



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 291123 Report

This analysis was run 03/28/26 on database version 641.

Pham number 291123 has 72 members, 15 are drafts.

Phages represented in each track:

- Track 1 : Soos\_13
- Track 2 : Grumio\_14, Jollymon\_14, Amo99\_15, ColdSoup\_15, DonTron\_13
- Track 3 : Sting\_14
- Track 4 : Purplicious\_13
- Track 5 : Makar\_16
- Track 6 : KingstonB\_13
- Track 7 : Clawz\_16
- Track 8 : Stillion\_14
- Track 9 : BritBrat\_89
- Track 10 : PantheRoc\_77
- Track 11 : Oregano\_70
- Track 12 : Hortense\_71, Howe\_71, Adora\_68
- Track 13 : DobbysSock\_66
- Track 14 : Twinkle\_70, Shlim410\_69
- Track 15 : Moosehead\_69
- Track 16 : MortyNRick\_82
- Track 17 : Budski\_95
- Track 18 : Frickyeah\_97, Periwinkle\_99, Horus\_91, Leroy\_90, ShawBrad\_95
- Track 19 : Holliday\_92
- Track 20 : Phistory\_88, Crater\_90, Apricot\_90, Ecliptus\_97
- Track 21 : Kamaru\_84
- Track 22 : Gina\_49, Teamocil\_49
- Track 23 : NoodlelyBoi\_48, SirFrank\_47
- Track 24 : ClearAsMud\_50
- Track 25 : Tyumbra\_47, RobsFeet\_50, Fireman\_49
- Track 26 : Nicole72\_45
- Track 27 : Metamorphoo\_49
- Track 28 : Shrubaron\_49
- Track 29 : Skugga\_46
- Track 30 : Jayden\_49
- Track 31 : Megan\_45
- Track 32 : Bran\_49
- Track 33 : LordVader\_60
- Track 34 : Frankie\_73
- Track 35 : Brujita\_53, Island3\_53
- Track 36 : Sbash\_61
- Track 37 : Che9c\_64

- Track 38 : Cubone\_56, DocMcStuffins\_70, Aloeri\_71, Piper2020\_71, ChickenDinner\_70, Awesomesauce\_70, Misha28\_68, TootsiePop\_68
- Track 39 : Scitech\_46
- Track 40 : SkinnyPete\_48
- Track 41 : Tortellini\_59
- Track 42 : Finkle\_64
- Track 43 : Jace\_77
- Track 44 : LilSpotty\_67
- Track 45 : Mbo4\_59
- Track 46 : BigAnti\_50

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

The start number called the most often in the published annotations is 41, it was called in 30 of the 57 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Adora\_68, Aloeri\_71, Apricot\_90, Awesomesauce\_70, BigAnti\_50, BritBrat\_89, Brujita\_53, Che9c\_64, ChickenDinner\_70, Crater\_90, Cubone\_56, DocMcStuffins\_70, Ecliptus\_97, Finkle\_64, Frankie\_73, Holliday\_92, Hortense\_71, Howe\_71, Island3\_53, Kamaru\_84, LilSpotty\_67, Mbo4\_59, Misha28\_68, Moosehead\_69, MortyNRick\_82, Oregano\_70, PantheRoc\_77, Phistory\_88, Piper2020\_71, Sbash\_61, SkinnyPete\_48, TootsiePop\_68, Tortellini\_59,

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

- DobbysSock\_66, LordVader\_60, Scitech\_46, Shlim410\_69, Twinkle\_70,

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

- Amo99\_15, Bran\_49, Budski\_95, Clawz\_16, ClearAsMud\_50, ColdSoup\_15, DonTron\_13, Fireman\_49, Frickyeah\_97, Gina\_49, Grumio\_14, Horus\_91, Jace\_77, Jayden\_49, Jollymon\_14, KingstonB\_13, Leroy\_90, Makar\_16, Megan\_45, Metamorphoo\_49, Nicole72\_45, NoodlelyBoi\_48, Periwinkle\_99, Purplicious\_13, RobsFeet\_50, ShawBrad\_95, Shrubaron\_49, SirFrank\_47, Skugga\_46, Soos\_13, Stillion\_14, Sting\_14, Teamocil\_49, Tyrumbra\_47,

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

Start 33:

- Found in 2 of 72 ( 2.8% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: LordVader\_60 (F), Scitech\_46 (N),

Start 34:

- Found in 12 of 72 ( 16.7% ) of genes in pham
- No Manual Annotations of this start.
- Called 8.3% of time when present
- Phage (with cluster) where this start called: Stillion\_14 (CP),

Start 36:

- Found in 6 of 72 ( 8.3% ) of genes in pham
- Manual Annotations of this start: 3 of 57
- Called 50.0% of time when present
- Phage (with cluster) where this start called: DobbysSock\_66 (CZ4), Shlim410\_69 (CZ4), Twinkle\_70 (CZ4),

#### Start 37:

- Found in 12 of 72 ( 16.7% ) of genes in pham
- No Manual Annotations of this start.
- Called 16.7% of time when present
- Phage (with cluster) where this start called: Makar\_16 (CP), Purplicious\_13 (CP),

#### Start 38:

- Found in 12 of 72 ( 16.7% ) of genes in pham
- Manual Annotations of this start: 5 of 57
- Called 66.7% of time when present
- Phage (with cluster) where this start called: Amo99\_15 (CP), Clawz\_16 (CP), ColdSoup\_15 (CP), DonTron\_13 (CP), Grumio\_14 (CP), Jollymon\_14 (CP), Soos\_13 (CP), Sting\_14 (CP),

#### Start 40:

- Found in 12 of 72 ( 16.7% ) of genes in pham
- No Manual Annotations of this start.
- Called 8.3% of time when present
- Phage (with cluster) where this start called: KingstonB\_13 (CP),

#### Start 41:

- Found in 38 of 72 ( 52.8% ) of genes in pham
- Manual Annotations of this start: 30 of 57
- Called 86.8% of time when present
- Phage (with cluster) where this start called: Adora\_68 (CZ4), Aloeri\_71 (F1), Apricot\_90 (DN3), Awesomesauce\_70 (F1), BigAnti\_50 (singleton), BritBrat\_89 (CY2), Brujita\_53 (I1), Che9c\_64 (I2), ChickenDinner\_70 (F1), Crater\_90 (DN3), Cubone\_56 (N), DocMcStuffins\_70 (F1), Ecliptus\_97 (DN), Finkle\_64 (singleton), Frankie\_73 (F1), Holliday\_92 (DN1), Hortense\_71 (CZ4), Howe\_71 (CZ4), Island3\_53 (I1), Kamaru\_84 (DN1), LilSpotty\_67 (singleton), Mbo4\_59 (singleton), Misha28\_68 (F1), Moosehead\_69 (CZ6), MortyNRick\_82 (DN), Oregano\_70 (CZ4), PantheRoc\_77 (CZ3), Phistory\_88 (DN1), Piper2020\_71 (F1), Sbash\_61 (I2), SkinnyPete\_48 (N), TootsiePop\_68 (F1), Tortellini\_59 (P2),

#### Start 42:

- Found in 6 of 72 ( 8.3% ) of genes in pham
- Manual Annotations of this start: 4 of 57
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Budski\_95 (DN), Frickyeah\_97 (DN1), Horus\_91 (DN1), Leroy\_90 (DN1), Periwinkle\_99 (DN1), ShawBrad\_95 (DN1),

#### Start 43:

- Found in 11 of 72 ( 15.3% ) of genes in pham
- Manual Annotations of this start: 1 of 57
- Called 9.1% of time when present
- Phage (with cluster) where this start called: Megan\_45 (EC),

Start 44:

- Found in 13 of 72 ( 18.1% ) of genes in pham
- Manual Annotations of this start: 12 of 57
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Bran\_49 (EP), ClearAsMud\_50 (EC), Fireman\_49 (EC), Gina\_49 (EC), Jayden\_49 (EC), Metamorphoo\_49 (EC), NoodlelyBoi\_48 (EC), RobsFeet\_50 (EC), Shrubaron\_49 (EC), SirFrank\_47 (EC), Skugga\_46 (EC), Teamocil\_49 (EC), Tyrumbra\_47 (EC),

Start 45:

- Found in 1 of 72 ( 1.4% ) of genes in pham
- Manual Annotations of this start: 1 of 57
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Jace\_77 (singleton),

Start 46:

- Found in 1 of 72 ( 1.4% ) of genes in pham
- Manual Annotations of this start: 1 of 57
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Nicole72\_45 (EC),

**Summary by clusters:**

There are 17 clusters represented in this pham: P2, F1, singleton, DN, F, I1, CZ3, I2, CZ6, EC, N, DN1, CZ4, DN3, CP, CY2, EP,

Info for manual annotations of cluster CP:

- Start number 38 was manually annotated 5 times for cluster CP.

