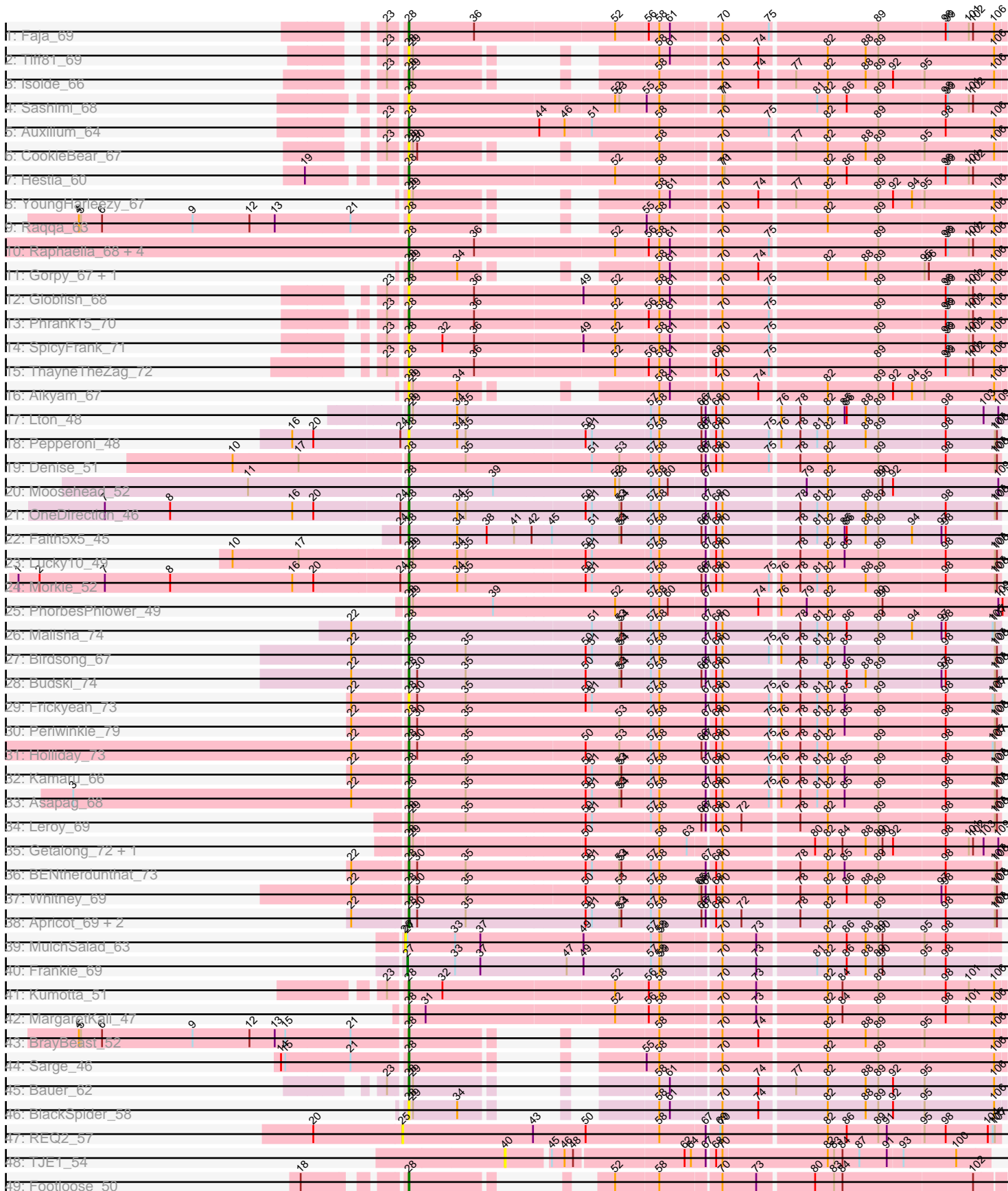


Pham 196572



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 196572 Report

This analysis was run 12/09/24 on database version 580.

Pham number 196572 has 57 members, 16 are drafts.

