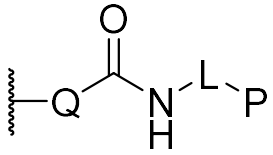
CLAIMS

What is claimed is:

1. A conjugate comprising ~~an~~ a monoclonal antibody or antigen-binding fragment thereof and one or more immunomodulating oligonucleotides (P), wherein the monoclonal antibody or antigen-binding fragment is linked to one or more Q-tag peptides (Q) comprising at least one glutamine residue, and wherein each immunomodulating oligonucleotide is linked to a Q-tag peptide via an amide bond with the glutamine residue of the Q-tag peptide and a linker (L) as shown in Formula (A):

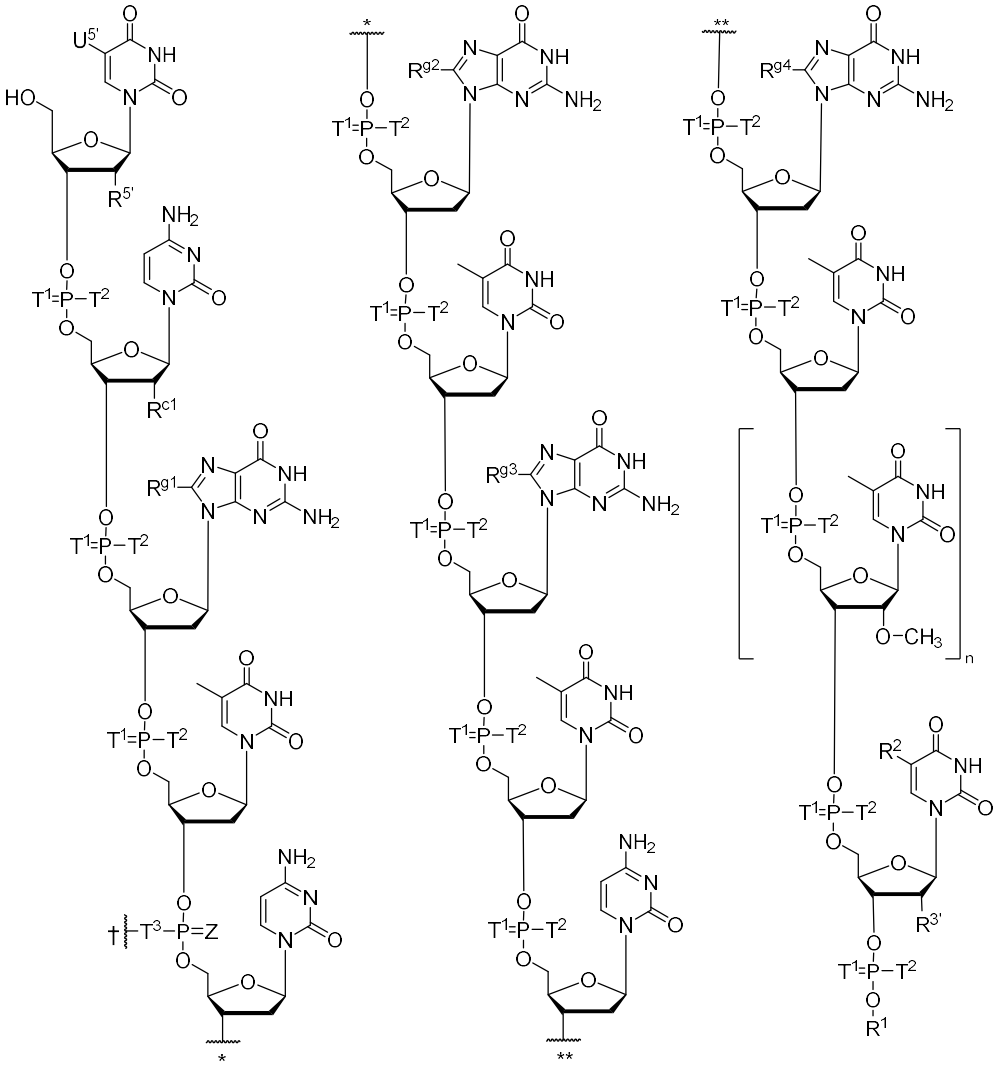


(A);

wherein ~~~~ indicates the point of attachment of each Q to the antibody or antigen-binding fragment thereof (Ab); and wherein:

(a) each of the one or more Q-tag peptides (Q) comprises the amino acid sequence RPQGF (SEQ ID NO:47); and/or

~~wherein~~ (b) each P is independently an immunomodulating oligonucleotide having the structure



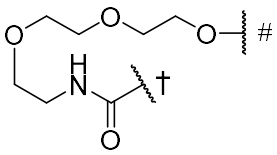
,

wherein

〰 * and 〰 ** indicate the points of attachment within the oligonucleotide, and wherein 〰 † indicates the point of attachment to the linker L;

each T^1 is independently O or S;

each T^2 is S^-;



T^3 is a group , wherein 〰 † indicates the point of attachment to L and wherein 〰 # indicates the point of attachment to the rest of the oligonucleotide;

Z is O or S;

$U^{5'}$ is –H or halogen;

$R^{5'}$ is -H or methoxy;

R^{c1} is -H or methoxy;

R^{g1}, R^{g2}, R^{g3}, and R^{g4} are H;

$R^{3'}$ is methoxy;

R^{1} is $-(CH_2)_3$-OH;

R^{2} is -H or methyl; and

n is an integer from 0 to 2.

~~2. The conjugate of claim 1, wherein the antibody or fragment thereof is a monoclonal antibody or fragment thereof.~~

~~3.~~2. The conjugate of claim 1 ~~or claim 2~~, wherein the antibody or fragment thereof is a Fab, F(ab')2, Fab'-SH, Fv, scFv, single domain, single heavy chain, or single light chain antibody or antibody fragment; and/or wherein the antibody or fragment thereof is a humanized, human, or chimeric antibody or fragment thereof.

~~4. The conjugate of any one of claims 1 to 3, wherein the antibody or fragment thereof is a humanized, human, or chimeric antibody or fragment thereof.~~

~~5.~~3. The conjugate of any one of claims 1 to ~~2~~4, wherein the antibody or fragment thereof specifically binds human CD22; wherein optionally the antibody comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain, and wherein:

(a) the VH domain comprises CDR-H1, CDR-H2, and CDR-H3 sequences from a VH domain sequence selected from the group consisting of SEQ ID Nos:64-67, and/or the VL domain comprises CDR-L1, CDR-L2, and CDR-L3 sequences from a VL domain sequence selected from the group consisting of SEQ ID Nos:68-91;

(b) the VH domain comprises a CDR-H1 comprising the sequence of SEQ ID NO:113, a CDR-H2 comprising the sequence of SEQ ID NO:115, and a CDR-H3 comprising the sequence of SEQ ID NO:116 or a CDR-H1 comprising the sequence of SEQ ID NO:114, a CDR-H2 comprising the sequence of SEQ ID NO:189, and a CDR-H3 comprising the sequence of SEQ ID NO:116, and/or the VL domain comprises a CDR-L1 comprising the sequence of SEQ ID NO:117, a CDR-L2 comprising the sequence of SEQ ID NO:119, and a CDR-L3 comprising the sequence of SEQ ID NO:120 or a CDR-L1 comprising the sequence of SEQ ID NO:118, a CDR-

L2 comprising the sequence of SEQ ID NO:177, and a CDR-L3 comprising the sequence of SEQ ID NO:120; or

(c) the VH domain comprises an amino acid sequence selected from the group consisting of SEQ ID Nos:64-67 and/or the VL domain comprises an amino acid sequence selected from the group consisting of SEQ ID Nos:68-91.

~~6. The conjugate of any one of claims 1 to 5, wherein the antibody comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain, wherein:~~

~~(a) the VH domain comprises CDR-H1, CDR-H2, and CDR-H3 sequences from a VH domain sequence selected from the group consisting of SEQ ID Nos:64-67;~~

~~(b) the VH domain comprises a CDR-H1 comprising the sequence of SEQ ID NO:113, a CDR-H2 comprising the sequence of SEQ ID NO:115, and a CDR-H3 comprising the sequence of SEQ ID NO:116; or~~

~~(c) the VH domain comprises a CDR-H1 comprising the sequence of SEQ ID NO:114, a CDR-H2 comprising the sequence of SEQ ID NO:189, and a CDR-H3 comprising the sequence of SEQ ID NO:116.~~

~~7. The conjugate of any one of claims 1 to 6, wherein the antibody comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain, and wherein the VH domain comprises an amino acid sequence selected from the group consisting of SEQ ID Nos:64-67.~~

~~8. The conjugate of any one of claims 1 to 7, wherein the antibody comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain, wherein:~~

~~(a) the VL domain comprises CDR-L1, CDR-L2, and CDR-L3 sequences from a VL domain sequence selected from the group consisting of SEQ ID Nos:68-91;~~

~~(b) the VL domain comprises a CDR-L1 comprising the sequence of SEQ ID NO:117, a CDR-L2 comprising the sequence of SEQ ID NO:119, and a CDR-L3 comprising the sequence of SEQ ID NO:120; or~~

~~(c) the VL domain comprises a CDR-L1 comprising the sequence of SEQ ID NO:118, a CDR-L2 comprising the sequence of SEQ ID NO:177, and a CDR-L3 comprising the sequence of SEQ ID NO:120.~~

~~9. The conjugate of claim 8, wherein the VL domain further comprises an amino acid substitution at residue N92 (numbering starting at the N-terminus of the VL domain sequence).~~

10. The conjugate of claim 9, wherein the VL domain comprises an amino acid substitution selected from the group consisting of N92A, N92L and N92S.

11. The conjugate of any one of claims 1 to 7, wherein the antibody comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain, and wherein the VL domain comprises an amino acid sequence selected from the group consisting of SEQ ID Nos:68-91.

12. The conjugate of any one of claims 1 to 7, wherein the antibody comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain, wherein the VH domain comprises the amino acid sequence QVQLLESGGGVVQPGGSLRLSCAASGFAFSIYDMNWVRQAPGKGLEWVSAISSGGGTTY YADSVKGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARHSGYGTHWGVLFAYWGRG TLVTVSS (SEQ ID NO: 65), and wherein the VL domain comprises the amino acid sequence DIQMTQSPSSLSASVGDRVTITCRASQDIHGYLNWYQQKPGKAPKLLIYYTSILHSGVPSR FSGSGSGTDFTLTISSLQPEDFATYFCQQGNTLPWTFGQGTKLEIK (SEQ ID NO: 68).

13. The conjugate of any one of claims 1 to 7, wherein the antibody comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain, wherein the VH domain comprises the amino acid sequence QVQLLESGGGVVQPGGSLRLSCAASGFAFSIYDMNWVRQAPGKGLEWVSAISSGGGTTY YADSVKGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARHSGYGTHWGVLFAYWGRG TLVTVSS (SEQ ID NO: 65), and wherein the VL domain comprises the amino acid sequence DIQMTQSPSSLSASVGDRVTITCRASQDIHGYLNWYQQKPGKAPKLLIYYTSILHSGVPSR FSGSGSGTDFTLTISSLQPEDFATYFCQQGATLPWTFGQGTKLEIK (SEQ ID NO: 73).

14. The conjugate of any one of claims 1 to 7, wherein the antibody comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain, wherein the VH domain comprises a CDR-H1 comprising the sequence of SEQ ID NO:113, a CDR-H2 comprising the sequence of SEQ ID NO:115, and a CDR-H3 comprising the sequence of SEQ ID NO:116; and the VL domain comprises a CDR-L1 comprising the sequence of SEQ ID NO:117, a CDR-L2 comprising the sequence of SEQ ID NO:119, and a CDR-L3 comprising the sequence of SEQ ID NO:120.

15. The conjugate of any one of claims 1 to 7, wherein the antibody comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain, wherein the VH domain comprises the amino acid sequence QVQLLESGGGVVQPGGSLRLSCAASGFAFSIYDMNWVRQAPGKGLEWVSAISSGGGTT

~~YYADSVKGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARHSGYGTHWGVLFAYWG RGTLVTVSS (SEQ ID NO: 65), and wherein the VL domain comprises the amino acid sequence~~

~~DIQMTQSPSSLSASVGDRVTITCRASQDIHGYLNWYQQKPGKAPKLLIYYTSILHSGVPS RFSGSGSGTDFTLTISSLQPEDFATYFCQQGSTLPWTFGQGTKLEIK (SEQ ID NO: 87).~~

~~16.~~4. The conjugate of any one of claims 1 to 2~~4~~, wherein the antibody or fragment thereof specifically binds human Her2; wherein optionally the antibody comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain, and wherein:

(a) the VH domain comprises CDR-H1, CDR-H2, and CDR-H3 sequences from the VH domain sequence of SEQ ID NO:168, and/or the VL domain comprises CDR-L1, CDR-L2, and CDR-L3 sequences from the VL domain sequence of SEQ ID NO:169;

(b) the VH domain comprises the sequence of SEQ ID NO:168 and/or the VL domain comprises the sequence of SEQ ID NO:169;

(c) the VH domain comprises CDR-H1, CDR-H2, and CDR-H3 sequences from the VH domain sequence of SEQ ID NO:170, and/or the VL domain comprises CDR-L1, CDR-L2, and CDR-L3 sequences from the VL domain sequence of SEQ ID NO:171; or

(d) the VH domain comprises the sequence of SEQ ID NO:170 and/or the VL domain comprises the sequence of SEQ ID NO:171.

~~17. The conjugate of claim 16, wherein the antibody comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain, and wherein the VH domain comprises CDR-H1, CDR-H2, and CDR-H3 sequences from the VH domain sequence~~

~~EVQLVESGGGLVQPGGSLRLSCAASGFNIKDTYIHWVRQAPGKGLEWVARIYPTNGYTR YADSVKGRFTISADTSKNTAYLQMNSLRAEDTAVYYCSRWGGDGFYAMDYWGQGTLV TVSS (SEQ ID NO:168).~~

~~18. The conjugate of claim 17, wherein the VH domain comprises the sequence~~

~~EVQLVESGGGLVQPGGSLRLSCAASGFNIKDTYIHWVRQAPGKGLEWVARIYPTNGYTR YADSVKGRFTISADTSKNTAYLQMNSLRAEDTAVYYCSRWGGDGFYAMDYWGQGTLV TVSS (SEQ ID NO:168).~~

~~19. The conjugate of claim 17 or claim 18, wherein the antibody comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain, and wherein the VL domain comprises CDR-L1, CDR-L2, and CDR-L3 sequences from the VL domain sequence~~

~~DIQMTQSPSSLSASVGDRVTITCRASQDVNTAVAWYQQKPGKAPKLLIYSASFLYSGVPS RFSGSRSGTDFTLTISSLQPEDFATYYCQQHYTTPPTFGQGTKVEIK (SEQ ID NO:169).~~

~~20. The conjugate of claim 19, wherein the VL domain comprises the sequence DIQMTQSPSSLSASVGDRVTITCRASQDVNTAVAWYQQKPGKAPKLLIYSASFLYSGVPS RFSGSRSGTDFTLTISSLQPEDFATYYCQQHYTTPPTFGQGTKVEIK (SEQ ID NO:169).~~

~~21. The conjugate of claim 16, wherein the antibody comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain, and wherein the VH domain comprises CDR-H1, CDR-H2, and CDR-H3 sequences from the VH domain sequence EVQLVESGGGLVQPGGSLRLSCAASGFTFTDYTMDWVRQAPGKGLEWVADVNPNSGGS IYNQRFKGRFTLSVDRSKNTLYLQMNSLRAEDTAVYYCARNLGPSFYFDYWGQGTLVT VSS (SEQ ID NO:170).~~

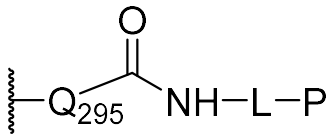
~~22. The conjugate of claim 21, wherein the VH domain comprises the sequence EVQLVESGGGLVQPGGSLRLSCAASGFTFTDYTMDWVRQAPGKGLEWVADVNPNSGGS IYNQRFKGRFTLSVDRSKNTLYLQMNSLRAEDTAVYYCARNLGPSFYFDYWGQGTLVT VSS (SEQ ID NO:170).~~

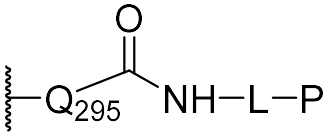
~~23. The conjugate of claim 21 or claim 22, wherein the antibody comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain, and wherein the VL domain comprises CDR-L1, CDR-L2, and CDR-L3 sequences from the VL domain sequence DIQMTQSPSSLSASVGDRVTITCKASQDVSIGVAWYQQKPGKAPKLLIYSASYRYTGVPS RFSGSGSGTDFTLTISSLQPEDFATYYCQQYYIYPYTFGQGTKVEIK (SEQ ID NO:171).~~

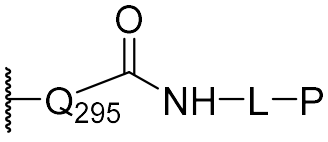
~~24. The conjugate of any one of claims 21-23, wherein the VL domain comprises the sequence DIQMTQSPSSLSASVGDRVTITCKASQDVSIGVAWYQQKPGKAPKLLIYSASYRYTGVPS RFSGSGSGTDFTLTISSLQPEDFATYYCQQYYIYPYTFGQGTKVEIK (SEQ ID NO:171).~~

~~25.~~5. The conjugate of any one of claims 1 to ~~2~~4, wherein the antibody comprises an Fc region; wherein optionally the Fc region is a human IgG1, human IgG2, or human IgG4 Fc region; wherein optionally the Fc region is a wild-type human IgG1, wild-type human IgG2, or wild-type human IgG4 Fc region; optionally wherein the Fc region is:

(a) a human IgG1 Fc region comprising L234A, L235A, and/or G237A substitutions, amino acid position numbering according to EU index, optionally further comprising an N297A substitution, amino acid position numbering according to EU index, optionally wherein the

conjugate further comprises an immunomodulating oligonucleotide P attached to the Q295 of the Fc region residue as shown in the following formula , wherein L is a linker moiety connected to Q295 of the Fc region via an amide bond;

(b) a human IgG2 Fc region comprising A330S and/or P331S substitutions, amino acid position numbering according to EU index, optionally further comprising an N297A substitution, amino acid position numbering according to EU index, optionally wherein the conjugate further comprises an immunomodulating oligonucleotide P attached to the Q295 of the Fc region residue as shown in the following formula , wherein L is a linker moiety connected to Q295 of the Fc region via an amide bond; or

(c) a human IgG4 Fc region comprising S228P and/or L235E substitutions, amino acid position numbering according to EU index, optionally further comprising an N297A substitution, amino acid position numbering according to EU index, optionally wherein the conjugate further comprises an immunomodulating oligonucleotide P attached to the Q295 of the Fc region residue as shown in the following formula , wherein L is a linker moiety connected to Q295 of the Fc region via an amide bond; and

optionally wherein the antibody comprises an antibody heavy chain constant domain comprising an amino acid sequence selected from the group consisting of SEQ ID Nos: 92-107 and 178.

~~26. The conjugate of claim 25, wherein the Fc region is a human Fc region selected from the group consisting of an IgG1 Fc region, an IgG2 Fc region, and an IgG4 Fc region.~~

~~27. The conjugate of claim 26, wherein the Fc region is a wild-type human IgG1, IgG2, or IgG4 Fc region.~~

~~28. The conjugate of claim 26, wherein the Fc region is a human Fc region comprising one or more amino acid substitutions that reduce binding to C1q.~~

~~29. The conjugate of claim 26, wherein the Fc region is a human Fc region comprising one or more amino acid substitutions that reduce effector function, as compared with a human Fc region that lacks the amino acid substitution(s).~~

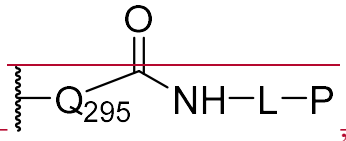
~~30. The conjugate of claim 26, wherein the Fc region is:~~

~~(a) a human IgG1 Fc region comprising L234A, L235A, and/or G237A substitutions, amino acid position numbering according to EU index;~~

~~(b) a human IgG2 Fc region comprising A330S and/or P331S substitutions, amino acid position numbering according to EU index; or~~

~~(c) a human IgG4 Fc region comprising S228P and/or L235E substitutions, amino acid position numbering according to EU index.~~

~~31. The conjugate of any one of claims 25, 26, and 28-30, wherein the Fc region further comprises an N297A substitution, amino acid position numbering according to EU index.~~

~~32. The conjugate of claim 31, wherein the conjugate further comprises an immunomodulating oligonucleotide P attached to the Q295 of the Fc region residue as shown in the following formula~~  ~~, wherein L is a linker moiety connected to Q295 of the Fc region via an amide bond.~~

~~33. The conjugate of any one of claims 26 and 28 to 32, wherein the Fc region further comprises a D265A substitution, amino acid position numbering according to EU index.~~

~~34. The conjugate of any one of claims 1 to 24, wherein the antibody comprises an antibody heavy chain constant domain comprising an amino acid sequence selected from the group consisting of SEQ ID Nos: 92-107 and 178.~~

~~35.~~6. The conjugate of any one of claims 1 to ~~5~~34, wherein the antibody comprises a human lambda or human kappa light chain; wherein optionally the antibody comprises an antibody light chain constant domain comprising an amino acid sequence selected from the group consisting of SEQ ID Nos:108-110.

~~36. The conjugate of any one of claims 1 to 34, wherein the antibody comprises a human kappa light chain.~~

~~37. The conjugate of any one of claims 1 to 34, wherein the antibody comprises an antibody light chain constant domain comprising an amino acid sequence selected from the group consisting of SEQ ID Nos:108-110.~~

~~38.~~7. The conjugate of any one of claims 1 to 6~~37~~, wherein:

(a) the antibody comprises two antibody heavy chains and two antibody light chains, and wherein one Q-tag is attached to one or both heavy chain(s) of the antibody, wherein optionally the Q-tag is fused to the C-terminus of the heavy chain of the antibody(ies) or within the Fc domain; or

(b) the antibody comprises two antibody heavy chains and two antibody light chains, and wherein one Q-tag is attached to one or both light chain(s) of the antibody.

~~39. The conjugate of claim 38, wherein the Q-tag is fused to the C-terminus of the heavy chain of the antibody(ies).~~

~~40. The conjugate of any one of claims 1 to 37, wherein the antibody comprises two antibody heavy chains and two antibody light chains, and wherein one Q-tag is attached to one or both light chain(s) of the antibody.~~

~~41. The conjugate of claim 38, wherein the Q-tag is within the Fc domain.~~

~~42. The conjugate of any one of claims 1 to 15 and 25 to 41, wherein the conjugate binds to human CD22 expressed on the surface of a B cell.~~

~~43. The conjugate of any one of claims 1 to 42, wherein the conjugate induces activation of TLR9.~~

~~44.~~8. The conjugate of any one of claims 1 to 7~~43~~, wherein: ~~each Q-tag independently comprises a peptide sequence having between 5 and 15 amino acid residues~~

(a) the one or more Q-tags are naturally occurring; or

(b) the one or more Q-tags independently comprise a peptide sequence having between 5 and 15 amino acid residues; wherein optionally:

(i) the peptide sequence of each Q-tag is independently selected from the group consisting of SEQ ID NOs: 39-55; or

(ii) the peptide sequence of each Q-tag comprises the peptide sequence RPQGF (SEQ ID NO:47), optionally wherein the peptide sequence of each Q-tag independently comprises RPQGF (SEQ ID NO:47), RPQGFPP (SEQ ID NO:48), or RPQGFGPP (SEQ ID NO:49).