Info for manual annotations of cluster CY2:

- Start number 41 was manually annotated 1 time for cluster CY2.

Info for manual annotations of cluster CZ3:

- Start number 41 was manually annotated 1 time for cluster CZ3.

Info for manual annotations of cluster CZ4:

- Start number 36 was manually annotated 3 times for cluster CZ4.
- Start number 41 was manually annotated 4 times for cluster CZ4.

Info for manual annotations of cluster CZ6:

- Start number 41 was manually annotated 1 time for cluster CZ6.

Info for manual annotations of cluster DN:

- Start number 41 was manually annotated 2 times for cluster DN.
- Start number 42 was manually annotated 1 time for cluster DN.

Info for manual annotations of cluster DN1:

- Start number 41 was manually annotated 3 times for cluster DN1.
- Start number 42 was manually annotated 3 times for cluster DN1.

Info for manual annotations of cluster DN3:

- Start number 41 was manually annotated 2 times for cluster DN3.

Info for manual annotations of cluster EC:

- Start number 43 was manually annotated 1 time for cluster EC.
- Start number 44 was manually annotated 11 times for cluster EC.
- Start number 46 was manually annotated 1 time for cluster EC.

Info for manual annotations of cluster EP:

- Start number 44 was manually annotated 1 time for cluster EP.

Info for manual annotations of cluster F1:

- Start number 41 was manually annotated 8 times for cluster F1.

Info for manual annotations of cluster I1:

- Start number 41 was manually annotated 2 times for cluster I1.

Info for manual annotations of cluster I2:

- Start number 41 was manually annotated 2 times for cluster I2.

Info for manual annotations of cluster N:

- Start number 41 was manually annotated 1 time for cluster N.

Info for manual annotations of cluster P2:

- Start number 41 was manually annotated 1 time for cluster P2.

### ***Gene Information:***

Gene: Adora\_68 Start: 47407, Stop: 47808, Start Num: 41

Candidate Starts for Adora\_68:

(Start: 36 @47389 has 3 MA's), (Start: 41 @47407 has 30 MA's), (72, 47584), (88, 47728), (100, 47770),

Gene: Aloeri\_71 Start: 43637, Stop: 44014, Start Num: 41

Candidate Starts for Aloeri\_71:

(Start: 41 @43637 has 30 MA's), (53, 43706), (60, 43742), (63, 43760), (84, 43901), (85, 43925), (99, 43982), (106, 44006),

Gene: Amo99\_15 Start: 7379, Stop: 7768, Start Num: 38

Candidate Starts for Amo99\_15:

(11, 7193), (25, 7304), (34, 7349), (37, 7376), (Start: 38 @7379 has 5 MA's), (40, 7388), (Start: 43 @7397 has 1 MA's), (55, 7472), (70, 7571), (79, 7649), (83, 7664), (85, 7691), (88, 7703), (90, 7721), (103, 7754),

Gene: Apricot\_90 Start: 48459, Stop: 48836, Start Num: 41

Candidate Starts for Apricot\_90:

(Start: 41 @48459 has 30 MA's), (52, 48507), (60, 48555), (69, 48621), (77, 48693), (88, 48759), (92, 48780), (100, 48801),

Gene: Awesomesauce\_70 Start: 42720, Stop: 43097, Start Num: 41

Candidate Starts for Awesomesauce\_70:

(Start: 41 @42720 has 30 MA's), (53, 42789), (60, 42825), (63, 42843), (84, 42984), (85, 43008), (99, 43065), (106, 43089),

Gene: BigAnti\_50 Start: 44697, Stop: 45083, Start Num: 41

Candidate Starts for BigAnti\_50:

(Start: 41 @44697 has 30 MA's), (51, 44739), (60, 44796), (78, 44943), (80, 44955), (88, 45006), (96, 45036),

Gene: Bran\_49 Start: 35390, Stop: 35785, Start Num: 44

Candidate Starts for Bran\_49:

(Start: 44 @35390 has 12 MA's), (53, 35450), (75, 35606),

Gene: BritBrat\_89 Start: 51800, Stop: 52234, Start Num: 41

Candidate Starts for BritBrat\_89:

(Start: 41 @51800 has 30 MA's), (49, 51821), (52, 51848), (57, 51881), (62, 51920), (65, 51947), (84, 52097), (85, 52121), (104, 52199),

Gene: Brujita\_53 Start: 36853, Stop: 37233, Start Num: 41

Candidate Starts for Brujita\_53:

(Start: 41 @36853 has 30 MA's), (53, 36925), (83, 37117), (84, 37120), (99, 37201),

Gene: Budski\_95 Start: 51613, Stop: 51987, Start Num: 42

Candidate Starts for Budski\_95:

(15, 51436), (30, 51556), (Start: 42 @51613 has 4 MA's), (49, 51631), (53, 51670), (58, 51694), (59, 51697), (60, 51706), (62, 51718), (65, 51745), (67, 51766), (76, 51835), (79, 51856), (80, 51859), (85, 51898), (88, 51910),

Gene: Che9c\_64 Start: 45395, Stop: 45778, Start Num: 41

Candidate Starts for Che9c\_64:

(Start: 41 @45395 has 30 MA's), (53, 45467), (83, 45659), (84, 45662), (99, 45743), (107, 45770),

Gene: ChickenDinner\_70 Start: 43637, Stop: 44014, Start Num: 41

Candidate Starts for ChickenDinner\_70:

(Start: 41 @43637 has 30 MA's), (53, 43706), (60, 43742), (63, 43760), (84, 43901), (85, 43925), (99, 43982), (106, 44006),

Gene: Clawz\_16 Start: 7752, Stop: 8141, Start Num: 38

Candidate Starts for Clawz\_16:

(8, 7545), (11, 7566), (21, 7653), (34, 7722), (37, 7749), (Start: 38 @7752 has 5 MA's), (40, 7761), (50, 7806), (58, 7860), (67, 7932), (75, 7992), (80, 8025), (83, 8037), (85, 8064), (88, 8076), (89, 8082), (103, 8127),

Gene: ClearAsMud\_50 Start: 32507, Stop: 32881, Start Num: 44

Candidate Starts for ClearAsMud\_50:

(Start: 44 @32507 has 12 MA's), (53, 32567), (59, 32594), (69, 32663), (71, 32672), (73, 32681), (74, 32714), (84, 32765), (85, 32789), (88, 32801), (94, 32831), (103, 32852), (105, 32858),

Gene: ColdSoup\_15 Start: 7379, Stop: 7768, Start Num: 38

Candidate Starts for ColdSoup\_15:

(11, 7193), (25, 7304), (34, 7349), (37, 7376), (Start: 38 @7379 has 5 MA's), (40, 7388), (Start: 43 @7397 has 1 MA's), (55, 7472), (70, 7571), (79, 7649), (83, 7664), (85, 7691), (88, 7703), (90, 7721), (103, 7754),

Gene: Crater\_90 Start: 48803, Stop: 49180, Start Num: 41

Candidate Starts for Crater\_90:

(Start: 41 @48803 has 30 MA's), (52, 48851), (60, 48899), (69, 48965), (77, 49037), (88, 49103), (92, 49124), (100, 49145),

Gene: Cubone\_56 Start: 34210, Stop: 34587, Start Num: 41

Candidate Starts for Cubone\_56:

(Start: 41 @34210 has 30 MA's), (53, 34279), (60, 34315), (63, 34333), (84, 34474), (85, 34498), (99, 34555), (106, 34579),

Gene: DobbysSock\_66 Start: 44836, Stop: 45252, Start Num: 36

Candidate Starts for DobbysSock\_66:

(Start: 36 @44836 has 3 MA's), (Start: 41 @44854 has 30 MA's), (72, 45031), (100, 45217),

Gene: DocMcStuffins\_70 Start: 43637, Stop: 44014, Start Num: 41

Candidate Starts for DocMcStuffins\_70:

(Start: 41 @43637 has 30 MA's), (53, 43706), (60, 43742), (63, 43760), (84, 43901), (85, 43925), (99, 43982), (106, 44006),

Gene: DonTron\_13 Start: 6968, Stop: 7357, Start Num: 38

Candidate Starts for DonTron\_13:

(11, 6782), (25, 6893), (34, 6938), (37, 6965), (Start: 38 @6968 has 5 MA's), (40, 6977), (Start: 43 @6986 has 1 MA's), (55, 7061), (70, 7160), (79, 7238), (83, 7253), (85, 7280), (88, 7292), (90, 7310), (103, 7343),

Gene: Ecliptus\_97 Start: 52002, Stop: 52379, Start Num: 41

Candidate Starts for Ecliptus\_97:

(Start: 41 @52002 has 30 MA's), (52, 52050), (60, 52098), (69, 52164), (77, 52236), (88, 52302), (92, 52323), (100, 52344),

