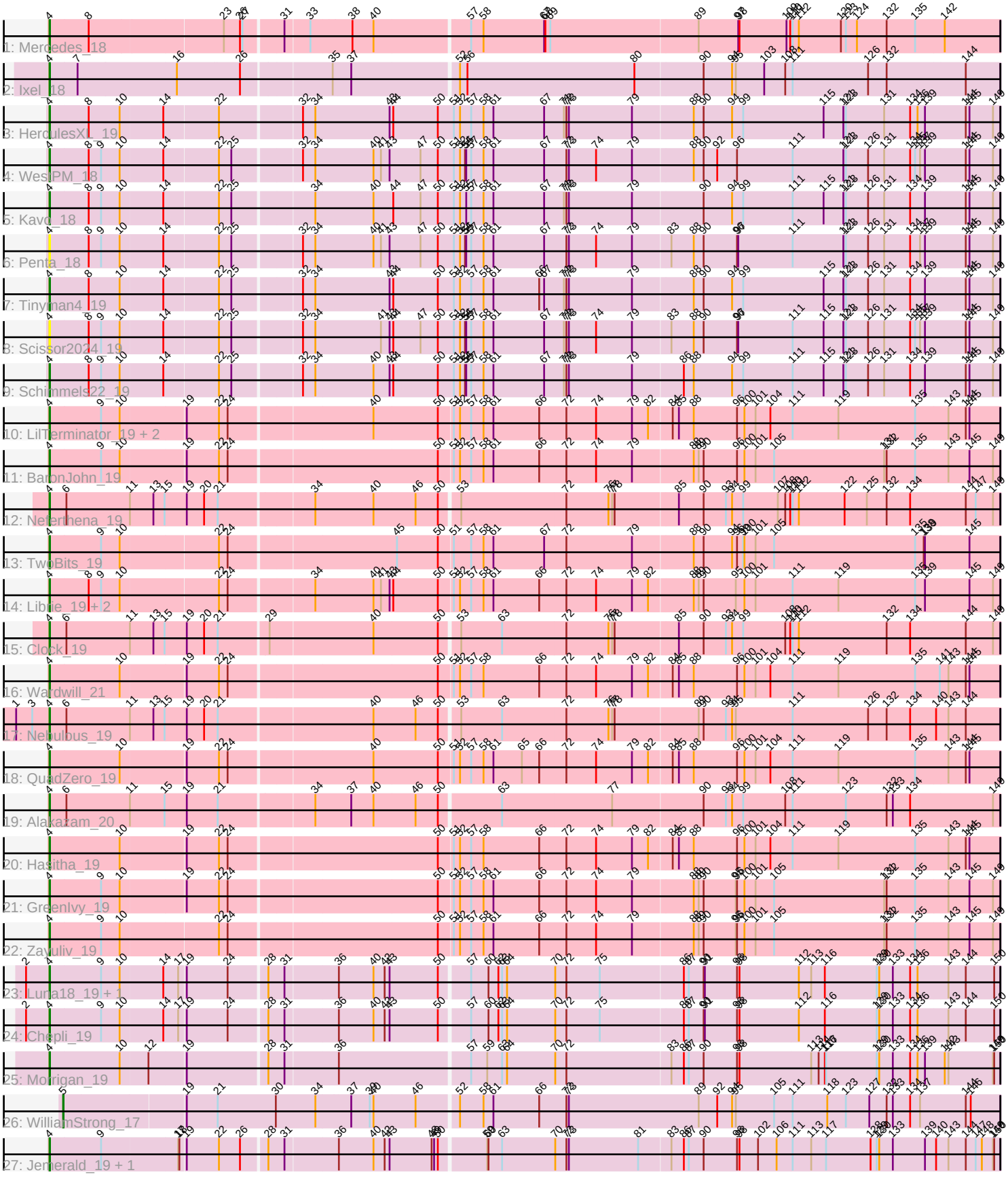
Pham 345980


1: Mercedes_18
2: Ixel_18
3: HerculesXI_19
4: WestPM_18
5: Kavo_18
6: Penta_18
7: Tinyman4_19
8: Scissor2024_19
9: Schimmels22_19
10: LilTerminator_19 + 2
11: BaronJohn_19
12: Neterthena_19
13: TwoBits_19
14: Libbie_19 + 2
15: Clock_19
16: Wardwill_21
17: Nebulbus_19
18: QuadZero_19
19: Alakazam_20
20: Hasitha_19
21: GreenIvy_19
22: Zavuliv_19
23: Luna18_19 + 1
24: Chepli_19
25: Morrigan_19
26: WilliamStrong_17
27: Jemerald_19 + 1

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 345980 Report

This analysis was run 11/14/26 on database version 672.

