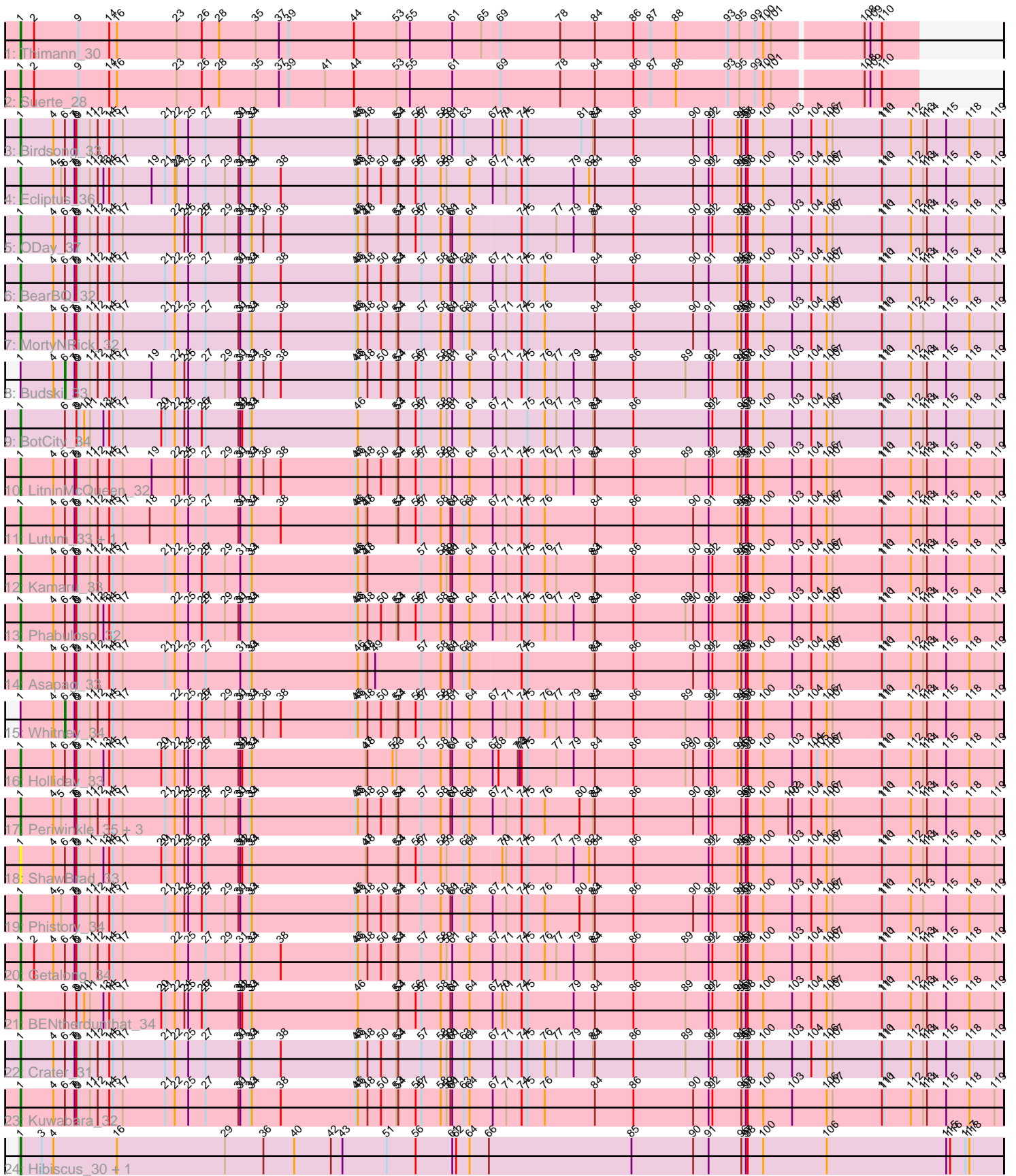


Pham 309049



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 309049 Report

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

Pham number 309049 has 29 members, 1 are drafts.

Phages represented in each track:

- Track 1 : Thimann\_30
- Track 2 : Suerte\_28
- Track 3 : Birdsong\_33
- Track 4 : Ecliptus\_36
- Track 5 : ODay\_37
- Track 6 : BearBQ\_32
- Track 7 : MortyNRick\_32
- Track 8 : Budski\_33
- Track 9 : BotCity\_34
- Track 10 : LitninMcQueen\_32
- Track 11 : Lutum\_33, Kenna\_32
- Track 12 : Kamaru\_33
- Track 13 : Phabuloso\_32
- Track 14 : Asapag\_33
- Track 15 : Whitney\_34
- Track 16 : Holliday\_33
- Track 17 : Periwinkle\_35, Leroy\_33, Apricot\_32, Horus\_33
- Track 18 : ShawBrad\_33
- Track 19 : Phistory\_34
- Track 20 : Getalong\_34
- Track 21 : BENtherdunthat\_34
- Track 22 : Crater\_31
- Track 23 : Kuwabara\_32
- Track 24 : Hibiscus\_30, Heinz\_30

