**Additional file 3.**

**PCR primers used in this study.**

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| 1 | 5’- SAK GTG CAG CTC GAG SAG TCA GGA CCT  | 5’heavy chain Fd |
| 2 | 5’- GAG GTY CAG CTC GAG CAR TCT GGA CCT | 5’heavy chain Fd |
| 3 | 5’- CAG GTC CAA CTC GAG CAG YCT GGG KCT | 5’heavy chain Fd |
| 4 | 5’- GAG GTT CAG CTC GAG CAG TCT GGR GCW G | 5’heavy chain Fd |
| 5 | 5’- GAR GTG AAG CTC GAG GAG WCT GGA SGA | 5’heavy chain Fd |
| 6 | 5’- GAG GTG AAG CTT CTC GAG TCT GGA GGT  | 5’heavy chain Fd |
| 7 | 5’- GAA GTG MAG CTC GAG GAG TCT GGG GGA | 5’heavy chain Fd |
| 8 | 5’- AGG CTT ACT AGT ACA ATC CCT GGG CAC AAT | 3’ IgG1 |
| 9 | 5’- GTT CTG ACT AGT GGG CAC TCT GGG CTC | 3’ IgG2a |
| 10 | 5’- CTC CTT ACT AGT AGG ACA GGG GTT GAT TGT | 3’ IgG2b |
| 11 | 5’- GGG GGT ACT AGT CTT GGG TAT TCT AGG CTC  | 3’ IgG3 |
| 12 | 5’- CCA GTT CCG AGC TCG TTG TGA CTC AGG AAT CT | 5’ κ light chain |
| 13 | 5’- CCA GTT CCG AGC TCG TGT TGA CGC AGC CGC CC | 5’ κ light chain |
| 14 | 5’- CCA GTT CCG AGC TCG TGC TCA CCC AGT CTC CA | 5’ κ light chain |
| 15 | 5’- CCA GTT CCG AGC TCC AGA TGA CCC AGT CTC CA | 5’ κ light chain |
| 16 | 5’- CCA GAT GTG AGC TCG TGA TGA CCC AGA CTC CA | 5’ κ light chain |
| 17 | 5’- CCA GAT GTG AGC TCG TCA TGA CCC AGT CTC CA | 5’ κ light chain |
| 18 | 5’- CCA GTT CCG AGC TCG TGA TGA CAC AGT CTC CA | 5’ κ light chain |
| 19 | 5’- GCG CCG TCT AGA ATT AAC ACT CAT TCC TGT TGA A | 3’ κ light chain |
| 20 | 5’- AAG ACA GCT ATC GCG ATT GCA G | sequencing |
| 21 | 5’- GCC CCC TTA TTA GCG TTT GCC ATC | sequencing |

Primers 1-19 were used for the amplification of IgG Fab fragments, while primers 20-21 for the sequencing of the isolated phagemids.Degenerative nucleotide symbols:K = G or T, S = C or G, M = A or C, W = A or T, R = A or G, Y = C or T. Restriction enzymes recognition sites are underlined, with A|CTAGT for *Spe*I, C|TCGAG for *Xho*I, T|CTAGA for *Xba*I and GAGCT|C for *Sac*I.