

**Table S1. Sequence analysis of CAIX-specific antibodies including V and J germline gene usage**

**A. Heavy Chain Variable Region**

	10 20 30 40 50 60 70 80 90 100 110							Germline		
	QVQLVQSGGGLVQP... SYAMS	WVROAPGKGLEWVS	AISGSGGX... AN..T	RFTISRDN... abc	N-GN--YR... abcde	WGQGLTVTVSS	VH gene	JH gene	V&J Mutation	
G11	.....P..	.....	..AN..T	.....	.....	.....M.....	V <sub>H</sub> 3-23	J <sub>H</sub> 3	7	
G10	.....P..	.....	..AN..T	.....	.....	.....M.....	V <sub>H</sub> 3-23	J <sub>H</sub> 3	7	
G45	.....P..	.....	..AN..T	.....	.....	.....M.....	V <sub>H</sub> 3-23	J <sub>H</sub> 3	7	
G37	.....V.....P..	.....	..AN..T	.....	.....	.....M.....	V <sub>H</sub> 3-23	J <sub>H</sub> 3	8	
G10	E.....	.....	..AN..T	.....	.....	.....T.....	V <sub>H</sub> 3-23	J <sub>H</sub> 3	5	
G36	E.....V.....P..	.....	..AN..T	.....	.....	.....M.....	V <sub>H</sub> 3-23	J <sub>H</sub> 3	7	
G57	.....	.....	..VS.....	.....	.....K	YCSSTSCYRGM.V	V <sub>H</sub> 3-23	J <sub>H</sub> 6	3	
G40	.....	.....	.....S.....	.....	.....T	Y..D...Y.SL.Y	V <sub>H</sub> 3-23	J <sub>H</sub> 4	3	
G6	.....E..G	T..T	..V.....S.....	.....	.....R.....R	GPV...L.YG...	V <sub>H</sub> 3-23	J <sub>H</sub> 3	10	
G10	..QE.....	I.....	.....G..H.....	.....	.....K	F.SA...S.-Y.L	V <sub>H</sub> 3-23	J <sub>H</sub> 5	5	
G39	..QE.....	.....	.....S.....	.....	.....K	I..R...SSSLGY	V <sub>H</sub> 3-23	J <sub>H</sub> 4	2	
G9	..QE.....	.....	.....S.....	.....	.....R	SHSS...G..Y	V <sub>H</sub> 3-23	J <sub>H</sub> 4	2	
G27	..KE...V...T	N...T	.....G	L..YD.SV.H.T	.....A..S.....T...D.....R	-..S...-YQEH	V <sub>H</sub> 3-30	J <sub>H</sub> 4	15	
G12	E...E...V...R	..G.H	.....S.....	.....	.....R	--AAVT.G..P	V <sub>H</sub> 3-23	J <sub>H</sub> 1	6	

**B. Light Chain Variable Region**

	10 20 30 40 50 60 70 80 90 100							Germline		
	QSVLTQPPSVSGAPG... TGSSSNIGAGYDVH	WYQQLPGTAPKLLIY	GNXNRPS	GVPDRFSGSKGTSASLAITGLQAEDEADYYC	QSYDSSLXAW-V	FGGGTKLTVL	vλ gene	Jλ gene	V&J Mutation	
G119	.....	.....	..T.....	.....I...D.....	.....T.RV..M	.....	V1-40	J <sub>L</sub> 3	6	
G10	.....	.....	..S.....	.....S.....H...	.....R..S-..	.....	V1-40	J <sub>L</sub> 3	4	
G45	.....I.....	..T.....	..N.....	.....S.....	.....K..S-..	.....	V1-40	J <sub>L</sub> 3	9	
G37	.....	..H.....	..S.....	.....T..F.....	.....S.....	.....V...	V1-40	J <sub>L</sub> 2/ J <sub>L</sub> 3 <sup>a</sup>	4	
G106	.....F.....	.....R.....	..N.....	.....T..F.....	.....S.....	.....V...	V1-40	J <sub>L</sub> 2/ J <sub>L</sub> 3 <sup>a</sup>	6	
G36	.....F.....	.....	..T.....	.....T.....	.....R..S.....	.....	V1-40	J <sub>L</sub> 3	5	
G57	.....	.....	A.N.....	.....	.....R.....	.....A.....	V1-40	J <sub>L</sub> 3	4	
G40	.....	.....	A.N.....	.....	.....R.....	.....A.....	V1-40	J <sub>L</sub> 3	4	
G6	.....I.....	..R...D.....	A.N.....	..G..A.....S.....	.....R.....	.....A.....	V1-40	J <sub>L</sub> 3	10	
G104	.....	..R..N.....	D.T.....	..A...A...T...D.....	.....G.R.....	.....L.....	V1-40	J <sub>L</sub> 3	11	
G39	.....	..R..N.....	D.T.....	..A...A...D...D.....	.....G.R.....	.....L.....	V1-40	J <sub>L</sub> 3	10	
G9	.....	..R..N.....	..T.....	.....G.....	.....R.....	.....	V1-40	J <sub>L</sub> 3	5	
G27	LP.....V...TAR.T	G--N...SK-S..	..K..Q..V.V..	YDSD...I.E--N..NT.T.T.SRVE.G	..VW...SDHHV.	.....	V3-21	J <sub>L</sub> 2/ J <sub>L</sub> 3 <sup>a</sup>	4	
G125	..PG.....V...TAR.T	G--D...RK-S..	..R..Q..I.V.R	DDRD...I.E...S.VNT.T.I.SRVE.G	..VW...SKHY..	..P...V.A.	V3-21	J <sub>L</sub> 1	14	

“.” = Matches exactly to consensus  
 “.” = filler space  
 “X” = in consensus is various AA  
 “C” = Consensus  
 The linker in G40, G57, G119 all have one AA change  
 “V&J Mutation” = # of V&J mutations from the germline  
<sup>a</sup> These genes are equally homologous to both germlines