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(54) Title: COMPLEMENT FACTOR H RELATED 4-SPECIFIC ANTIBODIES AND USES THEREOF

(57) Abstract: The present disclosure relates to the treatment and/or prevention of age-related macular degeneration (AMD), including the advanced form of dry AMD referred to as Geographic Atrophy (GA). In particular, the present disclosure provides novel therapeutic antibodies that target components of the alternative pathway of the complement activation system, including complement factor H-related (CFHR) 4.

COMPLEMENT FACTOR H RELATED 4-SPECIFIC ANTIBODIES AND USES THEREOF

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to and the benefit of U.S. Provisional Patent Application No. 63/336,751 filed April 29, 2022, which is incorporated herein by reference in its entirety for all purposes.

SEQUENCE LISTING

[0002] The text of the computer readable sequence listing filed herewith, titled "40186_601_SequenceListing," created March 30, 2023, having a file size of 643,199 bytes, is hereby incorporated by reference in its entirety.

FIELD

[0003] Embodiments of the present disclosure relate to the treatment and/or prevention of age-related macular degeneration (AMD), including the advanced form of dry AMD referred to as Geographic Atrophy (GA). In particular, the present disclosure provides novel therapeutic antibodies that target components of the alternative pathway of the complement activation system, including complement factor H-related (CFHR) 4.

BACKGROUND

[0004] Age-Related Macular Degeneration (AMD) is the leading cause of severe vision loss in adults over age 50. The Centers for Disease Control and Prevention estimate that 1.8 million people have AMD and another 7.3 million are at substantial risk for vision loss from AMD. This eye disease occurs when there are changes to the macula, a small portion of the retina that is located on the inside back layer of the eye. AMD is a loss of central vision that can occur in two forms: "dry" (atrophic) and "wet" (exudative). Most people with macular degeneration have the dry form. Geographic atrophy (GA) is considered the late stage of the dry form of AMD, characterized by focal and progressive loss of photoreceptors. GA is less common than neovascular AMD, and it is responsible for 10-20% of cases of legal blindness in this condition, affecting more than 5 million people worldwide. Currently there is no approved or effective treatment to prevent either the onset

or progression of GA; however, in recent years, significant progress has been made in understanding the pathogenesis of GA, which has led to a number of new potential therapies.

[0005] Genetic and molecular studies have identified the complement system as an important factor in the etiology and progression of AMD. Many of the genetic risk variants cluster in genes of the alternative pathway of the complement system, and complement activation products are elevated in AMD patients. Nevertheless, attempts in treating AMD via complement regulators have not yet been successful, suggesting a level of complexity that could not be predicted only from a genetic point of view. Thus, there remains a need for new therapeutic approaches for the treatment of AMD and GA.

SUMMARY

[0006] Embodiments of the present disclosure include antibodies directed against Complement Factor H Related 4 (CFHR4) peptides, or antigen-binding fragments thereof. In accordance with these embodiments, the present disclosure provides a heavy chain variable region (VH) comprising complementarity determining regions (CDRs) HCDR1, HCDR2, and HCDR3, and a light chain variable region (VL) comprising complementarity determining regions (CDRs) LCDR1, LCDR2, and LCDR3. In some embodiments, the HCDR1 comprises one of the following amino acid sequences: (a) $X_1YX_2X_3X_4$ (SEQ ID NO: 1), wherein X_1 is S, T, G, or N; X_2 is G or Y; X_3 is I or M; X_4 is S, H, or Q; (b) $X_1YX_2X_3X_4$ (SEQ ID NO: 21), wherein X_1 is S, T, R, or D; X_2 is T, V, A, G, S, or E; X_3 is M or I; X_4 is N, S, or H; (c) $X_1X_2X_3WX_4X_5$ (SEQ ID NO: 53), wherein X_1 is T, S, G, or I; X_2 is S, R, Y, or H; X_3 is D, N, H, K or Y; X_4 is W or S; X_5 is T or S; or (d) SNX_1AX_2WN (SEQ ID NO: 88), wherein X_1 is S, T, or N; X_2 is A or S. In some embodiments, the HCDR2 comprises one of the following amino acid sequences: (a) $X_1IX_2X_3X_4X_5GX_6TX_7X_8X_9X_{10}X_{11}X_{12}QX_{13}$ (SEQ ID NO: 8), wherein X_1 is W or I; X_2 is S, N, or D; X_3 is A or P; X_4 is Y, N, or S; X_5 is N, G, or S; X_6 is N, S, or G; X_7 is N, H, T, or S; X_8 is Y or N; X_9 is A or Y; X_{10} is Q or A; X_{11} is K or S; X_{12} is L or F; X_{13} is G or D; (b) $X_1IX_2X_3X_4X_5X_6X_7X_8X_9X_{10}X_{11}DX_{12}VX_{13}G$ (SEQ ID NO: 32), wherein X_1 is S, V, Y, G or D; X_2 is S or W; X_3 is S, V, G, H, or W; X_4 is S, D, N or T; X_5 is S or G; X_6 is S or G; X_7 is Y, S, T or R; X_8 is T, K, I or V; X_9 is Y, F, N, or G; X_{10} is Y or H; X_{11} is A or V; X_{12} is S or P; X_{13} is R, K, or T; (c) $X_1X_2X_3X_4X_5GX_6X_7X_8X_9X_{10}PLSX_{11}S$ (SEQ ID NO: 65), wherein X_1 is E or Y; X_2 is I, T, or V; X_3 is Y, H, or F; X_4 is H or Y; X_5 is S, D, T, G; X_6 is S, T, G, or N; X_7 is T or I; X_8 is N

or K; X_9 is Y, K, or S; X_{10} is N, S, K, or H; X_{11} is K or Q; or (d) $X_1TX_2YRSX_3X_4X_5X_6X_7X_8X_9X_{10}SX_{11}X_{12}S$ (SEQ ID NO: 102) wherein X_1 is R, T, M, or K; X_2 is Y or F; X_3 is K or R; X_4 is W or L; X_5 is F, Y, or S; X_6 is N, S, D, or A; X_7 is N, V, G, D, Y, or A; X_8 is Y or F; X_9 is S, A, or P; X_{10} is V, L, or A; X_{11} is V or M; X_{12} is K or S. In some embodiments, the HCDR3 comprises one of the following amino acid sequences: (a) SEQ ID NOs: 15-20; (b) SEQ ID NOs: 43-52; (c) SEQ ID NOs: 77-87; or (d) SEQ ID NOs: 116-128.

[0007] In accordance with the above embodiments, the LCDR1 of the anti-CFHR4 antibodies of the present disclosure includes an amino acid sequence of any of SEQ ID NOs: 130-151, SEQ ID NOs: 198-199, SEQ ID NOs: 207-215, or SEQ ID NOs: 237-243; the LCDR2 comprises an amino acid sequence of any of SEQ ID NOs: 153-174, SEQ ID NOs: 201-202, SEQ ID NOs: 217-225, or SEQ ID NOs 245-251; and the LCDR3 comprises an amino acid sequence of any of SEQ ID NOs: 175-196, SEQ ID NOs: 204-205, SEQ ID NOs: 227-235, or SEQ ID NOs: 253-259.

[0008] In some embodiments, the present disclosure provides antibodies directed against CFHR4 peptides, or antigen-binding fragments thereof, that include a VH comprising complementarity determining regions HCDR1, HCDR2, and HCDR3, and a VL comprising complementarity determining regions LCDR1, LCDR2, and LCDR3, wherein the LCDR1 comprises one of the following amino acid sequences: (a) $RX_1SX_2X_3X_4X_5X_6X_7LX_8$ (SEQ ID NO: 129), wherein X_1 is A or T; X_2 is Q or K; X_3 is G, S, D, or N; X_4 is I, F, or V; X_5 is T, R, A, S, N, G, or I; X_6 is T, N, G, S, I, K, or Y; X_7 is W, D, or Y; X_8 is A, T, G, N, or D; (b) $RSSQX_1LLHSX_2GYNX_3LD$ (SEQ ID NO: 197), wherein X_1 is S or R; X_2 is T or S; X_3 is F or Y (c) $RASQX_1X_2X_3X_4X_5X_6X_7X_8A$ (SEQ ID NO: 206), wherein X_1 is S, N, or T; X_2 is V or I; X_3 is S or R; X_4 is S, G or N; X_5 is N or S; X_6 is L or Y; X_7 is A, L, or V; or (d) SEQ ID NO: 236. In some embodiments, the LCDR2 comprises one of the following amino acid sequences: (a) $X_1X_2SX_3LX_4X_5$ (SEQ ID NO: 152), wherein X_1 is G, A, T, or K; X_2 is A or T; X_3 is S, T, G, or N; X_4 is E, Q, or L; X_5 is S, T, or G; (b) LX_1SX_2RAS (SEQ ID NO: 200), wherein X_1 is A or G; X_2 is N or S; (c) $GASX_1RAT$ (SEQ ID NO: 216), wherein X_1 is T, S, or N; or (d) $WASX_1RES$ (SEQ ID NO: 244), wherein X_1 is T, P or N. In some embodiments, the LCDR3 comprises one of the following amino acid sequences: (a) SEQ ID NOs: 175-196; (b) MQX_1LQTPX_2T (SEQ ID NO: 203), wherein X_1 is A or G; X_2 is Y or P; (c) $QX_1YX_2X_3X_4X_5X_6T$ (SEQ ID NO: 226), wherein X_1 is Q or H; X_2 is D or G; X_3 is N, S, or R; X_4 is W or S; X_5 is R, P, F, Y, V, or I; X_6 is T, W, L or

I; or (d) $QQX_1X_2X_3X_4PX_5X_6T$ (SEQ ID NO: 252), wherein X_1 is Y or F; X_2 is G or Y; X_3 is S or N; X_4 is S, T, or I; X_5 is M, Y, or R; X_6 is Y or T.

[0009] In accordance with the above embodiments, the HCDR1 of the anti-CFHR4 antibodies of the present disclosure includes an amino acid sequence of any of SEQ ID NOs: 2-7, SEQ ID NOs: 22-31, SEQ ID NOs: 54-64, or SEQ ID NOs: 89-101; the HCDR2 comprises an amino acid sequence of any of SEQ ID NOs: 9-14, SEQ ID NOs: 33-42, SEQ ID NOs: 66-76, or SEQ ID NOs 103-115; and the HCDR3 comprises an amino acid sequence of any of SEQ ID NOs: 15-20, SEQ ID NOs: 43-52, SEQ ID NOs: 77-87, or SEQ ID NOs: 116-128.

[0010] In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 2; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 9; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 15. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 3; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 10; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 16. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 4; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 11; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 17. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 5; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 12; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 18. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 6; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 13; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 19. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 7; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 14; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 20. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 22; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 33; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 43. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 23; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 34; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 44. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 24; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 35; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 45. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 25; the HCDR2 comprises the

amino acid sequence of SEQ ID NO: 36; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 46. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 26; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 37; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 47. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 27; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 38; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 48. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 28; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 39; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 49. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 29; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 40; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 50. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 30; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 41; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 51. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 31; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 42; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 52. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 54; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 66; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 77. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 55; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 67; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 78. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 56; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 68; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 79. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 57; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 69; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 80. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 58; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 70; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 81. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 59; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 71; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 82. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 60; the

HCDR2 comprises the amino acid sequence of SEQ ID NO: 72; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 83. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 61; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 73; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 84. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 62; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 74; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 85. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 63; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 75; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 86. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 64; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 76; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 87. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 89; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 103; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 116. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 90; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 104; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 117. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 91; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 105; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 118. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 92; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 106; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 119. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 93; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 107; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 120. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 94; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 108; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 121. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 95; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 109; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 122. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 96; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 110; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 123. In some embodiments, the HCDR1

comprises the amino acid sequence of SEQ ID NO: 97; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 111; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 124. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 98; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 112; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 125. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 99; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 113; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 126. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 100; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 114; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 127. In some embodiments, the HCDR1 comprises the amino acid sequence of SEQ ID NO: 101; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 115; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 128. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 130; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 153; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 175. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 131; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 154; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 176. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 132; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 155; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 177. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 133; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 156; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 178. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 134; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 157; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 179. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 135; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 158; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 180. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 136; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 159; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 181. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 137; the LCDR2 comprises the amino acid sequence of SEQ ID NO:

160; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 182. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 138; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 161; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 183. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 139; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 162; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 184. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 140; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 163; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 185. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 141; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 164; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 186. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 142; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 165; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 187. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 143; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 166; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 188. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 144; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 167; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 189. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 145; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 168; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 190. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 146; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 169; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 191. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 147; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 170; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 192. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 148; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 171; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 193. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 149; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 172; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 194. In some

embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 150; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 173; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 195. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 151; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 174; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 196. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 198; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 201; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 204. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 199; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 202; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 205. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 207; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 217; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 227. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 208; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 218; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 228. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 209; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 219; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 229. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 210; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 220; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 230. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 211; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 221; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 231. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 212; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 222; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 232. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 213; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 223; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 233. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 214; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 224; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 234. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 215; the LCDR2

comprises the amino acid sequence of SEQ ID NO: 225; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 235. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 237; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 245; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 253. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 238; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 246; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 254. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 239; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 247; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 255. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 240; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 248; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 256. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 241; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 249; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 257. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 242; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 250; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 258. In some embodiments, the LCDR1 comprises the amino acid sequence of SEQ ID NO: 243; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 251; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 259.

[0011] In some embodiments, the VH of the anti-CFHR4 antibodies of the present disclosure includes an amino acid sequence that is at least 90% identical to any of: (a) SEQ ID NOs: 260-265; (b) SEQ ID NOs: 284-293; (c) SEQ ID NOs: 324-334; or (d) SEQ ID NOs: 368-380. In some embodiments, the VL of the anti-CFHR4 antibodies of the present disclosure includes an amino acid sequence that is at least 90% identical to any of: (a) SEQ ID NOs: 272-277; (b) SEQ ID NOs: 304-313; (c) SEQ ID NOs: 346-356; or (d) SEQ ID NOs: 394-406. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 260 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 272. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 261 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 273. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 262 and the VL comprises an amino acid sequence that is at least 90%

identical to SEQ ID NO: 274. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 263 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 275. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 264 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 276. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 265 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 277. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 284 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 304. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 285 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 305. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 286 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 306. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 287 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 307. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 288 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 308. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 289 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 309. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 290 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 310. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 291 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 311. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 292 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 312. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 293 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 313. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 324 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID

NO: 346. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 325 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 347. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 326 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 348. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 327 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 349. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 328 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 350. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 329 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 351. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 330 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 352. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 331 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 353. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 332 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 354. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 333 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 354. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 334 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 356. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 368 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 394. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 369 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 395. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 370 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 396. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 371 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 397. In some

embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 372 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 398. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 373 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 399. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 374 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 400. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 375 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 401. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 376 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 402. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 377 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 403. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 378 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 404. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 379 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 405. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 380 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 406.

[0012] In accordance with the above embodiments, the present disclosure provides anti-CFHR4 antibodies comprising various functional characteristics. In some embodiments, the anti-CFHR4 antibodies described herein bind an antigen on CFHR4 (SEQ ID NO: 580), or a variant or isoform thereof, via interaction with its antigenic determinants (epitopes). In some embodiments, binding of an anti-CFHR4 antibody to CFHR4 reduces complement activation. In some embodiments, the anti-CFHR4 antibody binds human CFHR4b with a K_D of about 100 nM or lower (FIG. 6).

[0013] In some embodiments, the anti-CFHR4 antibody attenuates complement component 3 (C3) convertase activity. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 330 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 352. In some embodiments, the VH comprises an amino acid

sequence that is at least 90% identical to SEQ ID NO: 293 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 313. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 378 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 404. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 377 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 403. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 376 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 402. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 289 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 309. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 371 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 397. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 284 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 304.

[0014] In some embodiments, the antibody cross-reacts with Cynomolgus monkey CFHR4b protein (cCFHR4b). In some embodiments, the antibody comprises a VH region and a VL region that are at least 90% identical to a VH region and a VL region of an antibody selected from the group consisting of: ATX-P-560, ATX-P-561, ATX-P-562, ATX-P-563, ATX-P-564, ATX-P-565, ATX-P-566, ATX-P-568, ATX-P-569, ATX-P-570, ATX-P-571, ATX-P-573, ATX-P-574, ATX-P-576, ATX-P-577, ATX-P-578, ATX-P-579, ATX-P-580, ATX-P-581, ATX-P-582, ATX-P-583, ATX-P-587, ATX-P-588, ATX-P-591, ATX-P-592, ATX-P-594, ATX-P-596, ATX-P-600, and ATX-P-604.

[0015] In some embodiments, the antibody does not cross-react with Cynomolgus monkey CFHR4b protein (cCFHR4b). In some embodiments, the antibody comprises a VH region and a VL region that are at least 90% identical to a VH region and a VL region of an antibody selected from the group consisting of: ATX-P-572, ATX-P-595, ATX-P-597, ATX-P-598, ATX-P-601, ATX-P-602, ATX-P-603, ATX-P-607, ATX-P-608, ATX-P-609, and ATX-P-610.

[0016] In some embodiments, the antibody cross-reacts with complement factor H-related protein 4a (CFHR4a). In some embodiments, the antibody comprises a VH region and a VL region that are at least 90% identical to a VH region and a VL region of an antibody selected from the

group consisting of: ATX-P-560, ATX-P-561, ATX-P-562, ATX-P-563, ATX-P-564, ATX-P-565, ATX-P-566, ATX-P-568, ATX-P-569, ATX-P-570, ATX-P-571, ATX-P-572, ATX-P-573, ATX-P-574, ATX-P-576, ATX-P-577, ATX-P-578, ATX-P-579, ATX-P-580, ATX-P-581, ATX-P-582, ATX-P-583, ATX-P-587, ATX-P-588, ATX-P-591, ATX-P-592, ATX-P-594, ATX-P-595, ATX-P-596, ATX-P-597, ATX-P-600, ATX-P-601, ATX-P-602, ATX-P-603, ATX-P-604, ATX-P-607, ATX-P-608, ATX-P-609, and ATX-P-610.

[0017] In some embodiments, the antibody does not cross-react with complement factor H-related protein 4a (CFHR4a). In some embodiments, the antibody comprises a VH region and a VL region that are at least 90% identical to ATX-P-598.

[0018] In some embodiments, the antibody cross-reacts with complement factor H-related protein 3 (CFHR3). In some embodiments, the antibody comprises a VH region and a VL region that are at least 90% identical to a VH region and a VL region of an antibody selected from the group consisting of: ATX-P-561, ATX-P-562, ATX-P-563, ATX-P-564, ATX-P-565, ATX-P-566, ATX-P-568, ATX-P-569, ATX-P-572, ATX-P-573, ATX-P-574, ATX-P-576, ATX-P-577, ATX-P-578, ATX-P-579, ATX-P-580, ATX-P-581, ATX-P-583, ATX-P-587, ATX-P-588, ATX-P-592, ATX-P-594, ATX-P-595, ATX-P-596, ATX-P-600, ATX-P-603, ATX-P-604, ATX-P-608, ATX-P-609, and ATX-P-610.

[0019] In some embodiments, the antibody does not cross-react with complement factor H-related protein 3 (CFHR3). In some embodiments, the antibody comprises a VH region and a VL region that are at least 90% identical to a VH region and a VL region of an antibody selected from the group consisting of: ATX-P-560, ATX-P-570, ATX-P-571, ATX-P-582, ATX-P-591, ATX-P-597, ATX-P-598, ATX-P-601, ATX-P-602, ATX-P-603, ATX-P-604, and ATX-P-607.

[0020] In some embodiments, the antibody cross-reacts with complement factor H-related protein 1 (CFHL1). In some embodiments, the antibody comprises a VH region and a VL region that are at least 90% identical to a VH region and a VL region of an antibody selected from the group consisting of: ATX-P-561, ATX-P-562, ATX-P-563, ATX-P-564, ATX-P-565, ATX-P-566, ATX-P-568, ATX-P-570, ATX-P-571, ATX-P-573, ATX-P-574, ATX-P-576, ATX-P-577, ATX-P-578, ATX-P-579, ATX-P-580, ATX-P-581, ATX-P-582, ATX-P-583, ATX-P-587, ATX-P-588, ATX-P-591, ATX-P-594, ATX-P-595, ATX-P-596, ATX-P-600, and ATX-P-604.

[0021] In some embodiments, the antibody does not cross-react with complement factor H-related protein 1 (CFHL1). In some embodiments, the antibody comprises a VH region and a VL

region that are at least 90% identical to a VH region and a VL region of an antibody selected from the group consisting of: ATX-P-560, ATX-P-569, ATX-P-572, ATX-P-592, ATX-P-597, ATX-P-598, ATX-P-601, ATX-P-602, ATX-P-603, ATX-P-607, ATX-P-608, ATX-P-609, and ATX-P-610.

[0022] In accordance with the above embodiments, the anti-CFHR4 antibodies of the present disclosure can be a monoclonal antibody, a human antibody, a humanized antibody, and/or a chimeric antibody. In some embodiments, the antibody is a fragment selected from the group consisting of Fab, Fab-C, Fab'-SH, Fv, scFv, and $(Fab')_2$ fragments. In some embodiments, the anti-CFHR4 antibody is a monospecific antibody. In some embodiments, the anti-CFHR4 antibody is a bispecific antibody. In some embodiments, the anti-CFHR4 antibody comprises two or more single-domain antibodies that form a bivalent antibody, a trivalent antibody, or a tetravalent antibody that recognizes different epitopes on the same or different antigens.

[0023] In some embodiments, the antibody comprises a detection moiety. In some embodiments, the antibody comprises a purification moiety. In some embodiments, the antibody comprises a half-life extension moiety. In some embodiments, the half-life extension moiety comprises a polypeptide that is at least 20 amino acids in length and comprises any combination of G, A, S T, E, and P residues. In some embodiments, the half-life extension polypeptide is attached to the C-terminus or N-terminus of the antibody.

[0024] The anti-CFHR4 antibodies of the present disclosure can be administered as part of a pharmaceutical composition in a therapeutically effective amount to treat an eye disease (e.g., AMD or GA). In some embodiments, the composition is suitable for ocular administration. In some embodiments, ocular administration comprises injection into vitreous fluid. In some embodiments, ocular administration comprises delivering the antibody using a conjunctival insert, a contact lens, a gel, a nanoparticle, a mucoadhesive polymer, an ointment, a solution, a suspension, eye drops, and/or an implant.

[0025] Embodiments of the present disclosure also include methods of treating and/or preventing AMD and/or GA. In accordance with these embodiments, the methods include administering a pharmaceutical composition comprising a therapeutically effective amount of an anti-CFHR4 antibody of the present disclosure. In some embodiments, the pharmaceutical composition is administered ocularly and treats at least one AMD symptom. In some embodiments, AMD comprises wet AMD. In some embodiments, AMD comprises dry AMD (e.g., GA). In some

embodiments, the at least one AMD symptom comprises visual distortion, reduced central vision, blurred vision, and/or difficulty adapting to low light. In some embodiments, administering the pharmaceutical composition reduces complement activation in the subject's eye. In some embodiments, the pharmaceutical composition comprising a therapeutically effective amount of an anti-CFHR4 antibody of the present disclosure is administered at a dose ranging from about 0.0001 mg/dose to about 100 mg/dose. In some embodiments, the pharmaceutical composition is administered at a dose from about 0.0001 mg/ml to about 100 mg/ml.

[0026] Embodiments of the present disclosure also include a polynucleotide encoding any of the anti-CFHR4 antibodies of the present disclosure. In some embodiments, the polynucleotide comprises a sequence that is at least 70% identical to any of the following nucleic acid sequences: (a) SEQ ID NOs: 266-271; (b) SEQ ID NOs: 294-303; (c) SEQ ID NOs: 335-345; or (d) SEQ ID NOs: 381-393. In some embodiments, the polynucleotide comprises a sequence that is at least 70% identical to any of the following nucleic acid sequences: (a) SEQ ID NOs: 278-283; (b) SEQ ID NOs: 314-323; (c) SEQ ID NOs: 357-367; or (d) SEQ ID NOs: 407-419. In some embodiments, the polynucleotide comprises a sequence that is at least 70% identical to any of the following nucleic acid sequences: (a) SEQ ID NOs: 266-271; (b) SEQ ID NOs: 294-303; (c) SEQ ID NOs: 335-345; or (d) SEQ ID NOs: 380-393. In some embodiments, the polynucleotide comprises a sequence that is at least 70% identical to any of the following nucleic acid sequences: (a) SEQ ID NOs: 278-283; (b) SEQ ID NOs: 314-323; (c) SEQ ID NOs: 357-367; or (d) SEQ ID NOs: 407-419.

[0027] In some embodiments, the polynucleotide encoding an anti-CFHR4 antibody of the present disclosure comprises: (a) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 266 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 278; (b) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 267 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 279; (c) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 268 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 280; (d) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 269 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 281; (e) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 270 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 282; or (f) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 270 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 283.

[0028] In some embodiments, the polynucleotide encoding an anti-CFHR4 antibody of the present disclosure comprises: (a) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 294 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 314; (b) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 295 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 315; (c) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 296 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 316; (d) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 297 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 317; (e) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 298 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 318; (f) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 299 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 319; (g) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 300 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 320; (h) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 301 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 321; (i) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 302 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 322; or (j) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 303 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 323.

[0029] In some embodiments, the polynucleotide encoding an anti-CFHR4 antibody of the present disclosure comprises: (a) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 335 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 357; (b) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 336 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 358; (c) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 337 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 359; (d) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 338 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 360; (e) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 339 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 361; (f) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 340 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 362; (g) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 341 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 363; (h) a nucleic acid sequence that is at least 70% identical

to SEQ ID NO: 342 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 364; (i) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 343 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 365; (j) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 344 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 366; or (k) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 345 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 367.

[0030] In some embodiments, the polynucleotide encoding an anti-CFHR4 antibody of the present disclosure comprises: (a) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 381 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 407; (b) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 382 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 408; (c) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 383 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 409; (d) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 384 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 410; (e) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 385 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 411; (f) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 386 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 412; (g) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 387 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 413; (h) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 388 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 414; (i) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 389 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 415; (j) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 390 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 416; (k) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 391 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 417; (l) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 392 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 418; or (m) a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 393 and a nucleic acid sequence that is at least 70% identical to SEQ ID NO: 419.

[0031] In accordance with these embodiments, the present disclosure includes an expression vector comprising any of the polynucleotides encoding an anti-CFHR4 antibody of the present disclosure. In some embodiments, the expression vector is suitable for manufacturing an anti-

CFHR4 antibody of the present disclosure for delivery of the antibody to a subject. In some embodiments, the expression vector is suitable for use in gene therapy (e.g., an expression vector for delivering a polynucleotide encoding an anti-CFHR4 antibody of the present disclosure to a subject). In some embodiments, the expression vector is an adeno-associated virus (AAV) vector, or comprises an AAV backbone. In some embodiments, the expression vector is a lentiviral vector (LV), or comprises an LV backbone. In some embodiments, the expression vector is a herpes simplex virus (HSV) vector, or a retrovirus vector.

[0032] In accordance with these embodiments, the present disclosure also provides a method of administering ocular gene therapy to a subject in need thereof comprising injecting a pharmaceutical composition comprising an effective amount of an expression vector described herein (e.g., an expression vector comprising a polynucleotides encoding an anti-CFHR4 antibody of the present disclosure). In accordance with these embodiments, the present disclosure also provides a method of treating AMD and/or GA comprising administering a pharmaceutical composition comprising an effective amount of an expression vector described herein (e.g., an expression vector comprising a polynucleotides encoding an anti-CFHR4 antibody of the present disclosure). In some embodiments, administering the pharmaceutical composition treats at least one AMD symptom and/or GA.

BRIEF DESCRIPTION OF THE DRAWING(S)

[0033] FIG. 1: Representative illustration of the molecular mechanism underlying treatment of advanced Age-related Macular Degeneration (AMD), including Geographic Atrophy (GA) with the anti-CFHR4 antibodies of the present disclosure.

[0034] FIG. 2: Representing results (see Table 1) plotting Odds Ratio and confidence intervals of haplotype effect when there is a deletion (tagged by one of two variants) or a pQTL variant on Y402 haplotype. The associations were done in relation to the reference haplotype at OR=1.

[0035] FIGS. 3A-3C: Representative ELISA results used to determine antigen positive serum titers of mice immunized with CFHR4, according to three different immunization protocols/cohorts (FIG. 3A – Cohort 1; FIG. 3B – Cohort 2; FIG. 3C – Cohort 3).

[0036] FIG. 4: Representative results of the thermal stabilities of the human CFHR4 monoclonal antibodies of the present disclosure (see Table 2, "ATX" antibodies). Thermal stability

was assessed via differential scanning fluorimetry (DSF) utilizing the Protein Thermal Shift (PTS) assay.

[0037] FIGS. 5A-5B: Representative results of CFHR4 antibody cross-blocking experiments, including data from a representative heatmap analyzing the ability of the antibodies to block one another for binding to the antigen (FIG. 5A), and a representative network plot, which progressively groups antibodies with similar competition profiles.

[0038] FIG. 6: Representative results of CFHR4 antibody binding kinetics.

[0039] FIG. 7: Representative results of CFHR4 antibody cross-reactivity with Cynomolgus monkey CFHR4b protein (cCFHR4b).

[0040] FIG. 8: Representative results of CFHR4 antibody cross-reactivity with human CFHR4a protein.

[0041] FIG. 9: Representative results of CFHR4 antibody cross-reactivity with human CFHR3 protein.

[0042] FIG. 10: Representative results of CFHR4 antibody cross-reactivity with human CFHL-1 (Y402H) protein.

[0043] FIGS. 11A-11D: Representative schematic diagram of a C3 convertase assembly assay used to evaluate the ability of the CFHR4 antibodies of the present disclosure to affect C3 convertase formation (FIG. 11A). FIG. 11B includes representative dose response curves for the top inhibitory CFHR4 antibodies, and FIG. 11C includes the IC50 values calculated for each antibody tested in FIG. 11B. FIG. 11D provides a representative summary of data demonstrating at least three functional classes of anti-CFHR4 antibodies.

DETAILED DESCRIPTION

[0044] Embodiments of the present disclosure relate to the treatment and/or prevention of age-related macular degeneration (AMD), including the advanced form of dry AMD referred to as Geographic Atrophy (GA). In particular, the present disclosure provides novel therapeutic antibodies that target components of the alternative pathway of the complement activation system, including complement factor H-related (CFHR) 4.

[0045] Human complement factor H-related protein (CFHR) 4 belongs to the factor H family of plasma glycoproteins that are composed of short consensus repeat (SCR) domains. Although factor H is a well-known inhibitor of the alternative complement pathway, the functions of the

CFHR proteins are not as clear. For example, CFHR4 lacks SCRs homologous to the complement inhibitory domains of factor H; however, its complement regulatory activities are not fully understood. Previous studies have shown that CFHR4 binds C-reactive protein via its most N-terminal SCR, which leads to classical complement pathway activation. CFHR4 binds C3b via its C terminus, but the significance of this interaction is not as well understood. Recent reports indicate that CFHR4 may serve as a platform for the assembly of an alternative pathway C3 convertase by binding C3b. This is at least partially based on the sustained ability of CFHR4-bound C3b to bind factor B and properdin, leading to an active convertase that generates C3a and C3b from C3. The CFHR4-C3bBb convertase is less sensitive to the factor H-mediated decay compared with the C3bBb convertase. CFHR4 mutants containing exchanges of conserved residues within the C-terminal C3b-binding site showed significantly reduced C3b binding and alternative pathway complement activation. These initial data suggest that, in contrast to the complement inhibitor factor H, CFHR4 acts as an enhancer of opsonization by promoting complement activation.

[0046] Complement is a powerful effector system of innate immunity, with major roles in the elimination of microbes, inflammatory processes, disposal of cellular debris, and modulation of adaptive immunity. A multilevel regulation ensures complement activation on dangerous surfaces but prevents its harmful effects on host cells and tissues. This is achieved by the expression of complement inhibitors on host cell surfaces and the absence of those on foreign or altered self-surfaces, as well as by soluble regulators having distinct binding specificities for different surfaces. The plasma glycoprotein factor H (FH) is the major soluble inhibitor of the alternative complement pathway (AP). It prevents the formation of the AP C3 convertase C3bBb by blocking the binding of factor B (FB) to C3b, and it accelerates the decay of existing C3 convertases by displacing Bb. It also acts as a cofactor for the serine protease factor I (FI) in the cleavage of C3b to inactive C3b (iC3b), which can no longer form a convertase. By these mechanisms, FH inhibits the amplification of the complement cascade both in fluid phase and on the surface of host cells FH, its splicing variant complement factor H-like protein 1 (CFHL1), and five complement factor H-related proteins (CFHR1–CFHR5), which are encoded by separate genes, constitute the human factor H protein family. FH is composed of 20 short consensus repeat (SCR) domains, CFHL1 contains SCR1–7 of FH, and the CFHR proteins consist of four to nine SCRs that are homologous

to various domains of FH. Whereas CFHL1 shares the complement inhibitory activities of FH, the physiological roles of the CFHR proteins are less well understood.

[0047] CFHR4 is detected in human plasma as two different glycoproteins. The 86-kDa long isoform termed CFHR4A consists of nine SCRs. The ~45-kDa shorter isoform termed CFHR4B is composed of five SCRs that represent SCR1 and SCR6–9 of CFHR4A. In CFHR4A, SCR1–4 and SCR5–8 are highly related based on nucleotide and amino acid sequence identity, likely as a result of an intramolecular duplication. Like all CFHRs, both CFHR4 isoforms lack SCRs homologous to the N-terminal complement inhibitory domains SCR1–4 of FH and CFHL1. The two most C-terminal domains of CFHR4A and CFHR4B are homologous to the C-terminal FH domains SCR19–20 that contain C3b/C3d-binding sites. CFHR4B has been shown to bind the C3d region of C3b via its C-terminal SCR4–5. However, except for a slight enhancement of the cofactor activity of FH in the presence of high CFHR4B concentrations, no significant functions have been associated with this C3b binding capacity. The CFHR4A isoform has not yet been characterized for its interaction with C3b and complement regulatory activity.

[0048] Age-related macular degeneration (AMD) is a progressive retinal disease for which the early stage is characterized by relatively few small drusen within the macula. When AMD progresses, drusen size and number increase, eventually leading towards more advanced stages of AMD. Two forms of advanced AMD are distinguished. The first form, neovascular AMD, is characterized by infiltration of abnormal blood vessels into the retina. These newly formed vessels are fragile and when they break, the leakage of blood constituents in the retina leads to sudden vision loss. The second form of advanced AMD, geographic atrophy (GA), is the result of gradual degeneration of the RPE and photoreceptors cells. Although neovascularization occurs in only 15–20% of AMD cases, it is responsible for the vast majority of vision loss caused by AMD. Drugs targeting vascular endothelial growth factor (VEGF), one of the central molecules in neovascularization, have proven to be very successful in neovascular AMD. However, no treatment is available for the remaining majority of early, intermediate or geographic atrophy AMD cases, and furthermore there are no effective means of preventing progression of early to advanced stages. Although it is known that AMD is the result of a complex interaction of environmental and genetic risk factors, studies into the molecular constituents of drusen suggest that AMD may have an immunological component. This suggestion arose after proteins involved

in inflammation and/or other immune-associated responses, including components of the complement system, were found within drusen.

[0049] In light of this, experiments were performed to determine the role that CFHR4 may play in the etiology of AMD and GA, and concomitantly, to develop a therapeutic platform based on modulating CFHR4 activity using anti-CFHR4 antibodies.

Definitions

[0050] To facilitate an understanding of the present technology, a number of terms and phrases are defined below. Additional definitions are set forth throughout the detailed description.

[0051] The use of the terms "a" and "an" and "the" and "at least one" and similar referents in the context of describing the embodiments of the present disclosure (especially in the context of the following claims) are to be construed to cover both the singular and the plural, unless otherwise indicated herein or clearly contradicted by context. The use of the term "at least one" followed by a list of one or more items (for example, "at least one of A and B") is to be construed to mean one item selected from the listed items (A or B) or any combination of two or more of the listed items (A and B), unless otherwise indicated herein or clearly contradicted by context. The terms "comprising," "having," "including," and "containing" are to be construed as open-ended terms (i.e., meaning "including, but not limited to,") unless otherwise noted. Recitation of ranges of values herein are merely intended to serve as a shorthand method of referring individually to each separate value falling within the range, unless otherwise indicated herein, and each separate value is incorporated into the specification as if it were individually recited herein. All methods described herein can be performed in any suitable order unless otherwise indicated herein or otherwise clearly contradicted by context. The use of any and all examples, or exemplary language (e.g., "such as") provided herein, is intended merely to better illuminate the various embodiments of the present disclosure, and does not pose a limitation on the scope of these embodiment unless otherwise claimed. No language in the specification should be construed as indicating any non-claimed element as essential to the practice of the various embodiments of the present disclosure.

[0052] As used herein, the term "or" is an inclusive "or" operator and is equivalent to the term "and/or" unless the context clearly dictates otherwise. The term "based on" is not exclusive and allows for being based on additional factors not described, unless the context clearly dictates otherwise. In addition, throughout the specification, the meaning of "a," "an," and "the" include plural references. The meaning of "in" includes "in" and "on."

[0053] The transitional phrase "consisting essentially of" as used in claims in the present application limits the scope of a claim to the specified materials or steps "and those that do not materially affect the basic and novel characteristic(s)" of the claimed invention, as discussed in *In re Herz*, 537 F.2d 549, 551-52, 190 USPQ 461, 463 (CCPA 1976). For example, a composition "consisting essentially of" recited elements may contain an unrecited contaminant at a level such that, though present, the contaminant does not alter the function of the recited composition as compared to a pure composition, i.e., a composition "consisting of" the recited components.

[0054] The term "one or more," as used herein, refers to a number higher than one. For example, the term "one or more" encompasses any of the following: two or more, three or more, four or more, five or more, six or more, seven or more, eight or more, nine or more, ten or more, eleven or more, twelve or more, thirteen or more, fourteen or more, fifteen or more, twenty or more, fifty or more, 100 or more, or an even greater number.

[0055] The term "one or more but less than a higher number," "two or more but less than a higher number," "three or more but less than a higher number," "four or more but less than a higher number," "five or more but less than a higher number," "six or more but less than a higher number," "seven or more but less than a higher number," "eight or more but less than a higher number," "nine or more but less than a higher number," "ten or more but less than a higher number," "eleven or more but less than a higher number," "twelve or more but less than a higher number," "thirteen or more but less than a higher number," "fourteen or more but less than a higher number," or "fifteen or more but less than a higher number" is not limited to a higher number. For example, the higher number can be 10,000, 1,000, 100, 50, etc. For example, the higher number can be approximately 50 (e.g., 50, 49, 48, 47, 46, 45, 44, 43, 42, 41, 40, 39, 38, 37, 36, 35, 34, 33, 32, 31, 32, 30, 29, 28, 27, 26, 25, 24, 23, 22, 21, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3 or 2).

[0056] The term "immunoglobulin" or "antibody," as used herein, refers to a protein that is found in blood or other bodily fluids of vertebrates, which is used by the immune system to identify and neutralize foreign objects, such as bacteria and viruses. Typically, an immunoglobulin or antibody is a protein that comprises at least one complementarity determining region (CDR). The CDRs form the "hypervariable region" of an antibody, which is responsible for antigen binding (discussed further below). A whole antibody typically consists of four polypeptides: two identical copies of a heavy (H) chain polypeptide and two identical copies of a light (L) chain polypeptide.

Each of the heavy chains contains one N-terminal variable (V_H) region and three C-terminal constant (C_{H1}, C_{H2}, and C_{H3}) regions, and each light chain contains one N-terminal variable (V_L) region and one C-terminal constant (C_L) region. The light chains of antibodies can be assigned to one of two distinct types, either kappa (κ) or lambda (λ), based upon the amino acid sequences of their constant domains. In a typical antibody, each light chain is linked to a heavy chain by disulfide bonds, and the two heavy chains are linked to each other by disulfide bonds. The light chain variable region is aligned with the variable region of the heavy chain, and the light chain constant region is aligned with the first constant region of the heavy chain. The remaining constant regions of the heavy chains are aligned with each other.

[0057] The variable regions of each pair of light and heavy chains form the antigen binding site of an antibody. The V_H and V_L regions have the same general structure, with each region comprising four framework (FW or FR) regions. The term "framework region," as used herein, refers to the relatively conserved amino acid sequences within the variable region which are located between the CDRs. There are four framework regions in each variable domain, which are designated FR1, FR2, FR3, and FR4. The framework regions form the β sheets that provide the structural framework of the variable region (see, e.g., C. A. Janeway et al. (eds.), *Immunobiology*, 5th Ed., Garland Publishing, New York, N.Y. (2001)).

[0058] The framework regions are connected by three CDRs. As discussed above, the three CDRs, known as CDR1, CDR2, and CDR3, form the "hypervariable region" of an antibody, which is responsible for antigen binding. The CDRs form loops connecting, and in some cases comprising part of, the beta-sheet structure formed by the framework regions. While the constant regions of the light and heavy chains are not directly involved in binding of the antibody to an antigen, the constant regions can influence the orientation of the variable regions. The constant regions also exhibit various effector functions, such as participation in antibody-dependent complement-mediated lysis or antibody-dependent cellular toxicity via interactions with effector molecules and cells.

[0059] As used herein, when an antibody or other entity (e.g., antigen binding domain) "specifically recognizes" or "specifically binds" an antigen or epitope, it preferentially recognizes the antigen in a complex mixture of proteins and/or macromolecules, and binds the antigen or epitope with affinity which is substantially higher than to other entities not displaying the antigen or epitope. In this regard, "affinity which is substantially higher" means affinity that is high enough

to enable detection of an antigen or epitope which is distinguished from entities using a desired assay or measurement apparatus. Typically, it means binding affinity having a binding constant (K_a) of at least 10^7 M^{-1} (e.g., $>10^7$ M^{-1}, $>10^8$ M^{-1}, $>10^9$ M^{-1}, $>10^{10}$ M^{-1}, $>10^{11}$ M^{-1}, $>10^{12}$ M^{-1}, $>10^{13}$ M^{-1}, etc.). In certain such embodiments, an antibody is capable of binding different antigens so long as the different antigens comprise that particular epitope. In certain instances, for example, homologous proteins from different species may comprise the same epitope.

[0060] The terms "fragment of an antibody," "antibody fragment," and "antigen-binding fragment" of an antibody are used interchangeably herein to refer to one or more fragments of an antibody that retain the ability to specifically bind to an antigen (see, generally, Holliger et al., *Nat. Biotech.*, *23*(9): 1126-1129 (2005)). Any antigen-binding fragment of the antibody described herein is within the scope of the present disclosure. The antibody fragment desirably comprises, for example, one or more CDRs, the variable region (or portions thereof), the constant region (or portions thereof), or combinations thereof. Examples of antibody fragments include, but are not limited to, (i) a Fab fragment, which is a monovalent fragment consisting of the V_L, V_H, C_L, and C_{H1} domains, (ii) a F(ab')2 fragment, which is a bivalent fragment comprising two Fab fragments linked by a disulfide bridge at the hinge region, (iii) a Fv fragment consisting of the V_L and V_H domains of a single arm of an antibody, (iv) a Fab' fragment, which results from breaking the disulfide bridge of an F(ab')2 fragment using mild reducing conditions, (v) a disulfide-stabilized Fv fragment (dsFv), and (vi) a domain antibody (dAb), which is an antibody single variable region domain (V_H or V_L) polypeptide that specifically binds antigen.

[0061] The term "monoclonal antibody," as used herein, refers to an antibody produced by a single clone of B lymphocytes that is directed against a single epitope on an antigen. Monoclonal antibodies typically are produced using hybridoma technology, as first described in Köhler and Milstein, *Eur. J. Immunol.*, *5*: 511-519 (1976). Monoclonal antibodies may also be produced using recombinant DNA methods (see, e.g., U.S. Patent 4,816,567), isolated from phage display antibody libraries (see, e.g., Clackson et al. *Nature*, *352*: 624-628 (1991)); and Marks et al., *J. Mol. Biol.*, *222*: 581-597 (1991)), or produced from transgenic mice carrying a fully human immunoglobulin system (see, e.g., Lonberg, *Nat. Biotechnol.*, *23*(9): 1117-25 (2005), and Lonberg, *Handb. Exp. Pharmacol.*, *181*: 69-97 (2008)). In contrast, "polyclonal" antibodies are antibodies that are secreted by different B cell lineages within an animal. Polyclonal antibodies are a collection of immunoglobulin molecules that recognize multiple epitopes on the same antigen.

[0062] The terms "nucleic acid," "polynucleotide," "nucleotide sequence," and "oligonucleotide" are used interchangeably herein and refer to a polymer or oligomer of pyrimidine and/or purine bases, preferably cytosine, thymine, and uracil, and adenine and guanine, respectively (See Albert L. Lehninger, *Principles of Biochemistry*, at 793-800 (Worth Pub. 1982)). The terms encompass any deoxyribonucleotide, ribonucleotide, or peptide nucleic acid component, and any chemical variants thereof, such as methylated, hydroxymethylated, or glycosylated forms of these bases. The polymers or oligomers may be heterogenous or homogenous in composition, may be isolated from naturally occurring sources, or may be artificially or synthetically produced. In addition, the nucleic acids may be DNA or RNA, or a mixture thereof, and may exist permanently or transitionally in single-stranded or double-stranded form, including homoduplex, heteroduplex, and hybrid states. In some embodiments, a nucleic acid or nucleic acid sequence comprises other kinds of nucleic acid structures such as, for instance, a DNA/RNA helix, peptide nucleic acid (PNA), morpholino nucleic acid (see, e.g., Braasch and Corey, *Biochemistry*, *41*(14): 4503-4510 (2002) and U.S. Patent 5,034,506), locked nucleic acid (LNA; see Wahlestedt et al., *Proc. Natl. Acad. Sci. U.S.A.*, *97*: 5633-5638 (2000)), cyclohexenyl nucleic acids (see Wang, *J. Am. Chem. Soc.*, *122*: 8595-8602 (2000)), and/or a ribozyme. The terms "nucleic acid" and "nucleic acid sequence" may also encompass a chain comprising non-natural nucleotides, modified nucleotides, and/or non-nucleotide building blocks that can exhibit the same function as natural nucleotides (e.g., "nucleotide analogs").

[0063] The terms "peptide," "polypeptide," and "protein" are used interchangeably herein and refer to a polymeric form of amino acids of any length, which can include coded and non-coded amino acids, chemically or biochemically modified or derivatized amino acids, and polypeptides having modified peptide backbones.

[0064] As used herein, a "nucleic acid" or "nucleic acid molecule" generally refers to any ribonucleic acid or deoxyribonucleic acid, which may be unmodified or modified DNA or RNA. "Nucleic acids" include, without limitation, single- and double-stranded nucleic acids. As used herein, the term "nucleic acid" also includes DNA as described above that contains one or more modified bases. Thus, DNA with a backbone modified for stability or for other reasons is a "nucleic acid." The term "nucleic acid" as it is used herein embraces such chemically, enzymatically, or metabolically modified forms of nucleic acids, as well as the chemical forms of DNA characteristic of viruses and cells, including for example, simple and complex cells.

[0065] The terms "oligonucleotide" or "polynucleotide" or "nucleotide" or "nucleic acid" refer to a molecule having two or more deoxyribonucleotides or ribonucleotides, preferably more than three, and usually more than ten. The exact size will depend on many factors, which in turn depends on the ultimate function or use of the oligonucleotide. The oligonucleotide may be generated in any manner, including chemical synthesis, DNA replication, reverse transcription, or a combination thereof. Typical deoxyribonucleotides for DNA are thymine, adenine, cytosine, and guanine. Typical ribonucleotides for RNA are uracil, adenine, cytosine, and guanine.

[0066] The terms "complementary" and "complementarity" refer to nucleotides (e.g., 1 nucleotide) or polynucleotides (e.g., a sequence of nucleotides) related by the base-pairing rules. For example, the sequence 5'-A-G-T-3' is complementary to the sequence 3'-T-C-A-5'. Complementarity may be "partial," in which only some of the nucleic acids' bases are matched according to the base pairing rules. Or, there may be "complete" or "total" complementarity between the nucleic acids. The degree of complementarity between nucleic acid strands affects the efficiency and strength of hybridization between nucleic acid strands. This is of particular importance in amplification reactions and in detection methods that depend upon binding between nucleic acids.

[0067] The term "gene" refers to a nucleic acid (e.g., DNA or RNA) sequence that comprises coding sequences necessary for the production of an RNA, or of a polypeptide or its precursor. A functional polypeptide can be encoded by a full-length coding sequence or by any portion of the coding sequence as long as the desired activity or functional properties (e.g., enzymatic activity, ligand binding, signal transduction, etc.) of the polypeptide are retained. The term "portion" when used in reference to a gene refers to fragments of that gene. The fragments may range in size from a few nucleotides to the entire gene sequence minus one nucleotide. Thus, "a nucleotide comprising at least a portion of a "gene" may comprise fragments of the gene or the entire gene.

[0068] The term "gene" also encompasses the coding regions of a structural gene and includes sequences located adjacent to the coding region on both the 5' and 3' ends, e.g., for a distance of about 1 kb on either end, such that the gene corresponds to the length of the full-length mRNA (e.g., comprising coding, regulatory, structural and other sequences). The sequences that are located 5' of the coding region and that are present on the mRNA are referred to as 5' non-translated or untranslated sequences. The sequences that are located 3' or downstream of the coding region and that are present on the mRNA are referred to as 3' non-translated or 3' untranslated sequences.

The term "gene" encompasses both cDNA and genomic forms of a gene. In some organisms (e.g., eukaryotes), a genomic form or clone of a gene contains the coding region interrupted with non-coding sequences termed "introns" or "intervening regions" or "intervening sequences." Introns are segments of a gene that are transcribed into nuclear RNA (hnRNA); introns may contain regulatory elements such as enhancers. Introns are removed or "spliced out" from the nuclear or primary transcript; introns therefore are absent in the messenger RNA (mRNA) transcript. The mRNA functions during translation to specify the sequence or order of amino acids in a nascent polypeptide.

[0069] In addition to containing introns, genomic forms of a gene may also include sequences located on both the 5' and 3' ends of the sequences that are present on the RNA transcript. These sequences are referred to as "flanking" sequences or regions (these flanking sequences are located 5' or 3' to the non-translated sequences present on the mRNA transcript). The 5' flanking region may contain regulatory sequences such as promoters and enhancers that control or influence the transcription of the gene. The 3' flanking region may contain sequences that direct the termination of transcription, posttranscriptional cleavage, and polyadenylation.

[0070] The term "wild-type" when made in reference to a gene refers to a gene that has the characteristics of a gene isolated from a naturally occurring source. The term "wild-type" when made in reference to a gene product refers to a gene product that has the characteristics of a gene product isolated from a naturally occurring source. The term "wild-type" when made in reference to a protein refers to a protein that has the characteristics of a naturally occurring protein. The term "naturally-occurring" as applied to an object refers to the fact that an object can be found in nature. For example, a polypeptide or polynucleotide sequence that is present in an organism (including viruses) that can be isolated from a source in nature, and which has not been intentionally modified by the hand of a person in the laboratory is naturally-occurring. A wild-type gene is often that gene or allele that is most frequently observed in a population and is thus arbitrarily designated the "normal" or "wild-type" form of the gene. In contrast, the term "modified" or "mutant" when made in reference to a gene or to a gene product refers, respectively, to a gene or to a gene product that displays modifications in sequence and/or functional properties (e.g., altered characteristics) when compared to the wild-type gene or gene product. It is noted that naturally-occurring mutants can be isolated; these are identified by the fact that they have altered characteristics when compared to the wild-type gene or gene product.

[0071] The term "allele" refers to a variation of a gene; the variations include but are not limited to variants and mutants, polymorphic loci, and single nucleotide polymorphic loci, frameshift, and splice mutations. An allele may occur naturally in a population, or it might arise during the lifetime of any particular individual of the population.

[0072] Thus, the terms "variant" and "mutant" when used in reference to a nucleotide sequence refer to a nucleic acid sequence that differs by one or more nucleotides from another, usually related, nucleotide acid sequence. A "variation" is a difference between two different nucleotide sequences; typically, one sequence is a reference sequence.

[0073] The terms "immunogen" and "antigen" are used interchangeably herein and refer to any molecule, compound, or substance that induces an immune response in an animal (e.g., a mammal). An "immune response" can entail, for example, antibody production and/or the activation of immune effector cells. An antigen in the context of the disclosure can comprise any subunit, fragment, or epitope of any proteinaceous or non-proteinaceous (e.g., carbohydrate or lipid) molecule that provokes an immune response in a mammal. The term "epitope" refers to a sequence of an antigen that is recognized by an antibody or an antigen receptor. Epitopes also are referred to in the art as "antigenic determinants." In certain embodiments, an epitope is a region of an antigen that is specifically bound by an antibody. In certain embodiments, an epitope may include chemically active surface groupings of molecules such as amino acids, sugar side chains, phosphoryl, or sulfonyl groups. In certain embodiments, an epitope may have specific three-dimensional structural characteristics (e.g., a "conformational" epitope) and/or specific charge characteristics. The antigen can be a protein or peptide of viral, bacterial, parasitic, fungal, protozoan, prion, cellular, or extracellular origin, which provokes an immune response in a mammal, preferably leading to protective immunity.

[0074] A "pharmaceutically acceptable carrier" as used herein generally refers to an ingredient in a pharmaceutical formulation, other than an active ingredient, which is nontoxic to a subject. A pharmaceutically acceptable carrier includes, but is not limited to, a buffer, excipient, stabilizer, or preservative.

[0075] The term "pharmaceutical formulation" as used herein generally refers to a preparation which is in such form as to permit the biological activity of an active ingredient (e.g., an anti-CFHR4 antibody, an antibody conjugate, a fusion protein, or a polymeric formulation) contained

therein to be effective, and which contains no additional components which are unacceptably toxic to a subject to which the formulation would be administered.

[0076] As used herein, "treatment" (and grammatical variations thereof such as "treat" or "treating") generally refers to clinical intervention in an attempt to alter the natural course of the individual being treated, and can be performed either for prophylaxis or during the course of clinical pathology. Desirable effects of treatment include, but are not limited to, preventing occurrence or recurrence of disease, alleviation of symptoms, diminishment of any direct or indirect pathological consequences of the disease, preventing metastasis, decreasing the rate of disease progression, amelioration or palliation of the disease state, and remission or improved prognosis. In some embodiments, anti-CFHR4 antibodies of the present disclosure or other compositions that include an anti-CFHR4 antibody of the present disclosure (e.g., an antibody conjugate, a fusion protein, or a polymeric formulation) are used to delay development of a disease or to slow the progression of a disease.

[0077] The term "half-life" as used herein generally refers to the time required for the concentration of a substance (e.g., an anti-CFHR4 antibody, an antibody conjugate, a fusion protein (e.g., a Fab fusion protein), or a polymeric formulation) to decrease by one-half, in vivo (e.g., in the eye (e.g., the vitreous)) or in vitro.

[0078] An "effective amount" of an agent, e.g., a pharmaceutical formulation, as used herein generally refers to an amount effective, at dosages and for periods of time necessary, to achieve the desired therapeutic or prophylactic result.

[0079] An "individual" or "subject" is a mammal. Mammals include, but are not limited to, domesticated animals (e.g., cows, sheep, cats, dogs, and horses), primates (e.g., humans and non-human primates such as monkeys), rabbits, and rodents (e.g., mice and rats). In certain embodiments, the individual or subject is a human. A "subject" may be a "patient."

Anti-CFHR4 Antibodies

[0080] As described further herein, embodiments of the present disclosure relate to the treatment and/or prevention of age-related macular degeneration (AMD), including the advanced form of dry AMD referred to as Geographic Atrophy (GA). In particular, the present disclosure provides novel therapeutic antibodies that target components of the alternative pathway of the complement activation system, including complement factor H-related (CFHR) 4.

[0081] As described further herein, anti-CFHR4 antibodies were generated, and their structural and functional properties were elucidated. Based on these data, embodiments of the present disclosure include anti-CFHR4 antibodies, or antigen-binding fragments thereof, that are comprised of a heavy chain variable region (VH) comprising complementarity determining regions (CDRs) HCDR1, HCDR2, and HCDR3, and a light chain variable region (VL) comprising complementarity determining regions (CDRs) LCDR1, LCDR2, and LCDR3. In some embodiments, the HCDR1 comprises one of the following amino acid sequences: (a) $X_1YX_2X_3X_4$ (SEQ ID NO: 1), wherein X_1 is S, T, G, or N; X_2 is G or Y; X_3 is I or M; X_4 is S, H, or Q; (b) $X_1YX_2X_3X_4$ (SEQ ID NO: 21), wherein X_1 is S, T, R, or D; X_2 is T, V, A, G, S, or E; X_3 is M or I; X_4 is N, S, or H; (c) $X_1X_2X_3WX_4X_5$ (SEQ ID NO: 53), wherein X_1 is T, S, G, or I; X_2 is S, R, Y, or H; X_3 is D, N, H, K or Y; X_4 is W or S; X_5 is T or S; or (d) SNX_1AX_2WN (SEQ ID NO: 88), wherein X_1 is S, T, or N; X_2 is A or S. In some embodiments, the HCDR2 comprises one of the following amino acid sequences: (a) $X_1IX_2X_3X_4X_5GX_6TX_7X_8X_9X_{10}X_{11}X_{12}QX_{13}$ (SEQ ID NO: 8), wherein X_1 is W or I; X_2 is S, N, or D; X_3 is A or P; X_4 is Y, N, or S; X_5 is N, G, or S; X_6 is N, S, or G; X_7 is N, H, T, or S; X_8 is Y or N; X_9 is A or Y; X_{10} is Q or A; X_{11} is K or S; X_{12} is L or F; X_{13} is G or D; (b) $X_1IX_2X_3X_4X_5X_6X_7X_8X_9X_{10}X_{11}DX_{12}VX_{13}G$ (SEQ ID NO: 32), wherein X_1 is S, V, Y, G or D; X_2 is S or W; X_3 is S, V, G, H, or W; X_4 is S, D, N or T; X_5 is S or G; X_6 is S or G; X_7 is Y, S, T or R; X_8 is T, K, I or V; X_9 is Y, F, N, or G; X_{10} is Y or H; X_{11} is A or V; X_{12} is S or P; X_{13} is R, K, or T; (c) $X_1X_2X_3X_4X_5GX_6X_7X_8X_9X_{10}PLSX_{11}S$ (SEQ ID NO: 65), wherein X_1 is E or Y; X_2 is I, T, or V; X_3 is Y, H, or F; X_4 is H or Y; X_5 is S, D, T, G; X_6 is S, T, G, or N; X_7 is T or I; X_8 is N or K; X_9 is Y, K, or S; X_{10} is N, S, K, or H; X_{11} is K or Q; or (d) $X_1TX_2YRSX_3X_4X_5X_6X_7X_8X_9X_{10}SX_{11}X_{12}S$ (SEQ ID NO: 102) wherein X_1 is R, T, M, or K; X_2 is Y or F; X_3 is K or R; X_4 is W or L; X_5 is F, Y, or S; X_6 is N, S, D, or A; X_7 is N, V, G, D, Y, or A; X_8 is Y or F; X_9 is S, A, or P; X_{10} is V, L, or A; X_{11} is V or M; X_{12} is K or S. In some embodiments, the HCDR3 comprises one of the following amino acid sequences: (a) SEQ ID NOs: 15-20; (b) SEQ ID NOs: 43-52; (c) SEQ ID NOs: 77-87; or (d) SEQ ID NOs: 116-128.

[0082] In addition to the above HCDR1, HCDR2, and HCDR3 sequences, anti-CFHR4 antibodies of the present disclosure include an LCDR1 comprising an amino acid sequence of any of SEQ ID NOs: 130-151, SEQ ID NOs: 198-199, SEQ ID NOs: 207-215, or SEQ ID NOs: 237-243; an LCDR2 comprising an amino acid sequence of any of SEQ ID NOs: 153-174, SEQ ID NOs: 201-202, SEQ ID NOs: 217-225, or SEQ ID NOs 245-251; and an LCDR3 comprising an

amino acid sequence of any of SEQ ID NOs: 175-196, SEQ ID NOs: 204-205, SEQ ID NOs: 227-235, or SEQ ID NOs: 253-259.

[0083] In some embodiments, the present disclosure provides anti-CFHR4 antibodies, or antigen-binding fragments thereof, that include a VH comprising complementarity determining regions HCDR1, HCDR2, and HCDR3, and a VL comprising complementarity determining regions LCDR1, LCDR2, and LCDR3. In some embodiments, the LCDR1 comprises one of the following amino acid sequences: (a) $RX_1SX_2X_3X_4X_5X_6X_7LX_8$ (SEQ ID NO: 129), wherein X_1 is A or T; X_2 is Q or K; X_3 is G, S, D, or N; X_4 is I, F, or V; X_5 is T, R, A, S, N, G, or I; X_6 is T, N, G, S, I, K, or Y; X_7 is W, D, or Y; X_8 is A, T, G, N, or D; (b) $RSSQX_1LLHSX_2GYNX_3LD$ (SEQ ID NO: 197), wherein X_1 is S or R; X_2 is T or S; X_3 is F or Y (c) $RASQX_1X_2X_3X_4X_5X_6X_7X_8A$ (SEQ ID NO: 206), wherein X_1 is S, N, or T; X_2 is V or I; X_3 is S or R; X_4 is S, G or N; X_5 is N or S; X_6 is L or Y; X_7 is A, L, or V; or (d) SEQ ID NO: 236. In some embodiments, the LCDR2 comprises one of the following amino acid sequences: (a) $X_1X_2SX_3LX_4X_5$ (SEQ ID NO: 152), wherein X_1 is G, A, T, or K; X_2 is A or T; X_3 is S, T, G, or N; X_4 is E, Q, or L; X_5 is S, T, or G; (b) LX_1SX_2RAS (SEQ ID NO: 200), wherein X_1 is A or G; X_2 is N or S; (c) $GASX_1RAT$ (SEQ ID NO: 216), wherein X_1 is T, S, or N; or (d) $WASX_1RES$ (SEQ ID NO: 244), wherein X_1 is T, P or N. In some embodiments, the LCDR3 comprises one of the following amino acid sequences: (a) SEQ ID NOs: 175-196; (b) MQX_1LQTPX_2T (SEQ ID NO: 203), wherein X_1 is A or G; X_2 is Y or P; (c) $QX_1YX_2X_3X_4X_5X_6T$ (SEQ ID NO: 226), wherein X_1 is Q or H; X_2 is D or G; X_3 is N, S, or R; X_4 is W or S; X_5 is R, P, F, Y, V, or I; X_6 is T, W, L or I; or (d) $QQX_1X_2X_3X_4PX_5X_6T$ (SEQ ID NO: 252), wherein X_1 is Y or F; X_2 is G or Y; X_3 is S or N; X_4 is S, T, or I; X_5 is M, Y, or R; X_6 is Y or T.

[0084] In addition to the above LCDR1, LCDR2, and LCDR3 sequences, anti-CFHR4 antibodies of the present disclosure include an HCDR1 comprising an amino acid sequence of any of SEQ ID NOs: 2-7, SEQ ID NOs: 22-31, SEQ ID NOs: 54-64, or SEQ ID NOs: 89-101; the HCDR2 comprises an amino acid sequence of any of SEQ ID NOs: 9-14, SEQ ID NOs: 33-42, SEQ ID NOs: 66-76, or SEQ ID NOs 103-115; and the HCDR3 comprises an amino acid sequence of any of SEQ ID NOs: 15-20, SEQ ID NOs: 43-52, SEQ ID NOs: 77-87, or SEQ ID NOs: 116-128.

[0085] In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 2, the HCDR2 of SEQ ID NO: 9, and the HCDR3 of SEQ ID NO: 15. In some embodiments, an

anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 3, the HCDR2 of SEQ ID NO: 10, and the HCDR3 of SEQ ID NO: 16. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 4, the HCDR2 of SEQ ID NO: 11, and the HCDR3 of SEQ ID NO: 17. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 5, the HCDR2 of SEQ ID NO: 12, and the HCDR3 of SEQ ID NO: 18. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 6, the HCDR2 of SEQ ID NO: 13, and the HCDR3 of SEQ ID NO: 19. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 7, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 14, and the HCDR3 of SEQ ID NO: 20. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 22, the HCDR2 comprises the amino acid sequence of SEQ ID NO: 33, and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 43. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 23, the HCDR2 of SEQ ID NO: 34, and the HCDR3 of SEQ ID NO: 44. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 24, the HCDR2 of SEQ ID NO: 35, and the HCDR3 of SEQ ID NO: 45. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 25, the HCDR2 of SEQ ID NO: 36, and the HCDR3 of SEQ ID NO: 46. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 26, the HCDR2 of SEQ ID NO: 37, and the HCDR3 of SEQ ID NO: 47. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 27, the HCDR2 of SEQ ID NO: 38, and the HCDR3 of SEQ ID NO: 48. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 28, the HCDR2 of SEQ ID NO: 39, and the HCDR3 of SEQ ID NO: 49. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 29, the HCDR2 of SEQ ID NO: 40, and the HCDR3 of SEQ ID NO: 50. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 30, the HCDR2 of SEQ ID NO: 41, and the HCDR3 of SEQ ID NO: 51. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 31, the HCDR2 of SEQ ID NO: 42, and the HCDR3 of SEQ ID NO: 52. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 54, the HCDR2 of SEQ ID NO: 66, and the HCDR3 of SEQ ID NO: 77. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 55, the HCDR2 of SEQ ID NO: 67, and the HCDR3 of SEQ ID NO: 78. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 56, the HCDR2 of SEQ ID NO: 68, and the HCDR3 of SEQ ID NO: 79. In some embodiments, an anti-

CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 57, the HCDR2 of SEQ ID NO: 69, and the HCDR3 of SEQ ID NO: 80. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 58, the HCDR2 of SEQ ID NO: 70, and the HCDR3 of SEQ ID NO: 81. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 59, the HCDR2 of SEQ ID NO: 71, and the HCDR3 of SEQ ID NO: 82. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 60, the HCDR2 of SEQ ID NO: 72, and the HCDR3 of SEQ ID NO: 83. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 61, the HCDR2 of SEQ ID NO: 73, and the HCDR3 of SEQ ID NO: 84. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 62, the HCDR2 of SEQ ID NO: 74, and the HCDR3 of SEQ ID NO: 85. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 63, the HCDR2 of SEQ ID NO: 75, and the HCDR3 of SEQ ID NO: 86. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 64, the HCDR2 of SEQ ID NO: 76, and the HCDR3 of SEQ ID NO: 87. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 89, the HCDR2 of SEQ ID NO: 103, and the HCDR3 of SEQ ID NO: 116. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 90, the HCDR2 of SEQ ID NO: 104, and the HCDR3 of SEQ ID NO: 117. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 91, the HCDR2 of SEQ ID NO: 105, and the HCDR3 of SEQ ID NO: 118. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 92, the HCDR2 of SEQ ID NO: 106, and the HCDR3 of SEQ ID NO: 119. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 93, the HCDR2 of SEQ ID NO: 107, and the HCDR3 of SEQ ID NO: 120. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 94, the HCDR2 of SEQ ID NO: 108, and the HCDR3 of SEQ ID NO: 121. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 95, the HCDR2 of SEQ ID NO: 109, and the HCDR3 of SEQ ID NO: 122. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 96, the HCDR2 of SEQ ID NO: 110, and the HCDR3 of SEQ ID NO: 123. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 97, the HCDR2 of SEQ ID NO: 111, and the HCDR3 of SEQ ID NO: 124. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 98, the HCDR2 of SEQ ID NO: 112, and the HCDR3 of SEQ ID NO: 125. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 99, the HCDR2 of SEQ ID NO: 113,

and the HCDR3 of SEQ ID NO: 126. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 100, the HCDR2 of SEQ ID NO: 114, and the HCDR3 of SEQ ID NO: 127. In some embodiments, an anti-CFHR4 antibody comprises the HCDR1 of SEQ ID NO: 101, the HCDR2 of SEQ ID NO: 115, and the HCDR3 of SEQ ID NO: 128.

[0086] In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 130, the LCDR2 of SEQ ID NO: 153, and the LCDR3 of SEQ ID NO: 175. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 131, the LCDR2 of SEQ ID NO: 154, and the LCDR3 of SEQ ID NO: 176. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 132, the LCDR2 of SEQ ID NO: 155, and the LCDR3 of SEQ ID NO: 177. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 133, the LCDR2 of SEQ ID NO: 156, and the LCDR3 of SEQ ID NO: 178. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 134, the LCDR2 of SEQ ID NO: 157, and the LCDR3 of SEQ ID NO: 179. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 135, the LCDR2 of SEQ ID NO: 158, and the LCDR3 of SEQ ID NO: 180. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 136, the LCDR2 of SEQ ID NO: 159, and the LCDR3 SEQ ID NO: 181. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 137, the LCDR2 of SEQ ID NO: 160, and the LCDR3 of SEQ ID NO: 182. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 138, the LCDR2 of SEQ ID NO: 161, and the LCDR3 of SEQ ID NO: 183. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 139, the LCDR2 of SEQ ID NO: 162, and the LCDR3 of SEQ ID NO: 184. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 140, the LCDR2 of SEQ ID NO: 163, and the LCDR3 of SEQ ID NO: 185. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 141, the LCDR2 of SEQ ID NO: 164, and the LCDR3 of SEQ ID NO: 186. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 142, the LCDR2 of SEQ ID NO: 165, and the LCDR3 of SEQ ID NO: 187. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 143, the LCDR2 of SEQ ID NO: 166, and the LCDR3 of SEQ ID NO: 188. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 144, the LCDR2 of SEQ ID NO: 167, and the LCDR3 of SEQ ID NO: 189. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 145, the LCDR2 of SEQ ID NO: 168, and the

LCDR3 of SEQ ID NO: 190. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 146, the LCDR2 of SEQ ID NO: 169, and the LCDR3 of SEQ ID NO: 191. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 147, the LCDR2 of SEQ ID NO: 170, and the LCDR3 of SEQ ID NO: 192. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 148, the LCDR2 of SEQ ID NO: 171, and the LCDR3 of SEQ ID NO: 193. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 149, the LCDR2 of SEQ ID NO: 172, and the LCDR3 of SEQ ID NO: 194. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 150, the LCDR2 of SEQ ID NO: 173, and the LCDR3 of SEQ ID NO: 195. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 151, the LCDR2 of SEQ ID NO: 174, and the LCDR3 of SEQ ID NO: 196. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 198, the LCDR2 of SEQ ID NO: 201, and the LCDR3 of SEQ ID NO: 204. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 199, the LCDR2 of SEQ ID NO: 202, and the LCDR3 of SEQ ID NO: 205. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 207, the LCDR2 of SEQ ID NO: 217, and the LCDR3 of SEQ ID NO: 227. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 208, the LCDR2 of SEQ ID NO: 218, and the LCDR3 of SEQ ID NO: 228. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 209, the LCDR2 of SEQ ID NO: 219, and the LCDR3 of SEQ ID NO: 229. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 210, the LCDR2 of SEQ ID NO: 220, and the LCDR3 of SEQ ID NO: 230. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 211, the LCDR2 of SEQ ID NO: 221, and the LCDR3 of SEQ ID NO: 231. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 212, the LCDR2 of SEQ ID NO: 222, and the LCDR3 of SEQ ID NO: 232. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 213, the LCDR2 of SEQ ID NO: 223, and the LCDR3 of SEQ ID NO: 233. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 214, the LCDR2 of SEQ ID NO: 224, and the LCDR3 of SEQ ID NO: 234. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 215, the LCDR2 of SEQ ID NO: 225, and the LCDR3 of SEQ ID NO: 235. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 237, the LCDR2 of SEQ ID NO: 245, and the LCDR3 of

SEQ ID NO: 253. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 238, the LCDR2 of SEQ ID NO: 246, and the LCDR3 of SEQ ID NO: 254. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 239, the LCDR2 of SEQ ID NO: 247, and the LCDR3 of SEQ ID NO: 255. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 240, the LCDR2 of SEQ ID NO: 248, and the LCDR3 of SEQ ID NO: 256. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 241, the LCDR2 of SEQ ID NO: 249, and the LCDR3 of SEQ ID NO: 257. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 242, the LCDR2 of SEQ ID NO: 250, and the LCDR3 of SEQ ID NO: 258. In some embodiments, an anti-CFHR4 antibody comprises the LCDR1 of SEQ ID NO: 243, the LCDR2 of SEQ ID NO: 251, and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 259.

