

Pham 308847

1: PHTown_35 + 2	25	28	32		52	61	67	71	89	91	104	113	140	127	137	152	163	169	174	182	185	193	200	205	210	213	217	220	222	233	239			
2: Wentworth_36	19	21	23	30	54	59	61	67	77	89	104	108	127	137	139	147	163	169	174	182	185	193	200	205	210	213	217	220	222	233	239			
3: Virizion_39 + 2	21	23	25	36	43	54	61	67	81	86	104	112	118	133	152	163	169	174	182	185	193	200	204	219	213	217	222	234	239					
4: Greenbelt_35	23	25	27	36	43	54	61	67	81	86	99	101	104	137	141	163	169	174	182	185	193	200	209	219	213	217	220	222	234	239				
5: Dryad_39	19	21	23	39	46	54	61	67	81	86	99	101	104	142	163	169	174	182	185	193	200	209	219	213	217	220	222	234	239					
6: Wilkos_36	23	25	27	39	44	54	61	67	81	86	99	101	104	120	137	147	163	169	174	182	185	193	201	219	213	217	220	222	234	239				
7: SassyC_38	21	23	25	36	38	58	61	67	81	86	99	101	104	127	137	139	163	169	174	182	185	193	212	217	222	233	239							
8: Yara_33	18	20	22	33	37	41	58	61	81	86	99	100	108	121	126	137	163	169	171	175	188	202	204	214	217	222	233	239						
9: Kokushibo_51	23	25	27	37	41	58	61	67	81	86	99	100	108	121	126	137	163	169	171	175	188	202	204	214	217	222	233	239						
10: Hiyaa_50	23	25	27	37	41	58	61	67	81	86	99	100	108	121	126	137	163	169	171	175	188	202	204	214	217	222	233	239						
11: Spocter_49	23	25	27	37	41	58	61	67	82	86	99	100	108	126	137	163	169	171	181	186	202	211	214	217	222	233	239							
12: Galaxia_49	23	25	27	37	41	54	61	67	72	86	99	100	108	123	126	137	163	169	171	175	181	186	202	204	214	217	222	233	239					
13: Keahlu_49	6	14	23	34	40	46	60	67	76	81	84	99	107	110	119	125	136	155	159	164	176	182	189	199	205	214	218	233	236	242				
14: Chiliaas_191	34	40	46	60	67	76	81	84	99	105	110	119	125	131	140	146	155	159	165	183	203	205	208	214	218	233	236	242						
15: Bloom_197 + 1	28	40	46	51	55	70	76	81	84	92	106	110	119	125	130	146	155	159	176	180	184	197	206	214	218	233	236	242						
16: Atuh_187	28	40	46	51	55	70	76	81	84	92	106	110	119	125	130	146	155	159	176	180	184	197	206	214	218	233	236	242						
17: ReginaGlobina_200	8	14	20	34	40	46	63	76	81	84	92	106	110	119	125	128	146	155	159	175	184	192	203	205	208	212	214	223	233	236	242			
18: Stewart25555_189	40	42	44	53	53	73	76	81	83	92	106	110	119	125	128	146	155	159	175	184	197	203	205	208	212	214	223	233	236	242				
19: Emmetator_189 + 1	34	40	46	60	67	76	81	84	92	99	105	110	119	125	131	140	146	155	159	165	183	203	205	208	212	214	223	233	236	242				
20: Tallia_110_194	28	40	46	53	53	73	76	81	83	92	106	110	119	125	128	146	155	159	175	184	197	203	205	208	212	214	223	233	236	242				
21: Ellewin_185 + 1	34	40	46	60	67	76	81	84	92	99	105	110	119	125	131	140	146	155	159	165	183	203	205	208	212	214	223	233	236	242				
22: Mim_193	23	25	27	36	40	46	60	67	76	81	83	99	107	110	119	125	137	155	159	165	176	182	189	194	199	205	208	214	218	233	236	242		
23: Rodkave_195	34	40	46	60	67	76	81	84	99	105	110	119	125	131	140	146	155	159	165	173	183	203	205	208	214	218	233	236	242					
24: FrostClock_185	28	40	46	51	55	70	76	81	84	92	106	110	119	125	130	146	155	159	175	180	184	197	206	214	218	233	236	242						
25: Leo Jr_196	28	40	46	53	53	73	76	81	83	92	102	106	110	119	125	128	146	155	159	175	184	197	203	205	208	212	214	223	233	236	242			
26: WandleDee_183	28	40	46	53	53	73	76	81	83	92	106	110	119	125	128	146	155	159	175	184	197	203	205	208	212	214	223	233	236	242				
27: Boofeja_194	34	40	46	60	67	76	81	84	92	99	105	110	119	125	131	140	146	155	159	165	176	183	205	208	214	218	233	236	242					
28: FloraSnap32_191	38	40	42	51	57	76	76	81	84	92	103	107	110	125	134	143	155	159	177	184	189	199	203	205	209	219	229	236	242					
29: SJReid_183	28	40	46	53	53	73	76	81	83	92	102	106	110	119	125	128	146	155	159	175	184	197	203	205	208	212	214	223	233	236	242			
30: DunheerBols_186	34	40	46	60	67	76	81	84	92	99	105	110	119	125	131	140	146	155	159	165	175	184	197	203	205	208	214	218	233	236	242			
31: Panthjai_183	34	40	46	60	67	76	81	84	92	99	105	110	119	125	131	140	146	155	159	165	183	205	208	214	218	233	236	242						
32: GoldenEssence_181	34	40	46	60	67	76	81	84	92	99	105	110	119	125	129	140	146	155	159	164	183	205	208	214	218	233	236	242						
33: Phrampa_186	34	40	46	60	67	76	81	84	92	99	105	110	119	125	131	140	146	155	159	165	183	205	208	214	218	233	236	242						
34: Patbol_191	2	4	6	11	11	23	38	40	48	51	68	81	84	85	99	105	110	125	127	133	142	155	159	165	182	184	192	199	203	205	208	228	236	242
35: Laure_195	2	4	6	11	11	23	38	40	48	51	68	81	84	85	99	105	110	125	127	133	142	155	159	165	182	184	192	199	203	205	208	228	236	242

Note: Tracks are now grouped by subcluster and scaled. Switching in subcluster is indicated by changes in track color. Track scale is now set by default to display the region 30 bp upstream of start 1 to 30 bp downstream of the last possible start. If this default region is judged to be packed too tightly with annotated starts, the track will be further scaled to only show that region of the ORF with annotated starts. This action will be indicated by adding "Zoomed" to the title. For starts, yellow indicates the location of called starts comprised solely of Glimmer/GeneMark auto-annotations, green indicates the location of called starts with at least 1 manual gene annotation.