Pham number 345980 has 33 members, 3 are drafts.

Phages represented in each track:
- Track 1 : Mercedes_18
- Track 2 : Ixel_18
- Track 3 : HerculesXL_19
- Track 4 : WestPM_18
- Track 5 : Kavo_18
- Track 6 : Penta_18
- Track 7 : Tinyman4_19
- Track 8 : Scissor2024_19
- Track 9 : Schimmels22_19
- Track 10 : LilTerminator_19, Zepp_20, Vafari_20
- Track 11 : BaronJohn_19
- Track 12 : Neferthena_19
- Track 13 : TwoBits_19
- Track 14 : Librie_19, Fulton_19, CaptainRex_19
- Track 15 : Clock_19
- Track 16 : Wardwill_21
- Track 17 : Nebulous_19
- Track 18 : QuadZero_19
- Track 19 : Alakazam_20
- Track 20 : Hasitha_19
- Track 21 : GreenIvy_19
- Track 22 : Zayuliv_19
- Track 23 : Luna18_19, KatChan_19
- Track 24 : Chepli_19
- Track 25 : Morrigan_19
- Track 26 : WilliamStrong_17
- Track 27 : Jemerald_19, Juicer_19

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

The start number called the most often in the published annotations is 4, it was called in 29 of the 30 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

• Alakazam_20, BaronJohn_19, CaptainRex_19, Chepli_19, Clock_19, Fulton_19, GreenIvy_19, Hasitha_19, HerculesXL_19, Ixel_18, Jemerald_19, Juicer_19, KatChan_19, Kavo_18, Librie_19, LilTerminator_19, Luna18_19, Mercedes_18, Morrigan_19, Nebulous_19, Neferthena_19, Penta_18, QuadZero_19, Schimmels22_19, Scissor2024_19, Tinyman4_19, TwoBits_19, Vafari_20, Wardwill_21, WestPM_18, Zayuliv_19, Zepp_20,

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

Genes that do not have the "Most Annotated" start:
• WilliamStrong_17,

Summary by start number:

Start 4:
• Found in 32 of 33 (97.0%) of genes in pham
• Manual Annotations of this start: 29 of 30
• Called 100.0% of time when present
• Phage (with cluster) where this start called: Alakazam_20 (EA5), BaronJohn_19 (EA5), CaptainRex_19 (EA5), Chepli_19 (EA6), Clock_19 (EA5), Fulton_19 (EA5), GreenIvy_19 (EA5), Hasitha_19 (EA5), HerculesXL_19 (EA11), Ixel_18 (EA11), Jemerald_19 (EA6), Juicer_19 (EA6), KatChan_19 (EA6), Kavo_18 (EA11), Librie_19 (EA5), LilTerminator_19 (EA5), Luna18_19 (EA6), Mercedes_18 (EA), Morrigan_19 (EA6), Nebulous_19 (EA5), Neferthena_19 (EA5), Penta_18 (EA11), QuadZero_19 (EA5), Schimmels22_19 (EA11), Scissor2024_19 (EA11), Tinyman4_19 (EA11), TwoBits_19 (EA5), Vafari_20 (EA5), Wardwill_21 (EA5), WestPM_18 (EA11), Zayuliv_19 (EA5), Zepp_20 (EA5),

Start 5:
• Found in 1 of 33 (3.0%) of genes in pham
• Manual Annotations of this start: 1 of 30
• Called 100.0% of time when present
• Phage (with cluster) where this start called: WilliamStrong_17 (EA6),

Summary by clusters:

There are 4 clusters represented in this pham: EA11, EA5, EA, EA6,

Info for manual annotations of cluster EA:
•Start number 4 was manually annotated 1 time for cluster EA.