[0087] In some embodiments, the VH of the anti-CFHR4 antibodies of the present disclosure includes an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to any of: (a) SEQ ID NOs: 260-265; (b) SEQ ID NOs: 284-293; (c) SEQ ID NOs: 324-334; or (d) SEQ ID NOs: 368-380. In some embodiments, the VL of the anti-CFHR4 antibodies of the present disclosure includes an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to any of: (a) SEQ ID NOs: 272-277; (b) SEQ ID NOs: 304-313; (c) SEQ ID NOs: 346-356; or (d) SEQ ID NOs: 394-406.

[0088] In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 260 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 272. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 261 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 273. In some embodiments, the VH comprises an amino acid

sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 262 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 274. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 263 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 275. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 264 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 276. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 265 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 277. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 284 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 304. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 285 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 305. In some embodiments, the VH comprises an amino acid

sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 286 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 306. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 287 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 307. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 288 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 308. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 289 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 309. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 290 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 310. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 291 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 311. In some embodiments, the VH comprises an amino acid

sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 292 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 312. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 293 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 313. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 324 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 346. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 325 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 347. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 326 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 348. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 327 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 349. In some embodiments, the VH comprises an amino acid

sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 328 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 350. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 329 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 351. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 330 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 352. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 331 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 353. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 332 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 354. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 333 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 354. In some embodiments, the VH comprises an amino acid

sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 334 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 356. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 368 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 394. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 369 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 395. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 370 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 396. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 371 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 397. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 372 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 398. In some embodiments, the VH comprises an amino acid

sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 373 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 399. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 374 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 400. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 375 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 401. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 376 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 402. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 377 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 403. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 378 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 404. In some embodiments, the VH comprises an amino acid

sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 379 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 405. In some embodiments, the VH comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 380 and the VL comprises an amino acid sequence that is at least 90% identical (e.g., at least 91%, at least 92%, at least 93%, at least 94%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99%, or 100% identical) to SEQ ID NO: 406.

[0089] Nucleic acid or amino acid sequence "identity," as described herein, can be determined by comparing a nucleic acid or amino acid sequence of interest to a reference nucleic acid or amino acid sequence. A number of mathematical algorithms for obtaining the optimal alignment and calculating identity between two or more sequences are known and incorporated into a number of available software programs. Examples of such programs include CLUSTAL-W, T-Coffee, and ALIGN (for alignment of nucleic acid and amino acid sequences), BLAST programs (e.g., BLAST 2.1, BL2SEQ, and later versions thereof) and FASTA programs (e.g., FASTA3x, FAST™, and SSEARCH) (for sequence alignment and sequence similarity searches). Sequence alignment algorithms also are disclosed in, for example, Altschul et al., *J. Molecular Biol.*, *215*(3): 403-410 (1990), Beigert et al., *Proc. Natl. Acad. Sci. USA*, *106*(10): 3770-3775 (2009), Durbin et al., eds., *Biological Sequence Analysis: Probabilistic Models of Proteins and Nucleic Acids*, Cambridge University Press, Cambridge, UK (2009), Soding, *Bioinformatics*, *21*(7): 951-960 (2005), Altschul et al., *Nucleic Acids Res.*, *25*(17): 3389-3402 (1997), and Gusfield, *Algorithms on Strings, Trees and Sequences*, Cambridge University Press, Cambridge UK (1997)).

[0090] As would be recognized by one of ordinary skill in the art based on the present disclosure, one or more amino acids of the aforementioned anti-CFHR4 antibodies, or antigen fragments thereof, can be replaced or substituted with a different amino acid. An amino acid "replacement" or "substitution" refers to the replacement of one amino acid at a given position or residue by another amino acid at the same position or residue within a polypeptide sequence. Amino acids are broadly grouped as "aromatic" or "aliphatic." An aromatic amino acid includes an aromatic ring. Examples of "aromatic" amino acids include histidine (H or His), phenylalanine

(F or Phe), tyrosine (Y or Tyr), and tryptophan (W or Trp). Non-aromatic amino acids are broadly grouped as "aliphatic." Examples of "aliphatic" amino acids include glycine (G or Gly), alanine (A or Ala), valine (V or Val), leucine (L or Leu), isoleucine (I or Ile), methionine (M or Met), serine (S or Ser), threonine (T or Thr), cysteine (C or Cys), proline (P or Pro), glutamic acid (E or Glu), aspartic acid (A or Asp), asparagine (N or Asn), glutamine (Q or Gln), lysine (K or Lys), and arginine (R or Arg). Aliphatic amino acids may be sub-divided into four sub-groups. The "large aliphatic non-polar sub-group" consists of valine, leucine, and isoleucine. The "aliphatic slightly-polar sub-group" consists of methionine, serine, threonine, and cysteine. The "aliphatic polar/charged sub-group" consists of glutamic acid, aspartic acid, asparagine, glutamine, lysine, and arginine. The "small-residue sub-group" consists of glycine and alanine. The group of charged/polar amino acids may be sub-divided into three sub-groups: the "positively-charged sub-group" consisting of lysine and arginine, the "negatively-charged sub-group" consisting of glutamic acid and aspartic acid, and the "polar sub-group" consisting of asparagine and glutamine. Aromatic amino acids may be sub-divided into two sub-groups: the "nitrogen ring sub-group" consisting of histidine and tryptophan and the "phenyl sub-group" consisting of phenylalanine and tyrosine.

[0091] The amino acid replacement or substitution can be conservative, semi-conservative, or non-conservative. The phrase "conservative amino acid substitution" or "conservative mutation" refers to the replacement of one amino acid by another amino acid with a common property. A functional way to define common properties between individual amino acids is to analyze the normalized frequencies of amino acid changes between corresponding proteins of homologous organisms (Schulz and Schirmer, *Principles of Protein Structure*, Springer-Verlag, New York (1979)). According to such analyses, groups of amino acids may be defined where amino acids within a group exchange preferentially with each other, and therefore resemble each other most in their impact on the overall protein structure. Examples of conservative amino acid substitutions include substitutions of amino acids within the sub-groups described above, for example, lysine for arginine and vice versa such that a positive charge may be maintained, glutamic acid for aspartic acid and vice versa such that a negative charge may be maintained, serine for threonine such that a free -OH can be maintained, and glutamine for asparagine such that a free -NH_2 can be maintained. "Semi-conservative mutations" include amino acid substitutions of amino acids within the same groups listed above, but not within the same sub-group. For example, the substitution of

aspartic acid for asparagine, or asparagine for lysine, involves amino acids within the same group, but different sub-groups. "Non-conservative mutations" involve amino acid substitutions between different groups, for example, lysine for tryptophan, or phenylalanine for serine, etc.

[0092] In addition, one or more amino acids can be inserted into the anti-CFHR4 antibodies, or antigen-binding fragments thereof (e.g., insertion into the heavy and/or light chain variable region amino acid sequence). Any number of suitable amino acids can be inserted into the amino acid sequence of the antibody or antigen-binding fragment thereof. In this respect, at least one amino acid (e.g., 2 or more, 5 or more, or 10 or more amino acids), but not more than 20 amino acids (e.g., 18 or less, 15 or less, or 12 or less amino acids), can be inserted into the amino acid sequence of the antibody or antigen-binding fragment thereof. For example, 1-10 amino acids (e.g., 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 amino acids) may be inserted into the amino acid sequence of the monoclonal antibody or antigen-binding fragment thereof. In this respect, the amino acid(s) can be inserted into an antibody or antigen-binding fragment thereof in any suitable location. Preferably, the amino acid(s) are inserted into a CDR (e.g., CDR1, CDR2, or CDR3) of the antibody or antigen-binding fragment thereof.

[0093] The amino acid sequences of the anti-CFHR4 antibodies, or antigen-binding fragments thereof, are not limited to the specific amino acid sequences described herein. Indeed, an anti-CFHR4 antibody or antigen-binding fragment thereof can comprise any heavy chain polypeptide or light chain polypeptide that competes with the anti-CFHR4 antibodies or antigen-binding fragments thereof for conformational binding to CFHR4. Antibody competition can be assayed using routine peptide competition assays such as, for example, ELISA, Western blot, or immunohistochemistry methods (see, e.g., U.S. Patents 4,828,981 and 8,568,992; and Braitbard et al., *Proteome Sci., 4*: 12 (2006)).

[0094] An anti-CFHR4 antibody of the present disclosure may be a whole antibody, or an antigen-binding fragment of a whole antibody. As defined herein, antigen-binding antibody fragments encompassed by the present disclosure include, but are not limited to, $F(ab')_2$, Fab', Fab, Fv, scFv, dsFv, dAb, and single chain binding polypeptides. Antibody fragments and their therapeutic utility are further described in, e.g., Nelson, A.L., MAbs. 2010 Jan-Feb; 2(1): 77-83; Joosten et al., Microbial Cell Factories volume 2, Article number: 1 (2003); and Bates A, Power CA., Antibodies (Basel). 2019;8(2):28; doi:10.3390/antib8020028). In some embodiments, the anti-CFHR4 antigen-binding fragment is a single-chain variable fragment (scFv), which is an

engineered antibody generated by the fusion of the heavy (VH) and light chains (VL) of immunoglobulins through a short polypeptide linker. Single chain variable domain (Fv) fragments (scFv) are used in the art in a variety of clinical and therapeutic applications, primarily due to their improved pharmacokinetic properties as compared to the parent monoclonal antibodies and the relative ease of producing them in large quantities at low cost (Monnier et al., Antibodies 2013, 2(2), 193-208; doi.org/10.3390/antib2020193; Safdari et al., Mol Med. 2016; 22: 258-270; and Lu, R., Hwang, Y., Liu, I. et al. Development of therapeutic antibodies for the treatment of diseases. J Biomed Sci 27, 1 (2020). https://doi.org/10.1186/s12929-019-0592-z).

[0095] An anti-CFHR4 antibody of the present disclosure may be a diabody. Diabodies are antibody fragments with two antigen-binding sites that may be bivalent or bispecific. See, for example, EP 404,097; WO 1993/01161; Hudson et al., *Nat. Med.* 9:129-134 (2003); and Hollinger et al., *Proc. Natl. Acad. Sci. USA* 90: 6444-6448 (1993). Triabodies and tetrabodies are also described in Hudson et al., *Nat. Med.* 9:129-134 (2003). An anti-CFHR4 antibody of the present disclosure may be a single-domain antibody (also referred to as a nanobody). Single-domain antibodies are antibody fragments comprising all or a portion of the heavy chain variable domain or all or a portion of the light chain variable domain of an antibody. In certain embodiments, a single-domain antibody is a human single-domain antibody (Domantis, Inc., Waltham, Mass.; see, e.g., U.S. Pat. No. 6,248,516 B1). Antibody fragments can be made by various techniques, including but not limited to proteolytic digestion of an intact antibody as well as production by recombinant host cells (e.g., *E. coli* or phage), as described herein.

[0096] In other embodiments, the anti-CFHR4 antibody is a whole antibody. As defined herein, a whole antibody comprises two identical copies of a heavy (H) chain polypeptide and two identical copies of a light (L) chain polypeptide. Each of the heavy chains contains one N-terminal variable (V_H) region and three C-terminal constant (C_{H1}, C_{H2}, and C_{H3}) regions, and each light chain contains one N-terminal variable (V_L) region and one C-terminal constant (C_L). The heavy chain C-terminal constant region contains the fragment crystallizable (Fc) domain, which determines antibody class and is responsible for humoral and cellular effector functions. Antibodies are divided into five major classes (or "isotypes"), IgG, IgM, IgA, IgD and IgE, which differ in their function in the immune system. IgGs are the most abundant immunoglobulins in the blood, representing 60% of total serum antibodies in humans. IgG antibodies may be subclassified as IgG1, IgG2, IgG3, and IgG4, named in order of their abundance in serum (IgG1 being the most

abundant) (Vidarsson et al., Frontiers in Immunology. 5: 520 (2014)). A whole anti-CFHR4 monoclonal antibody described herein may be of any suitable class and/or subclass. In some embodiments, the monoclonal antibody is of class IgG (e.g., IgG1, IgG2, IgG3, or IgG4). For example, the monoclonal antibody may be an IgG1 antibody.

[0097] As discussed above, the Fc domain mediates several effector functions of antibodies, such as binding to receptors on target cells and complement fixation (triggering effector functions that eliminate the antigen). In some embodiments, the Fc domain may be modified or engineered to alter its effector functions. For example, Fc domains may be modified to improve antibody-dependent cellular cytotoxicity (ADCC) and antibody-dependent cellular phagocytosis (ADCP), and to control serum half-life. In some embodiments, the Fc domain of the anti-CFHR4 antibody may be engineered to modulate affinity for an Fc receptor, such as Fcγ receptors (FcγRs) and the neonatal Fc receptor (FcRn). Indeed, optimization of the interactions between antibodies and FcγRs has emerged as a promising approach for enhancing the activity of therapeutic antibodies for the treatment of various diseases (Mimoto et al., Curr. Pharm. Biotechnol. 17, 1298-1314 (2016); Lazar et al., Proc. Natl Acad. Sci. USA 103, 4005-4010 (2006); Richards et al., Mol. Cancer Ther. 7, 2517-2527 (2008); Nordstrom et al., Breast Cancer Res. 13, R123 (2011); and Kang, T.H., Jung, S.T., Exp Mol Med 51, 1-9 (2019)). The Fc domain also may be modified to improve serum half-life, e.g., by engineering IgG Fc for higher FcRn binding (Zalevsky et al., Nat. Biotechnol. 28, 157-159 (2010); and Dall'Acqua et al., J. Immunol. 169, 5171-5180 (2002)). In other embodiments, the Fc domain may be modified to create monovalency or antibody bispecificity for improving therapeutic potency. For example, an Fc domain may be generated that does not form a homodimer but remains as a soluble monomer, mFc, that exhibits high affinity for FcγRI but no detectable binding to FcγRIIIa. In other embodiments, a heterodimeric Fc domain may be generated to obtain bispecific properties for antigen binding to circumvent homodimer formation. Engineered Fc domains may be generated by inducing point mutations or by modifying glycosylation of the Fc domain (Saunders, K.O., Front Immunol. 2019;10:1296; Kelley, R.F., Meng, Y.G., Liu et al., J Biol Chem. 2014;289:3571-90; Monnet et al., MAbs. 2014;6:422-36; Li et al., Proc Natl Acad Sci U S A. 2017;114:3485-90; and Lin et al., Proc Natl Acad Sci U S A. 2015;112:10611-6; Kang and Jung, *supra*).

Multispecific Anti-CFHR4 Antibodies

[0098] As described above, the anti-CFHR4 antibodies of the present disclosure can be a monoclonal antibody, a human antibody, a humanized antibody, and/or a chimeric antibody. In some embodiments, the antibody is a fragment selected from the group consisting of Fab, Fab-C, Fab'-SH, Fv, scFv, and $(Fab')_2$ fragments. In some embodiments, the anti-CFHR4 antibody is a monospecific antibody. In some embodiments, the anti-CFHR4 antibody is a bispecific antibody. In some embodiments, the anti-CFHR4 antibody comprises two or more single-domain antibodies that form a bivalent antibody, a trivalent antibody, or a tetravalent antibody that recognizes different epitopes on the same or different antigens.

[0099] In some embodiments, an anti-CFHR4 antibody provided herein is a chimeric antibody. Certain chimeric antibodies are described, for example, in U.S. Pat. No. 4,816,567; and Morrison et al., *Proc. Natl. Acad. Sci. USA.* 81:6851-6855 (1984). In one example, a chimeric antibody comprises a non-human variable region (e.g., a variable domain derived from a mouse, rat, hamster, rabbit, or non-human primate, such as a monkey) and a human constant domain. In a further example, a chimeric antibody is a "class switched" antibody in which the class or subclass has been changed from that of the parent antibody. Chimeric antibodies include antigen-binding fragments thereof.

[00100] In certain embodiments, a chimeric antibody is a humanized antibody. Typically, a non-human antibody is humanized to reduce immunogenicity to humans, while retaining the specificity and affinity of the parental non-human antibody. Generally, a humanized antibody comprises one or more variable domains in which HVRs, for example, CDRs, (or portions thereof) are derived from a non-human antibody, and FRs (or portions thereof) are derived from human antibody sequences. A humanized antibody optionally will also comprise at least a portion of a human constant region. In some embodiments, some FR residues in a humanized antibody are substituted with corresponding residues from a non-human antibody (e.g., the antibody from which the HVR residues are derived), e.g., to restore or improve antibody specificity or affinity.

[00101] Humanized antibodies and methods of making them are reviewed, for example, in Almagro and Fransson, *Front. Biosci.* 13:1619-1633 (2008), and are further described, for example, in Riechmann et al., *Nature* 332:323-329 (1988); Queen et al., *Proc. Nat'l Acad. Sci. USA* 86:10029-10033 (1989); U.S. Pat. Nos. 5,821,337, 7,527,791, 6,982,321, and 7,087,409; Kashmiri et al., *Methods* 36:25-34 (2005) (describing specificity determining region (SDR) grafting); Padlan, *Mol. Immunol.* 28:489-498 (1991) (describing "resurfacing"); Dall'Acqua et

al., *Methods* 36:43-60 (2005) (describing "FR shuffling"); and Osbourn et al., *Methods* 36:61-68 (2005) and Klimka et al., *Br. J. Cancer*, 83:252-260 (2000) (describing the "guided selection" approach to FR shuffling).

[00102] In accordance with the above embodiments, an anti-CFHR4 antibody of the present disclosure can be made into bivalent, trivalent, or tetravalent formats. For example, an anti-CFHR4 antibody of the present disclosure can be a bivalent, bispecific antibody with heteromeric heavy chains (e.g., Triomab, knobs-into-holes (KIH), Duobody, etc). An anti-CFHR4 antibody of the present disclosure can be a tetravalent multispecific antibody comprised of IgGs with other binding domains fused to either the N- or C-termini of either the heavy or light chains (e.g., dual variable domain [DVD], IgG-scFv fusion, Mabtyrin (IgG with non-antibody binding scaffold "centyrin" fused to C-terminal end of heavy chains). An anti-CFHR4 antibody of the present disclosure can be comprised of IgGs to which additional antigen combining sites have been added within the structure (e.g., two-in-one antibodies, MAT "Modular Antibody Technology" platform from F-Star). An anti-CFHR4 antibody of the present disclosure can be an engineered antibody fragment linked by short peptide linkers which can be made into bivalent, trivalent, or tetravalent formats addressing two to three targets (e.g., bispecific T-cell engager (BiTE), Nanobody platform, dual-affinity re-targeting (DART) antibodies, "tandem antibody" structures (TandAbs)). And an anti-CFHR4 antibody of the present disclosure can be comprised of chemically coupled IgGs.

[00103] In some embodiments, an anti-CFHR4 antibody of the present disclosure is a multispecific antibody, such as a bispecific antibody, which have binding specificities for at least two different antigens. In some embodiments, the anti-CFHR4 antibodies of the present disclosure, or antigen-binding fragments thereof, can be used to form one arm (e.g., antigen-binding portion) of a bispecific antibody, whereas the other arm of the bispecific antibody can be specific for a different antigen. In some embodiments, the other antigen includes, but is not limited to, interleukin-1 beta (IL-1β), interleukin-6 (IL-6), interleukin-6 receptor (IL-6R), interleukin-13 (IL-13), IL-13 receptor (IL-13R), PDGF (e.g., PDGF-BB), angiopoietin, angiopoietin 2 (Ang2), Tie2, S1P, integrins αvβ3, αvβ5, and α5β1, betacellulin, apelin/APJ, erythropoietin, complement factor D, TNFα, HtrA1, a VEGF receptor (e.g., VEGFR1, VEGFR2, VEGFR3, membrane-bound VEGF-receptor (mbVEGFR), or soluble VEGF receptor (sVEGFR)), ST-2 receptor, and proteins genetically linked to age-related macular degeneration (AMD) risk, such as complement pathway components C2, factor B, factor H, CFHR3, C3b, C5, C5a, and C3a, HtrA1, ARMS2, TIMP3,

HLA; interleukin-8 (IL-8); CX3CR1; TLR3; TLR4; CETP; LIPC; COL10A1; and TNFRSF10A. In other embodiments, the bispecific antibody may have binding specificity for CFHR4 and IL-1β; CFHR4 and IL-6; CFHR4 and IL-6R; CFHR4 and IL-13; CFHR4 and IL-13R; CFHR4 and PDGF (e.g., PDGF-BB); CFHR4 and angiopoietin; CFHR4 and Ang2; CFHR4 and Tie2; CFHR4 and S1P; CFHR4 and integrin αvβ3; CFHR4 and integrin αvβ5; CFHR4 and integrin α5β1; CFHR4 and betacellulin; CFHR4 and apelin/APJ; CFHR4 and erythropoietin; CFHR4 and complement factor D; CFHR4 and TNFα; CFHR4 and HtrA1; CFHR4 and a VEGF receptor (e.g., VEGFR1, VEGFR2, VEGFR3, mbVEGFR, or sVEGFR); CFHR4 and ST-2 receptor; CFHR4 and C2; CFHR4 and factor B; CFHR4 and factor H; CFHR4 and CFHR3; CFHR4 and C3b; CFHR4 and C5; CFHR4 and C5a; CFHR4 and C3a; CFHR4 and ARMS2; CFHR4 and TIMP3; CFHR4 and HLA; CFHR4 and IL-8; CFHR4 and CX3CR1; CFHR4 and TLR3; CFHR4 and TLR4; CFHR4 and CETP; CFHR4 and LIPC; CFHR4 and COL10A1; or CFHR4 and TNFRSF10A.

[00104] In some embodiments, a bispecific antibody of the present disclosure includes an anti-CFHR4 antibody, or an antigen-binding fragment thereof, and an anti-VEGF antibody, or an antigen-binding fragment thereof. Such bispecific antibodies can be used to target the complement activation pathway from two different mechanisms, and thus provide additional therapeutic benefits. For example, the anti-CFHR4 arm can be any of the anti-CFHR4 antibodies of the present disclosure, and the anti-VEGF arm can be any VEGF antagonist, including but not limited to, anti-VEGF antibodies (e.g., bevacizumab, sevacizumab, and ranibizumab), anti-VEGFR2 antibodies and related molecules (e.g., ramucirumab, tanibirumab, aflibercept), anti-VEGFR1 antibodies and related molecules (e.g., icrucumab, aflibercept (VEGF Trap-Eye; EYLEA®), and ziv-aflibercept (VEGF Trap; ZALTRAP®)), anti-VEGF arms of VEGF bispecific antibodies (e.g., MP-0250, vanucizumab (VEGF-ANG2)), including anti-VEGF, anti-VEGFR1, and anti-VEGFR2 arms.

[00105] In other embodiments, a bispecific antibody of the present disclosure includes an anti-CFHR4 antibody, or an antigen-binding fragment thereof, and an anti-C3 antibody, or an antigen-binding fragment thereof. Such bispecific antibodies can be used to target the complement activation pathway from two different mechanisms, and thus provide additional therapeutic benefits. For example, the anti-CFHR4 arm can be any of the anti-CFHR4 antibodies of the present disclosure, and the anti-C3 arm can be any C3 antagonist, including but not limited to, POT-4 (AL-78898A), APL-2, and NGM621.

[00106] In other embodiments, a bispecific antibody of the present disclosure includes an anti-CFHR4 antibody, or an antigen-binding fragment thereof, and an anti-C5 antibody, or an antigen-binding fragment thereof. For example, the anti-CFHR4 arm can be any of the anti-CFHR4 antibodies of the present disclosure, and the anti-C5 arm can be any C5 antagonist, including but not limited to, eculizumab and tesidolumab (LFG316). In other embodiments, a bispecific antibody of the present disclosure includes an anti-CFHR4 antibody, or an antigen-binding fragment thereof, and an anti-FD antibody, or an antigen-binding fragment thereof. For example, the anti-CFHR4 arm can be any of the anti-CFHR4 antibodies of the present disclosure, and the anti-C5 arm can be any C5 antagonist, including but not limited to, lampalizumab.

Functional Characteristics of Anti-CFHR4 Antibodies

[00107] In accordance with the above embodiments, the present disclosure provides anti-CFHR4 antibodies comprising various functional characteristics. In some embodiments, the anti-CFHR4 antibodies described herein bind an antigen on CFHR4 (SEQ ID NO: 580), or a variant or isoform thereof, via interaction with its antigenic determinants (epitopes). In some embodiments, binding of an anti-CFHR4 antibody to CFHR4 reduces complement activation. In some embodiments, the anti-CFHR4 antibody binds human CFHR4b with a K_D of about 100 nM or lower (FIG. 6).

[00108] In some embodiments, the antibody cross-reacts with Cynomolgus monkey CFHR4b protein (cCFHR4b). In some embodiments, the antibody comprises a VH region and a VL region that are at least 90% identical to a VH region and a VL region of an antibody selected from the group consisting of: ATX-P-560, ATX-P-561, ATX-P-562, ATX-P-563, ATX-P-564, ATX-P-565, ATX-P-566, ATX-P-568, ATX-P-569, ATX-P-570, ATX-P-571, ATX-P-573, ATX-P-574, ATX-P-576, ATX-P-577, ATX-P-578, ATX-P-579, ATX-P-580, ATX-P-581, ATX-P-582, ATX-P-583, ATX-P-587, ATX-P-588, ATX-P-591, ATX-P-592, ATX-P-594, ATX-P-596, ATX-P-600, and ATX-P-604 (FIG. 7).

[00109] In some embodiments, the antibody does not cross-react with Cynomolgus monkey CFHR4b protein (cCFHR4b). In some embodiments, the antibody comprises a VH region and a VL region that are at least 90% identical to a VH region and a VL region of an antibody selected from the group consisting of: ATX-P-572, ATX-P-595, ATX-P-597, ATX-P-598, ATX-P-601, ATX-P-602, ATX-P-603, ATX-P-607, ATX-P-608, ATX-P-609, and ATX-P-610 (FG. 7).

[00110] In some embodiments, the antibody cross-reacts with complement factor H-related protein 4a (CFHR4a). In some embodiments, the antibody comprises a VH region and a VL region that are at least 90% identical to a VH region and a VL region of an antibody selected from the group consisting of: ATX-P-560, ATX-P-561, ATX-P-562, ATX-P-563, ATX-P-564, ATX-P-565, ATX-P-566, ATX-P-568, ATX-P-569, ATX-P-570, ATX-P-571, ATX-P-572, ATX-P-573, ATX-P-574, ATX-P-576, ATX-P-577, ATX-P-578, ATX-P-579, ATX-P-580, ATX-P-581, ATX-P-582, ATX-P-583, ATX-P-587, ATX-P-588, ATX-P-591, ATX-P-592, ATX-P-594, ATX-P-595, ATX-P-596, ATX-P-597, ATX-P-600, ATX-P-601, ATX-P-602, ATX-P-603, ATX-P-604, ATX-P-607, ATX-P-608, ATX-P-609, and ATX-P-610 (FIG. 8).

[00111] In some embodiments, the antibody does not cross-react with complement factor H-related protein 4a (CFHR4a). In some embodiments, the antibody comprises a VH region and a VL region that are at least 90% identical to ATX-P-598 (FIG. 8).

[00112] In some embodiments, the antibody cross-reacts with complement factor H-related protein 3 (CFHR3). In some embodiments, the antibody comprises a VH region and a VL region that are at least 90% identical to a VH region and a VL region of an antibody selected from the group consisting of: ATX-P-561, ATX-P-562, ATX-P-563, ATX-P-564, ATX-P-565, ATX-P-566, ATX-P-568, ATX-P-569, ATX-P-572, ATX-P-573, ATX-P-574, ATX-P-576, ATX-P-577, ATX-P-578, ATX-P-579, ATX-P-580, ATX-P-581, ATX-P-583, ATX-P-587, ATX-P-588, ATX-P-592, ATX-P-594, ATX-P-595, ATX-P-596, ATX-P-600, ATX-P-603, ATX-P-604, ATX-P-608, ATX-P-609, and ATX-P-610 (FIG. 9).

[00113] In some embodiments, the antibody does not cross-react with complement factor H-related protein 3 (CFHR3). In some embodiments, the antibody comprises a VH region and a VL region that are at least 90% identical to a VH region and a VL region of an antibody selected from the group consisting of: ATX-P-560, ATX-P-570, ATX-P-571, ATX-P-582, ATX-P-591, ATX-P-597, ATX-P-598, ATX-P-601, ATX-P-602, ATX-P-603, ATX-P-604, and ATX-P-607 (FIG. 9).

[00114] In some embodiments, the antibody cross-reacts with complement factor H-related protein 1 (CFHL1). In some embodiments, the antibody comprises a VH region and a VL region that are at least 90% identical to a VH region and a VL region of an antibody selected from the group consisting of: ATX-P-561, ATX-P-562, ATX-P-563, ATX-P-564, ATX-P-565, ATX-P-566, ATX-P-568, ATX-P-570, ATX-P-571, ATX-P-573, ATX-P-574, ATX-P-576, ATX-P-577,

ATX-P-578, ATX-P-579, ATX-P-580, ATX-P-581, ATX-P-582, ATX-P-583, ATX-P-587, ATX-P-588, ATX-P-591, ATX-P-594, ATX-P-595, ATX-P-596, ATX-P-600, and ATX-P-604 (FIG. 10).

[00115] In some embodiments, the antibody does not cross-react with complement factor H-related protein 1 (CFHL1). In some embodiments, the antibody comprises a VH region and a VL region that are at least 90% identical to a VH region and a VL region of an antibody selected from the group consisting of: ATX-P-560, ATX-P-569, ATX-P-572, ATX-P-592, ATX-P-597, ATX-P-598, ATX-P-601, ATX-P-602, ATX-P-603, ATX-P-607, ATX-P-608, ATX-P-609, and ATX-P-610 (FIG. 10).

[00116] Embodiments of the present disclosure also include means for evaluating one or more functional and/or biochemical characteristics of the anti-CFHR4 antibodies described herein. In one embodiment, the present disclosure provides a C3 convertase assembly assay (FIGS. 11A-11C). The C3 convertase assembly assay was developed as an antibody screening assay in order to evaluate the ability of the CFHR4 antibodies of the present disclosure to affect C3 convertase formation (FIG. 11A). More specifically, C3bBb is the C3 convertase (EC 3.4.21.43) of the alternative pathway of complement activation. The C3 enzyme is responsible for amplification of pathway activation and for deposition on target cells of C3b and the membrane attack complex. It is controlled by the serum proteins Factor H, Factor I (EC 3.4.21.45), and properdin. The formation of C3 convertase requires C3b, Factor B, Factor D (EC 3.4.21.46), and Mg2+. After formation of the reversible, bimolecular complex C3bB(Mg), Factor D cleaves Factor B, releasing the activation fragment Ba, and generates the active enzyme C3bBb. The C3 enzyme is a serine protease whose catalytic site resides in the Bb subunit. Additionally, CFHR4 has been reported to directly promote C3 convertase formation by binding to C3b, with stronger ability to assemble C3bBb on CFHR4, and with C3bBb-CFHR4 complex being more resistant to CFH cleavage in comparison with C3bBb.

[0100] Thus, the C3 convertase assay of the present disclosure is designed test the ability of a CHFR4 antibody to disrupt the formation of the C3 convertase complex by measuring the amount of Factor B that is present using an anti-FB monoclonal antibody conjugated to a reporter moiety. As illustrated in FIG. 11A, in the presence of CFHR4 (absence of an effective CFHR4 antibody), the C3 convertase complex is formed and the anti-FB antibody binds FB and a signal is detected (i.e., complement activation). However, in the presence of an effective anti-CFHR4 antibody, the

C3 convertase complex is disrupted and the antibody-bound FB is washed away, resulting in a decreased signal (i.e., no complement activation).

[0101] As shown in FIG. 11B, dose response curves were generated for the top 8 inhibitory antibodies screened in the C3 convertase assembly assay. The percent C3 convertase activity is plotted relative to negative control (diluent only). FIG. 11C includes the IC50 values calculated for each antibody tested in FIG. 11B. Thus, in accordance with these assay results, certain anti-CFHR4 antibodies of the present disclosure attenuate C3 convertase activity. In some embodiments, the VH of the anti-CFHR4 antibody comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 330 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 352. In some embodiments, the VH of the anti-CFHR4 antibody comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 293 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 313. In some embodiments, the VH of the anti-CFHR4 antibody comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 378 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 404. In some embodiments, the VH of the anti-CFHR4 antibody comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 377 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 403. In some embodiments, the VH of the anti-CFHR4 antibody comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 376 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 402. In some embodiments, the VH of the anti-CFHR4 antibody comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 289 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 309. In some embodiments, the VH of the anti-CFHR4 antibody comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 371 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 397. In some embodiments, the VH of the anti-CFHR4 antibody comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 284 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 304 (FIGS. 11A-11C).

Polypeptides and Expression Vectors

[00117] Embodiments of the present disclosure also include a polynucleotide encoding any of the anti-CFHR4 antibodies of the present disclosure. In some embodiments, the polynucleotide

comprises a sequence that is at least 70% identical to any of the following nucleic acid sequences: (a) SEQ ID NOs: 266-271; (b) SEQ ID NOs: 294-303; (c) SEQ ID NOs: 335-345; or (d) SEQ ID NOs: 381-393. In some embodiments, the polynucleotide comprises a sequence that is at least 70% identical to any of the following nucleic acid sequences: (a) SEQ ID NOs: 278-283; (b) SEQ ID NOs: 314-323; (c) SEQ ID NOs: 357-367; or (d) SEQ ID NOs: 407-419. In some embodiments, the polynucleotide comprises a sequence that is at least 70% identical to any of the following nucleic acid sequences: (a) SEQ ID NOs: 266-271; (b) SEQ ID NOs: 294-303; (c) SEQ ID NOs: 335-345; or (d) SEQ ID NOs: 380-393. In some embodiments, the polynucleotide comprises a sequence that is at least 70% identical to any of the following nucleic acid sequences: (a) SEQ ID NOs: 278-283; (b) SEQ ID NOs: 314-323; (c) SEQ ID NOs: 357-367; or (d) SEQ ID NOs: 407-419.

[00118] In some embodiments, the polynucleotide comprises a sequence that is at least 75% identical to any of the following nucleic acid sequences: (a) SEQ ID NOs: 266-271; (b) SEQ ID NOs: 294-303; (c) SEQ ID NOs: 335-345; or (d) SEQ ID NOs: 381-393. In some embodiments, the polynucleotide comprises a sequence that is at least 75% identical to any of the following nucleic acid sequences: (a) SEQ ID NOs: 278-283; (b) SEQ ID NOs: 314-323; (c) SEQ ID NOs: 357-367; or (d) SEQ ID NOs: 407-419. In some embodiments, the polynucleotide comprises a sequence that is at least 75% identical to any of the following nucleic acid sequences: (a) SEQ ID NOs: 266-271; (b) SEQ ID NOs: 294-303; (c) SEQ ID NOs: 335-345; or (d) SEQ ID NOs: 380-393. In some embodiments, the polynucleotide comprises a sequence that is at least 75% identical to any of the following nucleic acid sequences: (a) SEQ ID NOs: 278-283; (b) SEQ ID NOs: 314-323; (c) SEQ ID NOs: 357-367; or (d) SEQ ID NOs: 407-419.

[00119] In some embodiments, the polynucleotide comprises a sequence that is at least 80% identical to any of the following nucleic acid sequences: (a) SEQ ID NOs: 266-271; (b) SEQ ID NOs: 294-303; (c) SEQ ID NOs: 335-345; or (d) SEQ ID NOs: 381-393. In some embodiments, the polynucleotide comprises a sequence that is at least 80% identical to any of the following nucleic acid sequences: (a) SEQ ID NOs: 278-283; (b) SEQ ID NOs: 314-323; (c) SEQ ID NOs: 357-367; or (d) SEQ ID NOs: 407-419. In some embodiments, the polynucleotide comprises a sequence that is at least 80% identical to any of the following nucleic acid sequences: (a) SEQ ID NOs: 266-271; (b) SEQ ID NOs: 294-303; (c) SEQ ID NOs: 335-345; or (d) SEQ ID NOs: 380-393. In some embodiments, the polynucleotide comprises a sequence that is at least 80% identical

to any of the following nucleic acid sequences: (a) SEQ ID NOs: 278-283; (b) SEQ ID NOs: 314-323; (c) SEQ ID NOs: 357-367; or (d) SEQ ID NOs: 407-419.

[00120] In some embodiments, the polynucleotide comprises a sequence that is at least 85% identical to any of the following nucleic acid sequences: (a) SEQ ID NOs: 266-271; (b) SEQ ID NOs: 294-303; (c) SEQ ID NOs: 335-345; or (d) SEQ ID NOs: 381-393. In some embodiments, the polynucleotide comprises a sequence that is at least 85% identical to any of the following nucleic acid sequences: (a) SEQ ID NOs: 278-283; (b) SEQ ID NOs: 314-323; (c) SEQ ID NOs: 357-367; or (d) SEQ ID NOs: 407-419. In some embodiments, the polynucleotide comprises a sequence that is at least 85% identical to any of the following nucleic acid sequences: (a) SEQ ID NOs: 266-271; (b) SEQ ID NOs: 294-303; (c) SEQ ID NOs: 335-345; or (d) SEQ ID NOs: 380-393. In some embodiments, the polynucleotide comprises a sequence that is at least 85% identical to any of the following nucleic acid sequences: (a) SEQ ID NOs: 278-283; (b) SEQ ID NOs: 314-323; (c) SEQ ID NOs: 357-367; or (d) SEQ ID NOs: 407-419.

[00121] In some embodiments, the polynucleotide comprises a sequence that is at least 90% identical to any of the following nucleic acid sequences: (a) SEQ ID NOs: 266-271; (b) SEQ ID NOs: 294-303; (c) SEQ ID NOs: 335-345; or (d) SEQ ID NOs: 381-393. In some embodiments, the polynucleotide comprises a sequence that is at least 90% identical to any of the following nucleic acid sequences: (a) SEQ ID NOs: 278-283; (b) SEQ ID NOs: 314-323; (c) SEQ ID NOs: 357-367; or (d) SEQ ID NOs: 407-419. In some embodiments, the polynucleotide comprises a sequence that is at least 90% identical to any of the following nucleic acid sequences: (a) SEQ ID NOs: 266-271; (b) SEQ ID NOs: 294-303; (c) SEQ ID NOs: 335-345; or (d) SEQ ID NOs: 380-393. In some embodiments, the polynucleotide comprises a sequence that is at least 90% identical to any of the following nucleic acid sequences: (a) SEQ ID NOs: 278-283; (b) SEQ ID NOs: 314-323; (c) SEQ ID NOs: 357-367; or (d) SEQ ID NOs: 407-419.

[00122] In some embodiments, the polynucleotide comprises a sequence that is at least 95% identical to any of the following nucleic acid sequences: (a) SEQ ID NOs: 266-271; (b) SEQ ID NOs: 294-303; (c) SEQ ID NOs: 335-345; or (d) SEQ ID NOs: 381-393. In some embodiments, the polynucleotide comprises a sequence that is at least 95% identical to any of the following nucleic acid sequences: (a) SEQ ID NOs: 278-283; (b) SEQ ID NOs: 314-323; (c) SEQ ID NOs: 357-367; or (d) SEQ ID NOs: 407-419. In some embodiments, the polynucleotide comprises a sequence that is at least 95% identical to any of the following nucleic acid sequences: (a) SEQ ID

NOs: 266-271; (b) SEQ ID NOs: 294-303; (c) SEQ ID NOs: 335-345; or (d) SEQ ID NOs: 380-393. In some embodiments, the polynucleotide comprises a sequence that is at least 95% identical to any of the following nucleic acid sequences: (a) SEQ ID NOs: 278-283; (b) SEQ ID NOs: 314-323; (c) SEQ ID NOs: 357-367; or (d) SEQ ID NOs: 407-419.

[00123] In some embodiments, the polynucleotide encoding an anti-CFHR4 antibody of the present disclosure comprises: (a) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 266 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 278; (b) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 267 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 279; (c) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 268 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 280; (d) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 269 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 281; (e) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 270 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 282; or (f) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 270 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 283.

[00124] In some embodiments, the polynucleotide encoding an anti-CFHR4 antibody of the present disclosure comprises: (a) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to

SEQ ID NO: 294 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 314; (b) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 295 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 315; (c) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 296 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 316; (d) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 297 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 317; (e) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 298 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 318; (f) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 299 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 319; (g) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 300 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 320; (h) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 301 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 321; (i) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 302 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%,

at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 322; or (j) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 303 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 323.

[00125] In some embodiments, the polynucleotide encoding an anti-CFHR4 antibody of the present disclosure comprises: (a) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 335 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 357; (b) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 336 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 358; (c) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 337 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 359; (d) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) SEQ ID NO: 338 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 360; (e) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 339 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 361; (f) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 340 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 362; (g) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 341 and a nucleic acid sequence that

is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 363; (h) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 342 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 364; (i) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 343 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 365; (j) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 344 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 366; or (k) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 345 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 367.

[00126] In some embodiments, the polynucleotide encoding an anti-CFHR4 antibody of the present disclosure comprises: (a) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 381 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 407; (b) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 382 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 408; (c) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 383 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 409; (d) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least

95%, or 100% identical) to SEQ ID NO: 384 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 410; (e) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 385 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 411; (f) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 386 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 412; (g) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 387 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 413; (h) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 388 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 414; (i) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 389 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 415; (j) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 390 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 416; (k) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 391 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 417; (l) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 392 and a nucleic acid sequence that is at least 70%

identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 418; or (m) a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 393 and a nucleic acid sequence that is at least 70% identical (e.g., at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, at least 95%, or 100% identical) to SEQ ID NO: 419.

[00127] In accordance with these embodiments, the present disclosure includes an expression vector comprising any of the polynucleotides encoding an anti-CFHR4 antibody of the present disclosure. In some embodiments, the expression vector is suitable for manufacturing an anti-CFHR4 antibody of the present disclosure for delivery of the antibody to a subject. In certain embodiments, the nucleic acid sequence is in the form of a vector. The vector can be, for example, a plasmid, episome, cosmid, viral vector (e.g., retroviral or adenoviral), or phage. Suitable vectors and methods of vector preparation are well known in the art (see, e.g., Sambrook et al., *Molecular Cloning, a Laboratory Manual*, 4th edition, Cold Spring Harbor Press, Cold Spring Harbor, N.Y. (2012), and Ausubel et al., *Current Protocols in Molecular Biology*, Greene Publishing Associates and John Wiley & Sons, New York, N.Y. (1994)).

[00128] In addition to the nucleic acid encoding an anti-CFHR4 antibody or antigen-binding fragment thereof, the vector desirably comprises expression control sequences, such as promoters, enhancers, polyadenylation signals, transcription terminators, internal ribosome entry sites (IRES), and the like, that provide for the expression of the antibody-encoding nucleic sequence in a host cell. Exemplary expression control sequences are known in the art and described in, for example, Goeddel, *Gene Expression Technology: Methods in Enzymology*, Vol. 185, Academic Press, San Diego, Calif. (1990).

[00129] A vector comprising a nucleic acid sequence encoding an anti-CFHR4 antibody or antigen-binding fragment thereof may be introduced into a host cell that is capable of expressing the polypeptides encoded thereby, including any suitable prokaryotic or eukaryotic cell. Examples of suitable prokaryotic cells include, but are not limited to, cells from the genera *Bacillus* (such as *Bacillus subtilis* and *Bacillus brevis*), *Escherichia* (such as *E. coli*), *Pseudomonas*, *Streptomyces*, *Salmonella*, and *Erwinia*. Particularly useful prokaryotic cells include the various strains of *Escherichia coli* (e.g., K12, HB101 (ATCC No. 33694), DH5α, DH10, MC1061 (ATCC No. 53338), and CC102). Suitable eukaryotic cells are known in the art and include, for example, yeast

cells, insect cells, and mammalian cells. Examples of suitable yeast cells include those from the genera *Hansenula*, *Kluyveromyces*, *Pichia*, *Rhinosporidium*, *Saccharomyces*, and *Schizosaccharomyces*. Suitable insect cells include Sf-9 and HIS cells (Invitrogen, Carlsbad, Calif.) and are described in, for example, Kitts et al., *Biotechniques*, *14*: 810-817 (1993); Lucklow, *Curr. Opin. Biotechnol.*, *4*: 564-572 (1993); and Lucklow et al., *J. Virol.*, *67*: 4566-4579 (1993). Examples of suitable mammalian cells include, but are not limited to, Chinese hamster ovary cells (CHO) (ATCC No. CCL61), CHO DHFR-cells (Urlaub et al., *Proc. Natl. Acad. Sci. USA*, *97*: 4216-4220 (1980)), human embryonic kidney (HEK) 293 or 293T cells (ATCC No. CRL1573), and 3T3 cells (ATCC No. CCL92). Other suitable mammalian cell lines are the monkey COS-1 (ATCC No. CRL1650) and COS-7 cell lines (ATCC No. CRL1651), as well as the CV-1 cell line (ATCC No. CCL70). Further exemplary mammalian host cells include primate cell lines and rodent cell lines, including transformed cell lines. Normal diploid cells, cell strains derived from *in vitro* culture of primary tissue, as well as primary explants also are suitable. Other suitable mammalian cell lines include, but are not limited to, mouse neuroblastoma N2A cells, HeLa, mouse L-929 cells, and BHK or HaK hamster cell lines, all of which are available from the ATCC. Methods for selecting suitable mammalian host cells and methods for transformation, culture, amplification, screening, and purification of such cells are well known in the art (see, e.g., Ausubel et al., eds., *Short Protocols in Molecular Biology*, 5th ed., John Wiley & Sons, Inc., Hoboken, N.J. (2002)). Preferably, the mammalian cell is a human cell.

[00130] In some embodiments, the vector can include means for attaching a detection moiety to an anti-CFHR4 antibody of the present disclosure. In some embodiments, the vector can include means for attaching a purification moiety to an anti-CFHR4 antibody of the present disclosure. Exemplary detection and/or purification moieties/tags that can be coupled to an anti-CFHR4 antibody of the present disclosure includes, but is not limited to, hemagglutinin (HA), c-Myc, V5, DYKDDDDK, His tag (e.g., 6x-HIS), Glutathione S-Transferase (GST), Maltose Binding Protein (MBP), a fluorophore (e.g., Green Fluorescent Protein (GFP), Red Fluorescent Protein (RFP), mCherry, a chromophore, and/or a luminescent peptide (e.g., luciferase).

[00131] In some embodiments, the expression vector is suitable for use in gene therapy (e.g., an expression vector for delivering a polynucleotide encoding an anti-CFHR4 antibody of the present disclosure to a subject). In some embodiments, the expression vector is a herpes simplex virus (HSV) vector, or a retrovirus vector. In some embodiments, the expression vector is an

adeno-associated virus (AAV) vector, or comprises an AAV backbone. For example, AAV vectors have been designed, produced and used to mediate gene delivery in human subjects, including for therapeutic purposes. Typically, AAV vectors for use in gene transfer comprise a replication defective AAV genome lacking functional Rep and Cap coding viral sequences. Such replication defective AAV vectors more preferably lack most or all of the Rep and Cap coding sequences, and essentially retain one or two AAV ITR sequences and a packaging sequence. The defective genome is packaged in a viral particle, to form a defective, recombined AAV virus, also termed "AAV vector". Methods of producing such AAV vectors have been disclosed in the literature, including using packaging cells, auxiliary viruses or plasmids, and/or baculovirus systems (Samulski et al., (1989) J. Virology 63, 3822; Xiao et al., (1998) J. Virology 72, 2224; Inoue et al., (1998) J. Virol. 72, 7024; WO98/22607; W02005/072364). Methods of producing pseudotyped AAV vectors have also been reported (e.g., WO00/28004), as well as various modifications or formulations of AAV vectors, to reduce their immunogenicity upon in vivo administration (see e.g., W001/23001; WOOO/73316; WO04/112727; W005/005610; WO99/06562). AAV vectors may be prepared or derived from various serotypes of AAVs, which may be even mixed together or with other types of viruses to produce chimeric (e.g., pseudotyped) AAV viruses. Examples of tAAVs are human AAV4 vectors, human AAV7 vectors, human AAV9 vectors, human AAV10 vectors, or bovine AAV vectors. The AAV vector may be derived from a single AAV serotype or comprise sequences or components originating from at least two distinct AAV serotypes (pseudotyped AAV vector), e.g., an AAV vector comprising an AAV genome derived from one AAV serotype (for example AAV9), and a capsid derived at least in part from a distinct AAV serotype. An AAV vector, as used herein, is a vector which comprises at least one component part derivable from an adeno-associated virus. Preferably, that component part is involved in the biological mechanisms by which the vector infects or transduces target cells and expresses an anti-CFHR4 antibody of the present disclosure (e.g., ocular delivery/expression).

[00132] In other embodiments, the expression vector is a lentiviral vector (LV), or comprises an LV backbone. Lentiviruses are part of a larger group of retroviruses. A detailed list of lentiviruses may be found in Coffin et al (1997) "Retroviruses" Cold Spring Harbour Laboratory Press Eds: JM Coffin, SM Hughes, HE Varmus pp 758-763). For example, lentiviruses can be divided into primate and non-primate groups. Examples of primate lentiviruses include but are not limited to: the human immunodeficiency virus (HIV), the causative agent of human auto

immunodeficiency syndrome (AIDS), and the simian immunodeficiency virus (SIV). The non-primate lentiviral group includes the prototype "slow virus" visna/maedi virus (VMV), as well as the related caprine arthritis-encephalitis virus (CAEV), equine infectious anaemia virus (EIAV), feline immunodeficiency virus (FIV), Maedi visna virus (MVV) and bovine immunodeficiency virus (BIV). In one embodiment, the lentiviral vector is derived from HIV- 1, HIV-2, SIV, FIV, BIV, EIAV, CAEV or Visna lentivirus. The lentivirus family differs from retroviruses in that lentiviruses have the capability to infect both dividing and non-dividing cells (Lewis et al (1992) EM BO J 11 (8): 3053-3058 and Lewis and Emerman (1994) J Virol 68 (1):510-516). In contrast, other retroviruses, such as MLV, are unable to infect non-dividing or slowly dividing cells such as those that make up, for example, muscle, brain, lung and liver tissue. A lentiviral vector, as used herein, is a vector which comprises at least one component part derivable from a lentivirus. Preferably, that component part is involved in the biological mechanisms by which the vector infects or transduces target cells and expresses an anti-CFHR4 antibody of the present disclosure (e.g., ocular delivery/expression).

[00133] Additional compositions and method for ocular gene therapy can be found in, e.g., Bordet, T., and Behar-Cohen, F., "Ocular gene therapies in clinical practice: viral vectors and nonviral alternatives," Drug Discovery Today, Volume 24, Issue 8, August 2019, Pages 1685-1693). In some embodiments, gene therapy platforms, methods, and compositions that can be used to deliver an anti-CFHR4 antibody of the present disclosure to a subject (e.g., ocular delivery) includes the platforms, methods, and compositions disclosed in US20220025396, US20220011308, US20210371877, US20210363192, US20190078099, US20190038724, and US10494646B2, which are incorporated herein by reference. In other embodiments, gene therapy platforms, methods, and compositions that can be used to deliver an anti-CFHR4 antibody of the present disclosure to a subject (e.g., ocular delivery) includes the platforms, methods, and compositions based on HMR59 (Hemera Biosciences), which through its protein product soluble CD59, blocks the membrane attack complex that forms during the terminal step in the complement cascade. HMR59 is designed to be administered as a single intraocular injection.

[00134] In accordance with these embodiments, the present disclosure also provides a method of administering ocular gene therapy to a subject in need thereof comprising injecting a pharmaceutical composition comprising an effective amount of an expression vector described herein (e.g., an expression vector comprising a polynucleotides encoding an anti-CFHR4 antibody

of the present disclosure). As described further below, the present disclosure also provides a method of treating AMD and/or GA comprising administering a pharmaceutical composition comprising an effective amount of an expression vector described herein (e.g., an expression vector comprising a polynucleotides encoding an anti-CFHR4 antibody of the present disclosure). In some embodiments, administering the pharmaceutical composition treats at least one AMD symptom and/or GA.

Compositions and Methods of Treatment

[00135] The anti-CFHR4 antibodies of the present disclosure can be administered as part of a pharmaceutical composition in a therapeutically effective amount to treat an eye disease (e.g., AMD or GA). In some embodiments, the composition is suitable for ocular administration. In some embodiments, ocular administration comprises injection into vitreous fluid. In some embodiments, ocular administration comprises delivering the antibody using a conjunctival insert, a contact lens, a gel, a nanoparticle, a mucoadhesive polymer, an ointment, a solution, a suspension, eye drops, and/or an implant (e.g., Susvimo™). Recent methods and formulations for ocular administration can be found in, e.g., Souto, E.B., et al. "Advanced Formulation Approaches for Ocular Drug Delivery: State-Of-The-Art and Recent Patents," Pharmaceutics, 2019 Sep; 11(9): 460).

[00136] In accordance with these embodiments, the methods include administering a pharmaceutical composition comprising a therapeutically effective amount of an anti-CFHR4 antibody of the present disclosure. In some embodiments, the pharmaceutical composition is administered ocularly and treats at least one AMD symptom. In some embodiments, AMD comprises wet AMD. In some embodiments, AMD comprises dry AMD (e.g., GA). In some embodiments, the at least one AMD symptom comprises visual distortion, reduced central vision, blurred vision, and/or difficulty adapting to low light. In some embodiments, administering the pharmaceutical composition reduces complement activation in the subject's eye.

[00137] In some embodiments, the pharmaceutical composition comprising a therapeutically effective amount of an anti-CFHR4 antibody of the present disclosure is administered at a dose ranging from about 0.0001 mg/dose to about 100 mg/dose. In some embodiments, the anti-CFHR4 antibody is administered at a dose ranging from about 0.001 mg/dose to about 100 mg/dose. In some embodiments, the anti-CFHR4 antibody is administered at a dose ranging from about 0.01 mg/dose to about 100 mg/dose. In some embodiments, the anti-CFHR4 antibody is administered

at a dose ranging from about 0.1 mg/dose to about 100 mg/dose. In some embodiments, the anti-CFHR4 antibody is administered at a dose ranging from about 1.0 mg/dose to about 100 mg/dose. In some embodiments, the anti-CFHR4 antibody is administered at a dose ranging from about 10 mg/dose to about 100 mg/dose. In some embodiments, the anti-CFHR4 antibody is administered at a dose ranging from about 0.0001 mg/dose to about 10 mg/dose. In some embodiments, the anti-CFHR4 antibody is administered at a dose ranging from about 0.0001 mg/dose to about 1.0 mg/dose. In some embodiments, the anti-CFHR4 antibody is administered at a dose ranging from about 0.0001 mg/dose to about 0.1 mg/dose. In some embodiments, the anti-CFHR4 antibody is administered at a dose ranging from about 0.0001 mg/dose to about 0.001 mg/dose. In some embodiments, the anti-CFHR4 antibody is administered at a dose ranging from about 0.01 mg/dose to about 10 mg/dose. In some embodiments, the anti-CFHR4 antibody is administered at a dose ranging from about 0.001 mg/dose to about 1.0 mg/dose. In some embodiments, the anti-CFHR4 antibody is administered at a dose ranging from about 0.1 mg/dose to about 10 mg/dose.

[00138] In some embodiments, the pharmaceutical composition comprising a therapeutically effective amount of an anti-CFHR4 antibody of the present disclosure is administered at a dose ranging from about 0.0001 mg/ml to about 100 mg/ml. In some embodiments, the anti-CFHR4 antibody is administered at a dose ranging from about 0.001 mg/ml to about 100 mg/ml. In some embodiments, the anti-CFHR4 antibody is administered at a dose ranging from about 0.01 mg/ml to about 100 mg/ml. In some embodiments, the anti-CFHR4 antibody is administered at a dose ranging from about 0.1 mg/ml to about 100 mg/ml. In some embodiments, the anti-CFHR4 antibody is administered at a dose ranging from about 1.0 mg/ml to about 100 mg/ml. In some embodiments, the anti-CFHR4 antibody is administered at a dose ranging from about 10 mg/ml to about 100 mg/ml. In some embodiments, the anti-CFHR4 antibody is administered at a dose ranging from about 0.0001 mg/ml to about 10 mg/ml. In some embodiments, the anti-CFHR4 antibody is administered at a dose ranging from about 0.0001 mg/ml to about 1.0 mg/ml. In some embodiments, the anti-CFHR4 antibody is administered at a dose ranging from about 0.0001 mg/ml to about 0.1 mg/ml. In some embodiments, the anti-CFHR4 antibody is administered at a dose ranging from about 0.0001 mg/ml to about 0.01 mg/ml. In some embodiments, the anti-CFHR4 antibody is administered at a dose ranging from about 0.0001 mg/ml to about 0.001 mg/ml. In some embodiments, the anti-CFHR4 antibody is administered at a dose ranging from about 0.01 mg/ml to about 10 mg/ml. In some embodiments, the anti-CFHR4 antibody is administered at a

dose ranging from about 0.001 mg/ml to about 1.0 mg/ml. In some embodiments, the anti-CFHR4 antibody is administered at a dose ranging from about 0.1 mg/ml to about 10 mg/ml.

[00139] As used herein, the terms "treatment," "treating," and the like refer to obtaining a desired pharmacologic and/or physiologic effect. In some embodiments, the effect is therapeutic, i.e., the effect partially or completely cures a disease and/or adverse symptom attributable to the disease. To this end, the methods of the present disclosure comprise administering a "therapeutically effective amount" of an anti-CFHR4 antibody, or composition comprising an anti-CFHR4 antibody. A "therapeutically effective amount" refers to an amount effective, at dosages and for periods of time necessary, to achieve a desired therapeutic result. The therapeutically effective amount may vary according to factors such as the disease state, age, sex, and weight of the individual, and the ability of the monoclonal antibody to elicit a desired response in the individual. For example, a therapeutically effective amount of an anti-CFHR4 antibody of the present disclosure is an amount which treats at least one AMD and/or GA symptom in a subject. In some embodiments, the pharmacologic and/or physiologic effect may be prophylactic, i.e., the effect completely or partially prevents a disease or symptom thereof. In this respect, the methods of the present disclosure comprise administering a "prophylactically effective amount" of an anti-CFHR4 antibody or composition comprising an anti-CFHR4 antibody. A "prophylactically effective amount" refers to an amount effective, at dosages and for periods of time necessary, to achieve a desired prophylactic result (e.g., prevention of AMD and/or GA onset).

[00140] A typical dose of a therapeutically effective amount of an anti-CFHR4 antibody of the present disclosure can range from, for example, about 0.0001 mg/dose to about 100 mg/dose for each eye to be treated. In some embodiments, a therapeutically effective amount of an anti-CFHR4 antibody of the present disclosure can range from about 0.001 mg/dose to about 100 mg/dose, from about 0.01 mg/dose to about 100 mg/dose, from about 0.05 mg/dose to about 50 mg/dose, from about 0.1 mg/dose to about 10 mg/dose, from about 0.5 mg/dose to about 5 mg/dose, and from about 1 mg/dose to about 10 mg/dose. In some embodiments, a therapeutically effective concentration of an anti-CFHR4 antibody of the present disclosure can range from, for example, about 0.0001 mg to about 100 mg of the antibody per milliliter of solution. In some embodiments, a therapeutically effective concentration of an anti-CFHR4 antibody of the present disclosure can range from about 0.001 mg/ml to about 100 mg/ml, from about 0.01 mg/ml to about 100 mg/ml, from about 0.1 mg/ml to about 100 mg/ml, from about 1.0 mg/ml and about 100 mg/ml, from about

0.001 mg/ml and about 50 mg/ml, from about 0.01 mg/ml and about 50 mg/ml, from about 0.1 mg/ml and about 50 mg/ml, from about 0.1 mg/ml and about 25 mg/ml, from about 0.1 mg/ml and about 10 mg/ml, and from about 1.0 mg/ml and about 10 mg/ml. In some embodiments, a therapeutically effective dose of an anti-CFHR4 antibody of the present disclosure can be, exactly or approximately, 0.1 mg, 0.2 mg, 0.25 mg, 0.3 mg, 0.35 mg, 0.4 mg, 0.45 mg, 0.5 mg, 0.55 mg, 0.6 mg, 0.65 mg, 0.7 mg, 0.75 mg, 0.8 mg, 0.85 mg, 0.9 mg, 0.95 mg, 1.0 mg, 2.0 mg, 3.0 mg, 4.0 mg, 5.0 mg, 10.0 mg, 15.0 mg, 20.0 mg, or 25.0 mg, or can fall within a range delimited by any two of the foregoing values. For example, in certain embodiments, a sustained release formulation, (e.g., an ocular implant) can be, exactly or approximately, 0.1 mg, 0.2 mg, 0.25 mg, 0.3 mg, 0.35 mg, 0.4 mg, 0.45 mg, 0.5 mg, 0.55 mg, 0.6 mg, 0.65 mg, 0.7 mg, 0.75 mg, 0.8 mg, 0.85 mg, 0.9 mg, 0.95 mg, 1.0 mg, 2.0 mg, 3.0 mg, 4.0 mg, 5.0 mg, 10.0 mg, 15.0 mg, 20.0 mg, or 25.0 mg of an anti-CFHR4 antibody, or an amount that falls within a range delimited by any two of the foregoing values.

[00141] Therapeutic or prophylactic efficacy can be monitored by periodic assessment of treated patients. For repeated administrations over several days or longer, depending on the condition, the treatment is repeated until a desired suppression of disease symptoms occurs. However, other dosage regimens may be useful and are within the scope of the present disclosure. The desired dosage can be delivered by a single bolus administration of the composition, by multiple bolus administrations of the composition, or by continuous infusion administration of the composition. The composition comprising an anti-CFHR4 antibody, or antigen-binding fragment thereof, can be administered to a mammal using standard administration techniques, including ocular, oral, intravenous, intraperitoneal, subcutaneous, pulmonary, transdermal, intramuscular, intranasal, buccal, sublingual, or suppository administration. The composition preferably is suitable for ocular administration.

[00142] In accordance with the compositions and methods of treatment described herein, embodiments of the present disclosure include anti-CFHR4 antibodies that have enhanced half-life (e.g., after ocular administration), such that the anti-CFHR4 antibody can be administered less often to a subject. In some embodiments, the antibody comprises a half-life extension moiety. In some embodiments, the half-life extension moiety comprises a polypeptide that can be coupled to an anti-CFHR4 antibody of the present disclosure by any means known in the art (e.g., generation of a fusion protein). In some embodiments, the polypeptide that can be coupled to an anti-CFHR4

antibody of the present disclosure is at least 20 amino acids in length and comprises any combination of G, A, S T, E, and P residues. In some embodiments, the half-life extension polypeptide is attached to the C-terminus or N-terminus of the antibody. In some embodiments, this is referred to as "XTENylation," as described further in US8933197, US7846445, US7855279, US8492530, US9938331, US8673860, US9371369, US9926351, US10961287, US10172953, and US10953073.

[00143] The present disclosure also provides a composition comprising any of the anti-CFHR4 antibodies or antigen-binding fragments thereof described herein. The composition desirably is a pharmaceutically acceptable (e.g., physiologically acceptable) composition, which comprises a carrier, preferably a pharmaceutically acceptable (e.g., physiologically acceptable) carrier, and the anti-CFHR4 antibody or antigen-binding fragment thereof. Any suitable carrier can be used within the context of the present disclosure, and such carriers are well known in the art. For example, the composition may contain preservatives, such as, for example, methylparaben, propylparaben, sodium benzoate, and benzalkonium chloride. A mixture of two or more preservatives optionally may be used. In addition, buffering agents may be included in the composition. Suitable buffering agents include, for example, citric acid, sodium citrate, phosphoric acid, potassium phosphate, and various other acids and salts. A mixture of two or more buffering agents optionally may be used. Methods for preparing compositions for pharmaceutical use are known to those skilled in the art and are described in, for example, *Remington: The Science and Practice of Pharmacy*, Lippincott Williams & Wilkins; 21st ed. (May 1, 2005).

[00144] Once administered to a mammal (e.g., a human), the biological activity of the anti-CFHR4 antibody, or antigen-binding fragment thereof, can be measured by any suitable method known in the art. For example, the biological activity can be assessed by determining the stability of the anti-CFHR4 antibody. The biological activity of the anti-CFHR4 antibody also can be assessed by determining its binding affinity to CFHR4 peptides and/or by assessing its binding affinity to peptides with which it may cross-react. The term "affinity" refers to the equilibrium constant for the reversible binding of two agents and is expressed as the dissociation constant (K_D). Affinity of a binding agent to a ligand, such as affinity of an antibody for an epitope, can be, for example, from about 1 femtomolar (fM) to about 1 millimolar (mM) (e.g., from about 1 picomolar (pM) to about 1 nanomolar (nM), or from about 1 nM to about 1 micromolar (μM)). In some embodiments, the affinity of an anti-CFHR4 antibody may be from about 1 nm to about 20 nm,

and desirably from about 5 nm to about 10 nm. Antibody affinity for an antigen or epitope of interest can be measured using any art-recognized assay. Such methods include, for example, fluorescence activated cell sorting (FACS), separable beads (e.g., magnetic beads), antigen panning, and/or ELISA (see, e.g., Janeway et al. (eds.), Immunobiology, 5th ed., Garland Publishing, New York, N.Y., 2001).

[00145] In some embodiments, an anti-CFHR4 antibody, or composition comprising an anti-CFHR4 antibody, may be administered alone or in combination with other drugs. For example, the anti-CFHR4 antibody can be administered in combination with other agents for the treatment or prevention of AMD and/or GA, as disclosed herein. For example, anti-CFHR4 antibodies of the present disclosure, or antibody conjugates, fusion proteins, or polymeric formulations thereof, can be used either alone or in combination with other agents in a therapy. For instance, an anti-CFHR4 antibody may be co-administered with at least one additional therapeutic agent. In certain embodiments, an additional therapeutic agent is another antibody, a chemotherapeutic agent, a cytotoxic agent, an anti-angiogenic agent, an immunosuppressive agent, a prodrug, a cytokine, a cytokine antagonist, cytotoxic radiotherapy, a corticosteroid, an anti-emetic, a cancer vaccine, an analgesic, a growth-inhibitory agent, or combinations thereof.

[00146] For example, in certain embodiments, any of the preceding methods further comprises administering one or more additional compounds. In certain embodiments, the anti-CFHR4 antibody, antibody conjugate, fusion protein, or polymeric formulation is administered simultaneously with the additional compound(s). In certain embodiments, the anti-CFHR4 antibody, antibody conjugate, fusion protein, or polymeric formulation is administered before or after the additional compound(s). In certain embodiments, the additional compound binds to a second biological molecule selected from the group consisting of VEGF, IL-1β; IL-6; IL-6R; IL-13; IL-13R; PDGF; angiopoietin; Ang2; Tie2; S1P; integrins αvβ3, αvβ5, and α5β1; betacellulin; apelin/APJ; erythropoietin; complement factor D; TNFα; HtrA1; a VEGF receptor; ST-2 receptor; and proteins genetically linked to AMD risk, such as complement pathway components C2, factor B, factor H, CFHR3, C3b, C5, C5a, and C3a; HtrA1; ARMS2; TIMP3; HLA; interleukin-8 (IL-8); CX3CR1; TLR3; TLR4; CETP; LIPC; COL10A1; and TNFRSF10A. In some embodiments, the additional compound is an antibody or antigen-binding fragment thereof. In some embodiments according to (or as applied to) any of the embodiments above, the ocular disorder is an intraocular neovascular disease selected from the group consisting of proliferative retinopathies, choroidal

neovascularization (CNV), age-related macular degeneration (AMD), geographic atrophy (GA), diabetic and other ischemia-related retinopathies, diabetic macular edema, pathological myopia, von Hippel-Lindau disease, histoplasmosis of the eye, retinal vein occlusion (RVO), including CRVO and BRVO, corneal neovascularization, retinal neovascularization, and retinopathy of prematurity (ROP).

