

Table S1. DNA sequencing statistics and features of the IOC-B141 and IOC-B388 genomes

	IOC-B141		IOC-B388
	454	Illumina	Illumina
No. reads	92,655	40,379,611	21,213,791
Mapped reads ^a	3,533	2,394,619	1,129,777
Average read length (nt)	461	100	100
Mapped bases ^b	1,892,585	239,205,305	112,828,128
Initial contig sizes (bp)	49,449	170,259	173,922
	31,800	9,463	5,452
	30,805	533	215
	24,385	400	419
	17,439		
	16,184		
	1,509		
	569		
	191,805 ^c		
Genome Coverage (\times) ^d	1,256		603.4
Final genome size (bp)	192,017		186,980
Central genome region (bp)	170,071		173,734
ITR sizes (bp)	10,973		6,623
ITR repeats size in bp	54 (9.3); 70 (6.5);		54 (9.3)
(number of repeats)	125 (2.5); 133 (3)		125 (2.5)
A+T content	66.6%		66.6%

^a Number of reads mapped to the final genome.

^b Number of bases mapped to the final genome.

^c The final 454-derived contig of 191,805 bp was obtained after Sanger sequencing to fill the gaps.

^d Redundancy was calculated based on the final genome.

Table S2. Complete list of ORFs encoded by VACV-IOC-B141, VACV-IOC-B388 and CTGV

ORF ^a	B141		B388		Description or putative function	CTGV ^d Orthologs			VACV-Cop or VACV-WR Ortholog ^e	Ortholog Nt ^b (AA ^c)
	Nt ^b	AA ^c	Nt ^b	AA ^c		ORF ^a	Nt ^b	AA ^c		
IOC_001	255	84	-	-	hypothetical protein	-	-	-	VARV-Gar_1966- G4R HSPV-MNR76-001	498 (165)/ 219 (72)
IOC_002	147	48	147	48	hypothetical protein	-	-	-	HSPV-MNR76-001	219 (72)
-	-	-	-	-	chemokine-binding protein	CTGV_001	126	41	Cop C23L/B29R	735 (244)
IOC_003	681	226	711	236		CTGV_002	519	172		
IOC_004	192	63	-	-	TNF-alpha-receptor-like protein	CTGV_003	192	63	WR-002	183 (61)
IOC_005	105	34	105	34		CTGV_004	105	34		
IOC_006	360	119	342	113	TNF-alpha-receptor-like protein	-	-	-	Cop C22L/B28R	369 (122)
IOC_007	150	49	150	49	ankyrin-like protein	-	-	-	WR-005	147 (48)
IOC_008	201	66	201	66	ankyrin-like protein	-	-	-	Cop C21L/B27R	342 (113)
IOC_009	141	46	141	46		-	-	-		
IOC_010	186	61	186	61	ankyrin-like protein	-	-	-	Cop C18L/B24R	453 (150)
IOC_011	318	105	318	105	ankyrin-like protein	-	-	-	Cop C17L/B23R	1161 (386)
IOC_012	192	63	195	64		-	-	-		
IOC_013	702	233	702	233		CTGV_005	231	76		
IOC_014	531	176	522	173	predicted Bcl-2 protein	CTGV_006	453	150	Cop C16L/B22R	546 (181)

IOC_015	123	40	123	40	ankyrin-like protein	CTGV_007	123	40	HSPV201b	204 (67)
IOC_016	258	85	258	85	hypothetical protein	-	-	-	Cop C15L/B21R	276 (91)
IOC_017	1062	353	1065	354	serine protease inhibitor (Serp)-1 (SPI-1)	CTGV_008	1065	354	Cop C12L	1062 (353)
IOC_018	423	140	423	140	secreted epidermal growth factor-like (VGF)	CTGV_009	423	140	Cop C11R	429 (142)
IOC_019	279	92	279	92	IL-1 receptor antagonist; DNA-PK binding protein; binds to (PHD)2 protein; involved in hypoxic response	-	-	-	Cop C10L	996 (331)
IOC_020	573	190	573	190		CTGV_010	996	331		
-	-	-	-	-	Ubiquitin Ligase/Host defense modulator	CTGV_011	135	44	WR-011	546 (181)
IOC_021	252	83	252	83		CTGV_012	252	83		
IOC_022	189	62	189	62	zinc finger-like protein/Ubiquitin Ligase/Host defense modulator	CTGV_013	189	62	WR-012	189 (62)
IOC_023	363	120	381	126	host defense modulator; interleukin-18-binding protein	CTGV_014	381	126	WR-013	381 (126)
IOC_024	273	90	273	90	ankyrin-like protein (77 kDa cowpox host-range)	-	-	-	WR-014	714 (237)
IOC_025	525	174	414	137	ankyrin-like protein (77 kDa cowpox host-range)	-	-	-	WR-014	714 (237)
IOC_026	408	135	408	135	ankyrin-like protein (77 kDa cowpox host-range)	-	-	-	WR-015	414 (137)
IOC_027	474	157	384	127	ankyrin-like protein (77 kDa cowpox host-range)	-	-	-	WR-016/WR-017	234 (77) /216 (71)