Info for manual annotations of cluster EA11:
•Start number 4 was manually annotated 6 times for cluster EA11.

Info for manual annotations of cluster EA5:
•Start number 4 was manually annotated 16 times for cluster EA5.

Info for manual annotations of cluster EA6:
•Start number 4 was manually annotated 6 times for cluster EA6.
•Start number 5 was manually annotated 1 time for cluster EA6.

Gene Information:

Gene: Alakazam_20 Start: 13087, Stop: 15327, Start Num: 4
Candidate Starts for Alakazam_20:
(Start: 4 @13087 has 29 MA's), (6, 13126), (11, 13279), (15, 13363), (19, 13414), (21, 13489), (34, 13705), (37, 13792), (40, 13846), (46, 13945), (50, 13999), (63, 14137), (77, 14401), (90, 14614), (93, 14668), (94, 14683), (99, 14710), (108, 14812), (111, 14827), (123, 14956), (132, 15055), (133, 15070), (134, 15112), (149, 15310),

Gene: BaronJohn_19 Start: 12304, Stop: 14547, Start Num: 4
Candidate Starts for BaronJohn_19:
(Start: 4 @12304 has 29 MA's), (9, 12427), (10, 12472), (19, 12622), (22, 12700), (24, 12721), (50, 13204), (51, 13237), (52, 13252), (57, 13279), (58, 13309), (61, 13333), (66, 13444), (72, 13510), (74, 13582), (79, 13669), (88, 13810), (89, 13822), (90, 13834), (96, 13915), (100, 13933), (101, 13960), (105, 14005), (131, 14272), (132, 14278), (135, 14347), (143, 14422), (145, 14473), (149, 14530),

Gene: CaptainRex_19 Start: 12307, Stop: 14550, Start Num: 4
Candidate Starts for CaptainRex_19:
(Start: 4 @12307 has 29 MA's), (8, 12400), (9, 12430), (10, 12475), (22, 12703), (24, 12724), (34, 12916), (40, 13054), (41, 13072), (43, 13093), (44, 13099), (50, 13207), (51, 13240), (52, 13255), (57, 13282), (58, 13312), (61, 13336), (66, 13447), (72, 13513), (74, 13585), (79, 13672), (82, 13711), (88, 13813), (89, 13825), (90, 13837), (95, 13915), (100, 13936), (101, 13963), (111, 14053), (119, 14164), (135, 14350), (139, 14374), (145, 14476), (149, 14533),

Gene: Chepli_19 Start: 12294, Stop: 14522, Start Num: 4
Candidate Starts for Chepli_19:
(2, 12237), (Start: 4 @12294 has 29 MA's), (9, 12417), (10, 12462), (14, 12564), (17, 12597), (19, 12612), (24, 12711), (28, 12798), (31, 12834), (36, 12957), (40, 13041), (42, 13068), (43, 13080), (50, 13197), (57, 13260), (60, 13302), (62, 13326), (63, 13335), (64, 13347), (70, 13464), (72, 13488), (75, 13569), (86, 13764), (87, 13776), (90, 13812), (91, 13815), (96, 13893), (98, 13899), (112, 14040), (116, 14103), (129, 14229), (130, 14235), (133, 14268), (134, 14310), (136, 14328), (143, 14397), (144, 14439), (150, 14508),

Gene: Clock_19 Start: 13039, Stop: 15276, Start Num: 4
Candidate Starts for Clock_19:
(Start: 4 @13039 has 29 MA's), (6, 13078), (11, 13231), (13, 13288), (15, 13315), (19, 13366), (20, 13408), (21, 13441), (29, 13555), (40, 13798), (50, 13951), (53, 13990), (63, 14089), (72, 14242), (76, 14344), (77, 14353), (78, 14359), (85, 14506), (90, 14566), (93, 14620), (94, 14635), (99, 14662), (108, 14764), (110, 14776), (111, 14779), (112, 14794), (132, 15007), (134, 15064), (144, 15193), (149, 15259),