Gene: Finkle\_64 Start: 40296, Stop: 40754, Start Num: 41

Candidate Starts for Finkle\_64:

(6, 40047), (7, 40068), (Start: 41 @40296 has 30 MA's), (62, 40404), (69, 40458), (71, 40467), (85, 40605), (95, 40659),

Gene: Fireman\_49 Start: 33919, Stop: 34293, Start Num: 44

Candidate Starts for Fireman\_49:

(Start: 44 @33919 has 12 MA's), (74, 34126), (84, 34177), (85, 34201), (88, 34213), (102, 34261), (105, 34270),

Gene: Frankie\_73 Start: 45043, Stop: 45420, Start Num: 41

Candidate Starts for Frankie\_73:

(2, 44707), (4, 44749), (29, 44986), (Start: 41 @45043 has 30 MA's), (53, 45112), (83, 45304), (84, 45307), (85, 45331), (99, 45388),

Gene: Frickyeah\_97 Start: 50758, Stop: 51126, Start Num: 42

Candidate Starts for Frickyeah\_97:

(Start: 42 @50758 has 4 MA's), (53, 50815), (64, 50872), (68, 50914), (69, 50917), (70, 50923), (80, 51004), (85, 51043), (88, 51055), (89, 51061), (100, 51091),

Gene: Gina\_49 Start: 32061, Stop: 32435, Start Num: 44

Candidate Starts for Gina\_49:

(Start: 44 @32061 has 12 MA's), (61, 32166), (69, 32217), (74, 32268), (84, 32319), (85, 32343), (88, 32355), (89, 32361), (91, 32376), (103, 32406), (105, 32412),

Gene: Grumio\_14 Start: 6968, Stop: 7357, Start Num: 38

Candidate Starts for Grumio\_14:

(11, 6782), (25, 6893), (34, 6938), (37, 6965), (Start: 38 @6968 has 5 MA's), (40, 6977), (Start: 43 @6986 has 1 MA's), (55, 7061), (70, 7160), (79, 7238), (83, 7253), (85, 7280), (88, 7292), (90, 7310), (103, 7343),

Gene: Holliday\_92 Start: 52368, Stop: 52745, Start Num: 41

Candidate Starts for Holliday\_92:

(Start: 41 @52368 has 30 MA's), (52, 52416), (60, 52464), (77, 52602), (88, 52668), (100, 52710),

Gene: Hortense\_71 Start: 48762, Stop: 49163, Start Num: 41

Candidate Starts for Hortense\_71:

(Start: 36 @48744 has 3 MA's), (Start: 41 @48762 has 30 MA's), (72, 48939), (88, 49083), (100, 49125),

Gene: Horus\_91 Start: 51033, Stop: 51401, Start Num: 42

Candidate Starts for Horus\_91:

(Start: 42 @51033 has 4 MA's), (53, 51090), (64, 51147), (68, 51189), (69, 51192), (70, 51198), (80, 51279), (85, 51318), (88, 51330), (89, 51336), (100, 51366),

Gene: Howe\_71 Start: 48762, Stop: 49163, Start Num: 41

Candidate Starts for Howe\_71:

(Start: 36 @48744 has 3 MA's), (Start: 41 @48762 has 30 MA's), (72, 48939), (88, 49083), (100, 49125),

Gene: Island3\_53 Start: 36853, Stop: 37233, Start Num: 41

Candidate Starts for Island3\_53:

(Start: 41 @36853 has 30 MA's), (53, 36925), (83, 37117), (84, 37120), (99, 37201),

Gene: Jace\_77 Start: 44043, Stop: 44462, Start Num: 45

Candidate Starts for Jace\_77:

(3, 43710), (12, 43836), (Start: 45 @44043 has 1 MA's), (52, 44088), (54, 44103), (57, 44121), (60, 44148), (62, 44160), (67, 44208), (69, 44214), (81, 44313), (82, 44316), (83, 44358), (84, 44361), (85, 44385), (100, 44445),

Gene: Jayden\_49 Start: 32758, Stop: 33132, Start Num: 44

Candidate Starts for Jayden\_49:

(26, 32671), (Start: 44 @32758 has 12 MA's), (58, 32842), (69, 32914), (74, 32965), (85, 33040), (88, 33052), (89, 33058), (103, 33103), (105, 33109),

Gene: Jollymon\_14 Start: 7379, Stop: 7768, Start Num: 38

Candidate Starts for Jollymon\_14:

(11, 7193), (25, 7304), (34, 7349), (37, 7376), (Start: 38 @7379 has 5 MA's), (40, 7388), (Start: 43 @7397 has 1 MA's), (55, 7472), (70, 7571), (79, 7649), (83, 7664), (85, 7691), (88, 7703), (90, 7721), (103, 7754),

Gene: Kamaru\_84 Start: 48067, Stop: 48444, Start Num: 41

Candidate Starts for Kamaru\_84:

(15, 47893), (Start: 41 @48067 has 30 MA's), (49, 48088), (52, 48115), (65, 48202), (77, 48301), (79, 48313), (87, 48364), (88, 48367), (100, 48409),

Gene: KingstonB\_13 Start: 6977, Stop: 7357, Start Num: 40

Candidate Starts for KingstonB\_13:

(11, 6782), (25, 6893), (34, 6938), (37, 6965), (Start: 38 @6968 has 5 MA's), (40, 6977), (Start: 43 @6986 has 1 MA's), (55, 7061), (70, 7160), (79, 7238), (83, 7253), (85, 7280), (88, 7292), (90, 7310), (103, 7343),

Gene: Leroy\_90 Start: 49228, Stop: 49596, Start Num: 42

Candidate Starts for Leroy\_90:

(Start: 42 @49228 has 4 MA's), (53, 49285), (64, 49342), (68, 49384), (69, 49387), (70, 49393), (80, 49474), (85, 49513), (88, 49525), (89, 49531), (100, 49561),

Gene: LilSpotty\_67 Start: 41443, Stop: 41820, Start Num: 41

Candidate Starts for LilSpotty\_67:

(20, 41326), (22, 41329), (24, 41350), (Start: 41 @41443 has 30 MA's), (53, 41512), (83, 41704), (84, 41707), (85, 41731), (99, 41788),

Gene: LordVader\_60 Start: 37776, Stop: 38195, Start Num: 33

Candidate Starts for LordVader\_60:

(16, 37668), (33, 37776), (39, 37803), (Start: 41 @37818 has 30 MA's), (53, 37887), (60, 37923), (63, 37941), (84, 38082), (99, 38163), (106, 38187),

Gene: Makar\_16 Start: 7749, Stop: 8141, Start Num: 37

Candidate Starts for Makar\_16:

(8, 7545), (11, 7566), (21, 7653), (34, 7722), (37, 7749), (Start: 38 @7752 has 5 MA's), (40, 7761), (50, 7806), (58, 7860), (67, 7932), (75, 7992), (80, 8025), (83, 8037), (85, 8064), (88, 8076), (89, 8082), (103, 8127),

Gene: Mbo4\_59 Start: 42474, Stop: 42896, Start Num: 41

Candidate Starts for Mbo4\_59:

(5, 42183), (10, 42258), (18, 42348), (Start: 41 @42474 has 30 MA's), (52, 42522), (56, 42552), (65, 42621), (85, 42795),

Gene: Megan\_45 Start: 35422, Stop: 35853, Start Num: 43

Candidate Starts for Megan\_45:

(32, 35371), (Start: 43 @35422 has 1 MA's), (60, 35521), (72, 35593), (74, 35629), (76, 35641), (80, 35665), (83, 35677), (84, 35680), (85, 35704), (86, 35707), (88, 35716), (98, 35755), (103, 35767), (105, 35773), (106, 35782), (108, 35809),

Gene: Metamorphoo\_49 Start: 33181, Stop: 33555, Start Num: 44

Candidate Starts for Metamorphoo\_49:

(Start: 44 @33181 has 12 MA's), (74, 33388), (84, 33439), (85, 33463), (88, 33475), (102, 33523), (105, 33532),

Gene: Misha28\_68 Start: 42725, Stop: 43102, Start Num: 41

Candidate Starts for Misha28\_68:

(Start: 41 @42725 has 30 MA's), (53, 42794), (60, 42830), (63, 42848), (84, 42989), (85, 43013), (99, 43070), (106, 43094),

Gene: Moosehead\_69 Start: 39233, Stop: 39610, Start Num: 41

Candidate Starts for Moosehead\_69:

(13, 39047), (27, 39152), (28, 39164), (35, 39209), (Start: 41 @39233 has 30 MA's), (52, 39281), (60, 39329), (88, 39533),

Gene: MortyNRick\_82 Start: 48781, Stop: 49158, Start Num: 41

Candidate Starts for MortyNRick\_82:

(Start: 41 @48781 has 30 MA's), (52, 48829), (60, 48877), (77, 49015), (83, 49042), (88, 49081), (92, 49102), (100, 49123),