IOC_028	180	59	180	59	hypothetical protein	-	-	-	WR-018	183 (60)
IOC_029	924	307	924	307	ankyrin-like protein	-	-	-	Cop C9L	1905 (634)
IOC_030	153	50	153	50		-	-	-		
IOC_031	-	-	207	68		-	-	-		
IOC_032	684	227	495	164		CTGV_015	579	192		
IOC_033	555	184	534	177	hypothetical protein	CTGV_016	555	184	Cop C8L	555 (184)
IOC_034	453	150	453	150	host range, virulence factor	CTGV_017	453	150	Cop C7L	453 (150)
IOC_035	270	89	261	86	immunomodulatory; predicted	-	-	-	Cop C6L	456 (151)
IOC_036	126	41	126	41	Bcl-2 protein; binds TBK-1 adaptor proteins; inhibits IFR-3 and IRF-7; inhibits INF-I expression	CTGV_018	456	151		
IOC_037	606	201	606	201	hypothetical protein	CTGV_019	618	205	Cop C5L	615 (204)
IOC_038	189	62	189	62	putative IL-1 receptor	-	-	-	Cop C4L	951 (316)
IOC_039	231	76	231	76	antagonist; NFkB inhibitor	CTGV_020	414	137		
IOC_040	123	40	123	40		CTGV_021	123	40		
IOC_041	120	39	120	39		CTGV_022	120	39		
IOC_042	393	130	-	-	secreted complement C3b/C4b- binding protein; host defense	-	-	-	Cop C3L	792 (263)
IOC_043	189	62	786	261	modulator	CTGV_023	786	261		
IOC_044	105	34	105	34	POZ/BTB kelch domain	-	-	-	Cop C2L	1539 (512)
IOC_045	534	177	534	177	protein; virulence factor	-	-	-		

IOC_046	813	270	813	270		CTGV_024	1539	512		
IOC_047	675	224	672	223	host defense modulator; predicted Bcl-2 protein	CTGV_025	675	224	Cop C1L	675 (224)
IOC_048	354	117	354	117	virulence factor; anti-apoptotic; predicted Bcl-2 protein; NFkB inhibitor; ubiquitylated protein	CTGV_026	354	117	Cop N1L	354 (117)
IOC_049	513	170	513	170	alpha-amanitin target; predicted Bcl-2 protein; virulence factor; inhibits IRF3 activity	CTGV_027	513	170	Cop N2L	528 (175)
IOC_050	198	65	198	65	ankyrin-like protein	-	-	-	Cop M1L	1419 (472)
IOC_051	645	214	645	214		-	-	-		
IOC_052	474	157	474	157		CTGV_028	1413	470		
IOC_053	663	220	663	220	NFkB inhibitor	CTGV_029	663	220	Cop M2L	663 (220)
IOC_054	855	284	855	284	host-range; ankyrin-like protein; NFkB inhibitor; PKR inhibitor; antagonizes IRF-1	CTGV_030	855	284	Cop K1L	855 (284)
IOC_055	1095	364	1095	364	serine protease inhibitor-3 (SPI- 3); forms the cell fusion inhibitory complex with A56R; host range modulator	CTGV_031	1095	364	Cop K2L	1110 (369)
IOC_056	183	60	-	-	interferon resistance; eIF2 alpha-like PKR inhibitor	-	-	-	Cop K3L	267 (88)
IOC_057	183	60	267	88		CTGV_032	267	88		
IOC_058	1275	424	1275	424	nicking-joining enzyme; phospholipase-D-like protein	CTGV_033	1275	424	Cop K4L	1275 (424)
IOC_059	-	-	135	44	putative monoglyceride lipase	CTGV_034	111	36	WR-036	135 (44)

IOC_060	516	171	414	137	putative monoglyceride lipase	CTGV_035	348	115	Cop K5L	411 (136)
IOC_061	234	77	234	77	putative monoglyceride lipase	CTGV_036	195	64	Cop K6L	246 (81)
IOC_062	450	149	450	149	predicted Bcl-2 protein; NFkB inhibitor; inhibits IRF-3 activation and IFN-I expression	CTGV_037	444	147	Cop K7R	450 (149)
IOC_063	462	153	462	153	predicted Bcl-2 protein; inhibits	-	-	-	Cop F1L	681 (226)
IOC_064	207	68	204	67	apoptosis by mitochondrial pathway; inhibits inflammasome activation	CTGV_038	681	226		
IOC_065	444	147	444	147	Deoxyuridine 5'-triphosphate nucleotidohydrolase (dUTPase)	CTGV_039	444	147	Cop F2L	444 (147)
IOC_066	1443	480	1443	480	BTB/kelch-like protein protein; innate immune response modifier; virulence factor	CTGV_040	1443	480	Cop F3L	1443 (480)
IOC_067	960	319	960	319	Ribonucleotide reductase small subunit	CTGV_041	960	319	Cop F4L	960 (319)
IOC_068	960	319	960	319	36kDa major membrane protein	CTGV_042	969	322	Cop F5L	966 (321)
IOC_069	225	74	225	74	hypothetical protein	CTGV_043	225	74	Cop F6L	225 (74)
IOC_070	243	80	243	80	hypothetical protein	CTGV_044	243	80	Cop F7L	279 (92)
IOC_071	198	65	198	65	iActA-like proline repeat-containing protein; not required for actin tails formation	CTGV_045	198	65	Cop F8L	198 (65)
IOC_072	639	212	639	212	thiol substrate; S-S bond formation pathway protein; associated with the entry/fusion complex	CTGV_046	639	212	Cop F9L	639 (212)