Gene: Fulton_19 Start: 12289, Stop: 14532, Start Num: 4
Candidate Starts for Fulton_19:
(Start: 4 @12289 has 29 MA's), (8, 12382), (9, 12412), (10, 12457), (22, 12685), (24, 12706), (34, 12898), (40, 13036), (41, 13054), (43, 13075), (44, 13081), (50, 13189), (51, 13222), (52, 13237), (57, 13264), (58, 13294), (61, 13318), (66, 13429), (72, 13495), (74, 13567), (79, 13654), (82, 13693), (88, 13795), (89, 13807), (90, 13819), (95, 13897), (100, 13918), (101, 13945), (111, 14035), (119, 14146), (135, 14332), (139, 14356), (145, 14458), (149, 14515),

Gene: GreenIvy_19 Start: 12306, Stop: 14549, Start Num: 4
Candidate Starts for GreenIvy_19:
(Start: 4 @12306 has 29 MA's), (9, 12429), (10, 12474), (19, 12624), (22, 12702), (24, 12723), (50, 13206), (51, 13239), (52, 13254), (57, 13281), (58, 13311), (61, 13335), (66, 13446), (72, 13512), (74,

13584), (79, 13671), (88, 13812), (89, 13824), (90, 13836), (95, 13914), (96, 13917), (100, 13935), (101, 13962), (105, 14007), (131, 14274), (132, 14280), (135, 14349), (143, 14424), (145, 14475), (149, 14532),

Gene: Hasitha_19 Start: 12307, Stop: 14550, Start Num: 4
Candidate Starts for Hasitha_19:
(Start: 4 @12307 has 29 MA's), (10, 12475), (19, 12625), (22, 12703), (24, 12724), (50, 13207), (51, 13240), (52, 13255), (57, 13282), (58, 13312), (66, 13447), (72, 13513), (74, 13585), (79, 13672), (82, 13711), (84, 13762), (85, 13777), (88, 13813), (96, 13918), (100, 13936), (101, 13963), (104, 13999), (111, 14053), (119, 14164), (135, 14350), (143, 14425), (144, 14467), (145, 14476),

Gene: HerculesXL_19 Start: 12396, Stop: 14645, Start Num: 4
Candidate Starts for HerculesXL_19:
(Start: 4 @12396 has 29 MA's), (8, 12489), (10, 12564), (14, 12666), (22, 12792), (32, 12975), (34, 13005), (43, 13182), (44, 13188), (50, 13296), (51, 13335), (52, 13350), (57, 13377), (58, 13407), (61, 13431), (67, 13554), (71, 13602), (72, 13608), (73, 13614), (79, 13767), (88, 13908), (90, 13932), (94, 14001), (99, 14028), (115, 14223), (121, 14271), (123, 14277), (131, 14370), (134, 14433), (136, 14451), (139, 14469), (144, 14562), (145, 14571), (149, 14628),

Gene: Ixel_18 Start: 11985, Stop: 14213, Start Num: 4
Candidate Starts for Ixel_18:
(Start: 4 @11985 has 29 MA's), (7, 12051), (16, 12285), (26, 12432), (35, 12636), (37, 12678), (52, 12921), (56, 12939), (80, 13344), (90, 13503), (94, 13572), (95, 13581), (103, 13650), (108, 13701), (111, 13716), (126, 13899), (132, 13944), (144, 14130),

Gene: Jemerald_19 Start: 13251, Stop: 15479, Start Num: 4
Candidate Starts for Jemerald_19:
(Start: 4 @13251 has 29 MA's), (9, 13374), (17, 13554), (18, 13557), (19, 13569), (22, 13647), (26, 13698), (28, 13755), (31, 13791), (36, 13914), (40, 13998), (42, 14025), (43, 14037), (48, 14139), (49, 14145), (50, 14154), (59, 14256), (60, 14259), (63, 14292), (70, 14421), (72, 14445), (73, 14451), (81, 14619), (83, 14691), (86, 14721), (87, 14733), (90, 14769), (96, 14850), (98, 14856), (102, 14901), (106, 14946), (111, 14982), (113, 15027), (117, 15063), (128, 15171), (129, 15186), (130, 15192), (133, 15225), (139, 15303), (140, 15327), (143, 15354), (144, 15396), (147, 15420), (148, 15435), (149, 15462), (150, 15465),