~~45. The conjugate of any one of claims 1 to 44, wherein the Q-tag is naturally occurring.~~

~~46. The conjugate of any one of claims 1 to 42, wherein the peptide sequence of each Q-tag is independently selected from the group consisting of **SEQ ID NOs: 39-55.**~~

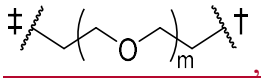
~~47. The conjugate of any one of claims 1 to 42, wherein the Q-tag comprises the peptide sequence RPQGF (SEQ ID NO:47).~~

~~48. The conjugate of any one of claims 1 to 47, wherein each Q-tag independently comprises RPQGF (SEQ ID NO:47), RPQGFPP (SEQ ID NO:48), or RPQGFGPP (SEQ ID NO:49).~~

~~49. The conjugate of any one of claims 1 to 48, wherein 1 or 2 Q-tags is/are linked to the antibody or antigen-binding fragment.~~

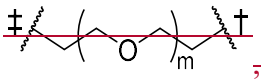
~~50.~~9. The conjugate of any one of claims 1 to 8~~49~~, wherein the conjugate has a DAR of 1 or 2.

~~51.~~10. The conjugate of any one of claims 1 to 9~~50~~, wherein the linker L comprises a polyethylene glycol moiety and/or the linker L is



wherein m is an integer ranging from about 0 to about 50, and wherein ~~wwww~~ † indicates the point of attachment to T^3, and ~~wwww~~ ‡ indicates the point of attachment to the rest of the conjugate.

~~52. The conjugate of any one of claims 1 to 51, wherein the linker L is~~



~~wherein m is an integer ranging from about 0 to about 50, and wherein ~~wwww~~† indicates the point of attachment to T^3, and ~~wwww~~‡ indicates the point of attachment to the rest of the conjugate.~~

~~53. The conjugate of any one of claims 1 to 52, wherein Z is S.~~

11. The conjugate of claim 10, wherein m is an integer from about 20 to about 25, wherein optionally m is 24.

~~54.~~12. The conjugate any one of claims 1 to 11~~53~~, wherein the oligonucleotide P comprises at least one pair of geminal T^1 and T^2 wherein T^1 is S and T^2 is S^-; and wherein optionally the at least one pair of geminal T^1 and T^2 wherein T^1 is S and T^2 is S is located at the 3'-position of nucleoside residue 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15.

~~55. The conjugate of claim 54, wherein the at least one pair of geminal T^1 and T^2 wherein T^1 is S and T^2 is S is located at the 3'-position of nucleoside residue 1.~~

~~56. The conjugate of claim 54, wherein the at least one pair of geminal T^1 and T^2 wherein T^1 is S and T^2 is S is located at the 3'-position of nucleoside residue 2.~~

~~57. The conjugate of claim 54, wherein the at least one pair of geminal T^1 and T^2 wherein T^1 is S and T^2 is S is located at the 3'-position of nucleoside residue 3.~~

~~58. The conjugate of claim 54, wherein the at least one pair of geminal T^1 and T^2 wherein T^1 is S and T^2 is S is located at the 3'-position of nucleoside residue 5.~~

~~59. The conjugate of claim 54, wherein the at least one pair of geminal T^1 and T^2 wherein T^1 is S and T^2 is S is located at the 3'-position of nucleoside residue 6.~~

~~60. The conjugate of claim 54, wherein the at least one pair of geminal T^1 and T^2 wherein T^1 is S and T^2 is S is located at the 3'-position of nucleoside residue 7.~~

~~61. The conjugate of claim 54, wherein the at least one pair of geminal T^1 and T^2 wherein T^1 is S and T^2 is S is located at the 3'-position of nucleoside residue 8.~~

~~62. The conjugate of claim 54, wherein the at least one pair of geminal T^1 and T^2 wherein T^1 is S and T^2 is S is located at the 3'-position of nucleoside residue 9.~~

~~63. The conjugate of claim 54, wherein the at least one pair of geminal T^1 and T^2 wherein T^1 is S and T^2 is S is located at the 3'-position of nucleoside residue 10.~~

~~64. The conjugate of claim 54, wherein the at least one pair of geminal T^1 and T^2 wherein T^1 is S and T^2 is S is located at the 3'-position of nucleoside residue 11.~~

~~65. The conjugate of claim 54, wherein the at least one pair of geminal T^1 and T^2 wherein T^1 is S and T^2 is S is located at the 3'-position of nucleoside residue 12.~~

~~66. The conjugate of claim 54, wherein the at least one pair of geminal T^1 and T^2 wherein T^1 is S and T^2 is S is located at the 3'-position of nucleoside residue 13.~~

~~67. The conjugate of claim 54, wherein the at least one pair of geminal T^1 and T^2 wherein T^1 is S and T^2 is S is located at the 3'-position of nucleoside residue 14.~~

~~68. The conjugate of claim 54, wherein the at least one pair of geminal T^1 and T^2 wherein T^1 is S and T^2 is S is located at the 3'-position of nucleoside residue 15.~~

~~69.~~13. The conjugate of any one of claims 1 to 12~~68~~, wherein the oligonucleotide P comprises at least two pairs of geminal T^1 and T^2 wherein T^1 is S and T^2 is S^-; and wherein optionally:

(a) $R^{5'}$ is H or methoxy;

(b) R^{c1} is H or methoxy;

(c) R^2 is methyl or H;

(d) m is an integer from 20 to 25 and optionally 24; and/or

(e) $U^{5'}$ is bromo or H.

~~70. The conjugate of any one of claims 1 to 69, wherein $R^{5'}$ is H.~~

~~71. The conjugate of any one of claims 1 to 69, wherein $R^{5'}$ is methoxy.~~

~~72. The conjugate of any one of claims 1 to 71, wherein R^{e1} is H.~~

~~73. The conjugate of any one of claims 1 to 71, wherein R^{e1} is methoxy.~~

~~74. The conjugate of any one of claims 1 to 73, wherein R^{2} is methyl.~~

~~75. The conjugate of any one of claims 1 to 73, wherein R^{2} is H.~~

~~76. The conjugate of any one of claims 1 to 75, wherein m is an integer from 20 to 25.~~

~~77. The conjugate of claim 76, wherein m is 24.~~

~~78. The conjugate of any one of claims 1 to 77, wherein $U^{5'}$ is bromo.~~

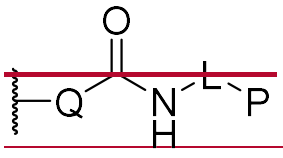
~~79. The conjugate of any one of claims 1 to 77, wherein $U^{5'}$ is H.~~

~~80.~~14. The conjugate of any one of claims 1 to 11~~53~~, wherein each P independently comprises an oligonucleotide selected from ***Table 10***.

~~81. A conjugate comprising an antibody or antigen-binding fragment thereof (Ab) and one or more immunomodulating oligonucleotides (P),~~

~~wherein the antibody or antigen-binding fragment is linked to one or more Q-tag peptides (Q) that comprise the amino acid sequence RPQGF (SEQ ID NO:47),~~

~~and wherein each immunomodulating oligonucleotide (P) is linked to a Q-tag peptide via an amide bond with the glutamine residue of the Q-tag peptide and a linker (L) as shown in Formula (A):~~



~~(A),~~

~~wherein ~~ indicates the point of attachment of each Q to the antibody or antigen-binding fragment thereof (Ab).~~

~~82. The conjugate of claim 81, wherein the antibody comprises two heavy chains and two light chains, wherein each heavy chain of the antibody is linked to a Q-tag peptide, and wherein one or both of the Q-tag peptides is linked to an immunomodulating oligonucleotide P.~~

~~83. The conjugate of claim 81, wherein the antibody or fragment thereof is a monoclonal antibody or fragment thereof.~~

~~84. The conjugate of any one of claims 81 to 83, wherein the antibody or fragment thereof is a Fab, F(ab')2, Fab'-SH, Fv, scFv, single domain, single heavy chain, or single light chain antibody or antibody fragment.~~

~~85. The conjugate of any one of claims 81 to 84, wherein the antibody or fragment thereof is a humanized, human, or chimeric antibody or fragment thereof.~~

~~86. The conjugate of any one of claims 81 to 85, wherein the antibody or fragment thereof specifically binds human CD22.~~

~~87. The conjugate of claim 86, wherein the antibody comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain, wherein:~~

~~(a) the VH domain comprises CDR-H1, CDR-H2, and CDR-H3 sequences from a VH domain sequence selected from the group consisting of SEQ ID Nos:64-67;~~

~~(b) the VH domain comprises a CDR-H1 comprising the sequence of SEQ ID NO:113, a CDR-H2 comprising the sequence of SEQ ID NO:115, and a CDR-H3 comprising the sequence of SEQ ID NO:116; or~~

~~(c) the VH domain comprises a CDR-H1 comprising the sequence of SEQ ID NO:114, a CDR-H2 comprising the sequence of SEQ ID NO:189, and a CDR-H3 comprising the sequence of SEQ ID NO:116.~~

~~88. The conjugate of claim 86 or claim 87, the antibody comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain, and wherein the VH domain comprises an amino acid sequence selected from the group consisting of SEQ ID Nos:64-67.~~

~~89. The conjugate of any one of claims 81 to 88, wherein the antibody comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain, and wherein:~~

~~(a) the VL domain comprises CDR-L1, CDR-L2, and CDR-L3 sequences from a VL domain sequence selected from the group consisting of SEQ ID Nos:68-91;~~

~~(b) the VL domain comprises a CDR-L1 comprising the sequence of SEQ ID NO:117, a CDR-L2 comprising the sequence of SEQ ID NO:119, and a CDR-L3 comprising the sequence of SEQ ID NO:120; or~~

~~(c) the VL domain comprises a CDR-L1 comprising the sequence of SEQ ID NO:118, a CDR-L2 comprising the sequence of SEQ ID NO:177, and a CDR-L3 comprising the sequence of SEQ ID NO:120.~~

~~90. The conjugate of claim 89, wherein the VL domain further comprises an amino acid substitution at residue N92 (numbering starting at the N-terminus of the VL domain sequence).~~

~~91. The conjugate of claim 90, wherein the VL domain comprises an amino acid substitution selected from the group consisting of N92A, N92L and N92S.~~

~~92. The conjugate of any one of claims 81 to 88, wherein the antibody comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain, and wherein the VL domain an amino acid sequence is selected from the group consisting of SEQ ID Nos:68-91.~~

~~93. The conjugate of claim 86, wherein the antibody comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain, wherein the VH domain comprises the amino acid sequence QVQLLESGGGVVQPGGSLRLSCAASGFAFSIYDMNWVRQAPGKGLEWVSAISSGGGTTY YADSVKGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARHSGYGTHWGVLFAYWGRG TLVTVSS (SEQ ID NO: 65), and wherein the VL domain comprises the amino acid sequence DIQMTQSPSSLSASVGDRVTITCRASQDIHGYLNWYQQKPGKAPKLLIYYTSILHSGVPSR FSGSGSGTDFTLTISSLQPEDFATYFCQQGNTLPWTFGQGTKLEIK (SEQ ID NO: 68).~~

~~94. The conjugate of claim 86, wherein the antibody comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain, wherein the VH domain comprises the amino acid sequence QVQLLESGGGVVQPGGSLRLSCAASGFAFSIYDMNWVRQAPGKGLEWVSAISSGGGTTY YADSVKGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARHSGYGTHWGVLFAYWGRG TLVTVSS (SEQ ID NO: 65), and wherein the VL domain comprises the amino acid sequence DIQMTQSPSSLSASVGDRVTITCRASQDIHGYLNWYQQKPGKAPKLLIYYTSILHSGVPSR FSGSGSGTDFTLTISSLQPEDFATYFCQQGATLPWTFGQGTKLEIK (SEQ ID NO: 73).~~

~~95. The conjugate of claim 86, wherein the antibody comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain, wherein the VH domain comprises a CDR-H1 comprising the sequence of SEQ ID NO:113, a CDR-H2 comprising the sequence of SEQ ID NO:115, and a CDR-H3 comprising the sequence of SEQ ID NO:116; and the VL domain comprises a CDR-L1 comprising the sequence of SEQ ID NO:117, a CDR-L2 comprising the sequence of SEQ ID NO:119, and a CDR-L3 comprising the sequence of SEQ ID NO:120.~~

~~96. The conjugate of claim 86, wherein the antibody comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain, wherein the VH domain comprises the amino~~

~~acid sequence QVQLLESGGGVVQPGGSLRLSCAASGFAFSIYDMNWVRQAPGKGLEWVSAISSGGGTTY YADSVKGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARHSGYGTHWGVLFAYWGRG TLVTVSS (SEQ ID NO: 65), and wherein the VL domain comprises the amino acid sequence DIQMTQSPSSLSASVGDRVTITCRASQDIHGYLNWYQQKPGKAPKLLIYYTSILHSGVPSR FSGSGSGTDFTLTISSLQPEDFATYFCQQGSTLPWTFGQGTKLEIK (SEQ ID NO: 87).~~

~~97. The conjugate of any one of claims 81 to 85, wherein the antibody or fragment thereof specifically binds human Her2.~~

~~98. The conjugate of claim 97, wherein the antibody comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain, and wherein the VH domain comprises CDR-H1, CDR-H2, and CDR-H3 sequences from the VH domain sequence EVQLVESGGGLVQPGGSLRLSCAASGFNIKDTYIHWVRQAPGKGLEWVARIYPTNGYTR YADSVKGRFTISADTSKNTAYLQMNSLRAEDTAVYYCSRWGGDGFYAMDYWGQGTLV TVSS (SEQ ID NO:168).~~

~~99. The conjugate of claim 98, wherein the VH domain comprises the sequence EVQLVESGGGLVQPGGSLRLSCAASGFNIKDTYIHWVRQAPGKGLEWVARIYPTNGYTR YADSVKGRFTISADTSKNTAYLQMNSLRAEDTAVYYCSRWGGDGFYAMDYWGQGTLV TVSS (SEQ ID NO:168).~~

~~100. The conjugate of claim 98 or claim 99, wherein the antibody comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain, and wherein the VL domain comprises CDR-L1, CDR-L2, and CDR-L3 sequences from the VL domain sequence DIQMTQSPSSLSASVGDRVTITCRASQDVNTAVAWYQQKPGKAPKLLIYSASFLYSGVPS RFSGSRSGTDFTLTISSLQPEDFATYYCQQHYTTPPTFGQGTKVEIK (SEQ ID NO:169).~~

~~101. The conjugate of claim 99 or claim 100, wherein the VL domain comprises the sequence DIQMTQSPSSLSASVGDRVTITCRASQDVNTAVAWYQQKPGKAPKLLIYSASFLYSGVPS RFSGSRSGTDFTLTISSLQPEDFATYYCQQHYTTPPTFGQGTKVEIK (SEQ ID NO:169).~~

~~102. The conjugate of claim 97, wherein the antibody comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain, and wherein the VH domain comprises CDR-H1, CDR-H2, and CDR-H3 sequences from the VH domain sequence EVQLVESGGGLVQPGGSLRLSCAASGFTFTDYTMDWVRQAPGKGLEWVADVNPNSGGS~~

~~IYNQRFKGRFTLSVDRSKNTLYLQMNSLRAEDTAVYYCARNLGPSFYFDYWGQGTLVT VSS (SEQ ID NO:170).~~

~~103. The conjugate of claim 102, wherein the VH domain comprises the sequence EVQLVESGGGLVQPGGSLRLSCAASGFTFTDYTMDWVRQAPGKGLEWVADVNPNSGGS IYNQRFKGRFTLSVDRSKNTLYLQMNSLRAEDTAVYYCARNLGPSFYFDYWGQGTLVT VSS (SEQ ID NO:170).~~

~~104. The conjugate of claim 102 or claim 103, wherein the antibody comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain, and wherein the VL domain comprises CDR-L1, CDR-L2, and CDR-L3 sequences from the VL domain sequence DIQMTQSPSSLSASVGDRVTITCKASQDVSIGVAWYQQKPGKAPKLLIYSASYRYTGVPS RFSGSGSGTDFTLTISSLQPEDFATYYCQQYYIYPYTFGQGTKVEIK (SEQ ID NO:171).~~

~~105. The conjugate of any one of claims 102 to 104, wherein the VL domain comprises the sequence DIQMTQSPSSLSASVGDRVTITCKASQDVSIGVAWYQQKPGKAPKLLIYSASYRYTGVPS RFSGSGSGTDFTLTISSLQPEDFATYYCQQYYIYPYTFGQGTKVEIK (SEQ ID NO:171).~~

~~106. The conjugate of any one of claims 81 to 105, wherein the antibody comprises an Fc region.~~

~~107. The conjugate of claim 106, wherein the Fc region is a human Fc region selected from the group consisting of an IgG1 Fc region, an IgG2 Fc region, and an IgG4 Fc region.~~

~~108. The conjugate of claim 107, wherein the Fc region is a wild-type human IgG1, IgG2, or IgG4 Fc region.~~

~~109. The conjugate of claim 107, wherein the Fc region is a human Fc region comprising one or more amino acid substitutions that reduce effector function, as compared with a human Fc region that lacks the amino acid substitution(s).~~

~~110. The conjugate of claim 107, wherein the Fc region is a human Fc region comprising one or more amino acid substitutions that reduce binding to C1q.~~

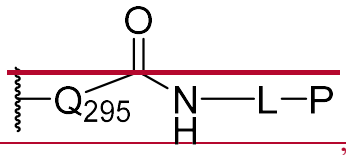
~~111. The conjugate of claim 107, wherein the Fc region is:~~

~~(a) a human IgG1 Fc region comprising L234A, L235A, and/or G237A substitutions, amino acid position numbering according to EU index;~~

~~(b) a human IgG2 Fc region comprising A330S and/or P331S substitutions, amino acid position numbering according to EU index; or~~

(c) a human IgG4 Fc region comprising S228P and/or L235E substitutions, amino acid position numbering according to EU index.

112. The conjugate of any one of claims 106, 107, and 109-111, wherein the Fc region further comprises an N297A substitution, amino acid position numbering according to EU index.

113. The conjugate of claim 112, wherein the conjugate further comprises an immunomodulating oligonucleotide P attached to the Q295 residue of the Fc region as shown in the following formula 

, wherein L is a linker moiety connected to Q295 of the Fc region via an amide bond.

114. The conjugate of any one of claims 108 and 110 to 113, wherein the Fc region further comprises a D265A substitution, amino acid position numbering according to EU index.

115. The conjugate of any one of claims 81 to 105, wherein the antibody comprises an antibody heavy chain constant domain comprising an amino acid sequence selected from the group consisting of SEQ ID Nos:92-107 and 178.

116. The conjugate of any one of claims 81 to 115, wherein the antibody comprises a human lambda light chain.

117. The conjugate of any one of claims 81 to 115, wherein the antibody comprises a human kappa light chain.

118. The conjugate of any one of claims 111 to 115, wherein the antibody comprises an antibody light chain constant domain comprising an amino acid sequence selected from the group consisting of SEQ ID Nos:108-110.

119. The conjugate of any one of claims 81 to 96 and 106 to 118, wherein the conjugate binds to human CD22 expressed on the surface of a B cell.

120. The conjugate of any one of claims 81 to 119, wherein the conjugate induces activation of TLR9.

121. The conjugate of any one of claims 81 to 120, wherein the antibody comprises two antibody heavy chains and two antibody light chains, and wherein one Q-tag is attached to one or both heavy chain(s) of the antibody.

122. The conjugate of claim 121, wherein the Q-tag is fused to the C-terminus of the heavy chain(s) of the antibody.

~~123. The conjugate of claim 121, wherein the Q-tag is within the Fc domain of the heavy chain(s) of the antibody.~~

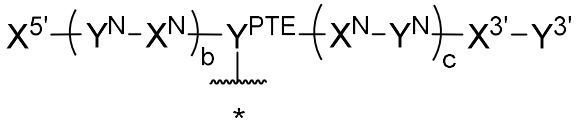
~~124. The conjugate of any one of claims 81 to 120, wherein the antibody comprises two antibody heavy chains and two antibody light chains, and wherein one Q-tag is attached to one or both light chain(s) of the antibody.~~

~~125. The conjugate of any one of claims 81 to 124, wherein each Q-tag independently comprises the sequence RPQGF (SEQ ID NO:47), RPQGFPP (SEQ ID NO:48), or RPQGFGPP (SEQ ID NO:49).~~

~~126. The conjugate of any one of claims 81 to 125, wherein 1 or 2 Q-tags is/are linked to the antibody or antigen-binding fragment.~~

~~127. The conjugate of any one of claims 81 to 126, wherein the conjugate has a DAR of 1 or 2.~~

~~128.~~15. The conjugate of claim 1~~any one of claims 81 to 127~~, wherein each of the one or more Q-tag peptides (Q) comprises the amino acid sequence RPQGF (SEQ ID NO:47); and wherein each immunomodulating oligonucleotide P is independently

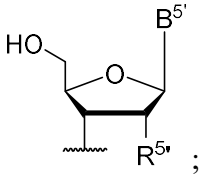


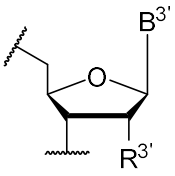
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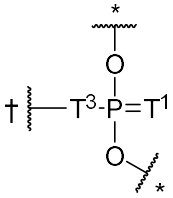
wherein

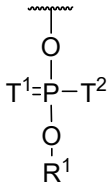
b and c are each independently an integer from 1 to 25; with the proviso that the sum of b and c is at least 5;

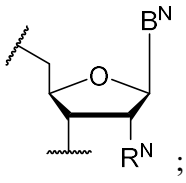
〰 * indicates the point of attachment of the immunomodulating oligonucleotide P to the rest of the conjugate;

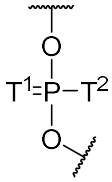
$X^{5'}$ is a 5' terminal nucleoside having the structure  ;

$X^{3'}$ is a 3' terminal nucleoside having the structure  ;

Y^{PTE} is an internucleoside phosphotriester having the structure , wherein * indicates the points of attachment to the rest of the oligonucleotide and 〰 † indicates the point of attachment to the linker L, or, if L is absent, 〰 † indicates the point of attachment to the Q tag peptide at the glutamine residue via an amide bond;

$Y^{3'}$ is a terminal phosphotriester having the structure ;

each X^N is independently a nucleoside having the structure ;

each Y^N is independently an internucleoside linker having the structure ;

wherein each B^N is independently a modified or unmodified nucleobase;

each R^N is independently -H or -O-C_{1-4}-alkyl, wherein the C_{1-4}-alkyl of the -O-C_{1-4}-alkyl is optionally further substituted by -O-C_1-C_4-alkyl;

$B^{5'}$ and $B^{3'}$ are independently a modified or unmodified nucleobase;

$R^{5'}$ and $R^{3'}$ are independently -H or -O-C_1-C_4-alkyl, wherein the C_{1-4}-alkyl of the -O-C_{1-4}-alkyl is optionally further substituted by -O-C_{1-4}-alkyl;

each T_1 is independently O or S;

each T_2 is independently O^- or S^-; and

T_3 is a group comprising an oligoethylene glycol moiety; and

R^1 is C_{1-4}-alkylene-hydroxy.