## Pham 308847 Report

This analysis was run 06/27/26 on database version 652.

Pham number 308847 has 42 members, 17 are drafts.

Phages represented in each track:

- Track 1 : PHTowN\_35, Lizz\_35, ShakeNBake\_35
- Track 2 : Wentworth\_36
- Track 3 : Virizion\_39, Gibson\_35, Rooney\_35
- Track 4 : Greenbelt\_35
- Track 5 : Dryad\_39
- Track 6 : Wilkos\_36
- Track 7 : SassyC\_38
- Track 8 : Yara\_33
- Track 9 : Kokushibo\_51
- Track 10 : Hiyaa\_50
- Track 11 : Spocter\_49
- Track 12 : Galactica\_49
- Track 13 : Keanu\_49
- Track 14 : Chilliams\_191
- Track 15 : Bloom\_197, Racecar\_194
- Track 16 : Atuin\_187
- Track 17 : ReginaGlobina\_200
- Track 18 : Stewart25555\_189
- Track 19 : Emmetator\_189, Artu\_189
- Track 20 : Talia1610\_194
- Track 21 : Ellewin\_185, KSunshine22\_190
- Track 22 : Mimi\_193
- Track 23 : Rockabye\_196
- Track 24 : FrostedClock\_195
- Track 25 : LeoJr\_196
- Track 26 : WaddleDee\_182
- Track 27 : BooTeria\_194
- Track 28 : FloraSnap32\_191
- Track 29 : SJReid\_198
- Track 30 : DunneganBoMo\_186
- Track 31 : Panchaali\_189
- Track 32 : GoldenEssence\_181
- Track 33 : Phrampa\_186
- Track 34 : Patbob\_191
- Track 35 : Laure\_195

### **Summary of Final Annotations (See graph section above for start numbers):**

The start number called the most often in the published annotations is 28, it was called in 11 of the 25 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Dryad\_39, Galactica\_49, Gibson\_35, Hiya\_50, Keanu\_49, Kokushibo\_51, Lizz\_35, PHTowN\_35, Rooney\_35, SassyC\_38, ShakeNBake\_35, Spocter\_49, Virizion\_39, Wentworth\_36, Wilkos\_36,

Genes that have the "Most Annotated" start but do not call it:

- Artu\_189, Atuin\_187, BooTeria\_194, DunneganBoMo\_186, Ellewin\_185, Emmetator\_189, KSunshine22\_190, LeoJr\_196, Panchaali\_189, ReginaGlobina\_200, Stewart25555\_189, WaddleDee\_182,

Genes that do not have the "Most Annotated" start:

- Bloom\_197, Chilliams\_191, FloraSnap32\_191, FrostedClock\_195, GoldenEssence\_181, Greenbelt\_35, Laure\_195, Mimi\_193, Patbob\_191, Phrampa\_186, Racecar\_194, Rockabye\_196, SJReid\_198, Talia1610\_194, Yara\_33,

### **Summary by start number:**

Start 4:

- Found in 1 of 42 ( 2.4% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Laure\_195 (UNK),

Start 6:

- Found in 12 of 42 ( 28.6% ) of genes in pham
- Manual Annotations of this start: 7 of 25
- Called 91.7% of time when present
- Phage (with cluster) where this start called: Bloom\_197 (FC), Chilliams\_191 (FC), FloraSnap32\_191 (FC), FrostedClock\_195 (FC), GoldenEssence\_181 (FC), Mimi\_193 (FC), Patbob\_191 (FC), Phrampa\_186 (FC), Racecar\_194 (FC), SJReid\_198 (FC), Talia1610\_194 (FC),

Start 8:

- Found in 11 of 42 ( 26.2% ) of genes in pham
- Manual Annotations of this start: 3 of 25
- Called 90.9% of time when present
- Phage (with cluster) where this start called: Artu\_189 (FC), BooTeria\_194 (FC), DunneganBoMo\_186 (FC), Ellewin\_185 (FC), Emmetator\_189 (FC), KSunshine22\_190 (FC), LeoJr\_196 (FC), ReginaGlobina\_200 (FC), Stewart25555\_189 (FC), WaddleDee\_182 (FC),

Start 9:

- Found in 1 of 42 ( 2.4% ) of genes in pham
- Manual Annotations of this start: 1 of 25
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Panchaali\_189 (FC),

Start 14:

- Found in 18 of 42 ( 42.9% ) of genes in pham
- Manual Annotations of this start: 1 of 25
- Called 5.6% of time when present
- Phage (with cluster) where this start called: Atuin\_187 (FC),

Start 17:

- Found in 2 of 42 ( 4.8% ) of genes in pham
- No Manual Annotations of this start.
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Rockabye\_196 (FC),

Start 27:

- Found in 2 of 42 ( 4.8% ) of genes in pham
- Manual Annotations of this start: 2 of 25
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Greenbelt\_35 (BN), Yara\_33 (BN),

Start 28:

- Found in 27 of 42 ( 64.3% ) of genes in pham
- Manual Annotations of this start: 11 of 25
- Called 55.6% of time when present
- Phage (with cluster) where this start called: Dryad\_39 (BN), Galactica\_49 (BQ), Gibson\_35 (BN), Hiyaa\_50 (BQ), Keanu\_49 (BQ), Kokushibo\_51 (BQ), Lizz\_35 (BN), PHTown\_35 (BN), Rooney\_35 (BN), SassyC\_38 (BN), ShakeNBake\_35 (BN), Spocter\_49 (BQ), Virizion\_39 (BN), Wentworth\_36 (BN), Wilkos\_36 (BN),

**Summary by clusters:**

There are 4 clusters represented in this pham: UNK, BN, FC, BQ,

Info for manual annotations of cluster BN:

- Start number 27 was manually annotated 2 times for cluster BN.
- Start number 28 was manually annotated 7 times for cluster BN.