Gene: Juicer_19 Start: 13251, Stop: 15479, Start Num: 4
Candidate Starts for Juicer_19:
(Start: 4 @13251 has 29 MA's), (9, 13374), (17, 13554), (18, 13557), (19, 13569), (22, 13647), (26, 13698), (28, 13755), (31, 13791), (36, 13914), (40, 13998), (42, 14025), (43, 14037), (48, 14139), (49, 14145), (50, 14154), (59, 14256), (60, 14259), (63, 14292), (70, 14421), (72, 14445), (73, 14451), (81, 14619), (83, 14691), (86, 14721), (87, 14733), (90, 14769), (96, 14850), (98, 14856), (102, 14901), (106, 14946), (111, 14982), (113, 15027), (117, 15063), (128, 15171), (129, 15186), (130, 15192), (133, 15225), (139, 15303), (140, 15327), (143, 15354), (144, 15396), (147, 15420), (148, 15435), (149, 15462), (150, 15465),

Gene: KatChan_19 Start: 12300, Stop: 14528, Start Num: 4
Candidate Starts for KatChan_19:
(2, 12243), (Start: 4 @12300 has 29 MA's), (9, 12423), (10, 12468), (14, 12570), (17, 12603), (19, 12618), (24, 12717), (28, 12804), (31, 12840), (36, 12963), (40, 13047), (42, 13074), (43, 13086), (50, 13203), (57, 13266), (60, 13308), (62, 13332), (63, 13341), (64, 13353), (70, 13470), (72, 13494), (75, 13575), (86, 13770), (87, 13782), (90, 13818), (91, 13821), (96, 13899), (98, 13905), (112, 14046), (113, 14076), (116, 14109), (129, 14235), (130, 14241), (133, 14274), (134, 14316), (136, 14334), (143, 14403), (144, 14445), (150, 14514),

Gene: Kavo_18 Start: 12235, Stop: 14484, Start Num: 4
Candidate Starts for Kavo_18:
(Start: 4 @12235 has 29 MA's), (8, 12328), (9, 12358), (10, 12403), (14, 12505), (22, 12631), (25, 12661), (34, 12844), (40, 12982), (44, 13027), (47, 13093), (50, 13135), (51, 13174), (52, 13189), (55, 13204), (57, 13216), (58, 13246), (61, 13270), (67, 13393), (71, 13441), (72, 13447), (73, 13453), (79, 13606), (90, 13771), (94, 13840), (99, 13867), (111, 13987), (115, 14062), (121, 14110), (123, 14116), (126, 14170), (131, 14209), (134, 14272), (139, 14308), (144, 14401), (145, 14410), (149, 14467),

Gene: Librie_19 Start: 12307, Stop: 14550, Start Num: 4
Candidate Starts for Librie_19:
(Start: 4 @12307 has 29 MA's), (8, 12400), (9, 12430), (10, 12475), (22, 12703), (24, 12724), (34, 12916), (40, 13054), (41, 13072), (43, 13093), (44, 13099), (50, 13207), (51, 13240), (52, 13255), (57, 13282), (58, 13312), (61, 13336), (66, 13447), (72, 13513), (74, 13585), (79, 13672), (82, 13711), (88, 13813), (89, 13825), (90, 13837), (95, 13915), (100, 13936), (101, 13963), (111, 14053), (119, 14164), (135, 14350), (139, 14374), (145, 14476), (149, 14533),

Gene: LilTerminator_19 Start: 12313, Stop: 14556, Start Num: 4
Candidate Starts for LilTerminator_19:
(Start: 4 @12313 has 29 MA's), (9, 12436), (10, 12481), (19, 12631), (22, 12709), (24, 12730), (40, 13060), (50, 13213), (51, 13246), (52, 13261), (57, 13288), (58, 13318), (61, 13342), (66, 13453), (72, 13519), (74, 13591), (79, 13678), (82, 13717), (84, 13768), (85, 13783), (88, 13819), (96, 13924), (100, 13942), (101, 13969), (104, 14005), (111, 14059), (119, 14170), (135, 14356), (143, 14431), (144, 14473), (145, 14482),