IOC_073	1320	439	1320	439	Serine/threonine kinase 2	CTGV_047	1320	439	Cop F10L	1320 (439)
IOC_074	1047	348	1047	348	RhoA signalling inhibitor, virus release protein; cell motility	CTGV_048	1065	354	Cop F11L	1065 (354)
IOC_075	1908	635	1908	635	IEV formation associated protein; KLC-like protein	CTGV_049	1908	635	Cop F12L	1908 (635)
IOC_076	1119	372	1119	372	palmytilated EV membrane protein	CTGV_050	1119	372	Cop F13L	1119 (372)
IOC_077	222	73	222	73	hypothetical protein	CTGV_051	222	73	Cop F14L	222 (73)
IOC_078	150	49	150	49	MV protein; virulence factor; cell adhesion	CTGV_052	150	49	Cop F14.5L	150 (49)
IOC_079	477	158	477	158	hypothetical protein	CTGV_053	477	158	Cop F15L	477 (158)
IOC_080	696	231	690	229	hypothetical protein	CTGV_054	696	231	Cop F16L	696 (231)
IOC_081	306	101	306	101	VP11; lateral body phosphoprotein	CTGV_055	306	101	Cop F17R	306 (101)
IOC_082	1440	479	1440	479	Poly(A) polymerase large subunit (VP55)	CTGV_056	1440	479	Cop E1L	1440 (479)
IOC_083	2214	737	2214	737	WV Assembly/Interaction with F12	CTGV_057	2193	730	Cop E2L	2214 (737)
IOC_084	573	190	573	190	dsRNA-binding and Z-DNA-binding protein; interferon resistance; PKR inhibitor; NFkB inhibitor	CTGV_058	573	190	Cop E3L	573 (190)
IOC_085	780	259	780	259	DNA-dependent RNA polymerase 30 subunit (RPO30)	CTGV_059	780	259	Cop E4L	780 (259)
IOC_086	993	330	996	331	virosome component protein	CTGV_060	1029	342	Cop E5R	996 (331)

IOC_087	1704	567	1704	567	Core protein/virus morphogenesis	CTGV_061	1704	567	Cop E6R	1704 (567)
IOC_088	501	166	501	166	EV myristylated soluble protein	CTGV_062	501	166	Cop E7R	501 (166)
IOC_089	822	273	822	273	virion core protein; substrate for F10 kinase	CTGV_063	822	273	Cop E8R	822 (273)
IOC_090	3018	1005	3018	1005	DNA polymerase	CTGV_064	3021	1006	Cop E9L	3021 (1006)
IOC_091	288	95	288	95	Disulfide bond formation pathway protein; ERV1/ALR family of FAD-containing sulfhydryl oxidases	CTGV_065	288	95	Cop E10R	288 (95)
IOC_092	390	129	390	129	Virion core protein	CTGV_066	390	129	Cop E11L	390 (129)
IOC_093	1992	663	1992	663	required for sustained ERK1/2 activation	CTGV_067	2001	666	Cop O1L	2001 (666)
IOC_094	327	108	327	108	non-essential glutaredoxin 1	CTGV_068	327	108	Cop O2L	327 (108)
IOC_095	108	35	108	35	integral component of virus entry/fusion complex	CTGV_069	108	35	Cop O3L	108 (35)
IOC_096	939	312	939	312	Telomere-binding protein	CTGV_070	939	312	Cop I1L	939 (312)
IOC_097	216	71	216	71	required for virus entry/fusion	CTGV_071	222	73	Cop I2L	222 (73)
IOC_098	801	266	801	266	ssDNA-binding phosphoprotein	CTGV_072	810	269	Cop I3L	810 (269)
IOC_099	2316	771	2316	771	Ribonucleotide reductase large subunit	CTGV_073	2316	771	Cop I4L	2316 (771)
IOC_100	240	79	240	79	MV protein VP13	CTGV_074	240	79	Cop I5L	240 (79)
IOC_101	1149	382	1149	382	Telomere-binding protein	CTGV_075	1149	382	Cop I6L	1149 (382)
IOC_102	1272	423	1272	423	viral core cysteine proteinase;ubiquitin-like	CTGV_076	1272	423	Cop I7L	1272 (423)

proteinasase										
IOC_103	2031	676	2031	676	DExH-Nucleoside triphosphate phosphohydrolase II (NPH-II); DNA-helicase aided by L4R	CTGV_077	2031	676	Cop I8R	2031 (676)
IOC_104	1776	591	1776	591	insulin metalloproteinase-like	CTGV_078	1776	591	Cop G1L	1776 (591)
IOC_105	336	111	336	111	integral component of the entry/fusion complex	CTGV_079	336	111	Cop G3L	336 (111)
IOC_106	663	220	663	220	late transcription elongation factor	CTGV_080	663	220	Cop G2R	663 (220)
IOC_107	375	124	375	124	thioredoxin-like; Disulfide oxidoreductase; S-S bond formation pathway protein; lateral body component	CTGV_081	375	124	Cop G4L	375 (124)
IOC_108	1305	434	1305	434	FEN1-like nuclease; required for homologous recombination, double-stand break repair and the production of full-length genome	CTGV_082	1305	434	Cop G5R	1305 (434)
IOC_109	192	63	192	63	DNA-dependent RNA polymerase 7 subunit (RPO7)	CTGV_083	192	63	Cop G5.5R	192 (63)
IOC_110	498	165	498	165	virulence factor/NIpC/P60 superfamily protein	CTGV_084	498	165	Cop G6R	498 (165)
IOC_111	1107	368	1107	368	virion structural phosphoprotein; substrate for F10 kinase; early morphogenesis	CTGV_085	1116	371	Cop G7L	1116 (371)
IOC_112	783	260	783	260	Viral late transcription factor	CTGV_086	783	260	Cop G8R	783 (260)