Phages represented in each track:

- Track 1 : Faja\_69
- Track 2 : Tiff81\_69
- Track 3 : Isolde\_66
- Track 4 : Sashimi\_68
- Track 5 : Auxilium\_64
- Track 6 : CookieBear\_67
- Track 7 : Hestia\_60
- Track 8 : YoungHarleezy\_67
- Track 9 : Raqqa\_63
- Track 10 : Raphaella\_68, BillyTP\_69, Richie\_71, Lawnathon\_68, BenchScraper\_68
- Track 11 : Gorpy\_67, Sakai\_66
- Track 12 : Globfish\_68
- Track 13 : Phrank15\_70
- Track 14 : SpicyFrank\_71
- Track 15 : ThayneTheZag\_72
- Track 16 : Aikyam\_67
- Track 17 : Lton\_48
- Track 18 : Pepperoni\_48
- Track 19 : Denise\_51
- Track 20 : Moosehead\_52
- Track 21 : OneDirection\_46
- Track 22 : Faith5x5\_45
- Track 23 : Lucky10\_49
- Track 24 : Morkie\_52
- Track 25 : PhorbesPhlower\_49
- Track 26 : Malisha\_74
- Track 27 : Birdsong\_67
- Track 28 : Budski\_74
- Track 29 : Frickyeah\_73
- Track 30 : Periwinkle\_79
- Track 31 : Holliday\_73
- Track 32 : Kamaru\_66
- Track 33 : Asapag\_68
- Track 34 : Leroy\_69
- Track 35 : Getalong\_72, Lutum\_72
- Track 36 : BENtherdunthat\_73
- Track 37 : Whitney\_69

- Track 38 : Apricot\_69, Phistory\_68, Crater\_69
- Track 39 : MulchSalad\_63
- Track 40 : Frankie\_69
- Track 41 : Kumotta\_51
- Track 42 : MargaretKali\_47
- Track 43 : BrayBeast\_52
- Track 44 : Sarge\_46
- Track 45 : Bauer\_62
- Track 46 : BlackSpider\_58
- Track 47 : REQ2\_57
- Track 48 : TJE1\_54
- Track 49 : Footloose\_50

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

The start number called the most often in the published annotations is 28, it was called in 40 of the 41 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Aikyam\_67, Apricot\_69, Asapag\_68, Auxilium\_64, BENtherdunthat\_73, Bauer\_62, BenchScraper\_68, BillyTP\_69, Birdsong\_67, BlackSpider\_58, BrayBeast\_52, Budski\_74, CookieBear\_67, Crater\_69, Denise\_51, Faith5x5\_45, Faja\_69, Footloose\_50, Frickyeah\_73, Getalong\_72, Globfish\_68, Gorpy\_67, Hestia\_60, Holliday\_73, Isolde\_66, Kamaru\_66, Kumotta\_51, Lawnathon\_68, Leroy\_69, Lton\_48, Lucky10\_49, Lutum\_72, Malisha\_74, MargaretKali\_47, Moosehead\_52, Morkie\_52, OneDirection\_46, Pepperoni\_48, Periwinkle\_79, Phistory\_68, PhorbesPhlower\_49, Phrank15\_70, Raphaella\_68, Raqqa\_63, Richie\_71, Sakai\_66, Sarge\_46, Sashimi\_68, SpicyFrank\_71, ThayneTheZag\_72, Tiff81\_69, Whitney\_69, YoungHarleezy\_67,

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

- 

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

- Frankie\_69, MulchSalad\_63, REQ2\_57, TJE1\_54,

**Summary by start number:**

Start 25:

- Found in 1 of 57 ( 1.8% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: REQ2\_57 (singleton),

Start 26:

- Found in 1 of 57 ( 1.8% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: MulchSalad\_63 (F),

#### Start 27:

- Found in 2 of 57 ( 3.5% ) of genes in pham
- Manual Annotations of this start: 1 of 41
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Frankie\_69 (F1),

#### Start 28:

- Found in 53 of 57 ( 93.0% ) of genes in pham
- Manual Annotations of this start: 40 of 41
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Aikyam\_67 (AY), Apricot\_69 (DN3), Asapag\_68 (DN1), Auxilium\_64 (AY), BENtherdunthat\_73 (DN1), Bauer\_62 (FN), BenchScraper\_68 (AY), BillyTP\_69 (AY), Birdsong\_67 (DN), BlackSpider\_58 (FN), BrayBeast\_52 (FB), Budski\_74 (DN), CookieBear\_67 (AY), Crater\_69 (DN3), Denise\_51 (CZ5), Faith5x5\_45 (CZ6), Faja\_69 (AY), Footloose\_50 (singleton), Frickyeah\_73 (DN1), Getalong\_72 (DN1), Globfish\_68 (AY), Gorpy\_67 (AY), Hestia\_60 (AY), Holliday\_73 (DN1), Isolde\_66 (AY), Kamaru\_66 (DN1), Kumotta\_51 (FB), Lawnathon\_68 (AY), Leroy\_69 (DN1), Lton\_48 (CZ), Lucky10\_49 (DH), Lutum\_72 (DN1), Malisha\_74 (DN), MargaretKali\_47 (FB), Moosehead\_52 (CZ6), Morkie\_52 (DH), OneDirection\_46 (CZ6), Pepperoni\_48 (CZ), Periwinkle\_79 (DN1), Phistory\_68 (DN1), PhorbesPhlower\_49 (DH), Phrank15\_70 (AY), Raphaella\_68 (AY), Raqqa\_63 (AY), Richie\_71 (AY), Sakai\_66 (AY), Sarge\_46 (FB), Sashimi\_68 (AY), SpicyFrank\_71 (AY), ThayneTheZag\_72 (AY), Tiff81\_69 (AY), Whitney\_69 (DN1), YoungHarleezy\_67 (AY),

