**We Claim**

1. A collection of synthetic antibodies or functional fragments thereof, comprising variable heavy chain and variable light chain framework regions,

wherein said variable heavy chain framework regions and variable light chain framework regions comprise germline protein sequences of a germline protein pair,

wherein said germline protein pair comprises the following properties:

i) a relative display rate in Fab format comprising a value within the top 75% of Fabs sampled;

ii) an expression level in Fab format of at least 0.4 as compared to Fab VH 1-69 VLA_VI1-40 AYA, the sequences of which are depicted in Table 5, Table 9, Figure 45A and Figure 47A;

iii) thermal stability at 60°C or more for at least 45 minutes in Fab format;

iv) stability in bovine or mouse serum in Fab format for greater than ten days at 37°C;

v) an expression level in IgG format of at least 0.4 as compared to MOR03080, the CDR sequences of which are depicted in Table 31; and

vi) stability in serum in IgG format for fourteen days at 37°C;

wherein said collection of antibodies or functional fragments thereof comprises germline protein sequences of at least two different germline protein pairs, and wherein said germline protein pair is encoded by a germline gene pair, wherein the germline protein pairs are selected from IGHV1-18/IGKV1-05; IGHV1-18/IGLV2-23; IGHV1-46/IGHV1-09; IGHV1-46/IGKV1-39; IGHV1-46/IGKV3-15; IGHV1-69*01/IGKV1-05; IGHV3-07/IGKV1-09; IGHV3-07/IGKV1-12; IGHV3-07/IGKV1-27; IGHV3-07/IGKV3-15; IGHV3-07/IGLV1-47; IGHV3-07/IGLV2-23; IGHV3-07/IGLV3-01; IGHV3-11/IGKV1-05; IGHV3-11/IGKV1-06; IGHV3-11/IGKV1-12; IGHV3-11/IGKV1-16; IGHV3-11/IGKV3-15; IGHV3-11/IGLV1-47; IGHV3-11/IGLV2-23; IGHV3-15/IGKV1-05; IGHV3-15/IGKV1-06; IGHV3-15/IGKV1-09; IGHV3-15/IGKV1-12; IGHV3-15/IGKV1-16; IGHV3-15/IGKV1-27; IGHV3-15/IGKV1-39; IGHV3-15/IGKV3-15; IGHV3-15/IGLV1-40; IGHV3-15/IGLV1-51; IGHV3-15/IGLV2-11; IGHV3-21/IGKV1-06; IGHV3-21/IGKV1-12; IGHV3-21/IGKV1-27; IGHV3-21/IGKV1-39; IGHV3-21/IGLV2-14; IGHV3-21/IGLV2-23; IGHV3-30/IGLV2-23; ~~IGHV3-30/IGLV2-23;~~ IGHV3-30/IGLV3-1; IGHV3-33/IGKV3-15; IGHV3-33/IGLV2-23; IGHV3-48/IGKV1-27; IGHV3-53/IGKV1-09; IGHV3-53/IGKV1-12; IGHV3-53/IGLV1-51; IGHV3-53/IGLV2-23; IGHV3-53/IGLV3-1; IGHV3-74/IGKV1-06; IGHV3-74/IGKV1-09; IGHV3-74/IGKV1-27; IGHV3-74/IGKV3-15; IGHV3-74/IGLV1-51; IGHV4-04/IGLV2-23; IGHV4-04/IGLV3-1; IGHV4-04/IGLV3-21; IGHV4-39/IGLV2-14; IGHV4-39/IGLV3-1; IGHV5-51/IGKV1-09; IGHV5-51/IGLV2-23; IGHV5-51/IGLV3-1; IGHV6-1/IGKV1-06; and IGHV6-1/IGLV2-23, the sequences of which are depicted in Figures 45 A-C, Figures 46 A-C and Figures 47 A-B.

2. A collection according to claim 1, wherein said variable heavy chain and variable light chain framework regions consist essentially of germline protein sequences of the germline protein pairs comprising the following properties:

i) a relative display rate in Fab format comprising a value within the top 75% of Fabs sampled;

ii) an expression level in Fab format of at least 0.4 as compared to Fab VH 1-69 VLA_VI1-40 AYA, the sequences of which are depicted in Table 5, Table 9, Figure 45A and Figure 47A;

iii) thermal stability at 60°C or more for at least 45 minutes in Fab format;

iv) stability in bovine or mouse serum in Fab format for greater than ten days at 37°C;

v) an expression level in IgG format of at least 0.4 as compared to MOR03080, the CDR sequences of which are depicted in Table 31; and

vi) stability in bovine serum in IgG format for fourteen days at 37°C.

