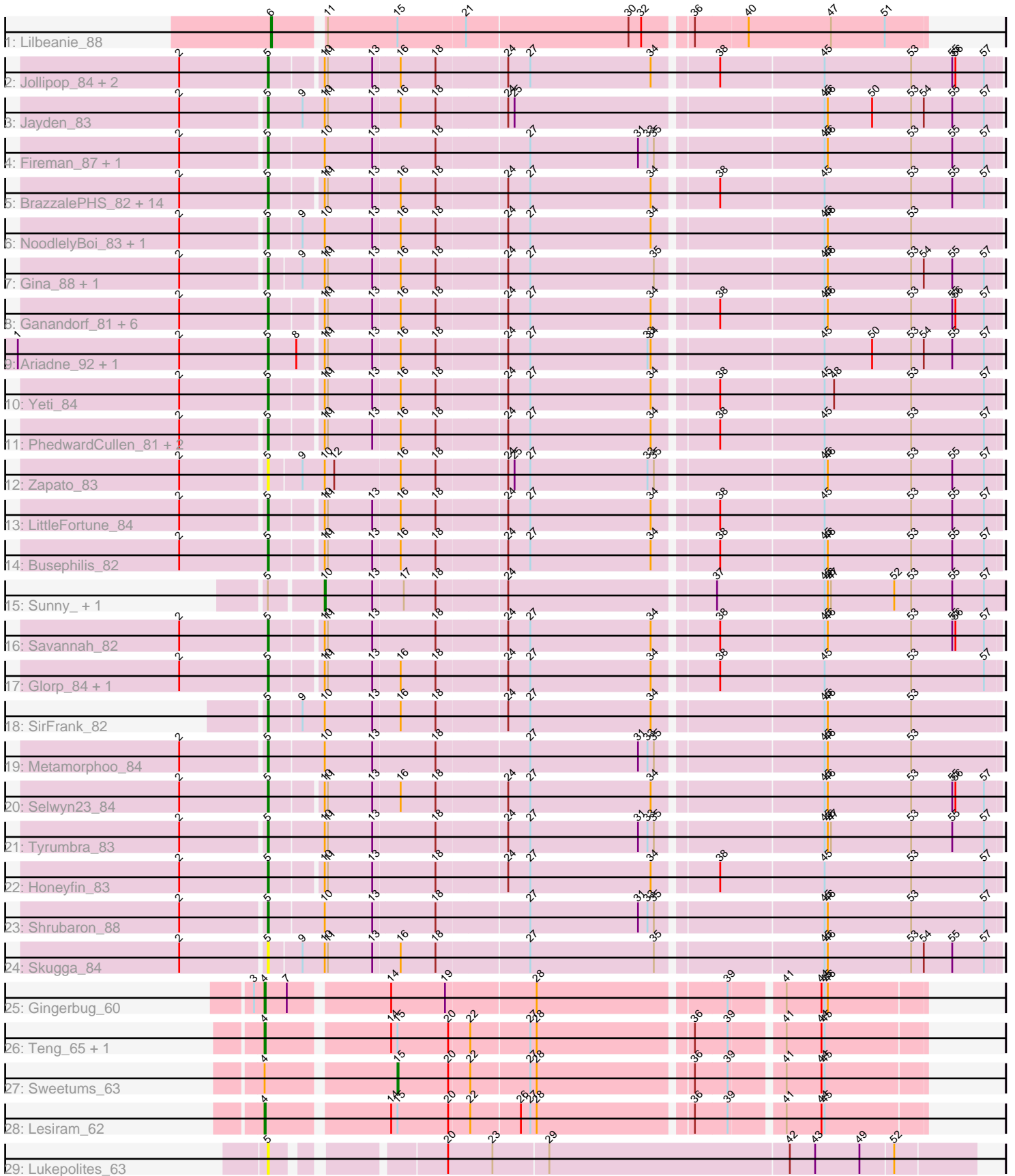


Pham 311621



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 311621 Report

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

Pham number 311621 has 60 members, 8 are drafts.

Phages represented in each track:

- Track 1 : Lilbeanie\_88
- Track 2 : Jollipop\_84, Germa\_85, Hermeonysus\_83
- Track 3 : Jayden\_83
- Track 4 : Fireman\_87, RobsFeet\_90
- Track 5 : BrazzalePHS\_82, Onika\_82, Paschalis\_83, PierreOrion\_82, Kowalski\_82, Phrancesco\_83, Rockwell\_82, KaiHaiDragon\_84, BeagleBug\_82, Jefe\_83, Quhwah\_87, Ramiel05\_82, EarickHC\_84, Shotgun\_82, Antares\_83
- Track 6 : NoodlelyBoi\_83, ClearAsMud\_86
- Track 7 : Gina\_88, Teamocil\_88
- Track 8 : Ganandorf\_81, Piperis\_84, Crisis\_84, Cranjjs\_84, Scumberland\_85, Pulchra\_85, Lucretia\_83
- Track 9 : Ariadne\_92, Smarties\_92
- Track 10 : Yeti\_84
- Track 11 : PhedwardCullen\_81, PiperSansNom\_84, CrazyRich\_81
- Track 12 : Zapato\_83
- Track 13 : LittleFortune\_84
- Track 14 : Busephilis\_82
- Track 15 : Sunny\_, Merry\_
- Track 16 : Savannah\_82
- Track 17 : Glorp\_84, Phorgeous\_83
- Track 18 : SirFrank\_82
- Track 19 : Metamorphoo\_84
- Track 20 : Selwyn23\_84
- Track 21 : Tyumbra\_83
- Track 22 : Honeyfin\_83
- Track 23 : Shrubaron\_88
- Track 24 : Skugga\_84
- Track 25 : Gingerbug\_60
- Track 26 : Teng\_65, DelaGarza\_61
- Track 27 : Sweetums\_63
- Track 28 : Lesiram\_62
- Track 29 : Lukepolites\_63

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

The start number called the most often in the published annotations is 5, it was called in 45 of the 52 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Antares\_83, Ariadne\_92, BeagleBug\_82, BrazzalePHS\_82, Busephilis\_82, ClearAsMud\_86, Cranjis\_84, CrazyRich\_81, Crisis\_84, EarickHC\_84, Fireman\_87, Ganandorf\_81, Germa\_85, Gina\_88, Glorp\_84, Hermeonysus\_83, Honeyfin\_83, Jayden\_83, Jefe\_83, Jollipop\_84, KaiHaiDragon\_84, Kowalski\_82, LittleFortune\_84, Lucretia\_83, Lukepolites\_63, Metamorphoo\_84, NoodlelyBoi\_83, Onika\_82, Paschalis\_83, PhedwardCullen\_81, Phorgeous\_83, Phrancesco\_83, PierreOrion\_82, PiperSansNom\_84, Piperis\_84, Pulchra\_85, Quhwah\_87, Ramiel05\_82, RobsFeet\_90, Rockwell\_82, Savannah\_82, Scumberland\_85, Selwyn23\_84, Shotgun\_82, Shrubaron\_88, SirFrank\_82, Skugga\_84, Smarties\_92, Teamocil\_88, Tyrumbra\_83, Yeti\_84, Zapato\_83,

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

- Merry\_, Sunny\_,

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

- DelaGarza\_61, Gingerbug\_60, Lesiram\_62, Lilbeanie\_88, Sweetums\_63, Teng\_65,

### Summary by start number:

Start 4:

- Found in 5 of 60 ( 8.3% ) of genes in pham
- Manual Annotations of this start: 3 of 52
- Called 80.0% of time when present
- Phage (with cluster) where this start called: DelaGarza\_61 (GF), Gingerbug\_60 (GF), Lesiram\_62 (GF), Teng\_65 (GF),

Start 5:

- Found in 54 of 60 ( 90.0% ) of genes in pham
- Manual Annotations of this start: 45 of 52
- Called 96.3% of time when present
- Phage (with cluster) where this start called: Antares\_83 (EC), Ariadne\_92 (EC), BeagleBug\_82 (EC), BrazzalePHS\_82 (EC), Busephilis\_82 (EC), ClearAsMud\_86 (EC), Cranjis\_84 (EC), CrazyRich\_81 (EC), Crisis\_84 (EC), EarickHC\_84 (EC), Fireman\_87 (EC), Ganandorf\_81 (EC), Germa\_85 (EC), Gina\_88 (EC), Glorp\_84 (EC), Hermeonysus\_83 (EC), Honeyfin\_83 (EC), Jayden\_83 (EC), Jefe\_83 (EC), Jollipop\_84 (EC), KaiHaiDragon\_84 (EC), Kowalski\_82 (EC), LittleFortune\_84 (EC), Lucretia\_83 (EC), Lukepolites\_63 (singleton), Metamorphoo\_84 (EC), NoodlelyBoi\_83 (EC), Onika\_82 (EC), Paschalis\_83 (EC), PhedwardCullen\_81 (EC), Phorgeous\_83 (EC), Phrancesco\_83 (EC), PierreOrion\_82 (EC), PiperSansNom\_84 (EC), Piperis\_84 (EC), Pulchra\_85 (EC), Quhwah\_87 (EC), Ramiel05\_82 (EC), RobsFeet\_90 (EC), Rockwell\_82 (EC), Savannah\_82 (EC), Scumberland\_85 (EC), Selwyn23\_84 (EC), Shotgun\_82 (EC), Shrubaron\_88 (EC), SirFrank\_82 (EC), Skugga\_84 (EC), Smarties\_92 (EC), Teamocil\_88 (EC), Tyrumbra\_83 (EC), Yeti\_84 (EC), Zapato\_83 (EC),