VLTF-1										
IOC_113	1023	340	1023	340	integral component of the virus entry/fusion complex; myristylprotein	CTGV_087	1023	340	Cop G9R	1023 (340)
IOC_114	753	250	753	250	neutralizing antibody MV membrane protein; S-S bond formation pathway thiol substrate; myristylprotein; associated with the entry/fusion complex	CTGV_088	753	250	Cop L1R	753 (250)
IOC_115	258	85	258	85	required for crescent membrane and immature virion formation; recruits ER-derived membranes; interacts with A30.5L	CTGV_089	258	85	Cop L2R	264 (87)
IOC_116	1053	350	1053	350	internal virion protein; required for early transcription	CTGV_090	1053	350	Cop L3L	1053 (350)
IOC_117	756	251	756	251	DNA-binding protein; nucleocapsid structural protein	CTGV_091	756	251	Cop L4R	756 (251)
IOC_118	387	128	387	128	integral component of virus entry/fusion complex	CTGV_092	387	128	Cop L5R	387 (128)
IOC_119	462	153	462	153	virion protein; required for morphogenesis	CTGV_093	462	153	Cop J1R	462 (153)
IOC_120	534	177	534	177	thymidine kinase	CTGV_094	534	177	Cop J2R	534 (177)
IOC_121	1002	333	1002	333	multifunctional poly-A polymerase subunit VP39/cap methyltransferase	CTGV_095	1002	333	Cop J3R	1002 (333)
IOC_122	558	185	558	185	DNA-dependent RNA	CTGV_096	558	185	Cop J4R	558 (185)

					polymerase subunit RPO22					
IOC_123	402	133	402	133	integral component of the virus entry/fusion complex	CTGV_097	402	133	Cop J5L	402 (133)
IOC_124	3861	1286	3861	1286	DNA-dependent RNA polymerase subunit RPO147	CTGV_098	3861	1286	Cop J6R	3861 (1286)
IOC_125	516	171	516	171	Dual specificity protein phosphatase (tyrosine/serine protein phosphatase)	CTGV_099	516	171	Cop H1L	516 (171)
IOC_126	570	189	570	189	integral component of virus entry/fusion complex	CTGV_100	570	189	Cop H2R	570 (189)
IOC_127	975	324	975	324	MV heparin binding surface protein; involved in MV maturation	CTGV_101	975	324	Cop H3L	975 (324)
IOC_128	2388	795	2388	795	RNA polymerase associated protein RAP94; tightly associated with DNA-dependent RNA polymerase	CTGV_102	2388	795	Cop H4L	2388 (795)
IOC_129	612	203	612	203	Viral late transcription factor VLTF-4; morphogenesis-related, substrate of B1R kinase	CTGV_103	612	203	Cop H5R	612 (203)
IOC_130	945	314	945	314	DNA topoisomerase type IB	CTGV_104	945	314	Cop H6R	945 (314)
IOC_131	441	146	441	146	involved in the formation of crescent membrane and immature virions; phosphoinositide-binding activity	CTGV_105	441	146	Cop H7R	441 (146)
IOC_132	2535	844	2535	844	mRNA capping enzyme large subunit; transcription	CTGV_106	2535	844	Cop D1R	2535 (844)

termination factor VTF										
IOC_133	441	146	441	146	virion core protein; required in early morphogenesis	CTGV_107	441	146	Cop D2L	441 (146)
IOC_134	702	233	702	233	virion core protein; required in early morphogenesis	CTGV_108	714	237	Cop D3R	714 (237)
IOC_135	657	218	657	218	uracil-DNA glycosylase	CTGV_109	657	218	Cop D4R	657 (218)
IOC_136	2358	785	2358	785	NTPase; interacts with A20R; essential for DNA replication	CTGV_110	2358	785	Cop D5R	2358 (785)
IOC_137	1914	637	1914	637	early gene transcription factor VETF 70 kDa small subunit	CTGV_111	1914	637	Cop D6R	1914 (637)
IOC_138	486	161	486	161	DNA-dependent RNA polymerase subunit RPO18	CTGV_112	486	161	Cop D7R	486 (161)
IOC_139	915	304	915	304	GAG-binding MV membrane protein; binds cell surface chondroitin; may affect viral entry; Carbonic anhydrase	CTGV_113	915	304	Cop D8L	915 (304)
IOC_140	642	213	642	213	mutT motif/mRNA decapping enzyme; contains mutT-like motif of NTP-phosphohydrolase for DNA repair	CTGV_114	642	213	Cop D9R	642 (213)
IOC_141	747	248	747	248	mutT motif/mRNA decapping enzyme; NPH-PPH mRNA levels regulator	CTGV_115	747	248	Cop D10R	747 (248)
IOC_142	1896	631	1896	631	ATPase; nucleoside triphosphate phosphohydrolase-I, NPH-I; transcription elongation, termination, release	CTGV_116	1896	631	Cop D11L	1896 (631)