Info for manual annotations of cluster BQ:

- Start number 28 was manually annotated 4 times for cluster BQ.

Info for manual annotations of cluster FC:

- Start number 6 was manually annotated 7 times for cluster FC.
- Start number 8 was manually annotated 3 times for cluster FC.
- Start number 9 was manually annotated 1 time for cluster FC.
- Start number 14 was manually annotated 1 time for cluster FC.

**Gene Information:**

Gene: Artu\_189 Start: 138667, Stop: 140760, Start Num: 8

Candidate Starts for Artu\_189:

(Start: 8 @138667 has 3 MA's), (Start: 28 @138838 has 11 MA's), (40, 138988), (42, 139018), (48, 139051), (50, 139063), (53, 139099), (70, 139264), (73, 139279), (76, 139300), (79, 139315), (83,

139354), (92, 139435), (106, 139528), (110, 139564), (115, 139621), (117, 139633), (119, 139639), (122, 139654), (124, 139660), (125, 139666), (128, 139705), (144, 139828), (146, 139846), (151, 139879), (155, 139909), (159, 139945), (161, 139957), (164, 139966), (175, 140110), (184, 140182), (195, 140293), (196, 140296), (197, 140305), (212, 140437), (214, 140467), (228, 140632), (231, 140656), (235, 140674), (242, 140719),

Gene: Atuin\_187 Start: 132143, Stop: 134191, Start Num: 14

Candidate Starts for Atuin\_187:

(Start: 8 @132107 has 3 MA's), (Start: 14 @132143 has 1 MA's), (Start: 28 @132278 has 11 MA's), (40, 132428), (42, 132458), (45, 132476), (46, 132485), (48, 132491), (51, 132518), (55, 132557), (57, 132566), (70, 132704), (75, 132734), (76, 132740), (78, 132752), (84, 132797), (90, 132866), (92, 132875), (106, 132968), (108, 132980), (110, 133004), (117, 133064), (119, 133070), (125, 133097), (130, 133151), (146, 133277), (155, 133340), (159, 133376), (176, 133547), (180, 133580), (184, 133613), (195, 133724), (196, 133727), (197, 133736), (228, 134063), (231, 134087),

Gene: Bloom\_197 Start: 133435, Stop: 135540, Start Num: 6

Candidate Starts for Bloom\_197:

(Start: 6 @133435 has 7 MA's), (12, 133474), (Start: 14 @133477 has 1 MA's), (34, 133690), (40, 133762), (46, 133819), (60, 133972), (76, 134074), (81, 134113), (83, 134137), (84, 134140), (92, 134218), (95, 134230), (105, 134302), (110, 134347), (119, 134422), (125, 134449), (131, 134512), (140, 134578), (145, 134617), (146, 134629), (155, 134692), (159, 134728), (165, 134755), (183, 134959), (184, 134962), (203, 135121), (205, 135154), (208, 135184), (228, 135412), (231, 135436), (237, 135466), (240, 135478),

Gene: BooTeria\_194 Start: 138173, Stop: 140266, Start Num: 8

Candidate Starts for BooTeria\_194:

(Start: 8 @138173 has 3 MA's), (Start: 28 @138344 has 11 MA's), (40, 138494), (42, 138524), (48, 138557), (50, 138569), (53, 138605), (70, 138770), (73, 138785), (76, 138806), (79, 138821), (83, 138860), (92, 138941), (106, 139034), (110, 139070), (115, 139127), (117, 139139), (119, 139145), (122, 139160), (124, 139166), (125, 139172), (128, 139211), (144, 139334), (146, 139352), (155, 139415), (159, 139451), (161, 139463), (164, 139472), (175, 139616), (184, 139688), (195, 139799), (196, 139802), (197, 139811), (212, 139943), (214, 139973), (228, 140138), (231, 140162), (235, 140180), (242, 140225),

Gene: Chilliams\_191 Start: 129398, Stop: 131506, Start Num: 6

Candidate Starts for Chilliams\_191:

(Start: 6 @129398 has 7 MA's), (Start: 14 @129434 has 1 MA's), (21, 129497), (23, 129518), (40, 129719), (48, 129782), (49, 129791), (50, 129794), (60, 129929), (69, 129992), (76, 130031), (81, 130070), (83, 130094), (84, 130097), (92, 130175), (95, 130187), (107, 130277), (110, 130304), (111, 130310), (119, 130379), (125, 130406), (136, 130493), (155, 130649), (159, 130688), (164, 130709), (176, 130859), (182, 130901), (187, 130958), (189, 130973), (199, 131057), (205, 131117), (214, 131210), (215, 131219), (218, 131264), (228, 131375), (229, 131381), (232, 131405), (236, 131426), (242, 131462),

Gene: Dryad\_39 Start: 30666, Stop: 28831, Start Num: 28

Candidate Starts for Dryad\_39:

(Start: 28 @30666 has 11 MA's), (31, 30639), (32, 30630), (54, 30408), (61, 30309), (62, 30306), (67, 30279), (80, 30189), (81, 30183), (91, 30087), (93, 30078), (101, 30042), (104, 30012), (137, 29778), (141, 29724), (163, 29574), (169, 29520), (171, 29505), (174, 29442), (179, 29406), (182, 29394), (185, 29343), (200, 29226), (201, 29223), (210, 29145), (211, 29139), (214, 29088), (217, 29061), (220, 29016), (222, 28989), (224, 28974), (226, 28935), (229, 28920), (239, 28869),

