CLAIMS

1. An anti-Epiregulin antibody selected from:

(1) an anti-Epiregulin antibody which comprises a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 153, and a heavy-chain CDR3 of SEQ ID NO: 158; and a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 14;

(2) an anti-Epiregulin antibody which comprises a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ. ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 153, and a heavy-chain CDR3 of SEQ IDNO: 152; and a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 14;

(3) an anti-Epiregulin antibody which comprises a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 153, and a heavy-chain CDR3 of SEQ ID NO: 158; and a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 14;

(4) an anti-Epiregulin antibody which comprises a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 160, and a heavy-chain CDR3 of SEQ IDNO: 158; and a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 14;

(5) an anti-Epiregulin antibody which comprises a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 153, and a heavy-chain CDR3 of SEQ IDNO: 158; and a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 164;

(6) an anti-Epiregulin antibody which comprises a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 153, and a heavy-chain CDR3 of SEQ ID NO: 152; and a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 164;

(7) an anti-Epiregulin antibody which comprises a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 153, and a heavy-chain CDR3 of SEQ IDNO: 158; and a light-chain variable region comprising a

light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 164; and

(8) an anti-Epiregulin antibody which comprises a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 160, and a heavy-chain CDR3 of SEQ IDNO: 158; and a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 164.

2. The antibody of claim 1, which comprises the heavy-chain constant region of SEQ ID NO: 26.

3. The antibody of claim 1 or 2, which comprises the light-chain constant region of SEQ ID NO: 27.

4. The antibody of any one of claims 1 to 3, which has a neutralizing activity.

5. The antibody of any one of claims 1 to 4, which has cytotoxicity.

6. The antibody of claim 5, wherein the cytotoxicity is CDC and/or ADCC.

7. The antibody of any one of claims 1 to 6, wherein the antibody is a low-molecular-weight antibody.

8. A vector comprising a polynucleotide encoding a heavy-chain variable region selected from:

(1) a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 153, and a heavy-chain CDR3 of SEQ ID NO: 158;

(2) a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ. ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 153, and a heavy-chain CDR3 of SEQ IDNO: 152;

(3) a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 153, and a heavy-chain CDR3 of SEQ ID NO: 158;

(4) a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 160, and a heavy-chain CDR3 of SEQ IDNO: 158;

(5) a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 153, and a heavy-chain CDR3 of SEQ IDNO: 158;

(6) a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 153, and a heavy-chain CDR3 of SEQ ID NO: 152;

(7) a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 153, and a heavy-chain CDR3 of SEQ IDNO: 158; and
(8) a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 160, and a heavy-chain CDR3 of SEQ IDNO: 158.

9. The vector of claim 8, which comprises a polynucleotide encoding the heavy-chain constant region of SEQ ID NO: 26.

10. A vector comprising a polynucleotide encoding a light-chain variable region selected from:
(1) a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 14;
(2) a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 14;
(3) a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 14;
(4) a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 14;
(5) a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 164;
(6) a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 164;
(7) a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 164; and
(8) a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 164.

11. The vector of claim 10, which comprises a polynucleotide encoding the light-chain constant region of SEQ ID NO: 27.

12. A vector comprising:
(1) a polynucleotide encoding a heavy-chain variable region selected from:
(a) a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 153, and a heavy-chain CDR3 of SEQ ID NO: 158;
(b) a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ. ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 153, and a heavy-chain CDR3 of SEQ IDNO: 152;

(c) a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 153, and a heavy-chain CDR3 of SEQ ID NO: 158;

(d) a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 160, and a heavy-chain CDR3 of SEQ IDNO: 158;

(e) a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 153, and a heavy-chain CDR3 of SEQ IDNO: 158;

(f) a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 153, and a heavy-chain CDR3 of SEQ ID NO: 152;

(g) a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 153, and a heavy-chain CDR3 of SEQ IDNO: 158; and

(h) a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 160, and a heavy-chain CDR3 of SEQ IDNO: 158; and

(2) a polynucleotide encoding a light-chain variable region selected from:

(i) a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 14;

(j) a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 14;

(k) a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 14;

(l) a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 14;

(m) a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 164;

(n) a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 164;

(o) a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 164; and

(p) a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 164.