Gene: Nicole72\_45 Start: 35846, Stop: 36274, Start Num: 46

Candidate Starts for Nicole72\_45:

(17, 35690), (Start: 46 @35846 has 1 MA's), (48, 35855), (74, 36047), (75, 36050), (83, 36095), (84, 36098), (85, 36122), (88, 36134), (93, 36161), (98, 36173), (101, 36179), (103, 36185), (105, 36191), (106, 36203), (108, 36230),

Gene: NoodlelyBoi\_48 Start: 32719, Stop: 33093, Start Num: 44

Candidate Starts for NoodlelyBoi\_48:

(Start: 44 @32719 has 12 MA's), (53, 32779), (59, 32806), (69, 32875), (71, 32884), (73, 32893), (74, 32926), (80, 32962), (84, 32977), (85, 33001), (88, 33013), (103, 33064), (105, 33070),

Gene: Oregano\_70 Start: 43852, Stop: 44250, Start Num: 41

Candidate Starts for Oregano\_70:

(Start: 41 @43852 has 30 MA's), (53, 43912), (72, 44029), (88, 44173), (100, 44215),

Gene: PantheRoc\_77 Start: 49218, Stop: 49622, Start Num: 41

Candidate Starts for PantheRoc\_77:

(19, 49101), (23, 49125), (25, 49128), (31, 49170), (Start: 41 @49218 has 30 MA's), (52, 49266), (62, 49326), (66, 49365), (69, 49380), (72, 49395), (88, 49539), (97, 49575), (100, 49584),

Gene: Periwinkle\_99 Start: 52035, Stop: 52403, Start Num: 42

Candidate Starts for Periwinkle\_99:

(Start: 42 @52035 has 4 MA's), (53, 52092), (64, 52149), (68, 52191), (69, 52194), (70, 52200), (80, 52281), (85, 52320), (88, 52332), (89, 52338), (100, 52368),

Gene: Phistory\_88 Start: 48067, Stop: 48444, Start Num: 41

Candidate Starts for Phistory\_88:

(Start: 41 @48067 has 30 MA's), (52, 48115), (60, 48163), (69, 48229), (77, 48301), (88, 48367), (92, 48388), (100, 48409),

Gene: Piper2020\_71 Start: 43620, Stop: 43997, Start Num: 41

Candidate Starts for Piper2020\_71:

(Start: 41 @43620 has 30 MA's), (53, 43689), (60, 43725), (63, 43743), (84, 43884), (85, 43908), (99, 43965), (106, 43989),

Gene: Purplicious\_13 Start: 6966, Stop: 7358, Start Num: 37

Candidate Starts for Purplicious\_13:

(11, 6783), (14, 6810), (25, 6894), (34, 6939), (37, 6966), (Start: 38 @6969 has 5 MA's), (40, 6978), (Start: 43 @6987 has 1 MA's), (55, 7062), (70, 7161), (79, 7239), (83, 7254), (85, 7281), (88, 7293), (90, 7311), (103, 7344),

Gene: RobsFeet\_50 Start: 33462, Stop: 33836, Start Num: 44

Candidate Starts for RobsFeet\_50:

(Start: 44 @33462 has 12 MA's), (74, 33669), (84, 33720), (85, 33744), (88, 33756), (102, 33804), (105, 33813),

Gene: Sbash\_61 Start: 42805, Stop: 43188, Start Num: 41

Candidate Starts for Sbash\_61:

(9, 42580), (28, 42736), (29, 42739), (Start: 41 @42805 has 30 MA's), (47, 42826), (53, 42877), (83, 43069), (84, 43072), (99, 43153), (107, 43180),

Gene: Scitech\_46 Start: 32555, Stop: 32974, Start Num: 33

Candidate Starts for Scitech\_46:

(33, 32555), (39, 32582), (Start: 41 @32597 has 30 MA's), (53, 32666), (60, 32702), (63, 32720), (84, 32861), (99, 32942), (106, 32966),

Gene: ShawBrad\_95 Start: 49284, Stop: 49652, Start Num: 42

Candidate Starts for ShawBrad\_95:

(Start: 42 @49284 has 4 MA's), (53, 49341), (64, 49398), (68, 49440), (69, 49443), (70, 49449), (80, 49530), (85, 49569), (88, 49581), (89, 49587), (100, 49617),

Gene: Shlim410\_69 Start: 48744, Stop: 49163, Start Num: 36

Candidate Starts for Shlim410\_69:

(Start: 36 @48744 has 3 MA's), (Start: 41 @48762 has 30 MA's), (72, 48939), (88, 49083), (100, 49125),

Gene: Shrubaron\_49 Start: 33096, Stop: 33470, Start Num: 44

Candidate Starts for Shrubaron\_49:

(Start: 44 @33096 has 12 MA's), (74, 33303), (84, 33354), (85, 33378), (88, 33390), (102, 33438), (105, 33447),

Gene: SirFrank\_47 Start: 32289, Stop: 32663, Start Num: 44

Candidate Starts for SirFrank\_47:

(Start: 44 @32289 has 12 MA's), (53, 32349), (59, 32376), (69, 32445), (71, 32454), (73, 32463), (74, 32496), (80, 32532), (84, 32547), (85, 32571), (88, 32583), (103, 32634), (105, 32640),

Gene: SkinnyPete\_48 Start: 33096, Stop: 33473, Start Num: 41

Candidate Starts for SkinnyPete\_48:

(Start: 41 @33096 has 30 MA's), (53, 33165), (60, 33201), (63, 33219), (84, 33360), (99, 33441), (106, 33465),

Gene: Skugga\_46 Start: 32083, Stop: 32457, Start Num: 44

Candidate Starts for Skugga\_46:

(Start: 44 @32083 has 12 MA's), (69, 32239), (85, 32365), (88, 32377), (103, 32428), (105, 32434),

Gene: Soos\_13 Start: 6967, Stop: 7356, Start Num: 38

Candidate Starts for Soos\_13:

(11, 6781), (25, 6892), (34, 6937), (37, 6964), (Start: 38 @6967 has 5 MA's), (40, 6976), (Start: 43 @6985 has 1 MA's), (55, 7060), (70, 7159), (79, 7237), (83, 7252), (85, 7279), (88, 7291), (90, 7309), (93, 7318), (103, 7342),

Gene: Stillion\_14 Start: 7417, Stop: 7836, Start Num: 34

Candidate Starts for Stillion\_14:

(11, 7261), (25, 7372), (34, 7417), (37, 7444), (Start: 38 @7447 has 5 MA's), (40, 7456), (Start: 43 @7465 has 1 MA's), (55, 7540), (70, 7639), (79, 7717), (83, 7732), (85, 7759), (88, 7771), (90, 7789), (103, 7822),

Gene: Sting\_14 Start: 7379, Stop: 7768, Start Num: 38

Candidate Starts for Sting\_14:

(8, 7172), (11, 7193), (25, 7304), (34, 7349), (37, 7376), (Start: 38 @7379 has 5 MA's), (40, 7388), (Start: 43 @7397 has 1 MA's), (55, 7472), (70, 7571), (79, 7649), (83, 7664), (85, 7691), (88, 7703), (90, 7721), (93, 7730), (103, 7754),

Gene: Teamocil\_49 Start: 32160, Stop: 32534, Start Num: 44

Candidate Starts for Teamocil\_49:

(Start: 44 @32160 has 12 MA's), (61, 32265), (69, 32316), (74, 32367), (84, 32418), (85, 32442), (88, 32454), (89, 32460), (91, 32475), (103, 32505), (105, 32511),

Gene: TootsiePop\_68 Start: 42725, Stop: 43102, Start Num: 41

Candidate Starts for TootsiePop\_68:

(Start: 41 @42725 has 30 MA's), (53, 42794), (60, 42830), (63, 42848), (84, 42989), (85, 43013), (99, 43070), (106, 43094),

Gene: Tortellini\_59 Start: 41926, Stop: 42303, Start Num: 41

Candidate Starts for Tortellini\_59:

(1, 41533), (13, 41752), (29, 41869), (Start: 41 @41926 has 30 MA's), (53, 41995), (60, 42031), (63, 42049), (85, 42214), (99, 42271), (106, 42295),

Gene: Twinkle\_70 Start: 49803, Stop: 50222, Start Num: 36

Candidate Starts for Twinkle\_70:

(Start: 36 @49803 has 3 MA's), (Start: 41 @49821 has 30 MA's), (72, 49998), (88, 50142), (100, 50184),

Gene: Tyrumbra\_47 Start: 33262, Stop: 33636, Start Num: 44

Candidate Starts for Tyrumbra\_47:

(Start: 44 @33262 has 12 MA's), (74, 33469), (84, 33520), (85, 33544), (88, 33556), (102, 33604), (105, 33613),