Gene: DunneganBoMo\_186 Start: 137638, Stop: 139731, Start Num: 8

Candidate Starts for DunneganBoMo\_186:

(Start: 8 @137638 has 3 MA's), (Start: 14 @137674 has 1 MA's), (20, 137722), (Start: 28 @137809 has 11 MA's), (40, 137959), (42, 137989), (48, 138022), (50, 138034), (53, 138070), (70, 138235), (73, 138250), (76, 138271), (79, 138286), (83, 138325), (92, 138406), (102, 138466), (106, 138499), (110, 138535), (115, 138592), (117, 138604), (119, 138610), (122, 138625), (124, 138631), (125, 138637), (128, 138676), (144, 138799), (146, 138817), (151, 138850), (155, 138880), (159, 138916), (161, 138928), (164, 138937), (184, 139153), (195, 139264), (196, 139267), (197, 139276), (212, 139408), (214, 139438), (228, 139603), (231, 139627), (235, 139645),

Gene: Ellewin\_185 Start: 136909, Stop: 139002, Start Num: 8

Candidate Starts for Ellewin\_185:

(Start: 8 @136909 has 3 MA's), (Start: 28 @137080 has 11 MA's), (40, 137230), (42, 137260), (48, 137293), (50, 137305), (51, 137320), (53, 137341), (70, 137506), (73, 137521), (76, 137542), (79, 137557), (92, 137677), (106, 137770), (110, 137806), (115, 137863), (117, 137875), (119, 137881), (122, 137896), (124, 137902), (125, 137908), (128, 137947), (144, 138070), (146, 138088), (151, 138121), (155, 138151), (159, 138187), (161, 138199), (164, 138208), (175, 138352), (184, 138424), (195, 138535), (196, 138538), (197, 138547), (212, 138679), (214, 138709), (228, 138874), (231, 138898), (235, 138916), (242, 138961),

Gene: Emmetator\_189 Start: 137037, Stop: 139130, Start Num: 8

Candidate Starts for Emmetator\_189:

(Start: 8 @137037 has 3 MA's), (Start: 28 @137208 has 11 MA's), (40, 137358), (42, 137388), (48, 137421), (50, 137433), (53, 137469), (70, 137634), (73, 137649), (76, 137670), (79, 137685), (83, 137724), (92, 137805), (106, 137898), (110, 137934), (115, 137991), (117, 138003), (119, 138009), (122, 138024), (124, 138030), (125, 138036), (128, 138075), (144, 138198), (146, 138216), (151, 138249), (155, 138279), (159, 138315), (161, 138327), (164, 138336), (175, 138480), (184, 138552), (195, 138663), (196, 138666), (197, 138675), (212, 138807), (214, 138837), (228, 139002), (231, 139026), (235, 139044), (242, 139089),

Gene: FloraSnap32\_191 Start: 132272, Stop: 134377, Start Num: 6

Candidate Starts for FloraSnap32\_191:

(Start: 6 @132272 has 7 MA's), (Start: 14 @132314 has 1 MA's), (34, 132527), (40, 132599), (46, 132656), (60, 132809), (76, 132911), (81, 132950), (83, 132974), (84, 132977), (92, 133055), (99, 133085), (105, 133139), (107, 133157), (110, 133184), (119, 133259), (125, 133286), (131, 133349), (140, 133415), (145, 133454), (146, 133466), (155, 133529), (159, 133565), (165, 133592), (176, 133733), (183, 133796), (205, 133991), (208, 134021), (214, 134084), (228, 134249), (231, 134273), (237, 134303), (240, 134315),

Gene: FrostedClock\_195 Start: 133305, Stop: 135410, Start Num: 6

Candidate Starts for FrostedClock\_195:

(Start: 6 @133305 has 7 MA's), (12, 133344), (Start: 14 @133347 has 1 MA's), (34, 133560), (40, 133632), (46, 133689), (60, 133842), (76, 133944), (81, 133983), (83, 134007), (84, 134010), (92, 134088), (95, 134100), (105, 134172), (110, 134217), (119, 134292), (125, 134319), (131, 134382), (140, 134448), (145, 134487), (146, 134499), (155, 134562), (159, 134598), (162, 134613), (165, 134625), (173, 134736), (183, 134829), (184, 134832), (203, 134991), (205, 135024), (208, 135054), (228, 135282), (231, 135306), (237, 135336), (240, 135348),

Gene: Galactica\_49 Start: 36656, Stop: 38509, Start Num: 28

Candidate Starts for Galactica\_49:

(11, 36518), (22, 36596), (Start: 28 @36656 has 11 MA's), (30, 36680), (31, 36683), (33, 36725), (37, 36767), (41, 36809), (82, 37157), (94, 37271), (97, 37283), (100, 37301), (108, 37364), (126, 37526), (135, 37577), (137, 37583), (157, 37745), (167, 37811), (168, 37814), (171, 37853), (181, 37958), (186, 38015), (202, 38141), (211, 38222), (214, 38273), (217, 38300), (222, 38363), (225, 38408),

(228, 38426), (239, 38477),

Gene: Gibson\_35 Start: 30172, Stop: 28340, Start Num: 28

Candidate Starts for Gibson\_35:

(19, 30253), (Start: 28 @30172 has 11 MA's), (31, 30145), (32, 30136), (54, 29914), (61, 29815), (67, 29785), (77, 29719), (80, 29698), (81, 29692), (89, 29611), (104, 29521), (108, 29491), (127, 29335), (147, 29191), (163, 29083), (166, 29062), (169, 29029), (171, 29014), (174, 28951), (179, 28915), (182, 28903), (185, 28852), (190, 28816), (193, 28792), (195, 28768), (200, 28735), (205, 28690), (210, 28654), (213, 28621), (214, 28597), (217, 28570), (220, 28525), (222, 28498), (239, 28378),