~~129.~~16. The conjugate of claim 15~~128~~, wherein:

(a) b is 3;

(b) P comprises at least one modified nucleoside X^N and/or has at least one modified internucleoside linker Y^N, wherein at least one of T^1 or T^2 is S;

(c) P has at least one phosphorodithioate or phosphorothioate internucleoside linker;

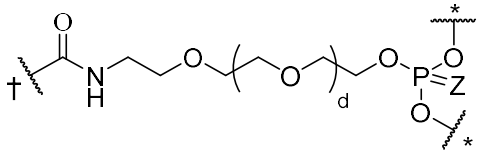
(d) P comprises 0, 1, 2 or 3 phosphorodithioate internucleoside linkers;

(e) P comprises a modified nucleoside selected from the group consisting of 2'-O-alkyl nucleoside, 2'-O-alkoxyalkyl nucleoside, 2'-deoxynucleoside and ribonucleoside, optionally wherein the modified nucleoside is selected from the group consisting of 5-bromo-2'-O-methyluridine, 5-bromo-2'-deoxyuridine, 2'-O-methyluridine, 2'-deoxyuridine, 2'-O-methylthymidine, 2'-O-methylcytidine, 2'-O-(2-methoxyethyl)thymidine and 8-oxo-7,8-dihydro-2'-deoxyguanosine;

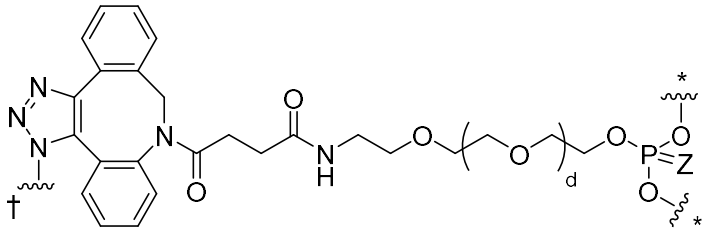
(f) $X^{5'}$ is a 5-bromo-2'-O-methyluridine, 5-bromo-2'-deoxyuridine, 2'-O-methyluridine or 2'-deoxyuridine;

(g) $Y^{3'}$ or the Y^N at the 3' position of $X^{5'}$ comprises an unsubstituted or substituted phosphorothioate; and/or

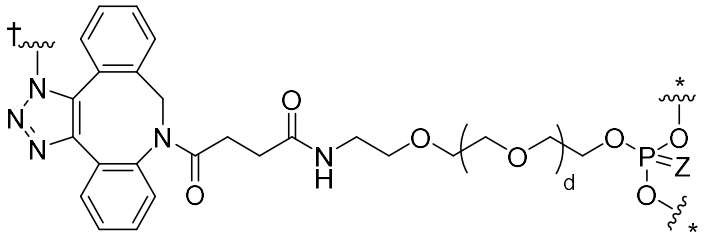
(h) wherein Y^{PTE} is



,



, or



,

wherein Z is O or S; d is an integer from 0 to 95, optionally d is an integer from 1 to 25; the two ~~~ * on the right side of the structure indicate the points of attachment to the adjacent

nucleosides X^N in the oligonucleotide P, and the ~~~ † on the left side of the structure indicates the point of attachment to the linker L.

~~130. The conjugate of claim 128 or claim 129, wherein~~

~~(i) P comprises at least one modified nucleoside X^N;~~

~~(ii) P has at least one modified internucleoside linker Y^N, wherein at least one of T^1 or T^2 is S; or~~

~~(iii) both (i) and (ii).~~

~~131. The conjugate of any one of claims 128 to 130, wherein P has at least one phosphorodithioate or phosphorothioate internucleoside linker.~~

~~132. The conjugate of any one of claims 128 to 131, wherein P comprises 0, 1, 2 or 3 phosphorodithioate internucleoside linkers.~~

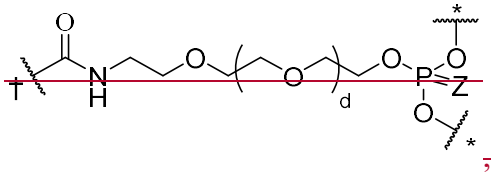
~~133. The conjugate of any one of claims 128 to 132, wherein P comprises a modified nucleoside selected from the group consisting of 2'-O-alkyl nucleoside, 2'-O-alkoxyalkyl nucleoside, 2'-deoxynucleoside and ribonucleoside.~~

~~134. The conjugate of claim 133, wherein the modified nucleoside is selected from the group consisting of 5-bromo-2'-O-methyluridine, 5-bromo-2'-deoxyuridine, 2'-O-methyluridine, 2'-deoxyuridine, 2'-O-methylthymidine, 2'-O-methylcytidine, 2'-O-(2-methoxyethyl)thymidine and 8-oxo-7,8-dihydro-2'-deoxyguanosine.~~

~~135. The conjugate of any one of claims 128 to 134, wherein $X^{5'}$ is a 5-bromo-2'-O-methyluridine, 5-bromo-2'-deoxyuridine, 2'-O-methyluridine or 2'-deoxyuridine.~~

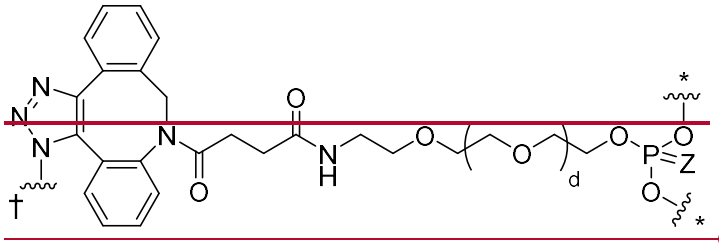
~~136. The conjugate of any one of claims 128 to 135, wherein $Y^{3'}$ or the Y^N at the 3' position of $X^{5'}$ comprises an unsubstituted or substituted phosphorothioate.~~

~~137. The conjugate of any one of claims 128 to 136, wherein Y^{PTE} is:~~

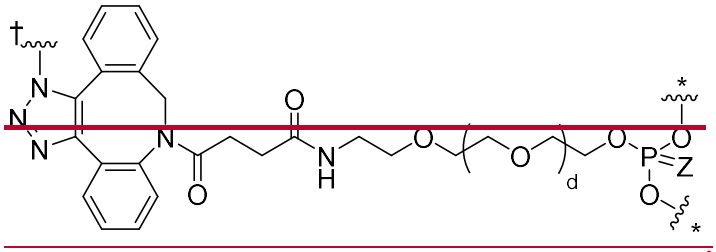


~~wherein Z is O or S; d is an integer from 0 to 95; the two ~~~* on the right side of the structure indicate the points of attachment to the adjacent nucleosides X^N in the oligonucleotide P, and the ~~~ † on the left side of the structure indicates the point of attachment to the linker L.~~

~~138. The conjugate of any one of claims 128 to 136, wherein Y^{PTE} is:~~



or



,

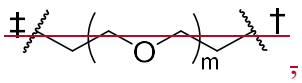
wherein Z is O or S; d is an integer from 0 to 95; the two ~~~~* on the right side of the structure indicate the points of attachment to the adjacent nucleosides X^N in the oligonucleotide P, and the one ~~~~† on the left side of the structure indicates the point of attachment to the linker L.

139. The conjugate of claim 137 or 138, wherein Z is S.

140. The conjugate of any one of claims 137 to 139, wherein d is an integer from 1 to 25.

141. The conjugate of any one of claims 81 to 140, wherein the linker L comprises a polyethylene glycol moiety.

142. The conjugate of any one of claims 81 to 141, wherein the linker L is



,

wherein m is an integer ranging from about 0 to about 50, and wherein ~~~~† indicates the point of attachment to Y^{PTE}, and ~~~~‡ indicates the point of attachment to the rest of the conjugate.

143. The conjugate of any one of claims 81 to 142, wherein P comprises one or more CpG sites.

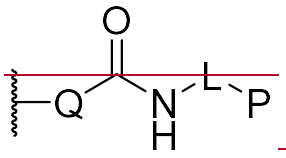
144. The conjugate of any one of claims 81 to 143, wherein P comprises at least 3 CpG sites.

145. The conjugate of any one of claims 81 to 144, wherein each P independently comprises an oligonucleotide selected from ***Table 9*** or ***Table 10***.

146. The conjugate of any one of claims 81 to 145, wherein the antibody comprises two antibody light chains, two antibody heavy chains, and two Q-tag peptides; wherein each of the Q-tag peptides is linked to the C-terminus of one of the antibody heavy chains; and wherein one

of the Q-tag peptides is linked to an immunomodulating oligonucleotide (P) via an amide bond with the glutamine residue of the Q-tag peptide and linker (L).

147. A conjugate comprising an antibody or antigen-binding fragment thereof (Ab) and one or more immunomodulating oligonucleotides (P), wherein the antibody or antigen-binding fragment is linked to one or more Q-tag peptides (Q), and wherein each immunomodulating oligonucleotide is linked to a Q-tag peptide via an amide bond with the glutamine residue of the Q-tag peptide and a linker (L) as shown in Formula (A)

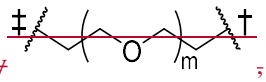


(A),

wherein:

~~~~ indicates the point of attachment of each Q to the antibody or antigen-binding fragment thereof (Ab)

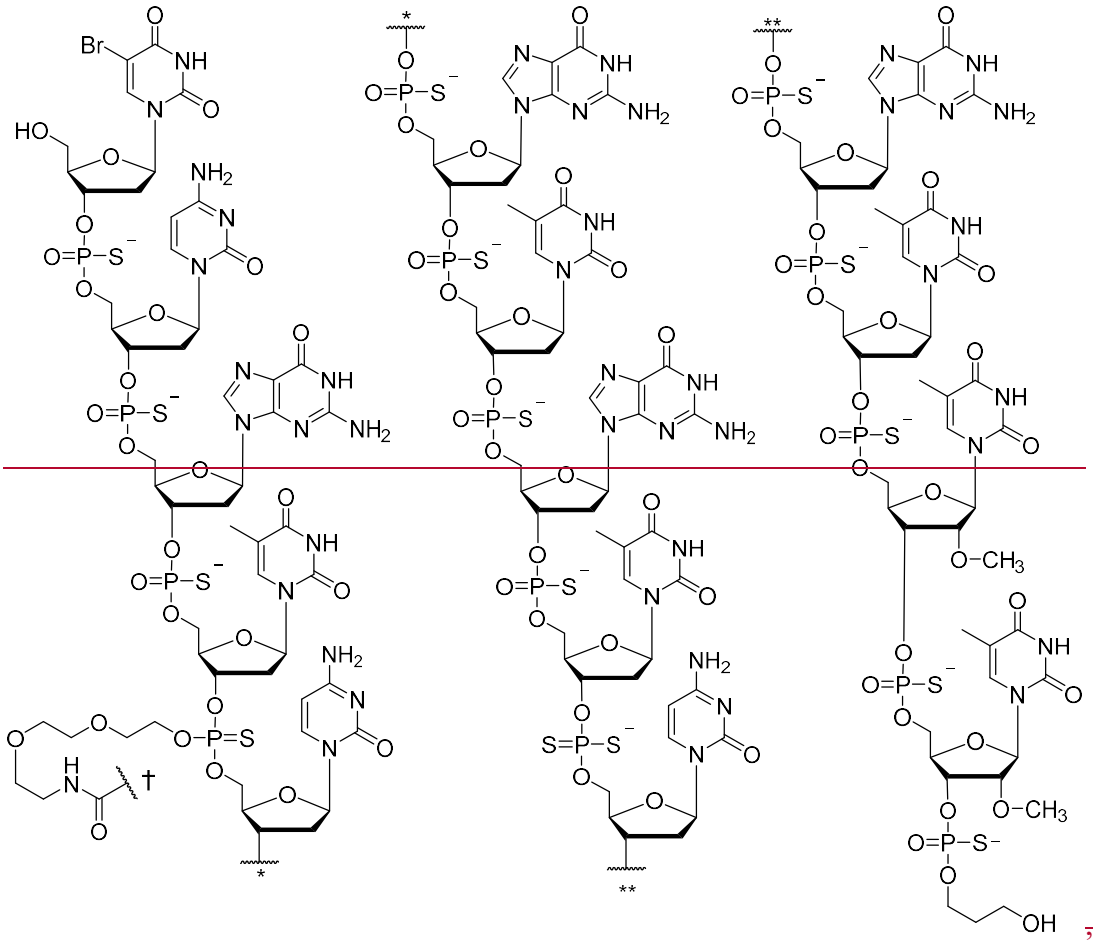
each Q independently comprises a Q-tag peptide sequence RPQGF (SEQ ID NO:47);

each L is independently a bond or a linker moiety 

,

wherein m is an integer ranging from about 0 to about 50, and wherein ~~~~† indicates the point of attachment to P, and ~~~~‡ indicates the point of attachment to the rest of the conjugate connected to Q via an amide bond with the glutamine residue; and

each P is independently an immunomodulating oligonucleotide having the structure
~~~~



wherein ~~~* and ~~~** indicate the points of attachment within the oligonucleotide, and wherein ~~~† indicates the point of attachment to the linker L;

wherein Ab comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain.

148. The conjugate of claim 147, wherein each Q tag independently comprises RPQGF (SEQ ID NO:47), RPQGFPP (SEQ ID NO:48), or RPQGFGPP (SEQ ID NO:49).

149. The conjugate of claim 148, wherein each Q tag is RPQGFGPP (SEQ ID NO:49).

150. The conjugate of any one of claims 147-149, wherein 1 or 2 Q tags are linked to the antibody or antigen-binding fragment.

151. The conjugate of any one of claims 147 to 150, wherein the Q-tag is linked to the C-terminus of the heavy chain of the antibody.

152. The conjugate of any one of claims 147 to 151, wherein:

(a) the antibody comprises a human IgG1 Fc region comprising L234A, L235A, and/or G237A substitutions, amino acid position numbering according to EU index;

(b) the antibody comprises a wild-type human IgG1 Fc region;

(c) the antibody comprises a human IgG1 Fc region comprising an N297A substitution, amino acid position numbering according to EU index;

(d) the antibody comprises a human IgG1 Fc region comprising a D265A substitution, amino acid position numbering according to EU index;

(e) the antibody comprises a wild-type human IgG2 Fc region;

(f) the antibody comprises a human IgG2 Fc region comprising an N297A substitution, amino acid position numbering according to EU index; or

(g) the antibody comprises a human IgG4 Fc region comprising an S228P substitution, amino acid position numbering according to EU index.

153. The conjugate of any one of claims 147 to 152, wherein m is an integer from about 20 to about 25.

154. The conjugate of claim 153, wherein m is 24.

155. The conjugate of any one of claims 147 to 154, wherein the conjugate has a DAR of 1 or 2.

156. The conjugate of any one of claims 147 to 155, wherein the conjugate binds to human CD22 expressed on the surface of a B cell.

157. The conjugate of claim 156, wherein:

(a) the VH domain comprises a CDR-H1 comprising the sequence of SEQ ID NO:113, a CDR-H2 comprising the sequence of SEQ ID NO:115, and a CDR-H3 comprising the sequence of SEQ ID NO:116, and the VL domain comprises a CDR-L1 comprising the sequence of SEQ ID NO:117, a CDR-L2 comprising the sequence of SEQ ID NO:119, and a CDR-L3 comprising the sequence of SEQ ID NO:120;

(b) the VH domain comprises a CDR-H1 comprising the sequence of SEQ ID NO:114, a CDR-H2 comprising the sequence of SEQ ID NO:189, and a CDR-H3 comprising the sequence of SEQ ID NO:116, and the VL domain comprises a CDR-L1 comprising the sequence of SEQ ID NO:117, a CDR-L2 comprising the sequence of SEQ ID NO:119, and a CDR-L3 comprising the sequence of SEQ ID NO:120;

(c) the VH domain comprises a CDR-H1 comprising the sequence of SEQ ID NO:113, a CDR-H2 comprising the sequence of SEQ ID NO:115, and a CDR-H3 comprising the sequence of SEQ ID NO:116, and the VL domain comprises a CDR-L1 comprising the sequence of SEQ ID NO:118, a CDR-L2 comprising the sequence of SEQ ID NO:177, and a CDR-L3 comprising the sequence of SEQ ID NO:120; or

(d) the VH domain comprises a CDR-H1 comprising the sequence of SEQ ID NO:114, a CDR-H2 comprising the sequence of SEQ ID NO:189, and a CDR-H3 comprising the sequence of SEQ ID NO:116, and the VL domain comprises a CDR-L1 comprising the sequence of SEQ ID NO:118, a CDR-L2 comprising the sequence of SEQ ID NO:177, and a CDR-L3 comprising the sequence of SEQ ID NO:120.

158. The conjugate of claim 156 or claim 157, wherein:

(a) the VH domain comprises the sequence of SEQ ID NO:65, and the VL domain comprises the sequence of SEQ ID NO:87; or

(b) the VH domain comprises the sequence of SEQ ID NO:65, and the VL domain comprises the sequence of SEQ ID NO:73.

159. The conjugate of any one of claims 156 to 158, wherein:

(a) the antibody comprises a heavy chain comprising the sequence of SEQ ID NO:179 and a light chain comprising the sequence of SEQ ID NO:181;

(b) the antibody comprises a heavy chain comprising the sequence of SEQ ID NO:180 and a light chain comprising the sequence of SEQ ID NO:181;

(c) the antibody comprises a heavy chain comprising the sequence of SEQ ID NO:179 and a light chain comprising the sequence of SEQ ID NO:182; or

(d) the antibody comprises a heavy chain comprising the sequence of SEQ ID NO:180 and a light chain comprising the sequence of SEQ ID NO:182.

160. The conjugate of any one of claims 147 to 155, wherein the conjugate binds to human Her2 expressed on the surface of a tumor cell.

161. The conjugate of claim 160, wherein:

(a) the VH domain comprises the sequence of SEQ ID NO:168, and the VL domain comprises the sequence of SEQ ID NO:169; or

(b) the VH domain comprises the sequence of SEQ ID NO:170, and the VL domain comprises the sequence of SEQ ID NO:171.

~~162. The conjugate of claim 161, wherein:~~

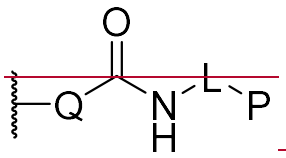
~~(a) the antibody comprises a heavy chain comprising the sequence of SEQ ID NO:184 and a light chain comprising the sequence of SEQ ID NO:185;~~

~~(b) the antibody comprises a heavy chain comprising the sequence of SEQ ID NO:183 and a light chain comprising the sequence of SEQ ID NO:185;~~

~~(c) the antibody comprises a heavy chain comprising the sequence of SEQ ID NO:187 and a light chain comprising the sequence of SEQ ID NO:188; or~~

~~(d) the antibody comprises a heavy chain comprising the sequence of SEQ ID NO:186 and a light chain comprising the sequence of SEQ ID NO:188.~~

~~163. A conjugate comprising an antibody or antigen-binding fragment thereof (Ab) and one or more immunomodulating oligonucleotides (P), wherein the antibody or antigen-binding fragment is linked to one or more Q-tag peptides (Q) , and wherein each immunomodulating oligonucleotide is linked to a Q-tag peptide via an amide bond with the glutamine residue of the Q-tag peptide and a linker (L) as shown in Formula (A)~~

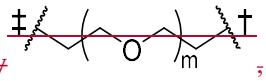


~~(A),~~

~~wherein:~~

~~~~ indicates the point of attachment of each Q to the antibody or antigen-binding fragment thereof (Ab)~~

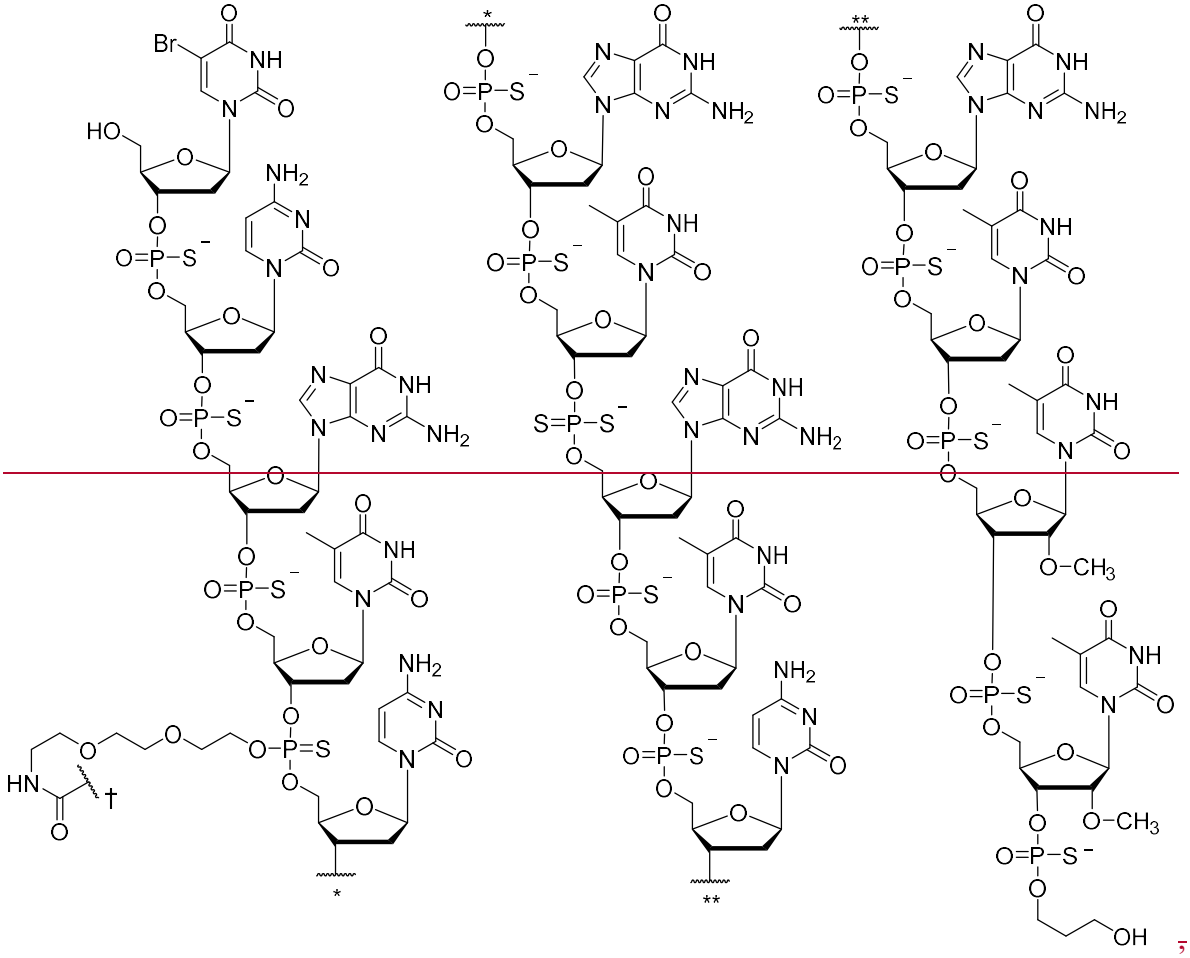
~~each Q independently comprises a Q-tag peptide sequence RPQGF (SEQ ID NO:47);~~

~~each L is independently a bond or a linker moiety~~ 

~~,~~

~~wherein m is an integer ranging from about 0 to about 50, and wherein ~~~~† indicates the point of attachment to P, and ~~~~‡ indicates the point of attachment to the rest of the conjugate connected to Q via an amide bond with the glutamine residue; and~~

~~each P is independently an immunomodulating oligonucleotide having the structure~~
~~~~



~~wherein ~~~~* and ~~~~** indicate the points of attachment within the oligonucleotide, and wherein ~~~~† indicates the point of attachment to the linker L;~~

~~wherein Ab comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain.~~

~~164. The conjugate of claim 163, wherein each Q tag independently comprises RPQGF (SEQ ID NO:47), RPQGFPP (SEQ ID NO:48), or RPQGFGPP (SEQ ID NO:49).~~

~~165. The conjugate of claim 164, wherein each Q tag is RPQGFGPP (SEQ ID NO:49).~~

~~166. The conjugate of any one of claims 163-165, wherein 1 or 2 Q tags are linked to the antibody or antigen-binding fragment.~~

~~167. The conjugate of any one of claims 163 to 166, wherein the Q tag is linked to the C-terminus of the heavy chain of the antibody .~~

~~168. The conjugate of any one of claims 163 to 167, wherein:~~

(a) the antibody comprises a human IgG1 Fc region comprising L234A, L235A, and/or G237A substitutions, amino acid position numbering according to EU index;

(b) the antibody comprises a wild-type human IgG1 Fc region;

(c) the antibody comprises a human IgG1 Fc region comprising an N297A substitution, amino acid position numbering according to EU index;

(d) the antibody comprises a human IgG1 Fc region comprising a D265A substitution, amino acid position numbering according to EU index;

(e) the antibody comprises a wild-type human IgG2 Fc region;

(f) the antibody comprises a human IgG2 Fc region comprising an N297A substitution, amino acid position numbering according to EU index; or

(g) the antibody comprises a human IgG4 Fc region comprising an S228P substitution, amino acid position numbering according to EU index.