3. A collection according to claims 1 or 2, wherein said variable heavy chain and variable light chain framework regions consist of germline protein sequences of the germline protein pairs comprising the following properties:

i) a relative display rate in Fab format comprising a value within the top 75% of Fabs sampled;

ii) an expression level in Fab format of at least 0.4 as compared to Fab VH1-69 VLA_VI1-40 AYA, the sequences of which are depicted in Table 5, Table 9, Figure 45A and Figure 47A;

iii) thermal stability at 60°C or more for at least 45 minutes in Fab format;

iv) stability in bovine or mouse serum in Fab format for greater than ten days at 37°C;

v) an expression level in IgG format of at least 0.4 as compared to MOR03080, the CDR sequences of which are depicted in Table 31; and

vi) stability in bovine serum in IgG format for fourteen days at 37°C.

4. A collection according to any one of the preceding claims, wherein said germline gene pairs are present at a concentration of at least 0.05% in the human immune repertoire.

~~5. A collection according to any one of the preceding claims, wherein said germline gene pairs are present at a concentration of at least 0.23% in the human immune repertoire.~~

~~6. A collection according to any one of the preceding claims, wherein said germline gene pairs are present at a concentration of at least 0.51% in the human immune repertoire.~~

~~7.~~5. A collection according to any one of the preceding claims, wherein said germline gene pairs are present at a concentration of at least 0.07% in the naïve human immune repertoire.

~~8. A collection according to any one of the preceding claims, wherein said germline gene pairs are present at a concentration of at least 0.52% in the naïve human immune repertoire.~~

~~9. A collection according to any one of the preceding claims, wherein said germline gene pairs are present at a concentration of at least 0.88% in the naïve human immune repertoire.~~

~~10.~~6. The collection according to any one of the preceding claims, wherein said antibodies or functional fragments thereof comprise human sequences.

~~11.~~7. The collection according to any one of the preceding claims, wherein said collection of antibodies or functional fragments thereof comprises germline protein sequences of at least seventeen different germline protein pairs.

~~12.~~8. The collection according to any one of the preceding claims, wherein said antibodies or functional fragments thereof comprise one or more complementarity determining regions comprising germline protein sequences.

~~13.~~9. The collection according to any one of the preceding claims, wherein said antibodies or functional fragments thereof comprise FR1, CDR1, FR2, CDR2, and FR3 regions comprising germline protein sequences.

~~14.~~10. The collection according to any one of the preceding claims, wherein said antibodies or functional fragments thereof comprise a FR4 region selected from the group consisting of: JH4, Jκ1, and Jλ2/3.

~~15.~~11. The collection according to any one of the preceding claims, wherein said antibodies or functional fragments thereof comprise a diversified HCDR3 region.

~~16.~~12. The collection according to any one of the preceding claims, wherein said antibodies or functional fragments thereof comprise a diversified LCDR3 region.

~~17.~~13. The collection according to any one of the ~~proceeding~~ preceding claims, wherein the collection comprises 1 X $10^4$ antibodies or functional fragments thereof.

~~18.~~14. The collection according to any one of the ~~proceeding~~ preceding claims, wherein said germline protein pairs comprise a relative display rate in Fab format comprising a value within the top 60% of Fabs sampled.

~~19.~~15. The collection according to any one of the ~~proceeding~~ preceding claims, wherein said germline protein pairs comprise an expression level in Fab format of at least 0.6 as compared to Fab VH1-69 VLA_VI1-40 AYA, the sequences of which are depicted in Table 5, Table 9, Figure 45A and Figure 47A.

~~20. The collection according to any one of the proceeding claims, wherein said germline protein pairs comprise thermal stability at 70°C or more for at least 45 minutes in Fab format.~~

~~21.~~16. The collection according to any one of the ~~proceeding~~ preceding claims, wherein said germline protein pairs comprise an expression level in IgG format of at least 0.6 as compared to MOR03080.

