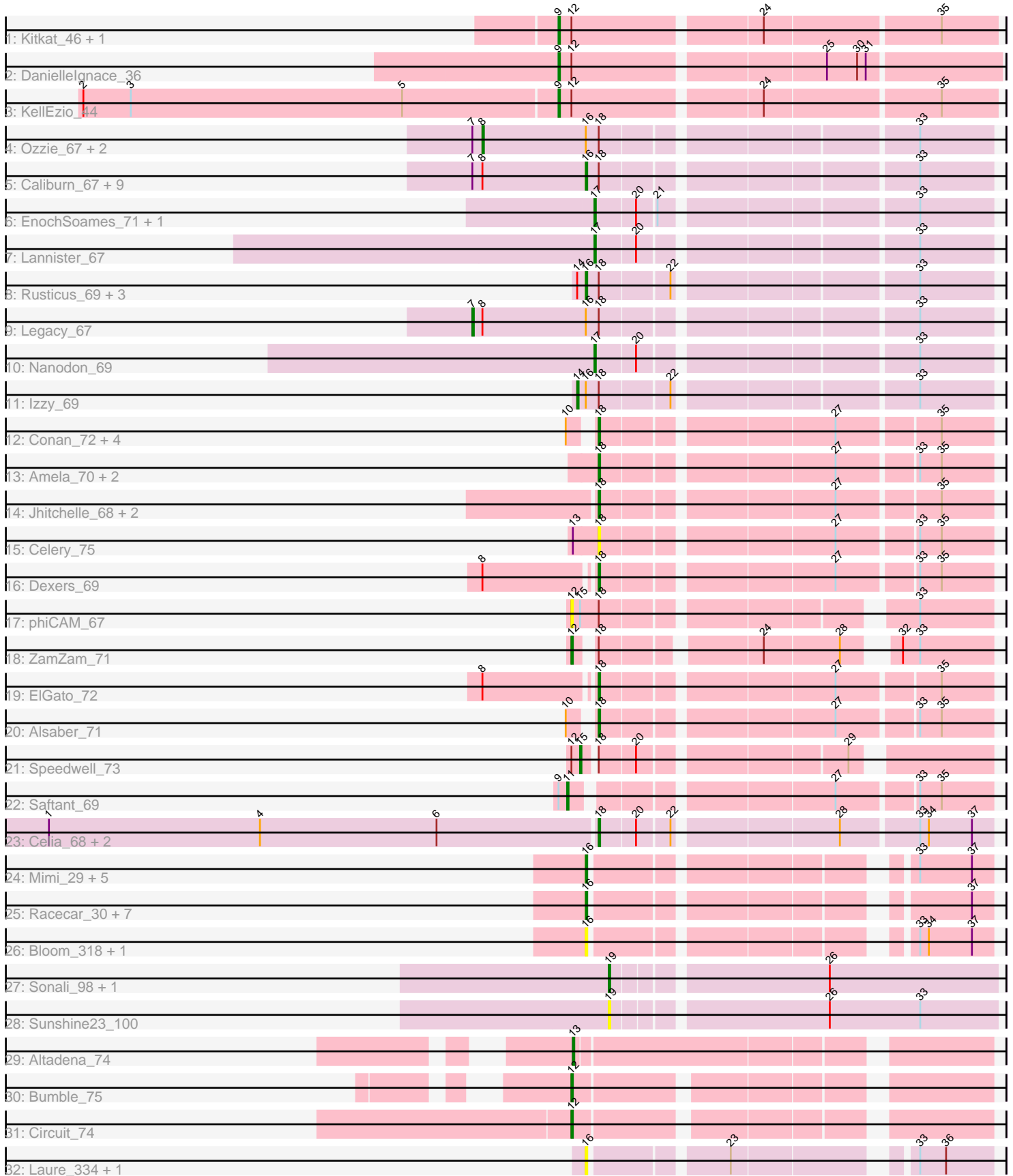


Pham 296527



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 296527 Report

This analysis was run 04/25/26 on database version 644.

Pham number 296527 has 73 members, 15 are drafts.

Phages represented in each track:

- Track 1 : Kitkat\_46, BeatusComedenti\_45
- Track 2 : DanielleIgnace\_36
- Track 3 : KelleEzio\_44
- Track 4 : Ozzie\_67, BeardedLady\_68, Aaronocolus\_67
- Track 5 : Caliburn\_67, Phettuccine\_67, Unstoppable\_67, Indigo\_66, Bovely\_67, Esperer\_68, Hydra\_70, Nerdos\_66, SunsetPointe\_67, Leviticus\_68
- Track 6 : EnochSoames\_71, Oliynyk\_69
- Track 7 : Lannister\_67
- Track 8 : Rusticus\_69, Eddasa\_70, BryanRecycles\_69, Jash\_69
- Track 9 : Legacy\_67
- Track 10 : Nanodon\_69
- Track 11 : Izzy\_69
- Track 12 : Conan\_72, Pavo\_72, Kaine\_71, Provolone\_72, Sudan\_71
- Track 13 : Amela\_70, SunkenRoot\_72, Verse\_71
- Track 14 : Jhitchelle\_68, Verabelle\_73, Vanseggelen\_76
- Track 15 : Celery\_75
- Track 16 : Dexers\_69
- Track 17 : phiCAM\_67
- Track 18 : ZamZam\_71
- Track 19 : ElGato\_72
- Track 20 : Alsaber\_71
- Track 21 : Speedwell\_73
- Track 22 : Saftant\_69
- Track 23 : Celia\_68, Itza\_71, Urza\_70
- Track 24 : Mimi\_29, Mimi\_314, FloraSnap32\_311, Patbob\_28, Patbob\_314, FloraSnap32\_26
- Track 25 : Racecar\_30, GoldenEssence\_15, Racecar\_319, Talia1610\_315, FrostedClock\_31, Talia1610\_29, GoldenEssence\_296, FrostedClock\_316
- Track 26 : Bloom\_318, Bloom\_31
- Track 27 : Sonali\_98, Maruru\_98
- Track 28 : Sunshine23\_100
- Track 29 : Altadena\_74
- Track 30 : Bumble\_75
- Track 31 : Circuit\_74
- Track 32 : Laure\_334, Laure\_16