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

The start number called the most often in the published annotations is 1, it was called in 26 of the 28 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Apricot\_32, Asapag\_33, BENtherdunthat\_34, BearBQ\_32, Birdsong\_33, BotCity\_34, Crater\_31, Ecliptus\_36, Getalong\_34, Heinz\_30, Hibiscus\_30, Holliday\_33, Horus\_33, Kamaru\_33, Kenna\_32, Kuwabara\_32, Leroy\_33, LitninMcQueen\_32,

Lutum\_33, MortyNRick\_32, ODay\_37, Periwinkle\_35, Phabuloso\_32, Phistory\_34, ShawBrad\_33, Suerte\_28, Thimann\_30,

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

- Budski\_33, Whitney\_34,

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

- 

### Summary by start number:

Start 1:

- Found in 29 of 29 ( 100.0% ) of genes in pham
- Manual Annotations of this start: 26 of 28
- Called 93.1% of time when present
- Phage (with cluster) where this start called: Apricot\_32 (DN3), Asapag\_33 (DN1), BENTherdunthat\_34 (DN1), BearBQ\_32 (DN), Birdsong\_33 (DN), BotCity\_34 (DN), Crater\_31 (DN3), Ecliptus\_36 (DN), Getalong\_34 (DN1), Heinz\_30 (DY), Hibiscus\_30 (DY), Holliday\_33 (DN1), Horus\_33 (DN1), Kamaru\_33 (DN1), Kenna\_32 (DN1), Kuwabara\_32 (DN4), Leroy\_33 (DN1), LitninMcQueen\_32 (DN1), Lutum\_33 (DN1), MortyNRick\_32 (DN), ODay\_37 (DN), Periwinkle\_35 (DN1), Phabuloso\_32 (DN1), Phistory\_34 (DN1), ShawBrad\_33 (DN1), Suerte\_28 (CZ4), Thimann\_30 (CZ4),

Start 6:

- Found in 20 of 29 ( 69.0% ) of genes in pham
- Manual Annotations of this start: 2 of 28
- Called 10.0% of time when present
- Phage (with cluster) where this start called: Budski\_33 (DN), Whitney\_34 (DN1),

### Summary by clusters:

There are 6 clusters represented in this pham: DN, CZ4, DN4, DN1, DN3, DY,

Info for manual annotations of cluster CZ4:

- Start number 1 was manually annotated 2 times for cluster CZ4.

Info for manual annotations of cluster DN:

- Start number 1 was manually annotated 6 times for cluster DN.
- Start number 6 was manually annotated 1 time for cluster DN.

Info for manual annotations of cluster DN1:

- Start number 1 was manually annotated 13 times for cluster DN1.
- Start number 6 was manually annotated 1 time for cluster DN1.

Info for manual annotations of cluster DN3:

- Start number 1 was manually annotated 2 times for cluster DN3.

Info for manual annotations of cluster DN4:

- Start number 1 was manually annotated 1 time for cluster DN4.

Info for manual annotations of cluster DY:

- Start number 1 was manually annotated 2 times for cluster DY.

**Gene Information:**

Gene: Apricot\_32 Start: 24360, Stop: 25883, Start Num: 1

Candidate Starts for Apricot\_32:

(Start: 1 @24360 has 26 MA's), (4, 24411), (5, 24423), (7, 24444), (8, 24447), (9, 24450), (11, 24468), (12, 24480), (14, 24498), (15, 24504), (17, 24519), (21, 24585), (22, 24600), (24, 24615), (25, 24621), (26, 24642), (27, 24648), (29, 24678), (30, 24699), (31, 24702), (33, 24717), (34, 24720), (45, 24882), (46, 24885), (48, 24900), (50, 24921), (53, 24945), (54, 24948), (57, 24984), (58, 25014), (60, 25029), (61, 25032), (63, 25050), (64, 25059), (67, 25092), (71, 25113), (74, 25137), (75, 25146), (76, 25173), (80, 25227), (83, 25248), (84, 25251), (86, 25311), (90, 25404), (91, 25428), (92, 25434), (96, 25479), (97, 25485), (98, 25488), (100, 25512), (102, 25551), (103, 25557), (104, 25587), (106, 25611), (107, 25620), (110, 25695), (111, 25698), (112, 25740), (113, 25758), (114, 25764), (115, 25794), (118, 25830), (119, 25869),

Gene: Asapag\_33 Start: 24801, Stop: 26324, Start Num: 1

Candidate Starts for Asapag\_33:

(Start: 1 @24801 has 26 MA's), (4, 24852), (Start: 6 @24870 has 2 MA's), (7, 24885), (8, 24888), (9, 24891), (11, 24909), (12, 24921), (14, 24939), (15, 24945), (17, 24960), (21, 25026), (22, 25041), (25, 25062), (27, 25089), (31, 25143), (33, 25158), (34, 25161), (46, 25326), (47, 25338), (48, 25341), (49, 25353), (57, 25425), (58, 25455), (60, 25470), (61, 25473), (63, 25491), (64, 25500), (74, 25578), (75, 25587), (83, 25689), (84, 25692), (86, 25752), (90, 25845), (91, 25869), (92, 25875), (94, 25914), (96, 25920), (97, 25926), (98, 25929), (100, 25953), (103, 25998), (104, 26028), (106, 26052), (107, 26061), (110, 26136), (111, 26139), (112, 26181), (113, 26199), (114, 26205), (115, 26235), (118, 26271), (119, 26310),