169. The conjugate of any one of claims 163 to 168, wherein m is an integer from about 20 to about 25.

170. The conjugate of claim 169, wherein m is 24.

171. The conjugate of any one of claims 163 to 170, wherein the conjugate has a DAR of 1 or 2.

172. The conjugate of any one of claims 163 to 171, wherein the conjugate binds to human CD22 expressed on the surface of a B cell.

173. The conjugate of claim 172, wherein:

(a) the VH domain comprises a CDR-H1 comprising the sequence of SEQ ID NO:113, a CDR-H2 comprising the sequence of SEQ ID NO:115, and a CDR-H3 comprising the sequence of SEQ ID NO:116, and the VL domain comprises a CDR-L1 comprising the sequence of SEQ ID NO:117, a CDR-L2 comprising the sequence of SEQ ID NO:119, and a CDR-L3 comprising the sequence of SEQ ID NO:120;

(b) the VH domain comprises a CDR-H1 comprising the sequence of SEQ ID NO:114, a CDR-H2 comprising the sequence of SEQ ID NO:189, and a CDR-H3 comprising the sequence of SEQ ID NO:116, and the VL domain comprises a CDR-L1 comprising the sequence of SEQ ID NO:117, a CDR-L2 comprising the sequence of SEQ ID NO:119, and a CDR-L3 comprising the sequence of SEQ ID NO:120;

(c) the VH domain comprises a CDR-H1 comprising the sequence of SEQ ID NO:113, a CDR-H2 comprising the sequence of SEQ ID NO:115, and a CDR-H3 comprising the sequence of SEQ ID NO:116, and the VL domain comprises a CDR-L1 comprising the sequence of SEQ ID NO:118, a CDR-L2 comprising the sequence of SEQ ID NO:177, and a CDR-L3 comprising the sequence of SEQ ID NO:120; or

(d) the VH domain comprises a CDR-H1 comprising the sequence of SEQ ID NO:114, a CDR-H2 comprising the sequence of SEQ ID NO:189, and a CDR-H3 comprising the sequence of SEQ ID NO:116, and the VL domain comprises a CDR-L1 comprising the sequence of SEQ ID NO:118, a CDR-L2 comprising the sequence of SEQ ID NO:177, and a CDR-L3 comprising the sequence of SEQ ID NO:120.

174. The conjugate of claim 172 or claim 173, wherein:

(a) the VH domain comprises the sequence of SEQ ID NO:65, and the VL domain comprises the sequence of SEQ ID NO:87; or

(b) the VH domain comprises the sequence of SEQ ID NO:65, and the VL domain comprises the sequence of SEQ ID NO:73.

175. The conjugate of any one of claims 172 to 174, wherein:

(a) the antibody comprises a heavy chain comprising the sequence of SEQ ID NO:179 and a light chain comprising the sequence of SEQ ID NO:181;

(b) the antibody comprises a heavy chain comprising the sequence of SEQ ID NO:180 and a light chain comprising the sequence of SEQ ID NO:181;

(c) the antibody comprises a heavy chain comprising the sequence of SEQ ID NO:179 and a light chain comprising the sequence of SEQ ID NO:182; or

(d) the antibody comprises a heavy chain comprising the sequence of SEQ ID NO:180 and a light chain comprising the sequence of SEQ ID NO:182.

176. The conjugate of any one of claims 163 to 171, wherein the conjugate binds to human Her2 expressed on the surface of a tumor cell.

177. The conjugate of claim 176, wherein:

(a) the VH domain comprises the sequence of SEQ ID NO:168, and the VL domain comprises the sequence of SEQ ID NO:169; or

(b) the VH domain comprises the sequence of SEQ ID NO:170, and the VL domain comprises the sequence of SEQ ID NO:171.

178. The conjugate of claim 177, wherein:

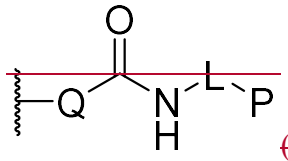
(a) the antibody comprises a heavy chain comprising the sequence of SEQ ID NO:184 and a light chain comprising the sequence of SEQ ID NO:185;

(b) the antibody comprises a heavy chain comprising the sequence of SEQ ID NO:183 and a light chain comprising the sequence of SEQ ID NO:185;

(c) the antibody comprises a heavy chain comprising the sequence of SEQ ID NO:187 and a light chain comprising the sequence of SEQ ID NO:188; or

(d) the antibody comprises a heavy chain comprising the sequence of SEQ ID NO:186 and a light chain comprising the sequence of SEQ ID NO:188.

179. A conjugate comprising an antibody (Ab) and an immunomodulating oligonucleotide (P), wherein the antibody comprises two antibody light chains, two antibody heavy chains, and two Q-tag peptides; wherein each of the Q-tag peptides (Q) comprises the amino acid sequence RPQGF (SEQ ID NO:47); wherein each of the Q-tag peptides is linked to the C-terminus of one of the antibody heavy chains; wherein one of the two Q-tag peptides is linked to the immunomodulating oligonucleotide via an amide bond with the glutamine residue of the Q-tag peptide and a linker (L) as shown in Formula (A):



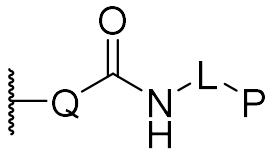
(A),

wherein 〰 indicates the point of attachment of Q to the antibody (Ab).

180. A conjugate comprising an antibody (Ab), wherein the antibody comprises two antibody light chains, two antibody heavy chains, and two Q-tag peptides comprising a peptide sequence RPQGF (SEQ ID NO:47); wherein each of the Q-tag peptides is linked to the C-terminus of one of the antibody heavy chains; and wherein at least one of the Q-tag peptides is linked to an immunomodulating oligonucleotide (P) via an amide bond with the glutamine residue of the Q-tag peptide and linker (L) as shown in **FIG. 16A** or **FIG. 16B.**

181.17. A conjugate comprising an antibody or antigen-binding fragment thereof (Ab) and one or more immunomodulating oligonucleotides (P), wherein the antibody or antigen-binding fragment is linked to one or more Q-tag peptides (Q) comprising a Q-tag peptide sequence RPQGF (SEQ ID NO:47), and wherein each immunomodulating

oligonucleotide is linked to a Q-tag peptide via an amide bond with the glutamine residue of the Q-tag peptide and a linker (L) as shown in Formula (A)

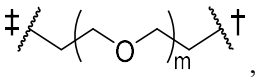


(A),

wherein:

〰 indicates the point of attachment of each Q to the antibody or antigen-binding fragment thereof (Ab)

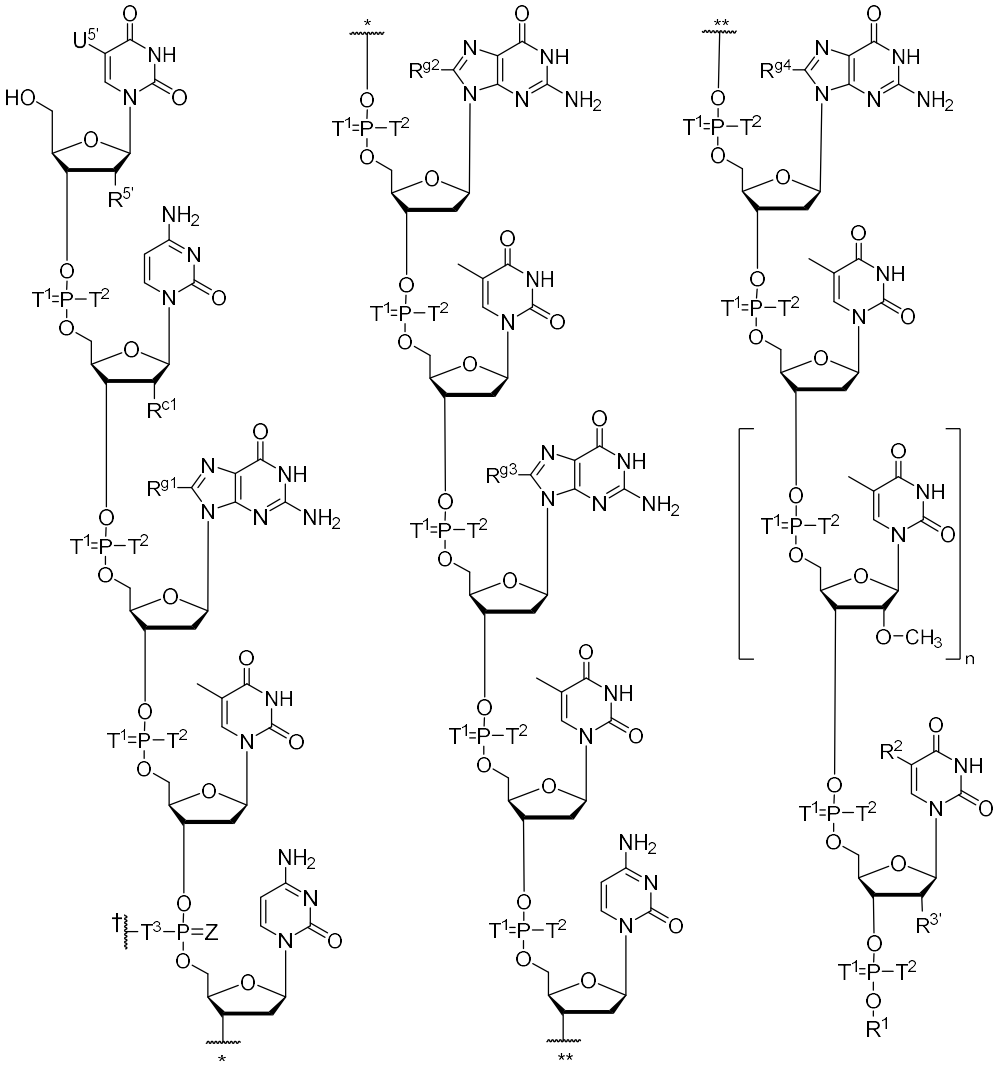
each Q independently comprises a Q-tag peptide sequence RPQGF (SEQ ID NO:47);

each L is independently a bond or a linker moiety 

,

wherein m is an integer ranging from about 0 to about 50, and wherein 〰 † indicates the point of attachment to P, and 〰 ‡ indicates the point of attachment to the rest of the conjugate connected to Q via an amide bond with the glutamine residue; and

each P is independently an immunomodulating oligonucleotide having the structure

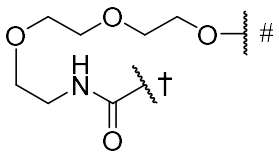


wherein ~~~ * and ~~~ ** indicate the points of attachment within the oligonucleotide, and wherein ~~~ † indicates the point of attachment to the linker L;

each T^1 is independently O or S;

each T^2 is S^-;

provided that each P comprises one or two pairs of geminal T^1 and T^2 wherein T^1 is S and T^2 is S, and the one or two pairs of geminal T^1 and T^2 are between nucleoside residues 2 and 3, between nucleoside residues 3 and 4, between nucleoside residues 5 and 6, between nucleoside residues 6 and 7, between nucleoside residues 7 and 8, between nucleoside residues 8 and 9, between nucleoside residues 9 and 10, or between nucleoside residues 10 and 11;

T^3 is a group  , wherein ~~~ † indicates the point of attachment to L and wherein ~~~ # indicates the point of attachment to the rest of the oligonucleotide;

Z is O or S;

$U^{5'}$ is –H or halogen;

$R^{5'}$ is -H;

R^{c1} is -H;

R^{g1}, R^{g2}, R^{g3}, and R^{g4} are H;

$R^{3'}$ is methoxy;

R^1 is $-(CH_2)_3$-OH;

R^2 is -methyl; and

n is 1,

wherein Ab is an antibody or antigen-binding fragment thereof that binds a tumor associated antigen.

~~182.~~18. The conjugate of claim 17~~181~~, wherein the tumor associated antigen is:

(a) expressed by a cancer cell, wherein optionally the cancer cell is a B cell cancer, solid tumor, breast cancer, colorectal cancer, lung cancer, non-small cell lung carcinoma (NSCLC), renal cell carcinoma (RCC), head and neck cancer, head and neck squamous cell carcinoma (HNSCC), hepatocellular carcinoma (HCC), bile duct carcinoma, esophageal cancer, cervical cancer, cervical squamous cell carcinoma, Merkle cell carcinoma, endometrial cancer, ovarian cancer, pancreatic cancer, melanoma, cutaneous melanoma, sarcoma, lymphoma, leukemia, acute lymphoblastic leukemia (ALL), hairy cell leukemia, diffuse large B cell lymphoma (DLBCL), small cell lung cancer (SCLC), cutaneous squamous cell carcinoma, urothelial cancer, or gastric cancer cell;

(b) expressed by a cancer-associated stromal cell, wherein optionally the cancer is a B cell cancer, solid tumor, breast cancer, colorectal cancer, lung cancer, non-small cell lung carcinoma (NSCLC), renal cell carcinoma (RCC), head and neck cancer, head and neck squamous cell carcinoma (HNSCC), hepatocellular carcinoma (HCC), bile duct carcinoma, esophageal cancer, cervical cancer, cervical squamous cell carcinoma, Merkle cell carcinoma, endometrial cancer, ovarian cancer, pancreatic cancer, melanoma,

cutaneous melanoma, sarcoma, lymphoma, leukemia, acute lymphoblastic leukemia (ALL), hairy cell leukemia, diffuse large B cell lymphoma (DLBCL), small cell lung cancer (SCLC), cutaneous squamous cell carcinoma, urothelial cancer, or gastric cancer; or

(c) selected from the group consisting of CD19, CD20, CD22, CD25, CD30, CD33, CD38, CD40, CD44, CD45R (B220), CD49, CD52, CD56, CD70, CD74, CD79a, CD79b, CD93, CD123, CD138, CD163, CD205, CD206, CD274, CD303, and CD304, folate receptor alpha, folate receptor beta, mesothelin, PSMA, Her-2, EGFR, CLDN18.2, 5T4, CD47, nectin 4, transferrin receptor, integrin, cripto, EphA2, AGS-5, AGS-16, CanAg, EpCAM, IL4 receptor, IL2 receptor, Lewis Y, GPNMB, DLL3, GCC, GPA33, tissue factor (TF), PD-L1, and Trop2.

~~183. The conjugate of claim 181, wherein the tumor associated antigen is expressed by a cancer-associated stromal cell.~~

~~184. The conjugate of claim 181, wherein the tumor associated antigen is selected from the group consisting of CD19, CD20, CD22, CD25, CD30, CD33, CD38, CD40, CD44, CD45R (B220), CD49, CD52, CD56, CD70, CD74, CD79a, CD79b, CD93, CD123, CD138, CD163, CD205, CD206, CD274, CD303, and CD304, folate receptor alpha, folate receptor beta, mesothelin, PSMA, Her-2, EGFR, CLDN18.2, 5T4, CD47, nectin 4, transferrin receptor, integrin, cripto, EphA2, AGS-5, AGS-16, CanAg, EpCAM, IL4 receptor, IL2 receptor, Lewis Y, GPNMB, DLL3, GCC, GPA33, tissue factor (TF), PD-L1, and Trop2.~~

~~185. The conjugate of any one of claims 181-184, wherein the cancer is breast cancer, colorectal cancer, lung cancer, head and neck cancer, melanoma, lymphoma, or leukemia.~~

~~186. The conjugate of any one of claims 181-185, wherein each Q tag independently comprises RPQGF (SEQ ID NO:47), RPQGFPP (SEQ ID NO:48), or RPQGFGPP (SEQ ID NO:49).~~

~~187. The conjugate of any one of claims 181-186, wherein each Q tag is RPQGFGPP (SEQ ID NO:49).~~

~~188. The conjugate of any one of claims 181-187, wherein the antibody comprises two antibody heavy chains and two antibody light chains, and wherein one Q tag is attached to one or both heavy chain(s) of the antibody.~~

~~189. The conjugate of any one of claims 181-188, wherein the Q-tag is linked to the C-terminus of the heavy chain of the antibody.~~

~~190. The conjugate of any one of claims 181-188, wherein the Q-tag is within the Fc domain.~~

~~191. The conjugate of any one of claims 181-190, wherein:~~

~~(a) the antibody comprises a human IgG1 Fc region comprising L234A, L235A, and/or G237A substitutions, amino acid position numbering according to EU index;~~

~~(b) the antibody comprises a wild-type human IgG1 Fc region;~~

~~(c) the antibody comprises a human IgG1 Fc region comprising an N297A substitution, amino acid position numbering according to EU index;~~

~~(d) the antibody comprises a human IgG1 Fc region comprising a D265A substitution, amino acid position numbering according to EU index;~~

~~(e) the antibody comprises a wild-type human IgG2 Fc region;~~

~~(f) the antibody comprises a human IgG2 Fc region comprising an N297A substitution, amino acid position numbering according to EU index; or~~

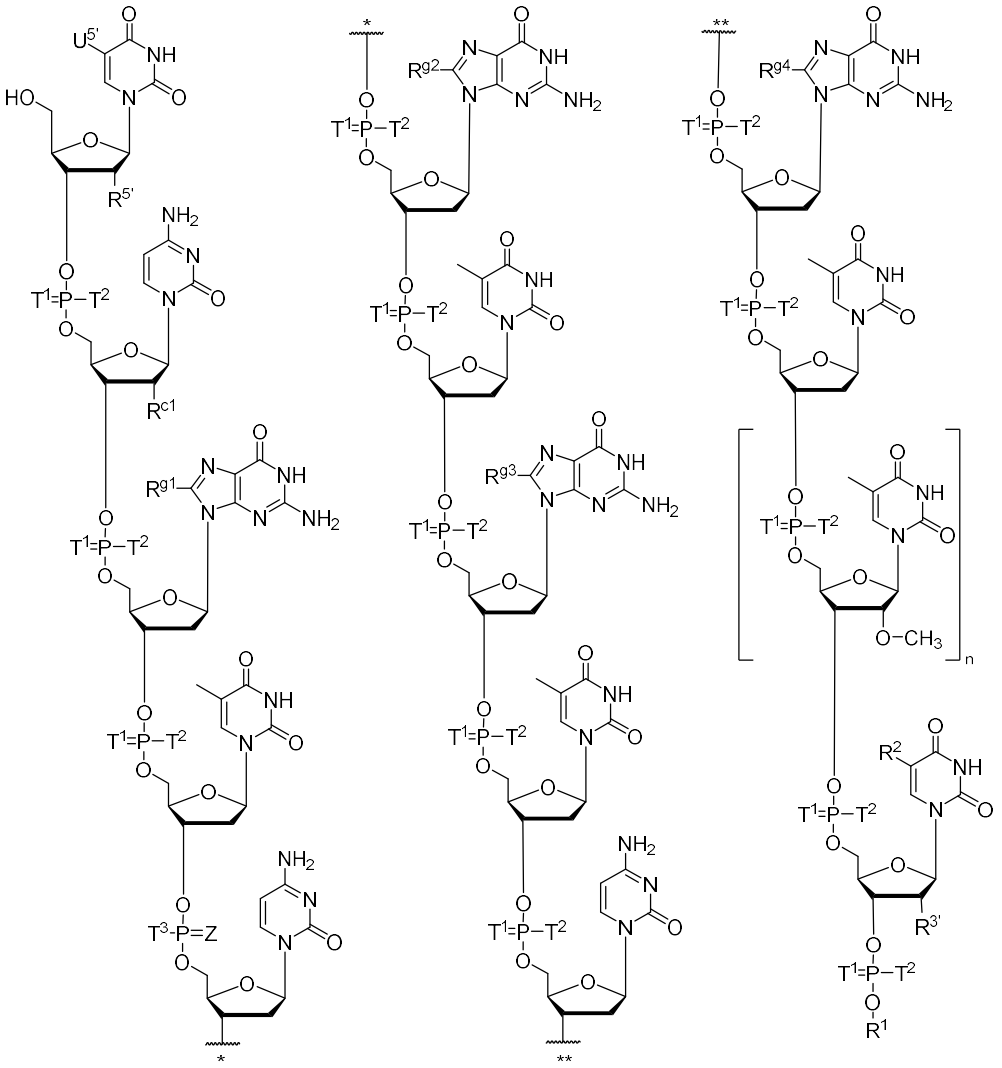
~~(g) the antibody comprises a human IgG4 Fc region comprising an S228P substitution, amino acid position numbering according to EU index.~~

~~192.~~19. The conjugate of any one of claims 17~~181~~-18~~191~~, wherein m is an integer from about 20 to about 25; optionally wherein m is 24.

~~193. The conjugate of any one of claims 181-192, wherein m is 24.~~

~~194. The conjugate of any one of claims 181-193, wherein the conjugate has a DAR of 1 or 2.~~

~~195.~~20. An immunomodulating oligonucleotide of Formula (C):



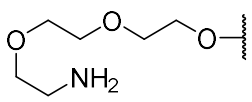
(C),

wherein

〰 * and 〰 ** indicate the points of attachment within the oligonucleotide;

each T^1 is independently O or S;

each T^2 is S^-;

T^3 is a group  , wherein m is an integer from 0 to 50 and wherein 〰 indicates the point of attachment to the rest of the oligonucleotide;

Z is O or S;

$U^{5'}$ is –H or halogen;

$R^{5'}$ is -H or methoxy;

R^{c1} is -H or methoxy;

R^{g1}, R^{g2}, R^{g3}, and R^{g4} are H;

$R^{3'}$ is methoxy;

R^1 is $-(CH_2)_3$-OH;

R^2 is -H or methyl; and

n is an integer from 0 to 2,

or a pharmaceutically acceptable salt thereof.

~~196.~~21. The immunomodulating oligonucleotide of claim 20~~195~~, wherein:

(a) Z is S;

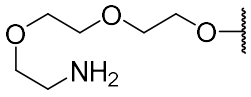
(b) the oligonucleotide comprises at least one pair of geminal T^1 and T^2 wherein T^1 is S and T^2 is S^-;

(c) the oligonucleotide comprises at least two pairs of geminal T^1 and T^2 wherein T^1 is S and T^2 is S^-;

(d) $R^{5'}$ is H or methoxy;

(e) R^{c1} is H or methoxy;

(f) R^2 is methyl or H;

(g) T^3 is ; and/or

(h) $U^{5'}$ is H or a halogen, optionally bromo.