factor										
IOC_143	864	287	864	287	mRNA capping enzyme small subunit; transcription termination factor VTF	CTGV_117	864	287	Cop D12L	864 (287)
IOC_144	1656	551	1656	551	Virus Assembly - Crescent/IV scaffold protein - rifampicin resistance	CTGV_118	1656	551	Cop D13L	1656 (551)
IOC_145	453	150	453	150	late gene transcription factor VLTF-2	CTGV_119	453	150	Cop A1L	453 (150)
IOC_146	675	224	675	224	late gene transcription factor VLTF-3	CTGV_120	675	224	Cop A2L	675 (224)
IOC_147	231	76	231	76	S-S bond formation pathway protein; thioredoxin-like protein; Together with E10 and G4 comprise a conserved cytoplasmic redox pathway	CTGV_121	231	76	Cop A2.5L	231 (76)
IOC_148	1935	644	1935	644	major core protein 4b precursor	CTGV_122	1935	644	Cop A3L	1935 (644)
IOC_149	840	279	822	273	39 kDa core protein; complexes with core protein p4a/4a	CTGV_123	816	271	Cop A4L	846 (281)
IOC_150	495	164	495	164	DNA-dependent RNA polymerase subunit RPO19	CTGV_124	495	164	Cop A5R	495 (164)
IOC_151	1119	372	1119	372	virion core protein; required for virus envelope biogenesis	CTGV_125	1119	372	Cop A6L	1119 (372)
IOC_152	2133	710	2133	710	early gene transcription factor VETF 82 kDa	CTGV_126	2133	710	Cop A7L	2133 (710)
IOC_153	867	288	867	288	intermediate gene transcription factor VITF-3 32 kDa small	CTGV_127	867	288	Cop A8R	867 (288)

subunit										
IOC_154	285	94	285	94	MV membrane protein; required in early morphogenesis	CTGV_128	333	110	Cop A9L	300 (99)
IOC_155	2676	891	2676	891	major core protein 4a precursor; complexes with A4	CTGV_129	2676	891	Cop A10L	2676 (891)
IOC_156	948	315	948	315	viral membrane biogenesis protein	CTGV_130	957	318	Cop A11R	957 (318)
IOC_157	573	190	573	190	core protein	CTGV_131	579	192	Cop A12L	579 (192)
IOC_158	207	68	207	68	MV membrane protein; required for virus maturation	CTGV_132	207	68	Cop A13L	213 (70)
IOC_159	273	90	273	90	phosphorylated MV membrane protein	CTGV_133	273	90	Cop A14L	273 (90)
IOC_160	162	53	162	53	nonessential hydrophobic IV/MV membrane protein	CTGV_134	162	53	Cop A14.5L	162 (53)
IOC_161	285	94	285	94	core protein; required for early morphogenesis	CTGV_135	285	94	Cop A15L	285 (94)
IOC_162	1137	378	1137	378	MV membrane-anchored protein; integral component of the virus entry/fusion complex	CTGV_136	1137	378	Cop A16L	1137 (378)
IOC_163	612	203	612	203	MV membrane protein; undergoes phosphorylation and proteolytic processing; required for morphogenesis	CTGV_137	612	203	Cop A17L	612 (203)
IOC_164	1482	493	1482	493	DNA helicase; Transcription Elongation Factor	CTGV_138	1482	493	Cop A18R	1482 (493)
IOC_165	234	77	234	77	zinc finger-like protein; IV	CTGV_139	234	77	Cop A19L	234 (77)

maturation										
IOC_166	354	117	354	117	MV membrane protein; integral component of the virus entry/fusion complex	CTGV_140	354	117	Cop A21L	354 (117)
IOC_167	1281	426	1281	426	DNA polymerase processivity factor	CTGV_141	1281	426	Cop A20R	1281 (426)
IOC_168	531	176	531	176	holliday junction resolvase palmitylprotein	CTGV_142	531	176	Cop A22R	531 (176)
IOC_169	1149	382	1149	382	intermediate gene transcription factor VITF-3 45kDa large subunit	CTGV_143	1149	382	Cop A23R	1149 (382)
IOC_170	3495	1164	3495	1164	DNA-dependent RNA polymerase subunit RPO132	CTGV_144	3495	1164	Cop A24R	3495 (1164)
-	-	-	-	-	cowpox A-type inclusion protein	CTGV_145	294	97	Cop A25L	
IOC_171	180	59	180	59	cowpox A-type inclusion protein	CTGV_146	195	64	WR-146	465 (154)
IOC_172	684	227	684	227	cowpox A-type inclusion protein	CTGV_147	651	216	WR-147	684 (227)
IOC_173	2169	722	2157	718	cowpox A-type inclusion protein	CTGV_148	2178	725	WR-148	2178 (725)
IOC_174	1503	500	1503	500	P4c precursor; membrane fusion suppressor; binds to laminin	CTGV_149	1506	501	Cop A26L	969 (322)
IOC_175	333	110	333	110	MV surface protein; involved in MV-cell attachment; binds to glycosaminoglycans	CTGV_150	333	110	Cop A27L	333 (110)

IOC_176	441	146	441	146	MV membrane protein; integral component of the virus entry/fusion complex	CTGV_151	441	146	Cop A28L	441 (146)
IOC_177	918	305	918	305	DNA-dependent RNA polymerase subunit RPO35	CTGV_152	918	305	Cop A29L	918 (305)
IOC_178	234	77	234	77	MV protein; involved in early morphogenesis; F10 kinase substrate	CTGV_153	234	77	Cop A30L	234 (77)
IOC_179	129	42	129	42	hypothetical protein; involved in early morphogenesis; interacts with L2R	CTGV_154	129	42	Cop A30.5L	129 (42)
IOC_180	375	124	375	124	hypothetical protein	CTGV_155	375	124	Cop A31R	375 (124)
IOC_181	813	270	813	270	DNA packaging protein; putative ATPase	CTGV_156	813	270	Cop A32L	903 (300)
IOC_182	549	182	549	182	EV envelope phosphoglycoprotein; involved in CEV-cell adherence and actin tail formation	CTGV_157	549	182	Cop A33R	558 (185)
IOC_183	507	168	507	168	EV envelope glycoprotein; involved in CEV cell adherence and actin tail formation	CTGV_158	507	168	Cop A34R	507 (168)
IOC_184	531	176	531	176	MHC-II antigen presentation inhibitor	CTGV_159	531	176	Cop A35R	531 (176)
IOC_185	639	212	630	209	WV transmembrane phosphoprotein; involved in actin tail formation	CTGV_160	660	219	Cop A36R	666 (221)
IOC_186	792	263	792	263	hypothetical protein	CTGV_161	807	268	Cop A37R	792 (263)