Gene: BENtherdunthat\_34 Start: 24366, Stop: 25889, Start Num: 1

Candidate Starts for BENtherdunthat\_34:

(Start: 1 @24366 has 26 MA's), (Start: 6 @24435 has 2 MA's), (8, 24453), (9, 24456), (10, 24465), (11, 24474), (13, 24495), (14, 24504), (15, 24510), (17, 24525), (20, 24585), (21, 24591), (22, 24606), (24, 24621), (25, 24627), (26, 24648), (27, 24654), (30, 24705), (31, 24708), (32, 24711), (33, 24723), (34, 24726), (46, 24891), (53, 24951), (54, 24954), (56, 24981), (57, 24990), (58, 25020), (60, 25035), (61, 25038), (64, 25065), (67, 25098), (70, 25113), (71, 25119), (74, 25143), (75, 25152), (79, 25224), (84, 25257), (86, 25317), (89, 25398), (91, 25434), (92, 25440), (94, 25479), (96, 25485), (97, 25491), (98, 25494), (100, 25518), (103, 25563), (104, 25593), (106, 25617), (107, 25626), (110, 25701), (111, 25704), (112, 25746), (113, 25764), (114, 25770), (115, 25800), (118, 25836), (119, 25875),

Gene: BearBQ\_32 Start: 25587, Stop: 27110, Start Num: 1

Candidate Starts for BearBQ\_32:

(Start: 1 @25587 has 26 MA's), (4, 25638), (Start: 6 @25656 has 2 MA's), (7, 25671), (8, 25674), (9, 25677), (11, 25695), (12, 25707), (14, 25725), (15, 25731), (17, 25746), (21, 25812), (22, 25827), (25, 25848), (27, 25875), (30, 25926), (31, 25929), (33, 25944), (34, 25947), (38, 25992), (45, 26109), (46, 26112), (48, 26127), (50, 26148), (53, 26172), (54, 26175), (57, 26211), (58, 26241), (60, 26256), (61, 26259), (63, 26277), (64, 26286), (67, 26319), (71, 26340), (74, 26364), (75, 26373), (76, 26400), (84, 26478), (86, 26538), (90, 26631), (91, 26655), (94, 26700), (96, 26706), (97, 26712), (98, 26715), (100, 26739), (103, 26784), (104, 26814), (106, 26838), (107, 26847), (110, 26922), (111, 26925), (112, 26967), (113, 26985), (114, 26991), (115, 27021), (118, 27057), (119, 27096),

Gene: Birdsong\_33 Start: 24480, Stop: 26003, Start Num: 1

Candidate Starts for Birdsong\_33:

(Start: 1 @24480 has 26 MA's), (4, 24531), (Start: 6 @24549 has 2 MA's), (7, 24564), (8, 24567), (9, 24570), (11, 24588), (12, 24600), (14, 24618), (15, 24624), (17, 24639), (21, 24705), (22, 24720), (25,

24741), (27, 24768), (30, 24819), (31, 24822), (33, 24837), (34, 24840), (45, 25002), (46, 25005), (48, 25020), (53, 25065), (54, 25068), (56, 25095), (57, 25104), (58, 25134), (59, 25143), (61, 25152), (63, 25170), (67, 25212), (70, 25227), (71, 25233), (74, 25257), (75, 25266), (81, 25350), (83, 25368), (84, 25371), (86, 25431), (90, 25524), (91, 25548), (92, 25554), (94, 25593), (96, 25599), (97, 25605), (98, 25608), (100, 25632), (103, 25677), (104, 25707), (106, 25731), (107, 25740), (110, 25815), (111, 25818), (112, 25860), (113, 25878), (114, 25884), (115, 25914), (118, 25950), (119, 25989),

Gene: BotCity\_34 Start: 24367, Stop: 25890, Start Num: 1

Candidate Starts for BotCity\_34:

(Start: 1 @24367 has 26 MA's), (Start: 6 @24436 has 2 MA's), (8, 24454), (9, 24457), (10, 24466), (11, 24475), (13, 24496), (14, 24505), (15, 24511), (17, 24526), (20, 24586), (21, 24592), (22, 24607), (24, 24622), (25, 24628), (26, 24649), (27, 24655), (30, 24706), (31, 24709), (32, 24712), (33, 24724), (34, 24727), (46, 24892), (53, 24952), (54, 24955), (56, 24982), (57, 24991), (58, 25021), (59, 25030), (61, 25039), (64, 25066), (67, 25099), (71, 25120), (75, 25153), (76, 25180), (77, 25198), (79, 25225), (83, 25255), (84, 25258), (86, 25318), (91, 25435), (92, 25441), (96, 25486), (97, 25492), (98, 25495), (100, 25519), (103, 25564), (104, 25594), (106, 25618), (107, 25627), (110, 25702), (111, 25705), (112, 25747), (113, 25765), (114, 25771), (115, 25801), (118, 25837), (119, 25876),

Gene: Budski\_33 Start: 24951, Stop: 26405, Start Num: 6

Candidate Starts for Budski\_33:

(Start: 1 @24882 has 26 MA's), (4, 24933), (Start: 6 @24951 has 2 MA's), (7, 24966), (8, 24969), (9, 24972), (11, 24990), (12, 25002), (14, 25020), (15, 25026), (17, 25041), (19, 25086), (22, 25122), (24, 25137), (25, 25143), (27, 25170), (29, 25200), (30, 25221), (31, 25224), (33, 25239), (34, 25242), (36, 25260), (38, 25287), (45, 25404), (46, 25407), (48, 25422), (50, 25443), (53, 25467), (54, 25470), (56, 25497), (57, 25506), (58, 25536), (59, 25545), (61, 25554), (64, 25581), (67, 25614), (71, 25635), (74, 25659), (75, 25668), (76, 25695), (77, 25713), (79, 25740), (83, 25770), (84, 25773), (86, 25833), (89, 25914), (91, 25950), (92, 25956), (94, 25995), (96, 26001), (97, 26007), (98, 26010), (100, 26034), (103, 26079), (104, 26109), (106, 26133), (107, 26142), (110, 26217), (111, 26220), (112, 26262), (113, 26280), (114, 26286), (115, 26316), (118, 26352), (119, 26391),

Gene: Crater\_31 Start: 24335, Stop: 25858, Start Num: 1

Candidate Starts for Crater\_31:

(Start: 1 @24335 has 26 MA's), (4, 24386), (Start: 6 @24404 has 2 MA's), (7, 24419), (8, 24422), (9, 24425), (11, 24443), (12, 24455), (14, 24473), (15, 24479), (17, 24494), (21, 24560), (22, 24575), (25, 24596), (27, 24623), (30, 24674), (31, 24677), (33, 24692), (34, 24695), (38, 24740), (45, 24857), (46, 24860), (48, 24875), (50, 24896), (53, 24920), (54, 24923), (57, 24959), (58, 24989), (59, 24998), (60, 25004), (61, 25007), (63, 25025), (64, 25034), (67, 25067), (71, 25088), (74, 25112), (75, 25121), (76, 25148), (77, 25166), (79, 25193), (83, 25223), (84, 25226), (86, 25286), (89, 25367), (91, 25403), (92, 25409), (94, 25448), (96, 25454), (97, 25460), (98, 25463), (100, 25487), (103, 25532), (104, 25562), (106, 25586), (107, 25595), (110, 25670), (111, 25673), (112, 25715), (113, 25733), (114, 25739), (115, 25769), (118, 25805), (119, 25844),

Gene: Ecliptus\_36 Start: 26322, Stop: 27845, Start Num: 1

Candidate Starts for Ecliptus\_36:

(Start: 1 @26322 has 26 MA's), (4, 26373), (5, 26385), (Start: 6 @26391 has 2 MA's), (7, 26406), (8, 26409), (9, 26412), (11, 26430), (12, 26442), (13, 26451), (14, 26460), (15, 26466), (17, 26481), (19, 26526), (21, 26547), (22, 26562), (23, 26565), (25, 26583), (27, 26610), (29, 26640), (30, 26661), (31, 26664), (33, 26679), (34, 26682), (38, 26727), (45, 26844), (46, 26847), (48, 26862), (50, 26883), (53, 26907), (54, 26910), (56, 26937), (57, 26946), (58, 26976), (59, 26985), (64, 27021), (67, 27054), (71, 27075), (74, 27099), (75, 27108), (79, 27180), (82, 27204), (84, 27213), (86, 27273), (90, 27366), (91, 27390), (92, 27396), (94, 27435), (96, 27441), (97, 27447), (98, 27450), (100, 27474), (103, 27519), (104, 27549), (106, 27573), (107, 27582), (110, 27657), (111, 27660), (112, 27702), (113, 27720), (114, 27726), (115, 27756), (118, 27792), (119, 27831),

Gene: Getalong\_34 Start: 25578, Stop: 27101, Start Num: 1

Candidate Starts for Getalong\_34:

(Start: 1 @25578 has 26 MA's), (2, 25599), (4, 25629), (Start: 6 @25647 has 2 MA's), (7, 25662), (8, 25665), (9, 25668), (11, 25686), (12, 25698), (14, 25716), (15, 25722), (17, 25737), (22, 25818), (25, 25839), (27, 25866), (29, 25896), (31, 25920), (33, 25935), (34, 25938), (38, 25983), (45, 26100), (46, 26103), (48, 26118), (50, 26139), (53, 26163), (54, 26166), (57, 26202), (58, 26232), (59, 26241), (61, 26250), (64, 26277), (67, 26310), (71, 26331), (74, 26355), (75, 26364), (76, 26391), (77, 26409), (79, 26436), (83, 26466), (84, 26469), (86, 26529), (89, 26610), (91, 26646), (92, 26652), (94, 26691), (96, 26697), (97, 26703), (98, 26706), (100, 26730), (103, 26775), (104, 26805), (106, 26829), (107, 26838), (110, 26913), (111, 26916), (112, 26958), (113, 26976), (114, 26982), (115, 27012), (118, 27048), (119, 27087),

Gene: Heinz\_30 Start: 22113, Stop: 23636, Start Num: 1

Candidate Starts for Heinz\_30:

(Start: 1 @22113 has 26 MA's), (3, 22146), (4, 22164), (16, 22263), (29, 22431), (36, 22491), (40, 22539), (42, 22596), (43, 22614), (51, 22683), (56, 22728), (61, 22785), (62, 22791), (64, 22812), (66, 22839), (85, 23061), (90, 23157), (91, 23181), (96, 23232), (97, 23238), (98, 23241), (100, 23265), (106, 23364), (115, 23547), (116, 23553), (117, 23577), (118, 23583),