~~197. The immunomodulating oligonucleotide of claim 195 or claim 196, wherein the oligonucleotide comprises at least one pair of geminal T^1 and T^2 wherein T^1 is S and T^2 is S^-.~~

~~198. The immunomodulating oligonucleotide of any one of claims 195 to 197, wherein the oligonucleotide comprises at least two pairs of geminal T^1 and T^2 wherein T^1 is S and T^2 is S^-.~~

~~199. The immunomodulating oligonucleotide of any one of claims 195 to 198, wherein $R^{5'}$ is H.~~

~~200. The immunomodulating oligonucleotide of any one of claims 195 to 198, wherein $R^{5'}$ is methoxy.~~

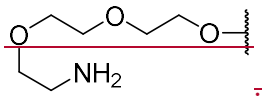
~~201. The immunomodulating oligonucleotide of any one of claims 195 to 200, wherein R^{e1} is H.~~

202. The immunomodulating oligonucleotide of any one of claims 195 to 200, wherein R^{e1} is methoxy.

203. The immunomodulating oligonucleotide of any one of claims 195 to 202, wherein R^2 is methyl.

204. The immunomodulating oligonucleotide of any one of claims 195 to 202, wherein R^2 is H.

205. The immunomodulating oligonucleotide of any one of claims 195 to 204, wherein T^3 is

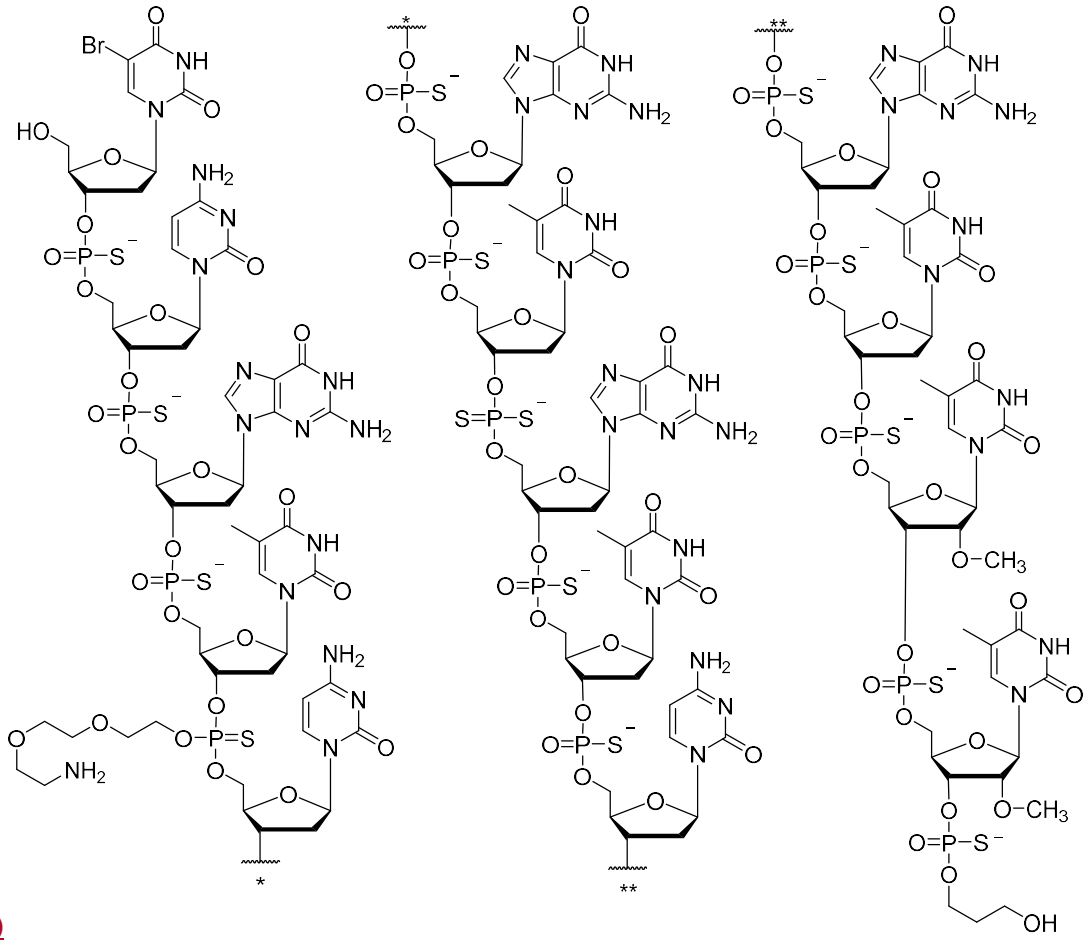


206. The immunomodulating oligonucleotide of any one of claims 195 to 205, wherein $U^{5'}$ is halogen.

207. The immunomodulating oligonucleotide of claim 206, wherein $U^{5'}$ is bromo.

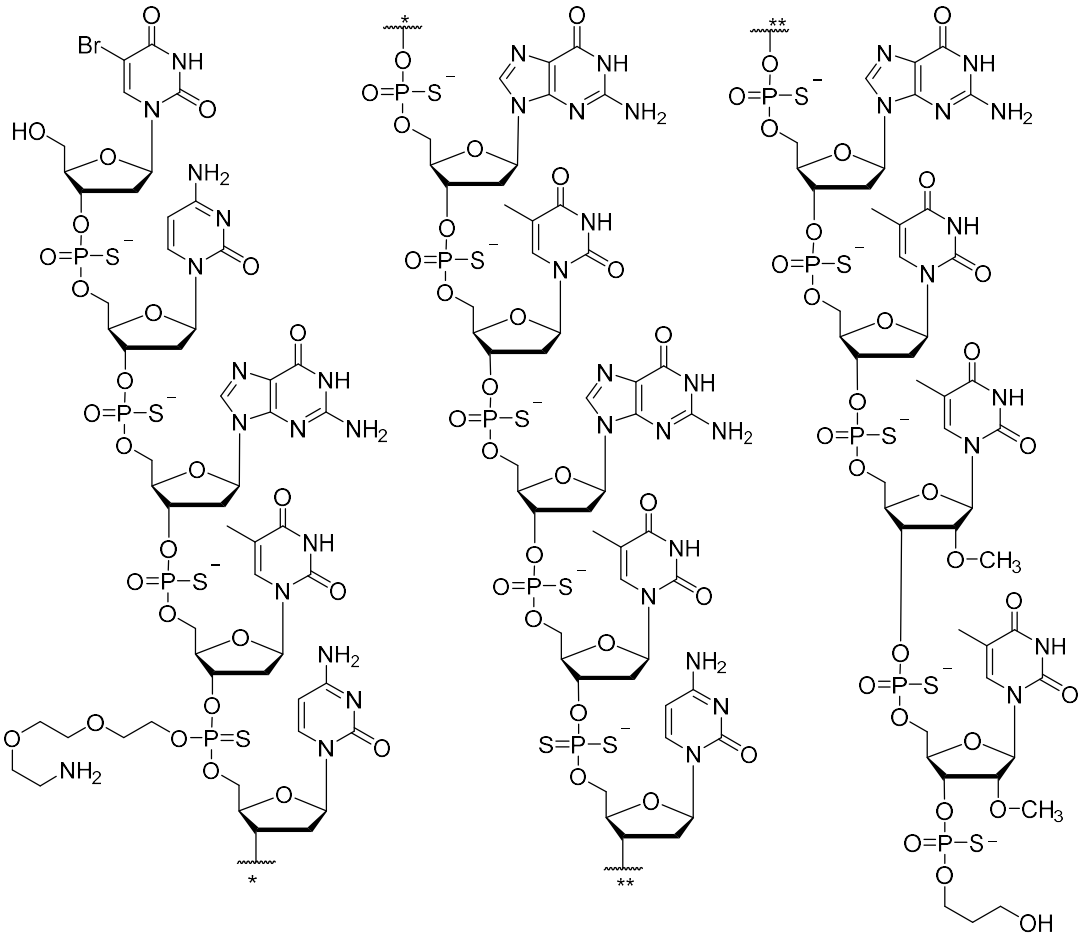
208. The immunomodulating oligonucleotide of any one of claims 195 to 205, wherein $U^{5'}$ is H.

~~209.~~22.The immunomodulating oligonucleotide of claim 20~~195~~, wherein the oligonucleotide is:



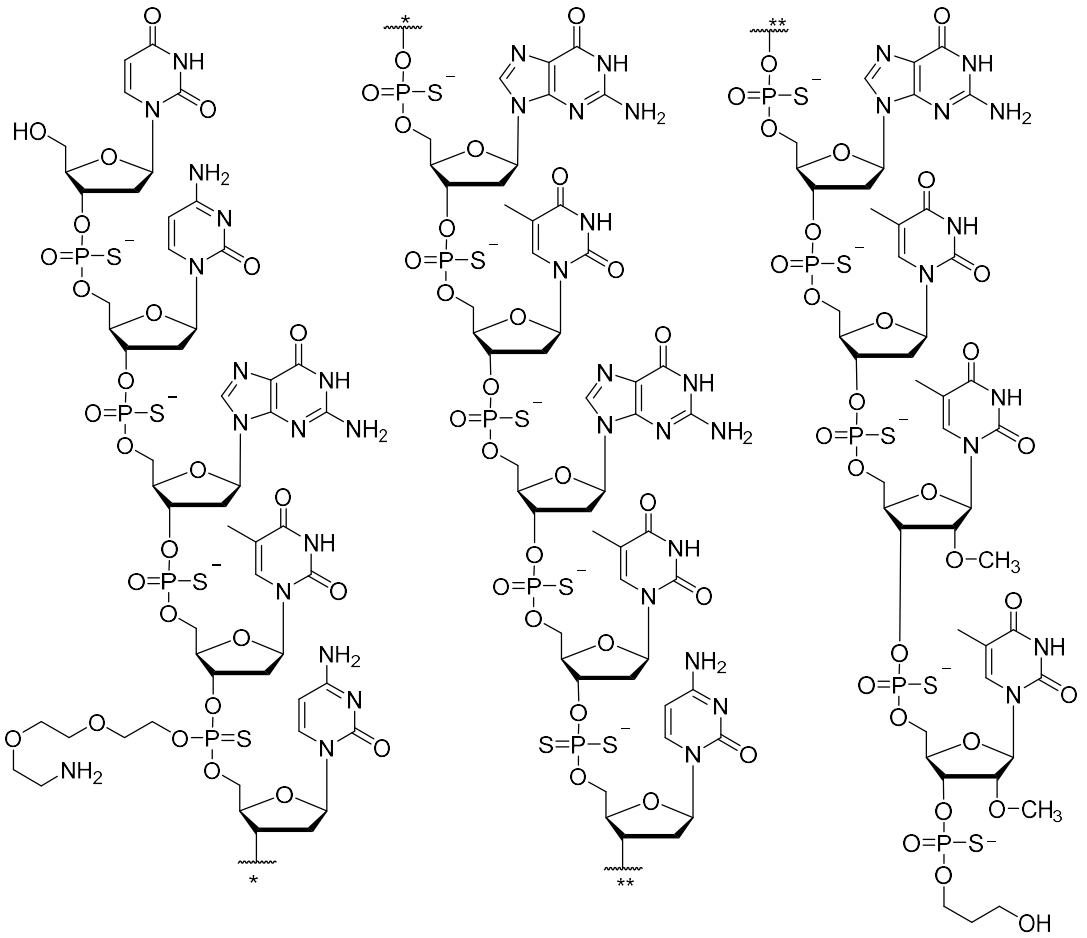
(a)

;



(b)

:

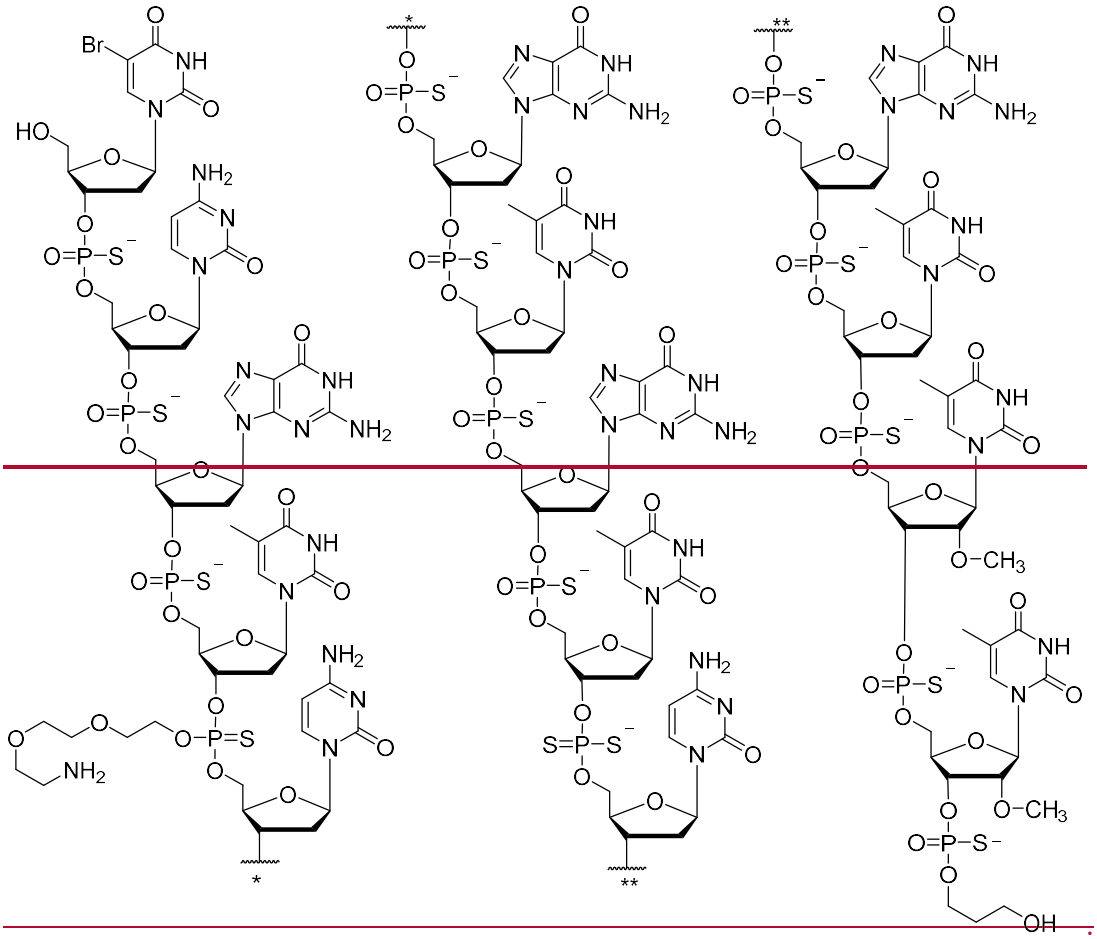


(c)

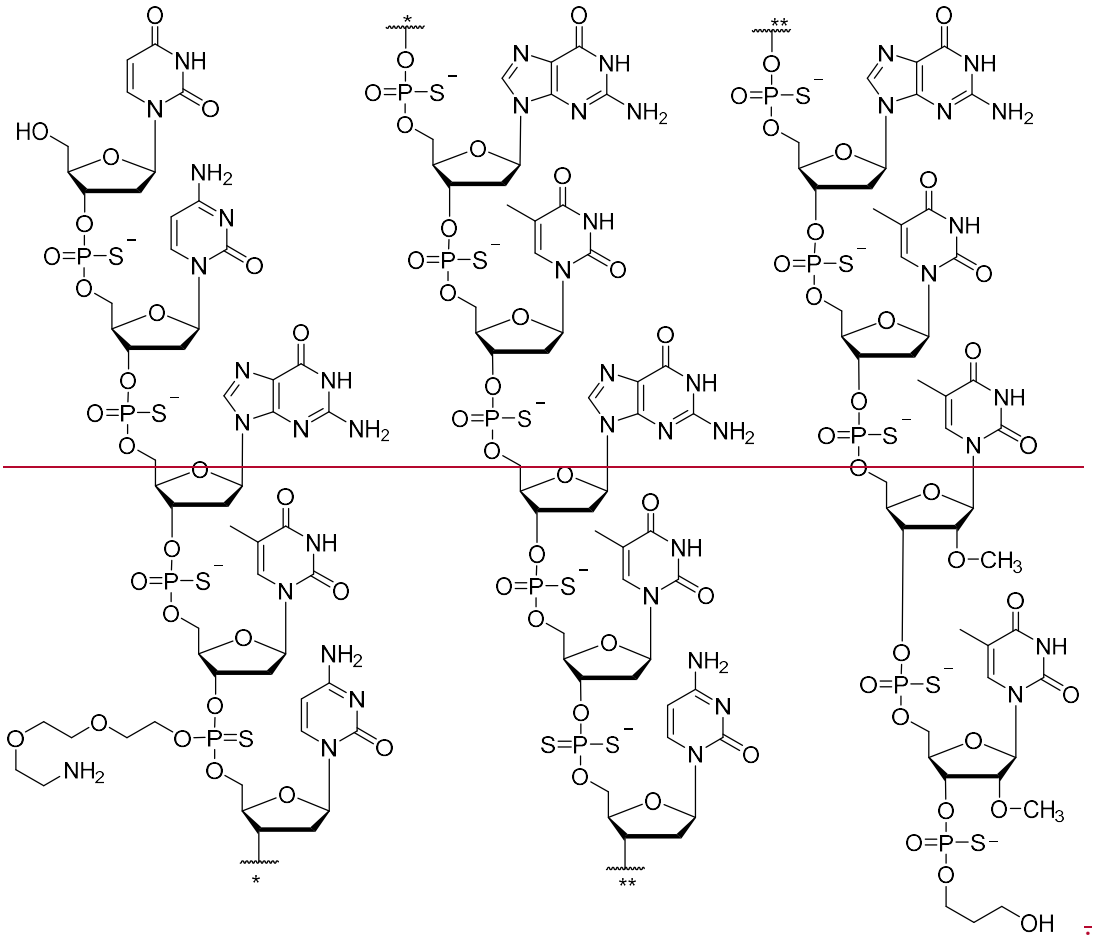
; or

(d) selected from the group consisting of the oligonucleotides of Table 10, or a pharmaceutically acceptable salt thereof.

~~210. The immunomodulating oligonucleotide of claim 195, wherein the oligonucleotide is~~

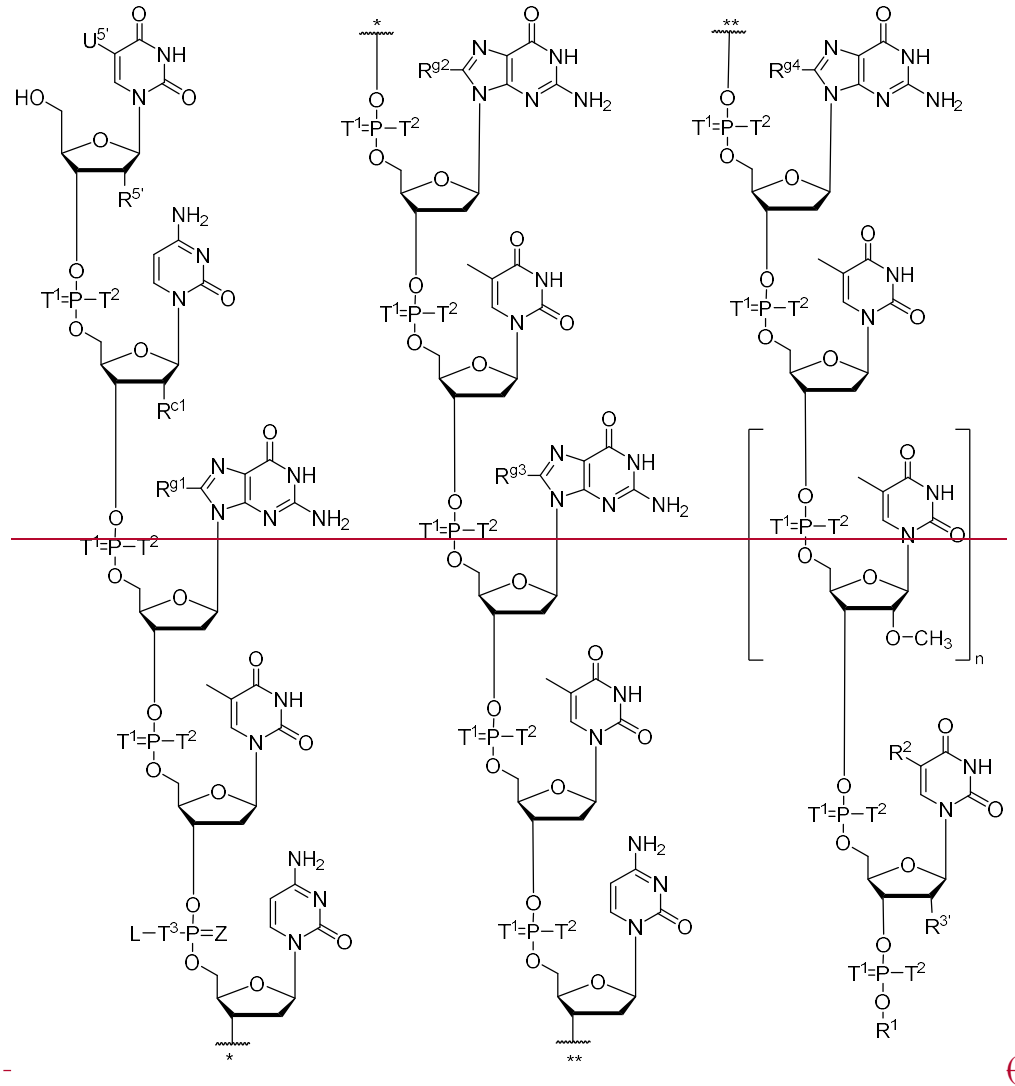


~~211. The immunomodulating oligonucleotide of claim 195, wherein the oligonucleotide is~~



~~212. The immunomodulating oligonucleotide of claim 195, wherein the oligonucleotide is selected from the group consisting of the oligonucleotides of ***Table 10***, or a pharmaceutically acceptable salt thereof.~~

~~213. An immunomodulating oligonucleotide of formula (D):~~



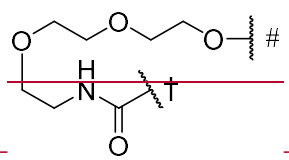
(D),

wherein

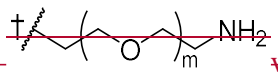
~~* and ** indicate the points of attachment within the oligonucleotide;~~

~~each T^1 is independently O or S;~~

~~each T^2 is S^-;~~



~~T^3 is a group , wherein † indicates the point of attachment to L and wherein # indicates the point of attachment to the rest of the oligonucleotide;~~



~~L is a group wherein m is an integer from 0 to 50 and wherein † indicates the point of attachment to the rest of the oligonucleotide via T^3;~~

~~Z is O or S;~~

~~$U^{5'}$ is –H or halogen;~~

~~$R^{5'}$ is –H or methoxy;~~

~~R^{e1} is –H or methoxy;~~

~~R^{g1}, R^{g2}, R^{g3}, and R^{g4} are H;~~

~~$R^{3'}$ is methoxy;~~

~~R^{1} is $-(CH_2)_3$-OH;~~

~~R^{2} is –H or methyl; and~~

~~n is an integer from 0 to 2,~~

~~or a pharmaceutically acceptable salt thereof.~~

~~214. The immunomodulating oligonucleotide of claim 213, wherein Z is S.~~

~~215. The immunomodulating oligonucleotide of claim 213 or claim 214, wherein the oligonucleotide comprises at least one pair of geminal T^1 and T^2 wherein T^1 is S and T^2 is S^-.~~

~~216. The immunomodulating oligonucleotide of any one of claims 213 to 215, wherein the oligonucleotide comprises at least two pairs of geminal T^1 and T^2 wherein T^1 is S and T^2 is S^-.~~

~~217. The immunomodulating oligonucleotide of any one of claims 213 to 216, wherein $R^{5'}$ is H.~~

