

Table S1. ARV isolates used in this study.

ID	Host	Pathology	Collection year	Location	NCBI Biosample no.
Alabama	Chicken	Mild lymphocytic myocarditis and moderate hepatic sinusoidal congestion	2021	AL:USA	SAMN36407456
ARV_94594	Chicken	Tenosynovitis	2012	AL:USA	SAMN36407457
ARV_126484	Chicken	Tenosynovitis	2018	IA:USA	SAMN36407458
ARV_99846	Chicken	Tenosynovitis	2013	NC:USA	SAMN36407459
ARV_106764	Chicken	Tenosynovitis	2014	IA:USA	SAMN36407460
ARV141045	Chicken	Tenosynovitis	2021	AL:USA	SAMN36407461
S1133	Vaccine	-			SAMN36407462

Table S2. Raw reads obtained per sample on each sequencing run.

A) Sequencing runs 1 and 2

Virion Purification Method	Benzonase Treatment	Host rRNA Depletion	R-SPA	#Exp1 ARV_Alabama	#Exp2 ARV_94594	#Exp2 ARV_126484
CaptoCore700	-	-	-	76,080	-	-
CaptoCore700	Benzonase	-	-	253,978	-	-
CaptoCore700	-	Depletion	-	64,268	-	-
CaptoCore700	Benzonase	Depletion	-	18,412	-	-
CaptoCore700	-	-	R-SPA	45,206	28,624	8,388
CaptoCore700	Benzonase	-	R-SPA	37,816	60,256	-
CaptoCore700	-	Depletion	R-SPA	34,178	33,338	16,700
CaptoCore700	Benzonase	Depletion	R-SPA	27,498	27,912	14,954
sSucrose Gradient	-	-	-	17,460	-	-
Sucrose Gradient	Benzonase	-	-	20,274	-	-
Sucrose Gradient	-	Depletion	-	5,110	-	-
Sucrose Gradient	Benzonase	Depletion	-	6,920	-	-
Sucrose Gradient	-	-	R-SPA	98,618	50,016	23,972
Sucrose Gradient	Benzonase	-	R-SPA	79,140	17,332	105,092
Sucrose Gradient	-	Depletion	R-SPA	194,348	13,882	118,070
Sucrose Gradient	Benzonase	Depletion	R-SPA	87,704	6,918	16,300

B) Sequencing run 3

Virion Purification Method	Host rRNA Depletion	R-SPA	Raw reads ARV_99846	Raw reads ARV_106764	Raw reads ARV_141045	Raw reads S1133
-	-	R-SPA	30,674	7,018	15,550	8,870
CaptoCore700	-	R-SPA	22,520	22,756	61,896	11,062
-	Depletion	R-SPA	16,762	14,830	22,702	25,746
CaptoCore700	Depletion	R-SPA	18,180	58,940	16,734	11,684

Table S3. Summary of the WGS data generated from ARV isolates ARV_Alabama in sequencing run 1 and, ARV_94594 and ARV_126484 in sequencing run 2.

Virus ID	Virion Purification Method	Benzonase Treatment	Host rRNA Depletion	R-SPA	Filtered reads	%Chicken-mapping Filtered Reads	%ARV-mapping Filtered Reads	Total Contigs	ARV Contigs	Estimated Genome Coverage	Estimated Genome Length (bp)
ARV_94594	s	-	-	R-SPA	24,518	98	2	15	14	8	15,510
	CaptoCore700	Benzonase	-	R-SPA	52,093	77	25	25	11	169	18,754
	CaptoCore700	-	Depletion	R-SPA	21,951	2	75	14	12	204	23,251
	CaptoCore700	Benzonase	Depletion	R-SPA	21,349	0	73	9	9	217	23,134
	Sucrose gradient	-	-	R-SPA	40,499	33	58	16	14	307	22,234
	Sucrose gradient	Benzonase	-	R-SPA	11,788	2	71	18	17	94	23,236
	Sucrose gradient	-	Depletion	R-SPA	5,972	43	50	32	15	36	20,427
	Sucrose gradient	Benzonase	Depletion	R-SPA	4,683	48	47	16	11	28	19,988
ARV_126484	CaptoCore700	-	-	R-SPA	6,343	98	2	-	-	-	-
	CaptoCore700	Benzonase	-	R-SPA	-	-	-	-	-	-	-
	CaptoCore700	-	Depletion	R-SPA	13,247	0	81	10	10	115	23,241
	CaptoCore700	Benzonase	Depletion	R-SPA	11,014	0	77	15	15	92	23,038
	Sucrose gradient	-	-	R-SPA	14,022	57	50	11	11	79	22,845
	Sucrose gradient	Benzonase	-	R-SPA	91,542	94	11	128	60	64	21,385
	Sucrose gradient	-	Depletion	R-SPA	112,316	0	60	26	16	541	18,752
	Sucrose gradient	Benzonase	Depletion	R-SPA	12,088	0	78	16	16	98	23,172
ARV_Alabama	CaptoCore700	-	-	R-SPA	30,665	98	0.1	0	0	0	0
	CaptoCore700	Benzonase	-	R-SPA	22,516	33	51	12	10	157	21,566
	CaptoCore700	-	Depletion	R-SPA	12,482	32	57	14	11	87	22,381
	CaptoCore700	Benzonase	Depletion	R-SPA	17,978	31	59	20	14	130	23,638
	Sucrose gradient	-	-	R-SPA	81,379	76	23	24	17	671	12,081
	Sucrose gradient	Benzonase	-	R-SPA	35,942	22	77	13	12	316	22,011
	Sucrose gradient	-	Depletion	R-SPA	150,048	84	16	15	13	435	15,486
	Sucrose gradient	Benzonase	Depletion	R-SPA	71,016	66	34	19	13	300	18,042

Table S4. ARV read enrichment (A) and cost associated (B) with the implementation of each strategy A)

	No Purification/ Enrichment	R-SPA	Capto. R-SPA	Depl. R-SPA	Capto. Depl. R-SPA	Ideal Conditions
Proportion of ARV reads in library	0.1%	17%	24%	52%	77%	100%
Reads for X200 genome coverage	2,820,000	165,882	117,500	54,231	36,623	28,200
Libraries per cartridge	1	12	17	37	55	71

B)

	No Purification/ Enrichment	R-SPA	Capto. R-SPA	Depl. R-SPA	Capto. Depl. R-SPA
Capto Core 700	-	-	3	-	3
RNA extraction	7	7	7	7	7
Host-rRNA depletion	-	-	-	18	18
R-SPA	-	25	25	25	25
Gnomic library prep	45	45	45	45	45
Cartridge price per sample	400	33	24	11	7
Price per genome	452	110	104	106	106