

Pham 216112

1: Quhwah_27 + 1	13	20	38	42	44	51	53	55	88	89	92	100	102	104	107	114	122	128	129	133	137	138	143	157		
2: Shrubaron_25 + 1	13	20	38	42	44	51	53	55	88	89	92	100	102	104	107	114	122	128	129	133	137	138	143	157		
3: Shotgun_24	13	20	38	42	44	51	53	55	88	89	92	100	102	104	107	114	122	128	129	133	137	138	143	157		
4: Paschalis_24 + 1	13	20	38	42	44	51	53	55	88	89	92	100	102	104	107	114	122	128	129	133	137	138	143	157		
5: Ganandorf_24 + 1	13	20	38	42	47	51	53	55	88	89	92	100	103	107	110	116	122	124	128	133	137	138	143	157		
6: Gina_26	13	20	38	42	47	51	53	55	88	89	92	98	100	107	110	116	122	124	128	133	137	138	143	144	148	157
7: Jayden_26	13	20	38	42	44	51	53	55	88	89	92	100	102	104	107	114	122	128	129	133	137	138	143	157		
8: Phorgeous_24 + 1	13	20	38	42	47	51	53	55	88	89	92	100	103	107	110	116	122	124	128	133	137	138	143	157		
9: Teamocil_26	13	20	38	42	47	51	53	55	88	89	92	98	102	107	110	116	122	124	128	133	137	138	143	157		
10: Merry_21	13	20	32	41	44	48	53	51	88	89	92	94	112	116	118	122	126	128	136	144	147	148	157			
11: Megan_19	13	20	38	42	44	51	53	55	88	89	92	100	102	104	107	114	122	128	129	133	137	138	143	157		
12: Onika_24	13	20	38	42	44	51	53	55	88	89	92	100	104	107	114	122	128	129	133	137	138	143	157			
13: Yeti_25	13	20	32	41	43	48	53	55	88	89	92	94	96	112	116	118	122	126	130	141	148	157				
14: Nicole_22	13	20	38	42	44	51	53	55	88	89	92	100	102	104	107	116	122	124	129	136	143	157				
15: ClearAsMud_27	13	20	38	42	47	51	53	55	88	89	92	100	110	116	122	124	128	133	137	144	157					
16: Smarties_33 + 1	13	20	38	42	44	51	53	55	88	89	92	100	107	110	116	122	124	128	133	137	157					
17: Fireman_25	13	20	38	42	44	51	53	55	88	89	92	100	102	104	107	116	122	125	129	136	143	157				
18: NoodlelyBoi_24 + 1	13	25	29	32	38	48	53	55	88	89	92	94	95	101	105	108	114	116	122	129	132	135	138	148	157	
19: Matzah_21	13	25	29	32	38	48	53	55	88	89	92	94	95	101	105	108	114	116	122	129	132	135	138	148	157	
20: MementoMori_25	13	25	29	32	38	48	53	55	88	89	92	94	95	101	105	108	114	116	122	129	132	135	138	148	157	
21: Cinna_20	13	25	27	32	38	48	53	55	88	89	92	94	95	101	105	108	114	116	122	129	132	137	145	148	157	
22: Margaery_19	13	25	29	32	38	48	53	55	88	89	92	94	95	101	105	108	114	116	122	129	132	137	148	155		
23: Cressida_22	13	27	32	38	48	53	55	88	89	92	94	95	105	107	114	116	123	129	132	137	148	150	157			
24: Terij_20	13	18	24	30	38	41	53	55	88	89	92	97	107	114	116	122	128	133	139	144	157					
25: Kozie_21	14	11	19	33	37	40	51	57	78	81	102	108	117	119	121	127	133	140	153	158						
26: Ellewin_12 + 3	14	16	19	36	46	48	51	57	73	78	81	108	117	119	121	127	133	140	153	158						
27: LeoJr_80	14	16	19	36	44	48	51	57	73	78	81	108	117	119	121	127	133	140	153	158						
28: Bloom_84 + 1	14	16	19	36	44	48	51	57	73	78	81	108	117	119	121	127	133	140	153	158						
29: Atuin_75 + 1	14	16	19	36	44	48	51	57	73	78	81	108	117	119	121	127	133	140	153	158						
30: Patbob_81	14	16	19	36	44	48	51	57	70	78	81	93	101	109	117	121	127	133	140	153	158					
31: Chilliains_71	14	16	19	31	35	44	50	57	70	78	81	102	108	117	121	127	133	140	149	153	158					
32: SJReid_85	14	16	19	31	35	44	50	57	70	78	81	102	108	117	121	127	133	140	149	153	158					
33: Phrampa_74	14	16	19	31	35	44	50	57	70	78	81	102	108	117	121	127	133	140	149	153	158					
34: Rockabye_82	14	16	19	31	35	44	50	57	70	78	81	102	108	117	121	127	133	140	149	153	158					
35: GoldenEssence_69	14	19	28	34	46	48	51	57	60	75	78	81	102	108	122	128	130	136	139	143	146	156				
36: Panchaali_78	14	19	28	34	46	48	51	57	60	75	78	81	102	108	122	128	130	136	139	143	146	156				
37: FuzzBuster_27	14	19	28	34	46	48	51	57	60	75	78	81	102	108	122	128	130	136	139	143	146	156				

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 216112 Report

This analysis was run 02/22/25 on database version 588.

Pham number 216112 has 75 members, 19 are drafts.

Phages represented in each track:

- Track 1 : Quhwah\_27, Hermeonysus\_24, LittleFortune\_26, Savannah\_24, Jefe\_25, CrazyRich\_24, KaiHaiDragon\_25, Crisis\_26, BrazzalePHS\_24, Selwyn23\_26, Pulchra\_26, Cranjis\_26, Ramiel05\_24, Honeyfin\_26, Kowalski\_24, Antares\_25, EarickHC\_25, Scumberland\_26
- Track 2 : Shrubaron\_25, Tyrumbra\_23, RobsFeet\_26, Metamorphoo\_25
- Track 3 : Shotgun\_24
- Track 4 : Paschalis\_24, PierreOrion\_25, Piperis\_25, Glorp\_26, Jollipop\_25, PiperSansNom\_25, Phrancesco\_25
- Track 5 : Ganandorf\_24, Busephilis\_24
- Track 6 : Gina\_26
- Track 7 : Jayden\_26
- Track 8 : Phorgeous\_24, PhedwardCullen\_23
- Track 9 : Teamocil\_26
- Track 10 : Merry\_, Sunny\_
- Track 11 : Megan\_19
- Track 12 : Onika\_24
- Track 13 : Yeti\_25
- Track 14 : Nicole72\_20
- Track 15 : ClearAsMud\_27
- Track 16 : Smarties\_33, Ariadne\_33
- Track 17 : Fireman\_25
- Track 18 : NoodlelyBoi\_24, SirFrank\_24
- Track 19 : Matzah\_21
- Track 20 : MementoMori\_21
- Track 21 : Cinna\_20
- Track 22 : Margaery\_19
- Track 23 : Cressida\_22
- Track 24 : Terij\_20
- Track 25 : Kozie\_21
- Track 26 : Ellewin\_72, DunneganBoMo\_74, KSunshine22\_75, WaddleDee\_74
- Track 27 : LeoJr\_80
- Track 28 : Bloom\_84, Talia1610\_80, Mimi\_80, Racecar\_81
- Track 29 : Atuin\_75, ReginaGlobina\_80
- Track 30 : Patbob\_81
- Track 31 : Chilliams\_77
- Track 32 : SJReid\_85
- Track 33 : Phrampa\_74

- Track 34 : Rockabye\_82
- Track 35 : GoldenEssence\_69
- Track 36 : Panchaali\_78
- Track 37 : FuzzBuster\_27

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

The start number called the most often in the published annotations is 13, it was called in 51 of the 56 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Antares\_25, Ariadne\_33, BrazzalePHS\_24, Busephilis\_24, Cinna\_20, ClearAsMud\_27, Cranjis\_26, CrazyRich\_24, Cressida\_22, Crisis\_26, EarickHC\_25, Fireman\_25, Ganandorf\_24, Gina\_26, Glorp\_26, Hermeonysus\_24, Honeyfin\_26, Jayden\_26, Jefe\_25, Jollipop\_25, KaiHaiDragon\_25, Kowalski\_24, Kozi\_21, LittleFortune\_26, Margaery\_19, Matzah\_21, Megan\_19, MementoMori\_21, Merry\_, Metamorphoo\_25, Nicole72\_20, NoodlelyBoi\_24, Onika\_24, Paschalis\_24, PhedwardCullen\_23, Phorgeous\_24, Phrancesco\_25, PierreOrion\_25, PiperSansNom\_25, Piperis\_25, Pulchra\_26, Quhwah\_27, Ramiel05\_24, RobsFeet\_26, Savannah\_24, Scumberland\_26, Selwyn23\_26, Shotgun\_24, Shrubaron\_25, SirFrank\_24, Smarties\_33, Sunny\_, Teamocil\_26, Terij\_20, Tyrumbra\_23, Yeti\_25,