#### Start 40:

- Found in 1 of 57 ( 1.8% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: TJE1\_54 (singleton),

### **Summary by clusters:**

There are 13 clusters represented in this pham: DN, F1, singleton, DH, F, CZ6, CZ5, CZ, FB, DN1, DN3, AY, FN,

Info for manual annotations of cluster AY:

- Start number 28 was manually annotated 11 times for cluster AY.

Info for manual annotations of cluster CZ:

- Start number 28 was manually annotated 1 time for cluster CZ.

Info for manual annotations of cluster CZ5:

- Start number 28 was manually annotated 1 time for cluster CZ5.

Info for manual annotations of cluster CZ6:

- Start number 28 was manually annotated 3 times for cluster CZ6.

Info for manual annotations of cluster DH:

- Start number 28 was manually annotated 3 times for cluster DH.

Info for manual annotations of cluster DN:

- Start number 28 was manually annotated 3 times for cluster DN.

Info for manual annotations of cluster DN1:

- Start number 28 was manually annotated 10 times for cluster DN1.

Info for manual annotations of cluster DN3:

- Start number 28 was manually annotated 2 times for cluster DN3.

Info for manual annotations of cluster F1:

- Start number 27 was manually annotated 1 time for cluster F1.

Info for manual annotations of cluster FB:

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

Info for manual annotations of cluster FN:

- Start number 28 was manually annotated 1 time for cluster FN.

### **Gene Information:**

Gene: Aikyam\_67 Start: 34135, Stop: 34815, Start Num: 28

Candidate Starts for Aikyam\_67:

(Start: 28 @34135 has 40 MA's), (29, 34141), (34, 34204), (58, 34345), (61, 34360), (70, 34426), (74, 34477), (82, 34567), (89, 34639), (92, 34660), (94, 34687), (95, 34702), (106, 34801),

Gene: Apricot\_69 Start: 40994, Stop: 41812, Start Num: 28

Candidate Starts for Apricot\_69:

(22, 40922), (Start: 28 @40994 has 40 MA's), (30, 41006), (35, 41075), (50, 41243), (51, 41252), (53, 41291), (54, 41294), (57, 41333), (58, 41345), (66, 41405), (67, 41411), (68, 41420), (70, 41429), (72, 41456), (78, 41531), (82, 41570), (89, 41642), (98, 41735), (107, 41804), (108, 41807),

Gene: Asapag\_68 Start: 40988, Stop: 41806, Start Num: 28

Candidate Starts for Asapag\_68:

(3, 40520), (22, 40916), (Start: 28 @40988 has 40 MA's), (35, 41069), (50, 41237), (51, 41246), (53, 41285), (54, 41288), (57, 41327), (58, 41339), (67, 41405), (68, 41414), (70, 41423), (75, 41489), (76, 41498), (78, 41525), (81, 41549), (82, 41564), (85, 41588), (89, 41636), (98, 41729), (107, 41798), (108, 41801),

Gene: Auxilium\_64 Start: 33296, Stop: 34126, Start Num: 28

Candidate Starts for Auxilium\_64:

(23, 33275), (Start: 28 @33296 has 40 MA's), (44, 33482), (46, 33518), (51, 33554), (58, 33647), (70, 33734), (75, 33800), (82, 33875), (89, 33947), (98, 34040), (106, 34109),

Gene: BENtherdunthat\_73 Start: 42342, Stop: 43160, Start Num: 28

Candidate Starts for BENtherdunthat\_73:

(22, 42270), (Start: 28 @42342 has 40 MA's), (30, 42354), (35, 42423), (50, 42591), (51, 42600), (53, 42639), (54, 42642), (57, 42681), (58, 42693), (67, 42759), (68, 42768), (70, 42777), (78, 42879), (82, 42918), (85, 42942), (89, 42990), (98, 43083), (107, 43152), (108, 43155),

Gene: Bauer\_62 Start: 34228, Stop: 34908, Start Num: 28

Candidate Starts for Bauer\_62:

(23, 34207), (Start: 28 @34228 has 40 MA's), (29, 34234), (58, 34438), (61, 34453), (70, 34519), (74, 34570), (77, 34615), (82, 34660), (88, 34714), (89, 34732), (92, 34753), (95, 34795), (106, 34894),