~~22. The collection according to any one of the proceeding claims, wherein the variable heavy and variable light chain framework regions comprise germline protein sequences of a germline protein pair selected from the group consisting of: IGHV3-23/IGKV1-5; IGHV3-23/IGKV3-20; IGHV4-39/IGKV3-15; IGHV3-23/IGKV3-15; IGHV4-39/IGKV1-39/1D-39; IGHV1-18/IGKV3-20; IGHV3-30/IGKV3-20; IGHV4-39/IGKV1-5; IGHV1-69/IGKV1-39/1D-39; IGHV5-51/IGLV 1-40; IGHV4-39/IGKV3-20; IGHV3-23/IGLV 2-14; IGHV4-39/IGLV 3-21; IGHV3-23/IGKV1-39/1D-39; IGHV3-30/IGKV1-39/1D-39; IGHV1-69/IGKV3-20; IGHV3-48/IGKV3-20; IGHV1-2/IGKV3-20; IGHV3-30/IGKV4-1; IGHV5-51/IGLV 2-14; IGHV5-51/IGKV3-20; IGHV3-7/IGKV1-39/1D-39; IGHV3-7/IGKV1-5; IGHV3-15/IGKV3-20; IGHV4-39/IGLV 2-14; IGHV3-23/IGKV3-11; IGHV3-30/IGKV1-5; IGHV3-30/IGKV3-15; IGHV3-21/IGKV1-5; IGHV3-21/IGKV3-15; IGHV3-30/IGLV 1-51 ; IGHV3-21/IGLV 1-51; and IGHV1-69/IGKV3-11.~~

~~23.~~17. The collection according to any one of the ~~proceeding~~ preceding claims, wherein said functional fragments of said antibodies are selected from the group consisting of Fab, F(ab')2, Fab', Fv, and scFv.

~~24.~~18. A collection of nucleic acids encoding the collection according to any one of the ~~proceeding~~ preceding claims.

~~25.~~19. A collection of vectors comprising the nucleic acids according to claim ~~24~~ 18.

~~26.~~20. A collection of recombinant host cells comprising the nucleic acids of claim ~~24~~ 18 or the vectors of claim ~~25~~ 19.

~~27.~~21. The recombinant host cells of claim ~~26~~ 20, which ~~is~~ are prokaryotic or eukaryotic.

~~28.~~22. The recombinant host cells of claim ~~27~~ 21 which ~~is~~ are *E. coli* or mammalian.

~~29. A collection of synthetic antibodies or functional fragments thereof, comprising variable heavy chain and variable light chain framework regions,~~

~~wherein said framework regions comprise germline protein sequences,~~

~~wherein said germline protein sequences comprise the following properties:~~

~~i) four or less post translational modifications in the complementarity determining regions;~~

~~ii) two or less methionines in the complementarity determining regions;~~

~~iii) one or less unpaired cysteines;~~

~~iv) one or less potential T-cell epitopes;~~

~~v) an intermediate or low propensity for aggregation; and~~

~~vi) an isoelectric point of at least 7.5; and~~

~~wherein said collection of antibodies or functional fragments thereof comprises at least two different variable heavy chain germline protein sequences,~~

~~wherein said germline protein sequence is encoded by a germline gene sequence.~~

~~30. A collection according to claim 29, wherein said variable heavy chain or variable light chain germline gene sequences are present at a concentration of at least 0.5% in the human immune repertoire.~~

~~31. A collection according to claims 29 or 30, wherein said collection of antibodies or functional fragments thereof comprises at least five different variable heavy chain germline protein sequences.~~

~~32. A collection according to any one claims 29-31, wherein said antibodies or functional fragments thereof comprise human sequences.~~

~~33. A collection according to any one of claims 29-32, wherein said variable heavy chain or variable light chain germline gene sequences are present at a concentration of at least 5.0% in the human immune repertoire.~~

~~34. The collection according to any one of claims 29-33, wherein said antibodies or functional fragments thereof comprise one or more complementarity determining regions comprising germline protein sequences.~~

~~35. The collection according to any one of claims 29-34, wherein said antibodies or functional fragments thereof comprise FR1, CDR1, FR2, CDR2, and FR3 comprising germline protein sequences.~~

~~36. The collection according to any one of claims 29-35, where said antibodies or functional fragments thereof comprise a FR4 region selected from the group consisting of: JH4, Jκ1, and Jλ2/3.~~

~~37. The collection according to any one of claims 29-36, wherein said antibodies or functional fragments thereof further comprise a diversified HCDR3 region.~~