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

- 

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

- Atuin\_75, Bloom\_84, Chilliams\_77, DunneganBoMo\_74, Ellewin\_72, FuzzBuster\_27, GoldenEssence\_69, KSunshine22\_75, LeoJr\_80, Mimi\_80, Panchaali\_78, Patbob\_81, Phrampa\_74, Racecar\_81, ReginaGlobina\_80, Rockabye\_82, SJReid\_85, Talia1610\_80, WaddleDee\_74,

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

Start 13:

- Found in 56 of 75 ( 74.7% ) of genes in pham
- Manual Annotations of this start: 51 of 56
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Antares\_25 (EC), Ariadne\_33 (EC), BrazzalePHS\_24 (EC), Busephilis\_24 (EC), Cinna\_20 (EI), ClearAsMud\_27 (EC), Cranjis\_26 (EC), CrazyRich\_24 (EC), Cressida\_22 (EI), Crisis\_26 (EC), EarickHC\_25 (EC), Fireman\_25 (EC), Ganandorf\_24 (EC), Gina\_26 (EC), Glorp\_26 (EC), Hermeonysus\_24 (EC), Honeyfin\_26 (EC), Jayden\_26 (EC), Jefe\_25 (EC), Jollipop\_25 (EC), KaiHaiDragon\_25 (EC), Kowalski\_24 (EC), Kozi\_21 (EI), LittleFortune\_26 (EC), Margaery\_19 (EI), Matzah\_21 (EI), Megan\_19 (EC), MementoMori\_21 (EI), Merry\_ (EC), Metamorphoo\_25 (EC), Nicole72\_20 (EC), NoodlelyBoi\_24 (EC), Onika\_24 (EC), Paschalis\_24 (EC), PhedwardCullen\_23 (EC), Phorgeous\_24 (EC), Phrancesco\_25 (EC), PierreOrion\_25 (EC), PiperSansNom\_25 (EC), Piperis\_25 (EC), Pulchra\_26 (EC), Quhwah\_27 (EC), Ramiel05\_24 (EC), RobsFeet\_26 (EC), Savannah\_24 (EC), Scumberland\_26 (EC), Selwyn23\_26 (EC),

Shotgun\_24 (EC), Shrubaron\_25 (EC), SirFrank\_24 (EC), Smarties\_33 (EC), Sunny\_ (EC), Teamocil\_26 (EC), Terij\_20 (EI), Tyrumbra\_23 (EC), Yeti\_25 (EC),

Start 14:

- Found in 5 of 75 ( 6.7% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: DunneganBoMo\_74 (FC), Ellewin\_72 (FC), KSunshine22\_75 (FC), Panchaali\_78 (FC), WaddleDee\_74 (FC),

Start 15:

- Found in 13 of 75 ( 17.3% ) of genes in pham
- Manual Annotations of this start: 4 of 56
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Atuin\_75 (FC), Bloom\_84 (FC), Chilliams\_77 (FC), GoldenEssence\_69 (FC), LeoJr\_80 (FC), Mimi\_80 (FC), Patbob\_81 (FC), Phrampa\_74 (FC), Racecar\_81 (FC), ReginaGlobina\_80 (FC), Rockabye\_82 (FC), SJReid\_85 (FC), Talia1610\_80 (FC),

Start 20:

- Found in 45 of 75 ( 60.0% ) of genes in pham
- Manual Annotations of this start: 1 of 56
- Called 2.2% of time when present
- Phage (with cluster) where this start called: FuzzBuster\_27 (singleton),

### **Summary by clusters:**

There are 4 clusters represented in this pham: singleton, FC, EI, EC,

Info for manual annotations of cluster EC:

- Start number 13 was manually annotated 44 times for cluster EC.

Info for manual annotations of cluster EI:

- Start number 13 was manually annotated 7 times for cluster EI.

Info for manual annotations of cluster FC:

- Start number 15 was manually annotated 4 times for cluster FC.

### **Gene Information:**

Gene: Antares\_25 Start: 12156, Stop: 13625, Start Num: 13

Candidate Starts for Antares\_25:

(Start: 13 @12156 has 51 MA's), (Start: 20 @12213 has 1 MA's), (23, 12225), (25, 12237), (36, 12333), (38, 12351), (42, 12387), (45, 12411), (47, 12423), (51, 12459), (53, 12489), (55, 12516), (61, 12582), (62, 12588), (63, 12597), (65, 12615), (67, 12639), (68, 12648), (69, 12651), (71, 12660), (80, 12723), (84, 12738), (85, 12756), (86, 12759), (92, 12804), (102, 12903), (104, 12930), (107, 12981), (114, 13119), (120, 13212), (122, 13224), (123, 13230), (129, 13308), (136, 13383), (137, 13398), (138, 13419), (139, 13437), (143, 13461), (157, 13590),

Gene: Ariadne\_33 Start: 13624, Stop: 15117, Start Num: 13

Candidate Starts for Ariadne\_33:

(Start: 13 @13624 has 51 MA's), (23, 13693), (25, 13705), (36, 13801), (38, 13819), (39, 13840), (47, 13891), (51, 13927), (55, 13984), (58, 14020), (60, 14044), (61, 14050), (62, 14056), (63, 14065), (67, 14107), (68, 14116), (69, 14119), (85, 14224), (86, 14227), (100, 14368), (110, 14536), (116, 14632), (122, 14716), (123, 14722), (124, 14743), (128, 14788), (131, 14845), (133, 14854), (137, 14890), (144, 14956), (157, 15082),

Gene: Atuin\_75 Start: 45156, Stop: 46664, Start Num: 15

Candidate Starts for Atuin\_75:

(10, 45114), (11, 45117), (Start: 15 @45156 has 4 MA's), (16, 45165), (19, 45216), (44, 45411), (46, 45423), (48, 45450), (57, 45552), (78, 45693), (88, 45744), (109, 45981), (119, 46131), (121, 46161), (134, 46314), (153, 46518), (158, 46584), (159, 46587),

Gene: Bloom\_84 Start: 46467, Stop: 48026, Start Num: 15

Candidate Starts for Bloom\_84:

(Start: 15 @46467 has 4 MA's), (19, 46527), (21, 46542), (44, 46752), (57, 46893), (73, 47007), (78, 47058), (87, 47106), (108, 47340), (117, 47475), (122, 47538), (140, 47757), (153, 47883), (158, 47949),

Gene: BrazzalePHS\_24 Start: 11949, Stop: 13418, Start Num: 13

Candidate Starts for BrazzalePHS\_24:

(Start: 13 @11949 has 51 MA's), (Start: 20 @12006 has 1 MA's), (23, 12018), (25, 12030), (36, 12126), (38, 12144), (42, 12180), (45, 12204), (47, 12216), (51, 12252), (53, 12282), (55, 12309), (61, 12375), (62, 12381), (63, 12390), (65, 12408), (67, 12432), (68, 12441), (69, 12444), (71, 12453), (80, 12516), (84, 12531), (85, 12549), (86, 12552), (92, 12597), (102, 12696), (104, 12723), (107, 12774), (114, 12912), (120, 13005), (122, 13017), (123, 13023), (129, 13101), (136, 13176), (137, 13191), (138, 13212), (139, 13230), (143, 13254), (157, 13383),

Gene: Busephilis\_24 Start: 11887, Stop: 13356, Start Num: 13

Candidate Starts for Busephilis\_24:

(Start: 13 @11887 has 51 MA's), (Start: 20 @11944 has 1 MA's), (23, 11956), (25, 11968), (36, 12064), (38, 12082), (42, 12118), (45, 12142), (47, 12154), (51, 12190), (53, 12220), (55, 12247), (61, 12313), (62, 12319), (63, 12328), (65, 12346), (67, 12370), (68, 12379), (69, 12382), (71, 12391), (80, 12454), (84, 12469), (85, 12487), (86, 12490), (91, 12529), (92, 12535), (102, 12634), (104, 12661), (107, 12712), (114, 12850), (120, 12943), (122, 12955), (123, 12961), (129, 13039), (136, 13114), (137, 13129), (138, 13150), (139, 13168), (143, 13192), (157, 13321),