Start 6:

- Found in 1 of 60 ( 1.7% ) of genes in pham
- Manual Annotations of this start: 1 of 52

- Called 100.0% of time when present
- Phage (with cluster) where this start called: Lilbeanie\_88 (DE5),

Start 10:

- Found in 53 of 60 ( 88.3% ) of genes in pham
- Manual Annotations of this start: 2 of 52
- Called 3.8% of time when present
- Phage (with cluster) where this start called: Merry\_ (EC), Sunny\_ (EC),

Start 15:

- Found in 5 of 60 ( 8.3% ) of genes in pham
- Manual Annotations of this start: 1 of 52
- Called 20.0% of time when present
- Phage (with cluster) where this start called: Sweetums\_63 (GF),

### **Summary by clusters:**

There are 4 clusters represented in this pham: GF, singleton, DE5, EC,

Info for manual annotations of cluster DE5:

- Start number 6 was manually annotated 1 time for cluster DE5.

Info for manual annotations of cluster EC:

- Start number 5 was manually annotated 45 times for cluster EC.
- Start number 10 was manually annotated 2 times for cluster EC.

Info for manual annotations of cluster GF:

- Start number 4 was manually annotated 3 times for cluster GF.
- Start number 15 was manually annotated 1 time for cluster GF.

### **Gene Information:**

Gene: Antares\_83 Start: 49113, Stop: 49772, Start Num: 5

Candidate Starts for Antares\_83:

(2, 49029), (Start: 5 @49113 has 45 MA's), (Start: 10 @49158 has 2 MA's), (11, 49161), (13, 49203), (16, 49227), (18, 49260), (24, 49323), (27, 49344), (34, 49458), (38, 49512), (45, 49608), (53, 49689), (55, 49728), (57, 49758),

Gene: Ariadne\_92 Start: 49948, Stop: 50610, Start Num: 5

Candidate Starts for Ariadne\_92:

(1, 49711), (2, 49864), (Start: 5 @49948 has 45 MA's), (8, 49975), (Start: 10 @49996 has 2 MA's), (11, 49999), (13, 50041), (16, 50065), (18, 50098), (24, 50161), (27, 50182), (33, 50293), (34, 50296), (45, 50446), (50, 50491), (53, 50527), (54, 50539), (55, 50566), (57, 50596),

Gene: BeagleBug\_82 Start: 48916, Stop: 49575, Start Num: 5

Candidate Starts for BeagleBug\_82:

(2, 48832), (Start: 5 @48916 has 45 MA's), (Start: 10 @48961 has 2 MA's), (11, 48964), (13, 49006), (16, 49030), (18, 49063), (24, 49126), (27, 49147), (34, 49261), (38, 49315), (45, 49411), (53, 49492), (55, 49531), (57, 49561),

Gene: BrazzalePHS\_82 Start: 48913, Stop: 49572, Start Num: 5

Candidate Starts for BrazzalePHS\_82:

(2, 48829), (Start: 5 @48913 has 45 MA's), (Start: 10 @48958 has 2 MA's), (11, 48961), (13, 49003), (16, 49027), (18, 49060), (24, 49123), (27, 49144), (34, 49258), (38, 49312), (45, 49408), (53, 49489), (55, 49528), (57, 49558),

Gene: Busephilis\_82 Start: 48820, Stop: 49479, Start Num: 5

Candidate Starts for Busephilis\_82:

(2, 48736), (Start: 5 @48820 has 45 MA's), (Start: 10 @48865 has 2 MA's), (11, 48868), (13, 48910), (16, 48934), (18, 48967), (24, 49030), (27, 49051), (34, 49165), (38, 49219), (45, 49315), (46, 49318), (53, 49396), (55, 49435), (57, 49465),

Gene: ClearAsMud\_86 Start: 49132, Stop: 49797, Start Num: 5

Candidate Starts for ClearAsMud\_86:

(2, 49054), (Start: 5 @49132 has 45 MA's), (9, 49162), (Start: 10 @49183 has 2 MA's), (13, 49228), (16, 49252), (18, 49285), (24, 49348), (27, 49369), (34, 49483), (45, 49633), (46, 49636), (53, 49714),

Gene: Cranjis\_84 Start: 49100, Stop: 49759, Start Num: 5

Candidate Starts for Cranjis\_84:

(2, 49016), (Start: 5 @49100 has 45 MA's), (Start: 10 @49145 has 2 MA's), (11, 49148), (13, 49190), (16, 49214), (18, 49247), (24, 49310), (27, 49331), (34, 49445), (38, 49499), (45, 49595), (46, 49598), (53, 49676), (55, 49715), (56, 49718), (57, 49745),

Gene: CrazyRich\_81 Start: 48604, Stop: 49263, Start Num: 5

Candidate Starts for CrazyRich\_81:

(2, 48526), (Start: 5 @48604 has 45 MA's), (Start: 10 @48649 has 2 MA's), (11, 48652), (13, 48694), (16, 48718), (18, 48751), (24, 48814), (27, 48835), (34, 48949), (38, 49003), (45, 49099), (53, 49180), (57, 49249),

Gene: Crisis\_84 Start: 49056, Stop: 49715, Start Num: 5

Candidate Starts for Crisis\_84:

(2, 48972), (Start: 5 @49056 has 45 MA's), (Start: 10 @49101 has 2 MA's), (11, 49104), (13, 49146), (16, 49170), (18, 49203), (24, 49266), (27, 49287), (34, 49401), (38, 49455), (45, 49551), (46, 49554), (53, 49632), (55, 49671), (56, 49674), (57, 49701),

Gene: DelaGarza\_61 Start: 35855, Stop: 35274, Start Num: 4

Candidate Starts for DelaGarza\_61:

(Start: 4 @35855 has 3 MA's), (14, 35747), (Start: 15 @35741 has 1 MA's), (20, 35693), (22, 35675), (27, 35621), (28, 35615), (36, 35477), (39, 35447), (41, 35402), (44, 35369), (45, 35366),

Gene: EarickHC\_84 Start: 48978, Stop: 49637, Start Num: 5

Candidate Starts for EarickHC\_84:

(2, 48894), (Start: 5 @48978 has 45 MA's), (Start: 10 @49023 has 2 MA's), (11, 49026), (13, 49068), (16, 49092), (18, 49125), (24, 49188), (27, 49209), (34, 49323), (38, 49377), (45, 49473), (53, 49554), (55, 49593), (57, 49623),

Gene: Fireman\_87 Start: 50364, Stop: 51029, Start Num: 5

Candidate Starts for Fireman\_87:

(2, 50286), (Start: 5 @50364 has 45 MA's), (Start: 10 @50415 has 2 MA's), (13, 50460), (18, 50517), (27, 50601), (31, 50703), (33, 50712), (35, 50718), (45, 50865), (46, 50868), (53, 50946), (55, 50985), (57, 51015),

Gene: Ganandorf\_81 Start: 48464, Stop: 49123, Start Num: 5

Candidate Starts for Ganandorf\_81:

(2, 48380), (Start: 5 @48464 has 45 MA's), (Start: 10 @48509 has 2 MA's), (11, 48512), (13, 48554), (16, 48578), (18, 48611), (24, 48674), (27, 48695), (34, 48809), (38, 48863), (45, 48959), (46, 48962), (53, 49040), (55, 49079), (56, 49082), (57, 49109),

Gene: Germa\_85 Start: 48908, Stop: 49567, Start Num: 5

Candidate Starts for Germa\_85:

(2, 48824), (Start: 5 @48908 has 45 MA's), (Start: 10 @48953 has 2 MA's), (11, 48956), (13, 48998), (16, 49022), (18, 49055), (24, 49118), (27, 49139), (34, 49253), (38, 49307), (45, 49403), (53, 49484), (55, 49523), (56, 49526), (57, 49553),

Gene: Gina\_88 Start: 48970, Stop: 49635, Start Num: 5

Candidate Starts for Gina\_88:

(2, 48892), (Start: 5 @48970 has 45 MA's), (9, 49000), (Start: 10 @49021 has 2 MA's), (11, 49024), (13, 49066), (16, 49090), (18, 49123), (24, 49186), (27, 49207), (35, 49324), (45, 49471), (46, 49474), (53, 49552), (54, 49564), (55, 49591), (57, 49621),

Gene: Gingerbug\_60 Start: 36358, Stop: 35777, Start Num: 4

Candidate Starts for Gingerbug\_60:

(3, 36367), (Start: 4 @36358 has 3 MA's), (7, 36337), (14, 36250), (19, 36199), (28, 36118), (39, 35950), (41, 35905), (44, 35872), (45, 35869), (46, 35866),

Gene: Glorp\_84 Start: 48865, Stop: 49524, Start Num: 5

Candidate Starts for Glorp\_84:

(2, 48781), (Start: 5 @48865 has 45 MA's), (Start: 10 @48910 has 2 MA's), (11, 48913), (13, 48955), (16, 48979), (18, 49012), (24, 49075), (27, 49096), (34, 49210), (38, 49264), (45, 49360), (53, 49441), (57, 49510),

Gene: Hermeonysus\_83 Start: 48821, Stop: 49480, Start Num: 5

Candidate Starts for Hermeonysus\_83:

(2, 48737), (Start: 5 @48821 has 45 MA's), (Start: 10 @48866 has 2 MA's), (11, 48869), (13, 48911), (16, 48935), (18, 48968), (24, 49031), (27, 49052), (34, 49166), (38, 49220), (45, 49316), (53, 49397), (55, 49436), (56, 49439), (57, 49466),