Gene: Hibiscus\_30 Start: 22062, Stop: 23585, Start Num: 1

Candidate Starts for Hibiscus\_30:

(Start: 1 @22062 has 26 MA's), (3, 22095), (4, 22113), (16, 22212), (29, 22380), (36, 22440), (40, 22488), (42, 22545), (43, 22563), (51, 22632), (56, 22677), (61, 22734), (62, 22740), (64, 22761), (66, 22788), (85, 23010), (90, 23106), (91, 23130), (96, 23181), (97, 23187), (98, 23190), (100, 23214), (106, 23313), (115, 23496), (116, 23502), (117, 23526), (118, 23532),

Gene: Holliday\_33 Start: 24898, Stop: 26421, Start Num: 1

Candidate Starts for Holliday\_33:

(Start: 1 @24898 has 26 MA's), (4, 24949), (Start: 6 @24967 has 2 MA's), (7, 24982), (8, 24985), (9, 24988), (11, 25006), (13, 25027), (14, 25036), (15, 25042), (17, 25057), (20, 25117), (21, 25123), (22, 25138), (24, 25153), (25, 25159), (26, 25180), (27, 25186), (30, 25237), (31, 25240), (32, 25243), (33, 25255), (34, 25258), (47, 25435), (48, 25438), (52, 25477), (53, 25483), (57, 25522), (58, 25552), (60, 25567), (61, 25570), (64, 25597), (67, 25630), (68, 25639), (72, 25669), (73, 25672), (74, 25675), (75, 25684), (77, 25729), (79, 25756), (84, 25789), (86, 25849), (89, 25930), (90, 25942), (91, 25966), (92, 25972), (94, 26011), (96, 26017), (97, 26023), (98, 26026), (100, 26050), (103, 26095), (104, 26125), (105, 26134), (106, 26149), (107, 26158), (110, 26233), (111, 26236), (112, 26278), (113, 26296), (114, 26302), (115, 26332), (118, 26368), (119, 26407),

Gene: Horus\_33 Start: 24823, Stop: 26346, Start Num: 1

Candidate Starts for Horus\_33:

(Start: 1 @24823 has 26 MA's), (4, 24874), (5, 24886), (7, 24907), (8, 24910), (9, 24913), (11, 24931), (12, 24943), (14, 24961), (15, 24967), (17, 24982), (21, 25048), (22, 25063), (24, 25078), (25, 25084), (26, 25105), (27, 25111), (29, 25141), (30, 25162), (31, 25165), (33, 25180), (34, 25183), (45, 25345), (46, 25348), (48, 25363), (50, 25384), (53, 25408), (54, 25411), (57, 25447), (58, 25477), (60, 25492), (61, 25495), (63, 25513), (64, 25522), (67, 25555), (71, 25576), (74, 25600), (75, 25609), (76, 25636), (80, 25690), (83, 25711), (84, 25714), (86, 25774), (90, 25867), (91, 25891), (92, 25897), (96, 25942), (97, 25948), (98, 25951), (100, 25975), (102, 26014), (103, 26020), (104, 26050), (106, 26074), (107, 26083), (110, 26158), (111, 26161), (112, 26203), (113, 26221), (114, 26227), (115, 26257), (118, 26293), (119, 26332),

Gene: Kamaru\_33 Start: 24898, Stop: 26421, Start Num: 1

Candidate Starts for Kamaru\_33:

(Start: 1 @24898 has 26 MA's), (4, 24949), (Start: 6 @24967 has 2 MA's), (7, 24982), (8, 24985), (9, 24988), (11, 25006), (12, 25018), (14, 25036), (15, 25042), (17, 25057), (21, 25123), (22, 25138), (25, 25159), (26, 25180), (27, 25186), (29, 25216), (31, 25240), (33, 25255), (34, 25258), (45, 25420), (46, 25423), (47, 25435), (48, 25438), (57, 25522), (58, 25552), (59, 25561), (60, 25567), (61, 25570), (64, 25597), (67, 25630), (71, 25651), (74, 25675), (75, 25684), (76, 25711), (77, 25729), (83, 25786), (84, 25789), (86, 25849), (90, 25942), (91, 25966), (92, 25972), (94, 26011), (96, 26017), (97, 26023), (98, 26026), (100, 26050), (103, 26095), (104, 26125), (106, 26149), (107, 26158), (110, 26233), (111, 26236), (112, 26278), (113, 26296), (114, 26302), (115, 26332), (118, 26368), (119, 26407),

Gene: Kenna\_32 Start: 24964, Stop: 26487, Start Num: 1

Candidate Starts for Kenna\_32:

(Start: 1 @24964 has 26 MA's), (4, 25015), (Start: 6 @25033 has 2 MA's), (7, 25048), (8, 25051), (9, 25054), (11, 25072), (12, 25084), (14, 25102), (15, 25108), (17, 25123), (18, 25165), (22, 25204), (25, 25225), (27, 25252), (30, 25303), (31, 25306), (33, 25321), (34, 25324), (38, 25369), (45, 25486), (46, 25489), (47, 25501), (48, 25504), (53, 25549), (54, 25552), (56, 25579), (57, 25588), (58, 25618), (60, 25633), (61, 25636), (63, 25654), (64, 25663), (67, 25696), (71, 25717), (74, 25741), (75, 25750), (76, 25777), (84, 25855), (86, 25915), (90, 26008), (91, 26032), (94, 26077), (96, 26083), (97, 26089), (98, 26092), (100, 26116), (103, 26161), (104, 26191), (106, 26215), (107, 26224), (110, 26299), (111, 26302), (112, 26344), (113, 26362), (114, 26368), (115, 26398), (118, 26434), (119, 26473),