Gene: GoldenEssence\_181 Start: 127646, Stop: 129751, Start Num: 6

Candidate Starts for GoldenEssence\_181:

(Start: 6 @127646 has 7 MA's), (12, 127685), (Start: 14 @127688 has 1 MA's), (34, 127901), (40, 127973), (46, 128030), (60, 128183), (76, 128285), (81, 128324), (83, 128348), (84, 128351), (92, 128429), (99, 128459), (105, 128513), (108, 128534), (110, 128558), (114, 128609), (119, 128633), (125, 128660), (131, 128723), (140, 128789), (145, 128828), (146, 128840), (155, 128903), (159, 128939), (165, 128966), (183, 129170), (184, 129173), (205, 129365), (208, 129395), (214, 129458), (228, 129623), (231, 129647), (237, 129677), (240, 129689),

Gene: Greenbelt\_35 Start: 26921, Stop: 25092, Start Num: 27

Candidate Starts for Greenbelt\_35:

(24, 26954), (Start: 27 @26921 has 2 MA's), (32, 26882), (35, 26831), (43, 26741), (54, 26660), (61, 26561), (64, 26552), (86, 26363), (108, 26237), (109, 26234), (110, 26213), (112, 26204), (118, 26144), (133, 26048), (152, 25913), (163, 25835), (169, 25781), (171, 25766), (174, 25700), (191, 25562), (195, 25517), (198, 25496), (204, 25457), (217, 25322), (222, 25250), (234, 25154), (239, 25130),

Gene: Hiyaa\_50 Start: 37839, Stop: 39692, Start Num: 28

Candidate Starts for Hiyaa\_50:

(18, 37749), (Start: 28 @37839 has 11 MA's), (30, 37863), (31, 37866), (32, 37875), (33, 37908), (37, 37950), (41, 37992), (56, 38115), (58, 38130), (94, 38454), (97, 38466), (100, 38484), (108, 38547), (121, 38655), (126, 38709), (135, 38760), (137, 38766), (148, 38874), (150, 38883), (168, 38997), (171, 39036), (175, 39102), (202, 39324), (208, 39393), (211, 39405), (214, 39456), (217, 39483), (222, 39546), (239, 39660),

Gene: KSunshine22\_190 Start: 135926, Stop: 138019, Start Num: 8

Candidate Starts for KSunshine22\_190:

(Start: 8 @135926 has 3 MA's), (Start: 28 @136097 has 11 MA's), (40, 136247), (42, 136277), (48, 136310), (50, 136322), (51, 136337), (53, 136358), (70, 136523), (73, 136538), (76, 136559), (79, 136574), (92, 136694), (106, 136787), (110, 136823), (115, 136880), (117, 136892), (119, 136898), (122, 136913), (124, 136919), (125, 136925), (128, 136964), (144, 137087), (146, 137105), (151, 137138), (155, 137168), (159, 137204), (161, 137216), (164, 137225), (175, 137369), (184, 137441), (195, 137552), (196, 137555), (197, 137564), (212, 137696), (214, 137726), (228, 137891), (231, 137915), (235, 137933), (242, 137978),

Gene: Keanu\_49 Start: 37590, Stop: 39443, Start Num: 28

Candidate Starts for Keanu\_49:

(1, 37338), (7, 37422), (10, 37443), (13, 37458), (15, 37479), (16, 37485), (18, 37500), (Start: 28 @37590 has 11 MA's), (30, 37614), (31, 37617), (32, 37626), (33, 37659), (37, 37701), (41, 37743), (54, 37854), (72, 38022), (94, 38205), (97, 38217), (100, 38235), (108, 38298), (123, 38418), (126, 38460), (135, 38511), (137, 38517), (139, 38550), (148, 38625), (153, 38643), (168, 38748), (171, 38787), (175, 38853), (202, 39075), (208, 39144), (211, 39156), (214, 39207), (217, 39234), (222, 39297), (223, 39300), (239, 39411),

Gene: Kokushibo\_51 Start: 37896, Stop: 39749, Start Num: 28

Candidate Starts for Kokushibo\_51:

(18, 37806), (Start: 28 @37896 has 11 MA's), (30, 37920), (31, 37923), (32, 37932), (33, 37965), (37, 38007), (41, 38049), (56, 38172), (58, 38187), (94, 38511), (97, 38523), (100, 38541), (108, 38604), (109, 38607), (121, 38712), (126, 38766), (135, 38817), (137, 38823), (148, 38931), (150, 38940), (168, 39054), (171, 39093), (175, 39159), (202, 39381), (208, 39450), (211, 39462), (214, 39513), (217, 39540), (222, 39603), (239, 39717),

Gene: Laure\_195 Start: 121872, Stop: 124010, Start Num: 4

Candidate Starts for Laure\_195:

(2, 121842), (4, 121872), (Start: 14 @121950 has 1 MA's), (17, 121986), (23, 122034), (36, 122187), (38, 122205), (40, 122235), (48, 122298), (51, 122325), (68, 122493), (69, 122508), (81, 122577), (84, 122604), (85, 122631), (92, 122682), (95, 122694), (98, 122706), (105, 122766), (110, 122811), (125, 122913), (127, 122949), (133, 122988), (143, 123072), (155, 123156), (158, 123192), (159, 123195), (164, 123216), (165, 123222), (182, 123408), (184, 123432), (192, 123501), (199, 123564), (203, 123591), (205, 123624), (228, 123882), (238, 123942), (240, 123948), (242, 123969),

Gene: LeoJr\_196 Start: 132661, Stop: 134745, Start Num: 8

Candidate Starts for LeoJr\_196:

(Start: 8 @132661 has 3 MA's), (Start: 14 @132697 has 1 MA's), (Start: 28 @132832 has 11 MA's), (40, 132982), (42, 133012), (45, 133030), (46, 133039), (48, 133045), (51, 133072), (55, 133111), (57, 133120), (70, 133258), (75, 133288), (76, 133294), (78, 133306), (84, 133351), (90, 133420), (92, 133429), (106, 133522), (108, 133534), (110, 133558), (117, 133618), (119, 133624), (125, 133651), (130, 133705), (146, 133831), (155, 133894), (159, 133930), (180, 134134), (184, 134167), (195, 134278), (196, 134281), (197, 134290), (228, 134617), (230, 134626), (231, 134641),

Gene: Lizz\_35 Start: 29987, Stop: 28152, Start Num: 28

Candidate Starts for Lizz\_35:

(25, 30017), (Start: 28 @29987 has 11 MA's), (32, 29951), (52, 29747), (54, 29729), (61, 29630), (67, 29600), (71, 29564), (80, 29510), (81, 29504), (91, 29408), (104, 29333), (113, 29258), (116, 29219), (120, 29207), (127, 29147), (137, 29099), (152, 28973), (163, 28895), (169, 28841), (174, 28763), (178, 28730), (179, 28727), (182, 28715), (185, 28664), (190, 28628), (193, 28604), (200, 28547), (205, 28502), (210, 28466), (213, 28433), (217, 28382), (220, 28337), (222, 28310), (233, 28217), (239, 28190),

Gene: Mimi\_193 Start: 133055, Stop: 135160, Start Num: 6

Candidate Starts for Mimi\_193:

(Start: 6 @133055 has 7 MA's), (12, 133094), (Start: 14 @133097 has 1 MA's), (34, 133310), (40, 133382), (46, 133439), (60, 133592), (76, 133694), (81, 133733), (83, 133757), (84, 133760), (92, 133838), (105, 133922), (110, 133967), (119, 134042), (125, 134069), (131, 134132), (140, 134198), (145, 134237), (146, 134249), (155, 134312), (159, 134348), (165, 134375), (183, 134579), (184, 134582), (203, 134741), (205, 134774), (208, 134804), (228, 135032), (231, 135056), (237, 135086), (240, 135098),

Gene: PHTowN\_35 Start: 29985, Stop: 28150, Start Num: 28

Candidate Starts for PHTowN\_35:

(25, 30015), (Start: 28 @29985 has 11 MA's), (32, 29949), (52, 29745), (54, 29727), (61, 29628), (67, 29598), (71, 29562), (80, 29508), (81, 29502), (91, 29406), (104, 29331), (113, 29256), (116, 29217), (120, 29205), (127, 29145), (137, 29097), (152, 28971), (163, 28893), (169, 28839), (174, 28761), (178, 28728), (179, 28725), (182, 28713), (185, 28662), (190, 28626), (193, 28602), (200, 28545), (205, 28500), (210, 28464), (213, 28431), (217, 28380), (220, 28335), (222, 28308), (233, 28215), (239, 28188),

Gene: Panchaali\_189 Start: 138408, Stop: 140498, Start Num: 9

Candidate Starts for Panchaali\_189:

(3, 138348), (5, 138375), (Start: 9 @138408 has 1 MA's), (Start: 14 @138441 has 1 MA's), (26, 138546), (Start: 28 @138576 has 11 MA's), (29, 138588), (40, 138726), (42, 138756), (48, 138789), (50, 138801), (51, 138816), (53, 138837), (70, 139002), (76, 139038), (79, 139053), (83, 139092), (84, 139095), (92, 139173), (101, 139218), (106, 139266), (110, 139302), (115, 139359), (117, 139371), (119, 139377), (122, 139392), (124, 139398), (125, 139404), (128, 139443), (144, 139566), (146, 139584), (155, 139647), (159, 139683), (161, 139695), (164, 139704), (165, 139710), (175, 139848), (184, 139920), (195, 140031), (196, 140034), (197, 140043), (214, 140205), (227, 140367), (228, 140370), (231, 140394), (235, 140412), (243, 140478),

Gene: Patbob\_191 Start: 133442, Stop: 135547, Start Num: 6

Candidate Starts for Patbob\_191:

(Start: 6 @133442 has 7 MA's), (12, 133481), (Start: 14 @133484 has 1 MA's), (34, 133697), (40, 133769), (46, 133826), (60, 133979), (76, 134081), (81, 134120), (83, 134144), (84, 134147), (92, 134225), (99, 134255), (105, 134309), (110, 134354), (114, 134405), (119, 134429), (125, 134456), (131, 134519), (140, 134585), (145, 134624), (146, 134636), (155, 134699), (159, 134735), (165, 134762), (183, 134966), (205, 135161), (214, 135254), (228, 135419), (231, 135443), (237, 135473), (240, 135485),

Gene: Phrampa\_186 Start: 132810, Stop: 134915, Start Num: 6

Candidate Starts for Phrampa\_186:

(Start: 6 @132810 has 7 MA's), (Start: 14 @132852 has 1 MA's), (34, 133065), (40, 133137), (46, 133194), (76, 133449), (81, 133488), (83, 133512), (84, 133515), (92, 133593), (99, 133623), (105, 133677), (110, 133722), (119, 133797), (125, 133824), (129, 133872), (140, 133953), (145, 133992), (146, 134004), (155, 134067), (159, 134103), (164, 134124), (183, 134334), (205, 134529), (208, 134559), (214, 134622), (228, 134787), (231, 134811), (237, 134841), (240, 134853),

Gene: Racecar\_194 Start: 133218, Stop: 135323, Start Num: 6

Candidate Starts for Racecar\_194:

(Start: 6 @133218 has 7 MA's), (12, 133257), (Start: 14 @133260 has 1 MA's), (34, 133473), (40, 133545), (46, 133602), (60, 133755), (76, 133857), (81, 133896), (83, 133920), (84, 133923), (92, 134001), (95, 134013), (105, 134085), (110, 134130), (119, 134205), (125, 134232), (131, 134295), (140, 134361), (145, 134400), (146, 134412), (155, 134475), (159, 134511), (165, 134538), (183, 134742), (184, 134745), (203, 134904), (205, 134937), (208, 134967), (228, 135195), (231, 135219), (237, 135249), (240, 135261),

Gene: ReginaGlobina\_200 Start: 133944, Stop: 136028, Start Num: 8

Candidate Starts for ReginaGlobina\_200:

(Start: 8 @133944 has 3 MA's), (Start: 14 @133980 has 1 MA's), (Start: 28 @134115 has 11 MA's), (40, 134265), (42, 134295), (45, 134313), (46, 134322), (48, 134328), (51, 134355), (55, 134394), (57, 134403), (70, 134541), (75, 134571), (76, 134577), (78, 134589), (90, 134703), (92, 134712), (106, 134805), (108, 134817), (110, 134841), (117, 134901), (119, 134907), (125, 134934), (130, 134988), (146, 135114), (155, 135177), (159, 135213), (176, 135384), (180, 135417), (184, 135450), (195, 135561), (196, 135564), (197, 135573), (206, 135657), (228, 135900), (230, 135909), (231, 135924),

Gene: Rockabye\_196 Start: 128249, Stop: 130285, Start Num: 17

Candidate Starts for Rockabye\_196:

(Start: 6 @128177 has 7 MA's), (Start: 14 @128213 has 1 MA's), (17, 128249), (21, 128276), (23, 128297), (26, 128318), (40, 128498), (48, 128561), (49, 128570), (50, 128573), (60, 128708), (69, 128771), (76, 128810), (81, 128849), (83, 128873), (92, 128954), (95, 128966), (107, 129056), (110, 129083), (119, 129158), (125, 129185), (137, 129275), (155, 129428), (159, 129467), (164, 129488),

(165, 129494), (176, 129638), (182, 129680), (189, 129752), (194, 129809), (199, 129836), (205, 129896), (208, 129926), (214, 129989), (215, 129998), (218, 130043), (228, 130154), (229, 130160), (232, 130184), (236, 130205), (240, 130220), (242, 130241),

Gene: Rooney\_35 Start: 30169, Stop: 28337, Start Num: 28

Candidate Starts for Rooney\_35:

(19, 30250), (Start: 28 @30169 has 11 MA's), (31, 30142), (32, 30133), (54, 29911), (61, 29812), (67, 29782), (77, 29716), (80, 29695), (81, 29689), (89, 29608), (104, 29518), (108, 29488), (127, 29332), (147, 29188), (163, 29080), (166, 29059), (169, 29026), (171, 29011), (174, 28948), (179, 28912), (182, 28900), (185, 28849), (190, 28813), (193, 28789), (195, 28765), (200, 28732), (205, 28687), (210, 28651), (213, 28618), (214, 28594), (217, 28567), (220, 28522), (222, 28495), (239, 28375),

Gene: SJReid\_198 Start: 127006, Stop: 129117, Start Num: 6

Candidate Starts for SJReid\_198:

(Start: 6 @127006 has 7 MA's), (Start: 14 @127048 has 1 MA's), (23, 127132), (38, 127303), (40, 127333), (47, 127393), (48, 127396), (51, 127423), (57, 127471), (74, 127633), (76, 127645), (81, 127684), (84, 127711), (92, 127789), (103, 127855), (107, 127891), (110, 127918), (125, 128020), (132, 128086), (134, 128098), (143, 128179), (155, 128263), (159, 128299), (164, 128320), (177, 128488), (182, 128512), (184, 128536), (189, 128584), (197, 128659), (199, 128668), (203, 128695), (205, 128728), (207, 128749), (209, 128761), (219, 128890), (229, 128992), (236, 129037),

Gene: SassyC\_38 Start: 30766, Stop: 28931, Start Num: 28

Candidate Starts for SassyC\_38:

(Start: 28 @30766 has 11 MA's), (31, 30739), (32, 30730), (44, 30586), (54, 30508), (61, 30409), (62, 30406), (65, 30394), (67, 30379), (81, 30283), (86, 30208), (104, 30112), (108, 30082), (120, 29986), (137, 29878), (147, 29782), (152, 29752), (153, 29746), (163, 29674), (166, 29653), (169, 29620), (174, 29542), (182, 29494), (201, 29323), (210, 29245), (211, 29239), (212, 29218), (214, 29188), (216, 29173), (217, 29161), (220, 29116), (222, 29089), (228, 29026), (229, 29020), (239, 28969), (241, 28948),

Gene: ShakeNBake\_35 Start: 30003, Stop: 28168, Start Num: 28

Candidate Starts for ShakeNBake\_35:

(25, 30033), (Start: 28 @30003 has 11 MA's), (32, 29967), (52, 29763), (54, 29745), (61, 29646), (67, 29616), (71, 29580), (80, 29526), (81, 29520), (91, 29424), (104, 29349), (113, 29274), (116, 29235), (120, 29223), (127, 29163), (137, 29115), (152, 28989), (163, 28911), (169, 28857), (174, 28779), (178, 28746), (179, 28743), (182, 28731), (185, 28680), (190, 28644), (193, 28620), (200, 28563), (205, 28518), (210, 28482), (213, 28449), (217, 28398), (220, 28353), (222, 28326), (233, 28233), (239, 28206),

Gene: Spocter\_49 Start: 37869, Stop: 39722, Start Num: 28

Candidate Starts for Spocter\_49:

(18, 37779), (Start: 28 @37869 has 11 MA's), (30, 37893), (31, 37896), (32, 37905), (33, 37938), (37, 37980), (41, 38022), (56, 38145), (58, 38160), (94, 38484), (97, 38496), (100, 38514), (108, 38577), (109, 38580), (126, 38739), (135, 38790), (137, 38796), (148, 38904), (150, 38913), (168, 39027), (171, 39066), (175, 39132), (202, 39354), (208, 39423), (211, 39435), (214, 39486), (217, 39513), (222, 39576), (239, 39690),