Gene: Chilliams\_77 Start: 48357, Stop: 49904, Start Num: 15

Candidate Starts for Chilliams\_77:

(2, 48171), (3, 48201), (5, 48237), (9, 48264), (10, 48315), (11, 48318), (Start: 15 @48357 has 4 MA's), (16, 48366), (19, 48417), (21, 48432), (44, 48642), (57, 48783), (70, 48870), (78, 48933), (87, 48981), (93, 49026), (107, 49179), (109, 49221), (153, 49758), (158, 49824),

Gene: Cinna\_20 Start: 11368, Stop: 12846, Start Num: 13

Candidate Starts for Cinna\_20:

(Start: 13 @11368 has 51 MA's), (25, 11461), (27, 11488), (29, 11506), (32, 11542), (38, 11572), (48, 11668), (53, 11713), (55, 11740), (61, 11806), (63, 11821), (65, 11839), (68, 11863), (83, 11923), (86, 11950), (87, 11953), (89, 11971), (90, 11980), (92, 11995), (94, 12028), (95, 12046), (101, 12100), (105, 12145), (106, 12175), (107, 12193), (114, 12331), (116, 12352), (122, 12436), (123, 12442), (129, 12520), (132, 12571), (135, 12589), (136, 12595), (137, 12610), (138, 12631), (139, 12649), (141, 12658), (142, 12670), (144, 12676), (145, 12682), (148, 12721), (154, 12775), (155, 12778), (156, 12796), (157, 12802),

Gene: ClearAsMud\_27 Start: 12684, Stop: 14153, Start Num: 13

Candidate Starts for ClearAsMud\_27:

(Start: 13 @12684 has 51 MA's), (Start: 20 @12741 has 1 MA's), (23, 12753), (25, 12765), (36, 12861), (38, 12879), (42, 12915), (45, 12939), (47, 12951), (51, 12987), (53, 13017), (55, 13044), (61, 13110), (62, 13116), (63, 13125), (65, 13143), (67, 13167), (68, 13176), (69, 13179), (80, 13248), (84, 13263), (85, 13281), (86, 13284), (92, 13329), (102, 13428), (104, 13455), (107, 13506), (115, 13650), (120, 13737), (122, 13749), (123, 13755), (125, 13779), (127, 13806), (129, 13833), (136, 13908), (139, 13962), (141, 13971), (143, 13986), (157, 14115),

Gene: Cranjjs\_26 Start: 12111, Stop: 13580, Start Num: 13

Candidate Starts for Cranjjs\_26:

(Start: 13 @12111 has 51 MA's), (Start: 20 @12168 has 1 MA's), (23, 12180), (25, 12192), (36, 12288), (38, 12306), (42, 12342), (45, 12366), (47, 12378), (51, 12414), (53, 12444), (55, 12471), (61, 12537), (62, 12543), (63, 12552), (65, 12570), (67, 12594), (68, 12603), (69, 12606), (71, 12615), (80, 12678), (84, 12693), (85, 12711), (86, 12714), (92, 12759), (102, 12858), (104, 12885), (107, 12936), (114, 13074), (120, 13167), (122, 13179), (123, 13185), (129, 13263), (136, 13338), (137, 13353), (138, 13374), (139, 13392), (143, 13416), (157, 13545),

Gene: CrazyRich\_24 Start: 11921, Stop: 13390, Start Num: 13

Candidate Starts for CrazyRich\_24:

(Start: 13 @11921 has 51 MA's), (Start: 20 @11978 has 1 MA's), (23, 11990), (25, 12002), (36, 12098), (38, 12116), (42, 12152), (45, 12176), (47, 12188), (51, 12224), (53, 12254), (55, 12281), (61, 12347), (62, 12353), (63, 12362), (65, 12380), (67, 12404), (68, 12413), (69, 12416), (71, 12425), (80, 12488), (84, 12503), (85, 12521), (86, 12524), (92, 12569), (102, 12668), (104, 12695), (107, 12746), (114, 12884), (120, 12977), (122, 12989), (123, 12995), (129, 13073), (136, 13148), (137, 13163), (138, 13184), (139, 13202), (143, 13226), (157, 13355),

Gene: Cressida\_22 Start: 11398, Stop: 12870, Start Num: 13

Candidate Starts for Cressida\_22:

(Start: 13 @11398 has 51 MA's), (25, 11491), (26, 11512), (27, 11518), (32, 11575), (38, 11605), (48, 11701), (53, 11746), (55, 11773), (61, 11839), (63, 11854), (65, 11872), (68, 11896), (83, 11956), (86, 11983), (89, 12004), (90, 12013), (92, 12028), (94, 12061), (101, 12136), (105, 12181), (106, 12211), (107, 12229), (114, 12367), (116, 12388), (122, 12472), (123, 12478), (129, 12556), (132, 12607), (135, 12625), (137, 12646), (138, 12667), (139, 12685), (141, 12694), (142, 12706), (144, 12712), (145, 12718), (148, 12757), (155, 12814),

Gene: Crisis\_26 Start: 11906, Stop: 13375, Start Num: 13

Candidate Starts for Crisis\_26:

(Start: 13 @11906 has 51 MA's), (Start: 20 @11963 has 1 MA's), (23, 11975), (25, 11987), (36, 12083), (38, 12101), (42, 12137), (45, 12161), (47, 12173), (51, 12209), (53, 12239), (55, 12266), (61, 12332), (62, 12338), (63, 12347), (65, 12365), (67, 12389), (68, 12398), (69, 12401), (71, 12410), (80, 12473), (84, 12488), (85, 12506), (86, 12509), (92, 12554), (102, 12653), (104, 12680), (107, 12731), (114, 12869), (120, 12962), (122, 12974), (123, 12980), (129, 13058), (136, 13133), (137, 13148), (138, 13169), (139, 13187), (143, 13211), (157, 13340),

Gene: DunneganBoMo\_74 Start: 42015, Stop: 43529, Start Num: 14

Candidate Starts for DunneganBoMo\_74:

(8, 41922), (14, 42015), (17, 42048), (19, 42075), (33, 42183), (37, 42201), (40, 42240), (44, 42270), (46, 42282), (49, 42312), (57, 42411), (78, 42558), (79, 42564), (87, 42606), (102, 42726), (109, 42846), (153, 43383), (158, 43449),

Gene: EarickHC\_25 Start: 11832, Stop: 13301, Start Num: 13

Candidate Starts for EarickHC\_25:

(Start: 13 @11832 has 51 MA's), (Start: 20 @11889 has 1 MA's), (23, 11901), (25, 11913), (36, 12009), (38, 12027), (42, 12063), (45, 12087), (47, 12099), (51, 12135), (53, 12165), (55, 12192), (61, 12258), (62, 12264), (63, 12273), (65, 12291), (67, 12315), (68, 12324), (69, 12327), (71, 12336), (80, 12399), (84, 12414), (85, 12432), (86, 12435), (92, 12480), (102, 12579), (104, 12606), (107, 12657), (114, 12795), (120, 12888), (122, 12900), (123, 12906), (129, 12984), (136, 13059), (137, 13074), (138, 13095), (139, 13113), (143, 13137), (157, 13266),

Gene: Ellewin\_72 Start: 41610, Stop: 43124, Start Num: 14

Candidate Starts for Ellewin\_72:

(8, 41517), (14, 41610), (17, 41643), (19, 41670), (33, 41778), (37, 41796), (40, 41835), (44, 41865), (46, 41877), (49, 41907), (57, 42006), (78, 42153), (79, 42159), (87, 42201), (102, 42321), (109, 42441), (153, 42978), (158, 43044),

Gene: Fireman\_25 Start: 11529, Stop: 13022, Start Num: 13

Candidate Starts for Fireman\_25:

(Start: 13 @11529 has 51 MA's), (Start: 20 @11586 has 1 MA's), (23, 11598), (25, 11610), (36, 11706), (38, 11724), (42, 11760), (45, 11784), (47, 11796), (51, 11832), (55, 11889), (58, 11925), (61, 11955), (62, 11961), (63, 11970), (65, 11988), (67, 12012), (68, 12021), (69, 12024), (84, 12111), (85, 12129), (86, 12132), (100, 12270), (107, 12375), (110, 12438), (116, 12534), (120, 12606), (122, 12618), (123, 12624), (124, 12645), (128, 12690), (133, 12756), (137, 12792), (157, 12984),

Gene: FuzzBuster\_27 Start: 11648, Stop: 13237, Start Num: 20

Candidate Starts for FuzzBuster\_27:

(Start: 20 @11648 has 1 MA's), (49, 11912), (50, 11915), (52, 11993), (54, 12041), (56, 12056), (59, 12089), (61, 12110), (64, 12137), (69, 12179), (71, 12188), (77, 12239), (81, 12254), (86, 12287), (87, 12290), (88, 12293), (110, 12635), (111, 12656), (116, 12731), (127, 12872), (128, 12887), (130, 12932), (136, 12974), (139, 13031), (143, 13055), (146, 13073), (156, 13181),

Gene: Ganandorf\_24 Start: 11968, Stop: 13437, Start Num: 13

Candidate Starts for Ganandorf\_24:

(Start: 13 @11968 has 51 MA's), (Start: 20 @12025 has 1 MA's), (23, 12037), (25, 12049), (36, 12145), (38, 12163), (42, 12199), (45, 12223), (47, 12235), (51, 12271), (53, 12301), (55, 12328), (61, 12394), (62, 12400), (63, 12409), (65, 12427), (67, 12451), (68, 12460), (69, 12463), (71, 12472), (80, 12535), (84, 12550), (85, 12568), (86, 12571), (91, 12610), (92, 12616), (102, 12715), (104, 12742), (107, 12793), (114, 12931), (120, 13024), (122, 13036), (123, 13042), (129, 13120), (136, 13195), (137, 13210), (138, 13231), (139, 13249), (143, 13273), (157, 13402),

Gene: Gina\_26 Start: 11315, Stop: 12709, Start Num: 13

Candidate Starts for Gina\_26:

(Start: 13 @11315 has 51 MA's), (Start: 20 @11372 has 1 MA's), (36, 11393), (38, 11411), (42, 11447), (47, 11483), (51, 11519), (55, 11576), (58, 11612), (61, 11642), (62, 11648), (63, 11657), (67, 11699), (68, 11708), (69, 11711), (70, 11717), (85, 11822), (86, 11825), (92, 11870), (100, 11960), (103, 11990), (110, 12128), (116, 12224), (122, 12308), (123, 12314), (124, 12335), (128, 12380), (133, 12446), (157, 12674),

Gene: Glorp\_26 Start: 11970, Stop: 13439, Start Num: 13

Candidate Starts for Glorp\_26:

(Start: 13 @11970 has 51 MA's), (Start: 20 @12027 has 1 MA's), (23, 12039), (25, 12051), (36, 12147), (38, 12165), (42, 12201), (45, 12225), (47, 12237), (51, 12273), (53, 12303), (55, 12330), (61, 12396), (62, 12402), (63, 12411), (65, 12429), (67, 12453), (68, 12462), (69, 12465), (71, 12474), (84, 12552), (85, 12570), (86, 12573), (92, 12618), (102, 12717), (104, 12744), (107, 12795), (114, 12933), (120, 13026), (122, 13038), (123, 13044), (129, 13122), (136, 13197), (137, 13212), (138, 13233), (139, 13251), (143, 13275), (157, 13404),

Gene: GoldenEssence\_69 Start: 40260, Stop: 41819, Start Num: 15

Candidate Starts for GoldenEssence\_69:

(Start: 15 @40260 has 4 MA's), (19, 40320), (21, 40335), (44, 40545), (57, 40686), (73, 40800), (78, 40851), (87, 40899), (108, 41133), (117, 41268), (140, 41550), (153, 41676), (158, 41742),

Gene: Hermeonysus\_24 Start: 11838, Stop: 13307, Start Num: 13

Candidate Starts for Hermeonysus\_24:

(Start: 13 @11838 has 51 MA's), (Start: 20 @11895 has 1 MA's), (23, 11907), (25, 11919), (36, 12015), (38, 12033), (42, 12069), (45, 12093), (47, 12105), (51, 12141), (53, 12171), (55, 12198), (61, 12264), (62, 12270), (63, 12279), (65, 12297), (67, 12321), (68, 12330), (69, 12333), (71, 12342), (80, 12405), (84, 12420), (85, 12438), (86, 12441), (92, 12486), (102, 12585), (104, 12612), (107, 12663), (114, 12801), (120, 12894), (122, 12906), (123, 12912), (129, 12990), (136, 13065), (137, 13080), (138, 13101), (139, 13119), (143, 13143), (157, 13272),

Gene: Honeyfin\_26 Start: 12153, Stop: 13622, Start Num: 13

Candidate Starts for Honeyfin\_26:

(Start: 13 @12153 has 51 MA's), (Start: 20 @12210 has 1 MA's), (23, 12222), (25, 12234), (36, 12330), (38, 12348), (42, 12384), (45, 12408), (47, 12420), (51, 12456), (53, 12486), (55, 12513), (61, 12579), (62, 12585), (63, 12594), (65, 12612), (67, 12636), (68, 12645), (69, 12648), (71, 12657), (80, 12720), (84, 12735), (85, 12753), (86, 12756), (92, 12801), (102, 12900), (104, 12927), (107, 12978), (114, 13116), (120, 13209), (122, 13221), (123, 13227), (129, 13305), (136, 13380), (137, 13395), (138, 13416), (139, 13434), (143, 13458), (157, 13587),

Gene: Jayden\_26 Start: 11599, Stop: 13095, Start Num: 13

Candidate Starts for Jayden\_26:

(Start: 13 @11599 has 51 MA's), (25, 11680), (36, 11776), (38, 11794), (42, 11830), (47, 11866), (51, 11902), (55, 11959), (61, 12025), (62, 12031), (63, 12040), (67, 12082), (68, 12091), (69, 12094), (85, 12202), (86, 12205), (92, 12250), (99, 12328), (100, 12346), (107, 12451), (110, 12514), (116, 12610), (122, 12694), (123, 12700), (124, 12721), (128, 12766), (133, 12832), (141, 12916), (142, 12928), (144, 12934), (147, 12955), (148, 12979), (157, 13060),

Gene: Jefe\_25 Start: 11891, Stop: 13360, Start Num: 13

Candidate Starts for Jefe\_25:

(Start: 13 @11891 has 51 MA's), (Start: 20 @11948 has 1 MA's), (23, 11960), (25, 11972), (36, 12068), (38, 12086), (42, 12122), (45, 12146), (47, 12158), (51, 12194), (53, 12224), (55, 12251), (61, 12317), (62, 12323), (63, 12332), (65, 12350), (67, 12374), (68, 12383), (69, 12386), (71, 12395), (80, 12458), (84, 12473), (85, 12491), (86, 12494), (92, 12539), (102, 12638), (104, 12665), (107, 12716), (114, 12854), (120, 12947), (122, 12959), (123, 12965), (129, 13043), (136, 13118), (137, 13133), (138, 13154), (139, 13172), (143, 13196), (157, 13325),

Gene: Jollipop\_25 Start: 12239, Stop: 13708, Start Num: 13

Candidate Starts for Jollipop\_25:

(Start: 13 @12239 has 51 MA's), (Start: 20 @12296 has 1 MA's), (23, 12308), (25, 12320), (36, 12416), (38, 12434), (42, 12470), (45, 12494), (47, 12506), (51, 12542), (53, 12572), (55, 12599), (61, 12665), (62, 12671), (63, 12680), (65, 12698), (67, 12722), (68, 12731), (69, 12734), (71, 12743), (84, 12821), (85, 12839), (86, 12842), (92, 12887), (102, 12986), (104, 13013), (107, 13064), (114, 13202), (120, 13295), (122, 13307), (123, 13313), (129, 13391), (136, 13466), (137, 13481), (138, 13502), (139, 13520), (143, 13544), (157, 13673),

Gene: KSunshine22\_75 Start: 43249, Stop: 44763, Start Num: 14

Candidate Starts for KSunshine22\_75:



(8, 43156), (14, 43249), (17, 43282), (19, 43309), (33, 43417), (37, 43435), (40, 43474), (44, 43504), (46, 43516), (49, 43546), (57, 43645), (78, 43792), (79, 43798), (87, 43840), (102, 43960), (109, 44080), (153, 44617), (158, 44683),

Gene: KaiHaiDragon\_25 Start: 11832, Stop: 13301, Start Num: 13

Candidate Starts for KaiHaiDragon\_25:

(Start: 13 @11832 has 51 MA's), (Start: 20 @11889 has 1 MA's), (23, 11901), (25, 11913), (36, 12009), (38, 12027), (42, 12063), (45, 12087), (47, 12099), (51, 12135), (53, 12165), (55, 12192), (61, 12258), (62, 12264), (63, 12273), (65, 12291), (67, 12315), (68, 12324), (69, 12327), (71, 12336), (80, 12399), (84, 12414), (85, 12432), (86, 12435), (92, 12480), (102, 12579), (104, 12606), (107, 12657), (114, 12795), (120, 12888), (122, 12900), (123, 12906), (129, 12984), (136, 13059), (137, 13074), (138, 13095), (139, 13113), (143, 13137), (157, 13266),