IOC_187	183	60	183	60	hypothetical protein; uncharacterized protein A37.5	CTGV_162	195	64	WR-161	189 (62)
IOC_188	834	277	834	277	CD47-like putative membrane protein	CTGV_163	834	277	Cop A38L	834 (277)
IOC_189	681	226	642	213	semaphorin-like protein; host defense modulator	CTGV_164	1206	401	Cop A39R	1212 (403)
IOC_190	258	85	258	85		-	-	-		
IOC_191	123	40	123	40		-	-	-		
IOC_192	480	159	507	168	C-type lectin-like type-II membrane protein; host defense modulator	CTGV_165	402	159	Cop A40R	507 (168)
IOC_193	639	212	639	212	secreted glycoprotein; host defense modulator; Chemokine binding protein	CTGV_166	582	219	Cop A41L	660 (219)
IOC_194	402	133	402	133	profilin-like protein; ATI- localized in Ectromelia virus	CTGV_167	402	133	Cop A42R	402 (133)
IOC_195	585	194	570	189	putative type-I membrane glycoprotein	CTGV_168	582	193	Cop A43R	585 (194)
IOC_196	129	42	129	42	hypothetical protein; similar to vaccinia virus MVA-156R	CTGV_169	237	78	Cop-270; WR-169	237 (78)
IOC_197	1041	346	1041	346	3-beta-hydroxysteroid dehydrogenase (3beta-HSD); host defense modulator	CTGV_170	1041	346	Cop A44L	1041 (346)
IOC_198	378	125	378	125	inactive Cu-Zn superoxide dismutase-like	CTGV_171	378	125	Cop A45R	378 (125)
IOC_199	723	240	723	240	Toll/IL1-receptor-like protein; predicted Bcl-2 protein; NFkB	CTGV_172	723	240	Cop A46R	645 (214)

inhibitor										
IOC_200	759	252	759	252	hypothetical protein; immunoprevalent protein	CTGV_173	759	252	Cop A47L	735 (244)
IOC_201	615	204	615	204	thymidylate kinase	CTGV_174	480	159	Cop A48R	615 (204)
-	-	-	-	-	thymidylate kinase	CTGV_175	138	45	Cop A48R	615 (204)
IOC_202	489	162	489	162	putative phosphotransferase; predicted Bcl-2 protein; NFkB inhibitor	CTGV_176	489	162	Cop A49R	489 (162)
IOC_203	1659	552	1659	552	DNA ligase	CTGV_177	1659	552	Cop A50R	1659 (552)
IOC_204	210	69	210	69	hypothetical protein; associates with and	CTGV_178	918	305	Cop A51R	1005 (334)
IOC_205	540	179	540	179	stabilizes ubiquitin; colocalizes with and stabilizes microtubules	-	-	-		
IOC_206	573	190	573	190	Toll/IL1-receptor-like protein; predicted Bcl-2 protein; NFkB inhibitor	CTGV_179	573	190	Cop A52R	573 (190)
IOC_207	324	107	324	107	hypothetical protein	CTGV_180	273	90	Cop A54L	273 (90)
IOC_208	303	100	303	100	secreted TNF-receptor-like protein; CrmC	CTGV_181	303	100	Cop A53R	312 (103)
IOC_209	255	84	255	84	kelch-like protein	CTGV_182	1695	564	Cop A55R	1695 (564)
IOC_210	1416	471	1416	471		-	-	-		
IOC_211	927	308	927	308	hemagglutinin; EV glycoprotein	CTGV_183	927	308	Cop A56R	948 (315)
IOC_212	171	56	114	37	guanylate kinase	CTGV_184	114	37	Cop A57R	456 (151)
IOC_213	456	151	456	151		CTGV_185	492	163		