~~38. The collection according to any one of claims 29-37, wherein said antibodies or functional fragments thereof further comprise a diversified LCDR3 region.~~

~~39. The collection according to any one of claims 29-38, wherein the collection comprises 1 X $10^4$ antibodies or functional fragments thereof.~~

~~40. The collection according to any one of claims 29-39, wherein said variable heavy chain germline protein sequences are selected from the group consisting of: IGHV3-23; IGHV3-30; IGHV4-39; IGHV4-34; IGHV4-59; IGHV1-69; IGHV5-51; IGHV3-7; IGHV1-18; IGHV3-48; IGHV3-15; IGHV3-21; IGHV1-2; IGHV3-33; IGHV4-31; IGHV3-53; IGHV3-11; IGHV3-9; IGHV4-4; IGHV1-46; IGHV3-74; IGHV1-24; IGHV4-61; IGHV1-8; IGHV1-3; IGHV3-49; IGHV3-43; IGHV4-28; IGHV3-64; and IGHV7-81.~~

~~41. The collection according to any one of claims 29-40, wherein the variable κ light chain germline protein sequences are selected from the group consisting of: IGKV3-20; IGKV1-39/1D-39; IGKV1-5; IGKV3-15; IGKV4-1; IGKV3-11; IGKV2-28/2D-28; IGKV1-33/1D-33; IGKV2-30; IGKV1-9; IGKV1-17; IGKV1-27; IGKV1-8; IGKV1-16; IGKV1-6; IGKV1-12; IGKV2D-29; IGKV1-13; IGKV1D-8; and IGKV2-24.~~

~~42. The collection according to any one of claims 29-41 , wherein the variable λ light chain germline protein sequences are selected from the group consisting of: IGLV2-14; IGLV1-40; IGLV1-44; IGLV1-51; IGLV2-23; IGLV3-21; IGLV1-47; IGLV3-1; IGLV2-11; IGLV2-8; IGLV6-57; IGLV3-25; IGLV7-46; IGLV1-36; IGLV7-43; IGLV9-49; IGLV4-69; IGLV2-18; IGLV3-10; and IGLV3-27.~~

~~43.~~23. A method of producing the collection of synthetic antibodies or functional fragments thereof according to any one of claims 1-3.

~~44. A method according to claim 43, wherein the step of producing further comprises generating a collection of antibodies or functional fragments thereof comprising variable heavy chain and variable light chain framework regions,~~

~~wherein said variable heavy chain framework regions and variable light chain framework regions comprise germline protein sequences of a germline protein pair,~~

~~wherein said germline protein pair comprises the following properties:~~

~~i) a relative display rate in Fab format comprising a value within the top 75% of Fabs sampled;~~

~~ii) an expression level in Fab format of at least 0.4 as compared to Fab VH1-69 VLA_VI1-40 AYA;~~

~~iii) thermal stability at 60°C or more for at least 45 minutes in Fab format;~~

~~iv) stability in bovine or mouse serum in Fab format for greater than ten days at 37°C;~~

~~v) an expression level in IgG format of at least 0.4 as compared to MOR03080; and~~

~~vi) stability in bovine serum in IgG format for fourteen days at 37°C; and~~

~~wherein said collection of antibodies or functional fragments thereof comprises at least two different germline protein pairs.~~

~~45.~~24. A method according to ~~claims 43 or 44~~ claim 23, wherein the step of producing further comprises the steps of

a) obtaining data comprising the variable heavy chain and variable light chain germline gene pairs present in the human immune repertoire;

b) identifying the variable heavy chain and variable light chain germline protein pairs comprising the following properties:

i) a relative display rate in Fab format comprising a value within the top 75% of Fabs sampled;

ii) an expression level in Fab format of at least 0.4 as compared to Fab ~~pMx11_FH~~ VH 1-69 VLA_VI1-40 AYA, the sequences of which are depicted in Table 5, Table 9, Figure 45A and Figure 47A;

iii) thermal stability at 60°C or more for at least 45 minutes in Fab format;

iv) stability in bovine or mouse serum in Fab format for greater than ten days at 37°C;

v) an expression level in IgG format of at least 0.4 as compared to MOR3080, the CDR sequences of which are depicted in Table 31; and

vi) stability in bovine serum in IgG format for fourteen days at 37°C; and

c) generating a collection of antibodies or functional fragments thereof comprising the variable heavy chain and variable light chain germline protein sequences of the germline protein pairs identified in step b).