13. A vector comprising:

(1) a polynucleotide encoding a heavy-chain variable region selected from:

(a) a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 153, and a heavy-chain CDR3 of SEQ ID NO: 158;

(b) a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ. ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 153, and a heavy-chain CDR3 of SEQ IDNO: 152;

(c) a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 153, and a heavy-chain CDR3 of SEQ ID NO: 158;
(d) a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 160, and a heavy-chain CDR3 of SEQ IDNO: 158;
(e) a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 153, and a heavy-chain CDR3 of SEQ IDNO: 158;
(f) a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 153, and a heavy-chain CDR3 of SEQ ID NO: 152;
(g) a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 153, and a heavy-chain CDR3 of SEQ IDNO: 158; and
(h) a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 of SEQ ID NO: 160, and a heavy-chain CDR3 of SEQ IDNO: 158,
and a polynucleotide encoding the heavy-chain constant region of SEQ ID NO: 26; and

(2) a polynucleotide encoding a light-chain variable region selected from:
(i) a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 14;
(j) a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 14;
(k) a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 14;
(l) a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 14;
(m) a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 164;
(n) a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 164;
(o) a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 164; and
(p) a light-chain variable region comprising a light-chain CDR1 of SEQ ID NO: 163, a light-chain CDR2 of SEQ ID NO: 13, and a light-chain CDR3 of SEQ ID NO: 164,
and a polynucleotide encoding the light-chain constant region of SEQ ID NO: 27.

14. A host cell comprising the vectors of any one of claims 8 to 13.

15. The host cell of claim 14, wherein the host cell is selected from the group consisting of a CHO cell, a BHK cell, an NS0 cell, an SP2/0 cell, a YO myeloma cell, a P3X63 mouse myeloma

cell, a PER cell, a PER.C6 cell, an HEK293 cell, and a hybridoma cell.

16. A method for producing the antibody of any one of claims 1 to 7, which comprises collecting the host cell of claim 14 or 15 from a culture solution.

17. A pharmaceutical composition comprising the antibody of any one of claims 1 to 7 as an active ingredient.

18. Use of a composition comprising an antibody of any one of claims 1 to 7 as an active ingredient in the manufacture of a medicament for treating cancer or for suppressing cancer recurrence or metastasis.

19. The use of claim 18, wherein the cancer is any cancer selected from the group consisting of colon cancer, lung adenocarcinoma, pancreatic cancer, stomach cancer, and kidney cancer.

20. The use of claim 19, wherein the colon cancer is a poorly differentiated colon cancer, a moderately differentiated colon cancer, or a well differentiated colon cancer.

21. The use of any one of claims 18 to 20, wherein a subject to be administered with the medicament is a subject carrying Epiregulin protein-expressing cancer cells detected in an isolated tissue sample.

CLAIMS

1. An anti-Epiregulin antibody which is an antibody that binds to an epitope bound by an anti-Epiregulin antibody comprising heavy-chain variable region CDRs of SEQ ID NOs: 9, 10, and 11 and light chain variable region CDRs of SEQ ID NO: 12, 13, and 14, wherein the antibody is characterized in having a smaller ratio of the KD value for monkey Epiregulin of SEQ ID NO: 170 (cEREG KD) to the KD value for human Epiregulin of SEQ ID NO: 34 (hEREG KD) (cEREG KD/hEREG KD) than the cEREG KD/hEREG KD ratio of the anti-Epiregulin antibody comprising heavy-chain variable region CDRs of SEQ ID NOs: 9, 10, and 11 and light-chain variable region CDRs of SEQ ID NO: 12, 13, and 14.

2. The antibody of claim 1, wherein cEREG KD/hEREG KD is less than 40.

3. The antibody of claim 1, wherein cEREG KD/hEREG KD is less than 10.

4. The antibody of claim 1, wherein cEREG KD/hEREG KD is less than 6.

5. The antibody of claim 1, wherein cEREG KD/hEREG KD is less than 4.

6. The antibody of any one of claims 1 to 5, which comprises a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 selected from the group consisting of SEQ ID NOs: 161, 160, 159, 157, 156, 155, 153 ,108 ,107, 106, 105, 104, 103, 102, 101, and 100, and a heavy-chain CDR3 selected from the group consisting of SEQ ID NOs: 158, 154, 152, 151, 112, 111, 110, and 11; and a light-chain variable region comprising a light-chain CDR1 selected from the group consisting of SEQ ID NOs: 163, 68, 67, and 12, a light-chain CDR2 selected from the group consisting of SEQ ID NOs: 71, 69, and 13, and a light-chain CDR3 selected from the group consisting of SEQ ID NOs: 164, 48, 47, and 14.

7. The antibody of any one of claims 1 to 5, which comprises a heavy-chain variable region selected from the group consisting of SEQ ID NOs: 150, 149, 148, 147, 146, 145, 144, 143, 142, 140, 139, 138, 137, 135, 134, 133, 132, 131, 127, 126, 125, 124, 123, 122, 121, 120, 119, 118, 117, 116, and 115, and a light-chain variable region selected from the group consisting of SEQ ID NOs: 141, 136, 130, 129, 128, 99, 85, 84, 83, 82, 81, 80, 58, 57, and 29.