Gene: Luna18_19 Start: 12300, Stop: 14528, Start Num: 4
Candidate Starts for Luna18_19:
(2, 12243), (Start: 4 @12300 has 29 MA's), (9, 12423), (10, 12468), (14, 12570), (17, 12603), (19, 12618), (24, 12717), (28, 12804), (31, 12840), (36, 12963), (40, 13047), (42, 13074), (43, 13086), (50, 13203), (57, 13266), (60, 13308), (62, 13332), (63, 13341), (64, 13353), (70, 13470), (72, 13494), (75, 13575), (86, 13770), (87, 13782), (90, 13818), (91, 13821), (96, 13899), (98, 13905), (112, 14046), (113, 14076), (116, 14109), (129, 14235), (130, 14241), (133, 14274), (134, 14316), (136, 14334), (143, 14403), (144, 14445), (150, 14514),

Gene: Mercedes_18 Start: 12052, Stop: 14277, Start Num: 4
Candidate Starts for Mercedes_18:
(Start: 4 @12052 has 29 MA's), (8, 12145), (23, 12457), (26, 12496), (27, 12502), (31, 12589), (33, 12646), (38, 12742), (40, 12793), (57, 13009), (58, 13039), (67, 13186), (68, 13189), (69, 13201), (89, 13552), (97, 13648), (98, 13651), (109, 13762), (110, 13771), (111, 13777), (112, 13792), (120, 13894), (123, 13906), (124, 13933), (132, 14005), (135, 14074), (142, 14143),

Gene: Morrigan_19 Start: 13204, Stop: 15432, Start Num: 4
Candidate Starts for Morrigan_19:
(Start: 4 @13204 has 29 MA's), (10, 13372), (12, 13438), (19, 13522), (28, 13708), (31, 13744), (36, 13867), (57, 14170), (59, 14209), (63, 14245), (64, 14257), (70, 14374), (72, 14398), (83, 14644), (86, 14674), (87, 14686), (90, 14722), (96, 14803), (98, 14809), (113, 14980), (114, 14998), (116, 15013), (117, 15016), (129, 15139), (130, 15145), (133, 15178), (134, 15220), (136, 15238), (139, 15256), (142, 15298), (143, 15307), (149, 15415), (150, 15418),

Gene: Nebulous_19 Start: 13045, Stop: 15282, Start Num: 4
Candidate Starts for Nebulous_19:
(1, 12964), (3, 13003), (Start: 4 @13045 has 29 MA's), (6, 13084), (11, 13237), (13, 13294), (15, 13321), (19, 13372), (20, 13414), (21, 13447), (40, 13804), (46, 13903), (50, 13957), (53, 13996), (63,

14095), (72, 14248), (76, 14350), (77, 14359), (78, 14365), (89, 14560), (90, 14572), (93, 14626), (94, 14641), (95, 14650), (111, 14785), (126, 14968), (132, 15013), (134, 15070), (140, 15130), (143, 15157), (144, 15199),

Gene: Neferthena_19 Start: 13059, Stop: 15296, Start Num: 4
Candidate Starts for Neferthena_19:
(Start: 4 @13059 has 29 MA's), (6, 13098), (11, 13251), (13, 13308), (15, 13335), (19, 13386), (20, 13428), (21, 13461), (34, 13677), (40, 13818), (46, 13917), (50, 13971), (53, 14010), (72, 14262), (76, 14364), (77, 14373), (78, 14379), (85, 14526), (90, 14586), (93, 14640), (94, 14655), (99, 14682), (107, 14766), (108, 14784), (110, 14796), (111, 14799), (112, 14814), (122, 14925), (125, 14979), (132, 15027), (134, 15084), (144, 15213), (147, 15237), (149, 15279),

Gene: Penta_18 Start: 12229, Stop: 14478, Start Num: 4
Candidate Starts for Penta_18:
(Start: 4 @12229 has 29 MA's), (8, 12322), (9, 12352), (10, 12397), (14, 12499), (22, 12625), (25, 12655), (32, 12808), (34, 12838), (40, 12976), (41, 12994), (43, 13015), (47, 13087), (50, 13129), (51, 13168), (52, 13183), (54, 13195), (55, 13198), (57, 13210), (58, 13240), (61, 13264), (67, 13387), (72, 13441), (73, 13447), (74, 13513), (79, 13600), (83, 13687), (88, 13741), (90, 13765), (96, 13846), (97, 13849), (111, 13981), (121, 14104), (123, 14110), (126, 14164), (131, 14203), (134, 14266), (137, 14290), (139, 14302), (144, 14395), (145, 14404), (149, 14461),