[00147] In some instances, an anti-CFHR4 antibody of the present disclosure, or an antibody conjugate, fusion protein, and/or polymeric formulation thereof, may be administered in combination with at least one additional therapeutic agent for treatment of an ocular disorder, for example, an ocular disorder described herein (e.g., AMD (e.g., wet AMD or dry AMD), GA, DME, DR, or RVO). Exemplary additional therapeutic agents for combination therapy for treatment of ocular disorders include, without limitation, anti-angiogenic agents, such as VEGF antagonists, including, for example, anti-VEGF antibodies (e.g., the anti-VEGF Fab LUCENTIS® (ranibizumab)), soluble receptor fusion proteins (e.g., the recombinant soluble receptor fusion protein EYLEA® (aflibercept, also known as VEGF Trap Eye; Regeneron/Aventis)), aptamers (e.g., the anti-VEGF pegylated aptamer MACUGEN® (pegaptanib sodium; NeXstar Pharmaceuticals/OSI Pharmaceuticals)), and VEGFR tyrosine kinase inhibitors (e.g., 4-(4-bromo-2-fluoroanilino)-6-methoxy-7-(1-methylpiperidin-4-ylmethoxy)quinazoline (ZD6474), 4-(4-fluoro-2-methylindol-5-yloxy)-6-methoxy-7-(3-pyrrolidin-1-ylpropoxy)quinazoline (AZD2171), vatalanib (PTK787), semaxaminib (SU5416; SUGEN), and SUTENT® (sunitinib)); Tryptophanyl-tRNA synthetase (TrpRS); squalamine; RETAANE® (anecortave acetate for depot suspension; Alcon, Inc.); Combretastatin A4 Prodrug (CA4P); MIFEPREX® (mifepristone-ru486); subtenon triamcinolone acetonide; intravitreal crystalline triamcinolone acetonide; matrix metalloproteinase inhibitors (e.g., Prinomastat (AG3340; Pfizer)); fluocinolone acetonide (including fluocinolone intraocular implant; Bausch & Lomb/Control Delivery Systems); linomide; inhibitors of integrin β3 function; angiostatin, and combinations thereof.

[00148] Further examples of additional therapeutic agents that can be used in combination with an anti-CFHR4 antibody of the present disclosure, or an antibody conjugate, fusion protein, and/or polymeric formulation thereof, for treatment of an ocular disorder (e.g., AMD, GA, DME, DR, or RVO), include, but are not limited to, VISUDYNE® (verteporfin; a light-activated drug that is typically used in conjunction with photodynamic therapy with a non-thermal laser), PKC412, Endovion (NS 3728; NeuroSearch A/S), neurotrophic factors (e.g., glial derived neurotrophic

factor (GDNF) and ciliary neurotrophic factor (CNTF)), diltiazem, dorzolamide, PHOTOTROP®, 9-cis-retinal, eye medication (e.g., phospholine iodide, echothiophate, or carbonic anhydrase inhibitors), veovastat (AE-941; AEterna Laboratories, Inc.), Sirna-027 (AGF-745; Sirna Therapeutics, Inc.), neurotrophins (including, by way of example only, NT-4/5, Genentech), Cand5 (Acuity Pharmaceuticals), INS-37217 (Inspire Pharmaceuticals), integrin antagonists (including those from Jerini AG and Abbott Laboratories), EG-3306 (Ark Therapeutics Ltd.), BDM-E (BioDiem Ltd.), thalidomide (as used, for example, by EntreMed, Inc.), cardiotrophin-1 (Genentech), 2-methoxyestradiol (Allergan/Oculex), DL-8234 (Toray Industries), NTC-200 (Neurotech), tetrathiomolybdate (University of Michigan), LYN-002 (Lynkeus Biotech), microalgal compound (Aquasearch/Albany, Mera Pharmaceuticals), D-9120 (Celitech Group plc), ATX-S10 (Hamamatsu Photonics), TGF-beta 2 (Genzyme/Celtrix), tyrosine kinase inhibitors (e.g., those from Allergan, SUGEN, or Pfizer), NX-278-L (NeXstar Pharmaceuticals/Gilead Sciences), Opt-24 (OPTIS France SA), retinal cell ganglion neuroprotectants (Cogent Neurosciences), N-nitropyrazole derivatives (Texas A&M University System), KP-102 (Krenitsky Pharmaceuticals), cyclosporin A, therapeutic agents used in photodynamic therapy (e.g., VISUDYNE®; receptor-targeted PDT, Bristol-Myers Squibb, Co.; porfimer sodium for injection with PDT; verteporfin, QLT Inc.; rostaporfin with PDT, Miravent Medical Technologies; talaporfin sodium with PDT, Nippon Petroleum; and motexafin lutetium, Pharmacyclics, Inc.), antisense oligonucleotides (including, by way of example, products tested by Novagali Pharma SA and ISIS-13650, Isis Pharmaceuticals), and combinations thereof.

[00149] An anti-CFHR4 antibody of the present disclosure, or an antibody conjugate, fusion protein, and/or polymeric formulation thereof, may be administered in combination with a therapy or surgical procedure for treatment of an ocular disorder (e.g., AMD, GA DME, DR, or RVO), including, for example, laser photocoagulation (e.g., panretinal photocoagulation (PRP)), drusen lasering, macular hole surgery, macular translocation surgery, implantable miniature telescopes, PHI-motion angiography (also known as micro-laser therapy and feeder vessel treatment), proton beam therapy, microstimulation therapy, retinal detachment and vitreous surgery, scleral buckle, submacular surgery, transpupillary thermotherapy, photosystem I therapy, use of RNA interference (RNAi), extracorporeal rheopheresis (also known as membrane differential filtration and rheotherapy), microchip implantation, stem cell therapy, gene replacement therapy, ribozyme gene therapy (including gene therapy for hypoxia response element, Oxford Biomedica; Lentipak,

Genetix; and PDEF gene therapy, GenVec), photoreceptor/retinal cells transplantation (including transplantable retinal epithelial cells, Diacrin, Inc.; retinal cell transplant, Cell Genesys, Inc.), acupuncture, and combinations thereof.

[00150] In some embodiments, an anti-CFHR4 antibody of the present disclosure, or an antibody conjugate, fusion protein, and/or polymeric formulation thereof, can be administered in combination with an anti-angiogenic agent for treatment of an ocular disorder (e.g., AMD, GA, DME, DR, or RVO). Any suitable anti-angiogenic agent can be used in combination with an antibody of the present disclosure, including, but not limited to, those listed by Carmeliet et al. *Nature* 407:249-257, 2000. In some embodiments, the anti-angiogenic agent is a VEGF antagonist, including, but not limited to, an anti-VEGF antibody (e.g., the anti-VEGF Fab LUCENTIS® (ranibizumab), RTH-258 (formerly ESBA-1008, an anti-VEGF single-chain antibody fragment; Novartis), or a bispecific anti-VEGF antibody (e.g., an anti-VEGF/anti-angiopoietin 2 bispecific antibody such as RG-7716; Roche)), a soluble recombinant receptor fusion protein (e.g., EYLEA® (aflibercept)), a VEGF variant, a soluble VEGFR fragment, an aptamer capable of blocking VEGF (e.g., pegaptanib) or VEGFR, a neutralizing anti-VEGFR antibody, a small molecule inhibitor of VEGFR tyrosine kinases, an anti-VEGF DARPin® (e.g., abicipar pegol), a small interfering RNAs which inhibits expression of VEGF or VEGFR, a VEGFR tyrosine kinase inhibitor (e.g., 4-(4-bromo-2-fluoroanilino)-6-methoxy-7-(1-methylpiperidin-4-ylmethoxy)quinazoline (ZD6474), 4-(4-fluoro-2-methylindol-5-yloxy)-6-methoxy-7-(3-pyrrolidin-1-ylpropoxy)quinazoline (AZD2171), vatalanib (PTK787), semaxaminib (SU5416; SUGEN), and SUTENT® (sunitinib)), and combinations thereof.

[00151] Other suitable anti-angiogenic agents that may be administered in combination with an antibody of the present disclosure, or an antibody conjugate, fusion protein, and/or polymeric formulation thereof, for treatment of an ocular disorder (e.g., AMD, GA, DME, DR, or RVO) include corticosteroids, angiostatic steroids, anecortave acetate, angiostatin, endostatin, tyrosine kinase inhibitors, matrix metalloproteinase (MMP) inhibitors, insulin-like growth factor-binding protein 3 (IGFBP3), stromal derived factor (SDF-1) antagonists (e.g., anti-SDF-1 antibodies), pigment epithelium-derived factor (PEDF), gamma-secretase, Delta-like ligand 4, integrin antagonists, hypoxia-inducible factor (HIF)-1α antagonists, protein kinase CK2 antagonists, agents that inhibit stem cell (e.g., endothelial progenitor cell) homing to the site of

neovascularization (e.g., an anti-vascular endothelial cadherin (CD-144) antibody and/or an anti-SDF-1 antibody), and combinations thereof.

[00152] In some embodiments, an anti-CFHR4 antibody of the present disclosure, or an antibody conjugate, fusion protein, and/or polymeric formulation thereof, can be administered in combination with an agent that has activity against neovascularization for treatment of an ocular disorder (e.g., AMD, GA, DME, DR, or RVO), such as an anti-inflammatory drug, a mammalian target of rapamycin (mTOR) inhibitor (e.g., rapamycin, AFINITOR® (everolimus), and TORISEL® (temsirolimus)), cyclosporine, a tumor necrosis factor (TNF) antagonist (e.g., an anti-TNFα antibody or antigen-binding fragment thereof (e.g., infliximab, adalimumab, certolizumab pegol, and golimumab) or a soluble receptor fusion protein (e.g., etanercept)), an anti-complement agent, a nonsteroidal anti-inflammatory agent (NSAID), or combinations thereof.

[00153] Any suitable AMD therapeutic agent can be administered as an additional therapeutic agent in combination with an anti-CFHR4 antibody of the present disclosure, or an antibody conjugate, fusion protein, and/or polymeric formulation thereof, for treatment of an ocular disorder (e.g., AMD, GA, DME, DR, or RVO), including, but not limited to, a VEGF antagonist, for example, an anti-VEGF antibody (e.g., LUCENTIS® (ranibizumab), RTH-258 (formerly ESBA-1008, an anti-VEGF single-chain antibody fragment; Novartis), or a bispecific anti-VEGF antibody (e.g., an anti-VEGF/anti-angiopoietin 2 bispecific antibody such as RG-7716; Roche)), a soluble VEGF receptor fusion protein (e.g., EYLEA® (aflibercept)), an anti-VEGF DARPin® (e.g., abicipar pegol; Molecular Partners AG/Allergan), or an anti-VEGF aptamer (e.g., MACUGEN® (pegaptanib sodium)); a platelet-derived growth factor (PDGF) antagonist, for example, an anti-PDGF antibody, an anti-PDGFR antibody (e.g., REGN2176-3), an anti-PDGF-BB pegylated aptamer (e.g., FOVISTA®; Ophthotech/Novartis), a soluble PDGFR receptor fusion protein, or a dual PDGF/VEGF antagonist (e.g., a small molecule inhibitor (e.g., DE-120 (Santen) or X-82 (TyrogeneX)) or a bispecific anti-PDGF/anti-VEGF antibody)); VISUDYNE® (verteporfin) in combination with photodynamic therapy; an antioxidant; a complement system antagonist, for example, a complement factor C5 antagonist (e.g., a small molecule inhibitor (e.g., ARC-1905; Opthotech) or an anti-C5 antibody (e.g., LFG-316; Novartis), a properdin antagonist (e.g., an anti-properdin antibody, e.g., CLG-561; Alcon), or a complement factor D antagonist (e.g., an anti-complement factor D antibody, e.g., lampalizumab; Roche)); a visual cycle modifier (e.g., emixustat hydrochloride); squalamine (e.g., OHR-102; Ohr Pharmaceutical); vitamin and

mineral supplements (e.g., those described in the Age-Related Eye Disease Study 1 (AREDS1; zinc and/or antioxidants) and Study 2 (AREDS2; zinc, antioxidants, lutein, zeaxanthin, and/or omega-3 fatty acids)); a cell-based therapy, for example, NT-501 (Renexus); PH-05206388 (Pfizer), huCNS-SC cell transplantation (StemCells), CNTO-2476 (Janssen), OpRegen (Cell Cure Neurosciences), or MA09-hRPE cell transplantation (Ocata Therapeutics); a tissue factor antagonist (e.g., hl-con1; Iconic Therapeutics); an alpha-adrenergic receptor agonist (e.g., brimonidine tartrate); a peptide vaccine (e.g., S-646240; Shionogi); an amyloid beta antagonist (e.g., an anti-beta amyloid monoclonal antibody, e.g., GSK-933776); an S1P antagonist (e.g., an anti-S1P antibody, e.g., iSONEP™; Lpath Inc); a ROBO4 antagonist (e.g., an anti-ROBO4 antibody, e.g., DS-7080a; Daiichi Sankyo); a lentiviral vector expressing endostatin and angiostatin (e.g., RetinoStat); and any combination thereof. In some instances, AMD therapeutic agents (including any of the preceding AMD therapeutic agents) can be co-formulated. For example, the anti-PDGFR antibody REGN2176-3 can be co-formulated with aflibercept (EYLEA®). In some instances, such a co-formulation can be administered in combination with an antibody of the present disclosure. In some instances, the ocular disorder is AMD (e.g., wet AMD).

[00154] In addition to therapeutic uses, an anti-CFHR4 antibody or antigen-binding fragment, described herein can be used in diagnostic or research applications. Research applications include, for example, methods that utilize the anti-CFHR4 antibody and a label to detect CFHR4 in a sample, e.g., in a human body fluid or in a cell or tissue extract. The anti-CFHR4 antibody or antigen-binding fragment thereof may be employed in any suitable assay for measuring CFHR4 in a sample for diagnostic and/or research purposes. Such assays include, but are not limited to, sandwich immunoassays, enzyme immunoassays (EIA), enzyme-linked immunosorbent assays (ELISA), lateral flow assays, competitive inhibition immunoassays (e.g., forward and reverse), competitive binding assays, Forster resonance energy transfer (FRET), one-step antibody detection assays, single molecule detection assays, radioimmunoassays (RIA), and FACS. Such methods are disclosed in, for example, U.S. Patents 6,143,576; 6,113,855; 6,019,944; 5,985,579; 5,947,124; 5,939,272; 5,922,615; 5,885,527; 5,851,776; 5,824,799; 5,679,526; 5,525,524; and 5,480,792; and Adamczyk et al., *Anal. Chim. Acta, 579*(1): 61-67 (2006).

[00155] The anti-CFHR4 antibody or antigen-binding fragment thereof can be provided in a kit, e.g., a packaged combination of reagents in predetermined amounts with instructions for performing an assay using the antibody (e.g., an assay that detects CFHR4). As such, the disclosure

provides a kit comprising the antibody or antigen-binding fragment described herein and instructions for use thereof. The instructions can be in paper form or computer-readable form, such as a disk, CD, DVD, etc. Alternatively or additionally, the kit can comprise a calibrator or control, and/or at least one container (e.g., tube, microtiter plates, or strips) for conducting an assay, and/or a buffer, such as an assay buffer or a wash buffer. Ideally, the kit comprises all components, i.e., reagents, standards, buffers, diluents, etc., which are necessary to perform the assay. Other additives may be included in the kit, such as stabilizers, buffers (e.g., a blocking buffer or lysis buffer), and the like. The relative amounts of the various reagents can be varied to provide for concentrations in solution of the reagents which substantially optimize the sensitivity of the assay. The reagents may be provided as dry powders (typically lyophilized), including excipients which on dissolution will provide a reagent solution having the appropriate concentration.

[00156] The following examples further illustrate the various embodiments of the present disclosure but should not be construed as in any way limiting its scope.

EXAMPLES

[00157] It will be readily apparent to those skilled in the art that other suitable modifications and adaptations of the methods of the present disclosure described herein are readily applicable and appreciable, and may be made using suitable equivalents without departing from the scope of the present disclosure or the aspects and embodiments disclosed herein. Having now described the present disclosure in detail, the same will be more clearly understood by reference to the following examples, which are merely intended only to illustrate some aspects and embodiments of the disclosure, and should not be viewed as limiting to the scope of the disclosure. The disclosures of all journal references, U.S. patents, and publications referred to herein are hereby incorporated by reference in their entireties.

[00158] The present disclosure has multiple aspects, illustrated by the following non-limiting examples.

EXAMPLE 1

[00159] **Genetic Analysis of CFHR4 in Geographic Atrophy.** This example describes analysis that was performed to determine the effects of CFHR1/4 deletions on Age-Related Macular Degeneration (AMD) in FinnGen. There are three common haplotypes composed of a

variant in CFH (rs1061170 Y402H) and a variant that is an eQTL and pQTL for CFH and CFHR4 (rs10922109) that are associated with three different levels of risk. The high AMD risk haplotype (H402 + high CFHR4 expression, rs106117_C(ref)/ rs10922109_C(ref)) was set as the "reference" haplotype to allow comparison to other haplotypes (frequency in cases: 0.56, frequency in controls: 0.36). The haplotype carrying Y402 (the alternate allele at rs106117) and with High CFHR4/low CFH expression (reference allele at rs10922109) is associated with "medium" AMD risk (frequency in cases: 0.196, frequency in controls: 0.21). The "low" risk haplotype carries Y402 (the alternate allele at rs106117) and has low CFHR4/ high CFH expression (alternate allele at rs10922109), with a frequency in cases: 0.22, frequency in controls: 0.43). It was hypothesized that haplotypes that carry a CFHR1/4 deletion will have a different risk for AMD on the medium risk background.

[00160] Genetic variation at this locus provides a natural experiment to determine the effect of CFHR1/4 deletion on AMD. The CFHR1/4 deletion is not directly genotyped in FinnGen but there are variants (rs528922402 and rs188297593) that imperfectly tag (r2 = 0.36, D' = 1 in Finland) non-overlapping subsets of the deletion in Finnish populations in 1000Genomes dataset (HapMap phase3). The variant rs188297593 has a D' <1.0 in HapMap Phase 3 samples of European ancestry (1 of 4 carriers are not tagging CFHR1/4 deletion). These two variants capture a subset but not all carriers of the deletion.

[00161] To determine the effect of the CFH variant (rs1061170), CFHR4/CFH eQTL/pQTL (rs10922109) and CFHR1/4 deletion (tagged by rs528922402 and rs188297593), AMD risk was examined for individuals from FinnGen R6. Haplotypes composed of the individual variants were generated and a logistic regression was run in R to predict the effect of the haplotype on AMD risk adjusting for sex, age, and PC's. The reference haplotype was used as reference such that all other haplotype effects are in relation to that one.

[00162] Consistent with the hypothesis that CFHR4 contributes directly to AMD risk, "medium" risk haplotypes with CFHR4 deleted conferred increased protection from AMD relative to "medium" risk haplotypes with intact CFHR4.

[00163] Table 1: Results from haplotype analysis in FinnGen showing AMD risk from each haplotype with Odds Ratio and p-values from logistic regression.

rs1061170 (C/T)	rs10922109 (C/A)	rs528922402 (GAA/G)	rs188297593 (T/A)	AMD cases	Controls	Frequency in Cases	Frequency in Controls	Odds Ratio	P-value

CFH risk variant	CFHR4 / CFH pQTL	CFHR1/4 deletion tagging variant	CFHR1/4 deletion tagging variant						
H402 (C)	High CFHR4/ low CFH (C)	-	-	5,447	218,864	0.5622	0.4336	1 (Ref)	-
Y402 (T)	High CFHR4/ low CFH (C)	-	-	1,452	75,112	0.1499	0.1488	0.75 [0.71, 0.80]	6e-19
Y402 (T)	High CFHR4/ low CFH (C)	-	CFHR1/4 deletion	100	6,188	0.0103	0.0123	0.65 [0.53, 0.80]	6e-05
Y402 (T)	High CFHR4/ low CFH (C)	CFHR1/4 deletion	-	43	4,011	0.0044	0.0079	0.42 [0.31, 0.57]	5e-08
Y402 (T)	Low CFHR4/ high CFH (A)	-	-	2,635	200,601	0.2720	0.3974	0.50 [0.48, 0.53]	2e-163

EXAMPLE 2

[00164] Generation of recombinant CFHR4 proteins. Recombinant protein preparations were undertaken to produce specific proteins which could be used as immunogens/antigens, screening reagents, and/or control reagents. All efforts were made in service of the goal of generating a panel of anti-CFHR4b antibodies with the desired properties.

[00165] Proteins with the sequence corresponding to human CFHR4b, human CFHL-1 wild type, human CFHL-1 with Tyrosine 402 mutated to Histidine, and cynomolgus CFHR4b were successfully produced with various protein tags. When finished, all protein preparations exceeded 90% purity by analytical methods and were less than <1 endotoxin unit per milliliter. Examples of final specifications for individual preparations are below.

[00166] Beginning with *in silico* analysis, appropriate wild type amino acid sequences of human and cynomolgus CFHR4b and human CFHL-1 were located and extracted from publicly available databases. The sequences were then further analyzed and modified manually using Geneious Prime software in accordance with the project plan. Sequences were examined for liabilities and modified to add further amino acid sequence which encoded for "tags" to facilitate purification, lower

immunogenicity, or simplify analytical screening. Examples of protein tags used in this work include the HIS tag, a proprietary mouse IgG Fc tag, and the Avi tag. Tags were separated from each other and from the CFHR4b or CFHL-1 sequence with short linker sequences. All tags were added to the C-terminal end of the sequences. Additionally, the native signal peptide was removed and replaced with a signal peptide conducive to recombinant expression.

[00167] After all modifications were complete, the amino acid sequences were back translated into DNA sequences and optimized for the codon biases found in the human genome. These optimized DNA sequences were sent to Integrated DNA Technologies and produced as DNA fragment(s) with DNA overhangs added to the 5' and 3' ends. Utilizing the DNA overhangs and the Gibson cloning method, these DNA fragments were assembled into the expected sequence and cloned into a mammalian expression plasmid driven by a CMV promoter. The plasmid was propagated in E. coli with appropriate antibiotic selection and prepared, at a scale useful for recombinant expression, utilizing commercially available preparation kits purchased from Qiagen. The sequence of the plasmid and the expression gene was then confirmed using Sanger sequencing.

[00168] Using polyethylenimine, the sequence verified plasmid was transfected into human embryonic kidney cells adapted for recombinant expression. One day after transfection, the cells were supplemented with chemicals and nutrients designed to increase recombinant protein expression. These supplements include sodium propionate, valproic acid, glucose, glutamine, and a variety of yeast lysates. Five days after transfection, the expressing cell cultures were harvested. As the recombinant protein is secreted into the growth medium, the cells, cell fragments, and cell debris, were removed via centrifugation and filtration through a membrane with pores no greater than 0.22 microns. The clarified culture medium, conditioned with the recombinant protein, was now ready for purification.

[00169] Using a FPLC (Fast pressure liquid chromatography) and the appropriate commercially available pre-packed affinity chromatography column for the C-terminal tag(s) the protein of interest was purified from the cell culture medium and immobilized on the chromatography column. For HIS tagged proteins, a Ni-NTA agarose column was used. For Fc tagged proteins, a proA agarose column was employed. Multiple column washes followed, each specific for the type of column/tag/chromatography. The protein of interest was eluted from the column with 300 mM of imidazole for HIS tagged proteins, and with 100 mM Citrate pH 3.5 for Fc tagged proteins.

Following elution, the Fc tagged proteins were adjusted to a neutral pH using 1M Hepes pH 9. Neutralization was unnecessary for HIS tagged proteins, as the elution buffer is at a neutral pH.

[00170] Protein quality and quantity were assessed using a combination of SDS-PAGE gel electrophoresis, spectrophotometry, and analytical-SEC (size exclusion chromatography). Most proteins for this project required further purification. To further polish the proteins, the FPLC and a second chromatography column were employed. Separation by size, accomplished with a size exclusion column, enabled increased protein purities up to >90%. SEC also enabled buffer exchange out of the affinity chromatography elution buffer and into the final buffer of choice (PBS). The protein sample then moved onto quality control. If, at any point during purification, protein concentration needed to be increased, Amicon Ultra molecular weight cutoff (MWCO) filtration units were used to concentrate protein by separating protein from buffer. MWCO was chosen to ensure compatibility with the size of the protein of interest. Before moving to final quality control, all final samples were concentrated to > 1 milligram per milliliter.

[00171] Endotoxin contamination in the final protein sample was assayed using Charles River's Endosafe PTS system. Spectrophotometry determined the final protein concentration. Three micrograms of the final sample were injected onto an analytical SEC column (YMC Diol 300) to determine its final purity. Additionally, sometimes SDS-PAGE electrophoresis was performed to determine final quality. Once all final metrics passed, the protein was sterilized in a biosafety cabinet using a sterile 0.22 micron filter. This was followed by sterile aliquoting and flash freezing in liquid nitrogen before storage at -80°C.

EXAMPLE 3

[00172] **Recovery of CFHR4 antibody sequences from immunized mice**. CFHR4 Immunization: Three cohorts of Alloy Therapeutic transgenic humanized mice (ATX-GK) were immunized with human CFHR4b using the following 5-week protocols (FIGS. 3A-3C):

[00173] Cohort 1: 5 ATX-GK mice immunized with human CFHR4B (ATX-P-57) using standard 5-week RIMMS protocol of 10 ug subcutaneous dosing of antigen emulsified in complete Freund's adjuvant followed by 5 weekly subcutaneous dosing of antigen emulsified in incomplete Freund's adjuvant. Cohort 2: 5 ATX-GK mice immunized with human CFHR4B (ATX-P-57) using 5-week RIMMS protocol of weekly 10 ug subcutaneous dosing of antigen emulsified in incomplete Freund's adjuvant. Cohort 3: 5 ATX-GK mice immunized with human CFHR4B

(ATX-P-57) using 5-week RIBI IP protocol of weekly 10 ug Intraperitoneal dosing of antigen emulsified in RIBI adjuvant.

[00174] Sample bleeds were taken at week four and tested for antigen positive serum titer and purification tag negative serum titer by ELISA. ELISA plates were coated with either 1ug/ml of CFHR4 immunogen or an irrelevant protein (P114) with the same purification tag as the immunogen. Antigen coated plates were incubated with seven 10-fold serial dilutions of sera starting at 1:300. Antibodies bound to antigen were detected by anti-mouse IgG HRP secondary antibody and one step TMB solution. The absorbance signal at 450 nm was measured with an ELISA microplate reader.

[00175] *Hybridoma*: Immune tissues from high titer mice were harvested and preserved for antibody discovery. Hybridoma cell lines producing CFHR4 antibodies were produced by fusion of single B Cells from spleen and lymph nodes of titer positive mice with myeloma cells. Twenty 96 well plates of hybridoma fusions were generated and expanded. Hybridomas expressing CFHR4 specific antibodies were detected by antigen binding by ELISA. Affinity of antibodies in the hybridoma supernatants were measured by SPR using the Octet instrument. CFHR4 antibodies in hybridoma supernatant were loaded on a biosensor. Response was measured as a nm shift in the interference pattern and was proportional to the number of antibodies bound to the surface of the biosensor. The binding interaction of CFHR4 to the immobilized antibodies was measured as association (kon). Following analyte association, the biosensor was dipped into PBS without CFHR4, and the bound antigen was allowed to dissociate from the antibody (kdis). KD (M), or affinity of the antibodies for CFHR4 was measured as kdis/kon. Heavy and light chains from validated hybridomas were sequenced. RNA was isolated from CFHR4 antibody secreting hybridomas and heavy and light chain variable regions were cloned by reverse transcription using gene specific primers followed by PCR amplification with variable chain gene specific primers. PCR products were sequenced by standard Sanger sequencing methods.

[00176] *Phage Display*: Variable heavy and light chains were amplified from the spleen of high titer immunized mice by reverse transcription using gene specific primers followed by PCR amplification with variable chain gene specific primers. Variable regions were cloned into a phage display vector designed to express Fabs on phage g3p protein. Libraries of phage expressing unique Fabs were amplified and purified. Phage were allowed to bind to biotinylated CFHR4 antigens captured on streptavidin magnetic beads. Phage remaining bound to antigen beads after

several stringent washes was eluted using a basic triethylamine solution and neutralized with Tris buffer pH 8.0. Eluted phages were reinfected into TG1 bacterial cells, amplified by co-infection with M13 helper phage, and purified by PEG precipitation. Purified phages expressing Fabs were selected for antigen binding as described. Phage from the second round were diluted and infected into TG1 cells. Polyclonal pools of phage output from two rounds of panning were tested by ELISA to confirm that the pools contained CFHR4-specific phage. Variable heavy and light chain regions were sequenced from single infected bacterial colonies using a rolling circle amplification and standard Sanger sequencing.

[00177] *Antibody Sequencing*: Unique variable heavy and light chain pairs from hybridoma and phage display campaigns were cloned into vectors designed to express full length antibodies as IgGs in HEK293 cells under the control of a CMV promoter. Antibody expression vectors were complexed with polyethylenimine and transfected into HEK293 cultures. After 5 days of shaking at 37 °C in 293 cell culture media, antibodies were captured on agarose-based protein A resin. After several stringent washes, antibodies were eluted in glycine solution, pH 3, neutralized with Hepes, pH 9, and buffer exchanged into PBS.

EXAMPLE 4

[00178] **Human CFHR4 monoclonal antibody differential scanning fluorimetry (DSF).** Development of effective monoclonal antibodies depends not only on their biological activity but also on their physicochemical properties, such as homogeneity and stability. mAb stability can be affected by their formulation. Among the many techniques used to study the stability of mAbs, differential scanning fluorimetry (DSF) offers both excellent throughput and minimal material consumption. DSF measures the temperature of the protein unfolding transition (Tm) based on the change in fluorescence intensity of an environmentally sensitive dye.

[00179] Experiments were conducted to assess the thermal stability of the human CFHR4 monoclonal antibodies ("ATX" antibodies) of the present disclosure by determining the melting temperature. Thermal stability was assessed via differential scanning fluorimetry (DSF) utilizing the Protein Thermal Shift (PTS) assay from Applied Biosystems. The assay was performed according to the manufacturer's instruction. Briefly, the antibody to be evaluated was prepared in triplicate by mixing with Protein Thermal Shift dye and buffer; a real-time melt experiment from

25 °C to 95 °C was run on QuantStudio 3. Data was analyzed by using Protein Thermal Shift Software and the melting temperature (Tm) was calculated from the melt curve (FIG. 4).

[00180] Table 2: DSF analysis of human anti-CFHR4 monoclonal antibodies.

Protein Thermal Shift Assay Results		
Sample ID	**Tm D - Mean**	**Tm 2 - Mean**
ATX-P-101	70.86	
ATX-P-560	61.92	
ATX-P-561	61.78	70.40
ATX-P-562	62.34	72.79
ATX-P-563	61.85	
ATX-P-564	61.71	
ATX-P-565	61.92	72.16
ATX-P-566	61.36	75.03
ATX-P-568	60.59	
ATX-P-569	61.78	
ATX-P-570	62.06	84.01
ATX-P-572	61.78	82.26
ATX-P-573	62.62	
ATX-P-574	61.78	
ATX-P-576	62.83	
ATX-P-577	61.85	
ATX-P-578	61.29	
ATX-P-579	62.40	
ATX-P-580	61.77	
ATX-P-582	61.84	76.00
ATX-P-583	61.56	72.22
ATX-P-587	62.19	80.49
ATX-P-588	61.42	
ATX-P-591	61.56	
ATX-P-592	61.21	82.10
ATX-P-594	62.04	
ATX-P-595	61.90	
ATX-P-596	61.90	74.80
ATX-P-597	63.51	
ATX-P-598	60.99	68.63
ATX-P-600	60.77	79.14
ATX-P-602	61.34	85.66
ATX-P-603	61.27	
ATX-P-604	61.54	
ATX-P-607	62.03	
ATX-P-608	61.12	
ATX-P-609	61.54	82.28

EXAMPLE 5

[00181] **CFHR4 Antibody Cross-Blocking.** High-throughput epitope binning experiments were conducted on real-time label-free biosensors (Carterra LSA) to sort large panels of mAbs into bins based on their ability to block one another for binding to the antigen. In a pairwise epitope

binning analysis, antigen and antibody 2 (analyte antibody) are sequentially applied to the sensor chip (HC200M) covalently pre-loaded with antibody 1 (ligand antibody). An increase in response upon exposure to the analyte antibody indicates non-competition between the two antibodies, whereas a lack of change in the signal indicates competition. Antibodies having the same blocking profiles towards others in the test set are grouped into one bin. Community network plots are used to explore clustering of mAbs that share similar but not necessarily identical competition profiles. Rather than relying strictly on the sandwiching/blocking assignments in the heat map (FIG. 5A), as the Bin network plots do, hierarchical clustering is applied to the sorted heat map to generate network plots (FIG. 5B), which progressively group mAbs.

EXAMPLE 6

[00182] CFHR4 Antibody Binding Kinetics. Kinetic experiments were performed on Carterra LSA with a running buffer of PBS pH 7.40, 1% BSA, 0.05% Tween20. Antibodies were covalently printed on an HC30M chip. The chip was activated with 33 mM s-NHS and 133 mM EDC in 100 mM MES pH 5.5 for 7 minutes. Antibodies at 10 mg/ml in acetic acid buffer pH 4.5 were used for printing for 10 min. The printed chip was then quenched with 1 M ethanolamine pH 8.5 for 7 min. For kinetics analysis, purified recombinant his tagged protein ATX-P-57, human CDFR4B-His, at a concentration from 0.076 nM to 1500 nM (a serial 3-fold dilution) was injected sequentially. For each concentration, there was 5 min association followed by 15 min dissociation. Results were processed and analyzed in Carterra LSA Kinetics Software. The kinetic data was referenced with the interstitial reference spots and double-referenced to a buffer cycle, and then fit globally to a 1:1 binding model to determine their apparent association and dissociation kinetic rate constants (ka and kd values). The ratio kd/ka was used to derive the KD value of each antigen/mAb interaction, i.e., KD=kd/ka (FIG. 6).

EXAMPLE 7

[00183] CFHR4 Antibody Cross Reactivity. Experiments were conducted to determine the reactivity of the CFHR4 antibodies of the present disclosure (developed using CFHR4b antigen; see Example 3) with various other CFHR4 proteins. As shown in FIG. 7, experiments were conducted to determine the reactivity of the CFHR4 antibodies with the Cynomolgus monkey CFHR4b protein (cCFHR4b). The binding experiments were performed on Carterra LSA with a

running buffer of PBS pH 7.40, 1% BSA, 0.05% Tween20. Antibodies were covalently printed on an HC30M chip. Chip was activated with 33 mM s-NHS and 133 mM EDC in 100 mM MES pH 5.5 for 7 Min . Antibodies at 10 mg/ml in acetic acid buffer pH 4.5 were used for printing for 10 min. The printed chip was then quenched with 1 M ethanolamine pH 8.5 for 7 min. For the reactivity assay, ATX-P-141, cyno CFHR4B-mFc, at 160 nM was tested with 5 min association followed by 15 min dissociation. Results were processed and analyzed in Carterra LSA Kinetics Software. The data was referenced with the interstitial reference spots and double-referenced to a buffer cycle, and then the responses (nm) after association were reported. Isotype control was used to determine the cutoff response for positive binding.

[00184] Experiments were also conducted to determine the reactivity of the CFHR4 antibodies with the human CFHR4a protein (FIG. 8). The binding experiments were performed on Carterra LSA with a running buffer of PBS pH 7.40, 1% BSA, 0.05% Tween20. Antibodies were covalently printed on an HC30M chip. Chip was activated with 33 mM s-NHS and 133 mM EDC in 100 mM MES pH 5.5 for 7 minutes. Antibodies at 10 mg/ml in acetic acid buffer pH 4.5 were used for printing for 10 min. The printed chip was then quenched with 1 M ethanolamine pH 8.5 for 7 min. For the reactivity assay, ATX-P-56, human CFHL4A-His, at 540 nM was tested with 5 min association followed by 15 min dissociation. Results were processed and analyzed in Carterra LSA Kinetics Software. The data was referenced with the interstitial reference spots and double-referenced to a buffer cycle, and then the responses (nm) after association were reported. Isotype control was used to determine the cutoff response for positive binding.

[00185] Experiments were also conducted to determine the reactivity of the CFHR4 antibodies with the human CFHR3 protein (FIG. 9). The binding experiments were performed on Carterra LSA with a running buffer of PBS pH 7.40, 1% BSA, 0.05% Tween20. Antibodies were covalently printed on an HC30M chip. Chip was activated with 33 mM s-NHS and 133 mM EDC in 100 mM MES pH 5.5 for 7 minutes. Antibodies at 10 mg/ml in acetic acid buffer pH 4.5 were used for printing for 10 min. The printed chip was then quenched with 1 M ethanolamine pH 8.5 for 7 min. For the reactivity assay, ATX-P-58, human CFHL3-His, at 550 nM was tested with 5 min association followed by 15 min dissociation. Results were processed and analyzed in Carterra LSA Kinetics Software. The data was referenced with the interstitial reference spots and double-referenced to a buffer cycle, and then the responses (nm) after association were reported. Isotype control was used to determine the cutoff response for positive binding.

[00186] Experiments were also conducted to determine the reactivity of the CFHR4 antibodies with the human CFHL-1 (Y402H) protein (FIG. 10). The binding experiments were performed on Carterra LSA with a running buffer of PBS pH 7.40, 1% BSA, 0.05% Tween20. Antibodies were covalently printed on an HC30M chip. Chip was activated with 33 mM s-NHS and 133 mM EDC in 100 mM MES pH 5.5 for 7 minutes. Antibodies at 10 mg/ml in acetic acid buffer pH 4.5 were used for printing for 10 min. The printed chip was then quenched with 1 M ethanolamine pH 8.5 for 7 min. For the reactivity assay, ATX-P-421, human CFHL1-Y402H-His, at 380 nM was tested with 5 min association followed by 15 min dissociation. Results were processed and analyzed in Carterra LSA Kinetics Software. The data was referenced with the interstitial reference spots and double-referenced to a buffer cycle, and then the responses (nm) after association were reported. Isotype control was used to determine the cutoff response for positive binding.

EXAMPLE 8

[00187] **C3 Convertase Assembly assay.** A screening assay was developed to evaluate the ability of the CFHR4 antibodies of the present disclosure to affect C3 convertase formation (FIG. 11A). C3bBb is the C3 convertase (EC 3.4.21.43) of the alternative pathway of complement activation. The C3 enzyme is responsible for amplification of pathway activation and for deposition on target cells of C3b and the membrane attack complex. It is controlled by the serum proteins Factor H, Factor I (EC 3.4.21.45), and properdin. The formation of C3 convertase requires C3b, Factor B, Factor D (EC 3.4.21.46), and Mg2+. After formation of the reversible, bimolecular complex C3bB(Mg), Factor D cleaves Factor B, releasing the activation fragment Ba, and generates the active enzyme C3bBb. The C3 enzyme is a serine protease whose catalytic site resides in the Bb subunit. Additionally, CFHR4 has been reported to directly promote C3 convertase formation by binding to C3b, with stronger ability to assemble C3bBb on CFHR4, and with C3bBb-CFHR4 complex being more resistant to CFH cleavage in comparison with C3bBb.

[00188] Thus, the assay is designed to test the ability of a CHFR4 antibody to disrupt the formation of the C3 convertase complex by measuring the amount of Factor B that is present using an anti-FB monoclonal antibody conjugated to a reporter moiety. As illustrated in FIG. 11A, in the presence of CFHR4 (absence of an effective CFHR4 antibody), the C3 convertase complex is formed and the anti-FB antibody binds FB and a signal is detected (i.e., complement activation). However, in the presence of an effective anti-CFHR4 antibody, the C3 convertase complex is

disrupted and the antibody-bound FB is washed away, resulting in a decreased signal (i.e., no complement activation).

[00189] An example of the assay protocol is provided below:

[00190] Preparation of FHR-4 coated plates – (1) Coat plates with 5 µg/ml FHR-4 in PBS, incubate in plastic bag with moist paper O/N in RT. (2) Wash 3 x 300 µl with Wieslab wash buffer. (3) Block wells with 150 µl 3% BSA in PBS. (4) Incubate for a minimum of 1 h RT. (5) Aspirate wells and wash with Superblock 1 x 300 µl. (6) Dry plates at 37°C, 16% RH, for at least 1 h. (7) Store in plate bags in fridge.

[00191] Assay protocol – (1) Bring diluent, plate, substrate, and stop solution to RT. (2) Dilute anti-OVA antibody to desired concentrations in AP diluent. (3) Add 50 µl Anti-OVA, AP diluent (blank), and diluent control to the plate. (4) Incubate with lid for 1 h at RT. (5) Wash with Wieslab wash buffer 3 x 300 µl. (6) Add 50 µl C3b at 5 µg/ml or AP diluent to the plate. (7) Incubate the plate at 37°C for 30 min. (8) Wash with Wieslab wash buffer 3 x 300 µl. (9) Add 50 µl protein mix (FB, FD, Properdin) to the plate. (10) Incubate the plate at 37°C for 30 min. (11) Wash with Wieslab wash buffer 3 x 300 µl. (12) 50 µl anti-factor B antibody diluted 1:2000 in AP diluent were added to the whole plate. (13) Incubate the plate at RT for 1 h. (14) Wash with Wieslab wash buffer 3 x 300 µl. (15) Add 50 µl Rabbit anti-goat IgG-HRP antibody diluted 1:5000 in Stabilzyme to the whole plate. (16) Incubate the plate at RT for 1 h. (17) Wash with Wieslab wash buffer 3x300 µl. (18) 50 µl substrate were added to the whole plate. (19) Incubate the plate at RT for 20 min. (20) 50 µl stop solution were added to the whole plate. (21) The plate was read at 450 – 620 nm.

[00192] As shown in FIG. 11B, dose response curves were generated for the top 8 inhibitory antibodies screened in the C3 Convertase Assembly assay. The percent C3 Convertase activity is plotted relative to negative control (diluent only). FIG. 11C includes the IC50 values calculated for each antibody tested in FIG. 11B. And FIG. 11D provides a representative summary of data demonstrating at least three functional classes of anti-CFHR4 antibodies.

[00193] **Sequences**

[00194] The various amino acid sequences and nucleic acid sequences referenced herein are provided below.

[00195] Table 3: Anti-CFHR4 antibodies (CDR sequences)

SEQ ID NO:	Antibody Name:	Descriptor:	Sequence:
VH Family: IGHV1			
1	-	HCDR1 Consensus	$X_1YX_2X_3X_4$ (X_1 is S, T, G, or N; X_2 is G or Y; X_3 is I or M; X_4 is S, H, or Q)
2	ATX-P-591	HCDR1	SYGIS
3	ATX-P-583	HCDR1	TYGIS
4	ATX-P-602	HCDR1	GYYMH
5	ATX-P-601	HCDR1	SYYMH
6	ATX-P-607	HCDR1	SYYMH
7	ATX-P-597	HCDR1	NYYMQ
8	-	HCDR2 Consensus	$X_1IX_2X_3X_4X_5GX_6TX_7X_8X_9X_{10}X_{11}X_{12}QX_{13}$ (X_1 is W or I; X_2 is S, N, or D; X_3 is A or P; X_4 is Y, N, or S; X_5 is N, G, or S; X_6 is N, S, or G; X_7 is N, H, T, or S; X_8 is Y or N; X_9 is A or Y; X_{10} is Q or A; X_{11} is K or S; X_{12} is L or F; X_{13} is G or D)
9	ATX-P-591	HCDR2	WISAYNGNTNYAQKLQG
10	ATX-P-583	HCDR2	WISAYSGNTHYAQSLQD
11	ATX-P-602	HCDR2	WINPNSGGTNYAKKFQG
12	ATX-P-601	HCDR2	IINPSGGSTNYAQKFQG
13	ATX-P-607	HCDR2	IINPSGGSTSYAQKFQG
14	ATX-P-597	HCDR2	IIDPSGGSTTYAQKFQG
15	ATX-P-591	HCDR3	DLRGTAFDY
16	ATX-P-583	HCDR3	DEGYCSSTGCLNLFDP
17	ATX-P-602	HCDR3	GDTIFRLVTPLDY
18	ATX-P-601	HCDR3	DQSGGMDV
19	ATX-P-607	HCDR3	DPEYSSAFDI
20	ATX-P-597	HCDR3	DEGTDRPGWGY
VH Family: IGHV3			
21	-	HCDR1 Consensus	$X_1YX_2X_3X_4$ (X_1 is S, T, R, or D; X_2 is T, V, A, G, S, or E; X_3 is M or I; X_4 is N, S, or H)
22	ATX-P-564	HCDR1	SYTMN
23	ATX-P-568	HCDR1	SYVMS
24	ATX-P-574	HCDR1	SYAMS
25	ATX-P-565	HCDR1	TYGIH
26	ATX-P-578	HCDR1	RYSMN
27	ATX-P-588	HCDR1	DYAMH
28	ATX-P-600	HCDR1	DYAMH
29	ATX-P-569	HCDR1	DYAMH
30	ATX-P-596	HCDR1	DYAMH
31	ATX-P-576	HCDR1	DYEMH
32	-	HCDR2 Consensus	$X_1IX_2X_3X_4X_5X_6X_7X_8X_9X_{10}X_{11}DX_{12}VX_{13}G$ (X_1 is S, V, Y, G or D; X_2 is S or W; X_3 is S, V, G, H, or W; X_4 is S, D, N or T; X_5 is S or G; X_6 is S or G; X_7 is Y, S, T or R; X_8 is T, K, I or V; X_9 is Y, F, N, or G; X_{10} is Y or H; X_{11} is A or V; X_{12} is S or P; X_{13} is R, K, or T)
33	ATX-P-564	HCDR2	SISSSSSYTYYADSVRG
34	ATX-P-568	HCDR2	VISVSGGSTFYADSVRG
35	ATX-P-574	HCDR2	VISGSGGTTYYADSVKG
36	ATX-P-565	HCDR2	VIWHDGSSKNYVDSVTG
37	ATX-P-578	HCDR2	YISSSSSTIFHADSVKG
38	ATX-P-588	HCDR2	GISWNSGSIGYADSVKG
39	ATX-P-600	HCDR2	GISWSGGSIGYADSVKG

40	ATX-P-569	HCDR2	GISWNSGSIGYADSVKG
41	ATX-P-596	HCDR2	GISWTGGSVGYADPVKG
42	ATX-P-576	HCDR2	DISRNSGRIGYADSVKG
43	ATX-P-564	HCDR3	SASIAAGMDV
44	ATX-P-568	HCDR3	DGLAVAGFDH
45	ATX-P-574	HCDR3	RGDYGDYMDV
46	ATX-P-565	HCDR3	RGNWNYGFYYYYMDV
47	ATX-P-578	HCDR3	GNWNYYYMDV
48	ATX-P-588	HCDR3	DRDDGYNYAGVFDY
49	ATX-P-600	HCDR3	DREDGYNYGGVFDY
50	ATX-P-569	HCDR3	DIGNGYTKGDVFDI
51	ATX-P-596	HCDR3	DMGDGYSRNWPFDY
52	ATX-P-576	HCDR3	DIWGSGYFDY
VH Family: IGHV4			
53	-	HCDR1 Consensus	$X_1X_2X_3WX_4X_5$ (X_1 is T, S, G, or I; X_2 is S, R, Y, or H; X_3 is D, N, H, K or Y; X_4 is W or S; X_5 is T or S)
54	ATX-P-580	HCDR1	TSDWWT
55	ATX-P-579	HCDR1	TSNWWT
56	ATX-P-577	HCDR1	SSNWWT
57	ATX-P-608	HCDR1	SSNWWS
58	ATX-P-609	HCDR1	SSNWWS
59	ATX-P-603	HCDR1	GSHWWS
60	ATX-P-582	HCDR1	ISKWWS
61	ATX-P-598	HCDR1	SSNWWS
62	ATX-P-571	HCDR1	SRNWWS
63	ATX-P-570	HCDR1	GYYWS
64	ATX-P-563	HCDR1	SHYWS
65	-	HCDR2 Consensus	$X_1X_2X_3X_4X_5GX_6X_7X_8X_9X_{10}PLSX_{11}S$ (X_1 is E or Y; X_2 is I, T, or V; X_3 is Y, H, or F; X_4 is H or Y; X_5 is S, D, T, G; X_6 is S, T, G, or N; X_7 is T or I; X_8 is N or K; X_9 is Y, K, or S; X_{10} is N, S, K, or H; X_{11} is K or Q)
66	ATX-P-580	HCDR2	EIYHSGSTNYNPSLKS
67	ATX-P-579	HCDR2	EIYHDGSTNYSPSLQS
68	ATX-P-577	HCDR2	ETYHDGSTNYNPSLKS
69	ATX-P-608	HCDR2	EIYHTGSTNKKPSLKS
70	ATX-P-609	HCDR2	EIYHSGSTNYNPSLKS
71	ATX-P-603	HCDR2	EIYHTGSTNKNPSLKS
72	ATX-P-582	HCDR2	EIYHTGSTNYHPSLKS
73	ATX-P-598	HCDR2	EIYHSGTTNYNPSLKS
74	ATX-P-571	HCDR2	EIYHGGTTNYNPSLKS
75	ATX-P-570	HCDR2	YVHYSGGTKSNPSLKS
76	ATX-P-563	HCDR2	YIFYSGNINYNPSLKS
77	ATX-P-580	HCDR3	WYFDL
78	ATX-P-579	HCDR3	FYIDV
79	ATX-P-577	HCDR3	FYFDY
80	ATX-P-608	HCDR3	DREGGTTEAFDI
81	ATX-P-609	HCDR3	DQLSSGPTDAFDI
82	ATX-P-603	HCDR3	DQYTGSPRDAFDI
83	ATX-P-582	HCDR3	DELRLGELSPSLDI
84	ATX-P-598	HCDR3	DRLRLGESSSDVFDI
85	ATX-P-571	HCDR3	GGLRLGELSPNAFDI
86	ATX-P-570	HCDR3	ERYEWNSYFDY
87	ATX-P-563	HCDR3	DRGGSYSYHFDC

VH Family: IGHV6			
88	-	HCDR1 Consensus	SNX_1AX_2WN (X_1 is S, T, or N; X_2 is A or S)
89	ATX-P-566	HCDR1	SNSAAWN
90	ATX-P-594	HCDR1	SNSASWN
91	ATX-P-604	HCDR1	SNSAAWN
92	ATX-P-595	HCDR1	SNSAAWN
93	ATX-P-610	HCDR1	SNSAAWN
94	ATX-P-572	HCDR1	SNSAAWN
95	ATX-P-587	HCDR1	SNSAAWN
96	ATX-P-592	HCDR1	SNSAAWN
97	ATX-P-560	HCDR1	SNTAAWN
98	ATX-P-581	HCDR1	SNNAAWN
99	ATX-P-573	HCDR1	SNSAAWN
100	ATX-P-561	HCDR1	SNSAAWN
101	ATX-P-562	HCDR1	SNSAAWN
102	-	HCDR2 Consensus	$X_1TX_2YRSX_3X_4X_5X_6X_7X_8X_9X_{10}SX_{11}X_{12}S$ (X_1 is R, T, M, or K; X_2 is Y or F; X_3 is K or R; X_4 is W or L; X_5 is F, Y, or S; X_6 is N, S, D, or A; X_7 is N, V, G, D, Y, or A; X_8 is Y or F; X_9 is S, A, or P; X_{10} is V, L, or A; X_{11} is V or M; X_{12} is K or S)
103	ATX-P-566	HCDR2	RTYYRSKWFNNYSVSVKS
104	ATX-P-594	HCDR2	TTYYRSKWFNVYAVSVKS
105	ATX-P-604	HCDR2	RTYYRSKWFNGYAVSVKS
106	ATX-P-595	HCDR2	RTYYRSKWFNDYALSVKS
107	ATX-P-610	HCDR2	RTYYRSKWYNDYALSVKS
108	ATX-P-572	HCDR2	MTYYRSKWYSVFAVSVKS
109	ATX-P-587	HCDR2	KTYYRSKWYNYYALSVKS
110	ATX-P-592	HCDR2	RTYYRSKWYSDYPLSVKS
111	ATX-P-560	HCDR2	RTYYRSKWYNDYAVSVKS
112	ATX-P-581	HCDR2	RTYYRSKWYNAYAVSVKS
113	ATX-P-573	HCDR2	RTYYRSKLYSDYAVSVKS
114	ATX-P-561	HCDR2	RTYYRSKWYNGYAVSMKS
115	ATX-P-562	HCDR2	RTFYRSRWSAAYAASVSS
116	ATX-P-566	HCDR3	DLGELLDWYFDL
117	ATX-P-594	HCDR3	DRGDLLHWYFDL
118	ATX-P-604	HCDR3	DRGELLHWYFDL
119	ATX-P-595	HCDR3	EPGIVAPGPFDY
120	ATX-P-610	HCDR3	EPGIAAPGPFDY
121	ATX-P-572	HCDR3	EGGIVGATPFDY
122	ATX-P-587	HCDR3	DGDYYLPSPFDL
123	ATX-P-592	HCDR3	DSGIVETTPFDY
124	ATX-P-560	HCDR3	DNWNNGGPGFDP
125	ATX-P-581	HCDR3	EGGYIYGLDQ
126	ATX-P-573	HCDR3	EGGYTYGYDY
127	ATX-P-561	HCDR3	EGVGATTGFDY
128	ATX-P-562	HCDR3	EGVGSSTGFDY
VL Family: IGKV1			
129	-	LCDR1 Consensus	$RX_1SX_2X_3X_4X_5X_6X_7LX_8$ (X_1 is A or T; X_2 is Q or K; X_3 is G, S, D, or N; X_4 is I, F, or V; X_5 is T, R, A, S, N, G, or I; X_6 is T, N, G, S, I, K, or Y; X_7 is W, D, or Y; X_8 is A, T, G, N, or D)
130	ATX-P-574	LCDR1	RASQGITTWLA
131	ATX-P-576	LCDR1	RTSQGIRNWLA

132	ATX-P-563	LCDR1	RASQSFAGWLA
133	ATX-P-610	LCDR1	RASQGISSWLA
134	ATX-P-560	LCDR1	RASQGISSWLA
135	ATX-P-581	LCDR1	RASQGVNNWLA
136	ATX-P-573	LCDR1	RASQGISSWLA
137	ATX-P-561	LCDR1	RASQGISSWLT
138	ATX-P-562	LCDR1	RASKGISIWLA
139	ATX-P-580	LCDR1	RASQGIRNDLG
140	ATX-P-579	LCDR1	RASQGIRKDLG
141	ATX-P-577	LCDR1	RASQDIRNDLG
142	ATX-P-591	LCDR1	RASQSINTYLN
143	ATX-P-583	LCDR1	RASQNIGSYLN
144	ATX-P-601	LCDR1	RASQSINYLN
145	ATX-P-607	LCDR1	RASQSIRSYLN
146	ATX-P-597	LCDR1	RASQSISSYLD
147	ATX-P-582	LCDR1	RASQNINNYLN
148	ATX-P-571	LCDR1	RASQSISSYLN
149	ATX-P-568	LCDR1	RASQSISTWLA
150	ATX-P-578	LCDR1	RASQSVNSWLA
151	ATX-P-569	LCDR1	RASQNIITWLA
152	-	LCDR2 Consensus	$X_1X_2SX_3LX_4X_5$ (X_1 is G, A, T, or K; X_2 is A or T; X_3 is S, T, G, or N; X_4 is E, Q, or L; X_5 is S, T, or G)
153	ATX-P-574	LCDR2	GASSLES
154	ATX-P-576	LCDR2	AASSLQT
155	ATX-P-563	LCDR2	AASTLQS
156	ATX-P-610	LCDR2	AASSLQS
157	ATX-P-560	LCDR2	AASSLQS
158	ATX-P-581	LCDR2	AASSLLS
159	ATX-P-573	LCDR2	AASSLQS
160	ATX-P-561	LCDR2	AASSLQG
161	ATX-P-562	LCDR2	AASSLQS
162	ATX-P-580	LCDR2	AASSLQS
163	ATX-P-579	LCDR2	TASTLQS
164	ATX-P-577	LCDR2	AASSLQS
165	ATX-P-591	LCDR2	AASSLQS
166	ATX-P-583	LCDR2	ATSTLQS
167	ATX-P-601	LCDR2	AASSLQS
168	ATX-P-607	LCDR2	AASSLQS
169	ATX-P-597	LCDR2	AASSLQS
170	ATX-P-582	LCDR2	AASSLQS
171	ATX-P-571	LCDR2	AASSLQS
172	ATX-P-568	LCDR2	KASGLES
173	ATX-P-578	LCDR2	KASNLEG
174	ATX-P-569	LCDR2	KASSLES
175	ATX-P-574	LCDR3	QQANSFPWT
176	ATX-P-576	LCDR3	QQANSFPYT
177	ATX-P-563	LCDR3	QQANSFPLT
178	ATX-P-610	LCDR3	QQNYRTPIT
179	ATX-P-560	LCDR3	QQANSFPPT
180	ATX-P-581	LCDR3	QQANSFPIT
181	ATX-P-573	LCDR3	QQANSFPPT
182	ATX-P-561	LCDR3	QQANSFPPT
183	ATX-P-562	LCDR3	QQANSFPPT

184	ATX-P-580	LCDR3	LHFNSYPFT
185	ATX-P-579	LCDR3	LQYNNYPFT
186	ATX-P-577	LCDR3	LQYNNYPFT
187	ATX-P-591	LCDR3	QHSFTTPFT
188	ATX-P-583	LCDR3	QQSFIIPFT
189	ATX-P-601	LCDR3	QQSYSTPIT
190	ATX-P-607	LCDR3	QQSYRTPVT
191	ATX-P-597	LCDR3	QQSYSTPLT
192	ATX-P-582	LCDR3	QQSYSTPLT
193	ATX-P-571	LCDR3	QETYSVPLT
194	ATX-P-568	LCDR3	QQYNSFSLI
195	ATX-P-578	LCDR3	QQYDTSWT
196	ATX-P-569	LCDR3	QQYSSYSYT
VL Family: IGKV2			
197	-	LCDR1 Consensus	RSSQX$_1$LLHSX$_2$GYNX$_3$LD (X$_1$ is S or R; X$_2$ is T or S; X$_3$ is F or Y)
198	ATX-P-564	LCDR1	RSSQS LLHST GYNFLD
199	ATX-P-565	LCDR1	RSSQR LLHSS GYNYLD
200	-	LCDR2 Consensus	LX$_1$SX$_2$RAS (X$_1$ is A or G; X$_2$ is N or S)
201	ATX-P-564	LCDR2	LASNRAS
202	ATX-P-565	LCDR2	LGSSRAS
203	-	LCDR3 Consensus	MQX$_1$LQTPX$_2$T (X$_1$ is A or G; X$_2$ is Y or P)
204	ATX-P-564	LCDR3	MQALQTPYT
205	ATX-P-565	LCDR3	MQGLQTPPT
VL Family: IGKV3			
206	-	LCDR1 Consensus	RASQX$_1$X$_2$X$_3$X$_4$X$_5$X$_6$X$_7$X$_8$A (X$_1$ is S, N, or T; X$_2$ is V or I; X$_3$ is S or R; X$_4$ is S, G or N; X$_5$ is N or S; X$_6$ is L or Y; X$_7$ is A, L, or V)
207	ATX-P-608	LCDR1	RASQSVSSNLA
208	ATX-P-609	LCDR1	RASQSVSSNLA
209	ATX-P-602	LCDR1	RASQSVSSSYLA
210	ATX-P-588	LCDR1	RASQSVSSNLA
211	ATX-P-600	LCDR1	RASQNVRGSYLA
212	ATX-P-603	LCDR1	RASQSVSSSYLA
213	ATX-P-566	LCDR1	RASQSVRNSYVA
214	ATX-P-594	LCDR1	RASQSVSSSYLA
215	ATX-P-604	LCDR1	RASQTIRSSYLA
216	-	LCDR2 Consensus	GASX$_1$RAT (X$_1$ is T, S, or N)
217	ATX-P-608	LCDR2	GASTRAT
218	ATX-P-609	LCDR2	GASTRAT
219	ATX-P-602	LCDR2	GASSRAT
220	ATX-P-588	LCDR2	GASSRAT
221	ATX-P-600	LCDR2	GASNRAT
222	ATX-P-603	LCDR2	GASSRAT
223	ATX-P-566	LCDR2	GASSRAT
224	ATX-P-594	LCDR2	GASSRAT
225	ATX-P-604	LCDR2	GASSRAT
226	-	LCDR3 Consensus	QX$_1$YX$_2$X$_3$X$_4$X$_5$X$_6$T (X$_1$ is Q or H; X$_2$ is D or G; X$_3$ is N, S, or R; X$_4$ is W or S; X$_5$ is R, P, F, Y, V, or I; X$_6$ is T, W, L or I)
227	ATX-P-608	LCDR3	QQYD NWRT

228	ATX-P-609	LCDR3	QQYD NWRT
229	ATX-P-602	LCDR3	QQYG SSPWT
230	ATX-P-588	LCDR3	QQYG SSFT
231	ATX-P-600	LCDR3	QQYG SSYT
232	ATX-P-603	LCDR3	QHYG NSPLT
233	ATX-P-566	LCDR3	QQYG NSPLT
234	ATX-P-594	LCDR3	QQYG RSVT
235	ATX-P-604	LCDR3	QQYG RSII
VL Family: IGKV4			
236	-	LCDR1 Consensus	KSSQSVLYSSNNKNYLA
237	ATX-P-596	LCDR1	KSSQSVLYSSNNKNYLA
238	ATX-P-598	LCDR1	KSSQSVLYSSNNKNYLA
239	ATX-P-570	LCDR1	KSSQSVLYSSNNKNYLA
240	ATX-P-595	LCDR1	KSSQSVLYSSNNKNYLA
241	ATX-P-572	LCDR1	KSSQSVLYSSNNKNYLA
242	ATX-P-587	LCDR1	KSSQSVLYSSNNKNYLA
243	ATX-P-592	LCDR1	KSSQSVLYSSNNKNYLA
244	-	LCDR2 Consensus	WASX$_1$RES (X_1 is T, P or N)
245	ATX-P-596	LCDR2	WASTRES
246	ATX-P-598	LCDR2	WASTRES
247	ATX-P-570	LCDR2	WASTRES
248	ATX-P-595	LCDR2	WASTRES
249	ATX-P-572	LCDR2	WASPRES
250	ATX-P-587	LCDR2	WASTRES
251	ATX-P-592	LCDR2	WASNRES
252	-	LCDR3 Consensus	QQX$_1$X$_2$X$_3$X$_4$PX$_5$X$_6$T (X_1 is Y or F; X_2 is G or Y; X_3 is S or N; X_4 is S, T, or I; X_5 is M, Y, or R; X_6 is Y or T)
253	ATX-P-596	LCDR3	QQYGSSPMYT
254	ATX-P-598	LCDR3	QQFYNTPYT
255	ATX-P-570	LCDR3	QQYYSSPRT
256	ATX-P-595	LCDR3	QQYYSTPYT
257	ATX-P-572	LCDR3	QQYYSIPRT
258	ATX-P-587	LCDR3	QQYYSTPYT
259	ATX-P-592	LCDR3	QQYYSTPYT

[00196] Table 4: Anti-CFHR4 antibodies (VH and VL sequences)

SEQ ID NO:	**Antibody Name:**	**Descriptor:**	**Sequence:**
260	ATX-P-583	VH	QVQLVQSGAEVKKPGASVKVSCKASGYTFTTYGISWVRQAPGQ GLEWMGWISAYSGNTHYAQSLQDRVTMTTDTSTSTAYMEVRSL RSDDTAVYYCAKDEGYCSSTGCLNLFDPWGQGTLVTVSS
261	ATX-P-591	VH	QVQLVQSGAEVKKPGASVKVSCKASGYTFTSYGISWVRQAPGQ GLEWMGWISAYNGNTNYAQKLQGRVTMTTDTSTSTAYMELRSL RSDDTAIYYCTRDLRGTAFDYWGQGTPVTVSS
262	ATX-P-602	VH	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPG QGLEWMGWINPNSGGTNYAKKFQGRVTMTRDTSISTAYMELSR LRSDDTAVYYCARGDTIFRLVTPLDYWGQGTLVTVSS
263	ATX-P-597	VH	QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYYMQWVRQAPG QGLEWLGIIDPSGGSTTYAQKFQGRVTMTRDTSTSTVHMELRSLR SEDTAVYYCARDEGTDRPGWGYWGQGTLVTVSS

264	ATX-P-601	VH	QVQLVQSGAEVKKPGASVKVSCKASGYTFTSYYMHWVRQAPG QGLEWMGIINPSGGSTNYAQKFQGRLTMTRDTSTNTVYMELSSL RSEDTAVYYCATDQSGGMDVWGKGTTVTVSS
265	ATX-P-607	VH	QVQLVQSGAEVKKPGASVKVSCKASGYTFTSYYMHWVRQAPG QGLEWMGIINPSGGSTSYAQKFQGRVTMTRDTSTNTVYMELSSL RSEDTAVYYCARDPEYSSAFDIWGQGTMVTVSS
266	ATX-P-583	VH – nucleotide	CAGGTTCAGCTGGTGCAGTCTGGAGCTGAGGTGAAGAAGCCT GGGGCCTCAGTGAAGGTCTCCTGCAAGGCTTCTGGTTACACCT TTACCACCTATGGTATCAGCTGGGTGCGACAGGCCCCTGGACA AGGGCTTGAGTGGATGGGATGGATCAGCGCTTACAGTGGTAA CACACACTATGCACAGAGCCTCCAGGACAGAGTCACCATGAC CACAGACACATCCACGAGTACAGCCTACATGGAGGTGAGGAG CCTGAGATCTGACGACACGGCCGTGTATTACTGTGCGAAAGAT GAGGGATATTGTAGTAGTACCGGCTGCTTAAACTTGTTCGACC CCTGGGGCCAGGGAACCCTGGTCACCGTCTCCTCA
267	ATX-P-591	VH – nucleotide	CAGGTTCAGCTGGTGCAGTCTGGAGCTGAGGTGAAGAAGCCT GGGGCCTCAGTGAAGGTCTCCTGCAAGGCTTCTGGTTACACCT TTACCAGCTATGGTATCAGCTGGGTGCGACAGGCCCCTGGACA AGGGCTTGAGTGGATGGGATGGATCAGCGCTTACAATGGTAA CACAAACTATGCACAGAAGCTCCAGGGCAGAGTCACCATGAC CACAGACACATCCACGAGCACAGCCTACATGGAGCTGAGGAG CCTGAGATCTGACGACACTGCCATTTATTACTGTACGAGAGAT CTACGTGGAACTGCCTTTGACTACTGGGGCCAGGGAACCCCGG TCACTGTCTCCTCA
268	ATX-P-602	VH – nucleotide	CAGGTGCAGCTGGTGCAATCTGGGGCTGAGGTGAAGAAGCCT GGGGCCTCAGTGAAGGTCTCCTGCAAGGCTTCTGGATACACCT TCACCGGCTACTATATGCACTGGGTGCGACAGGCCCCTGGACA AGGACTTGAGTGGATGGGATGGATCAACCCTAACAGTGGTGG CACAAACTATGCAAAGAAGTTTCAGGGCAGGGTCACCATGAC CAGGGACACGTCCATCAGCACAGCCTACATGGAGTTGAGCAG GCTGAGATCTGACGACACGGCCGTGTATTACTGTGCGAGAGG GGATACGATTTTTCGACTGGTTACCCCTCTTGACTACTGGGGC CAGGGAACCCTGGTCACCGTCTCCTCA
269	ATX-P-597	VH – nucleotide	CAGGTGCAGCTGGTGCAATCTGGAGCTGAGGTGAAGAAGCCT GGGGCCTCAGTGAAGGTTTCCTGCAAGGCATCTGGATACACCT TCACCAACTACTATATGCAGTGGGTGCGACAGGCCCCTGGACA AGGGCTTGAGTGGCTGGGAATAATCGACCCTAGTGGTGGTAG CACAACCTATGCACAGAAGTTCCAGGGCAGAGTCACCATGAC CAGGGACACGTCCACGAGCACAGTCCACATGGAGCTGAGAAG TCTGAGATCTGAGGACACGGCCGTCTATTATTGCGCGAGAGAT GAGGGAACAGATCGTCCCGGGTGGGGCTACTGGGGCCAGGGA ACCCTGGTCACTGTCTCCTCA
270	ATX-P-601	VH – nucleotide	CAGGTGCAGCTGGTGCAATCTGGGGCTGAGGTGAAGAAGCCT GGGGCCTCAGTGAAGGTTTCCTGCAAGGCATCTGGATACACCT TCACCAGCTACTATATGCACTGGGTGCGACAGGCCCCTGGACA AGGGCTTGAGTGGATGGGAATAATCAACCCTAGTGGTGGTAG CACAAACTACGCACAGAAGTTCCAGGGCAGACTCACCATGAC CAGGGACACGTCCACGAACACAGTCTACATGGAACTGAGTAG CCTGAGATCTGAGGACACGGCCGTGTATTACTGTGCGACAGAT CAAAGTGGGGGGATGGACGTCTGGGGCAAAGGGACCACGGTC ACCGTCTCCTCA
271	ATX-P-607	VH – nucleotide	CAGGTGCAGCTGGTGCAATCTGGGGCTGAGGTGAAGAAGCCT GGGGCCTCAGTGAAGGTTTCCTGCAAGGCATCTGGATACACCT TCACCAGTTACTATATGCACTGGGTGCGACAGGCCCCTGGACA AGGGCTTGAGTGGATGGGAATAATCAACCCTAGTGGTGGTAG