Gene: BenchScraper\_68 Start: 35513, Stop: 36331, Start Num: 28

Candidate Starts for BenchScraper\_68:

(Start: 28 @35513 has 40 MA's), (36, 35606), (52, 35801), (56, 35846), (58, 35861), (61, 35876), (70, 35942), (75, 36008), (89, 36155), (98, 36248), (99, 36251), (101, 36281), (102, 36287), (106, 36317),

Gene: BillyTP\_69 Start: 37368, Stop: 38186, Start Num: 28

Candidate Starts for BillyTP\_69:

(Start: 28 @37368 has 40 MA's), (36, 37461), (52, 37656), (56, 37701), (58, 37716), (61, 37731), (70, 37797), (75, 37863), (89, 38010), (98, 38103), (99, 38106), (101, 38136), (102, 38142), (106, 38172),

Gene: Birdsong\_67 Start: 40724, Stop: 41542, Start Num: 28

Candidate Starts for Birdsong\_67:

(22, 40652), (Start: 28 @40724 has 40 MA's), (35, 40805), (50, 40973), (51, 40982), (53, 41021), (54, 41024), (57, 41063), (58, 41075), (67, 41141), (68, 41150), (70, 41159), (75, 41225), (76, 41234), (78, 41261), (81, 41285), (82, 41300), (85, 41324), (89, 41372), (98, 41465), (107, 41534), (108, 41537),

Gene: BlackSpider\_58 Start: 33088, Stop: 33768, Start Num: 28

Candidate Starts for BlackSpider\_58:

(Start: 28 @33088 has 40 MA's), (29, 33094), (34, 33157), (58, 33298), (61, 33313), (70, 33379), (74, 33430), (82, 33520), (88, 33574), (89, 33592), (92, 33613), (95, 33655), (106, 33754),

Gene: BrayBeast\_52 Start: 29851, Stop: 30531, Start Num: 28

Candidate Starts for BrayBeast\_52:

(4, 29395), (5, 29398), (6, 29428), (9, 29557), (12, 29638), (13, 29674), (15, 29689), (21, 29779), (Start: 28 @29851 has 40 MA's), (58, 30061), (70, 30142), (74, 30193), (82, 30283), (88, 30337), (89, 30355), (95, 30418), (106, 30517),

Gene: Budski\_74 Start: 42848, Stop: 43663, Start Num: 28

Candidate Starts for Budski\_74:

(22, 42776), (Start: 28 @42848 has 40 MA's), (30, 42860), (35, 42929), (50, 43094), (53, 43142), (54, 43145), (57, 43184), (58, 43196), (66, 43256), (67, 43262), (68, 43271), (70, 43280), (78, 43382), (82, 43421), (86, 43448), (88, 43475), (89, 43493), (97, 43580), (98, 43586), (107, 43655), (108, 43658),

Gene: CookieBear\_67 Start: 35566, Stop: 36246, Start Num: 28

Candidate Starts for CookieBear\_67:

(23, 35545), (Start: 28 @35566 has 40 MA's), (29, 35572), (30, 35578), (58, 35776), (70, 35857), (77, 35953), (82, 35998), (88, 36052), (89, 36070), (95, 36133), (106, 36232),

Gene: Crater\_69 Start: 41389, Stop: 42207, Start Num: 28

Candidate Starts for Crater\_69:

(22, 41317), (Start: 28 @41389 has 40 MA's), (30, 41401), (35, 41470), (50, 41638), (51, 41647), (53, 41686), (54, 41689), (57, 41728), (58, 41740), (66, 41800), (67, 41806), (68, 41815), (70, 41824), (72, 41851), (78, 41926), (82, 41965), (89, 42037), (98, 42130), (107, 42199), (108, 42202),

Gene: Denise\_51 Start: 33901, Stop: 34716, Start Num: 28

Candidate Starts for Denise\_51:

(10, 33667), (17, 33760), (Start: 28 @33901 has 40 MA's), (35, 33982), (51, 34156), (53, 34195), (57, 34237), (58, 34249), (66, 34309), (67, 34315), (68, 34324), (70, 34333), (75, 34399), (78, 34435), (82, 34474), (89, 34546), (98, 34639), (107, 34708), (108, 34711),

Gene: Faith5x5\_45 Start: 30917, Stop: 31735, Start Num: 28

Candidate Starts for Faith5x5\_45:

(24, 30905), (Start: 28 @30917 has 40 MA's), (34, 30986), (38, 31028), (41, 31067), (42, 31091), (45, 31118), (51, 31175), (53, 31214), (54, 31217), (57, 31256), (58, 31268), (66, 31328), (67, 31334), (68, 31343), (70, 31352), (78, 31454), (81, 31478), (82, 31493), (85, 31517), (86, 31520), (88, 31547), (89, 31565), (94, 31613), (97, 31652), (98, 31658),

