	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
VRC-CH31 UCA	Q	V	Q	L	V	Q	S	G	A	E	V	K	K	P	G
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	C N/A, A N/A, G 0.68	G 1.07, T 0.61, G 0.42	C 0.18, A 0.26, G 2.21	C 3.09, T 0.31, G 0.30	G 0.99, T 0.61, G 0.42	C 0.18, A 1.38, G 0.82	T 0.35, C 0.22, T 0.48	G 0.18, G 0.14, G 0.06	G 1.72, C 0.19, T 0.19	G 0.53, A 0.59, G 0.99	G 1.07, T 0.90, G 0.27	A 0.56, A 1.61, G 0.31	A 0.53, A 1.37, G 0.16	C 0.93, C 0.21, T 1.04	G 0.18, G 0.14, G 0.06
VRC-CH31	Q	V	Q	L	V	Q	S	G	A	A	V	R	K	P	G
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	C N/A, A N/A, G 0.68	G 1.07, T 0.61, G 0.42	C 0.18, A 0.26, G 2.21	C 3.09, T 0.31, G 0.30	G 0.99, T 0.61, G 0.42	C 0.18, A 1.38, G 0.82	T 0.63, C 0.13, A 0.67	G 0.08, G 0.13, G 0.06	G 1.72, C 0.19, T 0.53	G 0.16, C 1.08, C 0.11	G 1.03, T 0.55, G 0.52	A 0.59, G 1.59, G 0.51	A 0.90, A 1.37, G 0.16	C 0.93, C 0.21, T 1.04	G 0.18, G 0.14, G 0.06
	0.58254	0.61841	0.61605	0.64101	0.62296	0.56148	0.82645	0.89731	0.58483	0.03837	0.59620	0.14400	0.59062	0.70853	0.91256

	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
VRC-CH31 UCA	A	S	V	K	V	S	C	K	A	S	G	Y	T	F	T
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	G 0.19, C 0.15, C 0.13	T 0.41, C 0.35, A 0.83	G 0.87, T 0.49, G 0.27	A 0.56, A 0.33, G 0.92	G 0.06, T 0.85, C 0.24	T 0.66, C 0.31, C 0.39	T 0.25, G 1.27, C 3.02	A 0.73, A 2.86, G 0.11	G 3.20, C 0.29, T 1.32	T 0.40, C 1.56, T 0.48	G 0.38, G 1.33, A 0.51	T 2.85, A 2.03, C 0.70	A 1.41, C 0.58, C 0.82	T 0.62, T 0.43, C 0.54	A 0.86, C 0.42, C 0.19
VRC-CH31	A	S	V	T	V	S	C	K	F	A	E	D	-	-	-
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	G 0.19, C 0.15, C 0.13	T 0.41, C 0.35, A 0.83	G 0.87, T 0.49, G 0.33	A 0.79, C 0.13, T 0.30	G 0.15, T 0.48, C 0.24	T 0.66, C 0.31, C 0.39	T 0.62, G 1.59, T 0.92	A 1.62, A 1.50, A 2.94	T 1.05, T 0.41, C 1.83	G 2.31, C 1.55, T 0.19	G 0.57, A 0.56, A 1.61	G 0.20, A 0.66, C 0.11	G 0.18, A 0.48, - N/A	- N/A, - N/A, - N/A	- N/A, - N/A, C 0.11
	0.89968	0.86061	0.68433	0.03628	0.77326	0.77215	0.60111	0.45597	0.00143	0.02742	0.11335	0.09888	0.00000	N/A	N/A