			CACAAGCTACGCACAGAAGTTCCAGGGCAGAGTCACCATGAC CAGGGACACGTCAACGAACACAGTCTACATGGAGCTGAGCAG CCTTCGATCTGAGGACACGGCCGTGTATTACTGTGCGAGAGAT CCCGAGTATAGCAGTGCTTTTGATATCTGGGGACAAGGGACAA TGGTCACCGTCTCCTCA
272	ATX-P-583	VL	DIQMTQSPSSLSASVGDRVTITCRASQNIGSYLNWYQQKPGNAPK LLIYATSTLQSGVPSRFSGSGSGTDFTLIISSLHPEDFTVYYCQQSFI IPFTFGPGTKVDIK
273	ATX-P-591	VL	DIQMTQSPSSLSASVGDRVTITCRASQSINTYLNWYQQKPGKAPK LLIYAASSLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYSCQHSF TTPFTFGPGTKLEIK
274	ATX-P-602	VL	EIVLTQSPGTLSLSPGERATLSCRASQSVSSSYLAWYQQKPGQAP RLLIYGASSRATGIPDRFSGSGSGTQFTLTISSLQSEDFAVYYCQQ YGSSPWTFGQGTKVDIK
275	ATX-P-597	VL	DIQMTQSPSSLSASIGDRVTITCRASQSISSYLDWYQRKSGKAPKL LIYAASSLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQSYS TPLTFGGGTKVDIK
276	ATX-P-601	VL	DIQMTQSPSSLSASVGDRVTITCRASQSINIYLNWYQQKPEKDPKL LIYAASSLQSGVPSRFSGSGSGTDFTLTISNLQPEDFATYYCQQSY STPITFGQGTRLEIK
277	ATX-P-607	VL	DIQMTQSPSSLSASVGDRGTITCRASQSIRSYLNWYQQKPGKAPK LLIYAASSLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQSY RTPVTFGPGTKVDIK
278	ATX-P-583	VL – nucleotide	GACATCCAGATGACCCAGTCTCCGTCCTCCCTGTCTGCATCTGT AGGAGACAGAGTCACCATCACTTGCCGGGCAAGTCAGAACAT TGGCAGTTATTTAAATTGGTATCAGCAGAAACCAGGGAATGCC CCTAAACTCCTGATCTATGCTACATCCACTTTGCAAAGTGGGG TCCCATCAAGGTTCAGTGGCAGTGGATCTGGGACAGATTTCAC TCTCATCATCAGCAGTCTGCACCCTGAAGATTTTACAGTTTATT ACTGTCAACAGAGTTTCATTATCCCATTCACTTTCGGCCCTGGG ACCAAAGTGGATATCAAA
279	ATX-P-591	VL – nucleotide	GACATCCAGATGACTCAGTCTCCATCCTCCCTGTCTGCATCTGT TGGAGACAGAGTCACCATCACTTGCCGGGCAAGTCAGAGCAT TAACACCTATTTAAATTGGTATCAGCAGAAACCAGGGAAAGC CCCTAAGCTCCTGATCTATGCTGCATCCAGTTTGCAAAGTGGG GTCCCATCAAGGTTCAGTGGCAGTGGATCTGGGACAGATTTCA CTCTCACCATCAGCAGTCTGCAACCTGAAGATTTTGCAACTTA CTCCTGTCAACATAGTTTCACTACCCCATTCACTTTCGGCCCTG GGACCAAGCTGGAAATCAAA
280	ATX-P-602	VL – nucleotide	GAAATTGTGTTGACGCAGTCTCCAGGCACCCTGTCTTTGTCTCC AGGGGAAAGAGCCACCCTCTCCTGCAGGGCCAGTCAGAGTGT TAGCAGCAGCTACTTAGCCTGGTACCAGCAGAAACCTGGCCA GGCTCCCAGGCTCCTCATCTATGGTGCATCCAGTAGGGCCACT GGCATCCCAGACAGGTTCAGTGGCAGTGGGTCTGGGACACAG TTCACTCTCACCATCAGCAGCCTGCAGTCTGAAGATTTTGCAG TTTATTACTGTCAGCAGTATGGTAGCTCACCGTGGACGTTCGG CCAAGGGACCAAAGTGGATATCAAA
281	ATX-P-597	VL – nucleotide	GACATCCAGATGACCCAGTCTCCATCCTCCCTGTCTGCATCTAT TGGAGACAGAGTCACCATCACTTGCCGGGCAAGTCAGAGCAT TAGCAGCTATTTAGATTGGTATCAGCGGAAATCAGGGAAAGC CCCTAAACTCCTGATCTATGCTGCATCCAGTTTGCAAAGTGGG GTCCCATCAAGGTTCAGTGGCAGTGGATCTGGGACAGATTTCA CTCTCACCATCAGCAGTCTGCAACCTGAAGATTTTGCAACTTA CTACTGTCAACAGAGTTACAGTACCCCGCTCACTTTCGGCGGA GGGACCAAAGTGGATATCAAA

282	ATX-P-601	VL – nucleotide	GACATCCAGATGACCCAGTCTCCATCCTCCCTGTCTGCATCTGT AGGAGACAGAGTCACCATCACTTGCCGGGCAAGTCAGAGCAT TAATATCTATTTAAATTGGTATCAGCAGAAACCAGAGAAAGAC CCTAAGCTCCTGATCTATGCTGCGTCCAGTTTGCAAAGTGGGG TCCCATCAAGGTTCAGTGGCAGTGGATCTGGGACAGATTTCAC TCTCACCATCAGCAATCTGCAACCTGAAGATTTTGCAACTTAC TACTGTCAACAGAGTTACAGTACCCCGATCACCTTCGGCCAAG GGACACGACTGGAGATTAAA
283	ATX-P-607	VL – nucleotide	GACATCCAGATGACACAGTCTCCATCCTCCCTGTCTGCATCTG TAGGAGACAGAGGCACCATCACTTGCCGGGCAAGTCAGAGCA TTAGAAGTTATTTAAATTGGTATCAGCAGAAACCAGGGAAAG CCCCTAAACTCCTGATCTATGCTGCATCCAGTTTGCAAAGTGG GGTCCCATCAAGGTTCAGTGGCAGTGGATCTGGGACAGATTTC ACTCTCACCATCAGCAGTCTGCAACCTGAAGATTTTGCAACTT ACTACTGTCAACAGAGTTACAGAACCCCAGTCACTTTCGGCCC TGGGACCAAAGTGGATATCAAA
284	ATX-P-564	VH	EVQLVESGGGLVKPGGSLRLSCAASGFTFSSYTMNWVRQAPGKG LEWVSSISSSSSYTYYADSVRGRFTISRDNAKNSLYLQMSSLRAE DTAVYYCARSASIAAGMDVWGKGTTVTVSS
285	ATX-P-568	VH	EVQLVESGGGLVQPGGSLRLSCAASGFPFSSYVMSWVRQAPGKG LEWVSVISVSGGSTFYADSVRGRFTISRDNSKNTLYLQVYSLRAE DTAVYYCAKDGLAVAGFDHWGQGTLVTVSS
286	ATX-P-574	VH	EVQLVESGGGLVQRGGSLRLSCVASGFTFSSYAMSWVRQAPGKG LEWVSVISGSGGTTYYADSVKGRFTISRDDSKKTLYLQMNSLRAE DTAVYYCAKRGDYGDYMDVWGKGTTVTVSS
287	ATX-P-565	VH	QVQLVESGGGVVQPGRSLRLSCAASGFTFNTYGIHWVRQAPGKG LEWVAVIWHDGSSKNYVDSVTGRFTISRDNSKNTVYLQMNSLRA EDTAVYYCARRGNWNYGFYYYYMDVWGKGTTVTVSS
288	ATX-P-578	VH	EVQLVESGGGLVQPGGSLRLSCAASGFTFSRYSMNWVRQAPGKG LEWVSYISSSSSTIFHADSVKGRFTISRDNAKNSLYLQMNSLRDED TAVYYCARGNWNYYYMDVWGKGTTVTVSS
289	ATX-P-569	VH	EVQLVESGGGLAQFGRSLRLSCAASGFTFDDYAMHWLRQAPGM GLEWVSGISWNSGSIGYADSVKGRFTIARDNAKNSVHLQMNSLR AEDTALYYCAKDIGNGYTKGDVFDIWGQGTMVTVSS
290	ATX-P-576	VH	EVQLVESGGGLVQPGRSLRLSCTASGFTFDDYEMHWVRQAPGK GLEWVSDISRNSGRIGYADSVKGRFTISRDNAKNSLYLQMNSLRA EDTALYYCAKDIWGSGYFDYWGQGILVTVSS
291	ATX-P-588	VH	EVQLVESGGGLVQPGRSLRLSCAASGFTFEDYAMHWVRQAPGK GLEWVSGISWNSGSIGYADSVKGRFTISRDNAKKSLYLQMNSLR AEDTALYYCTKDRDDGYNYAGVFDYWGQGTLVTVSS
292	ATX-P-596	VH	EVQLVESGGGLVQPGRSLRLSCAASGFSFDDYAMHWVRQVPGK GLEWVSGISWTGGSVGYADPVKGRFTISRDNAKNSLYLQMNSLR PEDTALYYCAKDMGDGYSRNWPFDYWGQGTLVTVSS
293	ATX-P-600	VH	EVQLVESGGGLVQPGRSLRLSCAASGFTFDDYAMHWVRQVPGR GLEWVSGISWSGGSIGYADSVKGRFTISRDNSKNSLYLQMNSLRA EDTALYYCTKDREDGYNYGGVFDYWGQGTLVTVSS
294	ATX-P-564	VH – nucleotide	GAGGTGCAGCTGGTGGAGTCTGGGGGAGGCCTGGTCAAGCCT GGGGGGTCCCTGAGACTCTCCTGTGCAGCCTCTGGATTCACCT TCAGTAGCTATACCATGAACTGGGTCCGCCAGGCTCCAGGGAA GGGGCTGGAGTGGGTGTCATCCATTAGTAGTAGTAGTAGTTAC ACATACTACGCAGACTCAGTGAGGGGCCGATTCACCATCTCCA GAGACAACGCCAAGAACTCACTGTATCTGCAAATGAGCAGCC TGAGAGCCGAGGACACAGCTGTGTATTACTGTGCGAGATCGG CGAGTATAGCAGCTGGGATGGACGTCTGGGGCAAAGGGACCA CGGTCACCGTCTCCTCA

295	ATX-P-568	VH – nucleotide	GAGGTGCAGCTGGTGGAGTCTGGGGGAGGCTTGGTACAGCCG GGGGGGTCCCTGAGACTCTCCTGTGCAGCCTCTGGATTCCCCT TTAGCAGCTATGTCATGAGCTGGGTCCGCCAGGCTCCAGGGAA GGGGCTGGAGTGGGTCTCAGTTATAAGTGTTAGTGGTGGTAGT ACATTCTACGCAGACTCCGTGAGGGGCCGGTTCACCATCTCCA GAGACAATTCCAAGAACACGCTGTATCTGCAAGTGTACAGCCT GCGAGCCGAGGACACGGCCGTATATTACTGTGCGAAAGATGG TTTGGCAGTGGCTGGTTTTGACCACTGGGGCCAGGGAACCCTG GTCACCGTCTCCTCA
296	ATX-P-574	VH – nucleotide	GAGGTGCAGCTGGTGGAGTCTGGGGGAGGCTTGGTACAGCGG GGGGGGTCCCTGAGACTCTCCTGTGTAGCCTCTGGATTCACCT TTAGTAGCTATGCCATGAGCTGGGTCCGCCAGGCTCCAGGGAA GGGGCTGGAGTGGGTCTCAGTTATTAGTGGTAGTGGTGGTACC ACATACTACGCAGACTCCGTGAAGGGCCGGTTCACCATCTCCA GAGACGATTCCAAGAAGACACTGTATCTGCAAATGAACAGCC TGAGAGCCGAGGACACGGCCGTATATTATTGTGCGAAAAGGG GTGACTACGGGGACTACATGGACGTCTGGGGCAAAGGGACCA CGGTCACCGTCTCCTCA
297	ATX-P-565	VH – nucleotide	CAGGTGCAGCTGGTGGAGTCTGGGGGAGGCGTGGTCCAGCCT GGGAGGTCCCTGAGACTCTCCTGTGCAGCGTCTGGATTCACCT TCAATACCTATGGCATCCACTGGGTCCGCCAGGCTCCAGGCAA GGGACTGGAGTGGGTGGCAGTTATATGGCATGATGGAAGTAG TAAAAACTATGTAGACTCCGTGACGGGCCGATTCACCATCTCC AGAGACAATTCCAAGAACACGGTGTATCTGCAAATGAACAGC CTGAGAGCCGAGGACACGGCTGTTTATTACTGTGCGAGAAGG GGTAACTGGAACTACGGCTTCTACTACTACTACATGGACGTCT GGGGCAAAGGAACCACGGTCACCGTCTCCTCA
298	ATX-P-578	VH – nucleotide	GAGGTGCAGCTGGTGGAGTCTGGGGGAGGTTTGGTACAGCCT GGGGGGTCCCTGAGACTCTCCTGTGCAGCCTCTGGATTCACCT TCAGTAGATATAGCATGAACTGGGTCCGCCAGGCTCCAGGGA AGGGGCTGGAGTGGGTTTCATACATTAGTAGTAGTAGTAGTAC CATTTTCCATGCAGACTCTGTGAAGGGCCGATTCACCATCTCC AGAGACAATGCCAAGAACTCACTGTACCTGCAAATGAACAGC CTGAGAGACGAGGACACGGCTGTGTATTACTGTGCGAGAGGG AACTGGAACTACTACTACATGGACGTCTGGGGCAAAGGGACC ACGGTCACCGTCTCCTCA
299	ATX-P-569	VH – nucleotide	GAAGTGCAGCTGGTGGAGTCTGGGGGAGGCTTGGCACAGTTT GGCAGGTCCCTGAGACTCTCCTGTGCAGCCTCTGGATTCACCT TTGATGATTATGCCATGCACTGGCTCCGGCAAGCTCCAGGGAT GGGCCTGGAGTGGGTCTCAGGTATTAGTTGGAATAGCGGGAG CATAGGCTATGCGGACTCTGTGAAGGGCCGATTCACCATCGCC AGAGACAACGCCAAGAACTCCGTGCATCTGCAAATGAACAGT CTGAGAGCTGAGGACACGGCCTTGTATTACTGTGCAAAAGATA TAGGAAATGGATATACGAAGGGTGATGTTTTTGATATCTGGGG ACAAGGGACAATGGTCACCGTCTCTTCA
300	ATX-P-576	VH – nucleotide	GAAGTGCAGCTGGTGGAGTCTGGGGGAGGCTTGGTACAGCCT GGCAGGTCCCTGAGACTCTCCTGTACAGCCTCTGGATTCACAT TTGATGATTATGAAATGCACTGGGTCCGGCAAGCTCCAGGGAA GGGCCTGGAGTGGGTCTCAGATATTAGTCGGAACAGTGGTAG AATAGGCTATGCGGACTCTGTGAAGGGCCGATTCACCATTTCC AGAGACAACGCCAAGAACTCCCTGTATCTACAAATGAACAGT CTGAGAGCTGAGGACACGGCCTTGTATTACTGTGCAAAAGATA TTTGGGGATCGGGGTACTTTGACTATTGGGGCCAGGGAATCCT GGTCACCGTCTCCTCA
301	ATX-P-588	VH – nucleotide	GAAGTGCAGCTGGTGGAGTCCGGGGGAGGCTTGGTACAACCT GGCAGGTCCCTGAGACTCTCCTGTGCAGCCTCTGGATTCACCT

			TTGAAGATTATGCCATGCACTGGGTCCGGCAAGCTCCAGGGAA GGGCCTGGAGTGGGTCTCAGGTATTAGTTGGAATAGTGGTAGC ATAGGCTATGCGGACTCTGTGAAGGGCCGATTCACCATCTCCA GAGACAACGCCAAGAAATCCCTGTATCTGCAAATGAACAGTC TGAGAGCTGAGGACACGGCCTTATATTACTGTACAAAAGATA GAGATGATGGCTACAACTATGCGGGGGTCTTTGACTACTGGGG CCAGGGAACCCTGGTCACTGTCTCCTCA
302	ATX-P-596	VH – nucleotide	GAAGTGCAGCTGGTGGAGTCTGGGGGAGGCTTGGTACAGCCT GGCAGGTCCCTGAGACTCTCCTGTGCAGCCTCTGGGTTCAGTT TTGATGATTATGCCATGCACTGGGTCCGGCAAGTTCCAGGGAA GGGCCTGGAATGGGTCTCAGGTATTAGTTGGACTGGTGGTAGC GTAGGCTATGCGGACCCCGTGAAGGGCCGATTCACCATCTCCA GAGACAACGCCAAGAACTCCCTGTATCTGCAAATGAACAGTCT GAGACCTGAGGACACGGCCTTGTATTACTGTGCAAAAGATATG GGAGACGGGTATAGCAGAAACTGGCCCTTTGACTACTGGGGC CAGGGAACCCTGGTCACCGTCTCCTCA
303	ATX-P-600	VH – nucleotide	GAAGTGCAGCTGGTGGAGTCTGGGGGAGGCTTGGTACAGCCT GGCAGGTCCCTGAGACTCTCCTGTGCAGCCTCTGGATTCACCT TTGATGATTATGCCATGCACTGGGTCCGGCAAGTTCCAGGGAG GGGCCTGGAGTGGGTCTCAGGTATTAGTTGGAGTGGTGGCAGC ATAGGCTATGCGGACTCTGTGAAGGGCCGATTCACCATCTCCA GAGACAACTCCAAGAACTCCCTGTATCTGCAAATGAACAGTCT GAGAGCTGAGGACACGGCCTTGTATTACTGTACAAAAGATAG AGAAGATGGATACAACTATGGGGGGGTCTTTGACTACTGGGG CCAGGGAACCCTGGTCACCGTCTCCTCA
304	ATX-P-564	VL	DIVMTQSPLSLPVTPGEPASISCRSSQSLLHSTGYNFLDWYLQKPG LSPQLLIYLASNRASGVPDRFSGSGSGTDFTLKISRVEAEDVGVYY CMQALQTPYTFGQGTKLEIK
305	ATX-P-568	VL	DIQMTQSPSTLSASVGDRVTITCRASQSISTWLAWYQQKPGKAPK LLIHKASGLESGVPSRFSGSGSGTEFTLTISSLQPDDFATYYCQQY NSFSLIFGGGTRVEIK
306	ATX-P-574	VL	DIQMTQSPSSVSASVGDRVTITCRASQGITTWLAWYQQKPGKAP KLLIFGASSLESGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQA NSFPWTFGQGTKVEIK
307	ATX-P-565	VL	DIVMTQSPLSLPVTPGEPASISCRSSQRLLHSSGYNYLDWYLQKPG QSPQLLIYLGSSRASGVPDRFSGSGSGTDFTLKISRVEAEDVGVYY CMQGLQTPPTFGQGTKVEIK
308	ATX-P-578	VL	DIQMTQSPSTLSASVGDRVTISCRASQSVNSWLAWYQQKPGKAP KLLIYKASNLEGGVPSSFSGSGSGTEFTLTISSLQPDDFATYYCQQ YDTSWTFGQGTKVEIK
309	ATX-P-569	VL	DIQMTQSPSTLSASVGDSVTITCRASQNIITWLAWYQQKPGKAPN LLIYKASSLESGVPSRFSGSGSGTEFTLTISSLQPDDFATYYCQQYS SYSYTFGQGTKLEIK
310	ATX-P-576	VL	DIQMTQSPSSVSASVGDRVTITCRTSQGIRNWLAWYQQKPGKAP KLLIYAASSLQTGGPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQ ANSFPYTFGQGTKLEIK
311	ATX-P-588	VL	EIVLTQSPATLSVSPGERATLSCRASQSVSSNLAWYQQKPGQAPR LLIYGASSRATGIPDRFSGSGSGTDFTLTISRLEPEDFAVYYCQQY GSSFTFGPGTKVDIK
312	ATX-P-596	VL	DIVMTQSPDSLAVSLGERATINCKSSQSVLYSSNNKNYLAWYQQ KPGQPPKLLIYWASTRESGVPDRFSGSGSGTDFTLTISSLQAEDVA VYYCQQYGSSPMYTFGQGTKLEIK
313	ATX-P-600	VL	EIVLTQSPGTLSLSPGERATLSCRASQNVRGSYLAWYQQKPGQAP RLLIYGASNRATDIPDRFSGSGSGTDFTLTISGLEPEDFVVYYCQQ YGSSYTFGQGTKVEIK

314	ATX-P-564	VL – nucleotide	GATATTGTGATGACTCAGTCTCCACTCTCCCTGCCCGTCACCCC TGGAGAGCCGGCCTCCATCTCCTGCAGGTCTAGTCAGAGCCTC CTGCATAGTACTGGATACAACTTTTTGGATTGGTACCTGCAGA AGCCAGGGCTGTCTCCACAGCTCCTGATCTATTTGGCTTCTAAT CGGGCCTCCGGGGTCCCTGACAGGTTCAGTGGCAGTGGATCAG GCACAGATTTTACACTGAAAATCAGCAGAGTGGAGGCTGAGG ATGTTGGGGTTTATTACTGCATGCAAGCTCTACAAACTCCGTA CACTTTTGGCCAGGGGACCAAGCTGGAGATCAAA
315	ATX-P-568	VL – nucleotide	GACATCCAGATGACCCAGTCTCCTTCCACCCTGTCTGCCTCTGT AGGAGACAGAGTCACCATCACTTGCCGGGCCAGCCAGAGTAT TAGTACCTGGTTGGCCTGGTATCAGCAGAAACCAGGGAAAGC CCCTAAGCTCCTGATCCATAAGGCGTCTGGTTTAGAAAGTGGG GTCCCATCAAGATTCAGCGGCAGTGGATCTGGGACAGAATTCA CTCTCACCATCAGCAGCCTGCAGCCTGATGATTTTGCAACTTA TTACTGCCAACAGTATAATAGTTTTTCTCTCATTTTCGGCGGAG GGACCAGGGTGGAGATCAAA
316	ATX-P-574	VL – nucleotide	GACATCCAGATGACCCAGTCTCCATCTTCCGTGTCTGCATCTGT AGGAGACAGAGTCACCATCACTTGTCGGGCGAGTCAGGGTAT TACCACCTGGTTAGCCTGGTATCAGCAGAAACCAGGGAAAGC CCCTAAGCTCCTGATCTTTGGTGCATCTAGTTTGGAAAGTGGG GTCCCATCAAGGTTCAGCGGCAGTGGATCTGGGACAGATTTCA CTCTCACCATCAGCAGCCTGCAGCCTGAAGATTTTGCAACTTA CTATTGTCAACAGGCTAACAGTTTCCCGTGGACGTTCGGCCAA GGGACCAAGGTGGAAATCAAA
317	ATX-P-565	VL – nucleotide	GATATTGTGATGACTCAGTCTCCACTCTCCCTGCCCGTCACCCC TGGAGAGCCGGCCTCCATCTCCTGCAGGTCTAGTCAGCGCCTC CTGCATAGTAGTGGATACAATTATTTGGATTGGTATCTGCAGA AGCCAGGACAGTCTCCACAGCTCCTGATCTATTTGGGTTCTAG TCGGGCCTCCGGGGTCCCTGACAGGTTCAGTGGCAGTGGATCA GGCACAGATTTTACACTGAAAATCAGCAGGGTGGAGGCTGAG GATGTTGGGGTTTATTACTGCATGCAAGGTCTACAAACTCCTC CGACGTTCGGCCAAGGGACCAAGGTGGAAATCAAA
318	ATX-P-578	VL – nucleotide	GACATCCAGATGACCCAGTCTCCTTCCACCCTGTCTGCATCTGT AGGAGACAGAGTCACCATCAGTTGCCGGGCCAGTCAGAGTGT TAATAGCTGGTTGGCCTGGTATCAGCAGAAACCAGGGAAAGC CCCTAAACTCCTGATCTATAAGGCGTCTAATTTAGAAGGTGGG GTCCCATCAAGTTTCAGCGGCAGTGGATCTGGGACAGAATTCA CTCTCACCATCAGCAGCCTGCAGCCTGATGATTTTGCAACTTA TTACTGCCAACAATATGATACTTCTTGGACGTTCGGCCAAGGG ACCAAGGTGGAGATCAAA
319	ATX-P-569	VL – nucleotide	GACATCCAGATGACCCAGTCTCCTTCCACCCTGTCTGCATCTGT AGGAGACAGCGTCACCATCACTTGCCGGGCCAGTCAGAATATT ATTACCTGGTTGGCTTGGTATCAGCAGAAACCAGGGAAAGCCC CTAACCTCCTGATCTATAAGGCGTCTAGTTTAGAAAGTGGGGT CCCATCAAGGTTCAGCGGCAGTGGATCTGGGACAGAATTCACT CTCACCATCAGCAGCCTGCAGCCTGATGATTTTGCAACTTATT ACTGCCAACAGTATAGTAGTTATTCGTACACTTTTGGCCAGGG GACCAAGCTGGAGATCAAA
320	ATX-P-576	VL – nucleotide	GACATCCAGATGACCCAGTCTCCATCTTCCGTGTCTGCATCTGT AGGAGACAGAGTCACCATCACTTGTCGGACGAGTCAGGGTAT TAGAAACTGGTTAGCCTGGTATCAGCAGAAACCAGGGAAAGC CCCTAAACTCCTGATCTATGCTGCATCCAGTTTGCAAACTGGG GGCCCATCAAGGTTCAGCGGCAGTGGATCTGGGACAGATTTCA CTCTCACCATCAGCAGCCTGCAGCCTGAAGATTTTGCAACTTA CTATTGTCAACAGGCTAACAGTTTCCCGTACACTTTTGGCCAG GGGACCAAGCTGGAGATCAAA

321	ATX-P-588	VL – nucleotide	GAAATTGTGTTGACGCAGTCTCCAGCCACCCTGTCTGTGTCTC CAGGGGAAAGAGCCACCCTCTCCTGCAGGGCCAGTCAGAGTG TTAGCAGCAACTTAGCCTGGTACCAGCAGAAACCTGGCCAGG CTCCCAGGCTCCTCATCTATGGTGCATCCAGCAGGGCCACTGG CATCCCAGACAGGTTCAGTGGCAGTGGGTCTGGGACAGACTTC ACTCTCACCATCAGCAGACTGGAGCCTGAAGATTTTGCAGTGT ATTACTGTCAGCAGTATGGTAGCTCATTCACTTTCGGCCCTGG GACCAAAGTGGATATCAAA
322	ATX-P-596	VL – nucleotide	GACATCGTGATGACTCAGTCTCCAGACTCCCTGGCTGTGTCTC TGGGCGAGAGGGCCACCATCAACTGCAAGTCCAGCCAGAGTG TTTTATACAGCTCCAACAATAAGAACTACTTAGCTTGGTACCA GCAGAAACCAGGACAGCCTCCTAAGCTGCTCATTTACTGGGCA TCTACCCGGGAATCCGGGGTCCCTGACCGATTCAGTGGCAGCG GGTCTGGGACAGATTTCACTCTCACCATCAGCAGCCTGCAGGC TGAAGATGTGGCAGTTTATTACTGTCAGCAGTATGGTAGCTCA CCCATGTACACTTTTGGCCAGGGGACCAAGCTGGAGATCAAA
323	ATX-P-600	VL – nucleotide	GAAATTGTGTTGACGCAGTCTCCAGGCACCCTGTCTTTGTCTCC AGGGGAAAGAGCCACCCTCTCCTGCAGGGCCAGTCAGAATGT TAGGGGCAGCTACTTAGCCTGGTACCAGCAGAAACCTGGCCA GGCTCCCAGGCTCCTCATATATGGTGCATCCAACAGGGCCACT GACATCCCAGACAGGTTCAGTGGCAGTGGGTCTGGGACAGAC TTCACTCTCACCATCAGCGGCCTGGAGCCTGAAGATTTTGTAG TGTATTACTGTCAGCAGTATGGTAGTTCGTACACTTTTGGCCA GGGGACCAAGGTGGAGATCAAA
324	ATX-P-571	VH	QVQLQESGPGLVKPSGTLSLTCAVSGGSISSRNWWSWVRQPPGK GLEWIGEIYHGGTTNYNPSLKSRVTISVDKSKNQFSLKLSSVTAA DTAVYYCARGGLRLGELSPNAFDIWGQGTMVTVSS
325	ATX-P-577	VH	QVQLQESGPGLVKPSGTLSLTCAVSGGSISSSNWWTWVRQPPGK GLEWIGETYHDGSTNYNPSLKSRVTISVDKSKNQFSLKLSSVTAA DTAVYYCLEFYFDYWGQGTLVTVSS
326	ATX-P-579	VH	QVQLQESGPGLVKPSGTLSLTCAVSGASISTSNWWTWVRQPPGK GLEWIGEIYHDGSTNYSPSLQSRVTISVDKSKNQFSLTLTSVTAAD TAIYYCGDFYIDVWGNGTTVTVSS
327	ATX-P-580	VH	QVQLQESGPGLVKPSGTLSLTCAVSGGSISTSDWWTWVRQPPGK GLEWIGEIYHSGSTNYNPSLKSRVTISVDKSKNQFSLKLSSVTAAD TAVYYCADWYFDLWGRGTLVTVSS
328	ATX-P-582	VH	QVQLQESGPGLVKPSGTLSLTCAVSGGSISISKWWSWVRQPPGKG LEWIGEIYHTGSTNYHPSLKSRVTISVDKSKNQFYLKLNSVTAAD TAVYYCARDELRLGELSPSLDIWGQGTMVTVSS
329	ATX-P-598	VH	QVQLQESGPGLVKPSGTLSLTCAVSGGSISSSNWWSWVRQSPGK GLEWIGEIYHSGTTNYNPSLKSRVTISVDKSKNQFSLKLSSATAAD TAVYYCARDRLRLGESSSDVFDIWGQGTMVTVSS
330	ATX-P-603	VH	QVQLQESGPGLVKPSGTLSLTCAVSGGSISGSHWWSWFRQPPGK GLEWIGEIYHTGSTNKNPSLKSRVTISLDKSKNQFSLRLRSVTDAD TAVYYCARDQYTGSPRDAFDIWGQGTMVTVSS
331	ATX-P-608	VH	QVQLQESGPGLVKPSGTLSLTCAVSGGSISSSNWWSWVRQSPGK GLEWIGEIYHTGSTNKKPSLKSRVHSVDKSKNQFSLKLISVNAAD TAIYYCARDREGGTTEAFDIWGQGTMVTVSS
332	ATX-P-609	VH	QVQLQESGPGLVKPSGTLSLTCAVSGGSISSSNWWSWVRQPPGK GLEWIGEIYHSGSTNYNPSLKSRVTISVDKSKNQFSLKLRSVTAAD TAVYYCARDQLSSGPTDAFDIWGQGTMVTVSS
333	ATX-P-563	VH	QVQLQESGPGLMKPSETLSLTCTVSGGSISSHYWSWIRQPPGKGL EWIGYIFYSGNINYNPSLKSRVTISVDTSKNQFSLKLRSVTTADTA VYYCARDRGGSYSYHFDCWGQGTLVTVSS

334	ATX-P-570	VH	QVQLQESGPGLVKPSETMSLTCTVSGGSFTGYYWSWIRQPPGKG LEWIGYVHYSGGTKSNPSLKSRVTISVDTSKNQFSLKLSSVTAAD TAVYYCARERYEWNSYFDYWGQGTLVTVSS
335	ATX-P-571	VH – nucleotide	CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGGTGAAGCCT TCGGGGACCCTGTCCCTCACCTGTGCTGTCTCGGGTGGCTCCA TCAGTAGTCGTAACTGGTGGAGTTGGGTCCGCCAGCCCCCAGG GAAGGGGCTGGAGTGGATTGGGGAAATCTATCATGGTGGGAC CACCAACTACAACCCGTCCCTTAAGAGTCGAGTCACCATATCA GTAGACAAGTCCAAGAACCAATTCTCCCTGAAGCTGAGTTCTG TGACCGCCGCGGACACGGCCGTGTATTACTGTGCGAGAGGGG GATTACGTTTGGGGGAGTTATCGCCTAATGCTTTTGATATCTG GGGACAAGGGACAATGGTCACCGTCTCTTCA
336	ATX-P-577	VH – nucleotide	CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGGTGAAGCCT TCGGGGACCCTGTCCCTCACCTGCGCTGTCTCTGGTGGCTCCAT CAGCAGTAGTAACTGGTGGACTTGGGTCCGCCAGCCCCCAGG GAAGGGGCTGGAGTGGATTGGGGAAACCTATCATGATGGGAG CACCAACTACAACCCGTCCCTCAAGAGTCGAGTCACCATTTCA GTAGACAAGTCCAAGAACCAATTCTCCCTGAAACTGAGTTCTG TGACCGCCGCGGACACGGCCGTGTATTACTGTTTGGAATTCTA CTTTGACTACTGGGGCCAGGGAACCCTGGTCACCGTCTCCTCA
337	ATX-P-579	VH – nucleotide	CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGGTGAAGCCT TCGGGGACCCTGTCCCTCACCTGCGCTGTGTCTGGTGCCTCCAT CAGCACAAGTAATTGGTGGACTTGGGTCCGCCAGCCCCCAGG GAAGGGGCTGGAGTGGATTGGTGAAATCTATCATGATGGGAG CACCAACTACAGCCCGTCCCTCCAGAGTCGAGTCACCATATCA GTAGACAAGTCCAAGAACCAGTTCTCCCTGACGCTGACCTCTG TGACCGCCGCGGACACGGCCATTTATTATTGTGGTGACTTCTA CATAGACGTCTGGGGCAACGGGACCACGGTCACCGTCTCCTCA
338	ATX-P-580	VH – nucleotide	CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGGTGAAGCCT TCGGGGACCCTGTCCCTCACCTGCGCTGTCTCTGGTGGCTCCAT CAGCACTAGTGACTGGTGGACTTGGGTCCGCCAGCCCCCAGGG AAGGGGCTGGAGTGGATTGGGGAAATCTATCATAGTGGGAGC ACCAACTACAACCCGTCCCTCAAGAGTCGAGTCACCATATCAG TAGACAAATCCAAGAACCAGTTCTCCCTGAAGCTGAGCTCTGT GACCGCCGCGGACACGGCCGTGTATTACTGTGCGGACTGGTAC TTCGATCTCTGGGGCCGTGGCACCCTGGTCACTGTCTCCTCA
339	ATX-P-582	VH – nucleotide	CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGGTGAAGCCT TCGGGGACCCTGTCCCTCACCTGCGCTGTGTCTGGTGGCTCCA TCAGCATTAGTAAATGGTGGAGTTGGGTCCGCCAGCCCCCAGG GAAGGGACTGGAGTGGATTGGGGAAATCTATCATACTGGGAG CACCAACTACCACCCGTCCCTCAAGAGCCGAGTCACCATATCA GTAGACAAGTCCAAGAACCAATTCTACCTGAAGCTGAACTCTG TGACCGCCGCGGACACGGCCGTATATTACTGTGCGAGAGATG AATTACGGTTGGGGGAGTTATCGCCCTCTCTTGATATCTGGGG ACAAGGGACAATGGTCACCGTCTCTTCA
340	ATX-P-598	VH – nucleotide	CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGGTGAAGCCT TCGGGGACCCTGTCCCTCACCTGCGCTGTCTCTGGTGGCTCCAT CAGCAGTAGTAACTGGTGGAGTTGGGTCCGCCAGTCCCCAGG GAAGGGGCTGGAATGGATTGGGGAAATCTATCATAGTGGGAC CACCAACTACAACCCGTCCCTCAAGAGTCGAGTCACCATATCA GTAGACAAGTCCAAGAACCAGTTCTCCCTGAAGCTGAGCTCTG CGACCGCCGCGGACACGGCCGTGTATTATTGTGCGAGAGATA GATTACGTTTGGGGGAGTCATCGTCCGATGTTTTTGATATCTG GGGACAAGGGACAATGGTCACCGTCTCTTCA

341	ATX-P-603	VH – nucleotide	CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGGTGAAGCCT TCGGGGACCCTGTCCCTCACCTGCGCTGTCTCTGGTGGCTCCAT CAGCGGTAGTCACTGGTGGAGTTGGTTCCGCCAGCCCCCAGGA AAGGGGCTGGAGTGGATTGGGGAAATCTATCATACTGGGAGC ACCAACAAAAACCCGTCCCTCAAGAGTCGAGTCACTATCTCAT TAGACAAGTCCAAGAATCAGTTCTCCCTGAGGCTGAGGTCTGT GACCGACGCGGACACGGCCGTGTATTACTGTGCGAGAGATCA GTATACTGGGAGCCCAAGGGATGCTTTTGATATCTGGGGACAA GGGACAATGGTCACCGTCTCCTCA
342	ATX-P-608	VH – nucleotide	CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGGTGAAGCCT TCGGGGACCCTGTCCCTCACCTGCGCTGTCTCTGGTGGCTCCAT CAGCAGTAGTAACTGGTGGAGTTGGGTCCGCCAGTCCCCAGG GAAGGGGCTGGAGTGGATTGGGGAAATCTATCATACTGGGAG CACCAACAAAAAACCGTCCCTCAAGAGTCGAGTCATCATATCA GTAGACAAGTCCAAGAACCAGTTCTCCCTGAAACTGATCTCTG TGAACGCCGCGGACACGGCCATATATTACTGTGCGAGAGATC GGGAAGGGGGAACTACTGAAGCTTTTGATATCTGGGGACAAG GGACAATGGTCACCGTCTCTTCA
343	ATX-P-609	VH – nucleotide	CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGGTGAAGCCT TCGGGGACCCTGTCCCTCACCTGCGCTGTCTCTGGTGGCTCCAT CAGCAGTAGTAACTGGTGGAGTTGGGTCCGCCAGCCCCCAGG GAAGGGGCTGGAGTGGATTGGGGAAATCTATCATAGTGGGAG CACCAACTACAACCCGTCCCTCAAGAGTCGAGTCACCATATCA GTAGACAAGTCCAAGAACCAGTTCTCCCTGAAGCTGAGGTCTG TGACCGCCGCGGACACGGCCGTTTATTACTGTGCGAGAGATCA ACTAAGTAGCGGACCTACGGATGCTTTTGATATCTGGGGACAA GGGACAATGGTCACCGTCTCTTCA
344	ATX-P-563	VH – nucleotide	CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGATGAAGCCT TCGGAGACCCTGTCCCTCACCTGCACTGTCTCTGGTGGCTCCAT CAGTAGTCACTACTGGAGCTGGATCCGGCAACCCCCAGGGAA GGGACTGGAGTGGATTGGATATATCTTTTACAGTGGGAACATA AATTACAACCCCTCCCTCAAGAGTCGAGTCACCATATCAGTAG ACACGTCCAAGAACCAGTTCTCCCTGAAGCTGAGGTCTGTGAC CACTGCGGACACGGCCGTATATTACTGTGCGAGAGATCGAGGT GGGAGCTATTCGTACCACTTTGACTGCTGGGGCCAGGGAACCC TGGTCACCGTCTCCTCA
345	ATX-P-570	VH – nucleotide	CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGGTGAAGCCT TCGGAGACTATGTCCCTCACCTGCACTGTCTCTGGTGGCTCCTT CACTGGATACTACTGGAGTTGGATCCGGCAGCCCCCAGGGAA GGGACTGGAGTGGATTGGATATGTCCATTACAGTGGGGGCAC CAAAAGCAACCCCTCCCTCAAGAGTCGAGTCACCATATCAGTA GACACGTCCAAGAACCAGTTTTCCCTGAAGCTGAGCTCTGTGA CCGCTGCGGACACGGCCGTGTATTACTGTGCGAGAGAGAGGT ATGAGTGGAACTCCTACTTTGACTACTGGGGCCAGGGAACCCT GGTCACCGTCTCCTCA
346	ATX-P-571	VL	DIQMTQSPSSLSASVGDRVTITCRASQSISSYLNWYQQKPGKAPK VLIYAASSLQSGIPSRFSGSGSGTDFTLTISSLQPEDFATYYCQETY SVPLTFGGGTKVEIK
347	ATX-P-577	VL	DIQMTQSPSSLSASVGDRVTITCRASQDIRNDLGWYQQKPGKVPK RLIYAASSLQSGVPSRFSGSGSGTEFTLTISSLQPEDFASYYCLQYN NYPFTLGPGTKVDIK
348	ATX-P-579	VL	DIQMTQSPSSLSASVGDRVTITCRASQGIRKDLGWYQQKPGKAPK RLIYTASTLQSGVPSRFSGSGSGTEFTLTISSLQPEDFATYYCLQYN NYPFTFGPGTKVDIK

349	ATX-P-580	VL	DIQMTQSPSSLSASVGDRVTITCRASQGIRNDLGWYQQKPGKAPK RLIYAASSLQSGVPSRFSGSGSGTEFTLAISSLQPEDFATYYCLHFN SYPFTFGPGTKVDIK
350	ATX-P-582	VL	DIQMTQSPSSLSASVGDRVTITCRASQNINNYLNWFRQKPGKAPK LLIFAASSLQSGVPSRFSGSESGTDFTLTISSLQPEDFATYYCQQSY STPLTFGGGTKVEIK
351	ATX-P-598	VL	DIVMTQSPDSLAVSLGERATINCKSSQSVLYSSNNKNYLAWYQQ KPGQPPELLIYWASTRESGVPDRFSGSGSGTDFTLTISSLQAEDMA VYYCQQFYNTPYTFGQGTKVDIK
352	ATX-P-603	VL	EIVLTQSPGTLSLSPGERATLSCRASQSVSSSYLAWYQQKPGQAP RLLIYGASSRATGIPDRFSGSGSGTDFTLTISRLEPEDFAVYYCQH YGNSPLTFGGGTKVEIK
353	ATX-P-608	VL	EIVMTQSPATLSVSPGERATLSCRASQSVSSNLAWYQQKPGQAPR LLIYGASTRATGIPVRFSGSGSGTQFTLTISSLQSEDFAVYYCQQY DNWRTFGQGTRLEIK
354	ATX-P-609	VL	EIVMTQSPATLSVSPGERATLSCRASQSVSSNLAWYQQKPGQAPR LLIYGASTRATGIPVRFSGSGSGTQFTLTISSLQSEDFAVYYCQQY DNWRTFGQGTKLEIK
355	ATX-P-563	VL	DIQMTQSPSSVSASVGDRVTITCRASQSFAGWLAWYQQKPGKAP KLLIYAASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQ ANSFPLTFGGGTKVEIK
356	ATX-P-570	VL	DIVMTQSPDSLAVSLGERATINCKSSQSVLYSSNNKNYLAWYHQ KPGQPPKLLIYWASTRESGVPDRFSGSGSGTDFTLTISSLQAEDVA VYYCQQYYSSPRTFGQGTKVEIK
357	ATX-P-571	VL – nucleotide	GACATCCAGATGACCCAGTCTCCATCCTCCCTGTCTGCATCTGT GGGAGACAGAGTCACCATCACTTGCCGGGCAAGTCAGAGCAT TAGCAGCTATTTAAATTGGTATCAGCAGAAACCAGGGAAAGC CCCTAAGGTCCTGATCTATGCTGCATCCAGTTTGCAGAGTGGG ATCCCATCACGGTTCAGTGGCAGTGGATCTGGGACAGATTTCA CTCTCACCATCAGCAGTCTGCAACCTGAAGATTTTGCAACTTA CTACTGTCAAGAGACTTACAGTGTTCCGCTCACTTTCGGCGGA GGGACCAAGGTGGAGATCAAA
358	ATX-P-577	VL – nucleotide	GACATCCAGATGACCCAGTCTCCATCCTCCCTGTCTGCATCTGT AGGAGACAGAGTCACCATCACTTGCCGGGCAAGTCAGGACAT TAGAAATGATTTAGGCTGGTATCAGCAGAAACCAGGGAAAGT CCCTAAGCGCCTGATCTATGCTGCATCTAGTTTGCAAAGTGGG GTCCCATCAAGGTTCAGCGGCAGTGGATCTGGGACAGAATTCA CTCTCACAATCAGCAGCCTGCAGCCTGAAGATTTCGCAAGTTA TTACTGTCTACAGTATAATAATTATCCATTCACTCTCGGCCCTG GGACCAAAGTGGATATCAAA
359	ATX-P-579	VL – nucleotide	GACATCCAGATGACCCAGTCTCCATCCTCCCTGTCTGCATCTGT AGGAGACAGAGTCACCATCACTTGCCGGGCAAGTCAGGGCAT TAGAAAAGATTTAGGCTGGTATCAGCAGAAACCAGGGAAAGC CCCTAAGCGCCTGATCTATACTGCATCCACTTTACAAAGTGGG GTCCCATCAAGGTTCAGCGGCAGTGGATCTGGGACAGAATTCA CTCTCACAATCAGCAGCCTGCAGCCTGAAGATTTTGCAACTTA TTACTGTCTACAGTATAATAATTACCCATTCACTTTCGGCCCTG GGACCAAAGTGGATATCAAA
360	ATX-P-580	VL – nucleotide	GACATCCAGATGACCCAGTCTCCATCCTCCCTGTCTGCTTCTGT CGGAGACAGAGTCACCATCACTTGCCGGGCAAGTCAGGGCAT TAGAAATGATTTAGGCTGGTATCAGCAGAAACCAGGGAAAGC CCCTAAGCGCCTGATCTATGCTGCATCCAGTTTGCAAAGTGGG GTCCCATCAAGGTTCAGCGGCAGTGGATCTGGGACAGAATTCA CTCTCGCAATCAGCAGCCTGCAGCCTGAAGATTTTGCAACTTA

			TTACTGTCTACACTTTAATAGTTACCCATTCACTTTCGGCCCTG GGACCAAAGTGGATATCAAA
361	ATX-P-582	VL – nucleotide	GACATCCAGATGACCCAGTCTCCATCCTCCCTGTCTGCATCTGT AGGAGACAGAGTCACCATCACTTGCCGGGCAAGTCAGAACAT TAACAACTATTTAAATTGGTTCCGGCAGAAACCAGGGAAAGC CCCTAAGCTCCTGATCTTTGCTGCATCCAGTTTACAAAGTGGG GTCCCATCAAGATTCAGTGGCAGTGAATCTGGGACAGATTTCA CTCTCACCATCAGCAGTCTGCAACCTGAGGATTTTGCGACTTA CTACTGTCAACAGAGTTACAGTACCCCTCTCACTTTCGGCGGA GGGACCAAGGTGGAGATCAAA
362	ATX-P-598	VL – nucleotide	GACATCGTGATGACTCAGTCTCCAGACTCCCTGGCTGTGTCTC TGGGCGAGAGGGCCACCATCAACTGCAAGTCCAGCCAGAGTG TTTTATACAGCTCCAACAATAAGAACTACTTAGCTTGGTACCA GCAGAAACCAGGACAGCCTCCTGAGCTGCTCATTTACTGGGCA TCTACCCGGGAATCCGGGGTCCCTGACCGATTCAGTGGCAGCG GGTCTGGGACAGATTTCACTCTCACCATCAGCAGCCTGCAGGC TGAAGATATGGCAGTTTATTACTGTCAACAATTTTATAATACT CCGTACACTTTTGGCCAGGGGACCAAAGTGGATATCAAA
363	ATX-P-603	VL – nucleotide	GAAATTGTGTTGACGCAGTCTCCAGGCACCCTGTCTTTGTCTCC AGGGGAAAGAGCCACCCTCTCCTGCAGGGCCAGTCAGAGTGT TAGCAGCAGCTACTTAGCCTGGTACCAGCAGAAACCTGGCCA GGCTCCCAGGCTCCTCATCTATGGTGCATCCAGCAGGGCCACT GGCATCCCAGACAGGTTCAGTGGCAGTGGGTCTGGGACAGAC TTCACTCTCACCATCAGCAGACTGGAGCCTGAAGATTTTGCAG TGTATTACTGTCAGCATTATGGTAACTCACCGCTCACTTTCGGC GGAGGGACCAAGGTGGAGATCAAA
364	ATX-P-608	VL – nucleotide	GAAATAGTGATGACGCAGTCTCCAGCCACCCTGTCTGTGTCTC CAGGGGAAAGAGCCACCCTCTCCTGCAGGGCCAGTCAGAGTG TTAGCAGCAACTTAGCCTGGTACCAGCAGAAACCTGGCCAGG CTCCCAGGCTCCTCATCTATGGTGCATCCACCAGGGCCACTGG TATCCCAGTCAGGTTCAGTGGCAGTGGGTCTGGGACACAGTTC ACTCTCACCATCAGCAGCCTGCAGTCTGAAGATTTTGCAGTTT ATTATTGTCAGCAATATGATAACTGGCGGACGTTCGGCCAAGG GACACGACTGGAGATTAAA
365	ATX-P-609	VL – nucleotide	GAAATAGTGATGACGCAGTCTCCAGCCACCCTGTCTGTGTCTC CAGGGGAAAGAGCCACCCTCTCCTGCAGGGCCAGTCAGAGTG TTAGCAGCAACTTAGCCTGGTACCAGCAGAAACCTGGCCAGG CTCCCAGGCTCCTCATCTATGGTGCATCCACCAGGGCCACTGG TATCCCAGTCAGGTTCAGTGGCAGTGGGTCTGGGACACAGTTC ACTCTCACCATCAGCAGCCTGCAGTCTGAAGATTTTGCAGTTT ATTATTGTCAGCAATATGATAACTGGCGGACGTTCGGCCAAGG GACCAAGCTGGAAATCAAA
366	ATX-P-563	VL – nucleotide	GACATCCAGATGACCCAGTCTCCATCTTCCGTGTCTGCATCTGT CGGAGACAGAGTCACCATCACTTGTCGGGCGAGTCAGAGTTTT GCCGGCTGGTTAGCCTGGTATCAGCAGAAACCAGGGAAAGCC CCTAAGCTCCTGATATATGCTGCATCCACTTTGCAAAGTGGGG TCCCATCAAGGTTCAGCGGCAGTGGATCTGGGACAGATTTCAC TCTCACCATCAGCAGCCTGCAGCCTGAAGATTTTGCAACTTAC TATTGTCAACAGGCTAACAGTTTCCCTCTCACTTTCGGCGGAG GGACCAAGGTGGAGATCAAA
367	ATX-P-570	VL – nucleotide	GACATCGTGATGACCCAGTCTCCAGACTCCCTGGCTGTGTCTC TGGGCGAGAGGGCCACCATCAACTGCAAGTCCAGTCAGAGTG TTTTATACAGCTCCAACAATAAGAATTACTTAGCTTGGTACCA CCAGAAACCAGGACAGCCTCCTAAGCTGCTCATTTACTGGGCA TCTACCCGGGAATCCGGGGTCCCTGACCGATTCAGTGGCAGCG

			GGTCTGGGACAGATTTCACTCTCACCATCAGCAGCCTGCAGGC TGAAGATGTGGCAGTTTATTACTGTCAGCAATACTATAGTAGT CCTCGGACGTTCGGCCAAGGGACCAAGGTGGAAATCAAA
368	ATX-P-560	VH	QVQLQQSGPGLVKPSQTLSLTCAISGDSVSSNTAAWNWIRQSPSR GLEWLGRTYYRSKWYNDYAVSVKSRITINPDTSKNQFSLQLSSVT PQDTAIYYCASDNWNNGGPGFDPWGQGTLVTVSS
369	ATX-P-561	VH	QVQLQQSGPGLVKPSQTLSLTCAISGDSVSSNSAAWNWIRQSPSR GLEWLGRTYYRSKWYNGYAVSMKSRITINPDTSKNQFSLQLNSV TPEDTAMYYCAREGVGATTGFDYWGQGTLVTVSS
370	ATX-P-562	VH	QVQLQQSGPGLVKSSQTLSLTCAISGDTVSSNSAAWNWIRQSPSR GLEWLGRTFYRSRWSAAYAASVSSRITINPDTSKNQFSLQLTSVT PADTAVYYCAREGVGSSTGFDYWGQGTLVTVSS
371	ATX-P-566	VH	QVQLQQSGPGLVKPSQTLSLTCAISGDSVSSNSAAWNWIRQSPSR GLEWLGRTYYRSKWFNNYSVSVKSRIAINPDTSKNQFSLQLNSVT PEDTAVYYCARDLGELLDWYFDLWGRGTLVTVSA
372	ATX-P-572	VH	QVQLQQSGPGLVKPSQTLSLTCAISGDSVSSNSAAWNWIRQSPSR GLEWLGMTYYRSKWYSVFAVSVKSRITINTDTSKNQFSLQLNSV TPEDTAVYYCAREGGIVGATPFDYWGQGTLVTVSS
373	ATX-P-573	VH	QVQLQQSGPGLVKPSQTLSLTCAISGDSVSSNSAAWNWIRQSPSR GLEWLGRTYYRSKLYSDYAVSVKSRITINPDTSRNQFSLQLNSVT PEDTAVYYCAREGGYTYGYDYWGQGTLVTVSS
374	ATX-P-581	VH	QVQLQQSGPGLVKPSQTLSLTCAISGDSVSSNNAAWNWIRQSPSR GLEWLGRTYYRSKWYNAYAVSVKSRIIINPDTSRNQFSLQLNSVT PEDTAVYYCAREGGYIYGLDQWGQGTLVTVSS
375	ATX-P-587	VH	QVQLQQSGPGLVKPSQTLSLTCAISGDSVSSNSAAWNWIRQSPSR GLEWLGKTYYRSKWYNYYALSVKSRITINPDTSKNQFSLHLNSV TPEDTAVYYCARDGDYYLPSPFDLWGHGTMVTVSS
376	ATX-P-592	VH	QVQLQQSGPGLVKPSQTLSLTCAISGDSVSSNSAAWNWIRQSPSR GLEWLGRTYYRSKWYSDYPLSVKSRITINPDTSKNQFSLQLNSVT PEDTAVYYCARDSGIVETTPFDYWGQGTLVTVSS
377	ATX-P-594	VH	QVQLQQSGPGLVKPSQTLSLTCAISGDSVSSNSASWNWIRQSPSR GLEWLGTTYYRSKWFNVYAVSVKSRITINPDTSKNQFSLHLNSVT PEDTAIYFCTRDRGDLLHWYFDLWGRGTLVTVSS
378	ATX-P-595	VH	QVQLQQSGPGLVKPSQTLSLTCAISGDSVSSNSAAWNWIRQSPSR GLEWLGRTYYRSKWFNDYALSVKSRITINPDTSKNQFSLHLNSVT PEDTAVYYCAREPGIVAPGPFDYWGQGTLVTVSS
379	ATX-P-604	VH	QVQLQQSGPGLVKPTQTLSLTCAISGDSVSSNSAAWNWIRQSPSR GLEWLGRTYYRSKWFNGYAVSVKSRITINPDASKNQFSLHLKSV TDEDTAVYYCATDRGELLHWYFDLWGRGTLVTVSS
380	ATX-P-610	VH	QVQLQQSGPGLVKSSQTLSITCAISGDSVSSNSAAWNWIRQSPSR GLEWLGRTYYRSKWYNDYALSVKSRIIIKSDTSKNQFSLQLNSVT PEDTAVYYCAREPGIAAPGPFDYWGQGSLVTVSS
381	ATX-P-560	VH – nucleotide	CAGGTACAGCTGCAGCAGTCAGGTCCAGGACTGGTGAAGCCC TCGCAGACCCTCTCACTCACCTGTGCCATTTCCGGGGACAGTG TCTCTAGCAACACTGCTGCTTGGAACTGGATCAGGCAGTCCCC ATCGAGAGGCCTTGAGTGGCTGGGAAGGACATACTACAGGTC CAAGTGGTATAATGATTATGCAGTATCTGTGAAAAGTCGAATA ACCATCAACCCAGACACATCCAAGAACCAGTTCTCCCTGCAGT TGAGCTCTGTGACTCCCCAGGACACGGCTATATATTACTGTGC GAGCGATAACTGGAACAACGGAGGCCCTGGGTTCGACCCCTG GGGCCAGGGAACCCTGGTCACCGTCTCCTCA
382	ATX-P-561	VH – nucleotide	CAGGTACAGCTGCAGCAGTCAGGTCCAGGACTGGTGAAGCCC TCGCAGACCCTCTCACTCACCTGTGCCATCTCCGGGGACAGTG TCTCTAGCAACAGTGCTGCTTGGAACTGGATCAGGCAGTCCCC ATCGAGAGGCCTTGAGTGGCTGGGAAGGACATACTACAGGTC

			CAAGTGGTATAATGGTTATGCAGTCTCTATGAAAAGTCGAATA ACCATCAACCCAGACACATCCAAGAACCAGTTCTCCCTGCAGC TGAACTCTGTGACTCCCGAGGACACGGCTATGTATTATTGTGC AAGAGAGGGAGTGGGAGCTACTACAGGCTTTGACTACTGGGG CCAGGGAACCCTGGTCACCGTCTCCTCA
383	ATX-P-562	VH – nucleotide	CAGGTACAGCTGCAGCAGTCAGGTCCAGGACTGGTGAAGTCC TCGCAGACCCTCTCACTCACCTGTGCCATCTCCGGGGACACTG TCTCTAGTAATAGTGCTGCTTGGAACTGGATCAGGCAGTCCCC ATCGAGAGGCCTTGAGTGGCTGGGAAGGACATTCTATAGGTCC AGGTGGTCTGCTGCTTATGCAGCGTCTGTGAGTAGTCGAATAA CCATCAACCCAGACACATCCAAGAACCAGTTCTCCCTGCAGCT GACCTCTGTGACTCCCGCGGACACGGCTGTGTATTACTGTGCA AGAGAGGGAGTAGGATCTTCTACAGGCTTTGACTACTGGGGCC AGGGAACCCTGGTCACCGTCTCCTCA
384	ATX-P-566	VH – nucleotide	CAGGTACAGCTGCAGCAGTCAGGTCCAGGACTGGTGAAGCCC TCGCAGACCCTCTCACTCACCTGTGCCATCTCCGGGGACAGTG TCTCTAGCAACAGTGCTGCTTGGAACTGGATCAGGCAGTCCCC ATCGAGAGGCCTTGAGTGGCTGGGAAGGACATACTACAGGTC CAAGTGGTTTAATAATTATTCAGTTTCTGTGAAAAGTCGAATA GCCATTAACCCAGACACATCCAAGAACCAGTTCTCCCTTCAAC TGAACTCTGTGACTCCCGAGGACACGGCTGTGTATTACTGTGC AAGAGATCTGGGGGAGTTACTTGACTGGTACTTCGATCTCTGG GGCCGTGGCACCCTGGTCACTGTCTCCGCA
385	ATX-P-572	VH – nucleotide	CAGGTACAGCTGCAGCAGTCAGGTCCAGGACTGGTGAAGCCC TCGCAGACCCTCTCACTCACCTGTGCCATCTCCGGGGACAGTG TCTCTAGCAACAGTGCTGCTTGGAACTGGATCAGGCAGTCCCC ATCGAGAGGCCTTGAGTGGCTGGGAATGACATACTACAGGTC CAAGTGGTATAGTGTTTTTGCAGTATCTGTGAAAAGTCGAATA ACCATCAATACAGACACATCCAAGAACCAGTTCTCCCTGCAGC TGAACTCTGTGACTCCCGAGGACACGGCTGTGTATTACTGTGC AAGAGAGGGGGGTATAGTGGGAGCCACCCCCTTTGACTACTG GGGCCAGGGAACCCTGGTCACCGTCTCTTCA
386	ATX-P-573	VH – nucleotide	CAGGTACAGCTGCAGCAGTCAGGTCCAGGACTGGTGAAGCCC TCGCAGACCCTCTCACTCACCTGTGCCATCTCCGGGGACAGTG TCTCTAGCAACAGTGCTGCTTGGAACTGGATCAGGCAGTCCCC ATCGAGAGGCCTTGAGTGGCTGGGCAGGACATACTACAGGTC CAAGTTGTATAGTGATTATGCAGTATCTGTGAAAAGTCGAATA ACCATCAACCCAGACACATCCAGGAACCAGTTCTCCCTGCAGC TGAACTCTGTGACTCCCGAGGACACGGCTGTGTATTACTGTGC AAGAGAGGGGGGGATACACCTATGGTTATGACTACTGGGGCCA GGGAACCCTGGTCACCGTCTCCTCA
387	ATX-P-581	VH – nucleotide	CAGGTACAGCTGCAGCAGTCAGGTCCAGGACTGGTGAAGCCC TCGCAGACCCTCTCACTCACCTGTGCCATCTCCGGGGACAGTG TCTCTAGCAACAATGCTGCTTGGAACTGGATCAGGCAGTCCCC ATCGAGAGGCCTTGAGTGGCTGGGAAGGACGTACTACAGGTC CAAGTGGTATAATGCTTATGCAGTTTCTGTGAAAAGTCGAATT ATCATCAATCCAGACACATCCAGGAACCAGTTCTCCCTGCAAC TGAACTCTGTGACTCCCGAGGACACGGCTGTGTATTACTGTGC AAGAGAGGGTGGATACATCTATGGTCTTGACCAATGGGGCCA GGGAACCCTGGTCACCGTCTCCTCA
388	ATX-P-587	VH – nucleotide	CAGGTGCAGCTGCAGCAGTCGGGTCCAGGACTGGTGAAGCCC TCGCAGACCCTCTCACTCACCTGTGCCATCTCCGGGGACAGTG TCTCTAGCAACAGTGCTGCTTGGAACTGGATCAGGCAGTCCCC ATCGAGAGGCCTTGAGTGGCTGGGAAAGACATACTACAGGTC CAAGTGGTATAATTATTATGCACTATCTGTGAAAAGTCGAATA ACCATCAACCCAGACACATCCAAGAACCAGTTCTCCCTGCACC

			TGAACTCTGTGACTCCCGAGGACACGGCTGTGTATTACTGTGC AAGAGACGGTGACTACTACCTTCCCTCTCCTTTTGATCTCTGGG GCCACGGGACAATGGTCACCGTCTCCTCA
389	ATX-P-592	VH – nucleotide	CAGGTACAGCTGCAGCAGTCAGGTCCAGGACTGGTGAAGCCC TCGCAGACCCTCTCACTCACCTGTGCCATCTCCGGGGACAGTG TCTCTAGCAACAGTGCTGCTTGGAACTGGATCAGGCAGTCCCC ATCGAGAGGCCTTGAGTGGCTGGGAAGGACATACTACAGGTC CAAGTGGTATAGTGATTATCCACTATCTGTGAAAAGTCGAATA ACCATCAACCCCGACACATCCAAGAACCAGTTCTCCCTGCAGC TGAACTCTGTGACTCCCGAGGACACGGCTGTGTATTACTGTGC AAGAGACTCCGGTATAGTTGAAACCACGCCCTTTGACTATTGG GGCCAGGGAACCCTGGTCACCGTCTCCTCA
390	ATX-P-594	VH – nucleotide	CAGGTACAGCTGCAGCAGTCAGGTCCAGGACTGGTGAAGCCC TCGCAGACCCTCTCACTCACCTGTGCCATCTCCGGGGACAGTG TCTCTAGTAACAGTGCTTCTTGGAACTGGATCAGGCAGTCCCC TTCGAGAGGCCTTGAGTGGCTGGGAACGACATACTACAGGTCC AAGTGGTTTAATGTTTATGCAGTCTCTGTGAAAAGTCGAATAA CCATCAACCCAGACACATCCAAGAACCAATTCTCCCTGCACCT GAACTCTGTGACTCCCGAGGACACGGCTATATATTTCTGTACA AGAGATCGGGGGGACCTACTCCACTGGTACTTCGATCTCTGGG GCCGTGGCACCCTGGTCACTGTCTCCTCA
391	ATX-P-595	VH – nucleotide	CAGGTACAGCTGCAGCAGTCGGGTCCAGGACTGGTGAAGCCC TCGCAGACCCTCTCACTCACCTGTGCCATCTCCGGGGACAGTG TCTCTAGCAACAGTGCTGCTTGGAACTGGATCAGGCAGTCCCC ATCGAGAGGCCTTGAGTGGCTGGGAAGGACATACTACAGGTC CAAGTGGTTTAATGATTATGCACTATCTGTGAAAAGTCGAATA ACCATCAACCCAGACACATCCAAGAACCAGTTCTCCCTGCACC TGAACTCTGTGACTCCCGAGGACACGGCTGTGTATTACTGTGC AAGAGAACCTGGTATAGTAGCACCTGGCCCTTTTGACTACTGG GGCCAGGGAACCCTGGTCACCGTCTCCTCA
392	ATX-P-604	VH – nucleotide	CAGGTACAGCTGCAGCAGTCAGGTCCAGGACTGGTGAAGCCC ACGCAGACCCTCTCACTCACCTGTGCCATCTCCGGGGACAGTG TCTCTAGCAACAGTGCTGCATGGAACTGGATCAGGCAGTCCCC ATCGAGAGGCCTTGAGTGGCTGGGGAGGACATACTACAGGTC CAAGTGGTTTAATGGTTATGCAGTATCTGTGAAAAGTCGAATA ACCATCAACCCCGACGCATCCAAGAACCAGTTCTCCCTGCACT TGAAGTCTGTGACTGACGAGGACACGGCTGTATATTACTGTGC AACAGATCGGGGGGAACTCCTCCACTGGTACTTCGATCTCTGG GGCCGTGGCACCCTGGTCACCGTCTCTTCA
393	ATX-P-610	VH – nucleotide	CAGGTACAGCTGCAGCAGTCAGGTCCAGGACTGGTGAAGTCC TCGCAGACCCTCTCAATCACCTGTGCCATCTCCGGGGACAGTG TCTCTAGCAACAGTGCTGCTTGGAACTGGATCAGGCAGTCCCC ATCGAGAGGCCTTGAGTGGCTGGGAAGGACATACTACAGGTC CAAGTGGTATAATGATTATGCACTATCTGTGAAAAGTCGAATA ATCATCAAGTCAGACACATCCAAGAACCAGTTCTCCCTGCAGT TGAACTCTGTGACTCCCGAGGACACGGCTGTGTACTACTGTGC AAGAGAACCGGGTATAGCAGCACCTGGTCCATTTGACTACTGG GGCCAGGGATCCCTGGTCACCGTCTCCTCA
394	ATX-P-560	VL	DIQMTQSPSSVSTSVGDRVTITCRASQGISSWLAWYQQKPGKAPK LLISAASSLQSGVPSRFSGSGSGTDFTLTISTLQPEDFASYYCQQAN SFPPTFGQGTRVEIK
395	ATX-P-561	VL	DIQMTQSPSSLSASVGDRVTITCRASQGISSWLTWYQQKPGKAPK LLIYAASSLQGGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQA NSFPPTFGQGTKVEIK

396	ATX-P-562	VL	DIQMTQSPSSVSASIGDRVTITCRASKGISIWLAWYQQKPGKAPK VLISAASSLQSGAPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQA NSFPPTFGQGTKVEIK
397	ATX-P-566	VL	EIVLTQSPGTLSLSPGDRATLSCRASQSVRNSYVAWYQQKPGQAP RLLIYGASSRATGIPDRFSGSGSGTDFSLTIGRLEPEDFVVYYCQQ YGNSPLTFGGGTKVEIK
398	ATX-P-572	VL	DIVMTQSPDSLAVSLGERATINCKSSQSVLYSSNNKNYLAWYQQ KPGQPPKLLIYWASPRESGVPDRFSGSGSGTDFTLTISSLQAEDVA VYYCQQYYSIPRTFGQGTKVEIK
399	ATX-P-573	VL	DIQMTQSPSSVSASVGDRVTITCRASQGISSWLAWYQQKPGKAPK VLIYAASSLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQA NSFPPTFGPGTKVDIK
400	ATX-P-581	VL	DIQMTQSPSSVSASVGDRVTITCRASQGVNNWLAWYQQKPGKAP KLLIHAASSLLSGVPSRFSGSGSGTDFTLTITSLQPEDFATYYCQQ ANSFPITFGQGTRLEIK
401	ATX-P-587	VL	DIVMTQSPDSLAVSLGERATINCKSSQSVLYSSNNKNYLAWYQQ KPGQPPKLLIYWASTRESGVPDRFSGSGSGTDFTLTISSLQAEDVA VYYCQQYYSTPYTFGQGTKLEIK
402	ATX-P-592	VL	DIVMTQSPDSLAVSLGERATINCKSSQSVLYSSNNKNYLAWYQQ KPGQPPKLLIYWASNRESGVPDRFSGSGSGTDFTLTISSLQAEDVA VYYCQQYYSTPYTFGQGTKLEIK
403	ATX-P-594	VL	EIVLTQSPGTLSLSPGERATLSCRASQSVSSSYLAWYQQKPGQSPR LLIYGASSRATGIPDRFSGSGSGTDFTLTISRLEPEDFAVYYCQQY GRSVTFGGGTKLEIK
404	ATX-P-595	VL	DIVMTQSPDSLAVSLGERATINCKSSQSVLYSSNNKNYLAWYQQ KPGQPPKLLIYWASTRESGVPDRFSGSGSGTDFTLTISSLQAEDVA VYYCQQYYSTPYTFGQGTKLEIK
405	ATX-P-604	VL	EIVLTQSPDTLSLSPGERATLSCRASQTIRSSYLAWYQLKPGQAPR LLIYGASSRATGIPDRFSGSGSGTDFTLSISRLEPEDFAVYYCQQY GRSIIFGGGTKVEIK
406	ATX-P-610	VL	DIQMTQSPSSVSASVGDRVTITCRASQGISSWLAWYQQKPGKAPK LLIYAASSLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQN YRTPITFGQGTRLEIK
407	ATX-P-581	VL – nucleotide	GACATCCAGATGACCCAGTCTCCATCTTCCGTGTCTACATCTGT TGGAGACAGAGTCACCATCACTTGTCGGGCGAGTCAGGGTATT AGCAGCTGGTTAGCCTGGTATCAGCAGAAACCAGGGAAAGCC CCTAAGCTCCTGATCTCTGCTGCATCCAGTTTGCAAAGTGGGG TCCCATCAAGGTTCAGCGGCAGTGGATCTGGGACAGATTTCAC TCTCACCATCAGCACCCTGCAGCCTGAAGACTTTGCATCTTAC TATTGTCAACAGGCTAACAGTTTCCCTCCGACGTTCGGCCAAG GGACCAGGGTGGAAATCAAA
408	ATX-P-561	VL – nucleotide	GACATCCAGATGACCCAGTCTCCATCTTCCCTGTCTGCATCTGT CGGAGACAGAGTCACCATCACTTGTCGGGCGAGTCAGGGTATT AGCAGCTGGTTAACCTGGTATCAGCAGAAACCAGGGAAAGCC CCTAAGCTCCTGATCTATGCTGCATCCAGTTTGCAAGGTGGGG TCCCATCAAGATTCAGCGGCAGTGGATCTGGGACAGATTTCAC TCTCACCATCAGCAGCCTGCAGCCTGAAGATTTTGCAACTTAC TATTGTCAACAGGCTAACAGTTTCCCTCCGACGTTCGGCCAAG GGACCAAGGTGGAAATCAAA
409	ATX-P-573	VL – nucleotide	GACATCCAGATGACCCAGTCTCCATCTTCCGTGTCTGCATCTAT AGGAGACAGAGTCACCATCACTTGTCGGGCGAGTAAGGGAAT TAGCATCTGGTTAGCCTGGTATCAGCAGAAACCAGGGAAAGC CCCTAAGGTCCTGATCTCTGCTGCATCCAGTTTGCAAAGTGGG GCCCCATCAAGGTTCAGCGGCAGTGGATCTGGGACAGATTTCA CTCTCACCATCAGCAGCCTGCAGCCTGAAGATTTTGCAACTTA