Gene: Kowalski\_24 Start: 11948, Stop: 13417, Start Num: 13

Candidate Starts for Kowalski\_24:

(Start: 13 @11948 has 51 MA's), (Start: 20 @12005 has 1 MA's), (23, 12017), (25, 12029), (36, 12125), (38, 12143), (42, 12179), (45, 12203), (47, 12215), (51, 12251), (53, 12281), (55, 12308), (61, 12374), (62, 12380), (63, 12389), (65, 12407), (67, 12431), (68, 12440), (69, 12443), (71, 12452), (80, 12515), (84, 12530), (85, 12548), (86, 12551), (92, 12596), (102, 12695), (104, 12722), (107, 12773), (114, 12911), (120, 13004), (122, 13016), (123, 13022), (129, 13100), (136, 13175), (137, 13190), (138, 13211), (139, 13229), (143, 13253), (157, 13382),

Gene: Kozie\_21 Start: 11363, Stop: 12874, Start Num: 13

Candidate Starts for Kozie\_21:

(Start: 13 @11363 has 51 MA's), (18, 11420), (24, 11459), (30, 11525), (32, 11561), (36, 11573), (41, 11621), (43, 11645), (45, 11654), (55, 11759), (58, 11795), (61, 11825), (62, 11831), (63, 11840), (65, 11858), (68, 11891), (85, 12002), (86, 12005), (89, 12026), (91, 12044), (92, 12050), (97, 12119), (107, 12233), (113, 12368), (115, 12377), (116, 12392), (122, 12476), (128, 12548), (138, 12671), (139, 12689), (144, 12716), (157, 12842),

Gene: LeoJr\_80 Start: 45284, Stop: 46792, Start Num: 15

Candidate Starts for LeoJr\_80:

(10, 45242), (11, 45245), (Start: 15 @45284 has 4 MA's), (16, 45293), (19, 45344), (44, 45539), (46, 45551), (48, 45578), (57, 45680), (78, 45821), (88, 45872), (109, 46109), (119, 46259), (121, 46289), (127, 46355), (153, 46646), (158, 46712), (159, 46715),

Gene: LittleFortune\_26 Start: 12195, Stop: 13664, Start Num: 13

Candidate Starts for LittleFortune\_26:

(Start: 13 @12195 has 51 MA's), (Start: 20 @12252 has 1 MA's), (23, 12264), (25, 12276), (36, 12372), (38, 12390), (42, 12426), (45, 12450), (47, 12462), (51, 12498), (53, 12528), (55, 12555), (61, 12621), (62, 12627), (63, 12636), (65, 12654), (67, 12678), (68, 12687), (69, 12690), (71, 12699), (80, 12762), (84, 12777), (85, 12795), (86, 12798), (92, 12843), (102, 12942), (104, 12969), (107, 13020), (114, 13158), (120, 13251), (122, 13263), (123, 13269), (129, 13347), (136, 13422), (137, 13437), (138, 13458), (139, 13476), (143, 13500), (157, 13629),

Gene: Margaery\_19 Start: 11140, Stop: 12612, Start Num: 13

Candidate Starts for Margaery\_19:

(Start: 13 @11140 has 51 MA's), (25, 11233), (27, 11260), (32, 11314), (38, 11344), (48, 11440), (55, 11512), (58, 11548), (61, 11578), (65, 11611), (68, 11635), (83, 11695), (86, 11722), (89, 11743), (90, 11752), (92, 11767), (94, 11800), (101, 11878), (105, 11923), (106, 11953), (107, 11971), (114, 12109), (116, 12130), (122, 12214), (123, 12220), (129, 12298), (132, 12349), (137, 12388), (139, 12427), (145, 12460), (148, 12499),

Gene: Matzah\_21 Start: 11345, Stop: 12823, Start Num: 13

Candidate Starts for Matzah\_21:

(Start: 13 @11345 has 51 MA's), (25, 11438), (27, 11465), (29, 11483), (32, 11519), (38, 11549), (48, 11645), (53, 11690), (55, 11717), (61, 11783), (63, 11798), (65, 11816), (68, 11840), (83, 11900), (86, 11927), (89, 11948), (90, 11957), (92, 11972), (94, 12005), (95, 12023), (101, 12077), (105, 12122), (106, 12152), (107, 12170), (114, 12308), (116, 12329), (122, 12413), (123, 12419), (129, 12497), (132, 12548), (135, 12566), (136, 12572), (137, 12587), (138, 12608), (139, 12626), (141, 12635), (142, 12647), (144, 12653), (145, 12659), (148, 12698), (154, 12752), (155, 12755), (156, 12773), (157, 12779),

Gene: Megan\_19 Start: 12956, Stop: 14425, Start Num: 13

Candidate Starts for Megan\_19:

(6, 12860), (9, 12875), (12, 12947), (Start: 13 @12956 has 51 MA's), (Start: 20 @13013 has 1 MA's), (32, 13112), (41, 13172), (43, 13196), (45, 13205), (47, 13217), (48, 13238), (55, 13310), (57, 13343), (60, 13370), (61, 13376), (63, 13391), (66, 13424), (68, 13436), (74, 13457), (85, 13532), (86, 13535), (89, 13556), (92, 13580), (94, 13613), (112, 13895), (115, 13922), (116, 13937), (118, 13964), (122, 14021), (125, 14051), (126, 14066), (128, 14093), (136, 14180), (144, 14261), (145, 14267), (147, 14282), (157, 14387),

Gene: MementoMori\_21 Start: 11058, Stop: 12539, Start Num: 13

Candidate Starts for MementoMori\_21:

(Start: 13 @11058 has 51 MA's), (25, 11151), (27, 11178), (29, 11196), (32, 11232), (38, 11262), (48, 11358), (53, 11403), (55, 11430), (58, 11466), (61, 11496), (63, 11511), (65, 11529), (68, 11553), (83, 11613), (86, 11640), (89, 11661), (90, 11670), (92, 11685), (94, 11718), (95, 11736), (101, 11793), (105, 11838), (106, 11868), (107, 11886), (114, 12024), (116, 12045), (122, 12129), (123, 12135), (129, 12213), (132, 12264), (135, 12282), (137, 12303), (138, 12324), (139, 12342), (141, 12351), (142, 12363), (144, 12369), (145, 12375), (148, 12414), (154, 12468), (155, 12471), (156, 12489), (157, 12495),

Gene: Merry\_ Start: 12177, Stop: 13676, Start Num: 13

Candidate Starts for Merry\_:

(Start: 13 @12177 has 51 MA's), (23, 12246), (25, 12258), (36, 12354), (38, 12372), (48, 12465), (51, 12480), (55, 12537), (58, 12573), (61, 12603), (62, 12609), (63, 12618), (67, 12660), (68, 12669), (69, 12672), (72, 12684), (82, 12753), (86, 12783), (92, 12828), (98, 12906), (102, 12954), (107, 13032), (116, 13191), (120, 13263), (122, 13275), (123, 13281), (124, 13302), (125, 13305), (128, 13347), (135, 13428), (148, 13560), (157, 13641),

Gene: Metamorphoo\_25 Start: 11518, Stop: 13008, Start Num: 13

Candidate Starts for Metamorphoo\_25:

(Start: 13 @11518 has 51 MA's), (Start: 20 @11575 has 1 MA's), (23, 11587), (25, 11599), (36, 11695), (38, 11713), (42, 11749), (45, 11773), (47, 11785), (51, 11821), (55, 11878), (58, 11914), (61, 11944), (62, 11950), (63, 11959), (65, 11977), (67, 12001), (68, 12010), (69, 12013), (84, 12100), (85, 12118), (86, 12121), (100, 12256), (107, 12361), (110, 12424), (116, 12520), (122, 12604), (123, 12610), (124, 12631), (128, 12676), (133, 12742), (137, 12778), (157, 12970),

Gene: Mimi\_80 Start: 45814, Stop: 47373, Start Num: 15

Candidate Starts for Mimi\_80:

(Start: 15 @45814 has 4 MA's), (19, 45874), (21, 45889), (44, 46099), (57, 46240), (73, 46354), (78, 46405), (87, 46453), (108, 46687), (117, 46822), (122, 46885), (140, 47104), (153, 47230), (158, 47296),