Gene: Faja\_69 Start: 37118, Stop: 37936, Start Num: 28

Candidate Starts for Faja\_69:

(23, 37097), (Start: 28 @37118 has 40 MA's), (36, 37211), (52, 37406), (56, 37451), (58, 37466), (61, 37481), (70, 37547), (75, 37613), (89, 37760), (98, 37853), (99, 37856), (101, 37886), (102, 37892), (106, 37922),

Gene: Footloose\_50 Start: 29476, Stop: 30153, Start Num: 28

Candidate Starts for Footloose\_50:

(18, 29362), (Start: 28 @29476 has 40 MA's), (52, 29626), (58, 29686), (70, 29767), (73, 29815), (80, 29890), (83, 29917), (84, 29929), (102, 30112),

Gene: Frankie\_69 Start: 42916, Stop: 43731, Start Num: 27

Candidate Starts for Frankie\_69:

(Start: 27 @42916 has 1 MA's), (33, 42982), (37, 43018), (47, 43141), (49, 43165), (57, 43258), (58, 43270), (59, 43273), (70, 43351), (73, 43399), (81, 43477), (82, 43492), (86, 43519), (88, 43546), (89, 43564), (90, 43570), (95, 43627), (98, 43657),

Gene: Frickyeah\_73 Start: 41481, Stop: 42299, Start Num: 28

Candidate Starts for Frickyeah\_73:

(22, 41409), (Start: 28 @41481 has 40 MA's), (30, 41493), (35, 41562), (50, 41730), (51, 41739), (57, 41820), (58, 41832), (67, 41898), (68, 41907), (70, 41916), (75, 41982), (76, 41991), (78, 42018), (81, 42042), (82, 42057), (85, 42081), (89, 42129), (98, 42222), (105, 42288), (107, 42291),

Gene: Getalong\_72 Start: 43580, Stop: 44404, Start Num: 28

Candidate Starts for Getalong\_72:

(Start: 28 @43580 has 40 MA's), (29, 43586), (50, 43820), (58, 43922), (63, 43961), (70, 44003), (80, 44126), (82, 44144), (84, 44165), (88, 44198), (89, 44216), (90, 44222), (92, 44237), (98, 44309), (101, 44342), (102, 44348), (103, 44363), (109, 44384),

Gene: Globfish\_68 Start: 36209, Stop: 37027, Start Num: 28

Candidate Starts for Globfish\_68:

(23, 36188), (Start: 28 @36209 has 40 MA's), (36, 36302), (49, 36452), (52, 36497), (58, 36557), (61, 36572), (70, 36638), (75, 36704), (89, 36851), (98, 36944), (99, 36947), (101, 36977), (102, 36983), (106, 37013),

Gene: Gorpy\_67 Start: 36558, Stop: 37238, Start Num: 28

Candidate Starts for Gorpy\_67:

(Start: 28 @36558 has 40 MA's), (29, 36564), (34, 36627), (58, 36768), (61, 36783), (70, 36849), (74, 36900), (82, 36990), (88, 37044), (89, 37062), (95, 37125), (96, 37131), (106, 37224),

Gene: Hestia\_60 Start: 33341, Stop: 34159, Start Num: 28

Candidate Starts for Hestia\_60:

(19, 33233), (Start: 28 @33341 has 40 MA's), (52, 33629), (58, 33689), (70, 33770), (71, 33773), (82, 33911), (86, 33938), (89, 33983), (98, 34076), (99, 34079), (101, 34109), (102, 34115),

Gene: Holliday\_73 Start: 45104, Stop: 45919, Start Num: 28

Candidate Starts for Holliday\_73:

(22, 45032), (Start: 28 @45104 has 40 MA's), (30, 45116), (35, 45185), (50, 45350), (53, 45398), (57, 45440), (58, 45452), (66, 45512), (67, 45518), (68, 45527), (70, 45536), (75, 45602), (76, 45611), (78, 45638), (81, 45662), (82, 45677), (89, 45749), (98, 45842), (105, 45908), (107, 45911),

Gene: Isolde\_66 Start: 35235, Stop: 35915, Start Num: 28

Candidate Starts for Isolde\_66:

(23, 35214), (Start: 28 @35235 has 40 MA's), (29, 35241), (58, 35445), (70, 35526), (74, 35577), (77, 35622), (82, 35667), (88, 35721), (89, 35739), (92, 35760), (95, 35802), (106, 35901),

Gene: Kamaru\_66 Start: 40909, Stop: 41727, Start Num: 28

Candidate Starts for Kamaru\_66:

(22, 40837), (Start: 28 @40909 has 40 MA's), (35, 40990), (50, 41158), (51, 41167), (53, 41206), (54, 41209), (57, 41248), (58, 41260), (67, 41326), (68, 41335), (70, 41344), (75, 41410), (76, 41419), (78, 41446), (81, 41470), (82, 41485), (85, 41509), (89, 41557), (98, 41650), (107, 41719), (108, 41722),

Gene: Kumotta\_51 Start: 30258, Stop: 31076, Start Num: 28

Candidate Starts for Kumotta\_51:

(23, 30237), (Start: 28 @30258 has 40 MA's), (32, 30306), (52, 30546), (56, 30591), (58, 30606), (70, 30687), (73, 30735), (82, 30828), (84, 30849), (89, 30900), (98, 30993), (101, 31026), (106, 31062),

Gene: Lawnathon\_68 Start: 35913, Stop: 36731, Start Num: 28

Candidate Starts for Lawnathon\_68:

(Start: 28 @35913 has 40 MA's), (36, 36006), (52, 36201), (56, 36246), (58, 36261), (61, 36276), (70, 36342), (75, 36408), (89, 36555), (98, 36648), (99, 36651), (101, 36681), (102, 36687), (106, 36717),

Gene: Leroy\_69 Start: 41325, Stop: 42143, Start Num: 28

Candidate Starts for Leroy\_69:

(Start: 28 @41325 has 40 MA's), (29, 41331), (35, 41406), (50, 41574), (51, 41583), (57, 41664), (58, 41676), (66, 41736), (67, 41742), (68, 41751), (70, 41760), (72, 41787), (78, 41862), (82, 41901), (89, 41973), (98, 42066), (107, 42135), (108, 42138),

Gene: Lton\_48 Start: 30793, Stop: 31626, Start Num: 28

Candidate Starts for Lton\_48:

(Start: 28 @30793 has 40 MA's), (29, 30799), (34, 30862), (35, 30874), (57, 31129), (58, 31141), (66, 31201), (67, 31207), (68, 31216), (70, 31225), (76, 31300), (78, 31327), (82, 31366), (85, 31390), (86, 31393), (88, 31420), (89, 31438), (98, 31531), (103, 31585), (109, 31606),

Gene: Lucky10\_49 Start: 33511, Stop: 34326, Start Num: 28

Candidate Starts for Lucky10\_49:

(10, 33277), (17, 33370), (Start: 28 @33511 has 40 MA's), (29, 33517), (34, 33580), (35, 33592), (50, 33757), (51, 33766), (57, 33847), (58, 33859), (67, 33925), (68, 33934), (70, 33943), (78, 34045), (82, 34084), (85, 34108), (89, 34156), (98, 34249), (107, 34318), (108, 34321),

Gene: Lutum\_72 Start: 42183, Stop: 43007, Start Num: 28

Candidate Starts for Lutum\_72:

(Start: 28 @42183 has 40 MA's), (29, 42189), (50, 42423), (58, 42525), (63, 42564), (70, 42606), (80, 42729), (82, 42747), (84, 42768), (88, 42801), (89, 42819), (90, 42825), (92, 42840), (98, 42912), (101, 42945), (102, 42951), (103, 42966), (109, 42987),

Gene: Malisha\_74 Start: 45847, Stop: 46662, Start Num: 28

Candidate Starts for Malisha\_74:



(22, 45775), (Start: 28 @45847 has 40 MA's), (51, 46102), (53, 46141), (54, 46144), (57, 46183), (58, 46195), (67, 46261), (68, 46270), (70, 46279), (78, 46381), (81, 46405), (82, 46420), (86, 46447), (89, 46492), (94, 46540), (97, 46579), (98, 46585), (105, 46651), (107, 46654),

Gene: MargaretKali\_47 Start: 28876, Stop: 29694, Start Num: 28

Candidate Starts for MargaretKali\_47:

(Start: 28 @28876 has 40 MA's), (31, 28900), (52, 29164), (56, 29209), (58, 29224), (70, 29305), (73, 29353), (82, 29446), (84, 29467), (89, 29518), (98, 29611), (101, 29644), (106, 29680),

Gene: Moosehead\_52 Start: 31917, Stop: 32753, Start Num: 28

Candidate Starts for Moosehead\_52:

(11, 31698), (Start: 28 @31917 has 40 MA's), (39, 32037), (52, 32208), (53, 32214), (57, 32259), (58, 32271), (60, 32283), (67, 32334), (79, 32463), (82, 32493), (89, 32565), (90, 32571), (92, 32586), (109, 32733),

Gene: Morkie\_52 Start: 33040, Stop: 33855, Start Num: 28

Candidate Starts for Morkie\_52:

(1, 32491), (2, 32521), (7, 32614), (8, 32707), (16, 32881), (20, 32911), (24, 33028), (Start: 28 @33040 has 40 MA's), (34, 33109), (35, 33121), (50, 33286), (51, 33295), (57, 33376), (58, 33388), (66, 33448), (67, 33454), (68, 33463), (70, 33472), (75, 33538), (76, 33547), (78, 33574), (81, 33598), (82, 33613), (88, 33667), (89, 33685), (98, 33778), (107, 33847), (108, 33850),

Gene: MulchSalad\_63 Start: 38756, Stop: 39574, Start Num: 26

Candidate Starts for MulchSalad\_63:

(26, 38756), (Start: 27 @38759 has 1 MA's), (33, 38825), (37, 38861), (49, 39008), (57, 39101), (58, 39113), (59, 39116), (70, 39194), (73, 39242), (82, 39335), (86, 39362), (88, 39389), (89, 39407), (90, 39413), (95, 39470), (98, 39500),

Gene: OneDirection\_46 Start: 30433, Stop: 31248, Start Num: 28

Candidate Starts for OneDirection\_46:

(7, 30007), (8, 30100), (16, 30274), (20, 30304), (24, 30421), (Start: 28 @30433 has 40 MA's), (34, 30502), (35, 30514), (50, 30679), (51, 30688), (53, 30727), (54, 30730), (57, 30769), (58, 30781), (67, 30847), (68, 30856), (70, 30865), (78, 30967), (81, 30991), (82, 31006), (88, 31060), (89, 31078), (98, 31171), (107, 31240), (108, 31243),

Gene: Pepperoni\_48 Start: 32196, Stop: 33011, Start Num: 28

Candidate Starts for Pepperoni\_48:

(16, 32037), (20, 32067), (24, 32184), (Start: 28 @32196 has 40 MA's), (34, 32265), (35, 32277), (50, 32442), (51, 32451), (57, 32532), (58, 32544), (66, 32604), (67, 32610), (68, 32619), (70, 32628), (75, 32694), (76, 32703), (78, 32730), (81, 32754), (82, 32769), (88, 32823), (89, 32841), (98, 32934), (107, 33003), (108, 33006),

Gene: Periwinkle\_79 Start: 44489, Stop: 45307, Start Num: 28

Candidate Starts for Periwinkle\_79:

(22, 44417), (Start: 28 @44489 has 40 MA's), (30, 44501), (35, 44570), (53, 44786), (57, 44828), (58, 44840), (67, 44906), (68, 44915), (70, 44924), (75, 44990), (76, 44999), (78, 45026), (81, 45050), (82, 45065), (85, 45089), (89, 45137), (98, 45230), (107, 45299), (108, 45302),

Gene: Phistory\_68 Start: 40554, Stop: 41372, Start Num: 28

Candidate Starts for Phistory\_68:

(22, 40482), (Start: 28 @40554 has 40 MA's), (30, 40566), (35, 40635), (50, 40803), (51, 40812), (53, 40851), (54, 40854), (57, 40893), (58, 40905), (66, 40965), (67, 40971), (68, 40980), (70, 40989), (72, 41016), (78, 41091), (82, 41130), (89, 41202), (98, 41295), (107, 41364), (108, 41367),

Gene: PhorbesPhlower\_49 Start: 31974, Stop: 32810, Start Num: 28

Candidate Starts for PhorbesPhlower\_49:

(Start: 28 @31974 has 40 MA's), (29, 31980), (39, 32094), (52, 32265), (57, 32316), (58, 32328), (60, 32340), (67, 32391), (74, 32460), (76, 32484), (79, 32520), (82, 32550), (89, 32622), (90, 32628), (109, 32790), (110, 32796),

Gene: Phrank15\_70 Start: 36044, Stop: 36862, Start Num: 28

Candidate Starts for Phrank15\_70:

(23, 36023), (Start: 28 @36044 has 40 MA's), (36, 36137), (52, 36332), (56, 36377), (58, 36392), (61, 36407), (70, 36473), (75, 36539), (89, 36686), (98, 36779), (99, 36782), (101, 36812), (102, 36818), (106, 36848),

Gene: REQ2\_57 Start: 38376, Stop: 39203, Start Num: 25

Candidate Starts for REQ2\_57:

(20, 38250), (25, 38376), (43, 38562), (50, 38637), (58, 38739), (67, 38802), (69, 38817), (70, 38820), (82, 38961), (86, 38988), (89, 39033), (91, 39045), (95, 39096), (98, 39126), (104, 39186), (105, 39192), (107, 39195),

Gene: Raphaella\_68 Start: 35611, Stop: 36429, Start Num: 28

Candidate Starts for Raphaella\_68:

(Start: 28 @35611 has 40 MA's), (36, 35704), (52, 35899), (56, 35944), (58, 35959), (61, 35974), (70, 36040), (75, 36106), (89, 36253), (98, 36346), (99, 36349), (101, 36379), (102, 36385), (106, 36415),