~~46.~~25. A method according to claim ~~45~~ 24, wherein step b) further comprises the steps of

ba) identifying the variable heavy chain and variable light chain germline gene pairs present at a concentration of at least 0.05% in the human immune repertoire;

bb) generating antibodies or functional fragments thereof comprising the germline protein pairs identified in step ba); and

bc) evaluating the following properties of said germline protein pairs:

i) relative display rate in Fab format;

ii) expression level in Fab format;

iii) thermal stability at 60°C or more in Fab format;

iv) stability in bovine or mouse serum in Fab format for greater than ten days at 37°C;

v) expression level in IgG format; and

vi) stability in bovine serum in IgG format for fourteen days at 37°C.

~~47. The method according to claims 45 or 46, wherein step a) further comprises the following steps:~~

~~aa) isolating human B cells from a sample;~~

~~ab) generating cDNAs from the B cells;~~

~~ac) PCR amplifying the cDNAs from the B cells;~~

~~ad) sequencing the PCR products;~~

~~ae) identifying the germline genes of each PCR product.~~

~~48. The method according to any one of claims 43-46, wherein the step of generating a collection further comprises the following steps:~~

~~ca) synthesizing the nucleic acids encoding the antibodies or functional fragments thereof;~~

~~cb) cloning the nucleic acids into a vector;~~

~~cc) expressing the antibodies or functional fragments thereof.~~

~~49. The method according to any one of claims 43-48, wherein said germline gene pairs are present at a concentration of at least 0.05% in the human immune repertoire.~~

~~50. The method according to any one of claims 43-49, wherein said germline gene pairs are present at a concentration of at least 0.23% in the human immune repertoire.~~

~~51. The method according to any one of claims 43-50, wherein said germline gene pairs are present at a concentration of at least 0.51% in the human immune repertoire.~~

~~52. The method according to any one of claims 43-51, wherein said germline gene pairs are present at a concentration of at least 0.07% in the naïve human immune repertoire.~~

~~53. The method according to any one of claims 43-52, wherein said germline gene pairs are present at a concentration of at least 0.52% in the naïve human immune repertoire.~~

~~54. The method according to any one of claims 43-53, wherein said germline gene pairs are present at a concentration of at least 0.88% in the naïve human immune repertoire.~~

~~55. The method according to any one of claims 43-54, wherein said antibodies or functional fragments thereof comprise human sequences.~~

~~56. The method according to any one of claims 43-55, wherein said antibodies or functional fragments thereof comprises germline protein sequences of at least seventeen different germline protein pairs.~~

~~57. The method according to any one of claims 43-56, wherein said antibodies or functional fragments thereof comprise one or more complementarity determining regions comprising germline protein sequences.~~

~~58. The method according to any one of claims 43-57, wherein said antibodies or functional fragments thereof comprise FR1, CDR1, FR2, CDR2, and FR3 comprising germline protein sequences.~~

59. The method according to any one of claims 43-58, where said antibodies or functional fragments thereof comprise a FR4 region selected from the group consisting of: JH4, Jκ1, and Jλ2/3.

60. The method according to any one of claims 43-59, wherein the antibodies or functional fragments thereof comprise a diversified HCDR3 region.

61. The method according to any one of claims 43-60, wherein the antibodies or functional fragments thereof comprise a diversified LCDR3 region.

62. The method according to any one of claims 43-61, wherein the collection comprises $1 X 10^4$ antibodies or functional fragments thereof.

63. The method according to any one of claims 43-62, wherein said germline protein pairs comprise a relative display in Fab format comprising a value within the top 60% of Fabs sampled.

64. The method according to any one of claims 43-63, wherein said germline protein pairs comprise an expression level in Fab format of at least 0.6 as compared to Fab VH1-69 VLA_VI1-40 AYA.

65. The method according to any one of claims 43-64, wherein said germline protein pairs comprise thermal stability at 70 °C or more for at least 45 minutes in Fab format.

66. The method according to any one of claims 43-65, wherein said germline protein pairs comprise an expression level in IgG format of at least 0.6 as compared to MOR03080.