Gene: Nicole72\_20 Start: 13339, Stop: 14817, Start Num: 13

Candidate Starts for Nicole72\_20:

(4, 13222), (Start: 13 @13339 has 51 MA's), (Start: 20 @13396 has 1 MA's), (32, 13495), (41, 13555), (43, 13579), (47, 13600), (48, 13621), (55, 13693), (60, 13753), (61, 13759), (63, 13774), (66, 13807), (68, 13819), (74, 13840), (76, 13864), (85, 13921), (86, 13924), (89, 13945), (92, 13969), (94, 14002), (96, 14032), (106, 14152), (107, 14170), (112, 14287), (115, 14314), (116, 14329), (118, 14356), (120, 14401), (122, 14413), (126, 14458), (130, 14530), (147, 14674), (148, 14698), (157, 14779),

Gene: NoodlelyBoi\_24 Start: 11989, Stop: 13458, Start Num: 13

Candidate Starts for NoodlelyBoi\_24:

(Start: 13 @11989 has 51 MA's), (Start: 20 @12046 has 1 MA's), (23, 12058), (25, 12070), (36, 12166), (38, 12184), (42, 12220), (45, 12244), (47, 12256), (51, 12292), (53, 12322), (55, 12349), (61, 12415), (62, 12421), (63, 12430), (65, 12448), (67, 12472), (68, 12481), (69, 12484), (80, 12553), (84, 12568), (85, 12586), (86, 12589), (92, 12634), (102, 12733), (104, 12760), (107, 12811), (115, 12955), (122, 13054), (123, 13060), (125, 13084), (129, 13138), (136, 13213), (139, 13267), (141, 13276), (143, 13291), (157, 13420),

Gene: Onika\_24 Start: 11922, Stop: 13391, Start Num: 13

Candidate Starts for Onika\_24:

(Start: 13 @11922 has 51 MA's), (Start: 20 @11979 has 1 MA's), (23, 11991), (25, 12003), (36, 12099), (38, 12117), (42, 12153), (45, 12177), (47, 12189), (51, 12225), (53, 12255), (55, 12282), (61, 12348), (62, 12354), (63, 12363), (65, 12381), (67, 12405), (68, 12414), (69, 12417), (71, 12426), (80, 12489), (84, 12504), (85, 12522), (86, 12525), (92, 12570), (102, 12669), (104, 12696), (107, 12747), (114, 12885), (120, 12978), (122, 12990), (123, 12996), (129, 13074), (132, 13125), (136, 13149), (137, 13164), (138, 13185), (139, 13203), (143, 13227), (157, 13356),

Gene: Panchaali\_78 Start: 42946, Stop: 44454, Start Num: 14

Candidate Starts for Panchaali\_78:

(14, 42946), (19, 43006), (28, 43063), (33, 43114), (34, 43117), (44, 43201), (46, 43213), (49, 43243), (57, 43342), (60, 43369), (75, 43459), (78, 43483), (79, 43489), (87, 43531), (102, 43651), (109, 43771), (122, 43960), (153, 44308), (158, 44374),

Gene: Paschalis\_24 Start: 11937, Stop: 13406, Start Num: 13

Candidate Starts for Paschalis\_24:

(Start: 13 @11937 has 51 MA's), (Start: 20 @11994 has 1 MA's), (23, 12006), (25, 12018), (36, 12114), (38, 12132), (42, 12168), (45, 12192), (47, 12204), (51, 12240), (53, 12270), (55, 12297), (61, 12363), (62, 12369), (63, 12378), (65, 12396), (67, 12420), (68, 12429), (69, 12432), (71, 12441), (84, 12519), (85, 12537), (86, 12540), (92, 12585), (102, 12684), (104, 12711), (107, 12762), (114, 12900), (120, 12993), (122, 13005), (123, 13011), (129, 13089), (136, 13164), (137, 13179), (138, 13200), (139, 13218), (143, 13242), (157, 13371),

Gene: Patbob\_81 Start: 46680, Stop: 48245, Start Num: 15

Candidate Starts for Patbob\_81:

(Start: 15 @46680 has 4 MA's), (19, 46740), (21, 46755), (22, 46758), (44, 46965), (57, 47106), (73, 47220), (78, 47271), (87, 47319), (108, 47559), (117, 47694), (122, 47757), (140, 47976), (153, 48102), (158, 48168),

Gene: PhedwardCullen\_23 Start: 11681, Stop: 13150, Start Num: 13

Candidate Starts for PhedwardCullen\_23:

(Start: 13 @11681 has 51 MA's), (Start: 20 @11738 has 1 MA's), (23, 11750), (25, 11762), (36, 11858), (38, 11876), (42, 11912), (45, 11936), (47, 11948), (51, 11984), (53, 12014), (55, 12041), (61, 12107), (62, 12113), (63, 12122), (65, 12140), (67, 12164), (68, 12173), (69, 12176), (71, 12185), (80, 12248), (84, 12263), (85, 12281), (86, 12284), (102, 12428), (104, 12455), (107, 12506), (114, 12644), (120, 12737), (122, 12749), (123, 12755), (129, 12833), (136, 12908), (137, 12923), (138, 12944), (139, 12962), (143, 12986), (157, 13115),

Gene: Phorgeous\_24 Start: 11789, Stop: 13258, Start Num: 13

Candidate Starts for Phorgeous\_24:

(Start: 13 @11789 has 51 MA's), (Start: 20 @11846 has 1 MA's), (23, 11858), (25, 11870), (36, 11966), (38, 11984), (42, 12020), (45, 12044), (47, 12056), (51, 12092), (53, 12122), (55, 12149), (61, 12215), (62, 12221), (63, 12230), (65, 12248), (67, 12272), (68, 12281), (69, 12284), (71, 12293), (80, 12356), (84, 12371), (85, 12389), (86, 12392), (102, 12536), (104, 12563), (107, 12614), (114, 12752), (120, 12845), (122, 12857), (123, 12863), (129, 12941), (136, 13016), (137, 13031), (138, 13052), (139, 13070), (143, 13094), (157, 13223),

Gene: Phrampa\_74 Start: 43330, Stop: 44889, Start Num: 15

Candidate Starts for Phrampa\_74:

(Start: 15 @43330 has 4 MA's), (19, 43390), (21, 43405), (44, 43615), (57, 43756), (73, 43870), (78, 43921), (87, 43969), (102, 44089), (108, 44203), (117, 44338), (147, 44668), (153, 44746), (158, 44812),

Gene: Phrancesco\_25 Start: 12068, Stop: 13537, Start Num: 13

Candidate Starts for Phrancesco\_25:

(Start: 13 @12068 has 51 MA's), (Start: 20 @12125 has 1 MA's), (23, 12137), (25, 12149), (36, 12245), (38, 12263), (42, 12299), (45, 12323), (47, 12335), (51, 12371), (53, 12401), (55, 12428), (61, 12494), (62, 12500), (63, 12509), (65, 12527), (67, 12551), (68, 12560), (69, 12563), (71, 12572), (84, 12650), (85, 12668), (86, 12671), (92, 12716), (102, 12815), (104, 12842), (107, 12893), (114, 13031), (120, 13124), (122, 13136), (123, 13142), (129, 13220), (136, 13295), (137, 13310), (138, 13331), (139, 13349), (143, 13373), (157, 13502),

Gene: PierreOrion\_25 Start: 12092, Stop: 13561, Start Num: 13

Candidate Starts for PierreOrion\_25:

(Start: 13 @12092 has 51 MA's), (Start: 20 @12149 has 1 MA's), (23, 12161), (25, 12173), (36, 12269), (38, 12287), (42, 12323), (45, 12347), (47, 12359), (51, 12395), (53, 12425), (55, 12452), (61, 12518), (62, 12524), (63, 12533), (65, 12551), (67, 12575), (68, 12584), (69, 12587), (71, 12596), (84, 12674), (85, 12692), (86, 12695), (92, 12740), (102, 12839), (104, 12866), (107, 12917), (114, 13055), (120, 13148), (122, 13160), (123, 13166), (129, 13244), (136, 13319), (137, 13334), (138, 13355), (139, 13373), (143, 13397), (157, 13526),

Gene: PiperSansNom\_25 Start: 12244, Stop: 13713, Start Num: 13

Candidate Starts for PiperSansNom\_25:

(Start: 13 @12244 has 51 MA's), (Start: 20 @12301 has 1 MA's), (23, 12313), (25, 12325), (36, 12421), (38, 12439), (42, 12475), (45, 12499), (47, 12511), (51, 12547), (53, 12577), (55, 12604), (61, 12670), (62, 12676), (63, 12685), (65, 12703), (67, 12727), (68, 12736), (69, 12739), (71, 12748), (84, 12826), (85, 12844), (86, 12847), (92, 12892), (102, 12991), (104, 13018), (107, 13069), (114, 13207), (120, 13300), (122, 13312), (123, 13318), (129, 13396), (136, 13471), (137, 13486), (138, 13507), (139, 13525), (143, 13549), (157, 13678),

Gene: Piperis\_25 Start: 11914, Stop: 13383, Start Num: 13

Candidate Starts for Piperis\_25:

(Start: 13 @11914 has 51 MA's), (Start: 20 @11971 has 1 MA's), (23, 11983), (25, 11995), (36, 12091), (38, 12109), (42, 12145), (45, 12169), (47, 12181), (51, 12217), (53, 12247), (55, 12274), (61, 12340), (62, 12346), (63, 12355), (65, 12373), (67, 12397), (68, 12406), (69, 12409), (71, 12418), (84, 12496), (85, 12514), (86, 12517), (92, 12562), (102, 12661), (104, 12688), (107, 12739), (114, 12877), (120, 12970), (122, 12982), (123, 12988), (129, 13066), (136, 13141), (137, 13156), (138, 13177), (139, 13195), (143, 13219), (157, 13348),

Gene: Pulchra\_26 Start: 12313, Stop: 13782, Start Num: 13

Candidate Starts for Pulchra\_26:

(Start: 13 @12313 has 51 MA's), (Start: 20 @12370 has 1 MA's), (23, 12382), (25, 12394), (36, 12490), (38, 12508), (42, 12544), (45, 12568), (47, 12580), (51, 12616), (53, 12646), (55, 12673), (61, 12739), (62, 12745), (63, 12754), (65, 12772), (67, 12796), (68, 12805), (69, 12808), (71, 12817), (80, 12880), (84, 12895), (85, 12913), (86, 12916), (92, 12961), (102, 13060), (104, 13087), (107, 13138), (114, 13276), (120, 13369), (122, 13381), (123, 13387), (129, 13465), (136, 13540), (137, 13555), (138, 13576), (139, 13594), (143, 13618), (157, 13747),

Gene: Quhwah\_27 Start: 12304, Stop: 13773, Start Num: 13

Candidate Starts for Quhwah\_27:

(Start: 13 @12304 has 51 MA's), (Start: 20 @12361 has 1 MA's), (23, 12373), (25, 12385), (36, 12481), (38, 12499), (42, 12535), (45, 12559), (47, 12571), (51, 12607), (53, 12637), (55, 12664), (61, 12730), (62, 12736), (63, 12745), (65, 12763), (67, 12787), (68, 12796), (69, 12799), (71, 12808), (80, 12871), (84, 12886), (85, 12904), (86, 12907), (92, 12952), (102, 13051), (104, 13078), (107, 13129), (114, 13267), (120, 13360), (122, 13372), (123, 13378), (129, 13456), (136, 13531), (137, 13546), (138, 13567), (139, 13585), (143, 13609), (157, 13738),

Gene: Racecar\_81 Start: 46467, Stop: 48026, Start Num: 15

Candidate Starts for Racecar\_81:

(Start: 15 @46467 has 4 MA's), (19, 46527), (21, 46542), (44, 46752), (57, 46893), (73, 47007), (78, 47058), (87, 47106), (108, 47340), (117, 47475), (122, 47538), (140, 47757), (153, 47883), (158, 47949),

Gene: Ramiel05\_24 Start: 11948, Stop: 13417, Start Num: 13

Candidate Starts for Ramiel05\_24:

(Start: 13 @11948 has 51 MA's), (Start: 20 @12005 has 1 MA's), (23, 12017), (25, 12029), (36, 12125), (38, 12143), (42, 12179), (45, 12203), (47, 12215), (51, 12251), (53, 12281), (55, 12308), (61, 12374), (62, 12380), (63, 12389), (65, 12407), (67, 12431), (68, 12440), (69, 12443), (71, 12452), (80, 12515), (84, 12530), (85, 12548), (86, 12551), (92, 12596), (102, 12695), (104, 12722), (107, 12773), (114, 12911), (120, 13004), (122, 13016), (123, 13022), (129, 13100), (136, 13175), (137, 13190), (138, 13211), (139, 13229), (143, 13253), (157, 13382),

Gene: ReginaGlobina\_80 Start: 46036, Stop: 47544, Start Num: 15

Candidate Starts for ReginaGlobina\_80:

(10, 45994), (11, 45997), (Start: 15 @46036 has 4 MA's), (16, 46045), (19, 46096), (44, 46291), (46, 46303), (48, 46330), (57, 46432), (78, 46573), (88, 46624), (109, 46861), (119, 47011), (121, 47041), (134, 47194), (153, 47398), (158, 47464), (159, 47467),

Gene: RobsFeet\_26 Start: 11796, Stop: 13289, Start Num: 13

Candidate Starts for RobsFeet\_26:

(Start: 13 @11796 has 51 MA's), (Start: 20 @11853 has 1 MA's), (23, 11865), (25, 11877), (36, 11973), (38, 11991), (42, 12027), (45, 12051), (47, 12063), (51, 12099), (55, 12156), (58, 12192), (61, 12222), (62, 12228), (63, 12237), (65, 12255), (67, 12279), (68, 12288), (69, 12291), (84, 12378), (85, 12396), (86, 12399), (100, 12537), (107, 12642), (110, 12705), (116, 12801), (122, 12885), (123, 12891), (124, 12912), (128, 12957), (133, 13023), (137, 13059), (157, 13251),

Gene: Rockabye\_82 Start: 48709, Stop: 50256, Start Num: 15

Candidate Starts for Rockabye\_82:

(1, 48484), (2, 48523), (3, 48553), (5, 48589), (7, 48604), (10, 48667), (11, 48670), (Start: 15 @48709 has 4 MA's), (16, 48718), (19, 48769), (21, 48784), (31, 48874), (44, 48994), (50, 49039), (57, 49135), (70, 49222), (78, 49285), (87, 49333), (102, 49453), (109, 49573), (121, 49756), (151, 50089), (153, 50110), (158, 50176),

Gene: SJReid\_85 Start: 47777, Stop: 49324, Start Num: 15

Candidate Starts for SJReid\_85:

(7, 47672), (10, 47735), (11, 47738), (Start: 15 @47777 has 4 MA's), (16, 47786), (19, 47837), (21, 47852), (31, 47942), (35, 47981), (44, 48062), (50, 48107), (57, 48203), (70, 48290), (78, 48353), (87, 48401), (109, 48641), (149, 49130), (153, 49178), (158, 49244),

Gene: Savannah\_24 Start: 11972, Stop: 13441, Start Num: 13

Candidate Starts for Savannah\_24:

(Start: 13 @11972 has 51 MA's), (Start: 20 @12029 has 1 MA's), (23, 12041), (25, 12053), (36, 12149), (38, 12167), (42, 12203), (45, 12227), (47, 12239), (51, 12275), (53, 12305), (55, 12332), (61, 12398), (62, 12404), (63, 12413), (65, 12431), (67, 12455), (68, 12464), (69, 12467), (71, 12476), (80, 12539), (84, 12554), (85, 12572), (86, 12575), (92, 12620), (102, 12719), (104, 12746), (107, 12797), (114, 12935), (120, 13028), (122, 13040), (123, 13046), (129, 13124), (136, 13199), (137, 13214), (138, 13235), (139, 13253), (143, 13277), (157, 13406),

Gene: Scumberland\_26 Start: 12163, Stop: 13632, Start Num: 13

Candidate Starts for Scumberland\_26:

(Start: 13 @12163 has 51 MA's), (Start: 20 @12220 has 1 MA's), (23, 12232), (25, 12244), (36, 12340), (38, 12358), (42, 12394), (45, 12418), (47, 12430), (51, 12466), (53, 12496), (55, 12523), (61, 12589), (62, 12595), (63, 12604), (65, 12622), (67, 12646), (68, 12655), (69, 12658), (71, 12667), (80, 12730), (84, 12745), (85, 12763), (86, 12766), (92, 12811), (102, 12910), (104, 12937), (107, 12988), (114, 13126), (120, 13219), (122, 13231), (123, 13237), (129, 13315), (136, 13390), (137, 13405), (138, 13426), (139, 13444), (143, 13468), (157, 13597),

Gene: Selwyn23\_26 Start: 12141, Stop: 13610, Start Num: 13

Candidate Starts for Selwyn23\_26:

(Start: 13 @12141 has 51 MA's), (Start: 20 @12198 has 1 MA's), (23, 12210), (25, 12222), (36, 12318), (38, 12336), (42, 12372), (45, 12396), (47, 12408), (51, 12444), (53, 12474), (55, 12501), (61, 12567), (62, 12573), (63, 12582), (65, 12600), (67, 12624), (68, 12633), (69, 12636), (71, 12645), (80, 12708), (84, 12723), (85, 12741), (86, 12744), (92, 12789), (102, 12888), (104, 12915), (107, 12966), (114, 13104), (120, 13197), (122, 13209), (123, 13215), (129, 13293), (136, 13368), (137, 13383), (138, 13404), (139, 13422), (143, 13446), (157, 13575),

Gene: Shotgun\_24 Start: 11770, Stop: 13239, Start Num: 13

Candidate Starts for Shotgun\_24:

(Start: 13 @11770 has 51 MA's), (Start: 20 @11827 has 1 MA's), (23, 11839), (25, 11851), (36, 11947), (38, 11965), (42, 12001), (45, 12025), (47, 12037), (51, 12073), (53, 12103), (55, 12130), (61, 12196), (62, 12202), (63, 12211), (65, 12229), (67, 12253), (68, 12262), (69, 12265), (71, 12274), (80, 12337), (84, 12352), (85, 12370), (86, 12373), (92, 12418), (102, 12517), (104, 12544), (107, 12595), (114, 12733), (120, 12826), (122, 12838), (123, 12844), (129, 12922), (136, 12997), (137, 13012), (138, 13033), (139, 13051), (157, 13204),

Gene: Shrubaron\_25 Start: 11431, Stop: 12921, Start Num: 13

Candidate Starts for Shrubaron\_25:

(Start: 13 @11431 has 51 MA's), (Start: 20 @11488 has 1 MA's), (23, 11500), (25, 11512), (36, 11608), (38, 11626), (42, 11662), (45, 11686), (47, 11698), (51, 11734), (55, 11791), (58, 11827), (61, 11857), (62, 11863), (63, 11872), (65, 11890), (67, 11914), (68, 11923), (69, 11926), (84, 12013), (85, 12031), (86, 12034), (100, 12169), (107, 12274), (110, 12337), (116, 12433), (122, 12517), (123, 12523), (124, 12544), (128, 12589), (133, 12655), (137, 12691), (157, 12883),

Gene: SirFrank\_24 Start: 11839, Stop: 13308, Start Num: 13

Candidate Starts for SirFrank\_24:

(Start: 13 @11839 has 51 MA's), (Start: 20 @11896 has 1 MA's), (23, 11908), (25, 11920), (36, 12016), (38, 12034), (42, 12070), (45, 12094), (47, 12106), (51, 12142), (53, 12172), (55, 12199), (61, 12265), (62, 12271), (63, 12280), (65, 12298), (67, 12322), (68, 12331), (69, 12334), (80, 12403), (84, 12418), (85, 12436), (86, 12439), (92, 12484), (102, 12583), (104, 12610), (107, 12661), (115, 12805), (122, 12904), (123, 12910), (125, 12934), (129, 12988), (136, 13063), (139, 13117), (141, 13126), (143, 13141), (157, 13270),

Gene: Smarties\_33 Start: 13624, Stop: 15117, Start Num: 13

Candidate Starts for Smarties\_33:

(Start: 13 @13624 has 51 MA's), (23, 13693), (25, 13705), (36, 13801), (38, 13819), (39, 13840), (47, 13891), (51, 13927), (55, 13984), (58, 14020), (60, 14044), (61, 14050), (62, 14056), (63, 14065), (67, 14107), (68, 14116), (69, 14119), (85, 14224), (86, 14227), (100, 14368), (110, 14536), (116, 14632), (122, 14716), (123, 14722), (124, 14743), (128, 14788), (131, 14845), (133, 14854), (137, 14890), (144, 14956), (157, 15082),

Gene: Sunny\_ Start: 12177, Stop: 13676, Start Num: 13

Candidate Starts for Sunny\_:

(Start: 13 @12177 has 51 MA's), (23, 12246), (25, 12258), (36, 12354), (38, 12372), (48, 12465), (51, 12480), (55, 12537), (58, 12573), (61, 12603), (62, 12609), (63, 12618), (67, 12660), (68, 12669), (69, 12672), (72, 12684), (82, 12753), (86, 12783), (92, 12828), (98, 12906), (102, 12954), (107, 13032), (116, 13191), (120, 13263), (122, 13275), (123, 13281), (124, 13302), (125, 13305), (128, 13347), (135, 13428), (148, 13560), (157, 13641),

Gene: Talia1610\_80 Start: 45832, Stop: 47391, Start Num: 15

Candidate Starts for Talia1610\_80:

(Start: 15 @45832 has 4 MA's), (19, 45892), (21, 45907), (44, 46117), (57, 46258), (73, 46372), (78, 46423), (87, 46471), (108, 46705), (117, 46840), (122, 46903), (140, 47122), (153, 47248), (158, 47314),

Gene: Teamocil\_26 Start: 11315, Stop: 12808, Start Num: 13

Candidate Starts for Teamocil\_26:

(Start: 13 @11315 has 51 MA's), (Start: 20 @11372 has 1 MA's), (23, 11384), (25, 11396), (36, 11492), (38, 11510), (42, 11546), (47, 11582), (51, 11618), (55, 11675), (58, 11711), (61, 11741), (62, 11747), (63, 11756), (67, 11798), (68, 11807), (69, 11810), (70, 11816), (85, 11921), (86, 11924), (92, 11969), (100, 12059), (103, 12089), (110, 12227), (116, 12323), (122, 12407), (123, 12413), (124, 12434), (128, 12479), (133, 12545), (157, 12773),

Gene: Terij\_20 Start: 11194, Stop: 12684, Start Num: 13

Candidate Starts for Terij\_20:

(Start: 13 @11194 has 51 MA's), (27, 11311), (32, 11368), (38, 11398), (48, 11494), (55, 11566), (61, 11632), (63, 11647), (65, 11665), (68, 11689), (83, 11749), (86, 11776), (89, 11797), (90, 11806), (91, 11815), (92, 11821), (94, 11854), (95, 11872), (105, 11983), (107, 12031), (114, 12169), (116, 12190), (123, 12280), (129, 12358), (132, 12409), (137, 12448), (142, 12508), (144, 12514), (145, 12520), (150, 12568), (152, 12604), (155, 12616), (156, 12634), (157, 12640),

Gene: Tyrumbra\_23 Start: 10872, Stop: 12365, Start Num: 13

Candidate Starts for Tyrumbra\_23:

(Start: 13 @10872 has 51 MA's), (Start: 20 @10929 has 1 MA's), (23, 10941), (25, 10953), (36, 11049), (38, 11067), (42, 11103), (45, 11127), (47, 11139), (51, 11175), (55, 11232), (58, 11268), (61, 11298), (62, 11304), (63, 11313), (65, 11331), (67, 11355), (68, 11364), (69, 11367), (84, 11454), (85, 11472), (86, 11475), (100, 11613), (107, 11718), (110, 11781), (116, 11877), (122, 11961), (123, 11967), (124, 11988), (128, 12033), (133, 12099), (137, 12135), (157, 12327),

Gene: WaddleDee\_74 Start: 41867, Stop: 43381, Start Num: 14

Candidate Starts for WaddleDee\_74:

(8, 41774), (14, 41867), (17, 41900), (19, 41927), (33, 42035), (37, 42053), (40, 42092), (44, 42122), (46, 42134), (49, 42164), (57, 42263), (78, 42410), (79, 42416), (87, 42458), (102, 42578), (109, 42698), (153, 43235), (158, 43301),

Gene: Yeti\_25 Start: 11944, Stop: 13413, Start Num: 13

Candidate Starts for Yeti\_25:

(Start: 13 @11944 has 51 MA's), (Start: 20 @12001 has 1 MA's), (23, 12013), (25, 12025), (36, 12121), (38, 12139), (42, 12175), (45, 12199), (47, 12211), (51, 12247), (55, 12304), (61, 12370), (62, 12376), (63, 12385), (65, 12403), (67, 12427), (68, 12436), (69, 12439), (71, 12448), (84, 12526), (85, 12544), (86, 12547), (92, 12592), (102, 12691), (104, 12718), (107, 12769), (114, 12907), (120, 13000), (122, 13012), (123, 13018), (129, 13096), (136, 13171), (137, 13186), (138, 13207), (139, 13225), (143, 13249), (157, 13378),