8. An anti-Epiregulin antibody selected from any one below:

(1) an anti-Epiregulin antibody comprising a heavy-chain variable region selected from the group consisting of SEQ ID NOs: 150, 149, 148, 147, 146, 145, 144, 143, 142, 140, 139, 138, 137, 135, 134, 133, 132, 131, 127, 126, 125, 124, 123, 122, 121, 120, 119, 118, 117, 116, 115, 98, 97, 96, 95, 94, 93, 92, 79, 78, 77, 76, 75, 74, 73, 72, 56, 55, 54, 53, 52, 51, 50, 49, and 38;

(2) an anti-Epiregulin antibody comprising a light-chain variable region selected from the group consisting of SEQ ID NOs: 141, 136, 130, 129, 128, 99, 85, 84, 83, 82, 81, 80, 58, 57, and 29; and

(3) an anti-Epiregulin antibody comprising a heavy-chain variable region selected from the group consisting of SEQ ID NOs: 150, 149, 148, 147, 146, 145, 144, 143, 142, 140, 139, 138, 137, 135, 134, 133, 132, 131, 127, 126, 125, 124, 123, 122, 121, 120, 119, 118, 117, 116, 115, 98, 97, 96, 95, 94, 93, 92, 79, 78, 77, 76, 75, 74, 73, 72, 56, 55, 54, 53, 52, 51, 50, 49, and 38, and a light-chain variable region selected from the group consisting of SEQ ID NOs: 141, 136, 130, 129, 128, 99, 85, 84, 83, 82, 81, 80, 58, 57, and 29.

9. The antibody of any one of claims 6 to 8, which comprises the heavy-chain constant region of SEQ ID NO: 26.

10. The antibody of any one of claims 6 to 9, which comprises the light-chain constant region of SEQ ID NO: 27.

11. The antibody of any one of claims 1 to 10, which has a neutralizing activity.

12. The antibody of any one of claims 1 to 11, which has cytotoxicity.

13. The antibody of claim 12, wherein the cytotoxicity is CDC and/or ADCC.

14. The antibody of any one of claims 1 to 12, wherein a growth inhibitor or a cytotoxic substance is linked to the antibody.

15. The antibody of claim 14, wherein the antibody is a low-molecular-weight antibody.

16. The antibody of any one of claims 12 to 15, wherein the heavy-chain constant region of SEQ ID NO: 26 comprises at least one substitution of amino acid at a position selected from the group consisting of 230, 240, 244, 245, 247, 262, 263, 266, 273, 275, 299, 302, 313, 323, 325, 328, and 332 as indicated by EU numbering.

17. A vector comprising a polynucleotide encoding a heavy-chain variable region that comprises a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 selected from the group consisting of SEQ ID NOs: 161, 160, 159, 157, 156, 155, 153, 108, 107, 106, 105, 104, 103, 102, 101, and 100, and a heavy-chain CDR3 selected from the group consisting of SEQ ID NOs: 158, 154, 152, 151, 112, 111, 110, and 11.

18. The vector of claim 17, which comprises a polynucleotide encoding the heavy-chain constant region of SEQ ID NO: 26.

19. A vector comprising a polynucleotide encoding a light-chain variable region that comprises a light-chain CDR1 selected from the group consisting of SEQ ID NOs: 163, 68, 67, and 12, a light-chain CDR2 selected from the group consisting of SEQ ID NOs: 71, 69, and 13, and a light-chain CDR3 selected from the group consisting of SEQ ID NOs: 164, 48, 47, and 14.

20. The vector of claim 19, which comprises a polynucleotide encoding the light-chain constant region of SEQ ID NO: 27.

21. A vector comprising:

(1) a polynucleotide encoding a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 selected from the group consisting of SEQ ID NOs: 161, 160, 159, 157, 156, 155, 153, 108, 107, 106, 105, 104, 103, 102, 101, and 100, and a heavy-chain CDR3 selected from the group consisting of SEQ ID NOs: 158, 154, 152, 151, 112, 111, 110, and 11; and

(2) a polynucleotide encoding a light-chain variable region comprising a light-chain CDR1 selected from the group consisting of SEQ ID NOs: 163, 68, 67, and 12, a light-chain CDR2 selected from the group consisting of SEQ ID NOs: 71, 69, and 13, and a light-chain CDR3 selected from the group consisting of SEQ ID NOs: 164, 48, 47, and 14.