~~218. The immunomodulating oligonucleotide of any one of claims 213 to 216, wherein $R^{5'}$ is methoxy.~~

~~219. The immunomodulating oligonucleotide of any one of claims 213 to 218, wherein R^{e1} is H.~~

~~220. The immunomodulating oligonucleotide of any one of claims 213 to 218, wherein R^{e1} is methoxy.~~

~~221. The immunomodulating oligonucleotide of any one of claims 213 to 220, wherein R^2 is methyl.~~

~~222. The immunomodulating oligonucleotide of any one of claims 213 to 220, wherein R^2 is H.~~

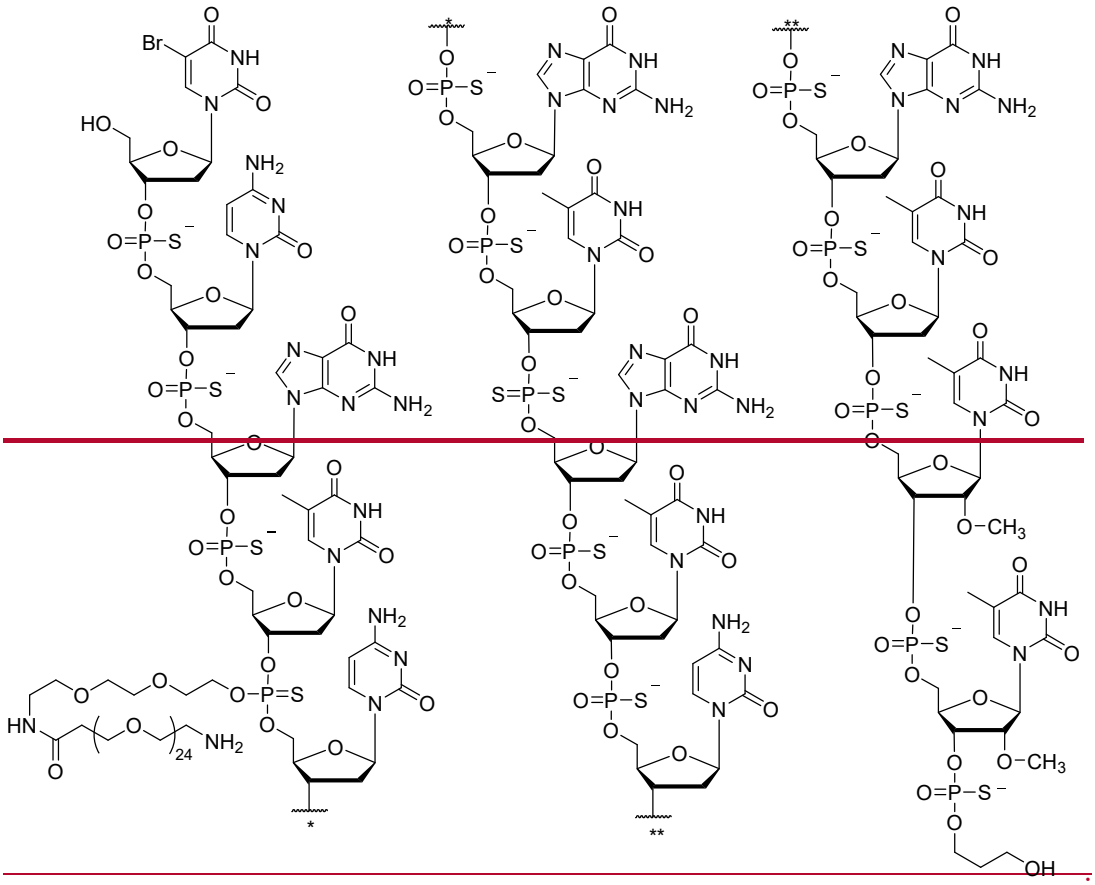
~~223. The immunomodulating oligonucleotide of any one of claims 213 to 222, wherein m is an integer from 20 to 25.~~

224. The immunomodulating oligonucleotide of any one of claims 213 to 223, wherein $U^{5'}$ is halogen.

225. The immunomodulating oligonucleotide of claim 224, wherein $U^{5'}$ is bromo.

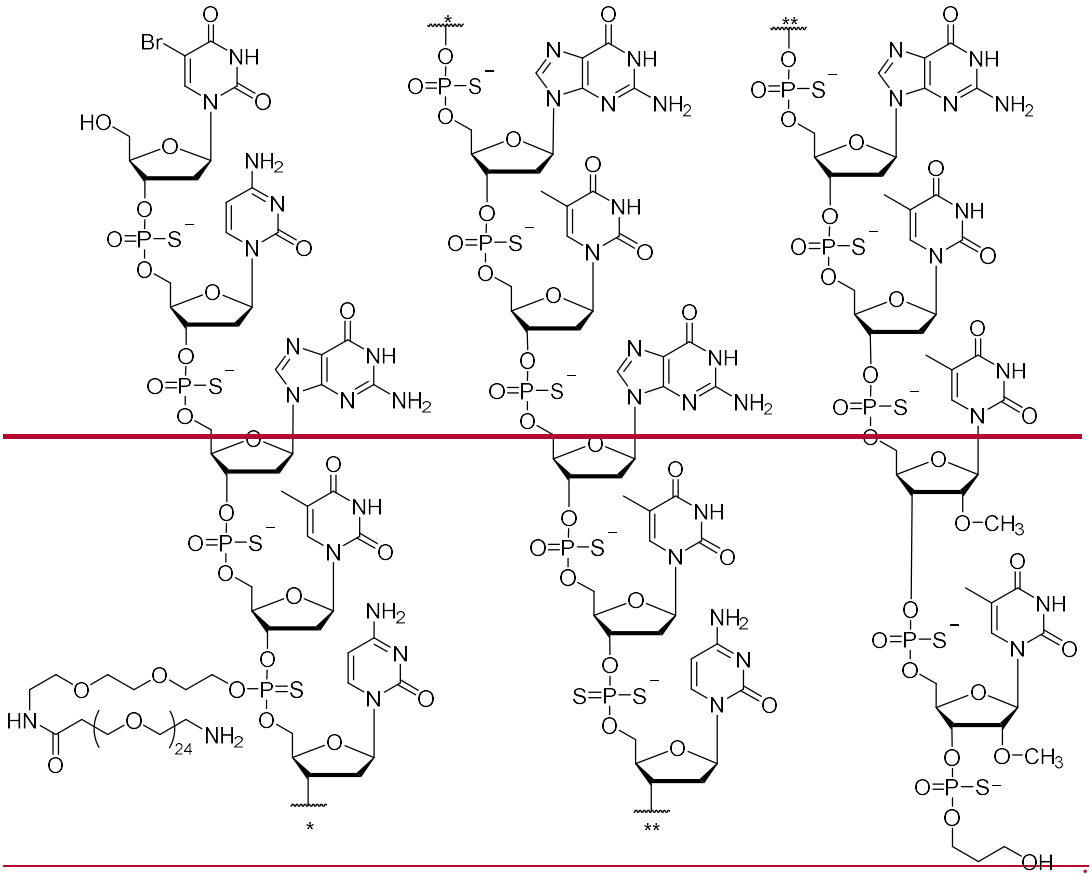
226. The immunomodulating oligonucleotide of any one of claims 213 to 223, wherein $U^{5'}$ is -H.

227. The immunomodulating oligonucleotide of claim 213, wherein the oligonucleotide is



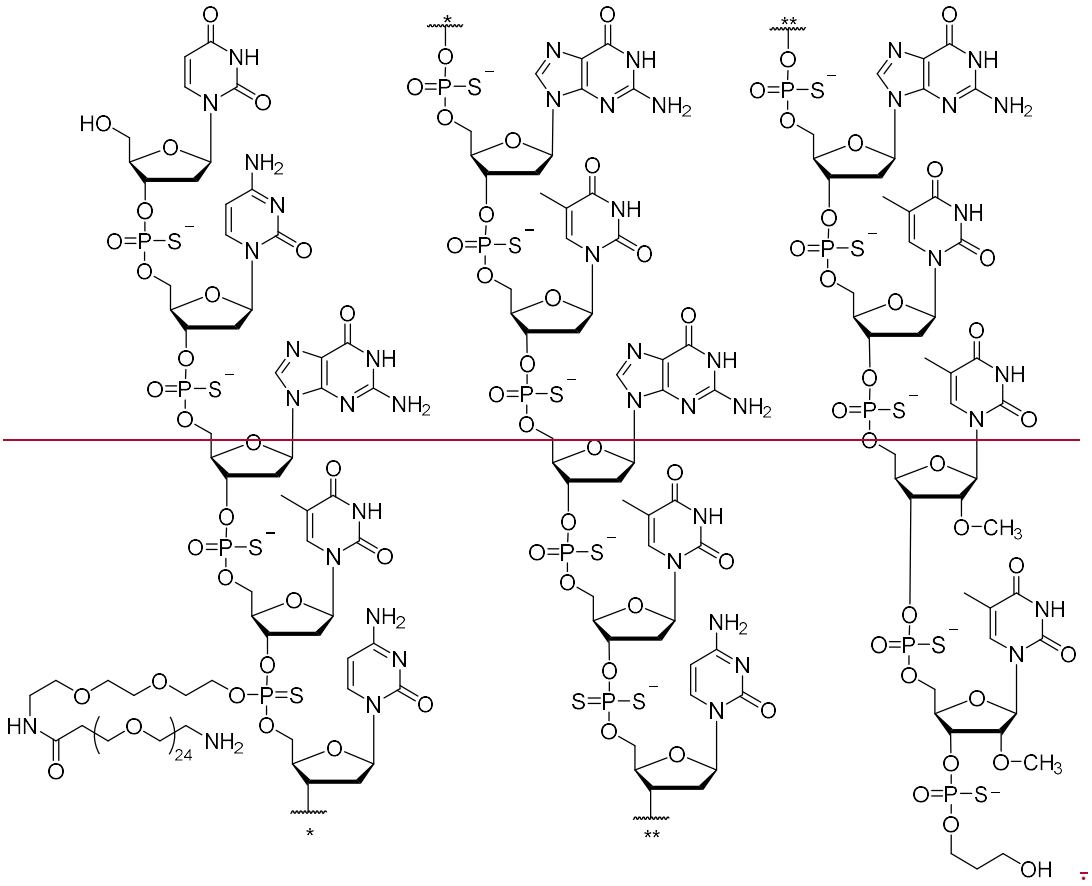
.

228. The immunomodulating oligonucleotide of claim 213, wherein the oligonucleotide is



.

~~229. The immunomodulating oligonucleotide of claim 213, wherein the oligonucleotide is~~



~~230. The immunomodulating oligonucleotide of claim 213, wherein the oligonucleotide is selected from the group consisting of the oligonucleotides of ***Table 12***, or a pharmaceutically acceptable salt thereof.~~

~~231. An immunomodulating oligonucleotide selected from the group consisting of the oligonucleotides of ***Table 10*** and ***Table 12***, or a pharmaceutically acceptable salt thereof.~~

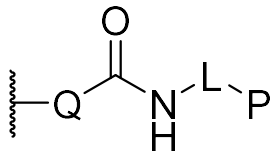
~~232.~~23. A conjugate comprising a protein, at least one Q tag peptide sequence comprising a glutamine residue, and at least one immunomodulatory oligonucleotide, wherein the Q-tag peptide sequence is naturally occurring or synthetic, and wherein each immunomodulatory oligonucleotide is linked to a Q-tag via an amide bond with the glutamine residue, wherein at least one Q-tag peptide sequence is selected from the group consisting of SEQ ID NOs: 40-55.

~~233.~~24. The conjugate of claim 23~~2~~, wherein the immunomodulatory oligonucleotide has a sequence selected from the group consisting of the oligonucleotides of ***Table 10*** and

Table 12; and/or the protein is an antibody comprising a light chain variable domain (VL) and a heavy chain variable domain (VH), and wherein VH comprises the sequence SEQ ID NO: 56; and VL comprises the sequence SEQ ID NO: 57.

~~234. The conjugate of claim 232 or 233, wherein the protein is an antibody comprising a light chain variable domain (VL) and a heavy chain variable domain (VH), and wherein VH comprises the sequence SEQ ID NO: 56; and VL comprises the sequence SEQ ID NO: 57.~~

25. A conjugate comprising an anti-CD22 antibody (Ab) and an immunomodulating oligonucleotide (P), wherein the Ab comprises two antibody light chains, two antibody heavy chains, and two Q-tag peptides (Q) having at least one glutamine residue; wherein one Q-tag peptide is linked to the C-terminus of each of the two antibody heavy chains; wherein one of the two Q-tag peptides is linked to the immunomodulating oligonucleotide via an amide bond with the glutamine residue of the Q-tag peptide and a linker (L) as shown in Formula (A):

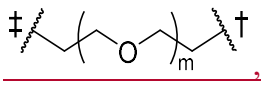


(A),

wherein 〰 indicates the point of attachment of Q to the antibody (Ab);

wherein each heavy chain of the Ab comprises a heavy chain variable (VH) domain comprising the amino acid sequence of SEQ ID NO:65, and each light chain of the Ab comprises a light chain variable (VL) domain comprising an amino acid sequence selected from the group consisting of SEQ ID Nos:68, 73, and 87;

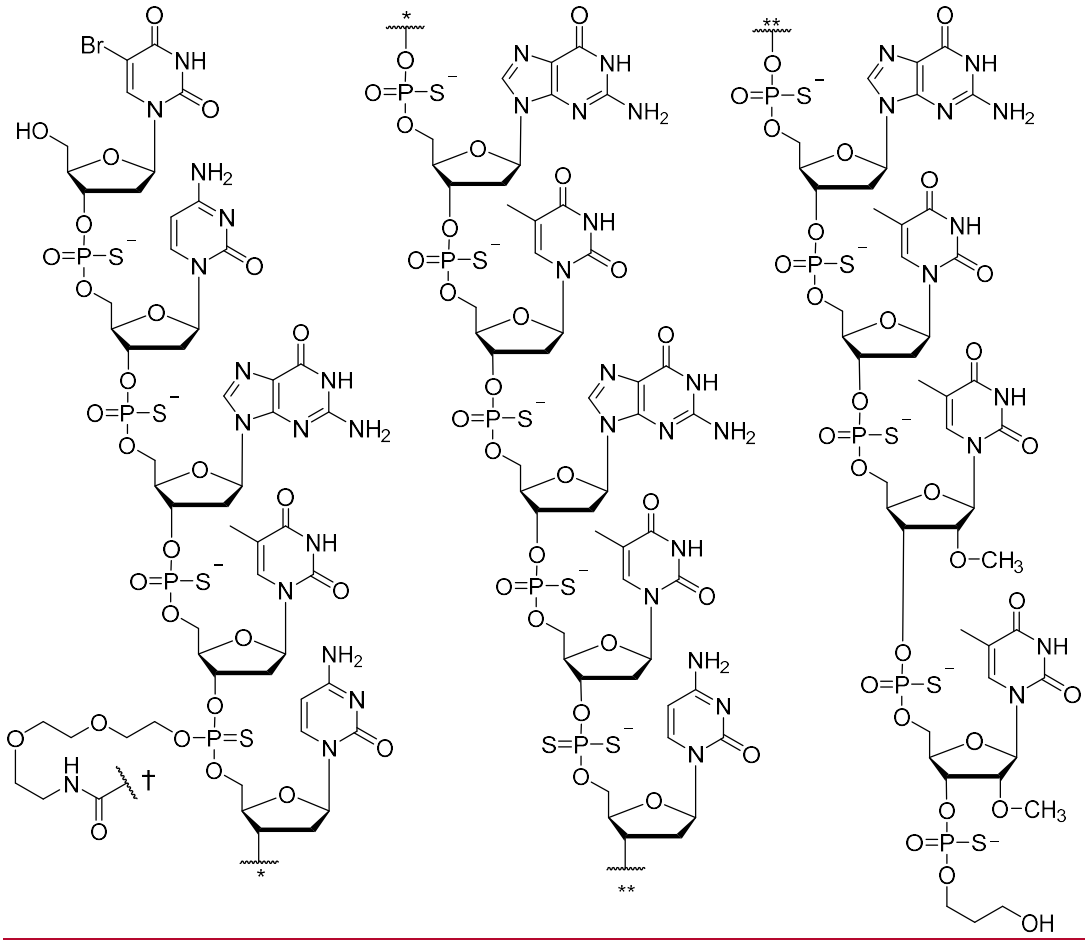
wherein the linker L is



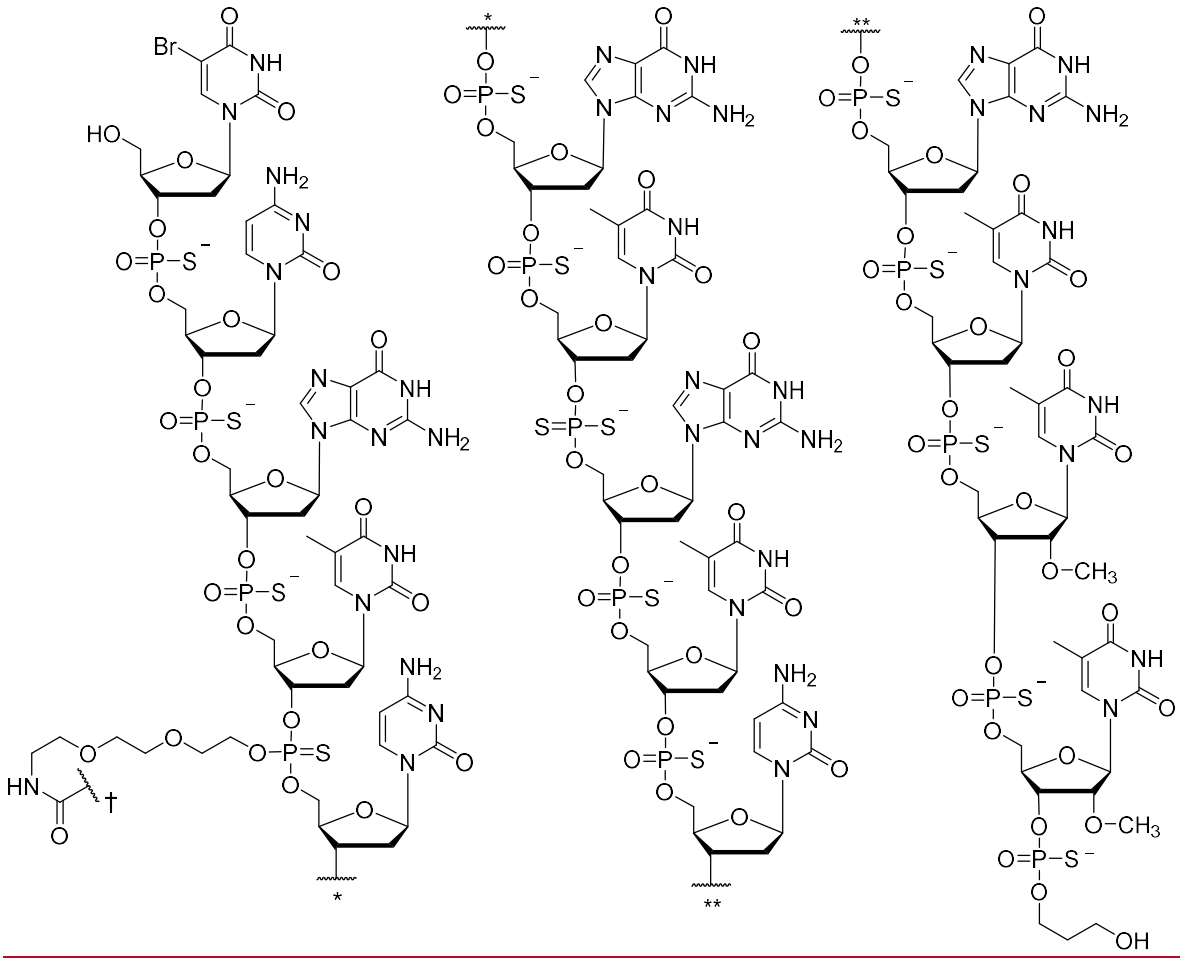
,

wherein m is 24, and wherein 〰 † indicates the point of attachment to the oligonucleotide P, and 〰 ‡ indicates the point of attachment to the glutamine residue of the Q-tag; and

wherein the oligonucleotide P comprises the structure:



or



or a pharmaceutically acceptable salt thereof, wherein ~~* and ~~** indicate the points of attachment within the oligonucleotide, and wherein ~~† indicates the point of attachment to the linker L.

26. The conjugate of claim 25, wherein:

(a) each heavy chain of the Ab comprises a heavy chain variable (VH) domain comprising the amino acid sequence of SEQ ID NO:65, and wherein each light chain of the Ab comprises a light chain variable (VL) domain comprising the amino acid sequence of SEQ ID NO:68;

(b) each heavy chain of the Ab comprises a heavy chain variable (VH) domain comprising the amino acid sequence of SEQ ID NO:65, and wherein each light chain of the Ab comprises a light chain variable (VL) domain comprising the amino acid sequence of SEQ ID NO:73; or

(c) each heavy chain of the Ab comprises a heavy chain variable (VH) domain comprising the amino acid sequence of SEQ ID NO:65, and wherein each light chain of the Ab comprises a light chain variable (VL) domain comprising the amino acid sequence of SEQ ID NO:87.

27. The conjugate of claim 25 or claim 26, wherein each of the two Q-tag peptides comprises the amino acid sequence RPQGFGPP (SEQ ID NO:49).