Gene: Honeyfin\_83 Start: 48654, Stop: 49313, Start Num: 5

Candidate Starts for Honeyfin\_83:

(2, 48570), (Start: 5 @48654 has 45 MA's), (Start: 10 @48699 has 2 MA's), (11, 48702), (13, 48744), (18, 48801), (24, 48864), (27, 48885), (34, 48999), (38, 49053), (45, 49149), (53, 49230), (57, 49299),

Gene: Jayden\_83 Start: 48575, Stop: 49243, Start Num: 5

Candidate Starts for Jayden\_83:

(2, 48497), (Start: 5 @48575 has 45 MA's), (9, 48608), (Start: 10 @48629 has 2 MA's), (11, 48632), (13, 48674), (16, 48698), (18, 48731), (24, 48794), (25, 48800), (45, 49079), (46, 49082), (50, 49124), (53, 49160), (54, 49172), (55, 49199), (57, 49229),

Gene: Jefe\_83 Start: 48876, Stop: 49535, Start Num: 5

Candidate Starts for Jefe\_83:

(2, 48792), (Start: 5 @48876 has 45 MA's), (Start: 10 @48921 has 2 MA's), (11, 48924), (13, 48966), (16, 48990), (18, 49023), (24, 49086), (27, 49107), (34, 49221), (38, 49275), (45, 49371), (53, 49452), (55, 49491), (57, 49521),

Gene: Jollipop\_84 Start: 49241, Stop: 49900, Start Num: 5

Candidate Starts for Jollipop\_84:

(2, 49157), (Start: 5 @49241 has 45 MA's), (Start: 10 @49286 has 2 MA's), (11, 49289), (13, 49331), (16, 49355), (18, 49388), (24, 49451), (27, 49472), (34, 49586), (38, 49640), (45, 49736), (53, 49817), (55, 49856), (56, 49859), (57, 49886),

Gene: KaiHaiDragon\_84 Start: 48978, Stop: 49637, Start Num: 5

Candidate Starts for KaiHaiDragon\_84:

(2, 48894), (Start: 5 @48978 has 45 MA's), (Start: 10 @49023 has 2 MA's), (11, 49026), (13, 49068), (16, 49092), (18, 49125), (24, 49188), (27, 49209), (34, 49323), (38, 49377), (45, 49473), (53, 49554), (55, 49593), (57, 49623),

Gene: Kowalski\_82 Start: 48908, Stop: 49567, Start Num: 5

Candidate Starts for Kowalski\_82:

(2, 48824), (Start: 5 @48908 has 45 MA's), (Start: 10 @48953 has 2 MA's), (11, 48956), (13, 48998), (16, 49022), (18, 49055), (24, 49118), (27, 49139), (34, 49253), (38, 49307), (45, 49403), (53, 49484), (55, 49523), (57, 49553),

Gene: Lesiram\_62 Start: 36108, Stop: 35527, Start Num: 4

Candidate Starts for Lesiram\_62:

(Start: 4 @36108 has 3 MA's), (14, 36000), (Start: 15 @35994 has 1 MA's), (20, 35946), (22, 35928), (26, 35883), (27, 35874), (28, 35868), (36, 35730), (39, 35700), (41, 35655), (44, 35622), (45, 35619),

Gene: Lilbeanie\_88 Start: 53927, Stop: 54514, Start Num: 6

Candidate Starts for Lilbeanie\_88:

(Start: 6 @53927 has 1 MA's), (11, 53969), (Start: 15 @54035 has 1 MA's), (21, 54098), (30, 54248), (32, 54260), (36, 54299), (40, 54347), (47, 54425), (51, 54476),

Gene: LittleFortune\_84 Start: 48891, Stop: 49550, Start Num: 5

Candidate Starts for LittleFortune\_84:

(2, 48813), (Start: 5 @48891 has 45 MA's), (Start: 10 @48936 has 2 MA's), (11, 48939), (13, 48981), (16, 49005), (18, 49038), (24, 49101), (27, 49122), (34, 49236), (38, 49290), (45, 49386), (53, 49467), (55, 49506), (57, 49536),

Gene: Lucretia\_83 Start: 48950, Stop: 49609, Start Num: 5

Candidate Starts for Lucretia\_83:

(2, 48866), (Start: 5 @48950 has 45 MA's), (Start: 10 @48995 has 2 MA's), (11, 48998), (13, 49040), (16, 49064), (18, 49097), (24, 49160), (27, 49181), (34, 49295), (38, 49349), (45, 49445), (46, 49448), (53, 49526), (55, 49565), (56, 49568), (57, 49595),

Gene: Lukepolites\_63 Start: 41719, Stop: 42342, Start Num: 5

Candidate Starts for Lukepolites\_63:

(Start: 5 @41719 has 45 MA's), (20, 41854), (23, 41896), (29, 41947), (42, 42172), (43, 42196), (49, 42238), (52, 42268),

Gene: Merry\_ Start: 49109, Stop: 49729, Start Num: 10

Candidate Starts for Merry\_:

(Start: 5 @49061 has 45 MA's), (Start: 10 @49109 has 2 MA's), (13, 49154), (17, 49181), (18, 49211), (24, 49274), (37, 49460), (45, 49559), (46, 49562), (47, 49565), (52, 49625), (53, 49640), (55, 49679), (57, 49709),

Gene: Metamorphoo\_84 Start: 49657, Stop: 50322, Start Num: 5

Candidate Starts for Metamorphoo\_84:

(2, 49579), (Start: 5 @49657 has 45 MA's), (Start: 10 @49708 has 2 MA's), (13, 49753), (18, 49810), (27, 49894), (31, 49996), (33, 50005), (35, 50011), (45, 50158), (46, 50161), (53, 50239),

Gene: NoodlelyBoi\_83 Start: 49237, Stop: 49902, Start Num: 5

Candidate Starts for NoodlelyBoi\_83:

(2, 49159), (Start: 5 @49237 has 45 MA's), (9, 49267), (Start: 10 @49288 has 2 MA's), (13, 49333), (16, 49357), (18, 49390), (24, 49453), (27, 49474), (34, 49588), (45, 49738), (46, 49741), (53, 49819),

Gene: Onika\_82 Start: 48879, Stop: 49538, Start Num: 5

Candidate Starts for Onika\_82:

(2, 48795), (Start: 5 @48879 has 45 MA's), (Start: 10 @48924 has 2 MA's), (11, 48927), (13, 48969), (16, 48993), (18, 49026), (24, 49089), (27, 49110), (34, 49224), (38, 49278), (45, 49374), (53, 49455), (55, 49494), (57, 49524),

Gene: Paschalis\_83 Start: 48906, Stop: 49565, Start Num: 5

Candidate Starts for Paschalis\_83:

(2, 48822), (Start: 5 @48906 has 45 MA's), (Start: 10 @48951 has 2 MA's), (11, 48954), (13, 48996), (16, 49020), (18, 49053), (24, 49116), (27, 49137), (34, 49251), (38, 49305), (45, 49401), (53, 49482), (55, 49521), (57, 49551),

Gene: PhedwardCullen\_81 Start: 48351, Stop: 49010, Start Num: 5

Candidate Starts for PhedwardCullen\_81:

(2, 48273), (Start: 5 @48351 has 45 MA's), (Start: 10 @48396 has 2 MA's), (11, 48399), (13, 48441), (16, 48465), (18, 48498), (24, 48561), (27, 48582), (34, 48696), (38, 48750), (45, 48846), (53, 48927), (57, 48996),

Gene: Phorgeous\_83 Start: 48695, Stop: 49354, Start Num: 5

Candidate Starts for Phorgeous\_83:

(2, 48611), (Start: 5 @48695 has 45 MA's), (Start: 10 @48740 has 2 MA's), (11, 48743), (13, 48785), (16, 48809), (18, 48842), (24, 48905), (27, 48926), (34, 49040), (38, 49094), (45, 49190), (53, 49271), (57, 49340),

Gene: Phrancesco\_83 Start: 49006, Stop: 49665, Start Num: 5

Candidate Starts for Phrancesco\_83:

(2, 48922), (Start: 5 @49006 has 45 MA's), (Start: 10 @49051 has 2 MA's), (11, 49054), (13, 49096), (16, 49120), (18, 49153), (24, 49216), (27, 49237), (34, 49351), (38, 49405), (45, 49501), (53, 49582), (55, 49621), (57, 49651),

Gene: PierreOrion\_82 Start: 48715, Stop: 49374, Start Num: 5

Candidate Starts for PierreOrion\_82:

(2, 48631), (Start: 5 @48715 has 45 MA's), (Start: 10 @48760 has 2 MA's), (11, 48763), (13, 48805), (16, 48829), (18, 48862), (24, 48925), (27, 48946), (34, 49060), (38, 49114), (45, 49210), (53, 49291), (55, 49330), (57, 49360),

Gene: PiperSansNom\_84 Start: 49209, Stop: 49868, Start Num: 5

Candidate Starts for PiperSansNom\_84:

(2, 49131), (Start: 5 @49209 has 45 MA's), (Start: 10 @49254 has 2 MA's), (11, 49257), (13, 49299), (16, 49323), (18, 49356), (24, 49419), (27, 49440), (34, 49554), (38, 49608), (45, 49704), (53, 49785), (57, 49854),

Gene: Piperis\_84 Start: 48814, Stop: 49473, Start Num: 5

Candidate Starts for Piperis\_84:

(2, 48730), (Start: 5 @48814 has 45 MA's), (Start: 10 @48859 has 2 MA's), (11, 48862), (13, 48904), (16, 48928), (18, 48961), (24, 49024), (27, 49045), (34, 49159), (38, 49213), (45, 49309), (46, 49312), (53, 49390), (55, 49429), (56, 49432), (57, 49459),

Gene: Pulchra\_85 Start: 49381, Stop: 50040, Start Num: 5

Candidate Starts for Pulchra\_85:

(2, 49297), (Start: 5 @49381 has 45 MA's), (Start: 10 @49426 has 2 MA's), (11, 49429), (13, 49471), (16, 49495), (18, 49528), (24, 49591), (27, 49612), (34, 49726), (38, 49780), (45, 49876), (46, 49879), (53, 49957), (55, 49996), (56, 49999), (57, 50026),

Gene: Quhwah\_87 Start: 49535, Stop: 50194, Start Num: 5

Candidate Starts for Quhwah\_87:

(2, 49451), (Start: 5 @49535 has 45 MA's), (Start: 10 @49580 has 2 MA's), (11, 49583), (13, 49625), (16, 49649), (18, 49682), (24, 49745), (27, 49766), (34, 49880), (38, 49934), (45, 50030), (53, 50111), (55, 50150), (57, 50180),

Gene: Ramiel05\_82 Start: 48908, Stop: 49567, Start Num: 5

Candidate Starts for Ramiel05\_82:

(2, 48824), (Start: 5 @48908 has 45 MA's), (Start: 10 @48953 has 2 MA's), (11, 48956), (13, 48998), (16, 49022), (18, 49055), (24, 49118), (27, 49139), (34, 49253), (38, 49307), (45, 49403), (53, 49484), (55, 49523), (57, 49553),

Gene: RobsFeet\_90 Start: 49974, Stop: 50639, Start Num: 5

Candidate Starts for RobsFeet\_90:

(2, 49896), (Start: 5 @49974 has 45 MA's), (Start: 10 @50025 has 2 MA's), (13, 50070), (18, 50127), (27, 50211), (31, 50313), (33, 50322), (35, 50328), (45, 50475), (46, 50478), (53, 50556), (55, 50595), (57, 50625),

Gene: Rockwell\_82 Start: 48932, Stop: 49591, Start Num: 5

Candidate Starts for Rockwell\_82:

(2, 48848), (Start: 5 @48932 has 45 MA's), (Start: 10 @48977 has 2 MA's), (11, 48980), (13, 49022), (16, 49046), (18, 49079), (24, 49142), (27, 49163), (34, 49277), (38, 49331), (45, 49427), (53, 49508), (55, 49547), (57, 49577),

Gene: Savannah\_82 Start: 49100, Stop: 49759, Start Num: 5

Candidate Starts for Savannah\_82:

(2, 49016), (Start: 5 @49100 has 45 MA's), (Start: 10 @49145 has 2 MA's), (11, 49148), (13, 49190), (18, 49247), (24, 49310), (27, 49331), (34, 49445), (38, 49499), (45, 49595), (46, 49598), (53, 49676), (55, 49715), (56, 49718), (57, 49745),

Gene: Scumberland\_85 Start: 49154, Stop: 49813, Start Num: 5

Candidate Starts for Scumberland\_85:

(2, 49070), (Start: 5 @49154 has 45 MA's), (Start: 10 @49199 has 2 MA's), (11, 49202), (13, 49244), (16, 49268), (18, 49301), (24, 49364), (27, 49385), (34, 49499), (38, 49553), (45, 49649), (46, 49652), (53, 49730), (55, 49769), (56, 49772), (57, 49799),

Gene: Selwyn23\_84 Start: 49039, Stop: 49698, Start Num: 5

Candidate Starts for Selwyn23\_84:

(2, 48955), (Start: 5 @49039 has 45 MA's), (Start: 10 @49084 has 2 MA's), (11, 49087), (13, 49129), (16, 49153), (18, 49186), (24, 49249), (27, 49270), (34, 49384), (45, 49534), (46, 49537), (53, 49615), (55, 49654), (56, 49657), (57, 49684),

Gene: Shotgun\_82 Start: 48410, Stop: 49069, Start Num: 5

Candidate Starts for Shotgun\_82:

(2, 48326), (Start: 5 @48410 has 45 MA's), (Start: 10 @48455 has 2 MA's), (11, 48458), (13, 48500), (16, 48524), (18, 48557), (24, 48620), (27, 48641), (34, 48755), (38, 48809), (45, 48905), (53, 48986),

(55, 49025), (57, 49055),

Gene: Shrubaron\_88 Start: 49564, Stop: 50229, Start Num: 5

Candidate Starts for Shrubaron\_88:

(2, 49486), (Start: 5 @49564 has 45 MA's), (Start: 10 @49615 has 2 MA's), (13, 49660), (18, 49717), (27, 49801), (31, 49903), (33, 49912), (35, 49918), (45, 50065), (46, 50068), (53, 50146), (57, 50215),

Gene: SirFrank\_82 Start: 48824, Stop: 49489, Start Num: 5

Candidate Starts for SirFrank\_82:

(Start: 5 @48824 has 45 MA's), (9, 48854), (Start: 10 @48875 has 2 MA's), (13, 48920), (16, 48944), (18, 48977), (24, 49040), (27, 49061), (34, 49175), (45, 49325), (46, 49328), (53, 49406),

Gene: Skugga\_84 Start: 49246, Stop: 49911, Start Num: 5

Candidate Starts for Skugga\_84:

(2, 49168), (Start: 5 @49246 has 45 MA's), (9, 49276), (Start: 10 @49297 has 2 MA's), (11, 49300), (13, 49342), (16, 49366), (18, 49399), (27, 49483), (35, 49600), (45, 49747), (46, 49750), (53, 49828), (54, 49840), (55, 49867), (57, 49897),

Gene: Smarties\_92 Start: 49945, Stop: 50607, Start Num: 5

Candidate Starts for Smarties\_92:

(1, 49708), (2, 49861), (Start: 5 @49945 has 45 MA's), (8, 49972), (Start: 10 @49993 has 2 MA's), (11, 49996), (13, 50038), (16, 50062), (18, 50095), (24, 50158), (27, 50179), (33, 50290), (34, 50293), (45, 50443), (50, 50488), (53, 50524), (54, 50536), (55, 50563), (57, 50593),

Gene: Sunny\_ Start: 49111, Stop: 49731, Start Num: 10

Candidate Starts for Sunny\_:

(Start: 5 @49063 has 45 MA's), (Start: 10 @49111 has 2 MA's), (13, 49156), (17, 49183), (18, 49213), (24, 49276), (37, 49462), (45, 49561), (46, 49564), (47, 49567), (52, 49627), (53, 49642), (55, 49681), (57, 49711),

Gene: Sweetums\_63 Start: 35628, Stop: 35161, Start Num: 15

Candidate Starts for Sweetums\_63:

(Start: 4 @35742 has 3 MA's), (Start: 15 @35628 has 1 MA's), (20, 35580), (22, 35562), (27, 35508), (28, 35502), (36, 35364), (39, 35334), (41, 35289), (44, 35256), (45, 35253),

Gene: Teamocil\_88 Start: 49063, Stop: 49728, Start Num: 5

Candidate Starts for Teamocil\_88:

(2, 48985), (Start: 5 @49063 has 45 MA's), (9, 49093), (Start: 10 @49114 has 2 MA's), (11, 49117), (13, 49159), (16, 49183), (18, 49216), (24, 49279), (27, 49300), (35, 49417), (45, 49564), (46, 49567), (53, 49645), (54, 49657), (55, 49684), (57, 49714),

Gene: Teng\_65 Start: 35647, Stop: 35066, Start Num: 4

Candidate Starts for Teng\_65:

(Start: 4 @35647 has 3 MA's), (14, 35539), (Start: 15 @35533 has 1 MA's), (20, 35485), (22, 35467), (27, 35413), (28, 35407), (36, 35269), (39, 35239), (41, 35194), (44, 35161), (45, 35158),

Gene: Tyumbra\_83 Start: 49578, Stop: 50243, Start Num: 5

Candidate Starts for Tyumbra\_83:

(2, 49500), (Start: 5 @49578 has 45 MA's), (Start: 10 @49629 has 2 MA's), (11, 49632), (13, 49674), (18, 49731), (24, 49794), (27, 49815), (31, 49917), (33, 49926), (35, 49932), (45, 50079), (46, 50082), (47, 50085), (53, 50160), (55, 50199), (57, 50229),

Gene: Yeti\_84 Start: 48436, Stop: 49095, Start Num: 5

Candidate Starts for Yeti\_84:

(2, 48352), (Start: 5 @48436 has 45 MA's), (Start: 10 @48481 has 2 MA's), (11, 48484), (13, 48526), (16, 48550), (18, 48583), (24, 48646), (27, 48667), (34, 48781), (38, 48835), (45, 48931), (48, 48940), (53, 49012), (57, 49081),

Gene: Zapato\_83 Start: 48903, Stop: 49568, Start Num: 5

Candidate Starts for Zapato\_83:

(2, 48825), (Start: 5 @48903 has 45 MA's), (9, 48933), (Start: 10 @48954 has 2 MA's), (12, 48963), (16, 49023), (18, 49056), (24, 49119), (25, 49125), (27, 49140), (33, 49251), (35, 49257), (45, 49404), (46, 49407), (53, 49485), (55, 49524), (57, 49554),