			CTATTGTCAACAGGCTAACAGTTTCCCTCCGACGTTCGGCCAA GGGACCAAGGTGGAGATCAAA
410	ATX-P-610	VL – nucleotide	GAAATTGTGTTGACGCAGTCTCCAGGCACCCTGTCTTTGTCTCC AGGGGACAGAGCCACCCTCTCATGCAGGGCCAGTCAGAGTGT TAGGAACAGTTACGTAGCCTGGTACCAGCAGAAACCTGGCCA GGCTCCCAGGCTCCTCATCTATGGTGCATCCAGCAGGGCCACT GGCATCCCAGACAGGTTCAGTGGCAGTGGGTCTGGGACAGAC TTCAGTCTCACCATCGGCAGACTGGAGCCTGAGGATTTTGTAG TGTATTATTGTCAGCAATACGGTAACTCACCTCTCACTTTCGGC GGAGGGACCAAGGTGGAGATCAAA
411	ATX-P-560	VL – nucleotide	GACATCGTGATGACCCAGTCTCCAGACTCCCTGGCTGTGTCTC TGGGCGAGAGGGCCACCATCAACTGCAAGTCCAGCCAGAGTG TTTTATACAGCTCCAACAATAAGAACTACTTAGCTTGGTACCA GCAGAAACCTGGACAGCCTCCTAAGCTGCTCATTTACTGGGCA TCTCCCCGGGAATCCGGGGTCCCTGACCGGTTCAGTGGCAGCG GGTCTGGGACAGATTTCACTCTCACCATCAGCAGCCTGCAGGC TGAAGATGTGGCAGTTTATTATTGTCAGCAATATTATAGTATT CCTCGGACGTTCGGCCAAGGGACCAAGGTGGAAATCAAA
412	ATX-P-562	VL – nucleotide	GACATCCAGATGACCCAGTCTCCATCTTCCGTGTCTGCATCTGT AGGAGACAGAGTCACCATCACTTGTCGGGCGAGTCAGGGTAT TAGCAGCTGGTTAGCCTGGTATCAGCAGAAACCAGGGAAAGC CCCTAAGGTCCTGATCTATGCTGCATCCAGTTTGCAAAGTGGG GTCCCATCAAGGTTCAGCGGCAGTGGATCTGGGACAGATTTCA CTCTCACCATCAGCAGCCTGCAGCCTGAAGATTTTGCAACTTA CTATTGTCAACAGGCTAACAGTTTCCCTCCCACTTTCGGCCCTG GGACCAAAGTGGATATCAAA
413	ATX-P-566	VL – nucleotide	GACATCCAGATGACTCAGTCTCCATCTTCCGTGTCTGCATCTGT AGGAGACAGAGTCACCATCACTTGTCGGGCGAGTCAGGGTGT TAACAACTGGTTAGCCTGGTATCAGCAGAAACCAGGGAAAGC CCCTAAGCTCCTGATCCATGCTGCATCCAGTTTGCTAAGTGGG GTCCCATCAAGGTTCAGCGGCAGTGGATCTGGGACAGATTTCA CGCTCACCATCACCAGCCTGCAGCCTGAAGATTTTGCAACTTA CTATTGTCAACAGGCTAACAGTTTCCCCATCACCTTCGGCCAA GGGACACGACTGGAAATTAAA
414	ATX-P-604	VL – nucleotide	GACATCGTGATGACCCAGTCTCCAGACTCCCTGGCTGTGTCTC TGGGCGAGAGGGCCACCATCAACTGCAAGTCCAGCCAGAGTG TTTTATACAGCTCCAACAATAAGAACTACTTAGCTTGGTACCA GCAGAAACCAGGACAGCCTCCTAAGCTGCTCATTTACTGGGCA TCTACCCGGGAATCCGGGGTCCCTGACCGATTCAGTGGCAGCG GGTCTGGGACAGATTTCACTCTCACCATCAGCAGCCTGCAGGC TGAAGATGTGGCAGTTTATTACTGTCAGCAATATTATAGTACT CCGTACACTTTTGGCCAGGGGACCAAGCTGGAGATCAAA
415	ATX-P-594	VL – nucleotide	GACATCGTGATGACCCAGTCTCCAGACTCCCTGGCTGTGTCTC TGGGCGAGAGGGCCACCATCAACTGCAAGTCCAGCCAGAGTG TTTTATACAGCTCCAACAATAAGAACTACTTAGCTTGGTACCA GCAGAAACCAGGACAGCCTCCTAAGCTGCTCATTTACTGGGCA TCTAACCGGGAATCCGGGGTCCCTGACCGATTCAGTGGCTCCG GGTCTGGGACAGATTTCACTCTCACCATCAGCAGCCTGCAGGC TGAAGATGTGGCAGTTTATTACTGTCAGCAATATTATAGTACT CCGTACACTTTTGGCCAGGGGACCAAGCTGGAGATCAAA
416	ATX-P-572	VL – nucleotide	GAAATTGTGTTGACGCAGTCTCCAGGCACCCTGTCTTTGTCTCC AGGGGAGAGAGCCACCCTCTCCTGCAGGGCCAGTCAGAGTGT TAGCAGCAGCTACTTAGCCTGGTACCAGCAGAAACCTGGCCA GTCTCCCAGGCTCCTCATCTATGGTGCATCCAGCAGGGCCACT GGCATCCCAGACAGGTTCAGTGGCAGTGGGTCTGGGACAGAC

			TTCACTCTCACCATCAGCAGACTGGAGCCTGAGGATTTTGCAG TATATTACTGTCAGCAGTATGGTAGGTCAGTCACTTTCGGCGG AGGGACCAAGCTGGAAATCAAA
417	ATX-P-587	VL – nucleotide	GACATCGTGATGACCCAGTCTCCAGACTCCCTGGCTGTGTCTC TGGGCGAGAGGGCCACCATCAACTGCAAGTCCAGCCAGAGTG TTTTATACAGCTCCAACAATAAGAACTACTTAGCTTGGTACCA GCAGAAACCAGGACAGCCTCCTAAGCTGCTCATTTACTGGGCA TCTACCCGGGAATCCGGGGTCCCTGACCGATTCAGTGGCAGCG GGTCTGGGACAGATTTCACTCTCACCATCAGCAGCCTGCAGGC TGAAGATGTGGCAGTTTATTACTGTCAGCAATATTATAGTACT CCGTACACTTTTGGCCAGGGGACCAAGCTGGAAATCAAA
418	ATX-P-592	VL – nucleotide	GAAATAGTGCTGACTCAGTCTCCAGACACCCTATCTTTGTCTC CAGGGGAAAGAGCCACCCTCTCCTGCAGGGCCAGTCAGACTA TTAGGAGCAGCTACTTAGCCTGGTACCAGCTGAAACCTGGCCA GGCTCCCAGGCTCCTCATCTATGGTGCATCCAGCAGGGCCACT GGCATCCCAGACAGGTTCAGTGGCAGTGGGTCTGGGACAGAC TTCACTCTCTCCATCAGCAGACTGGAGCCTGAAGATTTTGCAG TGTATTACTGTCAACAGTATGGCCGCTCAATCATTTTCGGCGG AGGGACCAAAGTGGAAATCAAA
419	ATX-P-595	VL – nucleotide	GACATCCAGATGACCCAGTCTCCATCTTCCGTGTCTGCATCTGT AGGAGACAGAGTCACCATCACTTGTCGGGCGAGTCAGGGTAT TAGCAGCTGGTTAGCCTGGTATCAGCAGAAACCAGGGAAAGC CCCTAAGCTCCTGATCTATGCTGCATCCAGTTTGCAAAGTGGG GTCCCATCAAGGTTCAGCGGCAGTGGATCTGGGACAGATTTCA CTCTCACCATCAGCAGCCTGCAGCCTGAAGATTTTGCAACTTA CTACTGTCAACAGAATTACAGAACCCCGATCACCTTCGGCCAA GGGACACGACTGGAGATTAAA

[00197] Table 5: Anti-CFHR4 antibodies (HC IgG1 Fc and LC Kappa sequences)

SEQ ID NO:	Antibody Name:	Descriptor:	Sequence:
420	ATX-P-583	HC IgG1 Fc	QVQLVQSGAEVKKPGASVKVSCKASGYTFTTYGISWVRQAPGQGLE WMGWISAYSGNTHYAQSLQDRVTMTTDTSTSTAYMEVRSLRSDDTA VYYCAKDEGYCSSTGCLNLFDPWGQGTLVTVSSASTKGPSVFPLAPS SKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSG LYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTC PPCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYK CKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCL VKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSR WQQGNVFSCSVMHEALHNHYTQKSLSLSPG
421	ATX-P-591	HC IgG1 Fc	QVQLVQSGAEVKKPGASVKVSCKASGYTFTSYGISWVRQAPGQGLE WMGWISAYNGNTNYAQKLQGRVTMTTDTSTSTAYMELRSLRSDDT AIYYCTRDLRGTAFDYWGQGTPVTVSSASTKGPSVFPLAPSSKSTSGG TAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSV VTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPE LLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVD GVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVSN KALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFY PSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQG NVFSCSVMHEALHNHYTQKSLSLSPG
422	ATX-P-602	HC IgG1 Fc	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGL EWMGWINPNSGGTNYAKKFQGRVTMTRDTSISTAYMELSRLRSDDT AVYYCARGDTIFRLVTPLDYWGQGTLVTVSSASTKGPSVFPLAPSSKS

			TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPC PAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNW YVDGVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCK VSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVK GFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRW QQGNVFSCSVMHEALHNHYTQKSLSLSPG
423	ATX-P-597	HC IgG1 Fc	QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYYMQWVRQAPGQGL EWLGIIDPSGGSTTYAQKFQGRVTMTRDTSTSTVHMELRSLRSEDTA VYYCARDEGTDRPGWGYWGQGTLVTVSSASTKGPSVFPLAPSSKSTS GGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLS SVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPA PELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVS NKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGF YPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQ GNVFSCSVMHEALHNHYTQKSLSLSPG
424	ATX-P-601	HC IgG1 Fc	QVQLVQSGAEVKKPGASVKVSCKASGYTFTSYYMHWVRQAPGQGL EWMGIINPSGGSTNYAQKFQGRLTMTRDTSTNTVYMELSSLRSEDTA VYYCATDQSGGMDVWGKGTTVTVSSASTKGPSVFPLAPSSKSTSGGT AALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVV TVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPEL LGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDG VEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPS DIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNV FSCSVMHEALHNHYTQKSLSLSPG
425	ATX-P-607	HC IgG1 Fc	QVQLVQSGAEVKKPGASVKVSCKASGYTFTSYYMHWVRQAPGQGL EWMGIINPSGGSTSYAQKFQGRVTMTRDTSTNTVYMELSSLRSEDTA VYYCARDPEYSSAFDIWGQGTMVTVSSASTKGPSVFPLAPSSKSTSGG TAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSV VTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPE LLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVD GVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVSN KALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFY PSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQG NVFSCSVMHEALHNHYTQKSLSLSPG
426	ATX-P-583	HC IgG1 Fc – nucleotide	CAGGTTCAGCTGGTGCAGTCTGGAGCTGAGGTGAAGAAGCCTGGG GCCTCAGTGAAGGTCTCCTGCAAGGCTTCTGGTTACACCTTTACCA CCTATGGTATCAGCTGGGTGCGACAGGCCCCTGGACAAGGGCTTG AGTGGATGGGATGGATCAGCGCTTACAGTGGTAACACACACTATG CACAGAGCCTCCAGGACAGAGTCACCATGACCACAGACACATCCA CGAGTACAGCCTACATGGAGGTGAGGAGCCTGAGATCTGACGACA CGGCCGTGTATTACTGTGCGAAAGATGAGGGATATTGTAGTAGTA CCGGCTGCTTAAACTTGTTCGACCCCTGGGGCCAGGGAACCCTGGT CACCGTCTCCTCAGCTAGCACTAAAGGGCCTTCTGTATTTCCCTTG GCCCCGTCCAGCAAATCGACCTCGGGAGGGACAGCCGCCCTGGGT TGCCTTGTGAAAGATTATTTCCCTGAGCCAGTTACCGTAAGTTGGA ACAGTGGGGCGCTGACAAGTGGTGTGCACACGTTTCCTGCCGTCCT GCAATCATCGGGCTTGTATAGCCTCAGCTCTGTGGTCACTGTCCCA AGTTCATCGCTGGGCACTCAGACGTATATTTGCAATGTGAACCACA AACCTTCAAATACAAAAGTGGATAAACGCGTAGAACCGAAATCGT GTGATAAAACTCACACATGCCCGCCATGCCCGGCACCTGAACTGC TTGGTGGTCCCAGCGTGTTCCTGTTCCCGCCGAAGCCTAAAGATAC TCTAATGATCAGCCGTACGCCAGAGGTGACATGTGTCGTGGTTGA CGTGTCCCACGAAGATCCCGAAGTTAAGTTCAATTGGTATGTTGAT

			GGTGTAGAGGTACACAATGCTAAGACTAAACCTCGCGAGGAGCAG TACGCCTCGACCTATCGTGTCGTGAGCGTTCTGACCGTCCTTCACC AAGATTGGCTTAACGGCAAAGAATATAAGTGCAAGGTAAGCAATA AAGCACTTCCGGCCCCAATCGAGAAAACCATTTCCAAGGCCAAAG GTCAACCAAGAGAACCCCAGGTGTATACTCTTCCGCCTTCTCGTGA GGAAATGACTAAAAATCAAGTATCCCTTACGTGTCTGGTTAAAGG TTTTTATCCTAGCGATATTGCTGTTGAATGGGAATCGAACGGTCAG CCGGAGAATAATTATAAAACAACGCCACCCGTCCTGGATAGCGAC GGCTCATTTTTTCTGTATAGCAAACTGACTGTAGATAAATCACGGT GGCAGCAGGGCAATGTATTCAGTTGCTCCGTTATGCATGAAGCGTT ACATAATCACTACACGCAGAAATCTCTTAGTCTTTCACCCGGT
427	ATX-P-591	HC IgG1 Fc – nucleotide	CAGGTTCAGCTGGTGCAGTCTGGAGCTGAGGTGAAGAAGCCTGGG GCCTCAGTGAAGGTCTCCTGCAAGGCTTCTGGTTACACCTTTACCA GCTATGGTATCAGCTGGGTGCGACAGGCCCCTGGACAAGGGCTTG AGTGGATGGGATGGATCAGCGCTTACAATGGTAACACAAACTATG CACAGAAGCTCCAGGGCAGAGTCACCATGACCACAGACACATCCA CGAGCACAGCCTACATGGAGCTGAGGAGCCTGAGATCTGACGACA CTGCCATTTATTACTGTACGAGAGATCTACGTGGAACTGCCTTTGA CTACTGGGGCCAGGGAACCCCGGTCACTGTCTCCTCAGCTAGCACT AAAGGGCCTTCTGTATTTCCCTTGGCCCCGTCCAGCAAATCGACCT CGGGAGGGACAGCCGCCCTGGGTTGCCTTGTGAAAGATTATTTCC CTGAGCCAGTTACCGTAAGTTGGAACAGTGGGGCGCTGACAAGTG GTGTGCACACGTTTCCTGCCGTCCTGCAATCATCGGGCTTGTATAG CCTCAGCTCTGTGGTCACTGTCCCAAGTTCATCGCTGGGCACTCAG ACGTATATTTGCAATGTGAACCACAAACCTTCAAATACAAAAGTG GATAAACGCGTAGAACCGAAATCGTGTGATAAAACTCACACATGC CCGCCATGCCCGGCACCTGAACTGCTTGGTGGTCCCAGCGTGTTCC TGTTCCCGCCGAAGCCTAAAGATACTCTAATGATCAGCCGTACGCC AGAGGTGACATGTGTCGTGGTTGACGTGTCCCACGAAGATCCCGA AGTTAAGTTCAATTGGTATGTTGATGGTGTAGAGGTACACAATGCT AAGACTAAACCTCGCGAGGAGCAGTACGCCTCGACCTATCGTGTC GTGAGCGTTCTGACCGTCCTTCACCAAGATTGGCTTAACGGCAAA GAATATAAGTGCAAGGTAAGCAATAAAGCACTTCCGGCCCCAATC GAGAAAACCATTTCCAAGGCCAAAGGTCAACCAAGAGAACCCCA GGTGTATACTCTTCCGCCTTCTCGTGAGGAAATGACTAAAAATCAA GTATCCCTTACGTGTCTGGTTAAAGGTTTTTATCCTAGCGATATTG CTGTTGAATGGGAATCGAACGGTCAGCCGGAGAATAATTATAAAA CAACGCCACCCGTCCTGGATAGCGACGGCTCATTTTTTCTGTATAG CAAACTGACTGTAGATAAATCACGGTGGCAGCAGGGCAATGTATT CAGTTGCTCCGTTATGCATGAAGCGTTACATAATCACTACACGCAG AAATCTCTTAGTCTTTCACCCGGT
428	ATX-P-602	HC IgG1 Fc – nucleotide	CAGGTGCAGCTGGTGCAATCTGGGGCTGAGGTGAAGAAGCCTGGG GCCTCAGTGAAGGTCTCCTGCAAGGCTTCTGGATACACCTTCACCG GCTACTATATGCACTGGGTGCGACAGGCCCCTGGACAAGGACTTG AGTGGATGGGATGGATCAACCCTAACAGTGGTGGCACAAACTATG CAAAGAAGTTTCAGGGCAGGGTCACCATGACCAGGGACACGTCCA TCAGCACAGCCTACATGGAGTTGAGCAGGCTGAGATCTGACGACA CGGCCGTGTATTACTGTGCGAGAGGGGATACGATTTTTCGACTGGT TACCCCTCTTGACTACTGGGGCCAGGGAACCCTGGTCACCGTCTCC TCAGCTAGCACTAAAGGGCCTTCTGTATTTCCCTTGGCCCCGTCCA GCAAATCGACCTCGGGAGGGACAGCCGCCCTGGGTTGCCTTGTGA AAGATTATTTCCCTGAGCCAGTTACCGTAAGTTGGAACAGTGGGG CGCTGACAAGTGGTGTGCACACGTTTCCTGCCGTCCTGCAATCATC GGGCTTGTATAGCCTCAGCTCTGTGGTCACTGTCCCAAGTTCATCG CTGGGCACTCAGACGTATATTTGCAATGTGAACCACAAACCTTCA AATACAAAAGTGGATAAACGCGTAGAACCGAAATCGTGTGATAAA

			ACTCACACATGCCCGCCATGCCCGGCACCTGAACTGCTTGGTGGTC CCAGCGTGTTCCTGTTCCCGCCGAAGCCTAAAGATACTCTAATGAT CAGCCGTACGCCAGAGGTGACATGTGTCGTGGTTGACGTGTCCCA CGAAGATCCCGAAGTTAAGTTCAATTGGTATGTTGATGGTGTAGA GGTACACAATGCTAAGACTAAACCTCGCGAGGAGCAGTACGCCTC GACCTATCGTGTCGTGAGCGTTCTGACCGTCCTTCACCAAGATTGG CTTAACGGCAAAGAATATAAGTGCAAGGTAAGCAATAAAGCACTT CCGGCCCCAATCGAGAAAACCATTTCCAAGGCCAAAGGTCAACCA AGAGAACCCCAGGTGTATACTCTTCCGCCTTCTCGTGAGGAAATG ACTAAAAATCAAGTATCCCTTACGTGTCTGGTTAAAGGTTTTTATC CTAGCGATATTGCTGTTGAATGGGAATCGAACGGTCAGCCGGAGA ATAATTATAAAACAACGCCACCCGTCCTGGATAGCGACGGCTCAT TTTTTCTGTATAGCAAACTGACTGTAGATAAATCACGGTGGCAGCA GGGCAATGTATTCAGTTGCTCCGTTATGCATGAAGCGTTACATAAT CACTACACGCAGAAATCTCTTAGTCTTTCACCCGGT
429	ATX-P-597	HC IgG1 Fc -- nucleotide	CAGGTGCAGCTGGTGCAATCTGGAGCTGAGGTGAAGAAGCCTGGG GCCTCAGTGAAGGTTTCCTGCAAGGCATCTGGATACACCTTCACCA ACTACTATATGCAGTGGGTGCGACAGGCCCCTGGACAAGGGCTTG AGTGGCTGGGAATAATCGACCCTAGTGGTGGTAGCACAACCTATG CACAGAAGTTCCAGGGCAGAGTCACCATGACCAGGGACACGTCCA CGAGCACAGTCCACATGGAGCTGAGAAGTCTGAGATCTGAGGACA CGGCCGTCTATTATTGCGCGAGAGATGAGGGAACAGATCGTCCCG GGTGGGGCTACTGGGGCCAGGGAACCCTGGTCACTGTCTCCTCAG CTAGCACTAAAGGGCCTTCTGTATTTCCCTTGGCCCCGTCCAGCAA ATCGACCTCGGGAGGGACAGCCGCCCTGGGTTGCCTTGTGAAAGA TTATTTCCCTGAGCCAGTTACCGTAAGTTGGAACAGTGGGGCGCTG ACAAGTGGTGTGCACACGTTTCCTGCCGTCCTGCAATCATCGGGCT TGTATAGCCTCAGCTCTGTGGTCACTGTCCCAAGTTCATCGCTGGG CACTCAGACGTATATTTGCAATGTGAACCACAAACCTTCAAATAC AAAAGTGGATAAACGCGTAGAACCGAAATCGTGTGATAAAACTCA CACATGCCCGCCATGCCCGGCACCTGAACTGCTTGGTGGTCCCAGC GTGTTCCTGTTCCCGCCGAAGCCTAAAGATACTCTAATGATCAGCC GTACGCCAGAGGTGACATGTGTCGTGGTTGACGTGTCCCACGAAG ATCCCGAAGTTAAGTTCAATTGGTATGTTGATGGTGTAGAGGTACA CAATGCTAAGACTAAACCTCGCGAGGAGCAGTACGCCTCGACCTA TCGTGTCGTGAGCGTTCTGACCGTCCTTCACCAAGATTGGCTTAAC GGCAAAGAATATAAGTGCAAGGTAAGCAATAAAGCACTTCCGGCC CCAATCGAGAAAACCATTTCCAAGGCCAAAGGTCAACCAAGAGAA CCCCAGGTGTATACTCTTCCGCCTTCTCGTGAGGAAATGACTAAAA ATCAAGTATCCCTTACGTGTCTGGTTAAAGGTTTTTATCCTAGCGA TATTGCTGTTGAATGGGAATCGAACGGTCAGCCGGAGAATAATTA TAAAACAACGCCACCCGTCCTGGATAGCGACGGCTCATTTTTTCTG TATAGCAAACTGACTGTAGATAAATCACGGTGGCAGCAGGGCAAT GTATTCAGTTGCTCCGTTATGCATGAAGCGTTACATAATCACTACA CGCAGAAATCTCTTAGTCTTTCACCCGGT
430	ATX-P-601	HC IgG1 Fc -- nucleotide	CAGGTGCAGCTGGTGCAATCTGGGGCTGAGGTGAAGAAGCCTGGG GCCTCAGTGAAGGTTTCCTGCAAGGCATCTGGATACACCTTCACCA GCTACTATATGCACTGGGTGCGACAGGCCCCTGGACAAGGGCTTG AGTGGATGGGAATAATCAACCCTAGTGGTGGTAGCACAAACTACG CACAGAAGTTCCAGGGCAGACTCACCATGACCAGGGACACGTCCA CGAACACAGTCTACATGGAACTGAGTAGCCTGAGATCTGAGGACA CGGCCGTGTATTACTGTGCGACAGATCAAAGTGGGGGGATGGACG TCTGGGGCAAAGGGACCACGGTCACCGTCTCCTCAGCTAGCACTA AAGGGCCTTCTGTATTTCCCTTGGCCCCGTCCAGCAAATCGACCTC GGGAGGGACAGCCGCCCTGGGTTGCCTTGTGAAAGATTATTTCCCT GAGCCAGTTACCGTAAGTTGGAACAGTGGGGCGCTGACAAGTGGT

			GTGCACACGTTTCCTGCCGTCCTGCAATCATCGGGCTTGTATAGCC TCAGCTCTGTGGTCACTGTCCCAAGTTCATCGCTGGGCACTCAGAC GTATATTTGCAATGTGAACCACAAACCTTCAAATACAAAAGTGGA TAAACGCGTAGAACCGAAATCGTGTGATAAAACTCACACATGCCC GCCATGCCCGGCACCTGAACTGCTTGGTGGTCCCAGCGTGTTCCTG TTCCCGCCGAAGCCTAAAGATACTCTAATGATCAGCCGTACGCCA GAGGTGACATGTGTCGTGGTTGACGTGTCCCACGAAGATCCCGAA GTTAAGTTCAATTGGTATGTTGATGGTGTAGAGGTACACAATGCTA AGACTAAACCTCGCGAGGAGCAGTACGCCTCGACCTATCGTGTCG TGAGCGTTCTGACCGTCCTTCACCAAGATTGGCTTAACGGCAAAG AATATAAGTGCAAGGTAAGCAATAAAGCACTTCCGGCCCCAATCG AGAAAACCATTTCCAAGGCCAAAGGTCAACCAAGAGAACCCCAG GTGTATACTCTTCCGCCTTCTCGTGAGGAAATGACTAAAAATCAAG TATCCCTTACGTGTCTGGTTAAAGGTTTTTATCCTAGCGATATTGCT GTTGAATGGGAATCGAACGGTCAGCCGGAGAATAATTATAAAACA ACGCCACCCGTCCTGGATAGCGACGGCTCATTTTTTCTGTATAGCA AACTGACTGTAGATAAATCACGGTGGCAGCAGGGCAATGTATTCA GTTGCTCCGTTATGCATGAAGCGTTACATAATCACTACACGCAGAA ATCTCTTAGTCTTTCACCCGGT
431	ATX-P-607	HC IgG1 Fc – nucleotide	CAGGTGCAGCTGGTGCAATCTGGGGCTGAGGTGAAGAAGCCTGGG GCCTCAGTGAAGGTTTCCTGCAAGGCATCTGGATACACCTTCACCA GTTACTATATGCACTGGGTGCGACAGGCCCCTGGACAAGGGCTTG AGTGGATGGGAATAATCAACCCTAGTGGTGGTAGCACAAGCTACG CACAGAAGTTCCAGGGCAGAGTCACCATGACCAGGGACACGTCAA CGAACACAGTCTACATGGAGCTGAGCAGCCTTCGATCTGAGGACA CGGCCGTGTATTACTGTGCGAGAGATCCCGAGTATAGCAGTGCTTT TGATATCTGGGGACAAGGGACAATGGTCACCGTCTCCTCAGCTAG CACTAAAGGGCCTTCTGTATTTCCCTTGGCCCCGTCCAGCAAATCG ACCTCGGGAGGGACAGCCGCCCTGGGTTGCCTTGTGAAAGATTAT TTCCCTGAGCCAGTTACCGTAAGTTGGAACAGTGGGGCGCTGACA AGTGGTGTGCACACGTTTCCTGCCGTCCTGCAATCATCGGGCTTGT ATAGCCTCAGCTCTGTGGTCACTGTCCCAAGTTCATCGCTGGGCAC TCAGACGTATATTTGCAATGTGAACCACAAACCTTCAAATACAAA AGTGGATAAACGCGTAGAACCGAAATCGTGTGATAAAACTCACAC ATGCCCGCCATGCCCGGCACCTGAACTGCTTGGTGGTCCCAGCGTG TTCCTGTTCCCGCCGAAGCCTAAAGATACTCTAATGATCAGCCGTA CGCCAGAGGTGACATGTGTCGTGGTTGACGTGTCCCACGAAGATC CCGAAGTTAAGTTCAATTGGTATGTTGATGGTGTAGAGGTACACA ATGCTAAGACTAAACCTCGCGAGGAGCAGTACGCCTCGACCTATC GTGTCGTGAGCGTTCTGACCGTCCTTCACCAAGATTGGCTTAACGG CAAAGAATATAAGTGCAAGGTAAGCAATAAAGCACTTCCGGCCCC AATCGAGAAAACCATTTCCAAGGCCAAAGGTCAACCAAGAGAACC CCAGGTGTATACTCTTCCGCCTTCTCGTGAGGAAATGACTAAAAAT CAAGTATCCCTTACGTGTCTGGTTAAAGGTTTTTATCCTAGCGATA TTGCTGTTGAATGGGAATCGAACGGTCAGCCGGAGAATAATTATA AAACAACGCCACCCGTCCTGGATAGCGACGGCTCATTTTTTCTGTA TAGCAAACTGACTGTAGATAAATCACGGTGGCAGCAGGGCAATGT ATTCAGTTGCTCCGTTATGCATGAAGCGTTACATAATCACTACACG CAGAAATCTCTTAGTCTTTCACCCGGT
432	ATX-P-583	LC Kappa	DIQMTQSPSSLSASVGDRVTITCRASQNIGSYLNWYQQKPGNAPKLLI YATSTLQSGVPSRFSGSGSGTDFTLIISSLHPEDFTVYYCQQSFIIPFTFG PGTKVDIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQ WKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYA CEVTHQGLSSPVTKSFNRGEC
433	ATX-P-591	LC Kappa	DIQMTQSPSSLSASVGDRVTITCRASQSINTYLNWYQQKPGKAPKLLI YAASSLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYSCQHSFTTPFTF

			GPGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKV QWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVY ACEVTHQGLSSPVTKSFNRGEC
434	ATX-P-602	LC Kappa	EIVLTQSPGTLSLSPGERATLSCRASQSVSSSYLAWYQQKPGQAPRLLI YGASSRATGIPDRFSGSGSGTQFTLTISSLQSEDFAVYYCQQYGSSPWT FGQGTKVDIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAK VQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKV YACEVTHQGLSSPVTKSFNRGEC
435	ATX-P-597	LC Kappa	DIQMTQSPSSLSASIGDRVTITCRASQSISSYLDWYQRKSGKAPKLLIY AASSLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQSYSTPLTF GGGTKVDIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKV QWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVY ACEVTHQGLSSPVTKSFNRGEC
436	ATX-P-601	LC Kappa	DIQMTQSPSSLSASVGDRVTITCRASQSINIYLNWYQQKPEKDPKLLIY AASSLQSGVPSRFSGSGSGTDFTLTISNLQPEDFATYYCQQSYSTPITFG QGTRLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQ WKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYA CEVTHQGLSSPVTKSFNRGEC
437	ATX-P-607	LC Kappa	DIQMTQSPSSLSASVGDRGTITCRASQSIRSYLNWYQQKPGKAPKLLI YAASSLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQSYRTPVT FGPGTKVDIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAK VQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKV YACEVTHQGLSSPVTKSFNRGEC
438	ATX-P-583	LC Kappa – nucleotide	GACATCCAGATGACCCAGTCTCCGTCCTCCCTGTCTGCATCTGTAG GAGACAGAGTCACCATCACTTGCCGGGCAAGTCAGAACATTGGCA GTTATTTAAATTGGTATCAGCAGAAACCAGGGAATGCCCCTAAAC TCCTGATCTATGCTACATCCACTTTGCAAAGTGGGGTCCCATCAAG GTTCAGTGGCAGTGGATCTGGGACAGATTTCACTCTCATCATCAGC AGTCTGCACCCTGAAGATTTTACAGTTTATTACTGTCAACAGAGTT TCATTATCCCATTCACTTTCGGCCCTGGGACCAAAGTGGATATCAA ACGTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCTGAC GAGCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGAATA ATTTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACAATG CTTTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGGATT CTAAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAGCAA AGCCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGACGCA CCAAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGGTGA GTGT
439	ATX-P-591	LC Kappa – nucleotide	GACATCCAGATGACTCAGTCTCCATCCTCCCTGTCTGCATCTGTTG GAGACAGAGTCACCATCACTTGCCGGGCAAGTCAGAGCATTAACA CCTATTTAAATTGGTATCAGCAGAAACCAGGGAAAGCCCCTAAGC TCCTGATCTATGCTGCATCCAGTTTGCAAAGTGGGGTCCCATCAAG GTTCAGTGGCAGTGGATCTGGGACAGATTTCACTCTCACCATCAGC AGTCTGCAACCTGAAGATTTTGCAACTTACTCCTGTCAACATAGTT TCACTACCCCATTCACTTTCGGCCCTGGGACCAAGCTGGAAATCAA ACGTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCTGAC GAGCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGAATA ATTTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACAATG CTTTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGGATT CTAAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAGCAA AGCCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGACGCA CCAAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGGTGA GTGT
440	ATX-P-602	LC Kappa – nucleotide	GAAATTGTGTTGACGCAGTCTCCAGGCACCCTGTCTTTGTCTCCAG GGGAAAGAGCCACCCTCTCCTGCAGGGCCAGTCAGAGTGTTAGCA

			GCAGCTACTTAGCCTGGTACCAGCAGAAACCTGGCCAGGCTCCCA GGCTCCTCATCTATGGTGCATCCAGTAGGGCCACTGGCATCCCAGA CAGGTTCAGTGGCAGTGGGTCTGGGACACAGTTCACTCTCACCATC AGCAGCCTGCAGTCTGAAGATTTTGCAGTTTATTACTGTCAGCAGT ATGGTAGCTCACCGTGGACGTTCGGCCAAGGGACCAAAGTGGATA TCAAACGTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCT GACGAGCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGA ATAATTTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACA ATGCTTTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGG ATTCTAAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAG CAAAGCCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGAC GCACCAAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGG TGAGTGT
441	ATX-P-597	LC Kappa – nucleotide	GACATCCAGATGACCCAGTCTCCATCCTCCCTGTCTGCATCTATTG GAGACAGAGTCACCATCACTTGCCGGGCAAGTCAGAGCATTAGCA GCTATTTAGATTGGTATCAGCGGAAATCAGGGAAAGCCCCTAAAC TCCTGATCTATGCTGCATCCAGTTTGCAAAGTGGGGTCCCATCAAG GTTCAGTGGCAGTGGATCTGGGACAGATTTCACTCTCACCATCAGC AGTCTGCAACCTGAAGATTTTGCAACTTACTACTGTCAACAGAGTT ACAGTACCCCGCTCACTTTCGGCGGAGGGACCAAAGTGGATATCA AACGTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCTGA CGAGCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGAAT AATTTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACAAT GCTTTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGGAT TCTAAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAGCA AAGCCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGACGC ACCAAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGGTG AGTGT
442	ATX-P-601	LC Kappa – nucleotide	GACATCCAGATGACCCAGTCTCCATCCTCCCTGTCTGCATCTGTAG GAGACAGAGTCACCATCACTTGCCGGGCAAGTCAGAGCATTAATA TCTATTTAAATTGGTATCAGCAGAAACCAGAGAAAGACCCTAAGC TCCTGATCTATGCTGCGTCCAGTTTGCAAAGTGGGGTCCCATCAAG GTTCAGTGGCAGTGGATCTGGGACAGATTTCACTCTCACCATCAGC AATCTGCAACCTGAAGATTTTGCAACTTACTACTGTCAACAGAGTT ACAGTACCCCGATCACCTTCGGCCAAGGGACACGACTGGAGATTA AACGTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCTGA CGAGCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGAAT AATTTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACAAT GCTTTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGGAT TCTAAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAGCA AAGCCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGACGC ACCAAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGGTG AGTGT
443	ATX-P-607	LC Kappa – nucleotide	GACATCCAGATGACACAGTCTCCATCCTCCCTGTCTGCATCTGTAG GAGACAGAGGCACCATCACTTGCCGGGCAAGTCAGAGCATTAGAA GTTATTTAAATTGGTATCAGCAGAAACCAGGGAAAGCCCCTAAAC TCCTGATCTATGCTGCATCCAGTTTGCAAAGTGGGGTCCCATCAAG GTTCAGTGGCAGTGGATCTGGGACAGATTTCACTCTCACCATCAGC AGTCTGCAACCTGAAGATTTTGCAACTTACTACTGTCAACAGAGTT ACAGAACCCCAGTCACTTTCGGCCCTGGGACCAAAGTGGATATCA AACGTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCTGA CGAGCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGAAT AATTTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACAAT GCTTTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGGAT TCTAAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAGCA AAGCCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGACGC

			ACCAAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGGTG AGTGT
444	ATX-P-564	HC IgG1 Fc	EVQLVESGGGLVKPGGSLRLSCAASGFTFSSYTMNWVRQAPGKGLE WVSSISSSSSYTYYADSVRGRFTISRDNAKNSLYLQMSSLRAEDTAVY YCARSASIAAGMDVWGKGTTVTVSSASTKGPSVFPLAPSSKSTSGGT AALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVV TVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPEL LGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDG VEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPS DIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNV FSCSVMHEALHNHYTQKSLSLSPG
445	ATX-P-568	HC IgG1 Fc	EVQLVESGGGLVQPGGSLRLSCAASGFPFSSYVMSWVRQAPGKGLE WVSVISVSGGSTFYADSVRGRFTISRDNSKNTLYLQVYSLRAEDTAV YYCAKDGLAVAGFDHWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGG TAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSV VTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPE LLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVD GVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVSN KALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFY PSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQG NVFSCSVMHEALHNHYTQKSLSLSPG
446	ATX-P-574	HC IgG1 Fc	EVQLVESGGGLVQRGGSLRLSCVASGFTFSSYAMSWVRQAPGKGLE WVSVISGSGGTTYYADSVKGRFTISRDDSKKTLYLQMNSLRAEDTAV YYCAKRGDYGDYMDVWGKGTTVTVSSASTKGPSVFPLAPSSKSTSG GTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSS VVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAP ELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVS NKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGF YPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQ GNVFSCSVMHEALHNHYTQKSLSLSPG
447	ATX-P-565	HC IgG1 Fc	QVQLVESGGGVVQPGRSLRLSCAASGFTFNTYGIHWVRQAPGKGLE WVAVIWHDGSSKNYVDSVTGRFTISRDNSKNTVYLQMNSLRAEDTA VYYCARRGNWNYGFYYYYMDVWGKGTTVTVSSASTKGPSVFPLAP SSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSS GLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHT CPPCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVK FNWYVDGVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTC LVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKS RWQQGNVFSCSVMHEALHNHYTQKSLSLSPG
448	ATX-P-578	HC IgG1 Fc	EVQLVESGGGLVQPGGSLRLSCAASGFTFSRYSMNWVRQAPGKGLE WVSYISSSSSTIFHADSVKGRFTISRDNAKNSLYLQMNSLRDEDTAVY YCARGNWNYYYMDVWGKGTTVTVSSASTKGPSVFPLAPSSKSTSGG TAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSV VTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPE LLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVD GVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVSN KALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFY PSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQG NVFSCSVMHEALHNHYTQKSLSLSPG
449	ATX-P-569	HC IgG1 Fc	EVQLVESGGGLAQFGRSLRLSCAASGFTFDDYAMHWLRQAPGMGLE WVSGISWNSGSIGYADSVKGRFTIARDNAKNSVHLQMNSLRAEDTAL YYCAKDIGNGYTKGDVFDIWGQGTMVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS

			LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPC PAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNW YVDGVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCK VSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVK GFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRW QQGNVFSCSVMHEALHNHYTQKSLSLSPG
450	ATX-P-576	HC IgG1 Fc	EVQLVESGGGLVQPGRSLRLSCTASGFTFDDYEMHWVRQAPGKGLE WVSDISRNSGRIGYADSVKGRFTISRDNAKNSLYLQMNSLRAEDTAL YYCAKDIWGSGYFDYWGQGILVTVSSASTKGPSVFPLAPSSKSTSGGT AALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVV TVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPEL LGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDG VEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPS DIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNV FSCSVMHEALHNHYTQKSLSLSPG
451	ATX-P-588	HC IgG1 Fc	EVQLVESGGGLVQPGRSLRLSCAASGFTFEDYAMHWVRQAPGKGLE WVSGISWNSGSIGYADSVKGRFTISRDNAKKSLYLQMNSLRAEDTAL YYCTKDRDDGYNYAGVFDYWGQGTLVTVSSASTKGPSVFPLAPSSK STSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPP CPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFN WYVDGVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKC KVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLV KGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSR WQQGNVFSCSVMHEALHNHYTQKSLSLSPG
452	ATX-P-596	HC IgG1 Fc	EVQLVESGGGLVQPGRSLRLSCAASGFSFDDYAMHWVRQVPGKGLE WVSGISWTGGSVGYADPVKGRFTISRDNAKNSLYLQMNSLRPEDTAL YYCAKDMGDGYSRNWPFDYWGQGTLVTVSSASTKGPSVFPLAPSSK STSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPP CPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFN WYVDGVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKC KVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLV KGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSR WQQGNVFSCSVMHEALHNHYTQKSLSLSPG
453	ATX-P-600	HC IgG1 Fc	EVQLVESGGGLVQPGRSLRLSCAASGFTFDDYAMHWVRQVPGRGLE WVSGISWSGGSIGYADSVKGRFTISRDNSKNSLYLQMNSLRAEDTAL YYCTKDREDGYNYGGVFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPC PAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNW YVDGVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCK VSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVK GFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRW QQGNVFSCSVMHEALHNHYTQKSLSLSPG
454	ATX-P-564	HC IgG1 Fc – nucleotide	GAGGTGCAGCTGGTGGAGTCTGGGGGAGGCCTGGTCAAGCCTGGG GGGTCCCTGAGACTCTCCTGTGCAGCCTCTGGATTCACCTTCAGTA GCTATACCATGAACTGGGTCCGCCAGGCTCCAGGGAAGGGGCTGG AGTGGGTGTCATCCATTAGTAGTAGTAGTAGTTACACATACTACGC AGACTCAGTGAGGGGCCGATTCACCATCTCCAGAGACAACGCCAA GAACTCACTGTATCTGCAAATGAGCAGCCTGAGAGCCGAGGACAC AGCTGTGTATTACTGTGCGAGATCGGCGAGTATAGCAGCTGGGAT GGACGTCTGGGGCAAAGGGACCACGGTCACCGTCTCCTCAGCTAG CACTAAAGGGCCTTCTGTATTTCCCTTGGCCCCGTCCAGCAAATCG ACCTCGGGAGGGACAGCCGCCCTGGGTTGCCTTGTGAAAGATTAT

			TTCCCTGAGCCAGTTACCGTAAGTTGGAACAGTGGGGCGCTGACA AGTGGTGTGCACACGTTTCCTGCCGTCCTGCAATCATCGGGCTTGT ATAGCCTCAGCTCTGTGGTCACTGTCCCAAGTTCATCGCTGGGCAC TCAGACGTATATTTGCAATGTGAACCACAAACCTTCAAATACAAA AGTGGATAAACGCGTAGAACCGAAATCGTGTGATAAAACTCACAC ATGCCCGCCATGCCCGGCACCTGAACTGCTTGGTGGTCCCAGCGTG TTCCTGTTCCCGCCGAAGCCTAAAGATACTCTAATGATCAGCCGTA CGCCAGAGGTGACATGTGTCGTGGTTGACGTGTCCCACGAAGATC CCGAAGTTAAGTTCAATTGGTATGTTGATGGTGTAGAGGTACACA ATGCTAAGACTAAACCTCGCGAGGAGCAGTACGCCTCGACCTATC GTGTCGTGAGCGTTCTGACCGTCCTTCACCAAGATTGGCTTAACGG CAAAGAATATAAGTGCAAGGTAAGCAATAAAGCACTTCCGGCCCC AATCGAGAAAACCATTTCCAAGGCCAAAGGTCAACCAAGAGAACC CCAGGTGTATACTCTTCCGCCTTCTCGTGAGGAAATGACTAAAAAT CAAGTATCCCTTACGTGTCTGGTTAAAGGTTTTTATCCTAGCGATA TTGCTGTTGAATGGGAATCGAACGGTCAGCCGGAGAATAATTATA AAACAACGCCACCCGTCCTGGATAGCGACGGCTCATTTTTTCTGTA TAGCAAACTGACTGTAGATAAATCACGGTGGCAGCAGGGCAATGT ATTCAGTTGCTCCGTTATGCATGAAGCGTTACATAATCACTACACG CAGAAATCTCTTAGTCTTTCACCCGGT
455	ATX-P-568	HC IgG1 Fc – nucleotide	GAGGTGCAGCTGGTGGAGTCTGGGGGAGGCTTGGTACAGCCGGGG GGGTCCCTGAGACTCTCCTGTGCAGCCTCTGGATTCCCCTTTAGCA GCTATGTCATGAGCTGGGTCCGCCAGGCTCCAGGGAAGGGGCTGG AGTGGGTCTCAGTTATAAGTGTTAGTGGTGGTAGTACATTCTACGC AGACTCCGTGAGGGGCCGGTTCACCATCTCCAGAGACAATTCCAA GAACACGCTGTATCTGCAAGTGTACAGCCTGCGAGCCGAGGACAC GGCCGTATATTACTGTGCGAAAGATGGTTTGGCAGTGGCTGGTTTT GACCACTGGGGCCAGGGAACCCTGGTCACCGTCTCCTCAGCTAGC ACTAAAGGGCCTTCTGTATTTCCCTTGGCCCCGTCCAGCAAATCGA CCTCGGGAGGGACAGCCGCCCTGGGTTGCCTTGTGAAAGATTATTT CCCTGAGCCAGTTACCGTAAGTTGGAACAGTGGGGCGCTGACAAG TGGTGTGCACACGTTTCCTGCCGTCCTGCAATCATCGGGCTTGTAT AGCCTCAGCTCTGTGGTCACTGTCCCAAGTTCATCGCTGGGCACTC AGACGTATATTTGCAATGTGAACCACAAACCTTCAAATACAAAAG TGGATAAACGCGTAGAACCGAAATCGTGTGATAAAACTCACACAT GCCCGCCATGCCCGGCACCTGAACTGCTTGGTGGTCCCAGCGTGTT CCTGTTCCCGCCGAAGCCTAAAGATACTCTAATGATCAGCCGTACG CCAGAGGTGACATGTGTCGTGGTTGACGTGTCCCACGAAGATCCC GAAGTTAAGTTCAATTGGTATGTTGATGGTGTAGAGGTACACAAT GCTAAGACTAAACCTCGCGAGGAGCAGTACGCCTCGACCTATCGT GTCGTGAGCGTTCTGACCGTCCTTCACCAAGATTGGCTTAACGGCA AAGAATATAAGTGCAAGGTAAGCAATAAAGCACTTCCGGCCCCAA TCGAGAAAACCATTTCCAAGGCCAAAGGTCAACCAAGAGAACCCC AGGTGTATACTCTTCCGCCTTCTCGTGAGGAAATGACTAAAAATCA AGTATCCCTTACGTGTCTGGTTAAAGGTTTTTATCCTAGCGATATT GCTGTTGAATGGGAATCGAACGGTCAGCCGGAGAATAATTATAAA ACAACGCCACCCGTCCTGGATAGCGACGGCTCATTTTTTCTGTATA GCAAACTGACTGTAGATAAATCACGGTGGCAGCAGGGCAATGTAT TCAGTTGCTCCGTTATGCATGAAGCGTTACATAATCACTACACGCA GAAATCTCTTAGTCTTTCACCCGGT
456	ATX-P-574	HC IgG1 Fc – nucleotide	GAGGTGCAGCTGGTGGAGTCTGGGGGAGGCTTGGTACAGCGGGGG GGGTCCCTGAGACTCTCCTGTGTAGCCTCTGGATTCACCTTTAGTA GCTATGCCATGAGCTGGGTCCGCCAGGCTCCAGGGAAGGGGCTGG AGTGGGTCTCAGTTATTAGTGGTAGTGGTGGTACCACATACTACGC AGACTCCGTGAAGGGCCGGTTCACCATCTCCAGAGACGATTCCAA GAAGACACTGTATCTGCAAATGAACAGCCTGAGAGCCGAGGACAC

			GGCCGTATATTATTGTGCGAAAAGGGGTGACTACGGGGACTACAT GGACGTCTGGGGCAAAGGGACCACGGTCACCGTCTCCTCAGCTAG CACTAAAGGGCCTTCTGTATTTCCCTTGGCCCCGTCCAGCAAATCG ACCTCGGGAGGGACAGCCGCCCTGGGTTGCCTTGTGAAAGATTAT TTCCCTGAGCCAGTTACCGTAAGTTGGAACAGTGGGGCGCTGACA AGTGGTGTGCACACGTTTCCTGCCGTCCTGCAATCATCGGGCTTGT ATAGCCTCAGCTCTGTGGTCACTGTCCCAAGTTCATCGCTGGGCAC TCAGACGTATATTTGCAATGTGAACCACAAACCTTCAAATACAAA AGTGGATAAACGCGTAGAACCGAAATCGTGTGATAAAACTCACAC ATGCCCGCCATGCCCGGCACCTGAACTGCTTGGTGGTCCCAGCGTG TTCCTGTTCCCGCCGAAGCCTAAAGATACTCTAATGATCAGCCGTA CGCCAGAGGTGACATGTGTCGTGGTTGACGTGTCCCACGAAGATC CCGAAGTTAAGTTCAATTGGTATGTTGATGGTGTAGAGGTACACA ATGCTAAGACTAAACCTCGCGAGGAGCAGTACGCCTCGACCTATC GTGTCGTGAGCGTTCTGACCGTCCTTCACCAAGATTGGCTTAACGG CAAAGAATATAAGTGCAAGGTAAGCAATAAAGCACTTCCGGCCCC AATCGAGAAAACCATTTCCAAGGCCAAAGGTCAACCAAGAGAACC CCAGGTGTATACTCTTCCGCCTTCTCGTGAGGAAATGACTAAAAAT CAAGTATCCCTTACGTGTCTGGTTAAAGGTTTTTATCCTAGCGATA TTGCTGTTGAATGGGAATCGAACGGTCAGCCGGAGAATAATTATA AAACAACGCCACCCGTCCTGGATAGCGACGGCTCATTTTTTCTGTA TAGCAAACTGACTGTAGATAAATCACGGTGGCAGCAGGGCAATGT ATTCAGTTGCTCCGTTATGCATGAAGCGTTACATAATCACTACACG CAGAAATCTCTTAGTCTTTCACCCGGT
457	ATX-P-565	HC IgG1 Fc – nucleotide	CAGGTGCAGCTGGTGGAGTCTGGGGGAGGCGTGGTCCAGCCTGGG AGGTCCCTGAGACTCTCCTGTGCAGCGTCTGGATTCACCTTCAATA CCTATGGCATCCACTGGGTCCGCCAGGCTCCAGGCAAGGGACTGG AGTGGGTGGCAGTTATATGGCATGATGGAAGTAGTAAAAACTATG TAGACTCCGTGACGGGCCGATTCACCATCTCCAGAGACAATTCCA AGAACACGGTGTATCTGCAAATGAACAGCCTGAGAGCCGAGGACA CGGCTGTTTATTACTGTGCGAGAAGGGGTAACTGGAACTACGGCT TCTACTACTACTACATGGACGTCTGGGGCAAAGGAACCACGGTCA CCGTCTCCTCAGCTAGCACTAAAGGGCCTTCTGTATTTCCCTTGGC CCCGTCCAGCAAATCGACCTCGGGAGGGACAGCCGCCCTGGGTTG CCTTGTGAAAGATTATTTCCCTGAGCCAGTTACCGTAAGTTGGAAC AGTGGGGCGCTGACAAGTGGTGTGCACACGTTTCCTGCCGTCCTGC AATCATCGGGCTTGTATAGCCTCAGCTCTGTGGTCACTGTCCCAAG TTCATCGCTGGGCACTCAGACGTATATTTGCAATGTGAACCACAAA CCTTCAAATACAAAAGTGGATAAACGCGTAGAACCGAAATCGTGT GATAAAACTCACACATGCCCGCCATGCCCGGCACCTGAACTGCTT GGTGGTCCCAGCGTGTTCCTGTTCCCGCCGAAGCCTAAAGATACTC TAATGATCAGCCGTACGCCAGAGGTGACATGTGTCGTGGTTGACG TGTCCCACGAAGATCCCGAAGTTAAGTTCAATTGGTATGTTGATGG TGTAGAGGTACACAATGCTAAGACTAAACCTCGCGAGGAGCAGTA CGCCTCGACCTATCGTGTCGTGAGCGTTCTGACCGTCCTTCACCAA GATTGGCTTAACGGCAAAGAATATAAGTGCAAGGTAAGCAATAAA GCACTTCCGGCCCCAATCGAGAAAACCATTTCCAAGGCCAAAGGT CAACCAAGAGAACCCCAGGTGTATACTCTTCCGCCTTCTCGTGAGG AAATGACTAAAAATCAAGTATCCCTTACGTGTCTGGTTAAAGGTTT TTATCCTAGCGATATTGCTGTTGAATGGGAATCGAACGGTCAGCCG GAGAATAATTATAAAACAACGCCACCCGTCCTGGATAGCGACGGC TCATTTTTTCTGTATAGCAAACTGACTGTAGATAAATCACGGTGGC AGCAGGGCAATGTATTCAGTTGCTCCGTTATGCATGAAGCGTTACA TAATCACTACACGCAGAAATCTCTTAGTCTTTCACCCGGT
458	ATX-P-578	HC IgG1 Fc – nucleotide	GAGGTGCAGCTGGTGGAGTCTGGGGGAGGTTTGGTACAGCCTGGG GGGTCCCTGAGACTCTCCTGTGCAGCCTCTGGATTCACCTTCAGTA

			GATATAGCATGAACTGGGTCCGCCAGGCTCCAGGGAAGGGGCTGG AGTGGGTTTCATACATTAGTAGTAGTAGTAGTACCATTTTCCATGC AGACTCTGTGAAGGGCCGATTCACCATCTCCAGAGACAATGCCAA GAACTCACTGTACCTGCAAATGAACAGCCTGAGAGACGAGGACAC GGCTGTGTATTACTGTGCGAGAGGGAACTGGAACTACTACTACAT GGACGTCTGGGGCAAAGGGACCACGGTCACCGTCTCCTCAGCTAG CACTAAAGGGCCTTCTGTATTTCCCTTGGCCCCGTCCAGCAAATCG ACCTCGGGAGGGACAGCCGCCCTGGGTTGCCTTGTGAAAGATTAT TTCCCTGAGCCAGTTACCGTAAGTTGGAACAGTGGGGCGCTGACA AGTGGTGTGCACACGTTTCCTGCCGTCCTGCAATCATCGGGCTTGT ATAGCCTCAGCTCTGTGGTCACTGTCCCAAGTTCATCGCTGGGCAC TCAGACGTATATTTGCAATGTGAACCACAAACCTTCAAATACAAA AGTGGATAAACGCGTAGAACCGAAATCGTGTGATAAAACTCACAC ATGCCCGCCATGCCCGGCACCTGAACTGCTTGGTGGTCCCAGCGTG TTCCTGTTCCCGCCGAAGCCTAAAGATACTCTAATGATCAGCCGTA CGCCAGAGGTGACATGTGTCGTGGTTGACGTGTCCCACGAAGATC CCGAAGTTAAGTTCAATTGGTATGTTGATGGTGTAGAGGTACACA ATGCTAAGACTAAACCTCGCGAGGAGCAGTACGCCTCGACCTATC GTGTCGTGAGCGTTCTGACCGTCCTTCACCAAGATTGGCTTAACGG CAAAGAATATAAGTGCAAGGTAAGCAATAAAGCACTTCCGGCCCC AATCGAGAAAACCATTTCCAAGGCCAAAGGTCAACCAAGAGAACC CCAGGTGTATACTCTTCCGCCTTCTCGTGAGGAAATGACTAAAAAT CAAGTATCCCTTACGTGTCTGGTTAAAGGTTTTTATCCTAGCGATA TTGCTGTTGAATGGGAATCGAACGGTCAGCCGGAGAATAATTATA AAACAACGCCACCCGTCCTGGATAGCGACGGCTCATTTTTTCTGTA TAGCAAACTGACTGTAGATAAATCACGGTGGCAGCAGGGCAATGT ATTCAGTTGCTCCGTTATGCATGAAGCGTTACATAATCACTACACG CAGAAATCTCTTAGTCTTTCACCCGGT
459	ATX-P-569	HC IgG1 Fc – nucleotide	GAAGTGCAGCTGGTGGAGTCTGGGGGAGGCTTGGCACAGTTTGGC AGGTCCCTGAGACTCTCCTGTGCAGCCTCTGGATTCACCTTTGATG ATTATGCCATGCACTGGCTCCGGCAAGCTCCAGGGATGGGCCTGG AGTGGGTCTCAGGTATTAGTTGGAATAGCGGGAGCATAGGCTATG CGGACTCTGTGAAGGGCCGATTCACCATCGCCAGAGACAACGCCA AGAACTCCGTGCATCTGCAAATGAACAGTCTGAGAGCTGAGGACA CGGCCTTGTATTACTGTGCAAAAGATATAGGAAATGGATATACGA AGGGTGATGTTTTTGATATCTGGGGACAAGGGACAATGGTCACCG TCTCTTCAGCTAGCACTAAAGGGCCTTCTGTATTTCCCTTGGCCCC GTCCAGCAAATCGACCTCGGGAGGGACAGCCGCCCTGGGTTGCCT TGTGAAAGATTATTTCCCTGAGCCAGTTACCGTAAGTTGGAACAGT GGGGCGCTGACAAGTGGTGTGCACACGTTTCCTGCCGTCCTGCAAT CATCGGGCTTGTATAGCCTCAGCTCTGTGGTCACTGTCCCAAGTTC ATCGCTGGGCACTCAGACGTATATTTGCAATGTGAACCACAAACC TTCAAATACAAAAGTGGATAAACGCGTAGAACCGAAATCGTGTGA TAAAACTCACACATGCCCGCCATGCCCGGCACCTGAACTGCTTGGT GGTCCCAGCGTGTTCCTGTTCCCGCCGAAGCCTAAAGATACTCTAA TGATCAGCCGTACGCCAGAGGTGACATGTGTCGTGGTTGACGTGT CCCACGAAGATCCCGAAGTTAAGTTCAATTGGTATGTTGATGGTGT AGAGGTACACAATGCTAAGACTAAACCTCGCGAGGAGCAGTACGC CTCGACCTATCGTGTCGTGAGCGTTCTGACCGTCCTTCACCAAGAT TGGCTTAACGGCAAAGAATATAAGTGCAAGGTAAGCAATAAAGCA CTTCCGGCCCCAATCGAGAAAACCATTTCCAAGGCCAAAGGTCAA CCAAGAGAACCCCAGGTGTATACTCTTCCGCCTTCTCGTGAGGAA ATGACTAAAAATCAAGTATCCCTTACGTGTCTGGTTAAAGGTTTTT ATCCTAGCGATATTGCTGTTGAATGGGAATCGAACGGTCAGCCGG AGAATAATTATAAAACAACGCCACCCGTCCTGGATAGCGACGGCT CATTTTTTCTGTATAGCAAACTGACTGTAGATAAATCACGGTGGCA

			GCAGGGCAATGTATTCAGTTGCTCCGTTATGCATGAAGCGTTACAT AATCACTACACGCAGAAATCTCTTAGTCTTTCACCCGGT
460	ATX-P-576	HC IgG1 Fc – nucleotide	GAAGTGCAGCTGGTGGAGTCTGGGGGAGGCTTGGTACAGCCTGGC AGGTCCCTGAGACTCTCCTGTACAGCCTCTGGATTCACATTTGATG ATTATGAAATGCACTGGGTCCGGCAAGCTCCAGGGAAGGGCCTGG AGTGGGTCTCAGATATTAGTCGGAACAGTGGTAGAATAGGCTATG CGGACTCTGTGAAGGGCCGATTCACCATTTCCAGAGACAACGCCA AGAACTCCCTGTATCTACAAATGAACAGTCTGAGAGCTGAGGACA CGGCCTTGTATTACTGTGCAAAAGATATTTGGGGATCGGGGTACTT TGACTATTGGGGCCAGGGAATCCTGGTCACCGTCTCCTCAGCTAGC ACTAAAGGGCCTTCTGTATTTCCCTTGGCCCCGTCCAGCAAATCGA CCTCGGGAGGGACAGCCGCCCTGGGTTGCCTTGTGAAAGATTATTT CCCTGAGCCAGTTACCGTAAGTTGGAACAGTGGGGCGCTGACAAG TGGTGTGCACACGTTTCCTGCCGTCCTGCAATCATCGGGCTTGTAT AGCCTCAGCTCTGTGGTCACTGTCCCAAGTTCATCGCTGGGCACTC AGACGTATATTTGCAATGTGAACCACAAACCTTCAAATACAAAAG TGGATAAACGCGTAGAACCGAAATCGTGTGATAAAACTCACACAT GCCCGCCATGCCCGGCACCTGAACTGCTTGGTGGTCCCAGCGTGTT CCTGTTCCCGCCGAAGCCTAAAGATACTCTAATGATCAGCCGTACG CCAGAGGTGACATGTGTCGTGGTTGACGTGTCCCACGAAGATCCC GAAGTTAAGTTCAATTGGTATGTTGATGGTGTAGAGGTACACAAT GCTAAGACTAAACCTCGCGAGGAGCAGTACGCCTCGACCTATCGT GTCGTGAGCGTTCTGACCGTCCTTCACCAAGATTGGCTTAACGGCA AAGAATATAAGTGCAAGGTAAGCAATAAAGCACTTCCGGCCCCAA TCGAGAAAACCATTTCCAAGGCCAAAGGTCAACCAAGAGAACCCC AGGTGTATACTCTTCCGCCTTCTCGTGAGGAAATGACTAAAAATCA AGTATCCCTTACGTGTCTGGTTAAAGGTTTTTATCCTAGCGATATT GCTGTTGAATGGGAATCGAACGGTCAGCCGGAGAATAATTATAAA ACAACGCCACCCGTCCTGGATAGCGACGGCTCATTTTTTCTGTATA GCAAACTGACTGTAGATAAATCACGGTGGCAGCAGGGCAATGTAT TCAGTTGCTCCGTTATGCATGAAGCGTTACATAATCACTACACGCA GAAATCTCTTAGTCTTTCACCCGGT
461	ATX-P-588	HC IgG1 Fc – nucleotide	GAAGTGCAGCTGGTGGAGTCCGGGGGAGGCTTGGTACAACCTGGC AGGTCCCTGAGACTCTCCTGTGCAGCCTCTGGATTCACCTTTGAAG ATTATGCCATGCACTGGGTCCGGCAAGCTCCAGGGAAGGGCCTGG AGTGGGTCTCAGGTATTAGTTGGAATAGTGGTAGCATAGGCTATG CGGACTCTGTGAAGGGCCGATTCACCATCTCCAGAGACAACGCCA AGAAATCCCTGTATCTGCAAATGAACAGTCTGAGAGCTGAGGACA CGGCCTTATATTACTGTACAAAAGATAGAGATGATGGCTACAACT ATGCGGGGGTCTTTGACTACTGGGGCCAGGGAACCCTGGTCACTG TCTCCTCAGCTAGCACTAAAGGGCCTTCTGTATTTCCCTTGGCCCC GTCCAGCAAATCGACCTCGGGAGGGACAGCCGCCCTGGGTTGCCT TGTGAAAGATTATTTCCCTGAGCCAGTTACCGTAAGTTGGAACAGT GGGGCGCTGACAAGTGGTGTGCACACGTTTCCTGCCGTCCTGCAAT CATCGGGCTTGTATAGCCTCAGCTCTGTGGTCACTGTCCCAAGTTC ATCGCTGGGCACTCAGACGTATATTTGCAATGTGAACCACAAACC TTCAAATACAAAAGTGGATAAACGCGTAGAACCGAAATCGTGTGA TAAAACTCACACATGCCCGCCATGCCCGGCACCTGAACTGCTTGGT GGTCCCAGCGTGTTCCTGTTCCCGCCGAAGCCTAAAGATACTCTAA TGATCAGCCGTACGCCAGAGGTGACATGTGTCGTGGTTGACGTGT CCCACGAAGATCCCGAAGTTAAGTTCAATTGGTATGTTGATGGTGT AGAGGTACACAATGCTAAGACTAAACCTCGCGAGGAGCAGTACGC CTCGACCTATCGTGTCGTGAGCGTTCTGACCGTCCTTCACCAAGAT TGGCTTAACGGCAAAGAATATAAGTGCAAGGTAAGCAATAAAGCA CTTCCGGCCCCAATCGAGAAAACCATTTCCAAGGCCAAAGGTCAA CCAAGAGAACCCCAGGTGTATACTCTTCCGCCTTCTCGTGAGGAA

			ATGACTAAAAATCAAGTATCCCTTACGTGTCTGGTTAAAGGTTTTT ATCCTAGCGATATTGCTGTTGAATGGGAATCGAACGGTCAGCCGG AGAATAATTATAAAACAACGCCACCCGTCCTGGATAGCGACGGCT CATTTTTTCTGTATAGCAAACTGACTGTAGATAAATCACGGTGGCA GCAGGGCAATGTATTCAGTTGCTCCGTTATGCATGAAGCGTTACAT AATCACTACACGCAGAAATCTCTTAGTCTTTCACCCGGT
462	ATX-P-596	HC IgG1 Fc – nucleotide	GAAGTGCAGCTGGTGGAGTCTGGGGGAGGCTTGGTACAGCCTGGC AGGTCCCTGAGACTCTCCTGTGCAGCCTCTGGGTTCAGTTTTGATG ATTATGCCATGCACTGGGTCCGGCAAGTTCCAGGGAAGGGCCTGG AATGGGTCTCAGGTATTAGTTGGACTGGTGGTAGCGTAGGCTATG CGGACCCCGTGAAGGGCCGATTCACCATCTCCAGAGACAACGCCA AGAACTCCCTGTATCTGCAAATGAACAGTCTGAGACCTGAGGACA CGGCCTTGTATTACTGTGCAAAAGATATGGGAGACGGGTATAGCA GAAACTGGCCCTTTGACTACTGGGGCCAGGGAACCCTGGTCACCG TCTCCTCAGCTAGCACTAAAGGGCCTTCTGTATTTCCCTTGGCCCC GTCCAGCAAATCGACCTCGGGAGGGACAGCCGCCCTGGGTTGCCT TGTGAAAGATTATTTCCCTGAGCCAGTTACCGTAAGTTGGAACAGT GGGGCGCTGACAAGTGGTGTGCACACGTTTCCTGCCGTCCTGCAAT CATCGGGCTTGTATAGCCTCAGCTCTGTGGTCACTGTCCCAAGTTC ATCGCTGGGCACTCAGACGTATATTTGCAATGTGAACCACAAACC TTCAAATACAAAAGTGGATAAACGCGTAGAACCGAAATCGTGTGA TAAAACTCACACATGCCCGCCATGCCCGGCACCTGAACTGCTTGGT GGTCCCAGCGTGTTCCTGTTCCCGCCGAAGCCTAAAGATACTCTAA TGATCAGCCGTACGCCAGAGGTGACATGTGTCGTGGTTGACGTGT CCCACGAAGATCCCGAAGTTAAGTTCAATTGGTATGTTGATGGTGT AGAGGTACACAATGCTAAGACTAAACCTCGCGAGGAGCAGTACGC CTCGACCTATCGTGTCGTGAGCGTTCTGACCGTCCTTCACCAAGAT TGGCTTAACGGCAAAGAATATAAGTGCAAGGTAAGCAATAAAGCA CTTCCGGCCCCAATCGAGAAAACCATTTCCAAGGCCAAAGGTCAA CCAAGAGAACCCCAGGTGTATACTCTTCCGCCTTCTCGTGAGGAA ATGACTAAAAATCAAGTATCCCTTACGTGTCTGGTTAAAGGTTTTT ATCCTAGCGATATTGCTGTTGAATGGGAATCGAACGGTCAGCCGG AGAATAATTATAAAACAACGCCACCCGTCCTGGATAGCGACGGCT CATTTTTTCTGTATAGCAAACTGACTGTAGATAAATCACGGTGGCA GCAGGGCAATGTATTCAGTTGCTCCGTTATGCATGAAGCGTTACAT AATCACTACACGCAGAAATCTCTTAGTCTTTCACCCGGT
463	ATX-P-600	HC IgG1 Fc – nucleotide	GAAGTGCAGCTGGTGGAGTCTGGGGGAGGCTTGGTACAGCCTGGC AGGTCCCTGAGACTCTCCTGTGCAGCCTCTGGATTCACCTTTGATG ATTATGCCATGCACTGGGTCCGGCAAGTTCCAGGGAGGGGCCTGG AGTGGGTCTCAGGTATTAGTTGGAGTGGTGGCAGCATAGGCTATG CGGACTCTGTGAAGGGCCGATTCACCATCTCCAGAGACAACTCCA AGAACTCCCTGTATCTGCAAATGAACAGTCTGAGAGCTGAGGACA CGGCCTTGTATTACTGTACAAAAGATAGAGAAGATGGATACAACT ATGGGGGGGTCTTTGACTACTGGGGCCAGGGAACCCTGGTCACCG TCTCCTCAGCTAGCACTAAAGGGCCTTCTGTATTTCCCTTGGCCCC GTCCAGCAAATCGACCTCGGGAGGGACAGCCGCCCTGGGTTGCCT TGTGAAAGATTATTTCCCTGAGCCAGTTACCGTAAGTTGGAACAGT GGGGCGCTGACAAGTGGTGTGCACACGTTTCCTGCCGTCCTGCAAT CATCGGGCTTGTATAGCCTCAGCTCTGTGGTCACTGTCCCAAGTTC ATCGCTGGGCACTCAGACGTATATTTGCAATGTGAACCACAAACC TTCAAATACAAAAGTGGATAAACGCGTAGAACCGAAATCGTGTGA TAAAACTCACACATGCCCGCCATGCCCGGCACCTGAACTGCTTGGT GGTCCCAGCGTGTTCCTGTTCCCGCCGAAGCCTAAAGATACTCTAA TGATCAGCCGTACGCCAGAGGTGACATGTGTCGTGGTTGACGTGT CCCACGAAGATCCCGAAGTTAAGTTCAATTGGTATGTTGATGGTGT AGAGGTACACAATGCTAAGACTAAACCTCGCGAGGAGCAGTACGC

