDR1, SEQ ID NO:56 of CDR2, and SEQ ID NO:57 of CDR3; and

a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:154 of CDR1, SEQ ID NO:155 of CDR2, and SEQ ID NO:156 of CDR3;

(t)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:58 of CDR1, SEQ ID NO:59 of CDR2, and SEQ ID NO:60 of CDR3; and

a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:157 of CDR1, SEQ ID NO:158 of CDR2, and SEQ ID NO:159 of CDR3;

(u)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:61 of CDR1, SEQ ID NO:62 of CDR2, and SEQ ID NO:63 of CDR3; and

a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:160 of CDR1, SEQ ID NO:161 of CDR2, and SEQ ID NO:162 of CDR3;

(v)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:64 of CDR1, SEQ ID NO:65 of CDR2, and SEQ ID NO:66 of CDR3; and

a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:163 of CDR1, SEQ ID NO:164 of CDR2, and SEQ ID NO:165 of CDR3;

(x)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:70 of CDR1, SEQ ID NO:71 of CDR2, and SEQ ID NO:72 of CDR3; and

a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:169 of CDR1, SEQ ID NO:170 of CDR2, and SEQ ID NO:171 of CDR3;

(y)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:73 of CDR1, SEQ ID NO:74 of

CDR2, and SEQ ID NO:75 of CDR3; and
a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:172 of CDR1, SEQ ID NO:173 of CDR2, and SEQ ID NO:174 of CDR3;
(z)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:76 of CDR1, SEQ ID NO:77 of CDR2, and SEQ ID NO:78 of CDR3; and
a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:175 of CDR1, SEQ ID NO:176 of CDR2, and SEQ ID NO:177 of CDR3;
(aa)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:79 of CDR1, SEQ ID NO:80 of CDR2, and SEQ ID NO:81 of CDR3; and
a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:178 of CDR1, SEQ ID NO:179 of CDR2, and SEQ ID NO:180 of CDR3;
(bb)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:82 of CDR1, SEQ ID NO:83 of CDR2, and SEQ ID NO:84 of CDR3; and
a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:181 of CDR1, SEQ ID NO:182 of CDR2, and SEQ ID NO:183 of CDR3;
(cc)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:85 of CDR1, SEQ ID NO:86 of CDR2, and SEQ ID NO:87 of CDR3; and
a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:184 of CDR1, SEQ ID NO:185 of CDR2, and SEQ ID NO:186 of CDR3;
(dd)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:88 of CDR1, SEQ ID NO:89 of CDR2, and SEQ ID NO:90 of CDR3; and
a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:187 of CDR1, SEQ ID NO:188 of CDR2, and SEQ ID NO:189 of CDR3;
(ee)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:91 of CDR1, SEQ ID NO:92 of CDR2, and SEQ ID NO:93 of CDR3; and
a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:190 of CDR1, SEQ ID NO:191 of CDR2, and SEQ ID NO:192 of CDR3;
(ff)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:94 of CDR1, SEQ ID NO:95 of CDR2, and SEQ ID NO:96 of CDR3; and

a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:193 of CDR1, SEQ ID NO:194 of CDR2, and SEQ ID NO:195 of CDR3;
(gg)a first amino acid sequence of a complementarity-determining region (CDR) of the heavy chain variable region comprising SEQ ID NO:97 of CDR1, SEQ ID NO:98 of CDR2, and SEQ ID NO:99 of CDR3; and
a second amino acid sequence of a CDR of the light chain variable region comprising SEQ ID NO:196 of CDR1, SEQ ID NO:197 of CDR2, and SEQ ID NO:198 of CDR3;
, wherein the monoclonal antibody comprises a human monoclonal antibody or a humanized monoclonal antibody.

[Claim 6]

The antiDENV human monoclonal antibody according to claim 5 comprising an IgG, a Fab, a Fab', a F(ab')2, a scFv, or a dsFv.

[Claim 7]

A method for producing an antidengue virus (DENV) human monoclonal antibody comprising:
1)producing a hybridoma by fusing a peripheral blood mononuclear cell (PBMC) from a patient in an acute phase of DENV infection with a fusion partner cell capable of efficient cell fusion;
2)obtaining an anti-DENV human monoclonal antibody from the hybridoma.

[Claim 8]

A method for producing an antiDENV human monoclonal antibody according to claim 7, wherein the fusion partner cell is a SPYMEG cell.

[Claim 9]

A method for producing a hybridoma comprising fusing a peripheral blood mononuclear cell (PBMC) from a patient in an acute phase of dengue virus (DENV) infection with a fusion partner cell capable of efficient cell fusion.

[Claim 10]

The method for producing hybridoma according to claim 9, wherein the fusion partner cell is a SPYMEG cell.

[Claim 11]

The method for producing a hybridoma according to claim 9, wherein an antiDENV human monoclonal antibody obtained from the hybridoma comprises a neutralization activity against serotypes of DENV-1, DENV-2, DENV-3 and DENV-4.