Gene: Stewart25555\_189 Start: 135327, Stop: 137420, Start Num: 8

Candidate Starts for Stewart25555\_189:

(Start: 8 @135327 has 3 MA's), (Start: 28 @135498 has 11 MA's), (40, 135648), (42, 135678), (48, 135711), (50, 135723), (51, 135738), (53, 135759), (63, 135873), (75, 135954), (76, 135960), (87, 136071), (92, 136095), (106, 136188), (107, 136197), (110, 136224), (117, 136293), (119, 136299), (122, 136314), (124, 136320), (125, 136326), (128, 136365), (146, 136506), (154, 136563), (155,

136569), (159, 136605), (160, 136611), (161, 136617), (164, 136626), (165, 136632), (175, 136770), (184, 136842), (192, 136911), (195, 136953), (196, 136956), (197, 136965), (214, 137127), (215, 137136), (223, 137232), (228, 137292), (231, 137316), (235, 137334),

Gene: Talia1610\_194 Start: 133514, Stop: 135619, Start Num: 6

Candidate Starts for Talia1610\_194:

(Start: 6 @133514 has 7 MA's), (12, 133553), (Start: 14 @133556 has 1 MA's), (34, 133769), (40, 133841), (46, 133898), (76, 134153), (81, 134192), (83, 134216), (84, 134219), (92, 134297), (99, 134327), (105, 134381), (110, 134426), (119, 134501), (125, 134528), (131, 134591), (140, 134657), (145, 134696), (146, 134708), (155, 134771), (159, 134807), (165, 134834), (183, 135038), (184, 135041), (203, 135200), (205, 135233), (208, 135263), (228, 135491), (231, 135515), (237, 135545), (240, 135557),

Gene: Virizion\_39 Start: 30368, Stop: 28536, Start Num: 28

Candidate Starts for Virizion\_39:

(19, 30449), (Start: 28 @30368 has 11 MA's), (31, 30341), (32, 30332), (54, 30110), (61, 30011), (67, 29981), (77, 29915), (80, 29894), (81, 29888), (89, 29807), (104, 29717), (108, 29687), (127, 29531), (147, 29387), (163, 29279), (166, 29258), (169, 29225), (171, 29210), (174, 29147), (179, 29111), (182, 29099), (185, 29048), (190, 29012), (193, 28988), (195, 28964), (200, 28931), (205, 28886), (210, 28850), (213, 28817), (214, 28793), (217, 28766), (220, 28721), (222, 28694), (239, 28574),

Gene: WaddleDee\_182 Start: 136104, Stop: 138197, Start Num: 8

Candidate Starts for WaddleDee\_182:

(Start: 8 @136104 has 3 MA's), (Start: 28 @136275 has 11 MA's), (40, 136425), (42, 136455), (48, 136488), (50, 136500), (53, 136536), (70, 136701), (73, 136716), (76, 136737), (79, 136752), (83, 136791), (92, 136872), (102, 136932), (106, 136965), (110, 137001), (115, 137058), (117, 137070), (119, 137076), (122, 137091), (124, 137097), (125, 137103), (128, 137142), (144, 137265), (146, 137283), (151, 137316), (155, 137346), (159, 137382), (161, 137394), (164, 137403), (175, 137547), (184, 137619), (195, 137730), (196, 137733), (197, 137742), (212, 137874), (214, 137904), (228, 138069), (231, 138093), (235, 138111), (242, 138156),

Gene: Wentworth\_36 Start: 30474, Stop: 28651, Start Num: 28

Candidate Starts for Wentworth\_36:

(19, 30555), (22, 30528), (Start: 28 @30474 has 11 MA's), (31, 30447), (32, 30438), (52, 30234), (54, 30216), (59, 30183), (61, 30117), (62, 30114), (65, 30102), (66, 30096), (67, 30087), (77, 30021), (88, 29916), (91, 29898), (93, 29889), (104, 29823), (108, 29793), (138, 29586), (139, 29556), (156, 29436), (169, 29340), (174, 29262), (182, 29214), (185, 29163), (193, 29103), (200, 29046), (205, 29001), (210, 28965), (211, 28959), (212, 28938), (214, 28908), (217, 28881), (220, 28836), (222, 28809), (228, 28746), (229, 28740), (239, 28689),

Gene: Wilkos\_36 Start: 30289, Stop: 28454, Start Num: 28

Candidate Starts for Wilkos\_36:

(19, 30370), (Start: 28 @30289 has 11 MA's), (32, 30253), (39, 30175), (46, 30097), (54, 30031), (61, 29932), (66, 29911), (67, 29902), (80, 29812), (91, 29710), (93, 29701), (101, 29665), (104, 29635), (141, 29347), (142, 29341), (163, 29197), (169, 29143), (171, 29128), (174, 29065), (179, 29029), (182, 29017), (190, 28930), (193, 28906), (200, 28849), (201, 28846), (210, 28768), (211, 28762), (216, 28696), (217, 28684), (220, 28639), (222, 28612), (224, 28597), (228, 28549), (229, 28543), (239, 28492), (241, 28471),

Gene: Yara\_33 Start: 29664, Stop: 27850, Start Num: 27

Candidate Starts for Yara\_33:

(Start: 27 @29664 has 2 MA's), (32, 29628), (35, 29577), (43, 29487), (46, 29472), (48, 29466), (58, 29379), (61, 29307), (96, 29067), (101, 29043), (104, 29013), (127, 28827), (137, 28779), (139,

28746), (149, 28674), (153, 28659), (169, 28533), (170, 28530), (171, 28518), (172, 28479), (174, 28455), (188, 28344), (189, 28335), (211, 28155), (212, 28134), (217, 28077), (221, 28014), (222, 28005), (228, 27942), (233, 27912), (239, 27888),