IOC_214	903	300	903	300	serine/threonine protein kinase	CTGV_186	903	300	Cop B1R	903 (300)
IOC_215	660	219	660	219	schlafen-like protein	CTGV_187	660	219	Cop B2R	660 (219)
IOC_216	183	60	183	60	schlafen-like protein	CTGV_188	186	60	Cop B3R	375 (124)
IOC_217	186	61	186	61		CTGV_189	1671	61		
IOC_218	1677	558	1677	558	ankyrin-like protein	CTGV_190	954	556	Cop B4R	1677 (558)
IOC_219	954	317	954	317	EV type-I membrane glycoprotein; involved in plaque size	CTGV_191	522	317	Cop B5R	954 (317)
IOC_220	522	173	522	173	ankyrin-like protein	CTGV_192	549	173	Cop B6R	522 (173)
IOC_221	549	182	549	182	21 kDa precursor protein; host defense modulator; ER resident	CTGV_193	549	182	Cop B7R	549 (182)
IOC_222	819	272	819	272	soluble interferon-gamma receptor-like protein; host defense modulator; interferon resistance	CTGV_194	819	272	Cop B8R	819 (272)
IOC_223	129	42	234	77	intracellular viral protein	CTGV_195	186	61	Cop B9R	234 (77)
IOC_224	501	166	501	166	kelch-like protein	CTGV_196	501	166	Cop B10R	501 (166)
IOC_225	219	72	219	72	hypothetical protein	-	-	-	Cop B11R	267 (88)
IOC_226	852	283	852	283	serine/threonine protein kinase	CTGV_197	852	283	Cop B12R	852 (283)
IOC_227	351	116	351	116	serine protease inhibitor (Serp)-2 (SPI-2/CrmA); inhibits apoptosis by the extrinsic pathway; inhibits ICE	CTGV_198	351	116	Cop B13R	351 (116)
IOC_228	144	47	144	47	serine protease inhibitor (Serp)-2 (SPI-2/CrmA);	CTGV_199	663	220	Cop B14R	669 (222)
IOC_229	534	177	534	177	inhibits apoptosis by the	-	-	-		

extrinsic pathway; inhibits ICE										
IOC_230	450	149	450	149	predicted Bcl-2 protein; NFkB inhibitor; host immune response modulator	CTGV_200	450	149	Cop B15R	450 (149)
IOC_231	981	326	981	326	IL-1-beta-inhibitor; host defense modulator	CTGV_201	981	326	Cop B16R	981 (326)
IOC_232	1023	340	1023	340	hypothetical protein	CTGV_202	1023	340	Cop B17L	1023 (340)
IOC_233	1725	574	1725	574	ankyrin-like protein	CTGV_203	1725	574	Cop B18R	1725 (574)
IOC_234	1062	353	1062	353	IFN-alpha/beta-receptor-like secreted glycoprotein	CTGV_204	1068	355	Cop B19R	1062 (353)
IOC_235	162	53	-	-	ankyrin-like protein	CTGV_205	162	53	Cop B20R	384 (127)
-	-	-	-	-	Ubiquitin Ligase/Host defense modulator	CTGV_206	135	44	WR-011	546 (181)
IOC_236	573	190	-	-	IL-1 Receptor antagonist; DNA-PK binding protein; binds to (PHD)2 protein; involved in hypoxic response	CTGV_207	996	331	Cop C10L	996 (331)
IOC_237	279	92	-	-		-	-	-		
IOC_238	423	140	-	-	secreted epidermal growth factor-like (VGF)	CTGV_208	423	140	Cop C11R	429 (142)
IOC_239	1062	353	-	-	serine protease inhibitor (Serpin)-1 (SPI-1)	CTGV_209	1065	354	Cop C12L	1062 (353)
IOC_240	258	85	258	85	hypothetical protein	-	-	-	Cop B21R /C15L	276 (91)
IOC_241	123	40	123	40	ankyrin-like protein	CTGV_210	123	40	HSPV201b	204 (67)
IOC_242	531	176	522	173	predicted Bcl-2 protein	CTGV_211	453	150	Cop B22R/C16L	546 (181)
IOC_243	702	233	702	233	ankyrin-like protein	CTGV_212	231	76	Cop B23R/C17L	1161 (386)

IOC_244	192	63	195	64		-	-	-		
IOC_245	318	105	318	105		-	-	-		
IOC_246	186	61	186	61	ankyrin-like protein	-	-	-	Cop B24R/C18L	453 (150)
IOC_247	141	46	141	46	ankyrin-like protein	-	-	-	Cop B27R/C21L	342 (113)
IOC_248	201	66	201	66		-	-	-		
IOC_249	150	49	150	49	ankyrin-like protein	-	-	-	WR-005	147 (48)
IOC_250	360	119	342	113	TNF-alpha-receptor-like protein	-	-	-	Cop B28R/C22L	369 (122)
IOC_251	105	34	105	34	TNF-alpha-receptor-like protein	CTGV_213	105	34	WR-002/217	186 (61)
IOC_252	192	63				CTGV_214	192	63		
IOC_253	681	226	711	236	chemokine-binding protein	CTGV_215	519	172	Cop B29R/C23L	735 (244)
						CTGV_216	126	41		
IOC_254	147	48	147	48	hypothetical protein	-	-	-	HSPV-MNR76-001	219 (72)
IOC_255	255	84	-	-	hypothetical protein				VARV-Gar_1966- G4R HSPV-MNR76- 001	498 (165)/ 219 (72)

^a ORFs in boldface had the highest identity score with HSPV (or the second highest score when the first highest score was Serro 2 virus).