22. A vector comprising:

(1) a polynucleotide encoding a heavy-chain variable region comprising a heavy-chain CDR1 of SEQ ID NO: 9, a heavy-chain CDR2 selected from the group consisting of SEQ ID NOs: 161, 160, 159, 157, 156, 155, 153, 108, 107, 106, 105, 104, 103, 102, 101, and 100, and a heavy-chain CDR3 selected from the group consisting of SEQ ID NOs: 158, 154, 152, 151, 112, 111, 110, and 11, and a polynucleotide encoding the heavy-chain constant region of SEQ ID NO: 26; and

(2) a polynucleotide encoding a light-chain variable region comprising a light-chain CDR1 selected from the group consisting of SEQ ID NOs: 163, 68, 67, and 12, a light-chain CDR2

selected from the group consisting of SEQ ID NOs: 71, 69, and 13, and a light-chain CDR3 selected from the group consisting of SEQ ID NOs: 164, 48, 47, and 14, and a polynucleotide encoding the light-chain constant region of SEQ ID NO: 27.

23. A vector comprising the polynucleotide of claim 18 or 22, which comprises a mutated nucleotide encoding a heavy-chain constant region with at least one substitution of amino acid at a position selected from the group consisting of 221, 222, 223, 224, 225, 227, 228, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 243, 244, 245, 246, 247, 249, 250, 251, 254, 255, 256, 258, 260, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 278, 279, 280, 281, 282, 283, 284, 285, 286, 288, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 311, 313, 315, 317, 318, 320, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 339, 376, 377, 378, 379, 380, 382, 385, 392, 396, 421, 427, 428, 429, 434, 436, and 440 as indicated by EU numbering in the heavy-chain constant region of SEQ ID NO: 26.

24. A host cell comprising the vectors of claims 17 and 19, the vectors of claims 18 and 20, or the vector of claim 21 or 22.

25. A host cell comprising the vector of claim 23.

26. The host cell of claim 25, wherein the ability to add fucose to a sugar chain in the host cell is low.

27. The host cell of claim 26, wherein the host cell with a low ability to add fucose to a sugar chain is a host cell deficient in one or more functional proteins selected from the group consisting of fucosyltransferase, fucose transporter, GMD (GDP-mannose-4,6-dehydratase), Fx(GDP-keto-6-deoxymannose-3,5-epimerase, 4-reductase), and GFPP (GDP-β-L-fucose pyrophosphorylase).

28. The host cell of claim 25, wherein the host cell has an ability to form a bisecting *N*-acetylglucosamine structure on a sugar chain.

29. The host cell of claim 28, wherein the host cell having an ability to form a bisecting *N*-acetylglucosamine structure on a sugar chain is a host cell that has β(1,4)-galactosyltransferase activity and comprises a vector comprising a polynucleotide encoding the functional Golgi localization domain of a Golgi-resident polypeptide.

30. The host cell of claim 29, comprising a vector that comprises a polynucleotide encoding a functional Golgi localization domain selected from the group consisting of the localization domain of mannosidase II, the localization domain of β(1,2)-*N*-acetylglucosaminyltransferase I, the localization domain of β(1,2)-*N*-acetylglucosaminyltransferase II, the localization domain of mannosidase I, and the localization domain of α1-6 core fucosyltransferase; and a polynucleotide encoding a fusion polypeptide comprising the catalytic domain of β(1,4)-galactosyltransferase.

31. The host cell of any one of claims 24 to 30, wherein the host cell is selected from the group consisting of a CHO cell, a BHK cell, an NS0 cell, an SP2/0 cell, a YO myeloma cell, a P3X63 mouse myeloma cell, a PER cell, a PER.C6 cell, an HEK293 cell, and a hybridoma cell.

32. A method for producing the antibody of any one of claims 1 to 16, which comprises collecting the host cell of any one of claims 24 to 31 from a culture solution.

33. An antibody produced by the method of claim 32.

34. The antibody of claim 33, wherein a growth inhibitor or a cytotoxic substance is linked to the antibody.

35. A pharmaceutical composition comprising the antibody of any one of claims 1 to 16 or claim 33 or 34 as an active ingredient.

36. A therapeutic agent for cancer or an agent for suppressing cancer recurrence or metastasis, which comprises the antibody of any one of claims 1 to 16 or claim 33 or 34 as an active ingredient.

37. The therapeutic agent for cancer or agent for suppressing cancer recurrence or metastasis of claim 36, wherein the cancer is any cancer selected from the group consisting of colon cancer, lung adenocarcinoma, pancreatic cancer, stomach cancer, and kidney cancer.

38. The therapeutic agent for cancer or agent for suppressing cancer recurrence or metastasis of claim 37, wherein the colon cancer is a poorly differentiated colon cancer, a moderately differentiated colon cancer, or a well differentiated colon cancer.

39. The therapeutic agent for cancer or agent for suppressing cancer recurrence or metastasis of any one of claims 36 to 38, wherein a subject administered with the therapeutic agent for cancer is a subject carrying Epiregulin protein-expressing cancer cells detected in an isolated tissue sample.