	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
VRC-CH31 UCA	G	Y	Y	M	H	W	V	-	-	-	-	-	-	-	-
	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
	G 0.12, G 2.12, C 0.52	T 1.07, A 1.86, C 2.56	T 0.89, A 3.02, T 1.42	A 3.93, T 0.65, G 3.11	C 0.94, A 1.58, C 0.84	T 0.35, G 0.18, G 0.64	G 0.81, T 0.61, G 0.29	- N/A, - N/A, - N/A	- N/A, - N/A, - N/A	- N/A, - N/A, - N/A	- N/A, - N/A, - N/A	- N/A, - N/A, - N/A	- N/A, - N/A, - N/A	- N/A, - N/A, - N/A	- N/A, - N/A, - N/A
VRC-CH31	D	Y	S	P	Y	W	V	N	P	A	P	E	H	F	I
	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
	G 0.18, A 0.74, C 0.85	T 0.96, A 1.86, C 2.38	T 0.52, C 0.27, T 0.66	C 0.19, C 0.33, A 1.00	T 1.30, A 1.74, C 2.83	T 0.35, G 0.18, G 0.64	G 0.81, T 0.90, G 0.27	A 0.56, A 1.95, T 0.39	C 0.60, C 0.17, G 0.12	G 0.75, C 0.15, C 0.10	C 0.20, C 0.22, T 0.38	G 0.57, A 0.67, A 1.00	C 1.08, A 1.16, T 1.01	T 0.47, T 0.61, T 1.71	A 2.86, T 0.94, T 0.41
	0.20453	0.43454	0.16216	0.01965	0.02639	0.81072	0.66035	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
VRC-CH31 UCA	-	-	-	R	Q	A	P	G	Q	G	L	E	W	M	G
	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
	- N/A, - N/A, - N/A	- N/A, - N/A, - N/A	- N/A, - N/A, - N/A	C 0.15, G 0.16, A 0.94	C 0.15, A 0.37, G 0.09	G 0.21, C 0.15, C 0.10	C 0.20, C 0.22, T 1.04	G 0.38, G 0.17, A 0.45	C 0.16, A 0.66, A 2.86	G 0.11, G 0.19, G 1.72	C 0.29, T 0.56, T 0.27	G 0.65, A 0.65, G 1.47	T 0.69, G 0.60, G 1.33	A 1.64, T 0.98, G 0.08	G 0.65, G 2.48, A 1.64
VRC-CH31	H	F	L	R	Q	A	P	G	Q	Q	L	E	W	L	A
	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
	C 0.54, A 1.02, C 0.36	T 0.61, T 0.76, T 0.75	T 0.68, T 0.52, G 1.12	C 0.15, G 0.16, A 0.94	C 0.15, A 0.37, G 0.09	G 0.21, C 0.15, C 0.10	C 0.20, C 0.22, T 1.04	G 0.38, G 0.17, A 0.45	C 0.16, A 0.61, A 2.18	C 2.23, A 0.61, A 1.20	C 1.73, T 1.03, A 0.90	G 0.46, A 0.42, G 1.47	T 0.69, G 0.19, G 2.14	C 0.19, T 0.31, G 0.15	G 1.47, C 0.18, A 1.09
	N/A	N/A	N/A	0.91459	0.85613	0.89223	0.89398	0.86636	0.53241	0.00052	0.76570	0.57472	0.69021	0.12573	0.08972

	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
VRC-CH31 UCA	W	I	N	P	N	S	G	G	T	N	Y	A	Q	K	F
	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
	T 0.98, G 0.85, G 1.33	A 0.60, T 0.41, C 0.46	A 0.72, A 0.66, C 2.13	C 0.31, C 0.09, T 0.92	A 1.36, A 1.00, C 1.19	A 0.83, G 0.87, T 0.69	G 0.64, G 0.99, T 0.78	G 0.19, G 1.47, C 2.04	A 0.62, C 0.36, A 0.51	A 1.78, A 0.66, C 1.73	T 0.89, A 2.46, T 0.65	G 3.11, C 0.94, A 0.62	C 0.72, A 0.64, G 0.32	A 0.53, A 1.11, G 1.50	T 0.79, T 0.76, T 0.48
VRC-CH31	W	M	N	P	T	N	G	A	V	N	Y	A	W	Y	L
	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
	T 1.05, G 0.85, G 1.33	A 1.64, T 0.88, G 0.65	A 0.67, A 1.33, C 2.13	C 0.51, C 0.17, A 0.57	A 1.15, C 1.76, G 0.50	A 0.64, A 2.14, T 1.47	G 0.15, G 0.75, C 0.18	G 0.38, C 1.01, C 0.11	G 1.84, T 0.98, T 1.76	A 1.71, A 2.02, T 0.57	T 1.77, A 2.59, T 0.65	G 3.11, C 0.40, A 1.09	T 1.05, G 0.64, G 3.41	T 2.87, A 1.48, C 1.19	C 0.82, T 1.03, T 1.60
	0.61294	0.02968	0.48709	0.78835	0.04083	0.05932	0.65487	0.07061	0.00580	0.38774	0.37382	0.40627	0.00171	0.00087	0.12856