28. The conjugate of claim 25, wherein:

(a) each heavy chain of the Ab including Q comprises the amino acid sequence of SEQ ID NO:179, and each light chain of the Ab comprises the amino acid sequence of SEQ ID NO:181;

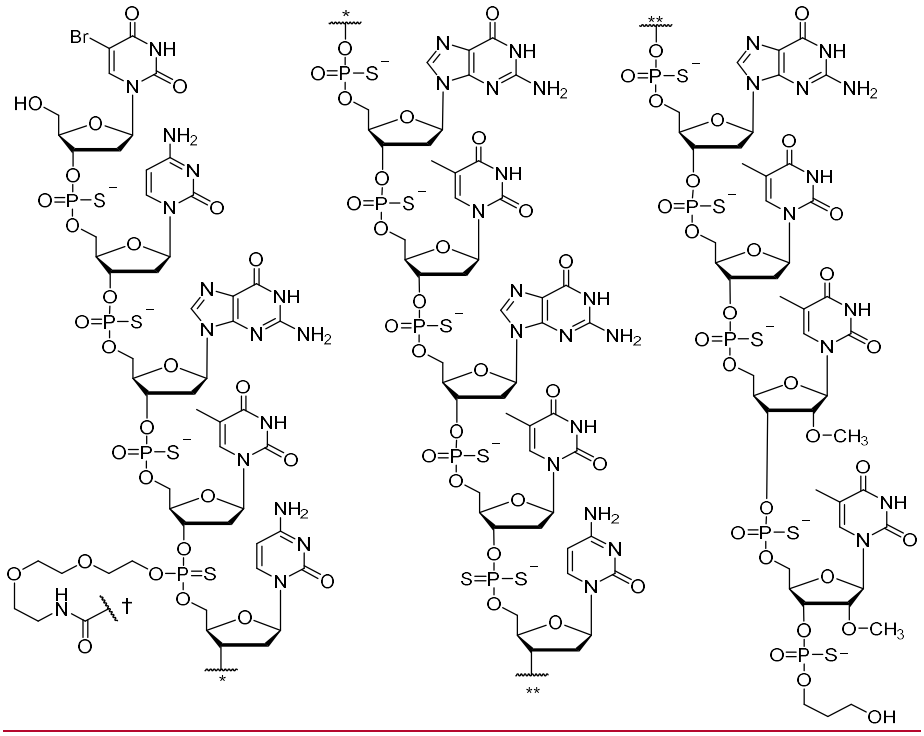
(b) each heavy chain of the Ab including Q comprises the amino acid sequence of SEQ ID NO:179, and each light chain of the Ab comprises the amino acid sequence of SEQ ID NO:182;

(c) each heavy chain of the Ab including Q comprises the amino acid sequence of SEQ ID NO:180, and each light chain of the Ab comprises the amino acid sequence of SEQ ID NO:181; or

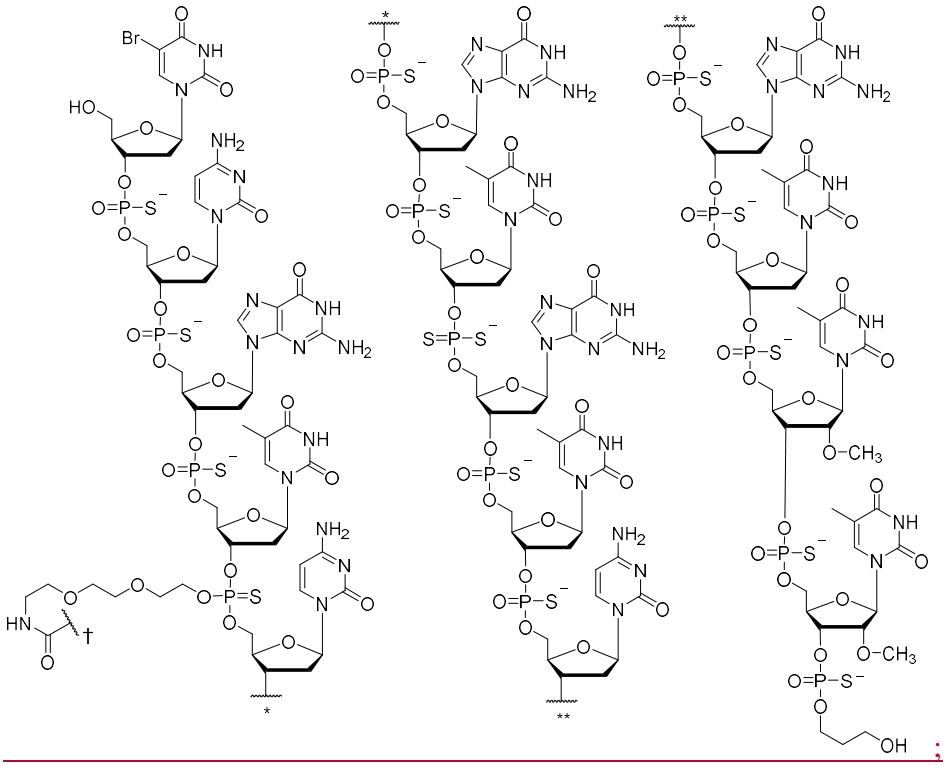
(d) each heavy chain of the Ab including Q comprises the amino acid sequence of SEQ ID NO:180, and each light chain of the Ab comprises the amino acid sequence of SEQ ID NO:182.

29. The conjugate of claim 25, wherein:

(a) each of the two Q-tag peptides comprises the amino acid sequence RPQGFGPP (SEQ ID NO:49), each heavy chain of the Ab including Q comprises the amino acid sequence of SEQ ID NO:179, each light chain of the Ab comprises the amino acid sequence of SEQ ID NO:182, and the oligonucleotide P comprises the structure:

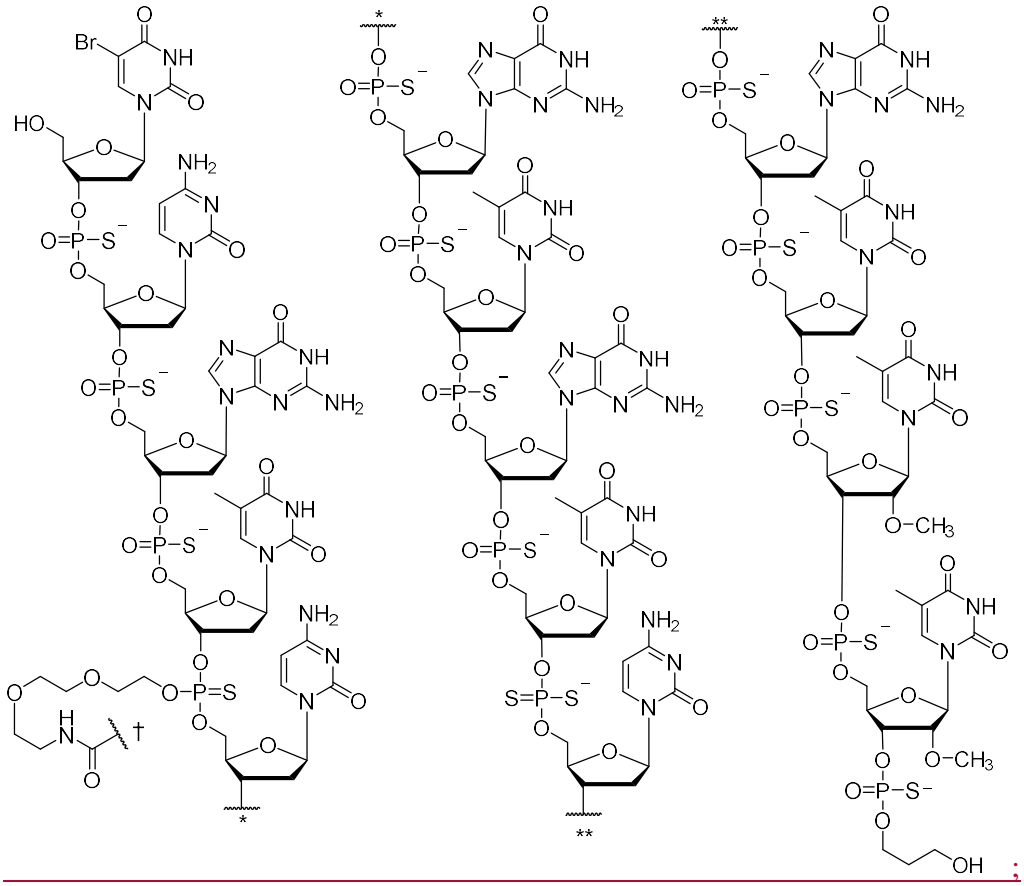


(b) each of the two Q-tag peptides comprises the amino acid sequence RPQGFGPP (SEQ ID NO:49), each heavy chain of the Ab including Q comprises the amino acid sequence of SEQ ID NO:179, each light chain of the Ab comprises the amino acid sequence of SEQ ID NO:182, and the oligonucleotide P comprises the structure:

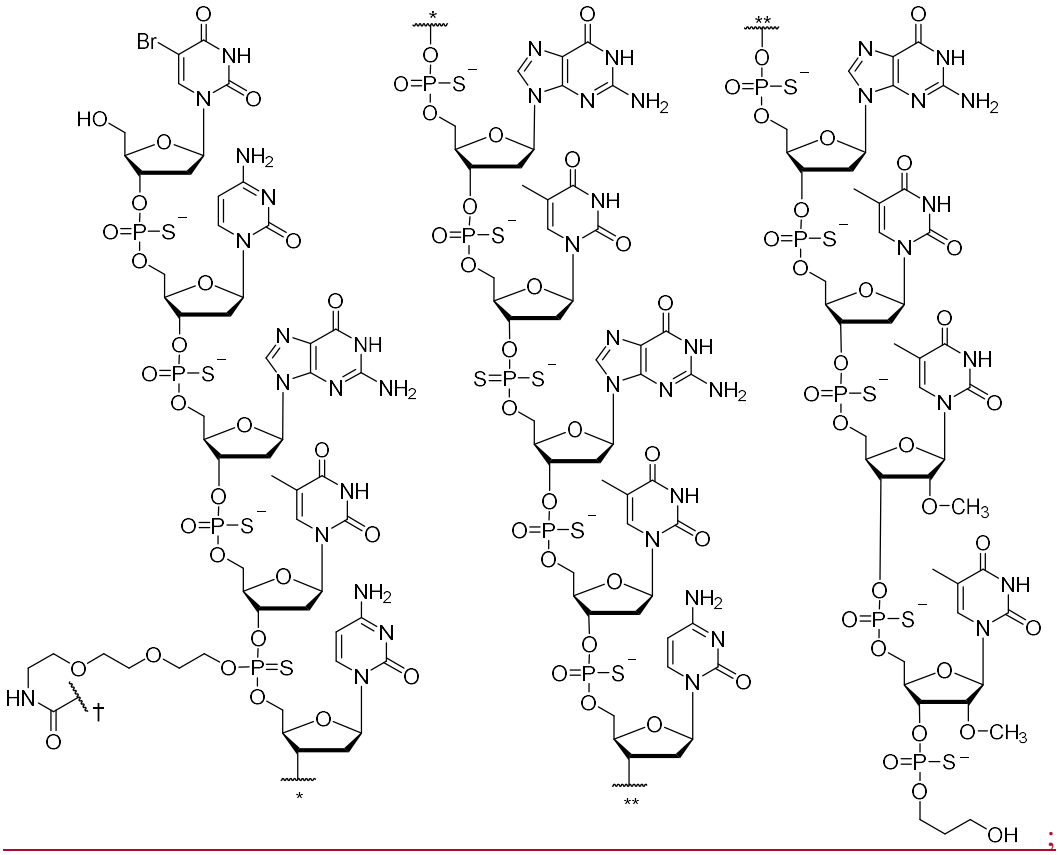


;

(c) each of the two Q-tag peptides comprises the amino acid sequence RPQGFGPP (SEQ ID NO:49), each heavy chain of the Ab including Q comprises the amino acid sequence of SEQ ID NO:180, each light chain of the Ab comprises the amino acid sequence of SEQ ID NO:182, and the oligonucleotide P comprises the structure:

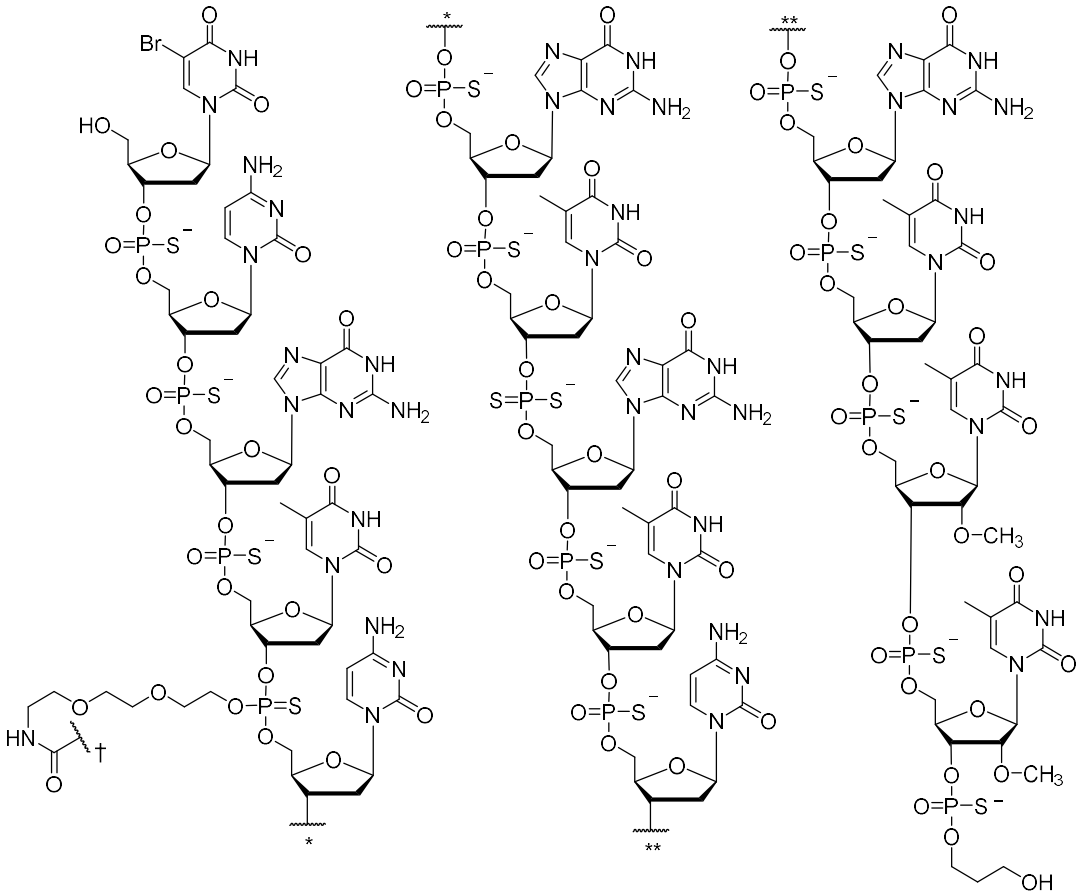


; (d) each of the two Q-tag peptides comprises the amino acid sequence RPQGFGPP (SEQ ID NO:49), each heavy chain of the Ab including Q comprises the amino acid sequence of SEQ ID NO:180, each light chain of the Ab comprises the amino acid sequence of SEQ ID NO:182, and the oligonucleotide P comprises the structure:



;

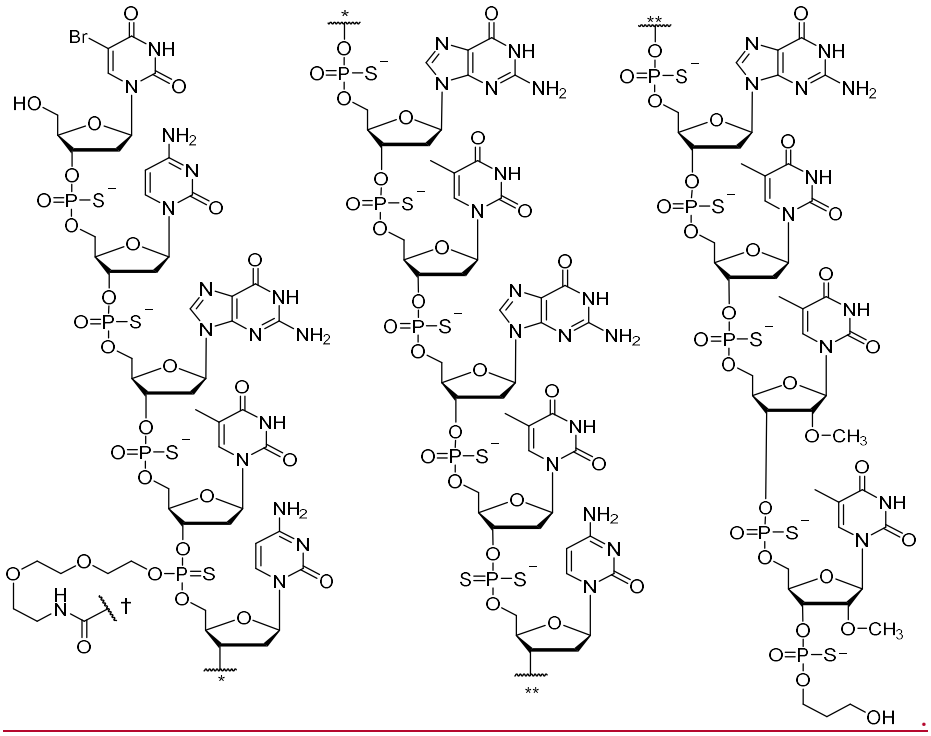
(e) each of the two Q-tag peptides comprises the amino acid sequence RPQGFGPP (SEQ ID NO:49), each heavy chain of the Ab including Q comprises the amino acid sequence of SEQ ID NO:180, each light chain of the Ab comprises the amino acid sequence of SEQ ID NO:181, and the oligonucleotide P comprises the structure:



; or

(f) each of the two Q-tag peptides comprises the amino acid sequence RPQGFGPP (SEQ ID NO:49), each heavy chain of the Ab including Q comprises the amino acid sequence of SEQ ID NO:180, each light chain of the Ab comprises the amino acid sequence of SEQ ID NO:181, and

the oligonucleotide P comprises the structure:



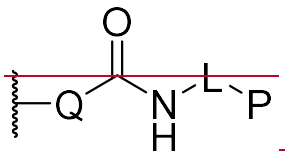
.

~~235.~~30.A pharmaceutical composition comprising: (a) a conjugate according to any one of claims 1-19 and 23-29; or (b) an immunomodulating oligonucleotide according to any one of claims 20-22; and a pharmaceutically acceptable carrier~~1 to 194 or any one of claims 232 to 234~~.

~~236. A pharmaceutical composition comprising an immunomodulating oligonucleotide according to any one of claims 195 to 231.~~

~~237. A kit, comprising a conjugate according to any one of claims 1 to 194 or any one of claims 232 to 234, and instructions for use of the conjugate.~~

~~238. A method for preparing a conjugate that comprises an antibody or antigen-binding fragment thereof (Ab) and one or more immunomodulating oligonucleotides (P), wherein the antibody or antigen-binding fragment is linked to one or more Q-tag peptides (Q) comprising the amino acid sequence RPQGF (SEQ ID NO:47), and wherein each immunomodulating oligonucleotide is linked to a Q-tag peptide via an amide bond with the glutamine residue of the Q-tag peptide and a linker (L) as shown in formula (A),~~



(A),

wherein:

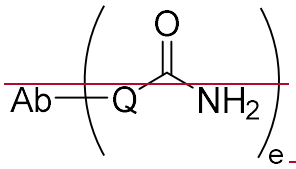
~~~~ indicates the point of attachment of each Q to the antibody or antigen-binding fragment thereof (Ab);

each Q independently comprises a Q-tag peptide sequence RPQGF (SEQ ID NO:47);

each L is independently a bond or a linker moiety connected to Q via an amide bond with the glutamine residue; and

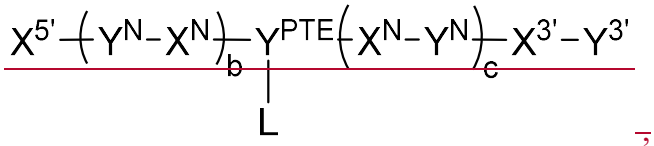
each P is independently an immunomodulating oligonucleotide;

comprising contacting a compound of formula (B)



(B),

wherein Ab and Q are as defined for formula (A) above, and e is an integer from 1 to 20, with one or more immunomodulating oligonucleotides P, wherein each P independently has the following formula:



,

wherein

$X^{5'}$ is a 5' terminal nucleoside;

$X^{3'}$ is a 3' terminal nucleoside;

Y^{PTE} is an internucleoside phosphotriester;

$Y^{3'}$ is a terminal phosphotriester;

each X^N is independently a nucleoside;

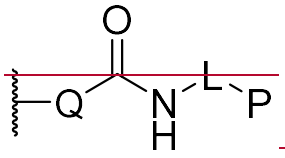
each Y^N is independently an internucleoside linker;

b and c are each independently an integer from 1 to 25; with the proviso that the sum of b and c is at least 5; and
~~~~

~~L is a linker moiety having a terminal amine,~~

~~in the presence of a transglutaminase.~~

~~239. A method for preparing a conjugate that comprises an antibody or antigen-binding fragment thereof (Ab) and one or more immunomodulating oligonucleotides (P), wherein the antibody or antigen-binding fragment is linked to one or more Q-tag peptides (Q), and wherein each immunomodulating oligonucleotide is linked to a Q-tag peptide via an amide bond with the glutamine residue of the Q-tag peptide and a linker (L) as shown in formula (A),~~



~~(A),~~

~~wherein:~~

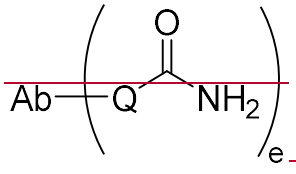
~~〰 indicates the point of attachment of each Q to the antibody or antigen-binding fragment thereof (Ab);~~

~~each Q is independently a Q-tag peptide having at least one glutamine residue;~~

~~each L is independently a bond or a linker moiety connected to Q via an amide bond with the glutamine residue; and~~

~~each P is independently an immunomodulating oligonucleotide;~~

~~comprising contacting a compound of formula (B)~~



~~(B),~~

~~wherein Ab and Q are as defined for formula (A) above, and e is an integer from 1 to 20, with one or more immunomodulating oligonucleotides P, wherein each oligonucleotide P is independently an immunomodulating oligonucleotide of formula (C) according to any one of claims 195 to 212 or an immunomodulating oligonucleotide of formula (D) according to any one of claims 213 to 231,~~

~~in the presence of a transglutaminase.~~

~~240. The method of claim 238 or claim 239, wherein each immunomodulating oligonucleotide is independently an oligonucleotide of formula (C) or formula (D) is selected from the group consisting of the oligonucleotides of ***Table 10*** and ***Table 12.***~~

~~241.~~31. An antibody or antigen binding fragment thereof that binds to CD22, wherein the antibody or fragment comprises a heavy chain variable (VH) domain and a light chain variable (VL) domain, wherein the VH domain comprises a VH domain sequence selected from the group consisting of SEQ ID Nos:64-67; and
wherein the VL domain comprises a VL domain sequence selected from the group consisting of SEQ ID Nos:68-91.

~~242. The antibody of claim 241, wherein the antibody is a Fab, F(ab')2, Fab'-SH, Fv, scFv, single domain, single heavy chain, or single light chain antibody or antibody fragment.~~

~~243. The antibody of claim 241, wherein the antibody comprises an Fc region.~~

~~244. The antibody of claim 243, wherein the Fc region is a human Fc region selected from the group consisting of an IgG1 Fc region, an IgG2 Fc region, and an IgG4 Fc region.~~

~~245. The antibody of claim 244, wherein the Fc region is a wild-type human IgG1, IgG2, or IgG4 Fc region.~~

~~246. The antibody of claim 244, wherein the Fc region is a human Fc region comprising one or more amino acid substitutions that reduce binding to C1q.~~

~~247. The antibody of claim 244, wherein the Fc region is a human Fc region comprising one or more amino acid substitutions that reduce effector function, as compared with a human Fc region that lacks the amino acid substitution(s).~~

~~248. The antibody of claim 244, wherein the Fc region is:~~

~~(a) a human IgG1 Fc region comprising L234A, L235A, and/or G237A substitutions, amino acid position numbering according to EU index;~~

~~(b) a human IgG2 Fc region comprising A330S and/or P331S substitutions, amino acid position numbering according to EU index; or~~

~~(c) a human IgG4 Fc region comprising S228P and/or L235E substitutions, amino acid position numbering according to EU index.~~

~~249. The antibody of claim 247 or claim 248, wherein the Fc region further comprises an N297A substitution, amino acid position numbering according to EU index.~~

~~250. The antibody of claim 243, wherein the antibody further comprises an amino acid sequence selected from the group consisting of SEQ ID Nos:92-110.~~

~~251. A conjugate comprising an antibody (Ab) and an immunomodulating oligonucleotide (P), wherein the antibody comprises two antibody light chains, two antibody heavy chains, and two Q-tag peptides; wherein each of the antibody light chains comprises the amino acid sequence of SEQ ID NO:182; wherein each of the antibody heavy chains comprises the amino acid sequence of SEQ ID NO:179; wherein the immunomodulating oligonucleotide comprises the sequence of SEQ ID NO:35; wherein each of the Q-tag peptides (Q) comprises the amino acid sequence of SEQ ID NO:49; and wherein at least one of the two Q-tag peptides is linked to the immunomodulating oligonucleotide via an amide bond with the glutamine residue of the Q-tag peptide and a linker (L).~~

~~252. A conjugate comprising an antibody (Ab) and an immunomodulating oligonucleotide (P), wherein the antibody comprises two antibody light chains, two antibody heavy chains, and two Q-tag peptides; wherein each of the antibody light chains comprises the amino acid sequence of SEQ ID NO:182; wherein each of the antibody heavy chains comprises the amino acid sequence of SEQ ID NO:180; wherein the immunomodulating oligonucleotide comprises the sequence of SEQ ID NO:35; wherein each of the Q-tag peptides (Q) comprises the amino acid sequence of SEQ ID NO:49; and wherein at least one of the two Q-tag peptides is linked to the immunomodulating oligonucleotide via an amide bond with the glutamine residue of the Q-tag peptide and a linker (L).~~

~~253. A conjugate comprising an antibody (Ab) and an immunomodulating oligonucleotide (P), wherein the antibody comprises two antibody light chains, two antibody heavy chains, and two Q-tag peptides; wherein each of the antibody light chains comprises the amino acid sequence of SEQ ID NO:181; wherein each of the antibody heavy chains comprises the amino acid sequence of SEQ ID NO:180; wherein the immunomodulating oligonucleotide comprises the sequence of SEQ ID NO:34; wherein each of the Q-tag peptides (Q) comprises the amino acid sequence of SEQ ID NO:49; and wherein at least one of the two Q-tag peptides is linked to the immunomodulating oligonucleotide via an amide bond with the glutamine residue of the Q-tag peptide and a linker (L).~~

~~254. A conjugate comprising an antibody (Ab) and an immunomodulating oligonucleotide (P), wherein the antibody comprises two antibody light chains, two antibody heavy chains,~~

and two Q-tag peptides; wherein each of the antibody light chains comprises the amino acid sequence of SEQ ID NO:181; wherein each of the antibody heavy chains comprises the amino acid sequence of SEQ ID NO:179; wherein the immunomodulating oligonucleotide comprises the sequence of SEQ ID NO:34; wherein each of the Q-tag peptides (Q) comprises the amino acid sequence of SEQ ID NO:49; and wherein at least one of the two Q-tag peptides is linked to the immunomodulating oligonucleotide via an amide bond with the glutamine residue of the Q-tag peptide and a linker (L).