67. The method according to any one of claims 43-66, wherein the variable heavy and light chain framework regions comprise germline protein sequences of a germline protein pair selected from the group consisting of: IGHV3-23/IGKV1-5; IGHV3-23/IGKV3-20; IGHV4-39/IGKV3-15; IGHV3-23/IGKV3-15; IGHV4-59/IGKV1-39/1D-39; IGHV4-39/IGKV1-39/1D-39; IGHV4-59/IGKV3-20; IGHV1-18/IGKV3-20; IGHV3-30/IGKV3-20; IGHV4-39/IGKV1-5; IGHV1-69/IGKV1-39/1D-39; IGHV5-51/IGLV 1-40; IGHV3-23/IGKV4-1; IGHV4-39/IGKV3-20; IGHV3-23/IGLV 2-14; IGHV4-39/IGLV 3-21; IGHV3-23/IGKV1-39/1D-39; IGHV3-30/IGKV1-39/1D-39; IGHV3-30/IGKV3-11; IGHV1-69/IGKV3-20; IGHV3-48/IGKV3-20; IGHV1-2/IGKV3-20; IGHV3-

30/IGKV4-1; IGHV5-51/IGLV 2-14; IGHV4-59/IGKV4-1; IGHV5-51/IGKV3-20; IGHV3-7/IGKV1-39/1D-39; IGHV3-7/IGKV1-5; IGHV3-15/IGKV3-20; IGHV4-39/IGLV 2-14; IGHV4-39/IGLV 2-8; IGHV3-23/IGKV3-11; IGHV3-30/IGKV1-5; IGHV3-30/IGKV3-15; IGHV3-21/IGKV1-5; IGHV3-21/IGKV3-15; IGHV3-30/IGLV 1-51; IGHV3-21/IGLV 1-51; IGHV3-53/IGLV 1-44; IGHV4-59/IGKV3-15; IGHV5-51/IGKV4-1; IGHV1-69/IGKV4-1; and IGHV1-69/IGKV3-11.

68. The method according to any one of claims 43-67, wherein said functional fragments of said antibodies are selected from the group consisting of Fab, F(ab')2, Fab', Fv, and scFv.

69. An isolated nucleic acid encoding a signal or leader sequence comprising a C-terminal restriction site.

70. The nucleic acid according to claim 69, wherein the restriction site is NheI.

71. The nucleic acid according to claims 69 or 70, wherein the signal or leader sequence comprises phoA or a human heavy chain leader sequence.

72. The nucleic acid according to claim 69, wherein the restriction site is NdeI.

73. The nucleic acid according to claims 69 or 72, wherein the signal sequence comprises ompA or a human kappa leader sequence.

74. A vector comprising the nucleic acid according any one of claims 69-73.

75. A host cell comprising the vector of claim 74.

76. The host cell according to claim 75 which is prokaryotic or eukaryotic.

77. The host cell according to claims 75 or 76 which is E. coli.

78. The host cell according to claims 75 or 76 which is mammalian.

79. An isolated antibody or functional fragment thereof, comprising a FR1, CDR1, FR2, CDR2, and FR3 comprising germline protein sequences of a germline protein pair,

wherein the germline protein pair is selected from the group consisting of:

~~IGHV3-23/IGKV1-5; IGHV3-23/IGKV3-20; IGHV4-39/IGKV3-15; IGHV3-23/IGKV3-15; IGHV4-39/IGKV1-39/1D-39; IGHV1-18/IGKV3-20; IGHV3-30/IGKV3-20; IGHV4-39/IGKV1-5; IGHV1-69/IGKV1-39/1D-39; IGHV5-51/IGLV 1-40; IGHV4-39/IGKV3-20; IGHV3-23/IGLV 2-14; IGHV4-39/IGLV 3-21; IGHV3-23/IGKV1-39/1D-39; IGHV3-30/IGKV1-39/1D-39; IGHV1-69/IGKV3-20; IGHV3-48/IGKV3-20; IGHV1-2/IGKV3-20; IGHV3-30/IGKV4-1; IGHV5-51/IGLV 2-14; IGHV5-51/IGKV3-20; IGHV3-7/IGKV1-39/1D-39; IGHV3-7/IGKV1-5; IGHV3-15/IGKV3-20; IGHV4-39/IGLV2-14; IGHV3-23/IGKV3-11; IGHV3-30/IGKV1-5; IGHV3-30/IGKV3-15; IGHV3-21/IGKV1-5; IGHV3-21/IGKV3-15; IGHV3-30/IGLV 1-51; IGHV3-21/IGLV 1-51; and IGHV1-69/I.~~