	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
VRC-CH31 UCA	Q	G	R	V	T	M	T	R	D	T	S	I	S	T	A
	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
	C 0.79, A 0.67, G 0.08	G 0.19, G 9.28, C 0.26	A 0.47, G 0.08, G 0.70	G 0.17, T 0.44, C 0.16	A 0.86, C 0.47, C 0.27	A 1.01, T 1.37, G 0.16	A 0.65, C 0.68, C 0.56	A 0.55, G 0.08, G 0.65	G 0.22, A 0.45, C 0.59	A 0.90, C 0.25, G 0.49	T 0.57, C 0.20, C 0.33	A 1.31, T 0.45, C 0.73	A 1.05, G 1.89, C 3.96	A 0.62, C 0.72, A 0.77	G 0.21, C 0.93, C 0.28
VRC-CH31	N	G	R	V	T	A	T	R	D	R	S	M	T	T	A
	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
	A 1.71, A 2.07, T 1.47	G 0.15, G 1.47, C 0.26	A 0.47, G 0.08, G 0.70	G 0.17, T 0.44, C 0.16	A 0.61, C 0.15, G 0.13	G 0.75, C 0.42, G 0.16	A 0.59, C 0.68, C 0.56	A 0.55, G 0.08, G 0.65	G 0.22, A 0.45, C 0.15	A 0.37, G 0.68, G 0.06	T 0.40, C 0.20, C 0.33	A 1.01, T 1.37, G 0.16	A 0.79, C 0.85, T 0.96	A 1.48, C 1.33, A 0.77	G 0.21, C 0.93, C 0.18
	0.00168	0.12159	0.82982	0.83164	0.68508	0.00841	0.69294	0.84696	0.72295	0.01578	0.80518	0.03761	0.07864	0.64386	0.66347

	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
VRC-CH31 UCA	Y	M	E	L	S	R	L	R	S	D	D	T	A	V	Y
	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
	T 1.31, A 1.48, C 1.23	A 1.16, T 1.05, G 0.85	G 0.41, A 0.54, G 4.09	C 3.09, T 0.19, G 0.53	A 0.74, G 0.70, C 4.23	A 0.47, G 0.09, G 3.20	C 0.19, T 0.19, G 0.53	A 0.49, G 1.42, A 0.28	T 0.35, C 1.82, T 0.42	G 0.08, A 0.58, C 0.11	G 0.18, A 0.94, C 0.59	A 0.90, C 0.15, G 0.13	G 0.75, C 0.24, C 0.11	G 1.03, T 0.67, G 4.51	T 1.60, A 2.62, T 1.00
VRC-CH31	F	L	E	V	K	S	L	R	S	D	D	T	A	V	Y
	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
	T 1.68, T 0.76, T 0.75	T 0.68, T 0.61, G 0.21	G 0.49, A 0.90, A 1.11	G 0.74, T 0.49, G 0.27	A 0.56, A 1.61, G 0.29	A 0.42, G 0.46, T 0.35	C 1.57, T 0.65, A 1.52	A 1.27, G 0.78, A 0.28	T 0.35, C 1.82, T 0.42	G 0.08, A 0.58, C 0.11	G 0.18, A 0.94, C 0.59	A 0.90, C 0.15, G 0.13	G 0.75, C 0.24, C 0.11	G 0.27, T 0.46, C 1.57	T 1.91, A 1.86, C 2.56
	0.05409	0.13255	0.57302	0.14592	0.04125	0.16816	0.89591	0.63772	0.59593	0.80641	0.65499	0.71163	0.76040	0.59054	0.32309