255. A conjugate comprising an antibody (Ab) and an immunomodulating oligonucleotide (P), wherein the antibody comprises two antibody light chains, two antibody heavy chains, and two Q-tag peptides; wherein each of the antibody light chains comprises the amino acid sequence of SEQ ID NO:181; wherein each of the antibody heavy chains comprises the amino acid sequence of SEQ ID NO:179; wherein the immunomodulating oligonucleotide comprises the sequence of SEQ ID NO:163; wherein each of the Q-tag peptides (Q) comprises the amino acid sequence of SEQ ID NO:49; and wherein at least one of the two Q-tag peptides is linked to the immunomodulating oligonucleotide via an amide bond with the glutamine residue of the Q-tag peptide and a linker (L).

256. A conjugate comprising an antibody (Ab) and an immunomodulating oligonucleotide (P), wherein the antibody comprises two antibody light chains, two antibody heavy chains, and two Q-tag peptides; wherein each of the antibody light chains comprises the amino acid sequence of SEQ ID NO:182; wherein each of the antibody heavy chains comprises the amino acid sequence of SEQ ID NO:179; wherein the immunomodulating oligonucleotide comprises the sequence of SEQ ID NO:163; wherein each of the Q-tag peptides (Q) comprises the amino acid sequence of SEQ ID NO:49; and wherein at least one of the two Q-tag peptides is linked to the immunomodulating oligonucleotide via an amide bond with the glutamine residue of the Q-tag peptide and a linker (L).

257. A conjugate comprising an antibody (Ab) and an immunomodulating oligonucleotide (P), wherein the antibody comprises two antibody light chains, two antibody heavy chains, and two Q-tag peptides; wherein each of the antibody light chains comprises the amino acid sequence of SEQ ID NO:185; wherein each of the antibody heavy chains comprises the amino acid sequence of SEQ ID NO:184; wherein the immunomodulating oligonucleotide comprises the sequence of SEQ ID NO:35; wherein each of the Q-tag

~~peptides (Q) comprises the amino acid sequence of SEQ ID NO:49; and wherein at least one of the two Q-tag peptides is linked to the immunomodulating oligonucleotide via an amide bond with the glutamine residue of the Q-tag peptide and a linker (L).~~

~~258. A conjugate comprising an antibody (Ab) and an immunomodulating oligonucleotide (P), wherein the antibody comprises two antibody light chains, two antibody heavy chains, and two Q-tag peptides; wherein each of the antibody light chains comprises the amino acid sequence of SEQ ID NO:185; wherein each of the antibody heavy chains comprises the amino acid sequence of SEQ ID NO:183; wherein the immunomodulating oligonucleotide comprises the sequence of SEQ ID NO:35; wherein each of the Q-tag peptides (Q) comprises the amino acid sequence of SEQ ID NO:49; and wherein at least one of the two Q-tag peptides is linked to the immunomodulating oligonucleotide via an amide bond with the glutamine residue of the Q-tag peptide and a linker (L).~~

~~259. A conjugate comprising an antibody (Ab) and an immunomodulating oligonucleotide (P), wherein the antibody comprises two antibody light chains, two antibody heavy chains, and two Q-tag peptides; wherein each of the antibody light chains comprises the amino acid sequence of SEQ ID NO:185; wherein each of the antibody heavy chains comprises the amino acid sequence of SEQ ID NO:184; wherein the immunomodulating oligonucleotide comprises the sequence of SEQ ID NO:163; wherein each of the Q-tag peptides (Q) comprises the amino acid sequence of SEQ ID NO:49; and wherein at least one of the two Q-tag peptides is linked to the immunomodulating oligonucleotide via an amide bond with the glutamine residue of the Q-tag peptide and a linker (L).~~

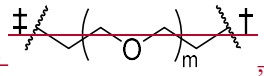
~~260. A conjugate comprising an antibody (Ab) and an immunomodulating oligonucleotide (P), wherein the antibody comprises two antibody light chains, two antibody heavy chains, and two Q-tag peptides; wherein each of the antibody light chains comprises the amino acid sequence of SEQ ID NO:188; wherein each of the antibody heavy chains comprises the amino acid sequence of SEQ ID NO:187; wherein the immunomodulating oligonucleotide comprises the sequence of SEQ ID NO:35; wherein each of the Q-tag peptides (Q) comprises the amino acid sequence of SEQ ID NO:49; and wherein at least one of the two Q-tag peptides is linked to the immunomodulating oligonucleotide via an amide bond with the glutamine residue of the Q-tag peptide and a linker (L).~~

261. A conjugate comprising an antibody (Ab) and an immunomodulating oligonucleotide (P), wherein the antibody comprises two antibody light chains, two antibody heavy chains, and two Q-tag peptides; wherein each of the antibody light chains comprises the amino acid sequence of SEQ ID NO:188; wherein each of the antibody heavy chains comprises the amino acid sequence of SEQ ID NO:186; wherein the immunomodulating oligonucleotide comprises the sequence of SEQ ID NO:35; wherein each of the Q-tag peptides (Q) comprises the amino acid sequence of SEQ ID NO:49; and wherein at least one of the two Q-tag peptides is linked to the immunomodulating oligonucleotide via an amide bond with the glutamine residue of the Q-tag peptide and a linker (L).

262. A conjugate comprising an antibody (Ab) and an immunomodulating oligonucleotide (P), wherein the antibody comprises two antibody light chains, two antibody heavy chains, and two Q-tag peptides; wherein each of the antibody light chains comprises the amino acid sequence of SEQ ID NO:188; wherein each of the antibody heavy chains comprises the amino acid sequence of SEQ ID NO:187; wherein the immunomodulating oligonucleotide comprises the sequence of SEQ ID NO:163; wherein each of the Q-tag peptides (Q) comprises the amino acid sequence of SEQ ID NO:49; and wherein at least one of the two Q-tag peptides is linked to the immunomodulating oligonucleotide via an amide bond with the glutamine residue of the Q-tag peptide and a linker (L).

263. The conjugate according to any one of claims 251-262, wherein one of the two Q-tag peptides is linked to the immunomodulating oligonucleotide.

264. The conjugate according to any one of claims 251-262, comprising two immunomodulating oligonucleotides, wherein each of the two Q-tag peptides is linked to one of the two immunomodulating oligonucleotides.

265. The conjugate according to any one of claims 261-264, wherein the linker comprises the linker moiety 

, wherein m is an integer 24, and wherein ----‡ indicates the point of attachment to P, and ----‡ indicates the point of attachment to the rest of the conjugate connected to Q via an amide bond with the glutamine residue.

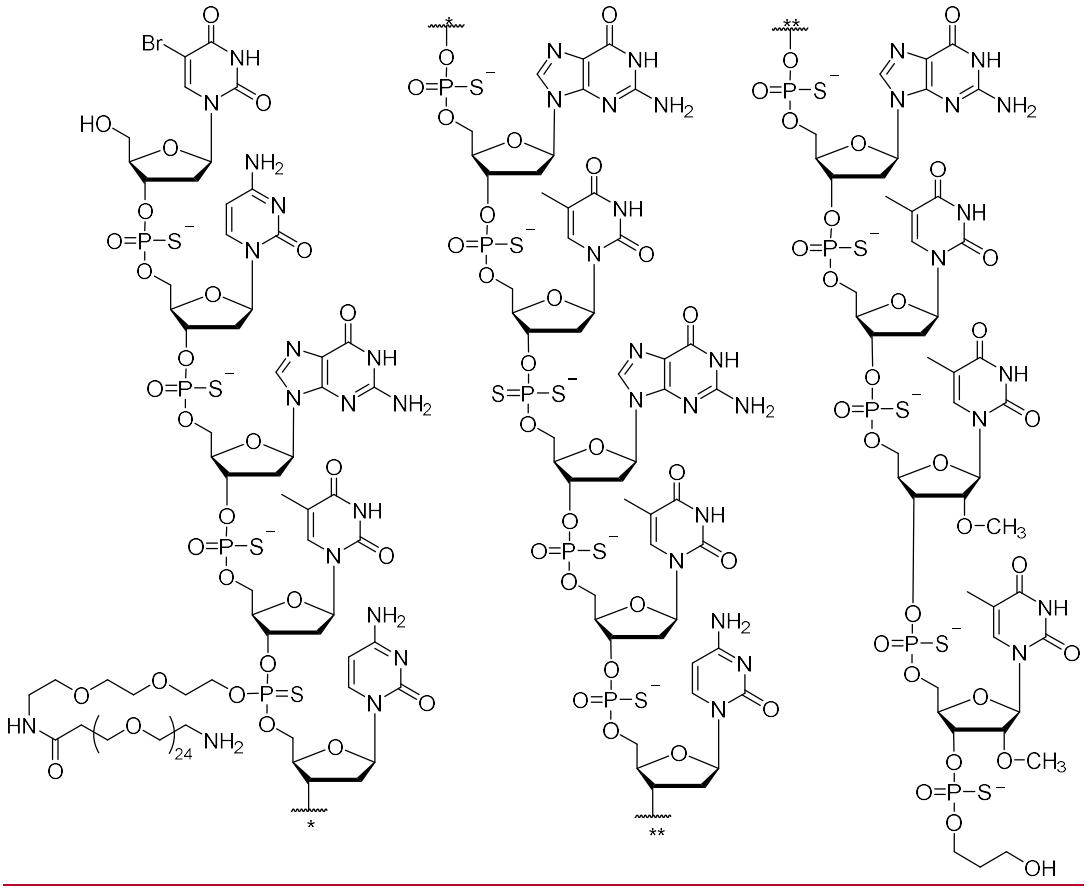
266. A pharmaceutical composition comprising the conjugate according to any one of claims 1 to 194 or any one of claims 232 to 234 and 251-265, or the antibody according to any one of claims 241 to 250, and pharmaceutically acceptable carrier.

32. A method for preparing a conjugate that comprises an antibody (Ab) and an immunomodulating oligonucleotide (P), comprising:

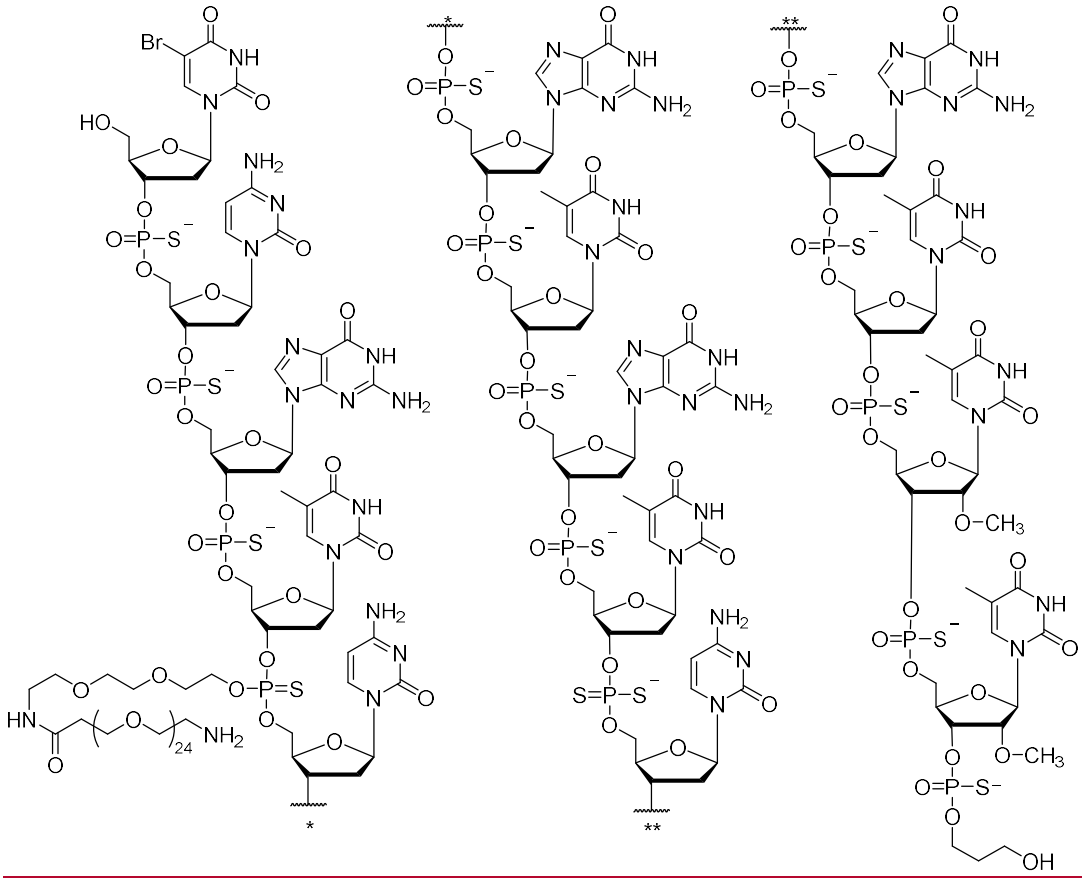
contacting the Ab with the oligonucleotide P in the presence of a transglutaminase;

wherein the Ab comprises two antibody light chains, two antibody heavy chains, and two Q-tag peptides (Q) having at least one glutamine residue; wherein one Q-tag peptide is linked to the C-terminus of each of the two antibody heavy chains; and

wherein the oligonucleotide P comprises the structure:



or



or a pharmaceutically acceptable salt thereof, wherein ~~* and ** indicate the points of attachment within the oligonucleotide.

33. The method of claim 32, wherein the antibody specifically binds to CD22.

34. The method of claim 32 or claim 33, further comprising separating the conjugate having a DAR of 1 from free oligonucleotide, unconjugated antibody, and conjugates having a DAR of 2.

~~267.~~35. Use of the conjugate according to any one of claims 1-19 and 23-29, immunomodulating oligonucleotide according to any one of claims 20-22, pharmaceutical composition of claim 30, or antibody of claim 31, in the manufacture of a medicament~~A method~~ for treating cancer in an individual~~, comprising administering to an individual an effective amount of the conjugate according to any one of claims to any one of claims 1 to 194 or any one of claims 232 to 234 and 251-265, the antibody according to any one of claims 241 to 250, or the pharmaceutical composition according to claim 235 or claim 266~~.

~~268. A pharmaceutical composition comprising the immunomodulating oligonucleotide according to any one of claims 195 to 231 and pharmaceutically acceptable carrier.~~

~~269. A method for treating cancer, comprising administering to an individual an effective amount of the immunomodulating oligonucleotide according to any one of claims 195 to 231 or the pharmaceutical composition according to claim 236 or claim 268.~~

~~270.~~36. The ~~method~~ use of claim ~~267 or claim 269~~35, wherein the cancer is a B cell cancer, solid tumor, breast cancer, colorectal cancer, lung cancer, non-small cell lung carcinoma (NSCLC), renal cell carcinoma (RCC), head and neck cancer, head and neck squamous cell carcinoma (HNSCC), hepatocellular carcinoma (HCC), bile duct carcinoma, esophageal cancer, cervical cancer, cervical squamous cell carcinoma, Merkle cell carcinoma, endometrial cancer, ovarian cancer, pancreatic cancer, melanoma, cutaneous melanoma, sarcoma, lymphoma, leukemia, acute lymphoblastic leukemia (ALL), hairy cell leukemia, diffuse large B cell lymphoma (DLBCL), small cell lung cancer (SCLC), cutaneous squamous cell carcinoma, urothelial cancer, or gastric cancer.

~~271. The method of claim 267 or claim 269, wherein the cancer is breast cancer, colorectal cancer, lung cancer, head and neck cancer, melanoma, lymphoma, or leukemia.~~

~~272.~~37. The ~~method~~ use of any one of claims 35-36~~267 and 269-271~~, wherein the antibody or conjugate specifically binds an antigen expressed by the cancer or cancer-associated stroma.

~~273. An antibody that binds to human CD22, wherein the antibody comprises an antibody heavy chain and an antibody light chain, wherein the antibody heavy chain comprises the sequence of SEQ ID NO:179 or 180, and the antibody light chain comprises the sequence of SEQ ID NO:181 or 182.~~

~~274. The antibody of claim 273, wherein:~~

~~(a) the antibody heavy chain comprises the sequence of SEQ ID NO:179, and the antibody light chain comprises the sequence of SEQ ID NO:181; or~~

~~(b) the antibody heavy chain comprises the sequence of SEQ ID NO:179, and the antibody light chain comprises the sequence of SEQ ID NO:182.~~

~~275. The antibody of claim 273, wherein:~~

~~(a) the antibody heavy chain comprises the sequence of SEQ ID NO:180, and the antibody light chain comprises the sequence of SEQ ID NO:181; or~~

~~(b) the antibody heavy chain comprises the sequence of SEQ ID NO:180, and the antibody light chain comprises the sequence of SEQ ID NO:182.~~

~~276. An antibody that binds to human Her2, wherein the antibody comprises an antibody heavy chain and an antibody light chain, wherein the antibody heavy chain comprises the sequence of SEQ ID NO:183, 184, 186, or 187, and the antibody light chain comprises the sequence of SEQ ID NO:185 or 188.~~

~~277. The antibody of claim 276, wherein:~~

~~(a) the antibody heavy chain comprises the sequence of SEQ ID NO:183, and the antibody light chain comprises the sequence of SEQ ID NO:185;~~

~~(b) the antibody heavy chain comprises the sequence of SEQ ID NO:184, and the antibody light chain comprises the sequence of SEQ ID NO:185;~~

~~(c) the antibody heavy chain comprises the sequence of SEQ ID NO:186, and the antibody light chain comprises the sequence of SEQ ID NO:185; or~~

~~(d) the antibody heavy chain comprises the sequence of SEQ ID NO:187, and the antibody light chain comprises the sequence of SEQ ID NO:185.~~

~~278. The antibody of claim 276, wherein:~~

~~(a) the antibody heavy chain comprises the sequence of SEQ ID NO:183, and the antibody light chain comprises the sequence of SEQ ID NO:188;~~

~~(b) the antibody heavy chain comprises the sequence of SEQ ID NO:184, and the antibody light chain comprises the sequence of SEQ ID NO:188;~~

~~(c) the antibody heavy chain comprises the sequence of SEQ ID NO:186, and the antibody light chain comprises the sequence of SEQ ID NO:188; or~~

~~(d) the antibody heavy chain comprises the sequence of SEQ ID NO:187, and the antibody light chain comprises the sequence of SEQ ID NO:188.~~

~~279.~~38.The use of any one of claims 35-37,~~A method for treating cancer, comprising administering to an individual~~ wherein ~~an effective amount of: (a)~~ an immune checkpoint inhibitor is to be further administered;~~and (b) the conjugate according to any one of claims to any one of claims 1 to 15, 25 to 96, 106 to 159, 162 to 175, and 179 to 194, or any one of claims 232 to 234 and 251-265, or the pharmaceutical composition according to claim 235 or claim 266;~~ wherein the cancer is refractory or resistant to the immune checkpoint inhibitor when administered in the absence of the conjugate; and wherein the

antibody or antigen-binding fragment thereof binds to human CD22; wherein optionally the immune checkpoint inhibitor is a PD-1 inhibitor or a PD-L1 inhibitor.

~~280. The method of claim 279, wherein the immune checkpoint inhibitor is a PD-1 inhibitor or a PD-L1 inhibitor.~~

~~281. The method of claim 280, wherein the immune checkpoint inhibitor is an anti-PD-1 antibody or an anti-PD-L1 antibody.~~

~~282. The method of any one of claims 279-281, wherein the administration results in reduced growth, size, and/or volume of the cancer.~~

~~283. A method for treating cancer, comprising administering to an individual an effective amount of the conjugate according to any one of claims to any one of claims 1 to 15, 25 to 96, 106 to 159, 162 to 175, and 179 to 194, or any one of claims 232 to 234 and 251-265, or the pharmaceutical composition according to claim 235 or claim 266; wherein the administration results in B cell activation in the individual.~~

~~284. The method of claim 283, wherein the administration results in reduced growth, size, and/or volume of the cancer.~~

~~285. A method for treating cancer, comprising administering to an individual an effective amount of the conjugate according to any one of claims to any one of claims 1 to 15, 25 to 96, 106 to 159, 162 to 175, and 179 to 194, or any one of claims 232 to 234 and 251-265, or the pharmaceutical composition according to claim 235 or claim 266; wherein the cancer is selected from the group consisting of head and neck squamous cell carcinoma (HNSCC), non-small cell lung carcinoma (NSCLC), renal cell carcinoma (RCC), gastric cancer, hepatocellular carcinoma (HCC), esophageal cancer, cervical cancer, cervical squamous cell carcinoma, Merkle cell carcinoma, endometrial cancer, ovarian cancer, pancreatic cancer, melanoma, cutaneous melanoma, sarcoma, colorectal cancer, breast cancer, small cell lung cancer (SCLC), cutaneous squamous cell carcinoma, and urothelial carcinoma.~~

~~286. A method for treating a B cell-related cancer, comprising administering to an individual an effective amount of the conjugate according to any one of claims to any one of claims 1 to 15, 25 to 96, 106 to 159, 162 to 175, and 179 to 194, or any one of claims 232 to 234 and 251-265, or the pharmaceutical composition according to claim 235 or claim~~

~~266; wherein the cancer is selected from the group consisting of acute lymphoblastic leukemia (ALL), hairy cell leukemia, and diffuse large B cell lymphoma (DLBCL).~~

~~287. A method for treating cancer, comprising administering to an individual an effective amount of the conjugate according to any one of claims to any one of claims 1 to 4, 16 to 85, 97 to 155, 160 to 171, and 176 to 194 or any one of claims 251-265, or the pharmaceutical composition according to claim 235 or claim 266; wherein the cancer is selected from the group consisting of breast cancer, urothelial cancer, and gastric cancer.~~