Gene: Kuwabara\_32 Start: 24174, Stop: 25697, Start Num: 1

Candidate Starts for Kuwabara\_32:

(Start: 1 @24174 has 26 MA's), (4, 24225), (Start: 6 @24243 has 2 MA's), (7, 24258), (8, 24261), (9, 24264), (11, 24282), (12, 24294), (14, 24312), (15, 24318), (17, 24333), (21, 24399), (22, 24414), (25, 24435), (27, 24462), (30, 24513), (31, 24516), (33, 24531), (34, 24534), (38, 24579), (45, 24696), (46, 24699), (48, 24714), (50, 24735), (53, 24759), (54, 24762), (56, 24789), (57, 24798), (58, 24828), (59, 24837), (60, 24843), (61, 24846), (63, 24864), (64, 24873), (67, 24906), (71, 24927), (74, 24951), (75, 24960), (76, 24987), (84, 25065), (86, 25125), (90, 25218), (91, 25242), (92, 25248), (96, 25293), (97, 25299), (98, 25302), (100, 25326), (103, 25371), (106, 25425), (107, 25434), (110, 25509), (111, 25512), (112, 25554), (113, 25572), (114, 25578), (115, 25608), (118, 25644), (119, 25683),

Gene: Leroy\_33 Start: 24824, Stop: 26347, Start Num: 1

Candidate Starts for Leroy\_33:

(Start: 1 @24824 has 26 MA's), (4, 24875), (5, 24887), (7, 24908), (8, 24911), (9, 24914), (11, 24932), (12, 24944), (14, 24962), (15, 24968), (17, 24983), (21, 25049), (22, 25064), (24, 25079), (25, 25085), (26, 25106), (27, 25112), (29, 25142), (30, 25163), (31, 25166), (33, 25181), (34, 25184), (45, 25346), (46, 25349), (48, 25364), (50, 25385), (53, 25409), (54, 25412), (57, 25448), (58, 25478), (60, 25493), (61, 25496), (63, 25514), (64, 25523), (67, 25556), (71, 25577), (74, 25601), (75, 25610), (76, 25637), (80, 25691), (83, 25712), (84, 25715), (86, 25775), (90, 25868), (91, 25892), (92, 25898), (96, 25943), (97, 25949), (98, 25952), (100, 25976), (102, 26015), (103, 26021), (104, 26051), (106, 26075), (107, 26084), (110, 26159), (111, 26162), (112, 26204), (113, 26222), (114, 26228), (115, 26258), (118, 26294), (119, 26333),

Gene: LitninMcQueen\_32 Start: 24641, Stop: 26164, Start Num: 1

Candidate Starts for LitninMcQueen\_32:

(Start: 1 @24641 has 26 MA's), (4, 24692), (Start: 6 @24710 has 2 MA's), (7, 24725), (8, 24728), (9, 24731), (11, 24749), (12, 24761), (14, 24779), (15, 24785), (17, 24800), (19, 24845), (22, 24881), (24, 24896), (25, 24902), (27, 24929), (29, 24959), (30, 24980), (31, 24983), (33, 24998), (34, 25001), (36, 25019), (38, 25046), (45, 25163), (46, 25166), (48, 25181), (50, 25202), (53, 25226), (54, 25229), (56, 25256), (57, 25265), (58, 25295), (59, 25304), (61, 25313), (64, 25340), (67, 25373), (71, 25394), (74, 25418), (75, 25427), (76, 25454), (77, 25472), (79, 25499), (83, 25529), (84, 25532), (86, 25592), (89, 25673), (91, 25709), (92, 25715), (94, 25754), (96, 25760), (97, 25766), (98, 25769), (100, 25793), (103, 25838), (104, 25868), (106, 25892), (107, 25901), (110, 25976), (111, 25979), (112, 26021),

(113, 26039), (114, 26045), (115, 26075), (118, 26111), (119, 26150),

Gene: Lutum\_33 Start: 24964, Stop: 26487, Start Num: 1

Candidate Starts for Lutum\_33:

(Start: 1 @24964 has 26 MA's), (4, 25015), (Start: 6 @25033 has 2 MA's), (7, 25048), (8, 25051), (9, 25054), (11, 25072), (12, 25084), (14, 25102), (15, 25108), (17, 25123), (18, 25165), (22, 25204), (25, 25225), (27, 25252), (30, 25303), (31, 25306), (33, 25321), (34, 25324), (38, 25369), (45, 25486), (46, 25489), (47, 25501), (48, 25504), (53, 25549), (54, 25552), (56, 25579), (57, 25588), (58, 25618), (60, 25633), (61, 25636), (63, 25654), (64, 25663), (67, 25696), (71, 25717), (74, 25741), (75, 25750), (76, 25777), (84, 25855), (86, 25915), (90, 26008), (91, 26032), (94, 26077), (96, 26083), (97, 26089), (98, 26092), (100, 26116), (103, 26161), (104, 26191), (106, 26215), (107, 26224), (110, 26299), (111, 26302), (112, 26344), (113, 26362), (114, 26368), (115, 26398), (118, 26434), (119, 26473),