			CTCGACCTATCGTGTCGTGAGCGTTCTGACCGTCCTTCACCAAGAT TGGCTTAACGGCAAAGAATATAAGTGCAAGGTAAGCAATAAAGCA CTTCCGGCCCCAATCGAGAAAACCATTTCCAAGGCCAAAGGTCAA CCAAGAGAACCCCAGGTGTATACTCTTCCGCCTTCTCGTGAGGAA ATGACTAAAAATCAAGTATCCCTTACGTGTCTGGTTAAAGGTTTTT ATCCTAGCGATATTGCTGTTGAATGGGAATCGAACGGTCAGCCGG AGAATAATTATAAAACAACGCCACCCGTCCTGGATAGCGACGGCT CATTTTTTCTGTATAGCAAACTGACTGTAGATAAATCACGGTGGCA GCAGGGCAATGTATTCAGTTGCTCCGTTATGCATGAAGCGTTACAT AATCACTACACGCAGAAATCTCTTAGTCTTTCACCCGGT
464	ATX-P-564	LC Kappa	DIVMTQSPLSLPVTPGEPASISCRSSQSLLHSTGYNFLDWYLQKPGLSP QLLIYLASNRASGVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCMQA LQTPYTFGQGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFY PREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYE KHKVYACEVTHQGLSSPVTKSFNRGEC
465	ATX-P-568	LC Kappa	DIQMTQSPSTLSASVGDRVTITCRASQSISTWLAWYQQKPGKAPKLLI HKASGLESGVPSRFSGSGSGTEFTLTISSLQPDDFATYYCQQYNSFSLIF GGGTRVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKV QWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVY ACEVTHQGLSSPVTKSFNRGEC
466	ATX-P-574	LC Kappa	DIQMTQSPSSVSASVGDRVTITCRASQGITTWLAWYQQKPGKAPKLLI FGASSLESGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANSFPWT FGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAK VQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKV YACEVTHQGLSSPVTKSFNRGEC
467	ATX-P-565	LC Kappa	DIVMTQSPLSLPVTPGEPASISCRSSQRLLHSSGYNYLDWYLQKPGQS PQLLIYLGSSRASGVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCMQG LQTPPTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFY PREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYE KHKVYACEVTHQGLSSPVTKSFNRGEC
468	ATX-P-578	LC Kappa	DIQMTQSPSTLSASVGDRVTISCRASQSVNSWLAWYQQKPGKAPKLL IYKASNLEGGVPSSFSGSGSGTEFTLTISSLQPDDFATYYCQQYDTSWT FGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAK VQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKV YACEVTHQGLSSPVTKSFNRGEC
469	ATX-P-569	LC Kappa	DIQMTQSPSTLSASVGDSVTITCRASQNIITWLAWYQQKPGKAPNLLI YKASSLESGVPSRFSGSGSGTEFTLTISSLQPDDFATYYCQQYSSYSYT FGQGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAK VQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKV YACEVTHQGLSSPVTKSFNRGEC
470	ATX-P-576	LC Kappa	DIQMTQSPSSVSASVGDRVTITCRTSQGIRNWLAWYQQKPGKAPKLLI YAASSLQTGGPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANSFPYT FGQGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAK VQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKV YACEVTHQGLSSPVTKSFNRGEC
471	ATX-P-588	LC Kappa	EIVLTQSPATLSVSPGERATLSCRASQSVSSNLAWYQQKPGQAPRLLI YGASSRATGIPDRFSGSGSGTDFTLTISRLEPEDFAVYYCQQYGSSFTF GPGTKVDIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKV QWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVY ACEVTHQGLSSPVTKSFNRGEC
472	ATX-P-596	LC Kappa	DIVMTQSPDSLAVSLGERATINCKSSQSVLYSSNNKNYLAWYQQKPG QPPKLLIYWASTRESGVPDRFSGSGSGTDFTLTISSLQAEDVAVYYCQ QYGSSPMYTFGQGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLL NNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSK ADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

473	ATX-P-600	LC Kappa	EIVLTQSPGTLSLSPGERATLSCRASQNVRGSYLAWYQQKPGQAPRLL IYGASNRATDIPDRFSGSGSGTDFTLTISGLEPEDFVVYYCQQYGSSYT FGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAK VQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKV YACEVTHQGLSSPVTKSFNRGEC
474	ATX-P-564	LC Kappa – nucleotide	GATATTGTGATGACTCAGTCTCCACTCTCCCTGCCCGTCACCCCTG GAGAGCCGGCCTCCATCTCCTGCAGGTCTAGTCAGAGCCTCCTGCA TAGTACTGGATACAACTTTTTGGATTGGTACCTGCAGAAGCCAGG GCTGTCTCCACAGCTCCTGATCTATTTGGCTTCTAATCGGGCCTCC GGGGTCCCTGACAGGTTCAGTGGCAGTGGATCAGGCACAGATTTT ACACTGAAAATCAGCAGAGTGGAGGCTGAGGATGTTGGGGTTTAT TACTGCATGCAAGCTCTACAAACTCCGTACACTTTTGGCCAGGGGA CCAAGCTGGAGATCAAACGTACGGTAGCTGCCCCTTCAGTTTTTAT CTTTCCGCCGTCTGACGAGCAGTTAAAATCCGGGACCGCTTCTGTA GTTTGCCTGCTGAATAATTTTTATCCGCGTGAGGCTAAAGTACAAT GGAAAGTCGACAATGCTTTGCAGTCGGGAAATTCACAGGAAAGTG TTACGGAGCAGGATTCTAAAGATTCCACATATTCACTCAGCTCCAC CCTTACACTGAGCAAAGCCGACTATGAAAAACATAAAGTTTACGC ATGTGAGGTGACGCACCAAGGATTATCCAGTCCGGTCACAAAATC GTTTAACCGCGGTGAGTGT
475	ATX-P-568	LC Kappa – nucleotide	GACATCCAGATGACCCAGTCTCCTTCCACCCTGTCTGCCTCTGTAG GAGACAGAGTCACCATCACTTGCCGGGCCAGCCAGAGTATTAGTA CCTGGTTGGCCTGGTATCAGCAGAAACCAGGGAAAGCCCCTAAGC TCCTGATCCATAAGGCGTCTGGTTTAGAAAGTGGGGTCCCATCAA GATTCAGCGGCAGTGGATCTGGGACAGAATTCACTCTCACCATCA GCAGCCTGCAGCCTGATGATTTTGCAACTTATTACTGCCAACAGTA TAATAGTTTTTCTCTCATTTTCGGCGGAGGGACCAGGGTGGAGATC AAACGTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCTG ACGAGCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGAA TAATTTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACAA TGCTTTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGGA TTCTAAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAGC AAAGCCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGACG CACCAAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGGT GAGTGT
476	ATX-P-574	LC Kappa – nucleotide	GACATCCAGATGACCCAGTCTCCATCTTCCGTGTCTGCATCTGTAG GAGACAGAGTCACCATCACTTGTCGGGCGAGTCAGGGTATTACCA CCTGGTTAGCCTGGTATCAGCAGAAACCAGGGAAAGCCCCTAAGC TCCTGATCTTTGGTGCATCTAGTTTGGAAAGTGGGGTCCCATCAAG GTTCAGCGGCAGTGGATCTGGGACAGATTTCACTCTCACCATCAGC AGCCTGCAGCCTGAAGATTTTGCAACTTACTATTGTCAACAGGCTA ACAGTTTCCCGTGGACGTTCGGCCAAGGGACCAAGGTGGAAATCA AACGTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCTGA CGAGCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGAAT AATTTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACAAT GCTTTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGGAT TCTAAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAGCA AAGCCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGACGC ACCAAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGGTG AGTGT
477	ATX-P-565	LC Kappa – nucleotide	GATATTGTGATGACTCAGTCTCCACTCTCCCTGCCCGTCACCCCTG GAGAGCCGGCCTCCATCTCCTGCAGGTCTAGTCAGCGCCTCCTGCA TAGTAGTGGATACAATTATTTGGATTGGTATCTGCAGAAGCCAGG ACAGTCTCCACAGCTCCTGATCTATTTGGGTTCTAGTCGGGCCTCC GGGGTCCCTGACAGGTTCAGTGGCAGTGGATCAGGCACAGATTTT ACACTGAAAATCAGCAGGGTGGAGGCTGAGGATGTTGGGGTTTAT

			TACTGCATGCAAGGTCTACAAACTCCTCCGACGTTCGGCCAAGGG ACCAAGGTGGAAATCAAACGTACGGTAGCTGCCCCTTCAGTTTTTA TCTTTCCGCCGTCTGACGAGCAGTTAAAATCCGGGACCGCTTCTGT AGTTTGCCTGCTGAATAATTTTTATCCGCGTGAGGCTAAAGTACAA TGGAAAGTCGACAATGCTTTGCAGTCGGGAAATTCACAGGAAAGT GTTACGGAGCAGGATTCTAAAGATTCCACATATTCACTCAGCTCCA CCCTTACACTGAGCAAAGCCGACTATGAAAAACATAAAGTTTACG CATGTGAGGTGACGCACCAAGGATTATCCAGTCCGGTCACAAAAT CGTTTAACCGCGGTGAGTGT
478	ATX-P-578	LC Kappa – nucleotide	GACATCCAGATGACCCAGTCTCCTTCCACCCTGTCTGCATCTGTAG GAGACAGAGTCACCATCAGTTGCCGGGCCAGTCAGAGTGTTAATA GCTGGTTGGCCTGGTATCAGCAGAAACCAGGGAAAGCCCCTAAAC TCCTGATCTATAAGGCGTCTAATTTAGAAGGTGGGGTCCCATCAAG TTTCAGCGGCAGTGGATCTGGGACAGAATTCACTCTCACCATCAGC AGCCTGCAGCCTGATGATTTTGCAACTTATTACTGCCAACAATATG ATACTTCTTGGACGTTCGGCCAAGGGACCAAGGTGGAGATCAAAC GTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCTGACGA GCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGAATAAT TTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACAATGCT TTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGGATTCT AAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAGCAAAG CCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGACGCACC AAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGGTGAGT GT
479	ATX-P-569	LC Kappa – nucleotide	GACATCCAGATGACCCAGTCTCCTTCCACCCTGTCTGCATCTGTAG GAGACAGCGTCACCATCACTTGCCGGGCCAGTCAGAATATTATTA CCTGGTTGGCTTGGTATCAGCAGAAACCAGGGAAAGCCCCTAACC TCCTGATCTATAAGGCGTCTAGTTTAGAAAGTGGGGTCCCATCAAG GTTCAGCGGCAGTGGATCTGGGACAGAATTCACTCTCACCATCAG CAGCCTGCAGCCTGATGATTTTGCAACTTATTACTGCCAACAGTAT AGTAGTTATTCGTACACTTTTGGCCAGGGGACCAAGCTGGAGATC AAACGTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCTG ACGAGCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGAA TAATTTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACAA TGCTTTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGGA TTCTAAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAGC AAAGCCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGACG CACCAAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGGT GAGTGT
480	ATX-P-576	LC Kappa – nucleotide	GACATCCAGATGACCCAGTCTCCATCTTCCGTGTCTGCATCTGTAG GAGACAGAGTCACCATCACTTGTCGGACGAGTCAGGGTATTAGAA ACTGGTTAGCCTGGTATCAGCAGAAACCAGGGAAAGCCCCTAAAC TCCTGATCTATGCTGCATCCAGTTTGCAAACTGGGGGCCCATCAAG GTTCAGCGGCAGTGGATCTGGGACAGATTTCACTCTCACCATCAGC AGCCTGCAGCCTGAAGATTTTGCAACTTACTATTGTCAACAGGCTA ACAGTTTCCCGTACACTTTTGGCCAGGGGACCAAGCTGGAGATCA AACGTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCTGA CGAGCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGAAT AATTTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACAAT GCTTTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGGAT TCTAAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAGCA AAGCCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGACGC ACCAAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGGTG AGTGT
481	ATX-P-588	LC Kappa – nucleotide	GAAATTGTGTTGACGCAGTCTCCAGCCACCCTGTCTGTGTCTCCAG GGGAAAGAGCCACCCTCTCCTGCAGGGCCAGTCAGAGTGTTAGCA

			GCAACTTAGCCTGGTACCAGCAGAAACCTGGCCAGGCTCCCAGGC TCCTCATCTATGGTGCATCCAGCAGGGCCACTGGCATCCCAGACA GGTTCAGTGGCAGTGGGTCTGGGACAGACTTCACTCTCACCATCA GCAGACTGGAGCCTGAAGATTTTGCAGTGTATTACTGTCAGCAGT ATGGTAGCTCATTCACTTTCGGCCCTGGGACCAAAGTGGATATCAA ACGTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCTGAC GAGCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGAATA ATTTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACAATG CTTTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGGATT CTAAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAGCAA AGCCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGACGCA CCAAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGGTGA GTGT
482	ATX-P-596	LC Kappa – nucleotide	GACATCGTGATGACTCAGTCTCCAGACTCCCTGGCTGTGTCTCTGG GCGAGAGGGCCACCATCAACTGCAAGTCCAGCCAGAGTGTTTTAT ACAGCTCCAACAATAAGAACTACTTAGCTTGGTACCAGCAGAAAC CAGGACAGCCTCCTAAGCTGCTCATTTACTGGGCATCTACCCGGGA ATCCGGGGTCCCTGACCGATTCAGTGGCAGCGGGTCTGGGACAGA TTTCACTCTCACCATCAGCAGCCTGCAGGCTGAAGATGTGGCAGTT TATTACTGTCAGCAGTATGGTAGCTCACCCATGTACACTTTTGGCC AGGGGACCAAGCTGGAGATCAAACGTACGGTAGCTGCCCCTTCAG TTTTTATCTTTCCGCCGTCTGACGAGCAGTTAAAATCCGGGACCGC TTCTGTAGTTTGCCTGCTGAATAATTTTTATCCGCGTGAGGCTAAA GTACAATGGAAAGTCGACAATGCTTTGCAGTCGGGAAATTCACAG GAAAGTGTTACGGAGCAGGATTCTAAAGATTCCACATATTCACTC AGCTCCACCCTTACACTGAGCAAAGCCGACTATGAAAAACATAAA GTTTACGCATGTGAGGTGACGCACCAAGGATTATCCAGTCCGGTC ACAAAATCGTTTAACCGCGGTGAGTGT
483	ATX-P-600	LC Kappa – nucleotide	GAAATTGTGTTGACGCAGTCTCCAGGCACCCTGTCTTTGTCTCCAG GGGAAAGAGCCACCCTCTCCTGCAGGGCCAGTCAGAATGTTAGGG GCAGCTACTTAGCCTGGTACCAGCAGAAACCTGGCCAGGCTCCCA GGCTCCTCATATATGGTGCATCCAACAGGGCCACTGACATCCCAG ACAGGTTCAGTGGCAGTGGGTCTGGGACAGACTTCACTCTCACCA TCAGCGGCCTGGAGCCTGAAGATTTTGTAGTGTATTACTGTCAGCA GTATGGTAGTTCGTACACTTTTGGCCAGGGGACCAAGGTGGAGAT CAAACGTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCT GACGAGCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGA ATAATTTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACA ATGCTTTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGG ATTCTAAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAG CAAAGCCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGAC GCACCAAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGG TGAGTGT
484	ATX-P-571	HC IgG1 Fc	QVQLQESGPGLVKPSGTLSLTCAVSGGSISSRNWWSWVRQPPGKGLE WIGEIYHGGTTNYNPSLKSRVTISVDKSKNQFSLKLSSVTAADTAVYY CARGGLRLGELSPNAFDIWGQGTMVTVSSASTKGPSVFPLAPSSKSTS GGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLS SVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPA PELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVS NKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGF YPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQ GNVFSCSVMHEALHNHYTQKSLSLSPG
485	ATX-P-577	HC IgG1 Fc	QVQLQESGPGLVKPSGTLSLTCAVSGGSISSSNWWTWVRQPPGKGLE WIGETYHDGSTNYNPSLKSRVTISVDKSKNQFSLKLSSVTAADTAVY YCLEFYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCL

			VKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSL GTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPELLGGPSVF LFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNA KTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIE KTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEW ESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVM HEALHNHYTQKSLSLSPG
486	ATX-P-579	HC IgG1 Fc	QVQLQESGPGLVKPSGTLSLTCAVSGASISTSNWWTWVRQPPGKGLE WIGEIYHDGSTNYSPSLQSRVTISVDKSKNQFSLTLTSVTAADTAIYYC GDFYIDVWGNGTTVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVK DYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGT QTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPELLGGPSVFLF PPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKT KPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTI SKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWES NGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMH EALHNHYTQKSLSLSPG
487	ATX-P-580	HC IgG1 Fc	QVQLQESGPGLVKPSGTLSLTCAVSGGSISTSDWWTWVRQPPGKGLE WIGEIYHSGSTNYNPSLKSRVTISVDKSKNQFSLKLSSVTAADTAVYY CADWYFDLWGRGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCL VKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSL GTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPELLGGPSVF LFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNA KTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIE KTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEW ESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVM HEALHNHYTQKSLSLSPG
488	ATX-P-582	HC IgG1 Fc	QVQLQESGPGLVKPSGTLSLTCAVSGGSISISKWWSWVRQPPGKGLE WIGEIYHTGSTNYHPSLKSRVTISVDKSKNQFYLKLNSVTAADTAVY YCARDELRLGELSPSLDIWGQGTMVTVSSASTKGPSVFPLAPSSKSTS GGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLS SVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPA PELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVS NKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGF YPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQ GNVFSCSVMHEALHNHYTQKSLSLSPG
489	ATX-P-598	HC IgG1 Fc	QVQLQESGPGLVKPSGTLSLTCAVSGGSISSSNWWSWVRQSPGKGLE WIGEIYHSGTTNYNPSLKSRVTISVDKSKNQFSLKLSSATAADTAVYY CARDRLRLGESSSDVFDIWGQGTMVTVSSASTKGPSVFPLAPSSKSTS GGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLS SVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPA PELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVS NKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGF YPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQ GNVFSCSVMHEALHNHYTQKSLSLSPG
490	ATX-P-603	HC IgG1 Fc	QVQLQESGPGLVKPSGTLSLTCAVSGGSISGSHWWSWFRQPPGKGLE WIGEIYHTGSTNKNPSLKSRVTISLDKSKNQFSLRLRSVTDADTAVYY CARDQYTGSPRDAFDIWGQGTMVTVSSASTKGPSVFPLAPSSKSTSG GTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSS VVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAP ELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVS NKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGF

			YPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQ GNVFSCSVMHEALHNHYTQKSLSLSPG
491	ATX-P-608	HC IgG1 Fc	QVQLQESGPGLVKPSGTLSLTCAVSGGSISSSNWWSWVRQSPGKGLE WIGEIYHTGSTNKKPSLKSRVIISVDKSKNQFSLKLISVNAADTAIYYC ARDREGGTTEAFDIWGQGTMVTVSSASTKGPSVFPLAPSSKSTSGGTA ALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVT VPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPELL GGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGV EVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVSNKA LPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVF SCSVMHEALHNHYTQKSLSLSPG
492	ATX-P-609	HC IgG1 Fc	QVQLQESGPGLVKPSGTLSLTCAVSGGSISSSNWWSWVRQPPGKGLE WIGEIYHSGSTNYNPSLKSRVTISVDKSKNQFSLKLRSVTAADTAVYY CARDQLSSGPTDAFDIWGQGTMVTVSSASTKGPSVFPLAPSSKSTSGG TAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSV VTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPE LLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVD GVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVSN KALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFY PSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQG NVFSCSVMHEALHNHYTQKSLSLSPG
493	ATX-P-563	HC IgG1 Fc	QVQLQESGPGLMKPSETLSLTCTVSGGSISSHYWSWIRQPPGKGLEWI GYIFYSGNINYNPSLKSRVTISVDTSKNQFSLKLRSVTTADTAVYYCA RDRGGSYSYHFDCWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTA ALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVT VPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPELL GGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGV EVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVSNKA LPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVF SCSVMHEALHNHYTQKSLSLSPG
494	ATX-P-570	HC IgG1 Fc	QVQLQESGPGLVKPSETMSLTCTVSGGSFTGYYWSWIRQPPGKGLEW IGYVHYSGGTKSNPSLKSRVTISVDTSKNQFSLKLSSVTAADTAVYYC ARERYEWNSYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTA ALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVT VPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPELL GGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGV EVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVSNKA LPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVF SCSVMHEALHNHYTQKSLSLSPG
495	ATX-P-571	HC IgG1 Fc – nucleotide	CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGGTGAAGCCTTCG GGGACCCTGTCCCTCACCTGTGCTGTCTCGGGTGGCTCCATCAGTA GTCGTAACTGGTGGAGTTGGGTCCGCCAGCCCCCAGGGAAGGGGC TGGAGTGGATTGGGGAAATCTATCATGGTGGGACCACCAACTACA ACCCGTCCCTTAAGAGTCGAGTCACCATATCAGTAGACAAGTCCA AGAACCAATTCTCCCTGAAGCTGAGTTCTGTGACCGCCGCGGACA CGGCCGTGTATTACTGTGCGAGAGGGGGATTACGTTTGGGGGAGT TATCGCCTAATGCTTTTGATATCTGGGGACAAGGGACAATGGTCAC CGTCTCTTCAGCTAGCACTAAAGGGCCTTCTGTATTTCCCTTGGCC CCGTCCAGCAAATCGACCTCGGGAGGGACAGCCGCCCTGGGTTGC CTTGTGAAAGATTATTTCCCTGAGCCAGTTACCGTAAGTTGGAACA GTGGGGCGCTGACAAGTGGTGTGCACACGTTTCCTGCCGTCCTGCA ATCATCGGGCTTGTATAGCCTCAGCTCTGTGGTCACTGTCCCAAGT TCATCGCTGGGCACTCAGACGTATATTTGCAATGTGAACCACAAA

			CCTTCAAATACAAAAGTGGATAAACGCGTAGAACCGAAATCGTGT GATAAAACTCACACATGCCCGCCATGCCCGGCACCTGAACTGCTT GGTGGTCCCAGCGTGTTCCTGTTCCCGCCGAAGCCTAAAGATACTC TAATGATCAGCCGTACGCCAGAGGTGACATGTGTCGTGGTTGACG TGTCCCACGAAGATCCCGAAGTTAAGTTCAATTGGTATGTTGATGG TGTAGAGGTACACAATGCTAAGACTAAACCTCGCGAGGAGCAGTA CGCCTCGACCTATCGTGTCGTGAGCGTTCTGACCGTCCTTCACCAA GATTGGCTTAACGGCAAAGAATATAAGTGCAAGGTAAGCAATAAA GCACTTCCGGCCCCAATCGAGAAAACCATTTCCAAGGCCAAAGGT CAACCAAGAGAACCCCAGGTGTATACTCTTCCGCCTTCTCGTGAGG AAATGACTAAAAATCAAGTATCCCTTACGTGTCTGGTTAAAGGTTT TTATCCTAGCGATATTGCTGTTGAATGGGAATCGAACGGTCAGCCG GAGAATAATTATAAAACAACGCCACCCGTCCTGGATAGCGACGGC TCATTTTTTCTGTATAGCAAACTGACTGTAGATAAATCACGGTGGC AGCAGGGCAATGTATTCAGTTGCTCCGTTATGCATGAAGCGTTACA TAATCACTACACGCAGAAATCTCTTAGTCTTTCACCCGGT
496	ATX-P-577	HC IgG1 Fc – nucleotide	CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGGTGAAGCCTTCG GGGACCCTGTCCCTCACCTGCGCTGTCTCTGGTGGCTCCATCAGCA GTAGTAACTGGTGGACTTGGGTCCGCCAGCCCCCAGGGAAGGGGC TGGAGTGGATTGGGGAAACCTATCATGATGGGAGCACCAACTACA ACCCGTCCCTCAAGAGTCGAGTCACCATTTCAGTAGACAAGTCCA AGAACCAATTCTCCCTGAAACTGAGTTCTGTGACCGCCGCGGACA CGGCCGTGTATTACTGTTTGGAATTCTACTTTGACTACTGGGGCCA GGGAACCCTGGTCACCGTCTCCTCAGCTAGCACTAAAGGGCCTTCT GTATTTCCCTTGGCCCCGTCCAGCAAATCGACCTCGGGAGGGACA GCCGCCCTGGGTTGCCTTGTGAAAGATTATTTCCCTGAGCCAGTTA CCGTAAGTTGGAACAGTGGGGCGCTGACAAGTGGTGTGCACACGT TTCCTGCCGTCCTGCAATCATCGGGCTTGTATAGCCTCAGCTCTGT GGTCACTGTCCCAAGTTCATCGCTGGGCACTCAGACGTATATTTGC AATGTGAACCACAAACCTTCAAATACAAAAGTGGATAAACGCGTA GAACCGAAATCGTGTGATAAAACTCACACATGCCCGCCATGCCCG GCACCTGAACTGCTTGGTGGTCCCAGCGTGTTCCTGTTCCCGCCGA AGCCTAAAGATACTCTAATGATCAGCCGTACGCCAGAGGTGACAT GTGTCGTGGTTGACGTGTCCCACGAAGATCCCGAAGTTAAGTTCA ATTGGTATGTTGATGGTGTAGAGGTACACAATGCTAAGACTAAAC CTCGCGAGGAGCAGTACGCCTCGACCTATCGTGTCGTGAGCGTTCT GACCGTCCTTCACCAAGATTGGCTTAACGGCAAAGAATATAAGTG CAAGGTAAGCAATAAAGCACTTCCGGCCCCAATCGAGAAAACCAT TTCCAAGGCCAAAGGTCAACCAAGAGAACCCCAGGTGTATACTCT TCCGCCTTCTCGTGAGGAAATGACTAAAAATCAAGTATCCCTTACG TGTCTGGTTAAAGGTTTTTATCCTAGCGATATTGCTGTTGAATGGG AATCGAACGGTCAGCCGGAGAATAATTATAAAACAACGCCACCCG TCCTGGATAGCGACGGCTCATTTTTTCTGTATAGCAAACTGACTGT AGATAAATCACGGTGGCAGCAGGGCAATGTATTCAGTTGCTCCGT TATGCATGAAGCGTTACATAATCACTACACGCAGAAATCTCTTAGT CTTTCACCCGGT
497	ATX-P-579	HC IgG1 Fc – nucleotide	CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGGTGAAGCCTTCG GGGACCCTGTCCCTCACCTGCGCTGTGTCTGGTGCCTCCATCAGCA CAAGTAATTGGTGGACTTGGGTCCGCCAGCCCCCAGGGAAGGGGC TGGAGTGGATTGGTGAAATCTATCATGATGGGAGCACCAACTACA GCCCGTCCCTCCAGAGTCGAGTCACCATATCAGTAGACAAGTCCA AGAACCAGTTCTCCCTGACGCTGACCTCTGTGACCGCCGCGGACA CGGCCATTTATTATTGTGGTGACTTCTACATAGACGTCTGGGGCAA CGGGACCACGGTCACCGTCTCCTCAGCTAGCACTAAAGGGCCTTCT GTATTTCCCTTGGCCCCGTCCAGCAAATCGACCTCGGGAGGGACA GCCGCCCTGGGTTGCCTTGTGAAAGATTATTTCCCTGAGCCAGTTA

			CCGTAAGTTGGAACAGTGGGGCGCTGACAAGTGGTGTGCACACGT TTCCTGCCGTCCTGCAATCATCGGGCTTGTATAGCCTCAGCTCTGT GGTCACTGTCCCAAGTTCATCGCTGGGCACTCAGACGTATATTTGC AATGTGAACCACAAACCTTCAAATACAAAAGTGGATAAACGCGTA GAACCGAAATCGTGTGATAAAACTCACACATGCCCGCCATGCCCG GCACCTGAACTGCTTGGTGGTCCCAGCGTGTTCCTGTTCCCGCCGA AGCCTAAAGATACTCTAATGATCAGCCGTACGCCAGAGGTGACAT GTGTCGTGGTTGACGTGTCCCACGAAGATCCCGAAGTTAAGTTCA ATTGGTATGTTGATGGTGTAGAGGTACACAATGCTAAGACTAAAC CTCGCGAGGAGCAGTACGCCTCGACCTATCGTGTCGTGAGCGTTCT GACCGTCCTTCACCAAGATTGGCTTAACGGCAAAGAATATAAGTG CAAGGTAAGCAATAAAGCACTTCCGGCCCCAATCGAGAAAACCAT TTCCAAGGCCAAAGGTCAACCAAGAGAACCCCAGGTGTATACTCT TCCGCCTTCTCGTGAGGAAATGACTAAAAATCAAGTATCCCTTACG TGTCTGGTTAAAGGTTTTTATCCTAGCGATATTGCTGTTGAATGGG AATCGAACGGTCAGCCGGAGAATAATTATAAAACAACGCCACCCG TCCTGGATAGCGACGGCTCATTTTTTCTGTATAGCAAACTGACTGT AGATAAATCACGGTGGCAGCAGGGCAATGTATTCAGTTGCTCCGT TATGCATGAAGCGTTACATAATCACTACACGCAGAAATCTCTTAGT CTTTCACCCGGT
498	ATX-P-580	HC IgG1 Fc – nucleotide	CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGGTGAAGCCTTCG GGGACCCTGTCCCTCACCTGCGCTGTCTCTGGTGGCTCCATCAGCA CTAGTGACTGGTGGACTTGGGTCCGCCAGCCCCCAGGGAAGGGGC TGGAGTGGATTGGGGAAATCTATCATAGTGGGAGCACCAACTACA ACCCGTCCCTCAAGAGTCGAGTCACCATATCAGTAGACAAATCCA AGAACCAGTTCTCCCTGAAGCTGAGCTCTGTGACCGCCGCGGACA CGGCCGTGTATTACTGTGCGGACTGGTACTTCGATCTCTGGGGCCG TGGCACCCTGGTCACTGTCTCCTCAGCTAGCACTAAAGGGCCTTCT GTATTTCCCTTGGCCCCGTCCAGCAAATCGACCTCGGGAGGGACA GCCGCCCTGGGTTGCCTTGTGAAAGATTATTTCCCTGAGCCAGTTA CCGTAAGTTGGAACAGTGGGGCGCTGACAAGTGGTGTGCACACGT TTCCTGCCGTCCTGCAATCATCGGGCTTGTATAGCCTCAGCTCTGT GGTCACTGTCCCAAGTTCATCGCTGGGCACTCAGACGTATATTTGC AATGTGAACCACAAACCTTCAAATACAAAAGTGGATAAACGCGTA GAACCGAAATCGTGTGATAAAACTCACACATGCCCGCCATGCCCG GCACCTGAACTGCTTGGTGGTCCCAGCGTGTTCCTGTTCCCGCCGA AGCCTAAAGATACTCTAATGATCAGCCGTACGCCAGAGGTGACAT GTGTCGTGGTTGACGTGTCCCACGAAGATCCCGAAGTTAAGTTCA ATTGGTATGTTGATGGTGTAGAGGTACACAATGCTAAGACTAAAC CTCGCGAGGAGCAGTACGCCTCGACCTATCGTGTCGTGAGCGTTCT GACCGTCCTTCACCAAGATTGGCTTAACGGCAAAGAATATAAGTG CAAGGTAAGCAATAAAGCACTTCCGGCCCCAATCGAGAAAACCAT TTCCAAGGCCAAAGGTCAACCAAGAGAACCCCAGGTGTATACTCT TCCGCCTTCTCGTGAGGAAATGACTAAAAATCAAGTATCCCTTACG TGTCTGGTTAAAGGTTTTTATCCTAGCGATATTGCTGTTGAATGGG AATCGAACGGTCAGCCGGAGAATAATTATAAAACAACGCCACCCG TCCTGGATAGCGACGGCTCATTTTTTCTGTATAGCAAACTGACTGT AGATAAATCACGGTGGCAGCAGGGCAATGTATTCAGTTGCTCCGT TATGCATGAAGCGTTACATAATCACTACACGCAGAAATCTCTTAGT CTTTCACCCGGT
499	ATX-P-582	HC IgG1 Fc – nucleotide	CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGGTGAAGCCTTCG GGGACCCTGTCCCTCACCTGCGCTGTGTCTGGTGGCTCCATCAGCA TTAGTAAATGGTGGAGTTGGGTCCGCCAGCCCCCAGGGAAGGGAC TGGAGTGGATTGGGGAAATCTATCATACTGGGAGCACCAACTACC ACCCGTCCCTCAAGAGCCGAGTCACCATATCAGTAGACAAGTCCA AGAACCAATTCTACCTGAAGCTGAACTCTGTGACCGCCGCGGACA

			CGGCCGTATATTACTGTGCGAGAGATGAATTACGGTTGGGGGAGT TATCGCCCTCTCTTGATATCTGGGGACAAGGGACAATGGTCACCGT CTCTTCAGCTAGCACTAAAGGGCCTTCTGTATTTCCCTTGGCCCCG TCCAGCAAATCGACCTCGGGAGGGACAGCCGCCCTGGGTTGCCTT GTGAAAGATTATTTCCCTGAGCCAGTTACCGTAAGTTGGAACAGT GGGGCGCTGACAAGTGGTGTGCACACGTTTCCTGCCGTCCTGCAAT CATCGGGCTTGTATAGCCTCAGCTCTGTGGTCACTGTCCCAAGTTC ATCGCTGGGCACTCAGACGTATATTTGCAATGTGAACCACAAACC TTCAAATACAAAAGTGGATAAACGCGTAGAACCGAAATCGTGTGA TAAAACTCACACATGCCCGCCATGCCCGGCACCTGAACTGCTTGGT GGTCCCAGCGTGTTCCTGTTCCCGCCGAAGCCTAAAGATACTCTAA TGATCAGCCGTACGCCAGAGGTGACATGTGTCGTGGTTGACGTGT CCCACGAAGATCCCGAAGTTAAGTTCAATTGGTATGTTGATGGTGT AGAGGTACACAATGCTAAGACTAAACCTCGCGAGGAGCAGTACGC CTCGACCTATCGTGTCGTGAGCGTTCTGACCGTCCTTCACCAAGAT TGGCTTAACGGCAAAGAATATAAGTGCAAGGTAAGCAATAAAGCA CTTCCGGCCCCAATCGAGAAAACCATTTCCAAGGCCAAAGGTCAA CCAAGAGAACCCCAGGTGTATACTCTTCCGCCTTCTCGTGAGGAA ATGACTAAAAATCAAGTATCCCTTACGTGTCTGGTTAAAGGTTTTT ATCCTAGCGATATTGCTGTTGAATGGGAATCGAACGGTCAGCCGG AGAATAATTATAAAACAACGCCACCCGTCCTGGATAGCGACGGCT CATTTTTTCTGTATAGCAAACTGACTGTAGATAAATCACGGTGGCA GCAGGGCAATGTATTCAGTTGCTCCGTTATGCATGAAGCGTTACAT AATCACTACACGCAGAAATCTCTTAGTCTTTCACCCGGT
500	ATX-P-598	HC IgG1 Fc – nucleotide	CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGGTGAAGCCTTCG GGGACCCTGTCCCTCACCTGCGCTGTCTCTGGTGGCTCCATCAGCA GTAGTAACTGGTGGAGTTGGGTCCGCCAGTCCCCAGGGAAGGGGC TGGAATGGATTGGGGAAATCTATCATAGTGGGACCACCAACTACA ACCCGTCCCTCAAGAGTCGAGTCACCATATCAGTAGACAAGTCCA AGAACCAGTTCTCCCTGAAGCTGAGCTCTGCGACCGCCGCGGACA CGGCCGTGTATTATTGTGCGAGAGATAGATTACGTTTGGGGGAGT CATCGTCCGATGTTTTTGATATCTGGGGACAAGGGACAATGGTCAC CGTCTCTTCAGCTAGCACTAAAGGGCCTTCTGTATTTCCCTTGGCC CCGTCCAGCAAATCGACCTCGGGAGGGACAGCCGCCCTGGGTTGC CTTGTGAAAGATTATTTCCCTGAGCCAGTTACCGTAAGTTGGAACA GTGGGGCGCTGACAAGTGGTGTGCACACGTTTCCTGCCGTCCTGCA ATCATCGGGCTTGTATAGCCTCAGCTCTGTGGTCACTGTCCCAAGT TCATCGCTGGGCACTCAGACGTATATTTGCAATGTGAACCACAAA CCTTCAAATACAAAAGTGGATAAACGCGTAGAACCGAAATCGTGT GATAAAACTCACACATGCCCGCCATGCCCGGCACCTGAACTGCTT GGTGGTCCCAGCGTGTTCCTGTTCCCGCCGAAGCCTAAAGATACTC TAATGATCAGCCGTACGCCAGAGGTGACATGTGTCGTGGTTGACG TGTCCCACGAAGATCCCGAAGTTAAGTTCAATTGGTATGTTGATGG TGTAGAGGTACACAATGCTAAGACTAAACCTCGCGAGGAGCAGTA CGCCTCGACCTATCGTGTCGTGAGCGTTCTGACCGTCCTTCACCAA GATTGGCTTAACGGCAAAGAATATAAGTGCAAGGTAAGCAATAAA GCACTTCCGGCCCCAATCGAGAAAACCATTTCCAAGGCCAAAGGT CAACCAAGAGAACCCCAGGTGTATACTCTTCCGCCTTCTCGTGAGG AAATGACTAAAAATCAAGTATCCCTTACGTGTCTGGTTAAAGGTTT TTATCCTAGCGATATTGCTGTTGAATGGGAATCGAACGGTCAGCCG GAGAATAATTATAAAACAACGCCACCCGTCCTGGATAGCGACGGC TCATTTTTTCTGTATAGCAAACTGACTGTAGATAAATCACGGTGGC AGCAGGGCAATGTATTCAGTTGCTCCGTTATGCATGAAGCGTTACA TAATCACTACACGCAGAAATCTCTTAGTCTTTCACCCGGT
501	ATX-P-603	HC IgG1 Fc – nucleotide	CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGGTGAAGCCTTCG GGGACCCTGTCCCTCACCTGCGCTGTCTCTGGTGGCTCCATCAGCG

			GTAGTCACTGGTGGAGTTGGTTCCGCCAGCCCCCAGGAAAGGGGC TGGAGTGGATTGGGGAAATCTATCATACTGGGAGCACCAACAAAA ACCCGTCCCTCAAGAGTCGAGTCACTATCTCATTAGACAAGTCCAA GAATCAGTTCTCCCTGAGGCTGAGGTCTGTGACCGACGCGGACAC GGCCGTGTATTACTGTGCGAGAGATCAGTATACTGGGAGCCCAAG GGATGCTTTTGATATCTGGGGACAAGGGACAATGGTCACCGTCTC CTCAGCTAGCACTAAAGGGCCTTCTGTATTTCCCTTGGCCCCGTCC AGCAAATCGACCTCGGGAGGGACAGCCGCCCTGGGTTGCCTTGTG AAAGATTATTTCCCTGAGCCAGTTACCGTAAGTTGGAACAGTGGG GCGCTGACAAGTGGTGTGCACACGTTTCCTGCCGTCCTGCAATCAT CGGGCTTGTATAGCCTCAGCTCTGTGGTCACTGTCCCAAGTTCATC GCTGGGCACTCAGACGTATATTTGCAATGTGAACCACAAACCTTC AAATACAAAAGTGGATAAACGCGTAGAACCGAAATCGTGTGATAA AACTCACACATGCCCGCCATGCCCGGCACCTGAACTGCTTGGTGGT CCCAGCGTGTTCCTGTTCCCGCCGAAGCCTAAAGATACTCTAATGA TCAGCCGTACGCCAGAGGTGACATGTGTCGTGGTTGACGTGTCCC ACGAAGATCCCGAAGTTAAGTTCAATTGGTATGTTGATGGTGTAG AGGTACACAATGCTAAGACTAAACCTCGCGAGGAGCAGTACGCCT CGACCTATCGTGTCGTGAGCGTTCTGACCGTCCTTCACCAAGATTG GCTTAACGGCAAAGAATATAAGTGCAAGGTAAGCAATAAAGCACT TCCGGCCCCAATCGAGAAAACCATTTCCAAGGCCAAAGGTCAACC AAGAGAACCCCAGGTGTATACTCTTCCGCCTTCTCGTGAGGAAAT GACTAAAAATCAAGTATCCCTTACGTGTCTGGTTAAAGGTTTTTAT CCTAGCGATATTGCTGTTGAATGGGAATCGAACGGTCAGCCGGAG AATAATTATAAAACAACGCCACCCGTCCTGGATAGCGACGGCTCA TTTTTTCTGTATAGCAAACTGACTGTAGATAAATCACGGTGGCAGC AGGGCAATGTATTCAGTTGCTCCGTTATGCATGAAGCGTTACATAA TCACTACACGCAGAAATCTCTTAGTCTTTCACCCGGT
502	ATX-P-608	HC IgG1 Fc – nucleotide	CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGGTGAAGCCTTCG GGGACCCTGTCCCTCACCTGCGCTGTCTCTGGTGGCTCCATCAGCA GTAGTAACTGGTGGAGTTGGGTCCGCCAGTCCCCAGGGAAGGGGC TGGAGTGGATTGGGGAAATCTATCATACTGGGAGCACCAACAAAA AACCGTCCCTCAAGAGTCGAGTCATCATATCAGTAGACAAGTCCA AGAACCAGTTCTCCCTGAAACTGATCTCTGTGAACGCCGCGGACA CGGCCATATATTACTGTGCGAGAGATCGGGAAGGGGGAACTACTG AAGCTTTTGATATCTGGGGACAAGGGACAATGGTCACCGTCTCTTC AGCTAGCACTAAAGGGCCTTCTGTATTTCCCTTGGCCCCGTCCAGC AAATCGACCTCGGGAGGGACAGCCGCCCTGGGTTGCCTTGTGAAA GATTATTTCCCTGAGCCAGTTACCGTAAGTTGGAACAGTGGGGCG CTGACAAGTGGTGTGCACACGTTTCCTGCCGTCCTGCAATCATCGG GCTTGTATAGCCTCAGCTCTGTGGTCACTGTCCCAAGTTCATCGCT GGGCACTCAGACGTATATTTGCAATGTGAACCACAAACCTTCAAA TACAAAAGTGGATAAACGCGTAGAACCGAAATCGTGTGATAAAAC TCACACATGCCCGCCATGCCCGGCACCTGAACTGCTTGGTGGTCCC AGCGTGTTCCTGTTCCCGCCGAAGCCTAAAGATACTCTAATGATCA GCCGTACGCCAGAGGTGACATGTGTCGTGGTTGACGTGTCCCACG AAGATCCCGAAGTTAAGTTCAATTGGTATGTTGATGGTGTAGAGG TACACAATGCTAAGACTAAACCTCGCGAGGAGCAGTACGCCTCGA CCTATCGTGTCGTGAGCGTTCTGACCGTCCTTCACCAAGATTGGCT TAACGGCAAAGAATATAAGTGCAAGGTAAGCAATAAAGCACTTCC GGCCCCAATCGAGAAAACCATTTCCAAGGCCAAAGGTCAACCAAG AGAACCCCAGGTGTATACTCTTCCGCCTTCTCGTGAGGAAATGACT AAAAATCAAGTATCCCTTACGTGTCTGGTTAAAGGTTTTTATCCTA GCGATATTGCTGTTGAATGGGAATCGAACGGTCAGCCGGAGAATA ATTATAAAACAACGCCACCCGTCCTGGATAGCGACGGCTCATTTTT TCTGTATAGCAAACTGACTGTAGATAAATCACGGTGGCAGCAGGG

			CAATGTATTCAGTTGCTCCGTTATGCATGAAGCGTTACATAATCAC TACACGCAGAAATCTCTTAGTCTTTCACCCGGT
503	ATX-P-609	HC IgG1 Fc – nucleotide	CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGGTGAAGCCTTCG GGGACCCTGTCCCTCACCTGCGCTGTCTCTGGTGGCTCCATCAGCA GTAGTAACTGGTGGAGTTGGGTCCGCCAGCCCCCAGGGAAGGGGC TGGAGTGGATTGGGGAAATCTATCATAGTGGGAGCACCAACTACA ACCCGTCCCTCAAGAGTCGAGTCACCATATCAGTAGACAAGTCCA AGAACCAGTTCTCCCTGAAGCTGAGGTCTGTGACCGCCGCGGACA CGGCCGTTTATTACTGTGCGAGAGATCAACTAAGTAGCGGACCTA CGGATGCTTTTGATATCTGGGGACAAGGGACAATGGTCACCGTCT CTTCAGCTAGCACTAAAGGGCCTTCTGTATTTCCCTTGGCCCCGTC CAGCAAATCGACCTCGGGAGGGACAGCCGCCCTGGGTTGCCTTGT GAAAGATTATTTCCCTGAGCCAGTTACCGTAAGTTGGAACAGTGG GGCGCTGACAAGTGGTGTGCACACGTTTCCTGCCGTCCTGCAATCA TCGGGCTTGTATAGCCTCAGCTCTGTGGTCACTGTCCCAAGTTCAT CGCTGGGCACTCAGACGTATATTTGCAATGTGAACCACAAACCTTC AAATACAAAAGTGGATAAACGCGTAGAACCGAAATCGTGTGATAA AACTCACACATGCCCGCCATGCCCGGCACCTGAACTGCTTGGTGGT CCCAGCGTGTTCCTGTTCCCGCCGAAGCCTAAAGATACTCTAATGA TCAGCCGTACGCCAGAGGTGACATGTGTCGTGGTTGACGTGTCCC ACGAAGATCCCGAAGTTAAGTTCAATTGGTATGTTGATGGTGTAG AGGTACACAATGCTAAGACTAAACCTCGCGAGGAGCAGTACGCCT CGACCTATCGTGTCGTGAGCGTTCTGACCGTCCTTCACCAAGATTG GCTTAACGGCAAAGAATATAAGTGCAAGGTAAGCAATAAAGCACT TCCGGCCCCAATCGAGAAAACCATTTCCAAGGCCAAAGGTCAACC AAGAGAACCCCAGGTGTATACTCTTCCGCCTTCTCGTGAGGAAAT GACTAAAAATCAAGTATCCCTTACGTGTCTGGTTAAAGGTTTTTAT CCTAGCGATATTGCTGTTGAATGGGAATCGAACGGTCAGCCGGAG AATAATTATAAAACAACGCCACCCGTCCTGGATAGCGACGGCTCA TTTTTTCTGTATAGCAAACTGACTGTAGATAAATCACGGTGGCAGC AGGGCAATGTATTCAGTTGCTCCGTTATGCATGAAGCGTTACATAA TCACTACACGCAGAAATCTCTTAGTCTTTCACCCGGT
504	ATX-P-563	HC IgG1 Fc – nucleotide	CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGATGAAGCCTTCG GAGACCCTGTCCCTCACCTGCACTGTCTCTGGTGGCTCCATCAGTA GTCACTACTGGAGCTGGATCCGGCAACCCCCAGGGAAGGGACTGG AGTGGATTGGATATATCTTTTACAGTGGGAACATAAATTACAACCC CTCCCTCAAGAGTCGAGTCACCATATCAGTAGACACGTCCAAGAA CCAGTTCTCCCTGAAGCTGAGGTCTGTGACCACTGCGGACACGGC CGTATATTACTGTGCGAGAGATCGAGGTGGGAGCTATTCGTACCA CTTTGACTGCTGGGGCCAGGGAACCCTGGTCACCGTCTCCTCAGCT AGCACTAAAGGGCCTTCTGTATTTCCCTTGGCCCCGTCCAGCAAAT CGACCTCGGGAGGGACAGCCGCCCTGGGTTGCCTTGTGAAAGATT ATTTCCCTGAGCCAGTTACCGTAAGTTGGAACAGTGGGGCGCTGA CAAGTGGTGTGCACACGTTTCCTGCCGTCCTGCAATCATCGGGCTT GTATAGCCTCAGCTCTGTGGTCACTGTCCCAAGTTCATCGCTGGGC ACTCAGACGTATATTTGCAATGTGAACCACAAACCTTCAAATACA AAAGTGGATAAACGCGTAGAACCGAAATCGTGTGATAAAACTCAC ACATGCCCGCCATGCCCGGCACCTGAACTGCTTGGTGGTCCCAGC GTGTTCCTGTTCCCGCCGAAGCCTAAAGATACTCTAATGATCAGCC GTACGCCAGAGGTGACATGTGTCGTGGTTGACGTGTCCCACGAAG ATCCCGAAGTTAAGTTCAATTGGTATGTTGATGGTGTAGAGGTACA CAATGCTAAGACTAAACCTCGCGAGGAGCAGTACGCCTCGACCTA TCGTGTCGTGAGCGTTCTGACCGTCCTTCACCAAGATTGGCTTAAC GGCAAAGAATATAAGTGCAAGGTAAGCAATAAAGCACTTCCGGCC CCAATCGAGAAAACCATTTCCAAGGCCAAAGGTCAACCAAGAGAA CCCCAGGTGTATACTCTTCCGCCTTCTCGTGAGGAAATGACTAAAA

			ATCAAGTATCCCTTACGTGTCTGGTTAAAGGTTTTTATCCTAGCGA TATTGCTGTTGAATGGGAATCGAACGGTCAGCCGGAGAATAATTA TAAAACAACGCCACCCGTCCTGGATAGCGACGGCTCATTTTTTCTG TATAGCAAACTGACTGTAGATAAATCACGGTGGCAGCAGGGCAAT GTATTCAGTTGCTCCGTTATGCATGAAGCGTTACATAATCACTACA CGCAGAAATCTCTTAGTCTTTCACCCGGT
505	ATX-P-570	HC IgG1 Fc -- nucleotide	CAGGTGCAGCTGCAGGAGTCGGGCCCAGGACTGGTGAAGCCTTCG GAGACTATGTCCCTCACCTGCACTGTCTCTGGTGGCTCCTTCACTG GATACTACTGGAGTTGGATCCGGCAGCCCCCAGGGAAGGGACTGG AGTGGATTGGATATGTCCATTACAGTGGGGGCACCAAAAGCAACC CCTCCCTCAAGAGTCGAGTCACCATATCAGTAGACACGTCCAAGA ACCAGTTTTCCCTGAAGCTGAGCTCTGTGACCGCTGCGGACACGGC CGTGTATTACTGTGCGAGAGAGAGGTATGAGTGGAACTCCTACTTT GACTACTGGGGCCAGGGAACCCTGGTCACCGTCTCCTCAGCTAGC ACTAAAGGGCCTTCTGTATTTCCCTTGGCCCCGTCCAGCAAATCGA CCTCGGGAGGGACAGCCGCCCTGGGTTGCCTTGTGAAAGATTATTT CCCTGAGCCAGTTACCGTAAGTTGGAACAGTGGGGCGCTGACAAG TGGTGTGCACACGTTTCCTGCCGTCCTGCAATCATCGGGCTTGTAT AGCCTCAGCTCTGTGGTCACTGTCCCAAGTTCATCGCTGGGCACTC AGACGTATATTTGCAATGTGAACCACAAACCTTCAAATACAAAAG TGGATAAACGCGTAGAACCGAAATCGTGTGATAAAACTCACACAT GCCCGCCATGCCCGGCACCTGAACTGCTTGGTGGTCCCAGCGTGTT CCTGTTCCCGCCGAAGCCTAAAGATACTCTAATGATCAGCCGTACG CCAGAGGTGACATGTGTCGTGGTTGACGTGTCCCACGAAGATCCC GAAGTTAAGTTCAATTGGTATGTTGATGGTGTAGAGGTACACAAT GCTAAGACTAAACCTCGCGAGGAGCAGTACGCCTCGACCTATCGT GTCGTGAGCGTTCTGACCGTCCTTCACCAAGATTGGCTTAACGGCA AAGAATATAAGTGCAAGGTAAGCAATAAAGCACTTCCGGCCCCAA TCGAGAAAACCATTTCCAAGGCCAAAGGTCAACCAAGAGAACCCC AGGTGTATACTCTTCCGCCTTCTCGTGAGGAAATGACTAAAAATCA AGTATCCCTTACGTGTCTGGTTAAAGGTTTTTATCCTAGCGATATT GCTGTTGAATGGGAATCGAACGGTCAGCCGGAGAATAATTATAAA ACAACGCCACCCGTCCTGGATAGCGACGGCTCATTTTTTCTGTATA GCAAACTGACTGTAGATAAATCACGGTGGCAGCAGGGCAATGTAT TCAGTTGCTCCGTTATGCATGAAGCGTTACATAATCACTACACGCA GAAATCTCTTAGTCTTTCACCCGGT
506	ATX-P-571	LC Kappa	DIQMTQSPSSLSASVGDRVTITCRASQSISSYLNWYQQKPGKAPKVLI YAASSLQSGIPSRFSGSGSGTDFTLTISSLQPEDFATYYCQETYSVPLTF GGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKV QWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVY ACEVTHQGLSSPVTKSFNRGEC
507	ATX-P-577	LC Kappa	DIQMTQSPSSLSASVGDRVTITCRASQDIRNDLGWYQQKPGKVPKRLI YAASSLQSGVPSRFSGSGSGTEFTLTISSLQPEDFASYYCLQYNNYPFT LGPGTKVDIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAK VQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKV YACEVTHQGLSSPVTKSFNRGEC
508	ATX-P-579	LC Kappa	DIQMTQSPSSLSASVGDRVTITCRASQGIRKDLGWYQQKPGKAPKRLI YTASTLQSGVPSRFSGSGSGTEFTLTISSLQPEDFATYYCLQYNNYPFT FGPGTKVDIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAK VQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKV YACEVTHQGLSSPVTKSFNRGEC
509	ATX-P-580	LC Kappa	DIQMTQSPSSLSASVGDRVTITCRASQGIRNDLGWYQQKPGKAPKRLI YAASSLQSGVPSRFSGSGSGTEFTLAISSLQPEDFATYYCLHFNSYPFT FGPGTKVDIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAK VQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKV YACEVTHQGLSSPVTKSFNRGEC

510	ATX-P-582	LC Kappa	DIQMTQSPSSLSASVGDRVTITCRASQNINNYLNWFRQKPGKAPKLLI FAASSLQSGVPSRFSGSESGTDFTLTISSLQPEDFATYYCQQSYSTPLTF GGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKV QWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVY ACEVTHQGLSSPVTKSFNRGEC
511	ATX-P-598	LC Kappa	DIVMTQSPDSLAVSLGERATINCKSSQSVLYSSNNKNYLAWYQQKPG QPPELLIYWASTRESGVPDRFSGSGSGTDFTLTISSLQAEDMAVYYCQ QFYNTPYTFGQGTKVDIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLN NFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKA DYEKHKVYACEVTHQGLSSPVTKSFNRGEC
512	ATX-P-603	LC Kappa	EIVLTQSPGTLSLSPGERATLSCRASQSVSSSYLAWYQQKPGQAPRLLI YGASSRATGIPDRFSGSGSGTDFTLTISRLEPEDFAVYYCQHYGNSPLT FGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAK VQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKV YACEVTHQGLSSPVTKSFNRGEC
513	ATX-P-608	LC Kappa	EIVMTQSPATLSVSPGERATLSCRASQSVSSNLAWYQQKPGQAPRLLI YGASTRATGIPVRFSGSGSGTQFTLTISSLQSEDFAVYYCQQYDNWRT FGQGTRLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKV QWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVY ACEVTHQGLSSPVTKSFNRGEC
514	ATX-P-609	LC Kappa	EIVMTQSPATLSVSPGERATLSCRASQSVSSNLAWYQQKPGQAPRLLI YGASTRATGIPVRFSGSGSGTQFTLTISSLQSEDFAVYYCQQYDNWRT FGQGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAK VQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKV YACEVTHQGLSSPVTKSFNRGEC
515	ATX-P-563	LC Kappa	DIQMTQSPSSVSASVGDRVTITCRASQSFAGWLAWYQQKPGKAPKLL IYAASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANSFPL TFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREA KVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHK VYACEVTHQGLSSPVTKSFNRGEC
516	ATX-P-570	LC Kappa	DIVMTQSPDSLAVSLGERATINCKSSQSVLYSSNNKNYLAWYHQKPG QPPKLLIYWASTRESGVPDRFSGSGSGTDFTLTISSLQAEDVAVYYCQ QYYSSPRTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNN FYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKAD YEKHKVYACEVTHQGLSSPVTKSFNRGEC
517	ATX-P-571	LC Kappa – nucleotide	GACATCCAGATGACCCAGTCTCCATCCTCCCTGTCTGCATCTGTGG GAGACAGAGTCACCATCACTTGCCGGGCAAGTCAGAGCATTAGCA GCTATTTAAATTGGTATCAGCAGAAACCAGGGAAAGCCCCTAAGG TCCTGATCTATGCTGCATCCAGTTTGCAGAGTGGGATCCCATCACG GTTCAGTGGCAGTGGATCTGGGACAGATTTCACTCTCACCATCAGC AGTCTGCAACCTGAAGATTTTGCAACTTACTACTGTCAAGAGACTT ACAGTGTTCCGCTCACTTTCGGCGGAGGGACCAAGGTGGAGATCA AACGTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCTGA CGAGCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGAAT AATTTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACAAT GCTTTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGGAT TCTAAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAGCA AAGCCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGACGC ACCAAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGGTG AGTGT
518	ATX-P-577	LC Kappa – nucleotide	GACATCCAGATGACCCAGTCTCCATCCTCCCTGTCTGCATCTGTAG GAGACAGAGTCACCATCACTTGCCGGGCAAGTCAGGACATTAGAA ATGATTTAGGCTGGTATCAGCAGAAACCAGGGAAAGTCCCTAAGC GCCTGATCTATGCTGCATCTAGTTTGCAAAGTGGGGTCCCATCAAG GTTCAGCGGCAGTGGATCTGGGACAGAATTCACTCTCACAATCAG

			CAGCCTGCAGCCTGAAGATTTCGCAAGTTATTACTGTCTACAGTAT AATAATTATCCATTCACTCTCGGCCCTGGGACCAAAGTGGATATCA AACGTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCTGA CGAGCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGAAT AATTTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACAAT GCTTTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGGAT TCTAAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAGCA AAGCCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGACGC ACCAAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGGTG AGTGT
519	ATX-P-579	LC Kappa – nucleotide	GACATCCAGATGACCCAGTCTCCATCCTCCCTGTCTGCATCTGTAG GAGACAGAGTCACCATCACTTGCCGGGCAAGTCAGGGCATTAGAA AAGATTTAGGCTGGTATCAGCAGAAACCAGGGAAAGCCCCTAAGC GCCTGATCTATACTGCATCCACTTTACAAAGTGGGGTCCCATCAAG GTTCAGCGGCAGTGGATCTGGGACAGAATTCACTCTCACAATCAG CAGCCTGCAGCCTGAAGATTTTGCAACTTATTACTGTCTACAGTAT AATAATTACCCATTCACTTTCGGCCCTGGGACCAAAGTGGATATCA AACGTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCTGA CGAGCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGAAT AATTTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACAAT GCTTTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGGAT TCTAAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAGCA AAGCCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGACGC ACCAAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGGTG AGTGT
520	ATX-P-580	LC Kappa – nucleotide	GACATCCAGATGACCCAGTCTCCATCCTCCCTGTCTGCTTCTGTCG GAGACAGAGTCACCATCACTTGCCGGGCAAGTCAGGGCATTAGAA ATGATTTAGGCTGGTATCAGCAGAAACCAGGGAAAGCCCCTAAGC GCCTGATCTATGCTGCATCCAGTTTGCAAAGTGGGGTCCCATCAAG GTTCAGCGGCAGTGGATCTGGGACAGAATTCACTCTCGCAATCAG CAGCCTGCAGCCTGAAGATTTTGCAACTTATTACTGTCTACACTTT AATAGTTACCCATTCACTTTCGGCCCTGGGACCAAAGTGGATATCA AACGTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCTGA CGAGCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGAAT AATTTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACAAT GCTTTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGGAT TCTAAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAGCA AAGCCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGACGC ACCAAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGGTG AGTGT
521	ATX-P-582	LC Kappa – nucleotide	GACATCCAGATGACCCAGTCTCCATCCTCCCTGTCTGCATCTGTAG GAGACAGAGTCACCATCACTTGCCGGGCAAGTCAGAACATTAACA ACTATTTAAATTGGTTCCGGCAGAAACCAGGGAAAGCCCCTAAGC TCCTGATCTTTGCTGCATCCAGTTTACAAAGTGGGGTCCCATCAAG ATTCAGTGGCAGTGAATCTGGGACAGATTTCACTCTCACCATCAGC AGTCTGCAACCTGAGGATTTTGCGACTTACTACTGTCAACAGAGTT ACAGTACCCCTCTCACTTTCGGCGGAGGGACCAAGGTGGAGATCA AACGTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCTGA CGAGCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGAAT AATTTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACAAT GCTTTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGGAT TCTAAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAGCA AAGCCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGACGC ACCAAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGGTG AGTGT

522	ATX-P-598	LC Kappa – nucleotide	GACATCGTGATGACTCAGTCTCCAGACTCCCTGGCTGTGTCTCTGG GCGAGAGGGCCACCATCAACTGCAAGTCCAGCCAGAGTGTTTTAT ACAGCTCCAACAATAAGAACTACTTAGCTTGGTACCAGCAGAAAC CAGGACAGCCTCCTGAGCTGCTCATTTACTGGGCATCTACCCGGGA ATCCGGGGTCCCTGACCGATTCAGTGGCAGCGGGTCTGGGACAGA TTTCACTCTCACCATCAGCAGCCTGCAGGCTGAAGATATGGCAGTT TATTACTGTCAACAATTTTATAATACTCCGTACACTTTTGGCCAGG GGACCAAAGTGGATATCAAACGTACGGTAGCTGCCCCTTCAGTTTT TATCTTTCCGCCGTCTGACGAGCAGTTAAAATCCGGGACCGCTTCT GTAGTTTGCCTGCTGAATAATTTTTATCCGCGTGAGGCTAAAGTAC AATGGAAAGTCGACAATGCTTTGCAGTCGGGAAATTCACAGGAAA GTGTTACGGAGCAGGATTCTAAAGATTCCACATATTCACTCAGCTC CACCCTTACACTGAGCAAAGCCGACTATGAAAAACATAAAGTTTA CGCATGTGAGGTGACGCACCAAGGATTATCCAGTCCGGTCACAAA ATCGTTTAACCGCGGTGAGTGT
523	ATX-P-603	LC Kappa – nucleotide	GAAATTGTGTTGACGCAGTCTCCAGGCACCCTGTCTTTGTCTCCAG GGGAAAGAGCCACCCTCTCCTGCAGGGCCAGTCAGAGTGTTAGCA GCAGCTACTTAGCCTGGTACCAGCAGAAACCTGGCCAGGCTCCCA GGCTCCTCATCTATGGTGCATCCAGCAGGGCCACTGGCATCCCAG ACAGGTTCAGTGGCAGTGGGTCTGGGACAGACTTCACTCTCACCA TCAGCAGACTGGAGCCTGAAGATTTTGCAGTGTATTACTGTCAGCA TTATGGTAACTCACCGCTCACTTTCGGCGGAGGGACCAAGGTGGA GATCAAACGTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCG TCTGACGAGCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGC TGAATAATTTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCG ACAATGCTTTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGC AGGATTCTAAAGATTCCACATATTCACTCAGCTCCACCCTTACACT GAGCAAAGCCGACTATGAAAAACATAAAGTTTACGCATGTGAGGT GACGCACCAAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCG CGGTGAGTGT
524	ATX-P-608	LC Kappa – nucleotide	GAAATAGTGATGACGCAGTCTCCAGCCACCCTGTCTGTGTCTCCAG GGGAAAGAGCCACCCTCTCCTGCAGGGCCAGTCAGAGTGTTAGCA GCAACTTAGCCTGGTACCAGCAGAAACCTGGCCAGGCTCCCAGGC TCCTCATCTATGGTGCATCCACCAGGGCCACTGGTATCCCAGTCAG GTTCAGTGGCAGTGGGTCTGGGACACAGTTCACTCTCACCATCAGC AGCCTGCAGTCTGAAGATTTTGCAGTTTATTATTGTCAGCAATATG ATAACTGGCGGACGTTCGGCCAAGGGACACGACTGGAGATTAAAC GTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCTGACGA GCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGAATAAT TTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACAATGCT TTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGGATTCT AAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAGCAAAG CCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGACGCACC AAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGGTGAGT GT
525	ATX-P-609	LC Kappa – nucleotide	GAAATAGTGATGACGCAGTCTCCAGCCACCCTGTCTGTGTCTCCAG GGGAAAGAGCCACCCTCTCCTGCAGGGCCAGTCAGAGTGTTAGCA GCAACTTAGCCTGGTACCAGCAGAAACCTGGCCAGGCTCCCAGGC TCCTCATCTATGGTGCATCCACCAGGGCCACTGGTATCCCAGTCAG GTTCAGTGGCAGTGGGTCTGGGACACAGTTCACTCTCACCATCAGC AGCCTGCAGTCTGAAGATTTTGCAGTTTATTATTGTCAGCAATATG ATAACTGGCGGACGTTCGGCCAAGGGACCAAGCTGGAAATCAAAC GTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCTGACGA GCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGAATAAT TTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACAATGCT TTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGGATTCT

			AAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAGCAAAG CCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGACGCACC AAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGGTGAGT GT
526	ATX-P-563	LC Kappa – nucleotide	GACATCCAGATGACCCAGTCTCCATCTTCCGTGTCTGCATCTGTCG GAGACAGAGTCACCATCACTTGTCGGGCGAGTCAGAGTTTTGCCG GCTGGTTAGCCTGGTATCAGCAGAAACCAGGGAAAGCCCCTAAGC TCCTGATATATGCTGCATCCACTTTGCAAAGTGGGGTCCCATCAAG GTTCAGCGGCAGTGGATCTGGGACAGATTTCACTCTCACCATCAGC AGCCTGCAGCCTGAAGATTTTGCAACTTACTATTGTCAACAGGCTA ACAGTTTCCCTCTCACTTTCGGCGGAGGGACCAAGGTGGAGATCA AACGTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCTGA CGAGCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGAAT AATTTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACAAT GCTTTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGGAT TCTAAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAGCA AAGCCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGACGC ACCAAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGGTG AGTGT
527	ATX-P-570	LC Kappa – nucleotide	GACATCGTGATGACCCAGTCTCCAGACTCCCTGGCTGTGTCTCTGG GCGAGAGGGCCACCATCAACTGCAAGTCCAGTCAGAGTGTTTTAT ACAGCTCCAACAATAAGAATTACTTAGCTTGGTACCACCAGAAAC CAGGACAGCCTCCTAAGCTGCTCATTTACTGGGCATCTACCCGGGA ATCCGGGGTCCCTGACCGATTCAGTGGCAGCGGGTCTGGGACAGA TTTCACTCTCACCATCAGCAGCCTGCAGGCTGAAGATGTGGCAGTT TATTACTGTCAGCAATACTATAGTAGTCCTCGGACGTTCGGCCAAG GGACCAAGGTGGAAATCAAACGTACGGTAGCTGCCCCTTCAGTTT TTATCTTTCCGCCGTCTGACGAGCAGTTAAAATCCGGGACCGCTTC TGTAGTTTGCCTGCTGAATAATTTTTATCCGCGTGAGGCTAAAGTA CAATGGAAAGTCGACAATGCTTTGCAGTCGGGAAATTCACAGGAA AGTGTTACGGAGCAGGATTCTAAAGATTCCACATATTCACTCAGCT CCACCCTTACACTGAGCAAAGCCGACTATGAAAAACATAAAGTTT ACGCATGTGAGGTGACGCACCAAGGATTATCCAGTCCGGTCACAA AATCGTTTAACCGCGGTGAGTGT
528	ATX-P-560	HC IgG1 Fc	QVQLQQSGPGLVKPSQTLSLTCAISGDSVSSNTAAWNWIRQSPSRGLE WLGRTYYRSKWYNDYAVSVKSRITINPDTSKNQFSLQLSSVTPQDTAI YYCASDNWNNGGPGFDPWGQGTLVTVSSASTKGPSVFPLAPSSKSTS GGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLS SVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPA PELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVS NKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGF YPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQ GNVFSCSVMHEALHNHYTQKSLSLSPG
529	ATX-P-561	HC IgG1 Fc	QVQLQQSGPGLVKPSQTLSLTCAISGDSVSSNSAAWNWIRQSPSRGLE WLGRTYYRSKWYNGYAVSMKSRITINPDTSKNQFSLQLNSVTPEDTA MYYCAREGVGATTGFDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTS GGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLS SVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPA PELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVS NKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGF YPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQ GNVFSCSVMHEALHNHYTQKSLSLSPG
530	ATX-P-562	HC IgG1 Fc	QVQLQQSGPGLVKSSQTLSLTCAISGDTVSSNSAAWNWIRQSPSRGLE WLGRTFYRSRWSAAYAASVSSRITINPDTSKNQFSLQLTSVTPADTAV

			YYCAREGVGSSTGFDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSG GTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSS VVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAP ELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVS NKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGF YPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQ GNVFSCSVMHEALHNHYTQKSLSLSPG
531	ATX-P-566	HC IgG1 Fc	QVQLQQSGPGLVKPSQTLSLTCAISGDSVSSNSAAWNWIRQSPSRGLE WLGRTYYRSKWFNNYSVSVKSRIAINPDTSKNQFSLQLNSVTPEDTA VYYCARDLGELLDWYFDLWGRGTLVTVSAASTKGPSVFPLAPSSKST SGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSL SSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWY VDGVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKV SNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKG FYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQ QGNVFSCSVMHEALHNHYTQKSLSLSPG
532	ATX-P-572	HC IgG1 Fc	QVQLQQSGPGLVKPSQTLSLTCAISGDSVSSNSAAWNWIRQSPSRGLE WLGMTYYRSKWYSVFAVSVKSRITINTDTSKNQFSLQLNSVTPEDTA VYYCAREGGIVGATPFDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTS GGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLS SVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPA PELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVS NKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGF YPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQ GNVFSCSVMHEALHNHYTQKSLSLSPG
533	ATX-P-573	HC IgG1 Fc	QVQLQQSGPGLVKPSQTLSLTCAISGDSVSSNSAAWNWIRQSPSRGLE WLGRTYYRSKLYSDYAVSVKSRITINPDTSRNQFSLQLNSVTPEDTAV YYCAREGGYTYGYDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGG TAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSV VTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPE LLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVD GVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVSN KALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFY PSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQG NVFSCSVMHEALHNHYTQKSLSLSPG
534	ATX-P-581	HC IgG1 Fc	QVQLQQSGPGLVKPSQTLSLTCAISGDSVSSNNAAWNWIRQSPSRGLE WLGRTYYRSKWYNAYAVSVKSRIIINPDTSRNQFSLQLNSVTPEDTA VYYCAREGGYIYGLDQWGQGTLVTVSSASTKGPSVFPLAPSSKSTSG GTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSS VVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAP ELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVS NKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGF YPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQ GNVFSCSVMHEALHNHYTQKSLSLSPG
535	ATX-P-587	HC IgG1 Fc	QVQLQQSGPGLVKPSQTLSLTCAISGDSVSSNSAAWNWIRQSPSRGLE WLGKTYYRSKWYNYYALSVKSRITINPDTSKNQFSLHLNSVTPEDTA VYYCARDGDYYLPSPFDLWGHGTMVTVSSASTKGPSVFPLAPSSKST SGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSL SSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWY VDGVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKV SNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKG

			FYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQ QGNVFSCSVMHEALHNHYTQKSLSLSPG
536	ATX-P-592	HC IgG1 Fc	QVQLQQSGPGLVKPSQTLSLTCAISGDSVSSNSAAWNWIRQSPSRGLE WLGRTYYRSKWYSDYPLSVKSRITINPDTSKNQFSLQLNSVTPEDTAV YYCARDSGIVETTPFDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSG GTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSS VVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAP ELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVS NKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGF YPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQ GNVFSCSVMHEALHNHYTQKSLSLSPG
537	ATX-P-594	HC IgG1 Fc	QVQLQQSGPGLVKPSQTLSLTCAISGDSVSSNSASWNWIRQSPSRGLE WLGTTYYRSKWFNVYAVSVKSRITINPDTSKNQFSLHLNSVTPEDTAI YFCTRDRGDLLHWYFDLWGRGTLVTVSSASTKGPSVFPLAPSSKSTS GGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLS SVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPA PELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVS NKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGF YPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQ GNVFSCSVMHEALHNHYTQKSLSLSPG
538	ATX-P-595	HC IgG1 Fc	QVQLQQSGPGLVKPSQTLSLTCAISGDSVSSNSAAWNWIRQSPSRGLE WLGRTYYRSKWFNDYALSVKSRITINPDTSKNQFSLHLNSVTPEDTA VYYCAREPGIVAPGPFDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTS GGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLS SVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPA PELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVS NKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGF YPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQ GNVFSCSVMHEALHNHYTQKSLSLSPG
539	ATX-P-604	HC IgG1 Fc	QVQLQQSGPGLVKPTQTLSLTCAISGDSVSSNSAAWNWIRQSPSRGLE WLGRTYYRSKWFNGYAVSVKSRITINPDASKNQFSLHLKSVTDEDTA VYYCATDRGELLHWYFDLWGRGTLVTVSSASTKGPSVFPLAPSSKST SGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSL SSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWY VDGVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKV SNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKG FYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQ QGNVFSCSVMHEALHNHYTQKSLSLSPG
540	ATX-P-610	HC IgG1 Fc	QVQLQQSGPGLVKSSQTLSITCAISGDSVSSNSAAWNWIRQSPSRGLE WLGRTYYRSKWYNDYALSVKSRIIIKSDTSKNQFSLQLNSVTPEDTAV YYCAREPGIAAPGPFDYWGQGSLVTVSSASTKGPSVFPLAPSSKSTSG GTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSS VVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAP ELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYASTYRVVSVLTVLHQDWLNGKEYKCKVS NKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGF YPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQ GNVFSCSVMHEALHNHYTQKSLSLSPG
541	ATX-P-560	HC IgG1 Fc -- nucleotide	CAGGTACAGCTGCAGCAGTCAGGTCCAGGACTGGTGAAGCCCTCG CAGACCCTCTCACTCACCTGTGCCATTTCCGGGGACAGTGTCTCTA GCAACACTGCTGCTTGGAACTGGATCAGGCAGTCCCCATCGAGAG GCCTTGAGTGGCTGGGAAGGACATACTACAGGTCCAAGTGGTATA

			ATGATTATGCAGTATCTGTGAAAAGTCGAATAACCATCAACCCAG ACACATCCAAGAACCAGTTCTCCCTGCAGTTGAGCTCTGTGACTCC CCAGGACACGGCTATATATTACTGTGCGAGCGATAACTGGAACAA CGGAGGCCCTGGGTTCGACCCCTGGGGCCAGGGAACCCTGGTCAC CGTCTCCTCAGCTAGCACTAAAGGGCCTTCTGTATTTCCCTTGGCC CCGTCCAGCAAATCGACCTCGGGAGGGACAGCCGCCCTGGGTTGC CTTGTGAAAGATTATTTCCCTGAGCCAGTTACCGTAAGTTGGAACA GTGGGGCGCTGACAAGTGGTGTGCACACGTTTCCTGCCGTCCTGCA ATCATCGGGCTTGTATAGCCTCAGCTCTGTGGTCACTGTCCCAAGT TCATCGCTGGGCACTCAGACGTATATTTGCAATGTGAACCACAAA CCTTCAAATACAAAAGTGGATAAACGCGTAGAACCGAAATCGTGT GATAAAACTCACACATGCCCGCCATGCCCGGCACCTGAACTGCTT GGTGGTCCCAGCGTGTTCCTGTTCCCGCCGAAGCCTAAAGATACTC TAATGATCAGCCGTACGCCAGAGGTGACATGTGTCGTGGTTGACG TGTCCCACGAAGATCCCGAAGTTAAGTTCAATTGGTATGTTGATGG TGTAGAGGTACACAATGCTAAGACTAAACCTCGCGAGGAGCAGTA CGCCTCGACCTATCGTGTCGTGAGCGTTCTGACCGTCCTTCACCAA GATTGGCTTAACGGCAAAGAATATAAGTGCAAGGTAAGCAATAAA GCACTTCCGGCCCCAATCGAGAAAACCATTTCCAAGGCCAAAGGT CAACCAAGAGAACCCCAGGTGTATACTCTTCCGCCTTCTCGTGAGG AAATGACTAAAAATCAAGTATCCCTTACGTGTCTGGTTAAAGGTTT TTATCCTAGCGATATTGCTGTTGAATGGGAATCGAACGGTCAGCCG GAGAATAATTATAAAACAACGCCACCCGTCCTGGATAGCGACGGC TCATTTTTTCTGTATAGCAAACTGACTGTAGATAAATCACGGTGGC AGCAGGGCAATGTATTCAGTTGCTCCGTTATGCATGAAGCGTTACA TAATCACTACACGCAGAAATCTCTTAGTCTTTCACCCGGT
542	ATX-P-561	HC IgG1 Fc – nucleotide	CAGGTACAGCTGCAGCAGTCAGGTCCAGGACTGGTGAAGCCCTCG CAGACCCTCTCACTCACCTGTGCCATCTCCGGGGACAGTGTCTCTA GCAACAGTGCTGCTTGGAACTGGATCAGGCAGTCCCCATCGAGAG GCCTTGAGTGGCTGGGAAGGACATACTACAGGTCCAAGTGGTATA ATGGTTATGCAGTCTCTATGAAAAGTCGAATAACCATCAACCCAG ACACATCCAAGAACCAGTTCTCCCTGCAGCTGAACTCTGTGACTCC CGAGGACACGGCTATGTATTATTGTGCAAGAGAGGGAGTGGGAGC TACTACAGGCTTTGACTACTGGGGCCAGGGAACCCTGGTCACCGT CTCCTCAGCTAGCACTAAAGGGCCTTCTGTATTTCCCTTGGCCCCG TCCAGCAAATCGACCTCGGGAGGGACAGCCGCCCTGGGTTGCCTT GTGAAAGATTATTTCCCTGAGCCAGTTACCGTAAGTTGGAACAGT GGGGCGCTGACAAGTGGTGTGCACACGTTTCCTGCCGTCCTGCAAT CATCGGGCTTGTATAGCCTCAGCTCTGTGGTCACTGTCCCAAGTTC ATCGCTGGGCACTCAGACGTATATTTGCAATGTGAACCACAAACC TTCAAATACAAAAGTGGATAAACGCGTAGAACCGAAATCGTGTGA TAAAACTCACACATGCCCGCCATGCCCGGCACCTGAACTGCTTGGT GGTCCCAGCGTGTTCCTGTTCCCGCCGAAGCCTAAAGATACTCTAA TGATCAGCCGTACGCCAGAGGTGACATGTGTCGTGGTTGACGTGT CCCACGAAGATCCCGAAGTTAAGTTCAATTGGTATGTTGATGGTGT AGAGGTACACAATGCTAAGACTAAACCTCGCGAGGAGCAGTACGC CTCGACCTATCGTGTCGTGAGCGTTCTGACCGTCCTTCACCAAGAT TGGCTTAACGGCAAAGAATATAAGTGCAAGGTAAGCAATAAAGCA CTTCCGGCCCCAATCGAGAAAACCATTTCCAAGGCCAAAGGTCAA CCAAGAGAACCCCAGGTGTATACTCTTCCGCCTTCTCGTGAGGAA ATGACTAAAAATCAAGTATCCCTTACGTGTCTGGTTAAAGGTTTTT ATCCTAGCGATATTGCTGTTGAATGGGAATCGAACGGTCAGCCGG AGAATAATTATAAAACAACGCCACCCGTCCTGGATAGCGACGGCT CATTTTTTCTGTATAGCAAACTGACTGTAGATAAATCACGGTGGCA GCAGGGCAATGTATTCAGTTGCTCCGTTATGCATGAAGCGTTACAT AATCACTACACGCAGAAATCTCTTAGTCTTTCACCCGGT

543	ATX-P-562	HC IgG1 Fc – nucleotide	CAGGTACAGCTGCAGCAGTCAGGTCCAGGACTGGTGAAGTCCTCG CAGACCCTCTCACTCACCTGTGCCATCTCCGGGGACACTGTCTCTA GTAATAGTGCTGCTTGGAACTGGATCAGGCAGTCCCCATCGAGAG GCCTTGAGTGGCTGGGAAGGACATTCTATAGGTCCAGGTGGTCTG CTGCTTATGCAGCGTCTGTGAGTAGTCGAATAACCATCAACCCAG ACACATCCAAGAACCAGTTCTCCCTGCAGCTGACCTCTGTGACTCC CGCGGACACGGCTGTGTATTACTGTGCAAGAGAGGGAGTAGGATC TTCTACAGGCTTTGACTACTGGGGCCAGGGAACCCTGGTCACCGTC TCCTCAGCTAGCACTAAAGGGCCTTCTGTATTTCCCTTGGCCCCGT CCAGCAAATCGACCTCGGGAGGGACAGCCGCCCTGGGTTGCCTTG TGAAAGATTATTTCCCTGAGCCAGTTACCGTAAGTTGGAACAGTG GGGCGCTGACAAGTGGTGTGCACACGTTTCCTGCCGTCCTGCAATC ATCGGGCTTGTATAGCCTCAGCTCTGTGGTCACTGTCCCAAGTTCA TCGCTGGGCACTCAGACGTATATTTGCAATGTGAACCACAAACCTT CAAATACAAAAGTGGATAAACGCGTAGAACCGAAATCGTGTGATA AAACTCACACATGCCCGCCATGCCCGGCACCTGAACTGCTTGGTG GTCCCAGCGTGTTCCTGTTCCCGCCGAAGCCTAAAGATACTCTAAT GATCAGCCGTACGCCAGAGGTGACATGTGTCGTGGTTGACGTGTC CCACGAAGATCCCGAAGTTAAGTTCAATTGGTATGTTGATGGTGTA GAGGTACACAATGCTAAGACTAAACCTCGCGAGGAGCAGTACGCC TCGACCTATCGTGTCGTGAGCGTTCTGACCGTCCTTCACCAAGATT GGCTTAACGGCAAAGAATATAAGTGCAAGGTAAGCAATAAAGCA CTTCCGGCCCCAATCGAGAAAACCATTTCCAAGGCCAAAGGTCAA CCAAGAGAACCCCAGGTGTATACTCTTCCGCCTTCTCGTGAGGAA ATGACTAAAAATCAAGTATCCCTTACGTGTCTGGTTAAAGGTTTTT ATCCTAGCGATATTGCTGTTGAATGGGAATCGAACGGTCAGCCGG AGAATAATTATAAAACAACGCCACCCGTCCTGGATAGCGACGGCT CATTTTTTCTGTATAGCAAACTGACTGTAGATAAATCACGGTGGCA GCAGGGCAATGTATTCAGTTGCTCCGTTATGCATGAAGCGTTACAT AATCACTACACGCAGAAATCTCTTAGTCTTTCACCCGGT
544	ATX-P-566	HC IgG1 Fc – nucleotide	CAGGTACAGCTGCAGCAGTCAGGTCCAGGACTGGTGAAGCCCTCG CAGACCCTCTCACTCACCTGTGCCATCTCCGGGGACAGTGTCTCTA GCAACAGTGCTGCTTGGAACTGGATCAGGCAGTCCCCATCGAGAG GCCTTGAGTGGCTGGGAAGGACATACTACAGGTCCAAGTGGTTTA ATAATTATTCAGTTTCTGTGAAAAGTCGAATAGCCATTAACCCAGA CACATCCAAGAACCAGTTCTCCCTTCAACTGAACTCTGTGACTCCC GAGGACACGGCTGTGTATTACTGTGCAAGAGATCTGGGGGAGTTA CTTGACTGGTACTTCGATCTCTGGGGCCGTGGCACCCTGGTCACTG TCTCCGCAGCTAGCACTAAAGGGCCTTCTGTATTTCCCTTGGCCCC GTCCAGCAAATCGACCTCGGGAGGGACAGCCGCCCTGGGTTGCCT TGTGAAAGATTATTTCCCTGAGCCAGTTACCGTAAGTTGGAACAGT GGGGCGCTGACAAGTGGTGTGCACACGTTTCCTGCCGTCCTGCAAT CATCGGGCTTGTATAGCCTCAGCTCTGTGGTCACTGTCCCAAGTTC ATCGCTGGGCACTCAGACGTATATTTGCAATGTGAACCACAAACC TTCAAATACAAAAGTGGATAAACGCGTAGAACCGAAATCGTGTGA TAAAACTCACACATGCCCGCCATGCCCGGCACCTGAACTGCTTGGT GGTCCCAGCGTGTTCCTGTTCCCGCCGAAGCCTAAAGATACTCTAA TGATCAGCCGTACGCCAGAGGTGACATGTGTCGTGGTTGACGTGT CCCACGAAGATCCCGAAGTTAAGTTCAATTGGTATGTTGATGGTGT AGAGGTACACAATGCTAAGACTAAACCTCGCGAGGAGCAGTACGC CTCGACCTATCGTGTCGTGAGCGTTCTGACCGTCCTTCACCAAGAT TGGCTTAACGGCAAAGAATATAAGTGCAAGGTAAGCAATAAAGCA CTTCCGGCCCCAATCGAGAAAACCATTTCCAAGGCCAAAGGTCAA CCAAGAGAACCCCAGGTGTATACTCTTCCGCCTTCTCGTGAGGAA ATGACTAAAAATCAAGTATCCCTTACGTGTCTGGTTAAAGGTTTTT ATCCTAGCGATATTGCTGTTGAATGGGAATCGAACGGTCAGCCGG

			AGAATAATTATAAAACAACGCCACCCGTCCTGGATAGCGACGGCT CATTTTTTCTGTATAGCAAACTGACTGTAGATAAATCACGGTGGCA GCAGGGCAATGTATTCAGTTGCTCCGTTATGCATGAAGCGTTACAT AATCACTACACGCAGAAATCTCTTAGTCTTTCACCCGGT
545	ATX-P-572	HC IgG1 Fc – nucleotide	CAGGTACAGCTGCAGCAGTCAGGTCCAGGACTGGTGAAGCCCTCG CAGACCCTCTCACTCACCTGTGCCATCTCCGGGGACAGTGTCTCTA GCAACAGTGCTGCTTGGAACTGGATCAGGCAGTCCCCATCGAGAG GCCTTGAGTGGCTGGGAATGACATACTACAGGTCCAAGTGGTATA GTGTTTTTGCAGTATCTGTGAAAAGTCGAATAACCATCAATACAGA CACATCCAAGAACCAGTTCTCCCTGCAGCTGAACTCTGTGACTCCC GAGGACACGGCTGTGTATTACTGTGCAAGAGAGGGGGGTATAGTG GGAGCCACCCCCTTTGACTACTGGGGCCAGGGAACCCTGGTCACC GTCTCTTCAGCTAGCACTAAAGGGCCTTCTGTATTTCCCTTGGCCC CGTCCAGCAAATCGACCTCGGGAGGGACAGCCGCCCTGGGTTGCC TTGTGAAAGATTATTTCCCTGAGCCAGTTACCGTAAGTTGGAACAG TGGGGCGCTGACAAGTGGTGTGCACACGTTTCCTGCCGTCCTGCAA TCATCGGGCTTGTATAGCCTCAGCTCTGTGGTCACTGTCCCAAGTT CATCGCTGGGCACTCAGACGTATATTTGCAATGTGAACCACAAAC CTTCAAATACAAAAGTGGATAAACGCGTAGAACCGAAATCGTGTG ATAAAACTCACACATGCCCGCCATGCCCGGCACCTGAACTGCTTG GTGGTCCCAGCGTGTTCCTGTTCCCGCCGAAGCCTAAAGATACTCT AATGATCAGCCGTACGCCAGAGGTGACATGTGTCGTGGTTGACGT GTCCCACGAAGATCCCGAAGTTAAGTTCAATTGGTATGTTGATGGT GTAGAGGTACACAATGCTAAGACTAAACCTCGCGAGGAGCAGTAC GCCTCGACCTATCGTGTCGTGAGCGTTCTGACCGTCCTTCACCAAG ATTGGCTTAACGGCAAAGAATATAAGTGCAAGGTAAGCAATAAAG CACTTCCGGCCCCAATCGAGAAAACCATTTCCAAGGCCAAAGGTC AACCAAGAGAACCCCAGGTGTATACTCTTCCGCCTTCTCGTGAGG AAATGACTAAAAATCAAGTATCCCTTACGTGTCTGGTTAAAGGTTT TTATCCTAGCGATATTGCTGTTGAATGGGAATCGAACGGTCAGCCG GAGAATAATTATAAAACAACGCCACCCGTCCTGGATAGCGACGGC TCATTTTTTCTGTATAGCAAACTGACTGTAGATAAATCACGGTGGC AGCAGGGCAATGTATTCAGTTGCTCCGTTATGCATGAAGCGTTACA TAATCACTACACGCAGAAATCTCTTAGTCTTTCACCCGGT
546	ATX-P-573	HC IgG1 Fc – nucleotide	CAGGTACAGCTGCAGCAGTCAGGTCCAGGACTGGTGAAGCCCTCG CAGACCCTCTCACTCACCTGTGCCATCTCCGGGGACAGTGTCTCTA GCAACAGTGCTGCTTGGAACTGGATCAGGCAGTCCCCATCGAGAG GCCTTGAGTGGCTGGGCAGGACATACTACAGGTCCAAGTTGTATA GTGATTATGCAGTATCTGTGAAAAGTCGAATAACCATCAACCCAG ACACATCCAGGAACCAGTTCTCCCTGCAGCTGAACTCTGTGACTCC CGAGGACACGGCTGTGTATTACTGTGCAAGAGAGGGGGGATACAC CTATGGTTATGACTACTGGGGCCAGGGAACCCTGGTCACCGTCTCC TCAGCTAGCACTAAAGGGCCTTCTGTATTTCCCTTGGCCCCGTCCA GCAAATCGACCTCGGGAGGGACAGCCGCCCTGGGTTGCCTTGTGA AAGATTATTTCCCTGAGCCAGTTACCGTAAGTTGGAACAGTGGGG CGCTGACAAGTGGTGTGCACACGTTTCCTGCCGTCCTGCAATCATC GGGCTTGTATAGCCTCAGCTCTGTGGTCACTGTCCCAAGTTCATCG CTGGGCACTCAGACGTATATTTGCAATGTGAACCACAAACCTTCA AATACAAAAGTGGATAAACGCGTAGAACCGAAATCGTGTGATAAA ACTCACACATGCCCGCCATGCCCGGCACCTGAACTGCTTGGTGGTC CCAGCGTGTTCCTGTTCCCGCCGAAGCCTAAAGATACTCTAATGAT CAGCCGTACGCCAGAGGTGACATGTGTCGTGGTTGACGTGTCCCA CGAAGATCCCGAAGTTAAGTTCAATTGGTATGTTGATGGTGTAGA GGTACACAATGCTAAGACTAAACCTCGCGAGGAGCAGTACGCCTC GACCTATCGTGTCGTGAGCGTTCTGACCGTCCTTCACCAAGATTGG CTTAACGGCAAAGAATATAAGTGCAAGGTAAGCAATAAAGCACTT

			CCGGCCCCAATCGAGAAAACCATTTCCAAGGCCAAAGGTCAACCA AGAGAACCCCAGGTGTATACTCTTCCGCCTTCTCGTGAGGAAATG ACTAAAAATCAAGTATCCCTTACGTGTCTGGTTAAAGGTTTTTATC CTAGCGATATTGCTGTTGAATGGGAATCGAACGGTCAGCCGGAGA ATAATTATAAAACAACGCCACCCGTCCTGGATAGCGACGGCTCAT TTTTTCTGTATAGCAAACTGACTGTAGATAAATCACGGTGGCAGCA GGGCAATGTATTCAGTTGCTCCGTTATGCATGAAGCGTTACATAAT CACTACACGCAGAAATCTCTTAGTCTTTCACCCGGT
547	ATX-P-581	HC IgG1 Fc – nucleotide	CAGGTACAGCTGCAGCAGTCAGGTCCAGGACTGGTGAAGCCCTCG CAGACCCTCTCACTCACCTGTGCCATCTCCGGGGACAGTGTCTCTA GCAACAATGCTGCTTGGAACTGGATCAGGCAGTCCCCATCGAGAG GCCTTGAGTGGCTGGGAAGGACGTACTACAGGTCCAAGTGGTATA ATGCTTATGCAGTTTCTGTGAAAAGTCGAATTATCATCAATCCAGA CACATCCAGGAACCAGTTCTCCCTGCAACTGAACTCTGTGACTCCC GAGGACACGGCTGTGTATTACTGTGCAAGAGAGGGTGGATACATC TATGGTCTTGACCAATGGGGCCAGGGAACCCTGGTCACCGTCTCCT CAGCTAGCACTAAAGGGCCTTCTGTATTTCCCTTGGCCCCGTCCAG CAAATCGACCTCGGGAGGGACAGCCGCCCTGGGTTGCCTTGTGAA AGATTATTTCCCTGAGCCAGTTACCGTAAGTTGGAACAGTGGGGC GCTGACAAGTGGTGTGCACACGTTTCCTGCCGTCCTGCAATCATCG GGCTTGTATAGCCTCAGCTCTGTGGTCACTGTCCCAAGTTCATCGC TGGGCACTCAGACGTATATTTGCAATGTGAACCACAAACCTTCAA ATACAAAAGTGGATAAACGCGTAGAACCGAAATCGTGTGATAAAA CTCACACATGCCCGCCATGCCCGGCACCTGAACTGCTTGGTGGTCC CAGCGTGTTCCTGTTCCCGCCGAAGCCTAAAGATACTCTAATGATC AGCCGTACGCCAGAGGTGACATGTGTCGTGGTTGACGTGTCCCAC GAAGATCCCGAAGTTAAGTTCAATTGGTATGTTGATGGTGTAGAG GTACACAATGCTAAGACTAAACCTCGCGAGGAGCAGTACGCCTCG ACCTATCGTGTCGTGAGCGTTCTGACCGTCCTTCACCAAGATTGGC TTAACGGCAAAGAATATAAGTGCAAGGTAAGCAATAAAGCACTTC CGGCCCCAATCGAGAAAACCATTTCCAAGGCCAAAGGTCAACCAA GAGAACCCCAGGTGTATACTCTTCCGCCTTCTCGTGAGGAAATGAC TAAAAATCAAGTATCCCTTACGTGTCTGGTTAAAGGTTTTTATCCT AGCGATATTGCTGTTGAATGGGAATCGAACGGTCAGCCGGAGAAT AATTATAAAACAACGCCACCCGTCCTGGATAGCGACGGCTCATTTT TTCTGTATAGCAAACTGACTGTAGATAAATCACGGTGGCAGCAGG GCAATGTATTCAGTTGCTCCGTTATGCATGAAGCGTTACATAATCA CTACACGCAGAAATCTCTTAGTCTTTCACCCGGT
548	ATX-P-587	HC IgG1 Fc – nucleotide	CAGGTGCAGCTGCAGCAGTCGGGTCCAGGACTGGTGAAGCCCTCG CAGACCCTCTCACTCACCTGTGCCATCTCCGGGGACAGTGTCTCTA GCAACAGTGCTGCTTGGAACTGGATCAGGCAGTCCCCATCGAGAG GCCTTGAGTGGCTGGGAAAGACATACTACAGGTCCAAGTGGTATA ATTATTATGCACTATCTGTGAAAAGTCGAATAACCATCAACCCAG ACACATCCAAGAACCAGTTCTCCCTGCACCTGAACTCTGTGACTCC CGAGGACACGGCTGTGTATTACTGTGCAAGAGACGGTGACTACTA CCTTCCCTCTCCTTTTGATCTCTGGGGCCACGGGACAATGGTCACC GTCTCCTCAGCTAGCACTAAAGGGCCTTCTGTATTTCCCTTGGCCC CGTCCAGCAAATCGACCTCGGGAGGGACAGCCGCCCTGGGTTGCC TTGTGAAAGATTATTTCCCTGAGCCAGTTACCGTAAGTTGGAACAG TGGGGCGCTGACAAGTGGTGTGCACACGTTTCCTGCCGTCCTGCAA TCATCGGGCTTGTATAGCCTCAGCTCTGTGGTCACTGTCCCAAGTT CATCGCTGGGCACTCAGACGTATATTTGCAATGTGAACCACAAAC CTTCAAATACAAAAGTGGATAAACGCGTAGAACCGAAATCGTGTG ATAAAACTCACACATGCCCGCCATGCCCGGCACCTGAACTGCTTG GTGGTCCCAGCGTGTTCCTGTTCCCGCCGAAGCCTAAAGATACTCT AATGATCAGCCGTACGCCAGAGGTGACATGTGTCGTGGTTGACGT

			GTCCCACGAAGATCCCGAAGTTAAGTTCAATTGGTATGTTGATGGT GTAGAGGTACACAATGCTAAGACTAAACCTCGCGAGGAGCAGTAC GCCTCGACCTATCGTGTCGTGAGCGTTCTGACCGTCCTTCACCAAG ATTGGCTTAACGGCAAAGAATATAAGTGCAAGGTAAGCAATAAAG CACTTCCGGCCCCAATCGAGAAAACCATTTCCAAGGCCAAAGGTC AACCAAGAGAACCCCAGGTGTATACTCTTCCGCCTTCTCGTGAGG AAATGACTAAAAATCAAGTATCCCTTACGTGTCTGGTTAAAGGTTT TTATCCTAGCGATATTGCTGTTGAATGGGAATCGAACGGTCAGCCG GAGAATAATTATAAAACAACGCCACCCGTCCTGGATAGCGACGGC TCATTTTTTCTGTATAGCAAACTGACTGTAGATAAATCACGGTGGC AGCAGGGCAATGTATTCAGTTGCTCCGTTATGCATGAAGCGTTACA TAATCACTACACGCAGAAATCTCTTAGTCTTTCACCCGGT
549	ATX-P-592	HC IgG1 Fc – nucleotide	CAGGTACAGCTGCAGCAGTCAGGTCCAGGACTGGTGAAGCCCTCG CAGACCCTCTCACTCACCTGTGCCATCTCCGGGGACAGTGTCTCTA GCAACAGTGCTGCTTGGAACTGGATCAGGCAGTCCCCATCGAGAG GCCTTGAGTGGCTGGGAAGGACATACTACAGGTCCAAGTGGTATA GTGATTATCCACTATCTGTGAAAAGTCGAATAACCATCAACCCCG ACACATCCAAGAACCAGTTCTCCCTGCAGCTGAACTCTGTGACTCC CGAGGACACGGCTGTGTATTACTGTGCAAGAGACTCCGGTATAGT TGAAACCACGCCCTTTGACTATTGGGGCCAGGGAACCCTGGTCAC CGTCTCCTCAGCTAGCACTAAAGGGCCTTCTGTATTTCCCTTGGCC CCGTCCAGCAAATCGACCTCGGGAGGGACAGCCGCCCTGGGTTGC CTTGTGAAAGATTATTTCCCTGAGCCAGTTACCGTAAGTTGGAACA GTGGGGCGCTGACAAGTGGTGTGCACACGTTTCCTGCCGTCCTGCA ATCATCGGGCTTGTATAGCCTCAGCTCTGTGGTCACTGTCCCAAGT TCATCGCTGGGCACTCAGACGTATATTTGCAATGTGAACCACAAA CCTTCAAATACAAAAGTGGATAAACGCGTAGAACCGAAATCGTGT GATAAAACTCACACATGCCCGCCATGCCCGGCACCTGAACTGCTT GGTGGTCCCAGCGTGTTCCTGTTCCCGCCGAAGCCTAAAGATACTC TAATGATCAGCCGTACGCCAGAGGTGACATGTGTCGTGGTTGACG TGTCCCACGAAGATCCCGAAGTTAAGTTCAATTGGTATGTTGATGG TGTAGAGGTACACAATGCTAAGACTAAACCTCGCGAGGAGCAGTA CGCCTCGACCTATCGTGTCGTGAGCGTTCTGACCGTCCTTCACCAA GATTGGCTTAACGGCAAAGAATATAAGTGCAAGGTAAGCAATAAA GCACTTCCGGCCCCAATCGAGAAAACCATTTCCAAGGCCAAAGGT CAACCAAGAGAACCCCAGGTGTATACTCTTCCGCCTTCTCGTGAGG AAATGACTAAAAATCAAGTATCCCTTACGTGTCTGGTTAAAGGTTT TTATCCTAGCGATATTGCTGTTGAATGGGAATCGAACGGTCAGCCG GAGAATAATTATAAAACAACGCCACCCGTCCTGGATAGCGACGGC TCATTTTTTCTGTATAGCAAACTGACTGTAGATAAATCACGGTGGC AGCAGGGCAATGTATTCAGTTGCTCCGTTATGCATGAAGCGTTACA TAATCACTACACGCAGAAATCTCTTAGTCTTTCACCCGGT
550	ATX-P-594	HC IgG1 Fc – nucleotide	CAGGTACAGCTGCAGCAGTCAGGTCCAGGACTGGTGAAGCCCTCG CAGACCCTCTCACTCACCTGTGCCATCTCCGGGGACAGTGTCTCTA GTAACAGTGCTTCTTGGAACTGGATCAGGCAGTCCCCTTCGAGAG GCCTTGAGTGGCTGGGAACGACATACTACAGGTCCAAGTGGTTTA ATGTTTATGCAGTCTCTGTGAAAAGTCGAATAACCATCAACCCAG ACACATCCAAGAACCAATTCTCCCTGCACCTGAACTCTGTGACTCC CGAGGACACGGCTATATATTTCTGTACAAGAGATCGGGGGGACCT ACTCCACTGGTACTTCGATCTCTGGGGCCGTGGCACCCTGGTCACT GTCTCCTCAGCTAGCACTAAAGGGCCTTCTGTATTTCCCTTGGCCC CGTCCAGCAAATCGACCTCGGGAGGGACAGCCGCCCTGGGTTGCC TTGTGAAAGATTATTTCCCTGAGCCAGTTACCGTAAGTTGGAACAG TGGGGCGCTGACAAGTGGTGTGCACACGTTTCCTGCCGTCCTGCAA TCATCGGGCTTGTATAGCCTCAGCTCTGTGGTCACTGTCCCAAGTT CATCGCTGGGCACTCAGACGTATATTTGCAATGTGAACCACAAAC

			CTTCAAATACAAAAGTGGATAAACGCGTAGAACCGAAATCGTGTG ATAAAACTCACACATGCCCGCCATGCCCGGCACCTGAACTGCTTG GTGGTCCCAGCGTGTTCCTGTTCCCGCCGAAGCCTAAAGATACTCT AATGATCAGCCGTACGCCAGAGGTGACATGTGTCGTGGTTGACGT GTCCCACGAAGATCCCGAAGTTAAGTTCAATTGGTATGTTGATGGT GTAGAGGTACACAATGCTAAGACTAAACCTCGCGAGGAGCAGTAC GCCTCGACCTATCGTGTCGTGAGCGTTCTGACCGTCCTTCACCAAG ATTGGCTTAACGGCAAAGAATATAAGTGCAAGGTAAGCAATAAAG CACTTCCGGCCCCAATCGAGAAAACCATTTCCAAGGCCAAAGGTC AACCAAGAGAACCCCAGGTGTATACTCTTCCGCCTTCTCGTGAGG AAATGACTAAAAATCAAGTATCCCTTACGTGTCTGGTTAAAGGTTT TTATCCTAGCGATATTGCTGTTGAATGGGAATCGAACGGTCAGCCG GAGAATAATTATAAAACAACGCCACCCGTCCTGGATAGCGACGGC TCATTTTTTCTGTATAGCAAACTGACTGTAGATAAATCACGGTGGC AGCAGGGCAATGTATTCAGTTGCTCCGTTATGCATGAAGCGTTACA TAATCACTACACGCAGAAATCTCTTAGTCTTTCACCCGGT
551	ATX-P-595	HC IgG1 Fc – nucleotide	CAGGTACAGCTGCAGCAGTCGGGTCCAGGACTGGTGAAGCCCTCG CAGACCCTCTCACTCACCTGTGCCATCTCCGGGGACAGTGTCTCTA GCAACAGTGCTGCTTGGAACTGGATCAGGCAGTCCCCATCGAGAG GCCTTGAGTGGCTGGGAAGGACATACTACAGGTCCAAGTGGTTTA ATGATTATGCACTATCTGTGAAAAGTCGAATAACCATCAACCCAG ACACATCCAAGAACCAGTTCTCCCTGCACCTGAACTCTGTGACTCC CGAGGACACGGCTGTGTATTACTGTGCAAGAGAACCTGGTATAGT AGCACCTGGCCCTTTTGACTACTGGGGCCAGGGAACCCTGGTCAC CGTCTCCTCAGCTAGCACTAAAGGGCCTTCTGTATTTCCCTTGGCC CCGTCCAGCAAATCGACCTCGGGAGGGACAGCCGCCCTGGGTTGC CTTGTGAAAGATTATTTCCCTGAGCCAGTTACCGTAAGTTGGAACA GTGGGGCGCTGACAAGTGGTGTGCACACGTTTCCTGCCGTCCTGCA ATCATCGGGCTTGTATAGCCTCAGCTCTGTGGTCACTGTCCCAAGT TCATCGCTGGGCACTCAGACGTATATTTGCAATGTGAACCACAAA CCTTCAAATACAAAAGTGGATAAACGCGTAGAACCGAAATCGTGT GATAAAACTCACACATGCCCGCCATGCCCGGCACCTGAACTGCTT GGTGGTCCCAGCGTGTTCCTGTTCCCGCCGAAGCCTAAAGATACTC TAATGATCAGCCGTACGCCAGAGGTGACATGTGTCGTGGTTGACG TGTCCCACGAAGATCCCGAAGTTAAGTTCAATTGGTATGTTGATGG TGTAGAGGTACACAATGCTAAGACTAAACCTCGCGAGGAGCAGTA CGCCTCGACCTATCGTGTCGTGAGCGTTCTGACCGTCCTTCACCAA GATTGGCTTAACGGCAAAGAATATAAGTGCAAGGTAAGCAATAAA GCACTTCCGGCCCCAATCGAGAAAACCATTTCCAAGGCCAAAGGT CAACCAAGAGAACCCCAGGTGTATACTCTTCCGCCTTCTCGTGAGG AAATGACTAAAAATCAAGTATCCCTTACGTGTCTGGTTAAAGGTTT TTATCCTAGCGATATTGCTGTTGAATGGGAATCGAACGGTCAGCCG GAGAATAATTATAAAACAACGCCACCCGTCCTGGATAGCGACGGC TCATTTTTTCTGTATAGCAAACTGACTGTAGATAAATCACGGTGGC AGCAGGGCAATGTATTCAGTTGCTCCGTTATGCATGAAGCGTTACA TAATCACTACACGCAGAAATCTCTTAGTCTTTCACCCGGT
552	ATX-P-604	HC IgG1 Fc – nucleotide	CAGGTACAGCTGCAGCAGTCAGGTCCAGGACTGGTGAAGCCCACG CAGACCCTCTCACTCACCTGTGCCATCTCCGGGGACAGTGTCTCTA GCAACAGTGCTGCATGGAACTGGATCAGGCAGTCCCCATCGAGAG GCCTTGAGTGGCTGGGGAGGACATACTACAGGTCCAAGTGGTTTA ATGGTTATGCAGTATCTGTGAAAAGTCGAATAACCATCAACCCCG ACGCATCCAAGAACCAGTTCTCCCTGCACTTGAAGTCTGTGACTGA CGAGGACACGGCTGTATATTACTGTGCAACAGATCGGGGGGAACT CCTCCACTGGTACTTCGATCTCTGGGGCCGTGGCACCCTGGTCACC GTCTCTTCAGCTAGCACTAAAGGGCCTTCTGTATTTCCCTTGGCCC CGTCCAGCAAATCGACCTCGGGAGGGACAGCCGCCCTGGGTTGCC

			TTGTGAAAGATTATTTCCCTGAGCCAGTTACCGTAAGTTGGAACAG TGGGGCGCTGACAAGTGGTGTGCACACGTTTCCTGCCGTCCTGCAA TCATCGGGCTTGTATAGCCTCAGCTCTGTGGTCACTGTCCCAAGTT CATCGCTGGGCACTCAGACGTATATTTGCAATGTGAACCACAAAC CTTCAAATACAAAAGTGGATAAACGCGTAGAACCGAAATCGTGTG ATAAAACTCACACATGCCCGCCATGCCCGGCACCTGAACTGCTTG GTGGTCCCAGCGTGTTCCTGTTCCCGCCGAAGCCTAAAGATACTCT AATGATCAGCCGTACGCCAGAGGTGACATGTGTCGTGGTTGACGT GTCCCACGAAGATCCCGAAGTTAAGTTCAATTGGTATGTTGATGGT GTAGAGGTACACAATGCTAAGACTAAACCTCGCGAGGAGCAGTAC GCCTCGACCTATCGTGTCGTGAGCGTTCTGACCGTCCTTCACCAAG ATTGGCTTAACGGCAAAGAATATAAGTGCAAGGTAAGCAATAAAG CACTTCCGGCCCCAATCGAGAAAACCATTTCCAAGGCCAAAGGTC AACCAAGAGAACCCCAGGTGTATACTCTTCCGCCTTCTCGTGAGG AAATGACTAAAAATCAAGTATCCCTTACGTGTCTGGTTAAAGGTTT TTATCCTAGCGATATTGCTGTTGAATGGGAATCGAACGGTCAGCCG GAGAATAATTATAAAACAACGCCACCCGTCCTGGATAGCGACGGC TCATTTTTTCTGTATAGCAAACTGACTGTAGATAAATCACGGTGGC AGCAGGGCAATGTATTCAGTTGCTCCGTTATGCATGAAGCGTTACA TAATCACTACACGCAGAAATCTCTTAGTCTTTCACCCGGT
553	ATX-P-610	HC IgG1 Fc -- nucleotide	CAGGTACAGCTGCAGCAGTCAGGTCCAGGACTGGTGAAGTCCTCG CAGACCCTCTCAATCACCTGTGCCATCTCCGGGGACAGTGTCTCTA GCAACAGTGCTGCTTGGAACTGGATCAGGCAGTCCCCATCGAGAG GCCTTGAGTGGCTGGGAAGGACATACTACAGGTCCAAGTGGTATA ATGATTATGCACTATCTGTGAAAAGTCGAATAATCATCAAGTCAG ACACATCCAAGAACCAGTTCTCCCTGCAGTTGAACTCTGTGACTCC CGAGGACACGGCTGTGTACTACTGTGCAAGAGAACCGGGTATAGC AGCACCTGGTCCATTTGACTACTGGGGCCAGGGATCCCTGGTCACC GTCTCCTCAGCTAGCACTAAAGGGCCTTCTGTATTTCCCTTGGCCC CGTCCAGCAAATCGACCTCGGGAGGGACAGCCGCCCTGGGTTGCC TTGTGAAAGATTATTTCCCTGAGCCAGTTACCGTAAGTTGGAACAG TGGGGCGCTGACAAGTGGTGTGCACACGTTTCCTGCCGTCCTGCAA TCATCGGGCTTGTATAGCCTCAGCTCTGTGGTCACTGTCCCAAGTT CATCGCTGGGCACTCAGACGTATATTTGCAATGTGAACCACAAAC CTTCAAATACAAAAGTGGATAAACGCGTAGAACCGAAATCGTGTG ATAAAACTCACACATGCCCGCCATGCCCGGCACCTGAACTGCTTG GTGGTCCCAGCGTGTTCCTGTTCCCGCCGAAGCCTAAAGATACTCT AATGATCAGCCGTACGCCAGAGGTGACATGTGTCGTGGTTGACGT GTCCCACGAAGATCCCGAAGTTAAGTTCAATTGGTATGTTGATGGT GTAGAGGTACACAATGCTAAGACTAAACCTCGCGAGGAGCAGTAC GCCTCGACCTATCGTGTCGTGAGCGTTCTGACCGTCCTTCACCAAG ATTGGCTTAACGGCAAAGAATATAAGTGCAAGGTAAGCAATAAAG CACTTCCGGCCCCAATCGAGAAAACCATTTCCAAGGCCAAAGGTC AACCAAGAGAACCCCAGGTGTATACTCTTCCGCCTTCTCGTGAGG AAATGACTAAAAATCAAGTATCCCTTACGTGTCTGGTTAAAGGTTT TTATCCTAGCGATATTGCTGTTGAATGGGAATCGAACGGTCAGCCG GAGAATAATTATAAAACAACGCCACCCGTCCTGGATAGCGACGGC TCATTTTTTCTGTATAGCAAACTGACTGTAGATAAATCACGGTGGC AGCAGGGCAATGTATTCAGTTGCTCCGTTATGCATGAAGCGTTACA TAATCACTACACGCAGAAATCTCTTAGTCTTTCACCCGGT
554	ATX-P-560	LC Kappa	DIQMTQSPSSVSTSVGDRVTITCRASQGISSWLAWYQQKPGKAPKLLI SAASSLQSGVPSRFSGSGSGTDFTLTISTLQPEDFASYYCQQANSFPPTF GQGTRVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKV QWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVY ACEVTHQGLSSPVTKSFNRGEC

555	ATX-P-561	LC Kappa	DIQMTQSPSSLSASVGDRVTITCRASQGISSWLTWYQQKPGKAPKLLI YAASSLQGGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANSFPPT FGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAK VQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKV YACEVTHQGLSSPVTKSFNRGEC
556	ATX-P-562	LC Kappa	DIQMTQSPSSVSASIGDRVTITCRASKGISIWLAWYQQKPGKAPKVLIS AASSLQSGAPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANSFPPTF GQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKV QWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVY ACEVTHQGLSSPVTKSFNRGEC
557	ATX-P-566	LC Kappa	EIVLTQSPGTLSLSPGDRATLSCRASQSVRNSYVAWYQQKPGQAPRLL IYGASSRATGIPDRFSGSGSGTDFSLTIGRLEPEDFVVYYCQQYGNSPL TFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREA KVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHK VYACEVTHQGLSSPVTKSFNRGEC
558	ATX-P-572	LC Kappa	DIVMTQSPDSLAVSLGERATINCKSSQSVLYSSNNKNYLAWYQQKPG QPPKLLIYWASPRESGVPDRFSGSGSGTDFTLTISSLQAEDVAVYYCQ QYYSIPRTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNN FYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKAD YEKHKVYACEVTHQGLSSPVTKSFNRGEC
559	ATX-P-573	LC Kappa	DIQMTQSPSSVSASVGDRVTITCRASQGISSWLAWYQQKPGKAPKVLI YAASSLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANSFPPT FGPGTKVDIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAK VQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKV YACEVTHQGLSSPVTKSFNRGEC
560	ATX-P-581	LC Kappa	DIQMTQSPSSVSASVGDRVTITCRASQGVNNWLAWYQQKPGKAPKL LIHAASSLLSGVPSRFSGSGSGTDFTLTITSLQPEDFATYYCQQANSFPI TFGQGTRLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAK VQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKV YACEVTHQGLSSPVTKSFNRGEC
561	ATX-P-587	LC Kappa	DIVMTQSPDSLAVSLGERATINCKSSQSVLYSSNNKNYLAWYQQKPG QPPKLLIYWASTRESGVPDRFSGSGSGTDFTLTISSLQAEDVAVYYCQ QYYSTPYTFGQGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNN FYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKAD YEKHKVYACEVTHQGLSSPVTKSFNRGEC
562	ATX-P-592	LC Kappa	DIVMTQSPDSLAVSLGERATINCKSSQSVLYSSNNKNYLAWYQQKPG QPPKLLIYWASNRESGVPDRFSGSGSGTDFTLTISSLQAEDVAVYYCQ QYYSTPYTFGQGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNN FYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKAD YEKHKVYACEVTHQGLSSPVTKSFNRGEC
563	ATX-P-594	LC Kappa	EIVLTQSPGTLSLSPGERATLSCRASQSVSSSYLAWYQQKPGQSPRLLI YGASSRATGIPDRFSGSGSGTDFTLTISRLEPEDFAVYYCQQYGRSVTF GGGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKV QWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVY ACEVTHQGLSSPVTKSFNRGEC
564	ATX-P-595	LC Kappa	DIVMTQSPDSLAVSLGERATINCKSSQSVLYSSNNKNYLAWYQQKPG QPPKLLIYWASTRESGVPDRFSGSGSGTDFTLTISSLQAEDVAVYYCQ QYYSTPYTFGQGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNN FYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKAD YEKHKVYACEVTHQGLSSPVTKSFNRGEC
565	ATX-P-604	LC Kappa	EIVLTQSPDTLSLSPGERATLSCRASQTIRSSYLAWYQLKPGQAPRLLI YGASSRATGIPDRFSGSGSGTDFTLSISRLEPEDFAVYYCQQYGRSIIFG GGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQ WKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYA CEVTHQGLSSPVTKSFNRGEC

566	ATX-P-610	LC Kappa	DIQMTQSPSSVSASVGDRVTITCRASQGISSWLAWYQQKPGKAPKLLI YAASSLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQNYRTPIT FGQGTRLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKV QWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVY ACEVTHQGLSSPVTKSFNRGEC
567	ATX-P-560	LC Kappa – nucleotide	GACATCCAGATGACCCAGTCTCCATCTTCCGTGTCTACATCTGTTG GAGACAGAGTCACCATCACTTGTCGGGCGAGTCAGGGTATTAGCA GCTGGTTAGCCTGGTATCAGCAGAAACCAGGGAAAGCCCCTAAGC TCCTGATCTCTGCTGCATCCAGTTTGCAAAGTGGGGTCCCATCAAG GTTCAGCGGCAGTGGATCTGGGACAGATTTCACTCTCACCATCAGC ACCCTGCAGCCTGAAGACTTTGCATCTTACTATTGTCAACAGGCTA ACAGTTTCCCTCCGACGTTCGGCCAAGGGACCAGGGTGGAAATCA AACGTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCTGA CGAGCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGAAT AATTTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACAAT GCTTTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGGAT TCTAAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAGCA AAGCCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGACGC ACCAAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGGTG AGTGT
568	ATX-P-561	LC Kappa – nucleotide	GACATCCAGATGACCCAGTCTCCATCTTCCCTGTCTGCATCTGTCG GAGACAGAGTCACCATCACTTGTCGGGCGAGTCAGGGTATTAGCA GCTGGTTAACCTGGTATCAGCAGAAACCAGGGAAAGCCCCTAAGC TCCTGATCTATGCTGCATCCAGTTTGCAAGGTGGGGTCCCATCAAG ATTCAGCGGCAGTGGATCTGGGACAGATTTCACTCTCACCATCAGC AGCCTGCAGCCTGAAGATTTTGCAACTTACTATTGTCAACAGGCTA ACAGTTTCCCTCCGACGTTCGGCCAAGGGACCAAGGTGGAAATCA AACGTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCTGA CGAGCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGAAT AATTTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACAAT GCTTTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGGAT TCTAAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAGCA AAGCCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGACGC ACCAAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGGTG AGTGT
569	ATX-P-562	LC Kappa – nucleotide	GACATCCAGATGACCCAGTCTCCATCTTCCGTGTCTGCATCTATAG GAGACAGAGTCACCATCACTTGTCGGGCGAGTAAGGGAATTAGCA TCTGGTTAGCCTGGTATCAGCAGAAACCAGGGAAAGCCCCTAAGG TCCTGATCTCTGCTGCATCCAGTTTGCAAAGTGGGGCCCCATCAAG GTTCAGCGGCAGTGGATCTGGGACAGATTTCACTCTCACCATCAGC AGCCTGCAGCCTGAAGATTTTGCAACTTACTATTGTCAACAGGCTA ACAGTTTCCCTCCGACGTTCGGCCAAGGGACCAAGGTGGAGATCA AACGTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCTGA CGAGCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGAAT AATTTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACAAT GCTTTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGGAT TCTAAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAGCA AAGCCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGACGC ACCAAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGGTG AGTGT
570	ATX-P-566	LC Kappa – nucleotide	GAAATTGTGTTGACGCAGTCTCCAGGCACCCTGTCTTTGTCTCCAG GGGACAGAGCCACCCTCTCATGCAGGGCCAGTCAGAGTGTTAGGA ACAGTTACGTAGCCTGGTACCAGCAGAAACCTGGCCAGGCTCCCA GGCTCCTCATCTATGGTGCATCCAGCAGGGCCACTGGCATCCCAG ACAGGTTCAGTGGCAGTGGGTCTGGGACAGACTTCAGTCTCACCA TCGGCAGACTGGAGCCTGAGGATTTTGTAGTGTATTATTGTCAGCA

			ATACGGTAACTCACCTCTCACTTTCGGCGGAGGGACCAAGGTGGA GATCAAACGTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCG TCTGACGAGCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGC TGAATAATTTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCG ACAATGCTTTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGC AGGATTCTAAAGATTCCACATATTCACTCAGCTCCACCCTTACACT GAGCAAAGCCGACTATGAAAAACATAAAGTTTACGCATGTGAGGT GACGCACCAAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCG CGGTGAGTGT
571	ATX-P-572	LC Kappa – nucleotide	GACATCGTGATGACCCAGTCTCCAGACTCCCTGGCTGTGTCTCTGG GCGAGAGGGCCACCATCAACTGCAAGTCCAGCCAGAGTGTTTTAT ACAGCTCCAACAATAAGAACTACTTAGCTTGGTACCAGCAGAAAC CTGGACAGCCTCCTAAGCTGCTCATTTACTGGGCATCTCCCCGGGA ATCCGGGGTCCCTGACCGGTTCAGTGGCAGCGGGTCTGGGACAGA TTTCACTCTCACCATCAGCAGCCTGCAGGCTGAAGATGTGGCAGTT TATTATTGTCAGCAATATTATAGTATTCCTCGGACGTTCGGCCAAG GGACCAAGGTGGAAATCAAACGTACGGTAGCTGCCCCTTCAGTTT TTATCTTTCCGCCGTCTGACGAGCAGTTAAAATCCGGGACCGCTTC TGTAGTTTGCCTGCTGAATAATTTTTATCCGCGTGAGGCTAAAGTA CAATGGAAAGTCGACAATGCTTTGCAGTCGGGAAATTCACAGGAA AGTGTTACGGAGCAGGATTCTAAAGATTCCACATATTCACTCAGCT CCACCCTTACACTGAGCAAAGCCGACTATGAAAAACATAAAGTTT ACGCATGTGAGGTGACGCACCAAGGATTATCCAGTCCGGTCACAA AATCGTTTAACCGCGGTGAGTGT
572	ATX-P-573	LC Kappa – nucleotide	GACATCCAGATGACCCAGTCTCCATCTTCCGTGTCTGCATCTGTAG GAGACAGAGTCACCATCACTTGTCGGGCGAGTCAGGGTATTAGCA GCTGGTTAGCCTGGTATCAGCAGAAACCAGGGAAAGCCCCTAAGG TCCTGATCTATGCTGCATCCAGTTTGCAAAGTGGGGTCCCATCAAG GTTCAGCGGCAGTGGATCTGGGACAGATTTCACTCTCACCATCAGC AGCCTGCAGCCTGAAGATTTTGCAACTTACTATTGTCAACAGGCTA ACAGTTTCCCTCCCACTTTCGGCCCTGGGACCAAAGTGGATATCAA ACGTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCTGAC GAGCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGAATA ATTTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACAATG CTTTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGGATT CTAAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAGCAA AGCCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGACGCA CCAAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGGTGA GTGT
573	ATX-P-581	LC Kappa – nucleotide	GACATCCAGATGACTCAGTCTCCATCTTCCGTGTCTGCATCTGTAG GAGACAGAGTCACCATCACTTGTCGGGCGAGTCAGGGTGTTAACA ACTGGTTAGCCTGGTATCAGCAGAAACCAGGGAAAGCCCCTAAGC TCCTGATCCATGCTGCATCCAGTTTGCTAAGTGGGGTCCCATCAAG GTTCAGCGGCAGTGGATCTGGGACAGATTTCACGCTCACCATCAC CAGCCTGCAGCCTGAAGATTTTGCAACTTACTATTGTCAACAGGCT AACAGTTTCCCCATCACCTTCGGCCAAGGGACACGACTGGAAATT AAACGTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCTG ACGAGCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGAA TAATTTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACAA TGCTTTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGGA TTCTAAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAGC AAAGCCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGACG CACCAAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGGT GAGTGT
574	ATX-P-587	LC Kappa – nucleotide	GACATCGTGATGACCCAGTCTCCAGACTCCCTGGCTGTGTCTCTGG GCGAGAGGGCCACCATCAACTGCAAGTCCAGCCAGAGTGTTTTAT

			ACAGCTCCAACAATAAGAACTACTTAGCTTGGTACCAGCAGAAAC CAGGACAGCCTCCTAAGCTGCTCATTTACTGGGCATCTACCCGGGA ATCCGGGGTCCCTGACCGATTCAGTGGCAGCGGGTCTGGGACAGA TTTCACTCTCACCATCAGCAGCCTGCAGGCTGAAGATGTGGCAGTT TATTACTGTCAGCAATATTATAGTACTCCGTACACTTTTGGCCAGG GGACCAAGCTGGAGATCAAACGTACGGTAGCTGCCCCTTCAGTTT TTATCTTTCCGCCGTCTGACGAGCAGTTAAAATCCGGGACCGCTTC TGTAGTTTGCCTGCTGAATAATTTTTATCCGCGTGAGGCTAAAGTA CAATGGAAAGTCGACAATGCTTTGCAGTCGGGAAATTCACAGGAA AGTGTTACGGAGCAGGATTCTAAAGATTCCACATATTCACTCAGCT CCACCCTTACACTGAGCAAAGCCGACTATGAAAAACATAAAGTTT ACGCATGTGAGGTGACGCACCAAGGATTATCCAGTCCGGTCACAA AATCGTTTAACCGCGGTGAGTGT
575	ATX-P-592	LC Kappa – nucleotide	GACATCGTGATGACCCAGTCTCCAGACTCCCTGGCTGTGTCTCTGG GCGAGAGGGCCACCATCAACTGCAAGTCCAGCCAGAGTGTTTTAT ACAGCTCCAACAATAAGAACTACTTAGCTTGGTACCAGCAGAAAC CAGGACAGCCTCCTAAGCTGCTCATTTACTGGGCATCTAACCGGG AATCCGGGGTCCCTGACCGATTCAGTGGCTCCGGGTCTGGGACAG ATTTCACTCTCACCATCAGCAGCCTGCAGGCTGAAGATGTGGCAGT TTATTACTGTCAGCAATATTATAGTACTCCGTACACTTTTGGCCAG GGGACCAAGCTGGAGATCAAACGTACGGTAGCTGCCCCTTCAGTT TTTATCTTTCCGCCGTCTGACGAGCAGTTAAAATCCGGGACCGCTT CTGTAGTTTGCCTGCTGAATAATTTTTATCCGCGTGAGGCTAAAGT ACAATGGAAAGTCGACAATGCTTTGCAGTCGGGAAATTCACAGGA AAGTGTTACGGAGCAGGATTCTAAAGATTCCACATATTCACTCAG CTCCACCCTTACACTGAGCAAAGCCGACTATGAAAAACATAAAGT TTACGCATGTGAGGTGACGCACCAAGGATTATCCAGTCCGGTCAC AAAATCGTTTAACCGCGGTGAGTGT
576	ATX-P-594	LC Kappa – nucleotide	GAAATTGTGTTGACGCAGTCTCCAGGCACCCTGTCTTTGTCTCCAG GGGAGAGAGCCACCCTCTCCTGCAGGGCCAGTCAGAGTGTTAGCA GCAGCTACTTAGCCTGGTACCAGCAGAAACCTGGCCAGTCTCCCA GGCTCCTCATCTATGGTGCATCCAGCAGGGCCACTGGCATCCCAG ACAGGTTCAGTGGCAGTGGGTCTGGGACAGACTTCACTCTCACCA TCAGCAGACTGGAGCCTGAGGATTTTGCAGTATATTACTGTCAGCA GTATGGTAGGTCAGTCACTTTCGGCGGAGGGACCAAGCTGGAAAT CAAACGTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCT GACGAGCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGA ATAATTTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACA ATGCTTTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGG ATTCTAAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAG CAAAGCCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGAC GCACCAAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGG TGAGTGT
577	ATX-P-595	LC Kappa – nucleotide	GACATCGTGATGACCCAGTCTCCAGACTCCCTGGCTGTGTCTCTGG GCGAGAGGGCCACCATCAACTGCAAGTCCAGCCAGAGTGTTTTAT ACAGCTCCAACAATAAGAACTACTTAGCTTGGTACCAGCAGAAAC CAGGACAGCCTCCTAAGCTGCTCATTTACTGGGCATCTACCCGGGA ATCCGGGGTCCCTGACCGATTCAGTGGCAGCGGGTCTGGGACAGA TTTCACTCTCACCATCAGCAGCCTGCAGGCTGAAGATGTGGCAGTT TATTACTGTCAGCAATATTATAGTACTCCGTACACTTTTGGCCAGG GGACCAAGCTGGAAATCAAACGTACGGTAGCTGCCCCTTCAGTTT TTATCTTTCCGCCGTCTGACGAGCAGTTAAAATCCGGGACCGCTTC TGTAGTTTGCCTGCTGAATAATTTTTATCCGCGTGAGGCTAAAGTA CAATGGAAAGTCGACAATGCTTTGCAGTCGGGAAATTCACAGGAA AGTGTTACGGAGCAGGATTCTAAAGATTCCACATATTCACTCAGCT CCACCCTTACACTGAGCAAAGCCGACTATGAAAAACATAAAGTTT

			ACGCATGTGAGGTGACGCACCAAGGATTATCCAGTCCGGTCACAA AATCGTTTAACCGCGGTGAGTGT
578	ATX-P-604	LC Kappa – nucleotide	GAAATAGTGCTGACTCAGTCTCCAGACACCCTATCTTTGTCTCCAG GGGAAAGAGCCACCCTCTCCTGCAGGGCCAGTCAGACTATTAGGA GCAGCTACTTAGCCTGGTACCAGCTGAAACCTGGCCAGGCTCCCA GGCTCCTCATCTATGGTGCATCCAGCAGGGCCACTGGCATCCCAG ACAGGTTCAGTGGCAGTGGGTCTGGGACAGACTTCACTCTCTCCAT CAGCAGACTGGAGCCTGAAGATTTTGCAGTGTATTACTGTCAACA GTATGGCCGCTCAATCATTTTCGGCGGAGGGACCAAAGTGGAAAT CAAACGTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCT GACGAGCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGA ATAATTTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACA ATGCTTTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGG ATTCTAAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAG CAAAGCCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGAC GCACCAAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGG TGAGTGT
579	ATX-P-610	LC Kappa – nucleotide	GACATCCAGATGACCCAGTCTCCATCTTCCGTGTCTGCATCTGTAG GAGACAGAGTCACCATCACTTGTCGGGCGAGTCAGGGTATTAGCA GCTGGTTAGCCTGGTATCAGCAGAAACCAGGGAAAGCCCCTAAGC TCCTGATCTATGCTGCATCCAGTTTGCAAAGTGGGGTCCCATCAAG GTTCAGCGGCAGTGGATCTGGGACAGATTTCACTCTCACCATCAGC AGCCTGCAGCCTGAAGATTTTGCAACTTACTACTGTCAACAGAATT ACAGAACCCCGATCACCTTCGGCCAAGGGACACGACTGGAGATTA AACGTACGGTAGCTGCCCCTTCAGTTTTTATCTTTCCGCCGTCTGA CGAGCAGTTAAAATCCGGGACCGCTTCTGTAGTTTGCCTGCTGAAT AATTTTTATCCGCGTGAGGCTAAAGTACAATGGAAAGTCGACAAT GCTTTGCAGTCGGGAAATTCACAGGAAAGTGTTACGGAGCAGGAT TCTAAAGATTCCACATATTCACTCAGCTCCACCCTTACACTGAGCA AAGCCGACTATGAAAAACATAAAGTTTACGCATGTGAGGTGACGC ACCAAGGATTATCCAGTCCGGTCACAAAATCGTTTAACCGCGGTG AGTGT

[00198] Human complement factor H-related protein 4b (CFHR4b) (see, e.g., UniProt Accession No. Q92496):

MLLLINVILTLWVSCANGQEVKPCDFPEIQHGGLYYKSLRRLYFPAAAGQSYSYYCDQN FVTPSGSYWDYIHCTQDGWSPTVPCLRTCSKSDIEIENGFISESSSIYILNKEIQYKCKPGY ATADGNSSGSITCLQNGWSAQPICIKFCDMPVFENSRAKSNGMRFKLHDTLDYECYDGY EISYGNTTGSIVCGEDGWSHFPTCYNSSEKCGPPPPISNGDTTSFLLKVYVPQSRVEYQCQ SYYELQGSNYVTCSNGEWSEPPRCIHPCIITEENMNKNNIQLKGKSDIKYYYAKTGDTIEF MCKLGYNANTSVLSFQAVCREGIVEYPRCE (SEQ ID NO: 580).

[00199] Human CFHL1-Y402H-His (ATX-P-421):

MYRMQLLSCIALSLALVTNSEDCNELPPRRNTEILTGSWSDQTYPEGTQAIYKCRPGYRS LGNVIMVCRKGEWVALNPLRKCQKRPCGHPGDTPFGTFTLTGGNVFEYGVKAVYTCN EGYQLLGEINYRECDTDGWTNDIPICEVVKCLPVTAPENGKIVSSAMEPDREYHFGQAV

RFVCNSGYKIEGDEEMHCSDDGFWSKEKPKCVEISCKSPDVINGSPISQKIIYKENERFQY
KCNMGYEYSERGDAVCTESGWRPLPSCEEKSCDNPYIPNGDYSPLRIKHRTGDEITYQC
RNGFYPATRGNTAKCTSTGWIPAPRCTLKPCDYPDIKHGGLYHENMRRPYFPVAVGKY
YSYYCDEHFETPSGSYWDHIHCTQDGWSPAVPCLRKCYFPYLENGYNQNHGRKFVQG
KSIDVACHPGYALPKAQTTVTCMENGWSPTPRCIRVSFTLGGGGSGLNDIFEAQKIEWH
EGGGGSHHHHHH (SEQ ID NO: 581).

[00200] Table 6: Summary of SEQ ID NOs for individual exemplary antibodies of the present disclosure.

Antibody Name	HCDRs 1,2,3 (aa)	LCDRs 1,2,3 (aa)	VH (aa)	VH (nucleotide)	VL (aa)	VL (nucleotide)	VH + constant (aa)	VH + constant (nucleotide)	VL + constant (aa)	VL + constant (nucleotide)
ATX-P-560	97,111,124	134,157,179	368	381	394	411	528	541	554	567
ATX-P-561	100,114,127	137,160,182	369	382	395	408	529	542	555	568
ATX-P-562	101,115,128	138,161,183	370	383	396	412	530	543	556	569
ATX-P-563	64,76,87	132,155,177	333	344	355	366	493	504	515	526
ATX-P-564	22,33,43	198,201,204	284	294	304	314	444	454	464	474
ATX-P-565	25,36,46	199,202,205	287	297	307	317	447	457	467	477
ATX-P-566	89,103,116	213,223,233	371	384	397	413	531	544	557	570
ATX-P-568	23,34,44	149,172,194	285	295	305	315	445	455	465	475
ATX-P-569	29,40,50	151,174,196	289	299	309	319	449	459	469	479
ATX-P-570	63,75,86	239,247,255	334	345	356	367	494	505	516	527
ATX-P-571	62,74,85	148,171,193	324	335	346	357	484	495	506	517
ATX-P-572	94,108,121	241,249,257	372	385	398	416	532	545	558	571
ATX-P-573	99,113,126	136,159,181	373	386	399	409	533	546	559	572
ATX-P-574	24,35,45	130,153,175	286	296	306	316	446	456	466	476
ATX-P-576	31,42,52	131,154,176	290	300	310	320	450	460	470	480
ATX-P-577	56,68,79	141,164,186	325	336	347	358	485	496	507	518
ATX-P-578	26,37,47	150,173,195	288	298	308	318	448	458	468	478
ATX-P-579	55,67,78	140,163,185	326	337	348	359	486	497	508	519
ATX-P-580	54,66,77	139,162,184	327	338	349	360	487	498	509	520
ATX-P-581	98,112,125	135,158,180	374	387	400	407	534	547	560	573
ATX-P-582	60,72,83	147,170,192	328	339	350	361	488	499	510	521
ATX-P-583	3,10,16	143,166,188	260	266	272	278	420	426	432	438
ATX-P-587	95,109,122	242,250,258	375	388	401	417	535	548	561	574
ATX-P-588	27,38,48	210,220,230	291	301	311	321	451	461	471	481
ATX-P-591	2,9,15	142,165,187	261	267	273	279	421	427	433	439
ATX-P-592	96,110,123	243,251,259	376	389	402	418	536	549	562	575
ATX-P-594	90,104,117	214,224,234	377	390	403	415	537	550	563	576
ATX-P-595	92,106,119	240,248,256	378	391	404	419	538	551	564	577
ATX-P-596	30,41,51	237,245,253	292	302	312	322	452	462	472	482
ATX-P-597	7,14,20	146,169,191	263	269	275	281	423	429	435	441
ATX-P-598	61,73,84	238,246,254	329	340	351	362	489	500	511	522
ATX-P-600	28,39,49	211,221,231	293	303	313	323	453	463	473	483
ATX-P-601	5,12,18	144,167,189	264	270	276	282	424	430	436	442
ATX-P-602	4,11,17	209,219,229	262	268	274	280	422	428	434	440

ATX-P-603	59,71,82	212,222,232	330	341	352	363	490	501	512	523
ATX-P-604	91,105,118	215,225,235	379	392	405	414	539	552	565	578
ATX-P-607	6,13,19	145,168,190	265	271	277	283	425	431	437	443
ATX-P-608	57,69,80	207,217,227	331	342	353	364	491	502	513	524
ATX-P-609	58,70,81	208,218,228	332	343	354	365	492	503	514	525
ATX-P-610	93,107,120	133,156,178	380	393	406	410	540	553	566	579

KEY: aa = amino acid; HCDR 1, 2, 3 = heavy chain CDRs 1, 2, and 3 (in numerical order); LCDRs 1, 2, 3 = light chain CDRs 1, 2, and 3 (in numerical order); VH = heavy chain variable region; VL = light chain variable region; VH + constant = heavy chain variable region sequence with an exemplary human heavy chain constant region sequence (typically IgG1); VL + constant = light chain variable region sequence with an exemplary human light chain constant region sequence (typically kappa). All numbers except in "Antibody Name" correspond to SEQ ID NOs in the sequence listing and Tables 3, 4, and 5.

[00201] Various embodiments of the present disclosure are described herein. Variations of those embodiments may become apparent to those of ordinary skill in the art upon reading the foregoing description. The inventors expect skilled artisans to employ such variations as appropriate, and the inventors intend for the various embodiments of the present disclosure to be practiced otherwise than as specifically described herein. Accordingly, embodiments of the present disclosure include all modifications and equivalents of the subject matter recited in the claims appended hereto as permitted by applicable law. Moreover, any combination of the above-described elements in all possible variations thereof is encompassed by the various embodiments of the present disclosure unless otherwise indicated herein or otherwise clearly contradicted by context.

CLAIMS

What is claimed is:

1. An antibody, or antigen binding fragment thereof, which specifically binds human complement factor H-related (CFHR) 4, optionally wherein said human CFHR4 is the CFHR4 b variant (CFHR4b), which is optionally a polypeptide comprising or consisting of the amino acid sequence of SEQ ID NO: 580.

2. The antibody or fragment of claim 1, which exhibits any one or more the following functional characteristics:

a. reduces complement activation and/or attenuates complement component 3 (C3) convertase activity, which is optionally measured in an in vitro C3 convertase assembly assay relative to the absence of said antibody or fragment; and/or
b. cross-reacts with at least one of Cynomolgus monkey CFHR4b protein (cCFHR4b), human CFHR4 a variant (CFHR4a), human complement factor H-related protein 3 (CFHR3), and/or complement factor H-related protein 1 (CFHL1); and/or
c. does not cross-react with at least one of Cynomolgus monkey CFHR4b protein (cCFHR4b), human CFHR4 a variant (CFHR4a), human complement factor H-related protein 3 (CFHR3), and/or complement factor H-related protein 1 (CFHL1); and/or
d. binds to human CFHR4 with a K_D of about 100nM or lower; and/or
e. binds to the same epitope on human CFHR4 as an antibody comprising the VH and VL sequences of any one of the exemplary antibodies the sequences of which are provided in Table 6; and/or
f. competes for binding to human CFHR4 with an antibody comprising the VH and VL sequences of any one of the exemplary antibodies the sequences of which are provided in Table 6.

3. The antibody of fragment according to any one of the preceding claims, which is monoclonal, optionally recombinant.

4. The antibody of fragment according to any one of the preceding claims, which is human, humanized or chimeric.

5. The antibody or fragment according to any one of the preceding claims, which is a full length antibody, a single chain antibody, a single chain variable fragment (scFv), a variable fragment (Fv), a fragment antigen-binding region (Fab), a Fab-C, a Fab'-SH, a (Fab')2, a single-domain antibody (sdAb), a VHH antibody, a nanobody, a camelid-derived single-domain antibody, a shark IgNAR-derived single-domain antibody fragment (VNAR), a diabody, a triabody, an anticalin or an aptamer, optionally wherein the antibody is a full length antibody comprising an Fc region such as a human IgG1, IgG2, IgG3 or IgG4 region.