Gene: QuadZero_19 Start: 12319, Stop: 14562, Start Num: 4
Candidate Starts for QuadZero_19:
(Start: 4 @12319 has 29 MA's), (10, 12487), (19, 12637), (22, 12715), (24, 12736), (40, 13066), (50, 13219), (51, 13252), (52, 13267), (57, 13294), (58, 13324), (61, 13348), (65, 13417), (66, 13459), (72, 13525), (74, 13597), (79, 13684), (82, 13723), (84, 13774), (85, 13789), (88, 13825), (96, 13930), (100, 13948), (101, 13975), (104, 14011), (111, 14065), (119, 14176), (135, 14362), (143, 14437), (144, 14479), (145, 14488),

Gene: Schimmels22_19 Start: 12759, Stop: 15008, Start Num: 4
Candidate Starts for Schimmels22_19:
(Start: 4 @12759 has 29 MA's), (8, 12852), (9, 12882), (10, 12927), (14, 13029), (22, 13155), (25, 13185), (32, 13338), (34, 13368), (40, 13506), (43, 13545), (44, 13551), (50, 13659), (51, 13698), (52, 13713), (54, 13725), (55, 13728), (57, 13740), (58, 13770), (61, 13794), (67, 13917), (71, 13965), (72, 13971), (73, 13977), (79, 14130), (86, 14247), (88, 14271), (94, 14364), (99, 14391), (111, 14511), (115, 14586), (121, 14634), (123, 14640), (126, 14694), (131, 14733), (134, 14796), (139, 14832), (144, 14925), (145, 14934), (149, 14991),

Gene: Scissor2024_19 Start: 12393, Stop: 14642, Start Num: 4
Candidate Starts for Scissor2024_19:
(Start: 4 @12393 has 29 MA's), (8, 12486), (9, 12516), (10, 12561), (14, 12663), (22, 12789), (25, 12819), (32, 12972), (34, 13002), (41, 13158), (43, 13179), (44, 13185), (47, 13251), (50, 13293), (51, 13332), (52, 13347), (54, 13359), (55, 13362), (57, 13374), (58, 13404), (61, 13428), (67, 13551), (71, 13599), (72, 13605), (73, 13611), (74, 13677), (79, 13764), (83, 13851), (88, 13905), (90, 13929), (96, 14010), (97, 14013), (111, 14145), (115, 14220), (121, 14268), (123, 14274), (126, 14328), (131, 14367), (134, 14430), (135, 14442), (137, 14454), (139, 14466), (144, 14559), (145, 14568), (149, 14625),

Gene: Tinyman4_19 Start: 12396, Stop: 14645, Start Num: 4
Candidate Starts for Tinyman4_19:
(Start: 4 @12396 has 29 MA's), (8, 12489), (10, 12564), (14, 12666), (22, 12792), (25, 12822), (32, 12975), (34, 13005), (43, 13182), (44, 13188), (50, 13296), (51, 13335), (52, 13350), (57, 13377), (58, 13407), (61, 13431), (66, 13542), (67, 13554), (71, 13602), (72, 13608), (73, 13614), (79, 13767), (88,

13908), (90, 13932), (94, 14001), (99, 14028), (115, 14223), (121, 14271), (123, 14277), (126, 14331), (131, 14370), (134, 14433), (139, 14469), (144, 14562), (145, 14571), (149, 14628),

Gene: TwoBits_19 Start: 12110, Stop: 14353, Start Num: 4
Candidate Starts for TwoBits_19:
(Start: 4 @12110 has 29 MA's), (9, 12233), (10, 12278), (22, 12506), (24, 12527), (45, 12911), (50, 13010), (51, 13043), (57, 13085), (58, 13115), (61, 13139), (67, 13262), (72, 13316), (79, 13475), (88, 13616), (90, 13640), (94, 13709), (96, 13721), (99, 13736), (100, 13739), (101, 13766), (105, 13811), (135, 14153), (138, 14174), (139, 14177), (145, 14279),