Gene: MortyNRick\_32 Start: 24480, Stop: 26003, Start Num: 1

Candidate Starts for MortyNRick\_32:

(Start: 1 @24480 has 26 MA's), (4, 24531), (Start: 6 @24549 has 2 MA's), (7, 24564), (8, 24567), (9, 24570), (11, 24588), (12, 24600), (14, 24618), (15, 24624), (17, 24639), (21, 24705), (22, 24720), (25, 24741), (27, 24768), (30, 24819), (31, 24822), (33, 24837), (34, 24840), (38, 24885), (45, 25002), (46, 25005), (48, 25020), (50, 25041), (53, 25065), (54, 25068), (57, 25104), (58, 25134), (60, 25149), (61, 25152), (63, 25170), (64, 25179), (67, 25212), (71, 25233), (74, 25257), (75, 25266), (76, 25293), (84, 25371), (86, 25431), (90, 25524), (91, 25548), (94, 25593), (96, 25599), (97, 25605), (98, 25608), (100, 25632), (103, 25677), (104, 25707), (106, 25731), (107, 25740), (110, 25815), (111, 25818), (112, 25860), (113, 25878), (115, 25914), (118, 25950), (119, 25989),

Gene: ODay\_37 Start: 26711, Stop: 28234, Start Num: 1

Candidate Starts for ODay\_37:

(Start: 1 @26711 has 26 MA's), (4, 26762), (Start: 6 @26780 has 2 MA's), (7, 26795), (8, 26798), (9, 26801), (11, 26819), (12, 26831), (14, 26849), (15, 26855), (17, 26870), (22, 26951), (24, 26966), (25, 26972), (26, 26993), (27, 26999), (29, 27029), (30, 27050), (31, 27053), (33, 27068), (34, 27071), (36, 27089), (38, 27116), (45, 27233), (46, 27236), (47, 27248), (48, 27251), (53, 27296), (54, 27299), (56, 27326), (57, 27335), (58, 27365), (60, 27380), (61, 27383), (64, 27410), (74, 27488), (75, 27497), (77, 27542), (79, 27569), (83, 27599), (84, 27602), (86, 27662), (90, 27755), (91, 27779), (92, 27785), (94, 27824), (96, 27830), (97, 27836), (98, 27839), (100, 27863), (103, 27908), (104, 27938), (106, 27962), (107, 27971), (110, 28046), (111, 28049), (112, 28091), (113, 28109), (114, 28115), (115, 28145), (118, 28181), (119, 28220),

Gene: Periwinkle\_35 Start: 25268, Stop: 26791, Start Num: 1

Candidate Starts for Periwinkle\_35:

(Start: 1 @25268 has 26 MA's), (4, 25319), (5, 25331), (7, 25352), (8, 25355), (9, 25358), (11, 25376), (12, 25388), (14, 25406), (15, 25412), (17, 25427), (21, 25493), (22, 25508), (24, 25523), (25, 25529), (26, 25550), (27, 25556), (29, 25586), (30, 25607), (31, 25610), (33, 25625), (34, 25628), (45, 25790), (46, 25793), (48, 25808), (50, 25829), (53, 25853), (54, 25856), (57, 25892), (58, 25922), (60, 25937), (61, 25940), (63, 25958), (64, 25967), (67, 26000), (71, 26021), (74, 26045), (75, 26054), (76, 26081), (80, 26135), (83, 26156), (84, 26159), (86, 26219), (90, 26312), (91, 26336), (92, 26342), (96, 26387), (97, 26393), (98, 26396), (100, 26420), (102, 26459), (103, 26465), (104, 26495), (106, 26519), (107, 26528), (110, 26603), (111, 26606), (112, 26648), (113, 26666), (114, 26672), (115, 26702), (118, 26738), (119, 26777),

Gene: Phabuloso\_32 Start: 24531, Stop: 26054, Start Num: 1

Candidate Starts for Phabuloso\_32:

(Start: 1 @24531 has 26 MA's), (4, 24582), (Start: 6 @24600 has 2 MA's), (7, 24615), (8, 24618), (9, 24621), (11, 24639), (12, 24651), (13, 24660), (14, 24669), (15, 24675), (17, 24690), (22, 24771), (25, 24792), (26, 24813), (27, 24819), (29, 24849), (30, 24870), (31, 24873), (33, 24888), (34, 24891), (45,

25053), (46, 25056), (48, 25071), (50, 25092), (53, 25116), (54, 25119), (56, 25146), (57, 25155), (58, 25185), (60, 25200), (61, 25203), (64, 25230), (67, 25263), (71, 25284), (74, 25308), (75, 25317), (76, 25344), (77, 25362), (79, 25389), (83, 25419), (84, 25422), (86, 25482), (89, 25563), (90, 25575), (91, 25599), (92, 25605), (94, 25644), (96, 25650), (97, 25656), (98, 25659), (100, 25683), (103, 25728), (104, 25758), (106, 25782), (107, 25791), (110, 25866), (111, 25869), (112, 25911), (113, 25929), (114, 25935), (115, 25965), (118, 26001), (119, 26040),