6. The antibody or fragment according to any one of the preceding claims, which is conjugated to at least one additional moiety, optionally selected from:

a. an antigen binding moiety, such as an antibody or antigen-binding fragment thereof, which is capable of specific binding to a target which is not human CFHR4, preferably wherein said target is expressed in the human eye;
b. a therapeutic or cytotoxic moiety;
c. a detection moiety;
d. a purification moiety;
e. a half-life extension moiety, optionally a polypeptide that is at least 20 amino acids in length and comprises any combination of G, A, S T, E, and P residue, which polypeptide is conjugated to the C- or N- terminus of the antibody.

7. The antibody or fragment according to any one of the preceding claims, which is a polypeptide comprising:

a. one, two or all three HCDRs of any one of the exemplary antibodies the sequences of which are provided in Table 6, and optionally also one, two or all three of the corresponding LCDRs of said exemplary antibody; and/or
b. a VH sequence having at least 90% identity to the VH sequence of any one of the exemplary antibodies the sequences of which are provided in Table 6, and optionally also a VL sequence having at least 90% identity to the corresponding VL sequence of

said exemplary antibody, preferably wherein variation is not permitted in the HCDRs or LCDRs; and/or

c. all six CDRs of any one of the exemplary antibodies the sequences of which are provided in Table 6; and/or
d. the VH and VL sequences of any one of the exemplary antibodies the sequences of which are provided in Table 6; and/or
e. the full length heavy chain (VH + constant) sequence of any one of the exemplary antibodies the sequences of which are provided in Table 6, and optionally the corresponding full length light chain (VL + constant) sequence of said exemplary antibody.

8. A polynucleotide encoding an antibody or fragment according to any one of the preceding claims, optionally wherein said polynucleotide comprises or consists of a nucleic acid sequence having at least 70, 80, 90 or 100% identity to a nucleic acid sequence of any one of the exemplary antibodies the sequences of which are provided in Table 6.

9. An expression vector comprising the polynucleotide of claim 8, which is optionally an adeno-associated virus (AAV) vector, a lentiviral (LV) vector, a herpes simplex virus (HSV) vector, or a retrovirus vector.

10. A pharmaceutical composition comprising an antibody or fragment, a polynucleotide, or a vector according to any one of the preceding claims, and optionally

a. at least one pharmaceutically acceptable carrier, diluent or preservative; and/or
b. at least one additional active ingredient.

11. The pharmaceutical composition of claim 10, which is suitable for ocular administration to a subject, optionally by delivery using a conjunctival insert, a contact lens, a gel, a nanoparticle, a mucoadhesive polymer, an ointment, a solution, a suspension, eye drops, and/or an implant, preferably by injection into the vitreous fluid.

12. The antibody or fragment according to any one of claims 1 to 7, the polynucleotide of claim 8, the vector of claim 9, or the composition of claim 10 or 11, for use as a medicament, optionally for use in a method of treating a disease of the eye in a subject.

13. The antibody, fragment, polynucleotide, vector or composition for use according to claim 12, wherein said disease is characterized by increased activation of the complement system, in particular the alternative pathway, and in particular within the eye of the subject, for example in drusen or retinal pigment epithelium (RPE) cells of the subject.

14. The antibody, fragment, polynucleotide, vector or composition for use according to claim 12 or 13, wherein the method comprises ocular administration of the antibody, preferably by injection into the vitreous fluid, and wherein said administration preferably relieves at least one symptom in the subject selected from visual distortion, reduced central vision, blurred vision, and/or difficulty adapting to low light.

15. The antibody, fragment, polynucleotide, vector or composition for use according to any one of claims 12 to 14, where the disease is age-related macular degeneration (AMD), optionally wherein said AMD is dry AMD, which may be at an early, intermediate or advanced stage (the latter otherwise known as geographic atrophy, GA).

16. An antibody directed against Complement Factor H Related 4 (CFHR4) peptides, or an antigen-binding fragment thereof, comprising a heavy chain variable region (VH) comprising complementarity determining regions (CDRs) HCDR1, HCDR2, and HCDR3, and a light chain variable region (VL) comprising complementarity determining regions (CDRs) LCDR1, LCDR2, and LCDR3, wherein:

the HCDR1 comprises one of the following amino acid sequences:

(a) $X_1YX_2X_3X_4$ (SEQ ID NO: 1), wherein X_1 is S, T, G, or N; X_2 is G or Y; X_3 is I or M; X_4 is S, H, or Q;

(b) $X_1YX_2X_3X_4$ (SEQ ID NO: 21), wherein X_1 is S, T, R, or D; X_2 is T, V, A, G, S, or E; X_3 is M or I; X_4 is N, S, or H;

(c) $X_1X_2X_3WX_4X_5$ (SEQ ID NO: 53), wherein X_1 is T, S, G, or I; X_2 is S, R, Y, or H; X_3 is D, N, H, K or Y; X_4 is W or S; X_5 is T or S; or

(d) SNX_1AX_2WN (SEQ ID NO: 88), wherein X_1 is S, T, or N; X_2 is A or S;

wherein the HCDR2 comprises one of the following amino acid sequences:

(a) $X_1IX_2X_3X_4X_5GX_6TX_7X_8X_9X_{10}X_{11}X_{12}QX_{13}$ (SEQ ID NO: 8), wherein X_1 is W or I; X_2 is S, N, or D; X_3 is A or P; X_4 is Y, N, or S; X_5 is N, G, or S; X_6 is N, S, or G; X_7 is N, H, T, or S; X_8 is Y or N; X_9 is A or Y; X_{10} is Q or A; X_{11} is K or S; X_{12} is L or F; X_{13} is G or D;

(b) $X_1IX_2X_3X_4X_5X_6X_7X_8X_9X_{10}X_{11}DX_{12}VX_{13}G$ (SEQ ID NO: 32), wherein X_1 is S, V, Y, G or D; X_2 is S or W; X_3 is S, V, G, H, or W; X_4 is S, D, N or T; X_5 is S or G; X_6 is S or G; X_7 is Y, S, T or R; X_8 is T, K, I or V; X_9 is Y, F, N, or G; X_{10} is Y or H; X_{11} is A or V; X_{12} is S or P; X_{13} is R, K, or T;

(c) $X_1X_2X_3X_4X_5GX_6X_7X_8X_9X_{10}PLSX_{11}S$ (SEQ ID NO: 65), wherein X_1 is E or Y; X_2 is I, T, or V; X_3 is Y, H, or F; X_4 is H or Y; X_5 is S, D, T, G; X_6 is S, T, G, or N; X_7 is T or I; X_8 is N or K; X_9 is Y, K, or S; X_{10} is N, S, K, or H; X_{11} is K or Q; or

(d) $X_1TX_2YRSX_3X_4X_5X_6X_7X_8X_9X_{10}SX_{11}X_{12}S$ (SEQ ID NO: 102) wherein X_1 is R, T, M, or K; X_2 is Y or F; X_3 is K or R; X_4 is W or L; X_5 is F, Y, or S; X_6 is N, S, D, or A; X_7 is N, V, G, D, Y, or A; X_8 is Y or F; X_9 is S, A, or P; X_{10} is V, L, or A; X_{11} is V or M; X_{12} is K or S;

wherein the HCDR3 comprises one of the following amino acid sequences:

(a) SEQ ID NOs: 15-20;

(b) SEQ ID NOs: 43-52;

(c) SEQ ID NOs: 77-87; or

(d) SEQ ID NOs: 116-128; and

wherein the LCDR1 comprises an amino acid sequences of any of SEQ ID NOs: 130-151, SEQ ID NOs: 198-199, SEQ ID NOs: 207-215, or SEQ ID NOs: 237-243; the LCDR2 comprises an amino acid sequence of any of SEQ ID NOs: 153-174, SEQ ID NOs: 201-202, SEQ ID NOs: 217-225, or SEQ ID NOs 245-251; and the LCDR3 comprises an amino acid sequence of any of SEQ ID NOs: 175-196, SEQ ID NOs: 204-205, SEQ ID NOs: 227-235, or SEQ ID NOs: 253-259.

17. An antibody directed against Complement Factor H Related 4 (CFHR4) peptides, or an antigen-binding fragment thereof, comprising a heavy chain variable region (VH) comprising complementarity determining regions (CDRs) HCDR1, HCDR2, and HCDR3, and a light chain variable region (VL) comprising complementarity determining regions (CDRs) LCDR1, LCDR2, and LCDR3, wherein:

the LCDR1 comprises one of the following amino acid sequences:

(a) $RX_1SX_2X_3X_4X_5X_6X_7LX_8$ (SEQ ID NO: 129), wherein X_1 is A or T; X_2 is Q or K; X_3 is G, S, D, or N; X_4 is I, F, or V; X_5 is T, R, A, S, N, G, or I; X_6 is T, N, G, S, I, K, or Y; X_7 is W, D, or Y; X_8 is A, T, G, N, or D;

(b) $RSSQX_1LLHSX_2GYNX_3LD$ (SEQ ID NO: 197), wherein X_1 is S or R; X_2 is T or S; X_3 is F or Y;

(c) $RASQX_1X_2X_3X_4X_5X_6X_7X_8A$ (SEQ ID NO: 206), wherein X_1 is S, N, or T; X_2 is V or I; X_3 is S or R; X_4 is S, G or N; X_5 is N or S; X_6 is L or Y; X_7 is A, L, or V; or

(d) SEQ ID NO: 236;

wherein the LCDR2 comprises one of the following amino acid sequences:

(a) $X_1X_2SX_3LX_4X_5$ (SEQ ID NO: 152), wherein X_1 is G, A, T, or K; X_2 is A or T; X_3 is S, T, G, or N; X_4 is E, Q, or L; X_5 is S, T, or G;

(b) LX_1SX_2RAS (SEQ ID NO: 200), wherein X_1 is A or G; X_2 is N or S;

(c) $GASX_1RAT$ (SEQ ID NO: 216), wherein X_1 is T, S, or N; or

(d) $WASX_1RES$ (SEQ ID NO: 244), wherein X_1 is T, P or N;

wherein the LCDR3 comprises one of the following amino acid sequences:

(a) SEQ ID NOs: 175-196;

(b) MQX_1LQTPX_2T (SEQ ID NO: 203), wherein X_1 is A or G; X_2 is Y or P;

(c) $QX_1YX_2X_3X_4X_5X_6T$ (SEQ ID NO: 226), wherein X_1 is Q or H; X_2 is D or G; X_3 is N, S, or R; X_4 is W or S; X_5 is R, P, F, Y, V, or I; X_6 is T, W, L or I; or

(d) $QQX_1X_2X_3X_4PX_5X_6T$ (SEQ ID NO: 252), wherein X_1 is Y or F; X_2 is G or Y; X_3 is S or N; X_4 is S, T, or I; X_5 is M, Y, or R; X_6 is Y or T; and

wherein the HCDR1 comprises an amino acid sequences of any of SEQ ID NOs: 2-7, SEQ ID NOs: 22-31, SEQ ID NOs: 54-64, or SEQ ID NOs: 89-101; the HCDR2 comprises an amino acid sequence of any of SEQ ID NOs: 9-14, SEQ ID NOs: 33-42, SEQ ID NOs: 66-76, or SEQ ID NOs 103-115; and the HCDR3 comprises an amino acid sequence of any of SEQ ID NOs: 15-20, SEQ ID NOs: 43-52, SEQ ID NOs: 77-87, or SEQ ID NOs: 116-128.

18. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 2; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 9; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 15.

19. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 3; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 10; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 16.

20. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 4; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 11; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 17.

21. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 5; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 12; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 18.

22. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 6; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 13; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 19.

23. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 7; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 14; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 20.

24. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 22; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 33; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 43.

25. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 23; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 34; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 44.

26. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 24; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 35; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 45.

27. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 25; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 36; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 46.

28. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 26; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 37; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 47.

29. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 27; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 38; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 48.

30. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 28; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 39; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 49.

31. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 29; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 40; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 50.

32. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 30; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 41; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 51.

33. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 31; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 42; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 52.

34. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 54; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 66; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 77.

35. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 55; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 67; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 78.

36. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 56; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 68; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 79.

37. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 57; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 69; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 80.

38. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 58; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 70; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 81.

39. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 59; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 71; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 82.

40. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 60; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 72; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 83.

41. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 61; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 73; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 84.

42. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 62; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 74; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 85.

43. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 63; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 75; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 86.

44. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 64; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 76; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 87.

45. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 89; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 103; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 116.

46. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 90; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 104; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 117.

47. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 91; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 105; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 118.

48. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 92; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 106; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 119.

49. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 93; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 107; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 120.

50. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 94; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 108; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 121.

51. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 95; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 109; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 122.

52. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 96; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 110; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 123.

53. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 97; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 111; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 124.

54. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 98; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 112; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 125.

55. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 99; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 113; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 126.

56. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 100; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 114; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 127.

57. The antibody of claim 16 or claim 17, wherein the HCDR1 comprises the amino acid sequence of SEQ ID NO: 101; the HCDR2 comprises the amino acid sequence of SEQ ID NO: 115; and the HCDR3 comprises the amino acid sequence of SEQ ID NO: 128.

58. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 130; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 153; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 175.

59. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 131; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 154; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 176.

60. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 132; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 155; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 177.

61. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 133; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 156; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 178.

62. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 134; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 157; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 179.

63. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 135; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 158; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 180.

64. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 136; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 159; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 181.

65. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 137; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 160; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 182.

66. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 138; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 161; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 183.

67. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 139; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 162; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 184.

68. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 140; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 163; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 185.

69. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 141; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 164; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 186.

70. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 142; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 165; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 187.

71. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 143; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 166; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 188.

72. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 144; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 167; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 189.

73. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 145; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 168; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 190.

74. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 146; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 169; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 191.

75. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 147; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 170; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 192.

76. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 148; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 171; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 193.

77. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 149; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 172; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 194.

78. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 150; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 173; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 195.

79. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 151; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 174; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 196.

80. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 198; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 201; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 204.

81. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 199; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 202; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 205.

82. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 207; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 217; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 227.

83. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 208; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 218; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 228.

84. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 209; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 219; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 229.

85. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 210; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 220; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 230.

86. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 211; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 221; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 231.

87. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 212; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 222; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 232.

88. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 213; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 223; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 233.

89. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 214; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 224; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 234.

90. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 215; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 225; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 235.

91. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 237; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 245; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 253.

92. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 238; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 246; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 254.

93. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 239; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 247; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 255.

94. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 240; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 248; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 256.

95. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 241; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 249; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 257.

96. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 242; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 250; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 258.

97. The antibody of claim 16 or claim 17, wherein the LCDR1 comprises the amino acid sequence of SEQ ID NO: 243; the LCDR2 comprises the amino acid sequence of SEQ ID NO: 251; and the LCDR3 comprises the amino acid sequence of SEQ ID NO: 259.

98. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to any of:

(a) SEQ ID NOs: 260-265;

(b) SEQ ID NOs: 284-293;

(c) SEQ ID NOs: 324-334; or

(d) SEQ ID NOs: 368-380.

99. The antibody of claim 16 or claim 17, wherein the VL comprises an amino acid sequence that is at least 90% identical to any of:

(a) SEQ ID NOs: 272-277;

(b) SEQ ID NOs: 304-313;

(c) SEQ ID NOs: 346-356; or

(d) SEQ ID NOs: 394-406.

100. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 260 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 272.

101. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 261 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 273.

102. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 262 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 274.

103. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 263 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 275.

104. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 264 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 276.

105. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 265 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 277.

106. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 284 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 304.

107. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 285 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 305.

108. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 286 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 306.

109. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 287 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 307.

110. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 288 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 308.

111. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 289 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 309.

112. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 290 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 310.

113. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 291 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 311.

114. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 292 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 312.

115. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 293 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 313.

116. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 324 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 346.

117. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 325 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 347.

118. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 326 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 348.

119. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 327 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 349.

120. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 328 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 350.

121. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 329 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 351.

122. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 330 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 352.

123. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 331 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 353.

124. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 332 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 354.

125. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 333 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 354.

126. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 334 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 356.

127. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 368 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 394.

128. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 369 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 395.

129. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 370 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 396.

130. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 371 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 397.

131. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 372 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 398.

132. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 373 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 399.

133. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 374 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 400.

134. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 375 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 401.

135. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 376 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 402.

136. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 377 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 403.

137. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 378 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 404.

138. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 379 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 405.

139. The antibody of claim 16 or claim 17, wherein the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 380 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 406.

140. The antibody of any one of claims 16 to 139, wherein the antibody binds CFHR4 and reduces complement activation.

141. The antibody of any one of claims 16 to 140, wherein the antibody binds human CFHR4b with a K_D of about 100 nM or lower.

142. The antibody of any one of claims 16 to 141, wherein the antibody attenuates complement component 3 (C3) convertase activity.

143. The antibody of claim 142, wherein;

(a) the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 330 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 352;

(b) the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 293 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 313;

(c) the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 378 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 404;

(d) the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 377 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 403;

(e) the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 376 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 402;

(f) the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 289 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 309;

(g) the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 371 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 397; or

(h) the VH comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 284 and the VL comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 304.

144. The antibody of any one of claims 16 to 141, wherein the antibody cross-reacts with Cynomolgus monkey CFHR4b protein (cCFHR4b).

145. The antibody of claim 144, wherein the antibody comprises a VH region and a VL region that are at least 90% identical to a VH region and a VL region of an antibody selected from the group consisting of: ATX-P-560, ATX-P-561, ATX-P-562, ATX-P-563, ATX-P-564, ATX-P-565, ATX-P-566, ATX-P-568, ATX-P-569, ATX-P-570, ATX-P-571, ATX-P-573, ATX-P-574, ATX-P-576, ATX-P-577, ATX-P-578, ATX-P-579, ATX-P-580, ATX-P-581, ATX-P-582,

ATX-P-583, ATX-P-587, ATX-P-588, ATX-P-591, ATX-P-592, ATX-P-594, ATX-P-596, ATX-P-600, and ATX-P-604.

146. The antibody of any one of claims 16 to 141, wherein the antibody does not cross-react with Cynomolgus monkey CFHR4b protein (cCFHR4b).

147. The antibody of claim 146, wherein the antibody comprises a VH region and a VL region that are at least 90% identical to a VH region and a VL region of an antibody selected from the group consisting of: ATX-P-572, ATX-P-595, ATX-P-597, ATX-P-598, ATX-P-601, ATX-P-602, ATX-P-603, ATX-P-607, ATX-P-608, ATX-P-609, and ATX-P-610.

148. The antibody of any one of claims 16 to 141, wherein the antibody cross-reacts with complement factor H-related protein 4a (CFHR4a).

149. The antibody of claim 148, wherein the antibody comprises a VH region and a VL region that are at least 90% identical to a VH region and a VL region of an antibody selected from the group consisting of: ATX-P-560, ATX-P-561, ATX-P-562, ATX-P-563, ATX-P-564, ATX-P-565, ATX-P-566, ATX-P-568, ATX-P-569, ATX-P-570, ATX-P-571, ATX-P-572, ATX-P-573, ATX-P-574, ATX-P-576, ATX-P-577, ATX-P-578, ATX-P-579, ATX-P-580, ATX-P-581, ATX-P-582, ATX-P-583, ATX-P-587, ATX-P-588, ATX-P-591, ATX-P-592, ATX-P-594, ATX-P-595, ATX-P-596, ATX-P-597, ATX-P-600, ATX-P-601, ATX-P-602, ATX-P-603, ATX-P-604, ATX-P-607, ATX-P-608, ATX-P-609, and ATX-P-610.

150. The antibody of any one of claims 16 to 141, wherein the antibody does not cross-react with complement factor H-related protein 4a (CFHR4a).

151. The antibody of claim 150, wherein the antibody comprises a VH region and a VL region that are at least 90% identical to ATX-P-598.

152. The antibody of any one of claims 16 to 141, wherein the antibody cross-reacts with complement factor H-related protein 3 (CFHR3).

153. The antibody of claim 152, wherein the antibody comprises a VH region and a VL region that are at least 90% identical to a VH region and a VL region of an antibody selected from the group consisting of: ATX-P-561, ATX-P-562, ATX-P-563, ATX-P-564, ATX-P-565, ATX-P-566, ATX-P-568, ATX-P-569, ATX-P-572, ATX-P-573, ATX-P-574, ATX-P-576, ATX-P-577, ATX-P-578, ATX-P-579, ATX-P-580, ATX-P-581, ATX-P-583, ATX-P-587, ATX-P-588, ATX-P-592, ATX-P-594, ATX-P-595, ATX-P-596, ATX-P-600, ATX-P-603, ATX-P-604, ATX-P-608, ATX-P-609, and ATX-P-610.

154. The antibody of any one of claims 16 to 141, wherein the antibody does not cross-react with complement factor H-related protein 3 (CFHR3).

155. The antibody of claim 154, wherein the antibody comprises a VH region and a VL region that are at least 90% identical to a VH region and a VL region of an antibody selected from the group consisting of: ATX-P-560, ATX-P-570, ATX-P-571, ATX-P-582, ATX-P-591, ATX-P-597, ATX-P-598, ATX-P-601, ATX-P-602, ATX-P-603, ATX-P-604, and ATX-P-607.

156. The antibody of any one of claims 16 to 141, wherein the antibody cross-reacts with complement factor H-related protein 1 (CFHL1).

157. The antibody of claim 156, wherein the antibody comprises a VH region and a VL region that are at least 90% identical to a VH region and a VL region of an antibody selected from the group consisting of: ATX-P-561, ATX-P-562, ATX-P-563, ATX-P-564, ATX-P-565, ATX-P-566, ATX-P-568, ATX-P-570, ATX-P-571, ATX-P-573, ATX-P-574, ATX-P-576, ATX-P-577, ATX-P-578, ATX-P-579, ATX-P-580, ATX-P-581, ATX-P-582, ATX-P-583, ATX-P-587, ATX-P-588, ATX-P-591, ATX-P-594, ATX-P-595, ATX-P-596, ATX-P-600, and ATX-P-604.

158. The antibody of any one of claims 16 to 141, wherein the antibody does not cross-react with complement factor H-related protein 1 (CFHL1).

159. The antibody of claim 158, wherein the antibody comprises a VH region and a VL region that are at least 90% identical to a VH region and a VL region of an antibody selected from the group consisting of: ATX-P-560, ATX-P-569, ATX-P-572, ATX-P-592, ATX-P-597, ATX-P-598, ATX-P-601, ATX-P-602, ATX-P-603, ATX-P-607, ATX-P-608, ATX-P-609, and ATX-P-610.

160. The antibody of any one of claims 16 to 159, wherein the antibody is a monoclonal antibody, a human antibody, a humanized antibody, and/or a chimeric antibody.

161. The antibody of any one of claims 16 to 160, wherein the antibody is a fragment selected from the group consisting of Fab, Fab-C, Fab'-SH, Fv, scFv, and $(Fab')_2$ fragments.

162. The antibody of any one of claims 16 to 161, wherein the antibody is a monospecific antibody.

163. The antibody of any one of claims 16 to 162, wherein the antibody is a bispecific antibody.

164. The antibody of any one of claims 16 to 163, wherein the antibody comprises a detection moiety.

165. The antibody of any one of claims 16 to 164, wherein the antibody comprises a purification moiety.

166. The antibody of any one of claims 16 to 165, wherein the antibody comprises a half-life extension moiety.

167. The antibody of claim 166, wherein the half-life extension moiety comprises a polypeptide that is at least 20 amino acids in length and comprises any combination of G, A, S T, E, and P residues.

168. The antibody of claim 167, wherein the half-life extension polypeptide is attached to the C-terminus or N-terminus of the antibody.

169. A pharmaceutical composition comprising any of the antibodies of claims 1 to 168.

170. The composition of claim 169, wherein the composition is suitable for ocular administration.

171. The composition of claim 170, wherein the ocular administration comprises injection into vitreous fluid.

172. The composition of claim 170, wherein the ocular administration comprises delivering the antibody using a conjunctival insert, a contact lens, a gel, a nanoparticle, a mucoadhesive polymer, an ointment, a solution, a suspension, eye drops, and/or an implant.

173. A method of treating age-related macular degeneration (AMD) comprising administering a pharmaceutical composition comprising an effective amount of the antibody of claim 1 or claim 2 to a subject in need thereof.

174. The method of claim 173, wherein the pharmaceutical composition is administered ocularly and treats at least one AMD symptom.

175. The method of claim 174, wherein AMD comprises wet AMD.

176. The method of claim 174, wherein AMD comprises dry AMD.

177. The method of any of claims 173-176, wherein the at least one AMD symptom comprises visual distortion, reduced central vision, blurred vision, and/or difficulty adapting to low light.

178. The method of any of claims 173-177, wherein administering the pharmaceutical composition reduces complement activation in the subject's eye.

179. The method of any of claims 173-178, wherein the pharmaceutical composition is administered at a dose ranging from about 0.0001 mg/dose to about 100 mg/dose.

180. The method of any of claims 173-178, wherein the pharmaceutical composition is administered at a dose ranging from about 0.0001 mg/ml to about 100 mg/ml.

181. A polynucleotide having at least 70% identity to any of the following nucleic acid sequences:

(a) SEQ ID NOs: 266-271;

(b) SEQ ID NOs: 294-303;

(c) SEQ ID NOs: 335-345; or

(d) SEQ ID NOs: 381-393.

182. A polynucleotide having at least 70% identity to any of the following nucleic acid sequences:

(a) SEQ ID NOs: 278-283;

(b) SEQ ID NOs: 314-323;

(c) SEQ ID NOs: 357-367; or

(d) SEQ ID NOs: 407-419.

183. A polynucleotide having at least 80% identity to any of the following nucleic acid sequences:

(a) SEQ ID NOs: 266-271;

(b) SEQ ID NOs: 294-303;

(c) SEQ ID NOs: 335-345; or

(d) SEQ ID NOs: 380-393.

184. A polynucleotide having at least 80% identity to any of the following nucleic acid sequences:

(a) SEQ ID NOs: 278-283;

(b) SEQ ID NOs: 314-323;

(c) SEQ ID NOs: 357-367; or

(d) SEQ ID NOs: 407-419.

185. A polynucleotide comprising:

(a) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 266 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 278;

(b) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 267 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 279;

(c) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 268 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 280;

(d) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 269 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 281;

(e) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 270 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 282; or

(f) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 270 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 283.

186. A polynucleotide comprising:

(a) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 294 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 314;

(b) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 295 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 315;

(c) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 296 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 316;

(d) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 297 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 317;

(e) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 298 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 318;

(f) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 299 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 319;

(g) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 300 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 320;

(h) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 301 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 321;

(i) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 302 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 322; or

(j) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 303 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 323.

187. A polynucleotide comprising:

(a) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 335 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 357;

(b) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 336 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 358;

(c) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 337 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 359;

(d) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 338 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 360;

(e) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 339 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 361;

(f) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 340 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 362;

(g) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 341 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 363;

(h) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 342 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 364;

(i) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 343 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 365;

(j) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 344 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 366; or

(k) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 345 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 367.

188. A polynucleotide comprising:

(a) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 381 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 407;

(b) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 382 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 408;

(c) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 383 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 409;

(d) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 384 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 410;

(e) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 385 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 411;

(f) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 386 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 412;

(g) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 387 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 413;

(h) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 388 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 414;

(i) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 389 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 415;

(j) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 390 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 416;

(k) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 391 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 417;

(l) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 392 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 418; or

(m) a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 393 and a nucleic acid sequence that is at least 90% identical to SEQ ID NO: 419.

189. An expression vector comprising any of the polynucleotides of claims 181-188.

190. The expression vector of claim 189, wherein the expression vector is at least one of: an adeno-associated virus (AAV) vector, a lentiviral (LV) vector, a herpes simplex virus (HSV) vector, and a retrovirus vector.

191. A method of administering ocular gene therapy to a subject in need thereof comprising injecting a pharmaceutical composition comprising an effective amount of the expression vector of claim 190.

192. A method of treating age-related macular degeneration (AMD) comprising administering a pharmaceutical composition comprising an effective amount of the expression vector of claim 190, wherein administering the pharmaceutical composition treats at least one AMD symptom.

193. The antibody of any one of claims 16 to 168, wherein the antibody binds an epitope from a CFHR4b polypeptide having an amino acid sequence of SEQ ID NO: 580.

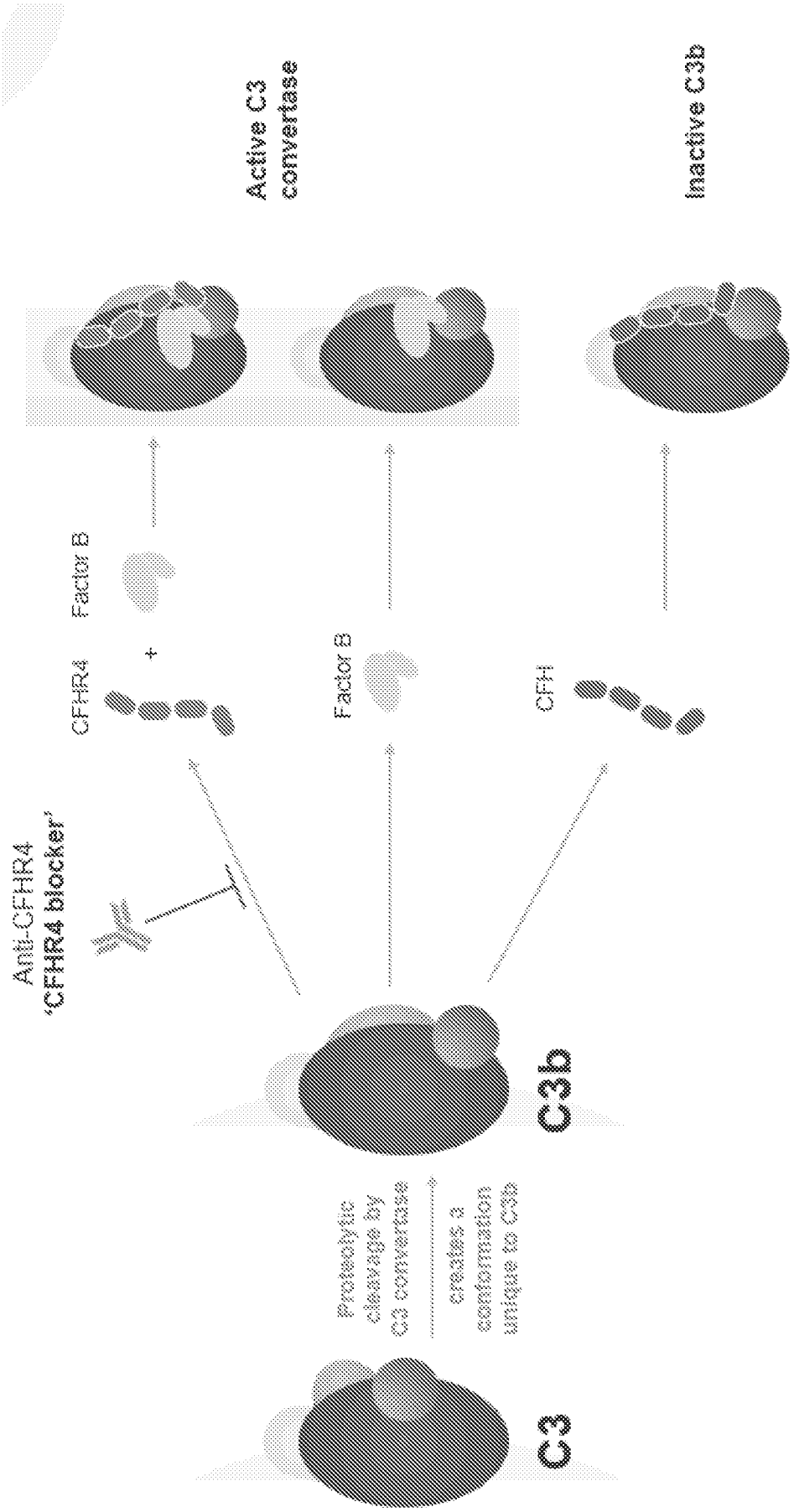

Active C3 convertase
Inactive C3b
Factor B
CFHR4
+
Factor B
CFH
Anti-CFHR4 'CFHR4 blocker'
C3b
Proteolytic cleavage by C3 convertase
creates a conformation unique to C3b
C3

FIG. 1

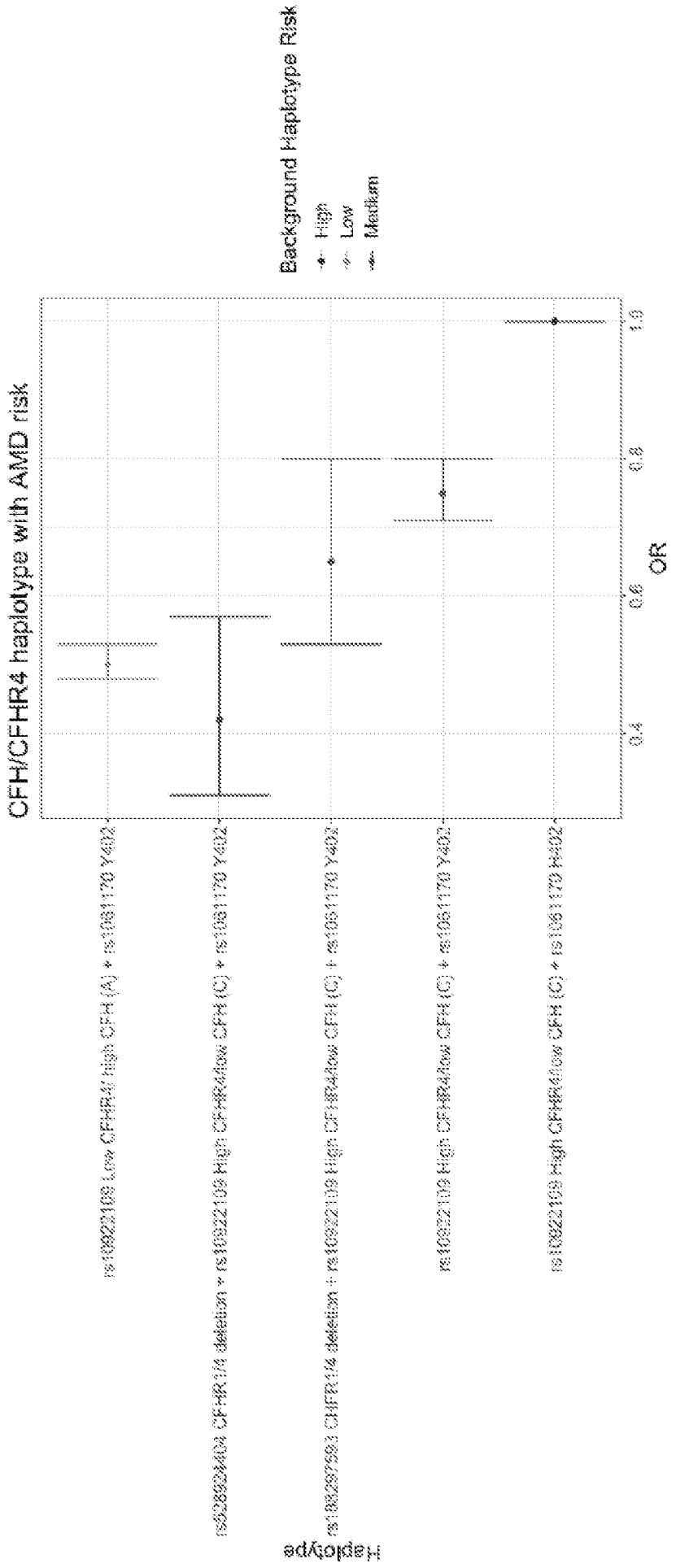
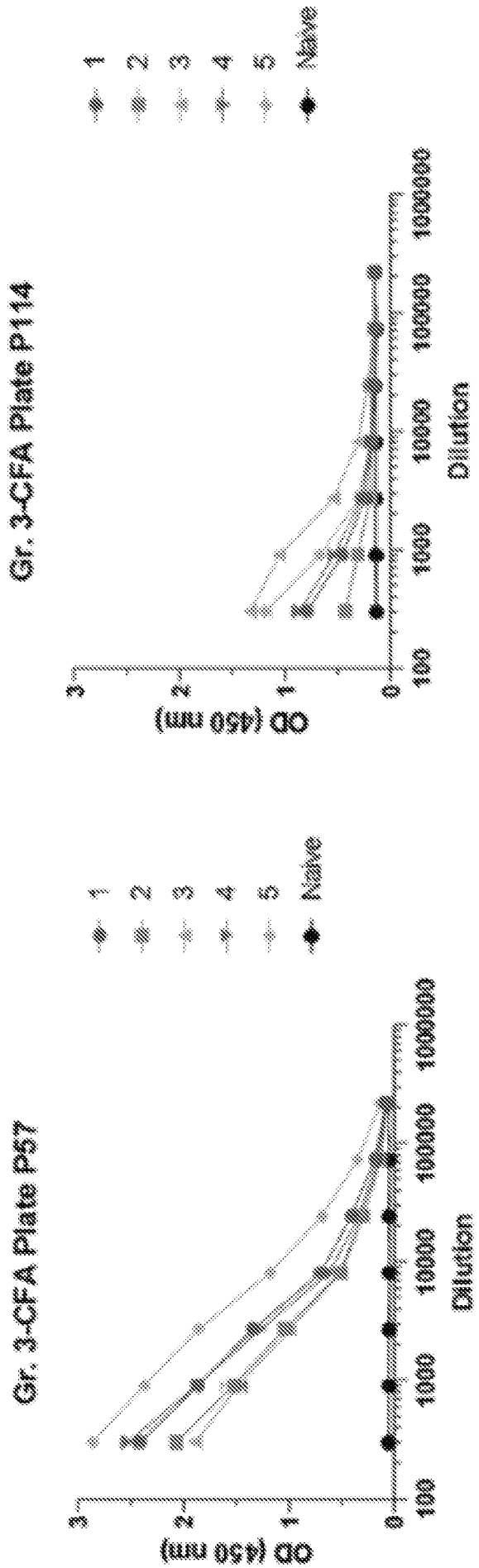

CFH/CFHR4 haplotype with AMD risk
Background Haplotype Risk
High
Low
Medium
OR
0.4
0.6
0.8
1.0
Haplotype
rs10922109 High CFHR4low CFH (C) + rs1061170 H402
rs10922109 High CFHR4low CFH (C) + rs1061170 Y402
rs1853743 CFHR4 114 deletion + rs10922109 High CFHR4low CFH (C) + rs1061170 Y402
rs6828244 CFHR4 114 deletion + rs10922109 High CFHR4low CFH (C) + rs1061170 Y402
rs10922109 Low CFHR4/ High CFH (A) + rs1061170 Y402

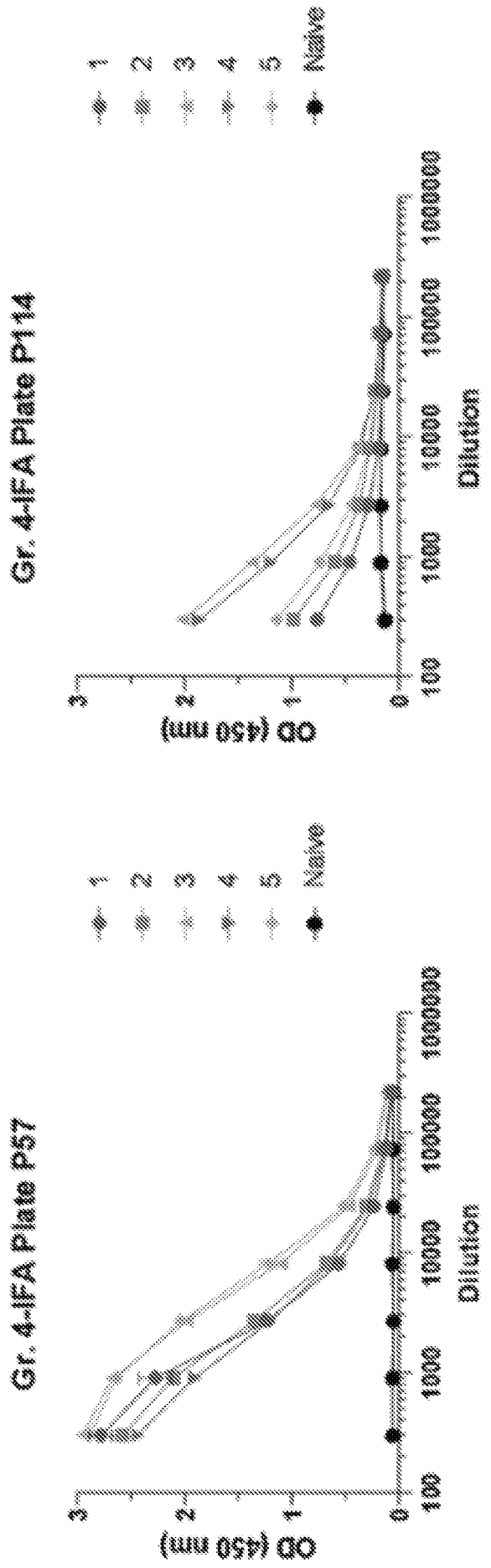
FIG. 2

FIG. 3A:



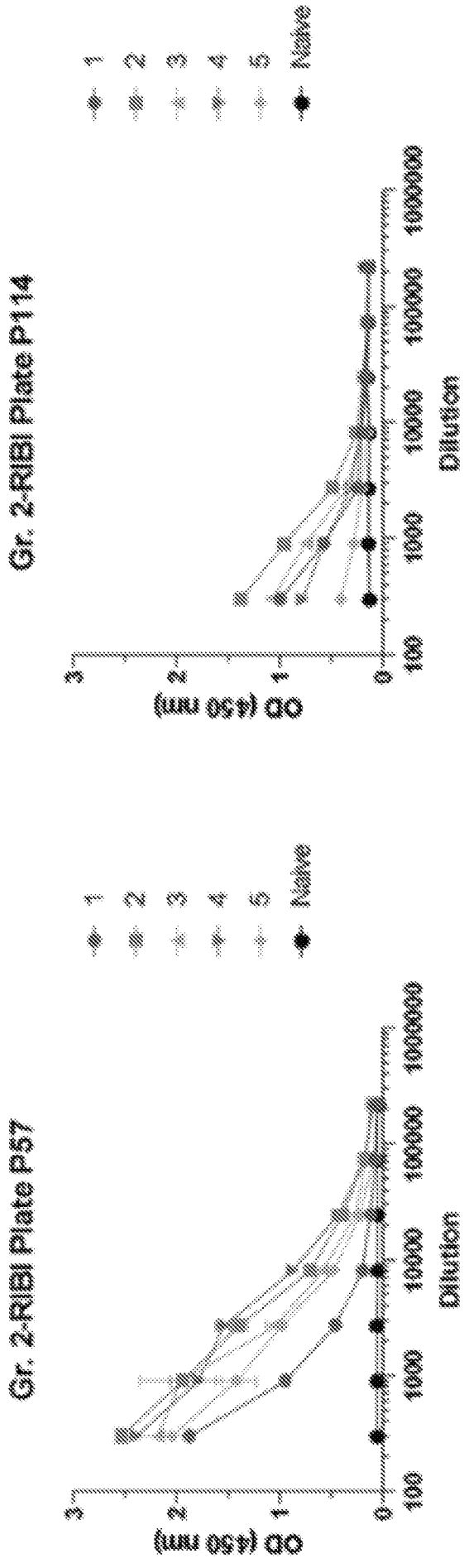
FIGS. 3A-3C

FIG. 3B:



FIGS. 3A-3C (cont'd)

FIG. 3C:



FIGS. 3A-3C (cont'd)

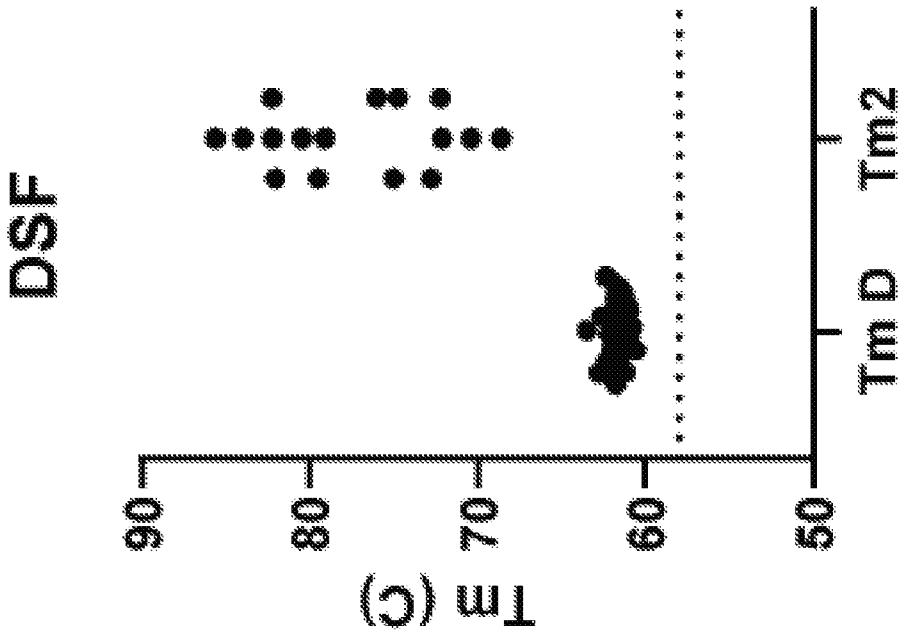
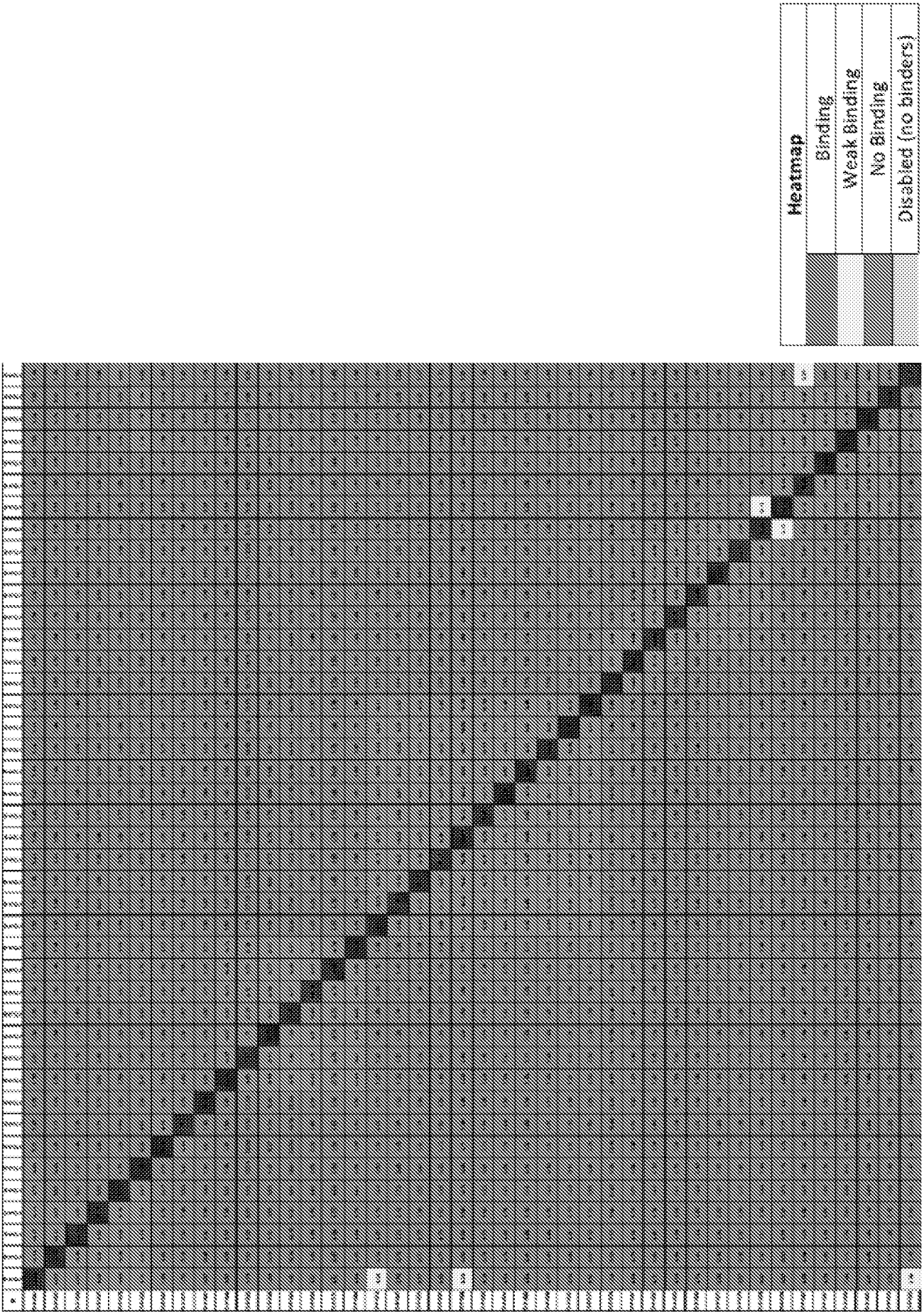


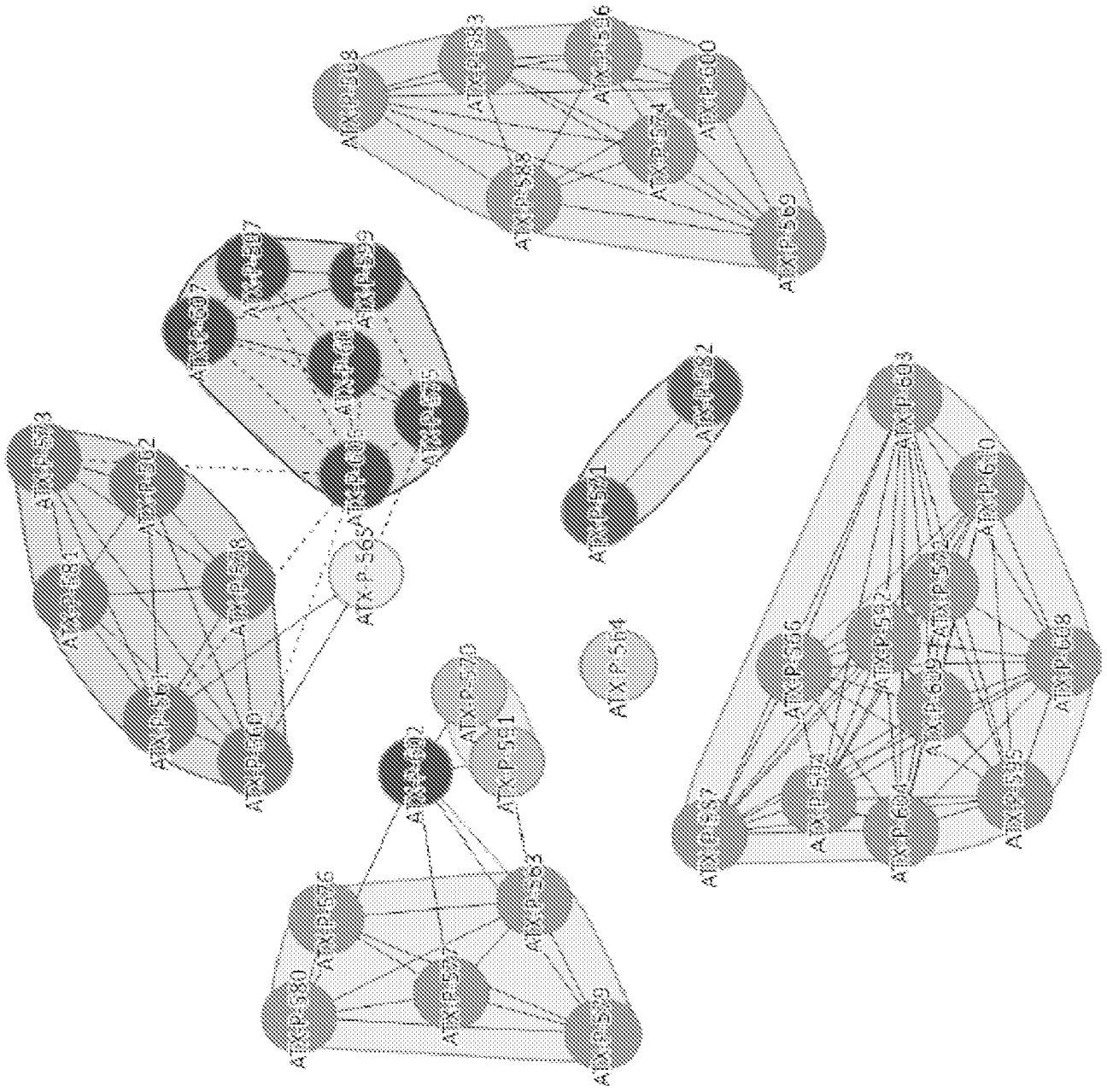
FIG. 4

FIG. 5A:



FIGS. 5A-5B

FIG. 5B:



FIGS. 5A-5B (cont'd)

FIG. 6:

hCFHR4 kinetics						
Antibody	k_a (M-1 s-1)	k_d (s-1)	K_D (M)	Rmax (RU)	Res SD	Res SD/Rmax (%)
ATX-P-560	3.53E+04	7.49E-05	2.12E-09	217.00	2.43	1.12
ATX-P-561	3.71E+04	1.18E-03	3.19E-08	147.78	2.22	1.50
ATX-P-562	1.89E+05	9.18E-05	4.87E-10	230.61	2.15	0.93
ATX-P-563	3.07E+05	3.22E-04	1.05E-09	230.96	5.10	2.21
ATX-P-564	1.63E+05	5.81E-04	3.56E-09	340.31	8.00	2.35
ATX-P-565	4.63E+04	3.19E-04	6.90E-09	231.30	2.41	1.04
ATX-P-566	1.55E+05	5.39E-04	3.48E-09	355.64	8.54	2.40
ATX-P-568	2.23E+05	3.60E-04	1.62E-09	364.47	6.21	1.70
ATX-P-569	6.34E+04	9.11E-05	1.44E-09	321.09	4.03	1.26
ATX-P-570	6.66E+04	6.97E-04	1.05E-08	310.44	5.48	1.77
ATX-P-571	8.72E+04	2.39E-03	2.74E-08	170.18	4.07	2.39
ATX-P-572	1.09E+05	1.64E-04	1.50E-09	380.13	6.41	1.69
ATX-P-573	2.33E+04	5.35E-04	2.30E-08	224.21	1.31	0.58
ATX-P-574	3.37E+05	1.99E-03	5.90E-09	359.75	8.76	2.43
ATX-P-575	1.06E+05	5.05E-04	4.77E-09	318.68	3.93	1.23
ATX-P-576	3.23E+05	2.91E-04	9.00E-10	273.01	4.74	1.74
ATX-P-577	1.60E+05	1.06E-04	6.65E-10	242.97	3.73	1.53
ATX-P-578	2.67E+05	6.68E-03	2.50E-08	193.30	9.90	5.12
ATX-P-579	1.37E+05	2.00E-04	1.46E-09	309.66	7.23	2.34
ATX-P-580	1.76E+05	5.63E-03	3.19E-08	156.14	4.23	2.71
ATX-P-581	6.88E+04	6.65E-04	9.65E-09	253.05	2.52	1.00
ATX-P-582	1.12E+05	1.12E-03	1.00E-08	212.43	4.50	2.12
ATX-P-583	1.66E+05	5.27E-05	3.17E-10	442.14	5.44	1.23
ATX-P-587	6.72E+04	2.86E-04	4.26E-09	335.51	5.97	1.78
ATX-P-588	1.82E+05	1.25E-03	6.87E-09	398.49	8.61	2.16
ATX-P-591	3.07E+04	3.59E-03	1.17E-07	220.78	6.97	3.16
ATX-P-592	2.07E+05	2.01E-04	9.73E-10	486.28	8.92	1.83
ATX-P-594	1.10E+05	3.57E-05	3.26E-10	421.93	11.06	2.62
ATX-P-595	1.53E+05	2.58E-03	1.69E-08	251.35	9.85	3.92
ATX-P-596	1.88E+05	4.22E-05	2.25E-10	293.05	5.21	1.78
ATX-P-597	2.00E+05	3.37E-05	1.68E-10	361.85	4.10	1.13
ATX-P-598	NB	NB	NB	NB	NB	NB
ATX-P-599	1.21E+05	5.02E-04	4.14E-09	330.80	4.99	1.51
ATX-P-600	1.04E+05	7.68E-04	7.39E-09	377.62	5.80	1.54
ATX-P-601	2.15E+05	3.91E-03	1.82E-08	227.56	8.48	3.73
ATX-P-602	1.25E+05	4.14E-03	3.30E-08	224.80	5.77	2.57
ATX-P-603	2.60E+05	2.38E-04	9.17E-10	410.51	10.41	2.54
ATX-P-604	1.11E+05	2.47E-05	2.22E-10	477.63	13.43	2.81
ATX-P-605	1.22E+05	6.09E-05	5.00E-10	384.59	3.99	1.04
ATX-P-607	1.12E+05	8.96E-04	7.97E-09	347.14	5.41	1.56
ATX-P-608	2.86E+05	9.93E-05	3.47E-10	363.90	9.29	2.55
ATX-P-609	6.90E+04	3.44E-04	4.98E-09	400.83	3.53	0.88

FIG. 7:

cCFHR4B		
Antibody	Response @1.6E-7M	Cross-reactivity
ATX-P-560	127.50	Yes
ATX-P-561	330.50	Yes
ATX-P-562	283.40	Yes
ATX-P-563	354.17	Yes
ATX-P-564	312.28	Yes
ATX-P-565	192.80	Yes
ATX-P-566	258.53	Yes
ATX-P-568	304.22	Yes
ATX-P-569	128.57	Yes
ATX-P-570	139.80	Yes
ATX-P-571	339.94	Yes
ATX-P-572	19.10	No
ATX-P-573	347.57	Yes
ATX-P-574	387.89	Yes
ATX-P-575	27.76	No
ATX-P-576	392.14	Yes
ATX-P-577	410.28	Yes
ATX-P-578	409.83	Yes
ATX-P-579	379.69	Yes
ATX-P-580	313.21	Yes
ATX-P-581	323.92	Yes
ATX-P-582	340.60	Yes

cCFHR4B		
Antibody	Response @1.6E-7M	Cross-reactivity
ATX-P-583	168.58	Yes
ATX-P-587	203.85	Yes
ATX-P-588	471.84	Yes
ATX-P-591	229.96	Yes
ATX-P-592	159.25	Yes
ATX-P-594	370.83	Yes
ATX-P-595	40.94	No
ATX-P-596	215.57	Yes
ATX-P-597	-2.60	No
ATX-P-598	9.08	No
ATX-P-599	-24.10	No
ATX-P-600	445.30	Yes
ATX-P-601	-4.50	No
ATX-P-602	-9.06	No
ATX-P-603	-7.27	No
ATX-P-604	301.51	Yes
ATX-P-605	46.07	No
ATX-P-607	-7.03	No
ATX-P-608	-41.39	No
ATX-P-609	-9.59	No
ATX-P-610	-3.17	No

FIG. 8:

hCHFR4a		
Antibody	Response @5.4E-7M	Cross-reactivity
ATX-P-560	68.80	Yes
ATX-P-561	226.14	Yes
ATX-P-562	265.08	Yes
ATX-P-563	253.28	Yes
ATX-P 564	352.34	Yes
ATX-P-565	190.05	Yes
ATX-P-566	321.44	Yes
ATX-P-568	339.59	Yes
ATX-P-569	108.27	Yes
ATX-P-570	232.55	Yes
ATX-P-571	145.02	Yes
ATX-P-572	333.23	Yes
ATX-P-573	261.18	Yes
ATX-P-574	282.10	Yes
ATX-P-575	230.85	Yes
ATX-P-576	282.13	Yes
ATX-P-577	327.29	Yes
ATX-P-578	228.95	Yes
ATX-P-579	282.63	Yes
ATX-P-580	210.49	Yes
ATX-P-581	270.87	Yes
ATX-P-582	199.93	Yes

hCHFR4a		
Antibody	Response @5.4E-7M	Cross-reactivity
ATX-P-583	149.73	Yes
ATX-P-587	256.75	Yes
ATX-P-588	416.79	Yes
ATX-P-591	208.26	Yes
ATX-P-592	442.86	Yes
ATX-P-594	362.72	Yes
ATX-P-595	236.71	Yes
ATX-P-596	183.66	Yes
ATX-P-597	335.18	Yes
ATX-P-598	-0.39	No
ATX-P-599	242.95	Yes
ATX-P-600	394.61	Yes
ATX-P-601	303.35	Yes
ATX-P-602	237.00	Yes
ATX-P-603	345.94	Yes
ATX-P-604	300.55	Yes
ATX-P-605	123.09	Yes
ATX-P-607	330.86	Yes
ATX-P-608	286.47	Yes
ATX-P-609	352.74	Yes
ATX-P-610	181.47	Yes

FIG. 9:

hCFHR3		
Antibody	Response @5.5E-7M	Cross-reactivity
ATX-P-560	7.58	No
ATX-P-561	135.94	Yes
ATX-P-562	183.80	Yes
ATX-P-563	254.70	Yes
ATX-P-564	177.77	Yes
ATX-P-565	88.77	Yes
ATX-P-566	275.66	Yes
ATX-P-568	319.77	Yes
ATX-P-569	89.95	Yes
ATX-P-570	9.12	No
ATX-P-571	-3.83	No
ATX-P-572	243.64	Yes
ATX-P-573	55.91	Yes
ATX-P-574	272.48	Yes
ATX-P-575	11.10	No
ATX-P-576	335.75	Yes
ATX-P-577	348.75	Yes
ATX-P-578	237.25	Yes
ATX-P-579	289.13	Yes
ATX-P-580	216.29	Yes
ATX-P-581	84.77	Yes
ATX-P-582	3.09	No

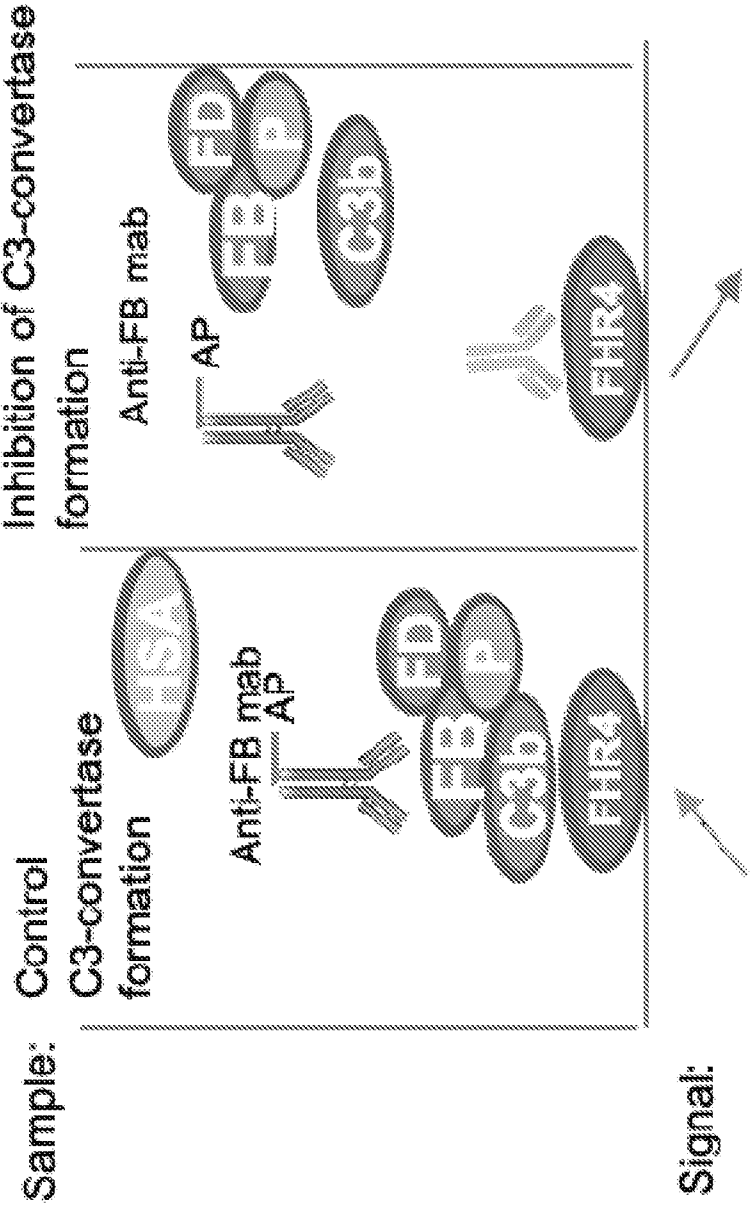
hCFHR3		
Antibody	Response @5.5E-7M	Cross-reactivity
ATX-P-583	160.62	Yes
ATX-P-587	210.21	Yes
ATX-P-588	425.72	Yes
ATX-P-591	2.17	No
ATX-P-592	337.99	Yes
ATX-P-594	300.26	Yes
ATX-P-595	92.28	Yes
ATX-P-596	177.36	Yes
ATX-P-597	6.91	No
ATX-P-598	7.90	No
ATX-P-599	0.37	No
ATX-P-600	424.01	Yes
ATX-P-601	-1.91	No
ATX-P-602	-7.09	No
ATX-P-603	337.64	Yes
ATX-P-604	253.23	Yes
ATX-P-605	12.37	No
ATX-P-607	6.55	No
ATX-P-608	285.03	Yes
ATX-P-609	320.00	Yes
ATX-P-610	71.76	Yes

FIG. 10:

hCFHL1-Y402H		
Antibody	Response @3.8E-7M	Cross-reactivity
ATX-P-560	27.07	No
ATX-P-561	76.20	Yes
ATX-P-562	235.03	Yes
ATX-P-563	253.08	Yes
ATX-P-564	113.27	Yes
ATX-P-565	109.75	Yes
ATX-P-566	122.95	Yes
ATX-P-568	328.39	Yes
ATX-P-569	35.67	No
ATX-P-570	202.96	Yes
ATX-P-571	269.23	Yes
ATX-P-572	-0.91	No
ATX-P-573	63.37	Weak
ATX-P-574	348.42	Yes
ATX-P-575	28.63	No
ATX-P-576	302.74	Yes
ATX-P-577	229.58	Yes
ATX-P-578	345.21	Yes
ATX-P-579	244.87	Yes
ATX-P-580	196.15	Yes
ATX-P-581	175.05	Yes
ATX-P-582	319.33	Yes

hCFHL1-Y402H		
Antibody	Response @3.8E-7M	Cross-reactivity
ATX-P-583	140.85	Yes
ATX-P-587	51.97	Weak
ATX-P-588	276.58	Yes
ATX-P-591	139.56	Yes
ATX-P-592	29.28	No
ATX-P-594	192.59	Yes
ATX-P-595	85.95	Yes
ATX-P-596	134.72	Yes
ATX-P-597	9.01	No
ATX-P-598	7.84	No
ATX-P-599	-1.32	No
ATX-P-600	227.63	Yes
ATX-P-601	-0.53	No
ATX-P-602	-10.20	No
ATX-P-603	6.08	No
ATX-P-604	157.76	Yes
ATX-P-605	14.96	No
ATX-P-607	7.26	No
ATX-P-608	-21.34	No
ATX-P-609	-4.92	No
ATX-P-610	-2.38	No

FIG. 11A:



FIGS. 11A-11D

FIG. 11B:

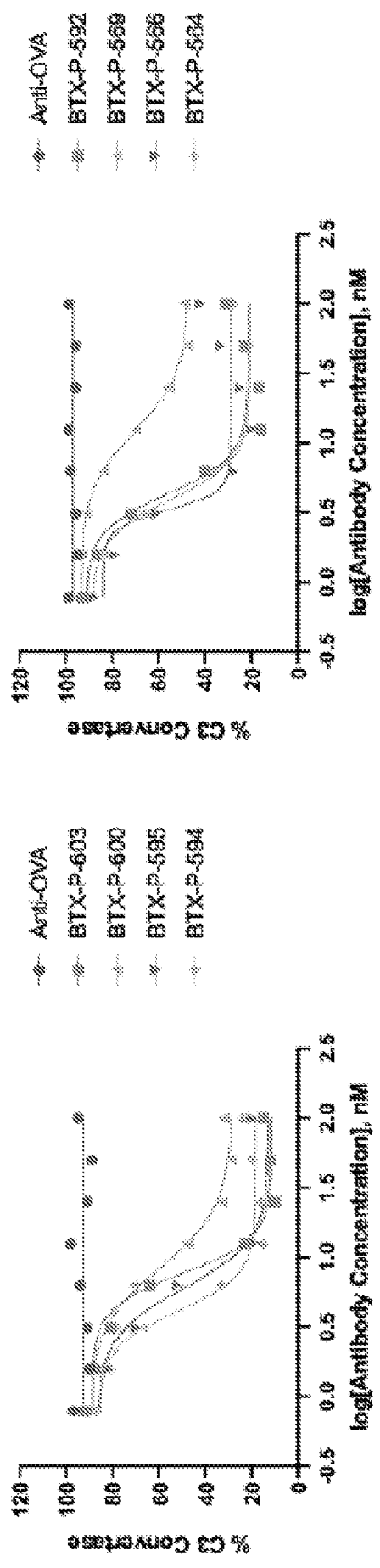


FIG. 11C:

Antibody	IC50 (nM)
ATX-P-603	7.602
ATX-P-600	8.444
ATX-P-595	5.94
ATX-P-594	4.087
ATX-P-592	4.275
ATX-P-569	12.08
ATX-P-566	3.271
ATX-P-564	3.937

FIGS. 11A-11D (cont'd)

FIG. 11D:

		hCFHR4b			hCFHL1	cCFHR4B	Convertase assembly
	Antibody	K_d (M)	Epitope group	Block C3b	Cross-reactivity	Cross-reactivity	IC_{50} [nM]
Block C3b binding	ATX-P-592	9.73E-10	A	Yes	No	Yes	4.2
	ATX-P-594	3.26E-10	A	Yes	Yes	Yes	4.0
Block both sites	ATX-P-603	9.17E-10	A	Yes	No	No	7.6
	ATX-P-595	1.69E-08	A	Yes	Yes	No	5.9
Block site involved in convertase assembly	ATX-P-600	7.39E-09	B	No	Yes	Yes	8.4
	ATX-P-569	1.44E-09	B	No	No	Yes	12.0

FIGS. 11A-11D (cont'd)

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