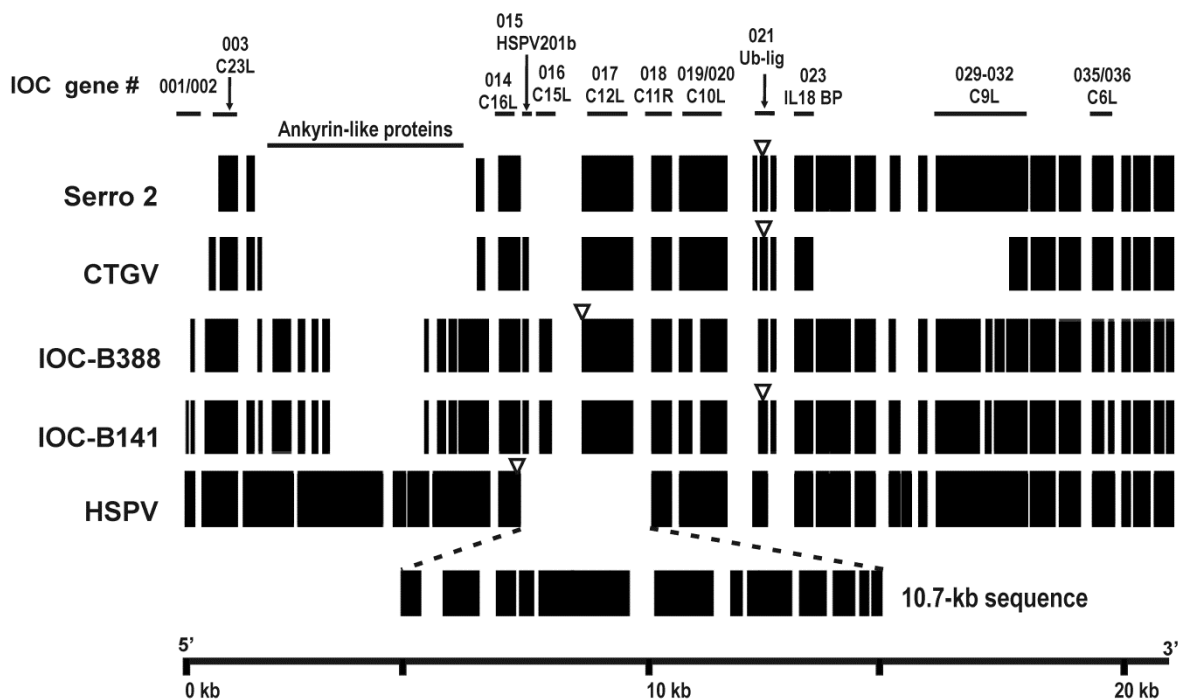
^b length in nucleotide number.

^c length in amino acid number.

^d CTGV = Cantagalo virus.

^e In the absence of an ortholog in VACV-Cop, an ortholog in VACV-WR was indicated if available or the best matching ORF is indicated. VARV= variola virus; HSPV= horsepox virus.

A



B

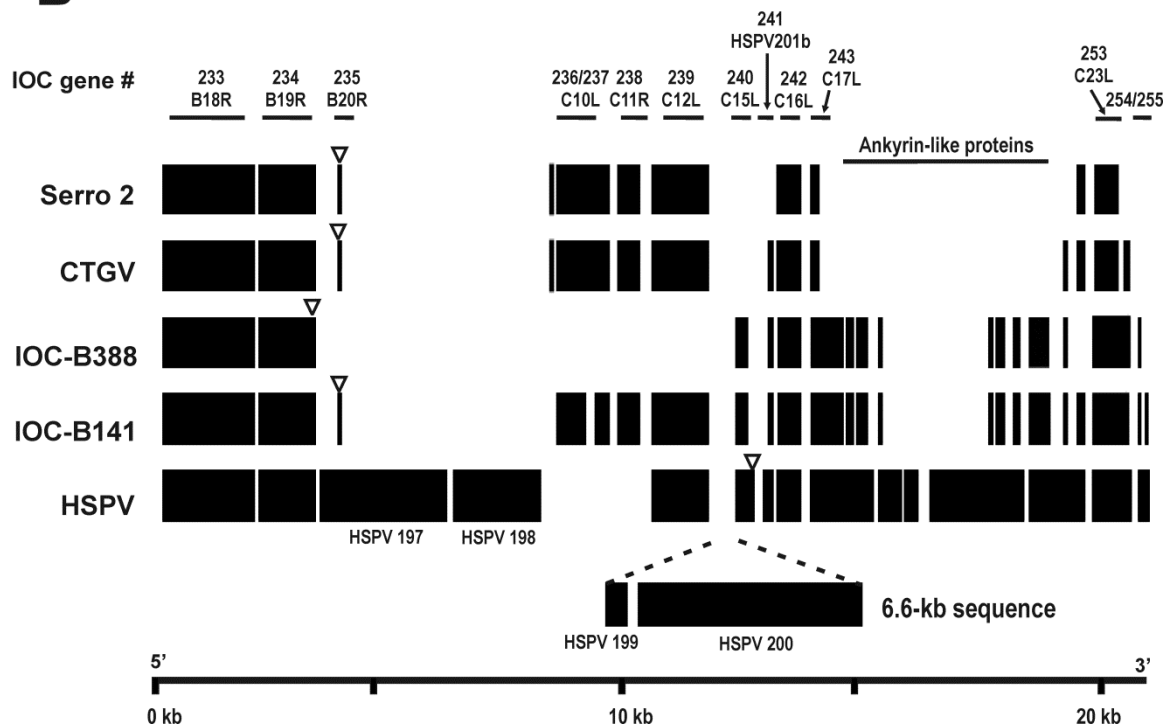


FIG S1. Blast atlas of the genome terminal regions of B141, B388, CTGV, Serro 2 virus, and HSPV. A blast atlas of the 5' (A) or 3'(B) genome ends was created using GView Server based on a synthetic reference genome that contained all possible genes present in the ends of the genomes of B141, B388, CTGV, Serro 2 virus, and HSPV. The IOC genes most relevant to the analysis are indicated on the top of each blast atlas. Orthologs of VACV-Cop, VACV-WR, or HSPV are also indicated below the IOC gene. Open triangles indicate the ITR junction sites: 5' ITR on the left (A) and 3' ITR on the right (B) of the open triangles.