Gene: Vafari_20 Start: 12304, Stop: 14547, Start Num: 4
Candidate Starts for Vafari_20:
(Start: 4 @12304 has 29 MA's), (9, 12427), (10, 12472), (19, 12622), (22, 12700), (24, 12721), (40, 13051), (50, 13204), (51, 13237), (52, 13252), (57, 13279), (58, 13309), (61, 13333), (66, 13444), (72, 13510), (74, 13582), (79, 13669), (82, 13708), (84, 13759), (85, 13774), (88, 13810), (96, 13915), (100, 13933), (101, 13960), (104, 13996), (111, 14050), (119, 14161), (135, 14347), (143, 14422), (144, 14464), (145, 14473),

Gene: Wardwill_21 Start: 12475, Stop: 14718, Start Num: 4
Candidate Starts for Wardwill_21:
(Start: 4 @12475 has 29 MA's), (10, 12643), (19, 12793), (22, 12871), (24, 12892), (50, 13375), (51, 13408), (52, 13423), (57, 13450), (58, 13480), (66, 13615), (72, 13681), (74, 13753), (79, 13840), (82, 13879), (84, 13930), (85, 13945), (88, 13981), (96, 14086), (100, 14104), (101, 14131), (104, 14167), (111, 14221), (119, 14332), (135, 14518), (141, 14575), (143, 14593), (144, 14635), (145, 14644),

Gene: WestPM_18 Start: 12238, Stop: 14487, Start Num: 4
Candidate Starts for WestPM_18:
(Start: 4 @12238 has 29 MA's), (8, 12331), (9, 12361), (10, 12406), (14, 12508), (22, 12634), (25, 12664), (32, 12817), (34, 12847), (40, 12985), (41, 13003), (43, 13024), (47, 13096), (50, 13138), (51, 13177), (52, 13192), (54, 13204), (55, 13207), (57, 13219), (58, 13249), (61, 13273), (67, 13396), (72, 13450), (73, 13456), (74, 13522), (79, 13609), (88, 13750), (90, 13774), (92, 13807), (96, 13855), (111, 13990), (121, 14113), (123, 14119), (126, 14173), (131, 14212), (134, 14275), (135, 14287), (137, 14299), (139, 14311), (144, 14404), (145, 14413), (149, 14470),

Gene: WilliamStrong_17 Start: 12923, Stop: 15148, Start Num: 5
Candidate Starts for WilliamStrong_17:
(Start: 5 @12923 has 1 MA's), (19, 13205), (21, 13280), (30, 13421), (34, 13517), (37, 13598), (39, 13643), (40, 13652), (46, 13751), (52, 13841), (58, 13898), (61, 13922), (66, 14033), (72, 14099), (73, 14105), (89, 14420), (92, 14465), (94, 14501), (95, 14510), (105, 14603), (111, 14648), (118, 14732), (123, 14777), (127, 14834), (132, 14876), (133, 14891), (134, 14933), (137, 14957), (144, 15065), (146, 15077),

Gene: Zayuliv_19 Start: 12295, Stop: 14538, Start Num: 4
Candidate Starts for Zayuliv_19:
(Start: 4 @12295 has 29 MA's), (9, 12418), (10, 12463), (22, 12691), (24, 12712), (50, 13195), (51, 13228), (52, 13243), (57, 13270), (58, 13300), (61, 13324), (66, 13435), (72, 13501), (74, 13573), (79, 13660), (88, 13801), (89, 13813), (90, 13825), (95, 13903), (96, 13906), (100, 13924), (101, 13951), (105, 13996), (131, 14263), (132, 14269), (135, 14338), (143, 14413), (145, 14464), (149, 14521),

Gene: Zepp_20 Start: 12303, Stop: 14546, Start Num: 4
Candidate Starts for Zepp_20:
(Start: 4 @12303 has 29 MA's), (9, 12426), (10, 12471), (19, 12621), (22, 12699), (24, 12720), (40, 13050), (50, 13203), (51, 13236), (52, 13251), (57, 13278), (58, 13308), (61, 13332), (66, 13443), (72,

13509), (74, 13581), (79, 13668), (82, 13707), (84, 13758), (85, 13773), (88, 13809), (96, 13914), (100, 13932), (101, 13959), (104, 13995), (111, 14049), (119, 14160), (135, 14346), (143, 14421), (144, 14463), (145, 14472),