	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
VRC-CH31 UCA	Y	C	A	R	A	Q	K	R	G	R	Y	N	W	N	Y
	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
	T 1.43, A 1.74, C 2.83	T 0.30, G 1.11, T 0.60	G 0.29, C 0.15, G 0.26	A 1.15, G 0.38, A 0.31	G 0.75, C 4.30, C 0.14	C 0.18, A 0.19, G 0.32	A 0.37, A 1.61, A 1.47	A 0.73, G 0.11, G 0.13	G 0.16, G 0.06, G 1.03	C 0.23, G 0.60, G 3.95	T 2.02, A 2.27, T 0.96	A 1.68, A 1.51, C 2.53	T 0.35, G 0.38, G 0.49	A 0.38, A 1.51, C 1.73	T 0.96, A 1.69, C 1.70
VRC-CH31	Y	C	A	R	A	Q	K	R	G	R	S	E	W	A	Y
	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
	T 0.89, A 2.70, T 1.01	T 0.63, G 1.03, T 0.60	G 0.29, C 0.15, G 0.26	A 0.55, G 0.09, G 0.19	G 0.19, C 0.15, C 0.14	C 0.18, A 0.19, G 0.32	A 0.37, A 1.61, A 1.47	A 0.73, G 0.11, G 0.13	G 0.16, G 0.06, G 1.03	C 0.23, G 0.31, G 0.39	A 0.89, G 1.47, T 0.49	G 0.52, A 0.65, G 1.47	T 0.69, G 0.28, G 0.16	G 0.19, C 0.15, C 0.28	T 1.31, A 1.69, C 1.70
	0.39696	0.64112	0.81086	0.73785	0.28009	0.86634	0.49449	0.81608	0.91271	0.80408	0.13236	0.01876	0.79847	0.00756	0.45368

	121	122	123	124	125	126	127	128	129	130	131	132	133
VRC-CH31 UCA	A	H	W	G	Q	G	T	L	V	T	V	S	S
	121	122	123	124	125	126	127	128	129	130	131	132	133
	G 0.48, C 1.19, C 0.14	C 0.14, A 0.79, C 0.84	T 0.35, G 0.18, G 0.14	G 0.06, G 0.19, C 0.16	C 0.29, A 0.55, G 0.08	G 0.19, G 9.28, C 2.04	A 0.77, C 0.20, C 0.31	C 0.22, T 1.04, G 0.30	G 0.40, T 0.44, C 0.16	A 0.86, C 0.42, C 0.17	G 0.27, T 0.46, C 0.24	T 0.66, C 0.31, C 0.62	T 0.41, C N/A, A N/A
VRC-CH31	A	H	W	G	Q	G	T	P	V	V	V	S	S
	121	122	123	124	125	126	127	128	129	130	131	132	133
	G 0.48, C 1.19, C 0.14	C 0.14, A 0.79, C 0.84	T 0.35, G 0.18, G 0.14	G 0.48, G 0.17, T 0.44	C 0.13, A 0.67, G 0.08	G 0.19, G 9.28, C 2.04	A 1.58, C 0.37, T 0.27	C 0.29, C 0.17, G 0.72	G 0.22, T 0.43, C 0.23	G 0.29, T 0.54, C 0.23	G 0.29, T 0.46, C 0.24	T 0.32, C 0.29, G 0.29	T 0.51, C N/A, A N/A
	0.63232	0.66487	0.85958	0.91698	0.78581	0.21391	0.68069	0.04946	0.79819	0.01054	0.80187	0.77049	0.79895