Gene: Raqqa\_63 Start: 33880, Stop: 34560, Start Num: 28

Candidate Starts for Raqqa\_63:

(4, 33424), (5, 33427), (6, 33457), (9, 33586), (12, 33667), (13, 33703), (21, 33808), (Start: 28 @33880 has 40 MA's), (55, 34072), (58, 34090), (70, 34171), (82, 34312), (89, 34384), (106, 34546),

Gene: Richie\_71 Start: 37416, Stop: 38234, Start Num: 28

Candidate Starts for Richie\_71:

(Start: 28 @37416 has 40 MA's), (36, 37509), (52, 37704), (56, 37749), (58, 37764), (61, 37779), (70, 37845), (75, 37911), (89, 38058), (98, 38151), (99, 38154), (101, 38184), (102, 38190), (106, 38220),

Gene: Sakai\_66 Start: 35269, Stop: 35949, Start Num: 28

Candidate Starts for Sakai\_66:

(Start: 28 @35269 has 40 MA's), (29, 35275), (34, 35338), (58, 35479), (61, 35494), (70, 35560), (74, 35611), (82, 35701), (88, 35755), (89, 35773), (95, 35836), (96, 35842), (106, 35935),

Gene: Sarge\_46 Start: 27598, Stop: 28278, Start Num: 28

Candidate Starts for Sarge\_46:

(14, 27430), (15, 27436), (21, 27526), (Start: 28 @27598 has 40 MA's), (55, 27790), (58, 27808), (70, 27889), (82, 28030), (89, 28102), (106, 28264),

Gene: Sashimi\_68 Start: 36533, Stop: 37351, Start Num: 28

Candidate Starts for Sashimi\_68:

(Start: 28 @36533 has 40 MA's), (52, 36821), (53, 36827), (55, 36863), (58, 36881), (70, 36962), (71, 36965), (81, 37088), (82, 37103), (86, 37130), (89, 37175), (98, 37268), (99, 37271), (101, 37301), (102, 37307),

Gene: SpicyFrank\_71 Start: 36831, Stop: 37649, Start Num: 28

Candidate Starts for SpicyFrank\_71:

(23, 36810), (Start: 28 @36831 has 40 MA's), (32, 36879), (36, 36924), (49, 37074), (52, 37119), (58, 37179), (61, 37194), (70, 37260), (75, 37326), (89, 37473), (98, 37566), (99, 37569), (101, 37599), (102, 37605), (106, 37635),

Gene: TJE1\_54 Start: 41888, Stop: 42547, Start Num: 40

Candidate Starts for TJE1\_54:

(40, 41888), (45, 41945), (46, 41963), (48, 41975), (62, 42125), (64, 42134), (67, 42155), (68, 42164), (70, 42173), (82, 42320), (83, 42329), (84, 42341), (87, 42365), (91, 42404), (93, 42425), (100, 42500),

Gene: ThayneTheZag\_72 Start: 36048, Stop: 36866, Start Num: 28

Candidate Starts for ThayneTheZag\_72:

(23, 36027), (Start: 28 @36048 has 40 MA's), (36, 36141), (52, 36336), (56, 36381), (58, 36396), (61, 36411), (68, 36468), (70, 36477), (75, 36543), (89, 36690), (98, 36783), (99, 36786), (101, 36816), (102, 36822), (106, 36852),

Gene: Tiff81\_69 Start: 34216, Stop: 34896, Start Num: 28

Candidate Starts for Tiff81\_69:

(23, 34195), (Start: 28 @34216 has 40 MA's), (29, 34222), (58, 34426), (61, 34441), (70, 34507), (74, 34558), (82, 34648), (88, 34702), (89, 34720), (106, 34882),

Gene: Whitney\_69 Start: 42761, Stop: 43576, Start Num: 28

Candidate Starts for Whitney\_69:

(22, 42689), (Start: 28 @42761 has 40 MA's), (30, 42773), (35, 42842), (50, 43007), (53, 43055), (57, 43097), (58, 43109), (65, 43166), (66, 43169), (67, 43175), (68, 43184), (70, 43193), (78, 43295), (82, 43334), (86, 43361), (88, 43388), (89, 43406), (97, 43493), (98, 43499), (107, 43568), (108, 43571),

Gene: YoungHarleezy\_67 Start: 35964, Stop: 36644, Start Num: 28

Candidate Starts for YoungHarleezy\_67:

(Start: 28 @35964 has 40 MA's), (29, 35970), (58, 36174), (61, 36189), (70, 36255), (74, 36306), (77, 36351), (82, 36396), (89, 36468), (92, 36489), (94, 36516), (95, 36531), (106, 36630),