Gene: Phistory\_34 Start: 25589, Stop: 27112, Start Num: 1

Candidate Starts for Phistory\_34:

(Start: 1 @25589 has 26 MA's), (4, 25640), (5, 25652), (7, 25673), (8, 25676), (9, 25679), (11, 25697), (12, 25709), (14, 25727), (15, 25733), (17, 25748), (21, 25814), (22, 25829), (24, 25844), (25, 25850), (26, 25871), (27, 25877), (29, 25907), (30, 25928), (31, 25931), (33, 25946), (34, 25949), (45, 26111), (46, 26114), (48, 26129), (50, 26150), (53, 26174), (54, 26177), (57, 26213), (58, 26243), (60, 26258), (61, 26261), (63, 26279), (64, 26288), (67, 26321), (71, 26342), (74, 26366), (75, 26375), (76, 26402), (80, 26456), (83, 26477), (84, 26480), (86, 26540), (90, 26633), (91, 26657), (92, 26663), (94, 26702), (96, 26708), (97, 26714), (98, 26717), (100, 26741), (103, 26786), (104, 26816), (106, 26840), (107, 26849), (110, 26924), (111, 26927), (112, 26969), (113, 26987), (115, 27023), (118, 27059), (119, 27098),

Gene: ShawBrad\_33 Start: 24811, Stop: 26334, Start Num: 1

Candidate Starts for ShawBrad\_33:

(Start: 1 @24811 has 26 MA's), (4, 24862), (Start: 6 @24880 has 2 MA's), (7, 24895), (8, 24898), (9, 24901), (11, 24919), (13, 24940), (14, 24949), (15, 24955), (17, 24970), (20, 25030), (21, 25036), (22, 25051), (24, 25066), (25, 25072), (26, 25093), (27, 25099), (30, 25150), (31, 25153), (32, 25156), (33, 25168), (34, 25171), (47, 25348), (48, 25351), (53, 25396), (54, 25399), (56, 25426), (57, 25435), (58, 25465), (59, 25474), (63, 25501), (64, 25510), (70, 25558), (71, 25564), (74, 25588), (75, 25597), (77, 25642), (79, 25669), (82, 25693), (84, 25702), (86, 25762), (91, 25879), (92, 25885), (94, 25924), (96, 25930), (97, 25936), (98, 25939), (100, 25963), (103, 26008), (104, 26038), (106, 26062), (107, 26071), (110, 26146), (111, 26149), (112, 26191), (113, 26209), (114, 26215), (115, 26245), (118, 26281), (119, 26320),

Gene: Suerte\_28 Start: 24000, Stop: 25373, Start Num: 1

Candidate Starts for Suerte\_28:

(Start: 1 @24000 has 26 MA's), (2, 24021), (9, 24090), (14, 24138), (16, 24150), (23, 24243), (26, 24282), (28, 24309), (35, 24366), (37, 24402), (39, 24417), (41, 24474), (44, 24519), (53, 24585), (55, 24606), (61, 24672), (69, 24744), (78, 24837), (84, 24891), (86, 24951), (87, 24978), (88, 25017), (93, 25092), (95, 25110), (99, 25134), (100, 25146), (101, 25158), (108, 25290), (109, 25299), (110, 25317),

Gene: Thimann\_30 Start: 24468, Stop: 25841, Start Num: 1

Candidate Starts for Thimann\_30:

(Start: 1 @24468 has 26 MA's), (2, 24489), (9, 24558), (14, 24606), (16, 24618), (23, 24711), (26, 24750), (28, 24777), (35, 24834), (37, 24870), (39, 24885), (44, 24987), (53, 25053), (55, 25074), (61, 25140), (65, 25185), (69, 25212), (78, 25305), (84, 25359), (86, 25419), (87, 25446), (88, 25485), (93, 25560), (95, 25578), (99, 25602), (100, 25614), (101, 25626), (108, 25758), (109, 25767), (110, 25785),

Gene: Whitney\_34 Start: 25755, Stop: 27209, Start Num: 6

Candidate Starts for Whitney\_34:

(Start: 1 @25686 has 26 MA's), (4, 25737), (Start: 6 @25755 has 2 MA's), (7, 25770), (8, 25773), (9, 25776), (11, 25794), (12, 25806), (14, 25824), (15, 25830), (17, 25845), (22, 25926), (25, 25947), (26, 25968), (27, 25974), (29, 26004), (30, 26025), (31, 26028), (33, 26043), (34, 26046), (36, 26064), (38, 26091), (45, 26208), (46, 26211), (48, 26226), (50, 26247), (53, 26271), (54, 26274), (56, 26301), (57,

26310), (58, 26340), (59, 26349), (61, 26358), (64, 26385), (67, 26418), (71, 26439), (74, 26463), (75, 26472), (76, 26499), (77, 26517), (79, 26544), (83, 26574), (84, 26577), (86, 26637), (89, 26718), (91, 26754), (92, 26760), (94, 26799), (96, 26805), (97, 26811), (98, 26814), (100, 26838), (103, 26883), (104, 26913), (106, 26937), (107, 26946), (110, 27021), (111, 27024), (112, 27066), (113, 27084), (114, 27090), (115, 27120), (118, 27156), (119, 27195),