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

The start number called the most often in the published annotations is 16, it was called in 24 of the 58 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Bloom\_31, Bloom\_318, Bovely\_67, BryanRecycles\_69, Caliburn\_67, Eddasa\_70, Esperer\_68, FloraSnap32\_26, FloraSnap32\_311, FrostedClock\_31, FrostedClock\_316, GoldenEssence\_15, GoldenEssence\_296, Hydra\_70, Indigo\_66, Jash\_69, Laure\_16, Laure\_334, Leviticus\_68, Mimi\_29, Mimi\_314, Nerdos\_66, Patbob\_28, Patbob\_314, Phettuccine\_67, Racecar\_30, Racecar\_319, Rusticus\_69, SunsetPointe\_67, Talia1610\_29, Talia1610\_315, Unstoppable\_67,

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

- Aaronocolus\_67, BeardedLady\_68, Izzy\_69, Legacy\_67, Ozzie\_67,

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

- Alsaber\_71, Altadena\_74, Amela\_70, BeatusComedenti\_45, Bumble\_75, Celery\_75, Celia\_68, Circuit\_74, Conan\_72, DanielleIgnace\_36, Dexers\_69, ElGato\_72, EnochSoames\_71, Itza\_71, Jhitchelle\_68, Kaine\_71, Kellezio\_44, Kitkat\_46, Lannister\_67, Maruru\_98, Nanodon\_69, Oliynyk\_69, Pavo\_72, Provolone\_72, Saftant\_69, Sonali\_98, Speedwell\_73, Sudan\_71, SunkenRoot\_72, Sunshine23\_100, Urza\_70, Vanseggelen\_76, Verabelle\_73, Verse\_71, ZamZam\_71, phiCAM\_67,

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

Start 7:

- Found in 14 of 73 ( 19.2% ) of genes in pham
- Manual Annotations of this start: 1 of 58
- Called 7.1% of time when present
- Phage (with cluster) where this start called: Legacy\_67 (BD1),

Start 8:

- Found in 16 of 73 ( 21.9% ) of genes in pham
- Manual Annotations of this start: 3 of 58
- Called 18.8% of time when present
- Phage (with cluster) where this start called: Aaronocolus\_67 (BD1), BeardedLady\_68 (BD1), Ozzie\_67 (BD1),

Start 9:

- Found in 5 of 73 ( 6.8% ) of genes in pham
- Manual Annotations of this start: 4 of 58
- Called 80.0% of time when present
- Phage (with cluster) where this start called: BeatusComedenti\_45 (AT), DanielleIgnace\_36 (AT), Kellezio\_44 (AT), Kitkat\_46 (AT),

Start 11:

- Found in 1 of 73 ( 1.4% ) of genes in pham
- Manual Annotations of this start: 1 of 58
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Saftant\_69 (BD3),

Start 12:

- Found in 9 of 73 ( 12.3% ) of genes in pham
- Manual Annotations of this start: 3 of 58
- Called 44.4% of time when present
- Phage (with cluster) where this start called: Bumble\_75 (FH), Circuit\_74 (FH), ZamZam\_71 (BD3), phiCAM\_67 (BD3),

Start 13:

- Found in 2 of 73 ( 2.7% ) of genes in pham
- Manual Annotations of this start: 1 of 58
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Altadena\_74 (FH),

Start 14:

- Found in 5 of 73 ( 6.8% ) of genes in pham
- Manual Annotations of this start: 1 of 58
- Called 20.0% of time when present
- Phage (with cluster) where this start called: Izzy\_69 (BD1),

Start 15:

- Found in 2 of 73 ( 2.7% ) of genes in pham
- Manual Annotations of this start: 1 of 58
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Speedwell\_73 (BD3),

Start 16:

- Found in 37 of 73 ( 50.7% ) of genes in pham
- Manual Annotations of this start: 24 of 58
- Called 86.5% of time when present
- Phage (with cluster) where this start called: Bloom\_31 (FC), Bloom\_318 (FC), Bovely\_67 (BD1), BryanRecycles\_69 (BD1), Caliburn\_67 (BD1), Eddasa\_70 (BD1), Esperer\_68 (BD1), FloraSnap32\_26 (FC), FloraSnap32\_311 (FC), FrostedClock\_31 (FC), FrostedClock\_316 (FC), GoldenEssence\_15 (FC), GoldenEssence\_296 (FC), Hydra\_70 (BD1), Indigo\_66 (BD1), Jash\_69 (BD1), Laure\_16 (UNK), Laure\_334 (UNK), Leviticus\_68 (BD1), Mimi\_29 (FC), Mimi\_314 (FC), Nerdos\_66 (BD1), Patbob\_28 (FC), Patbob\_314 (FC), Phettuccine\_67 (BD1), Racecar\_30 (FC), Racecar\_319 (FC), Rusticus\_69 (BD1), SunsetPointe\_67 (BD1), Talia1610\_29 (FC), Talia1610\_315 (FC), Unstoppable\_67 (BD1),

Start 17:

- Found in 4 of 73 ( 5.5% ) of genes in pham
- Manual Annotations of this start: 3 of 58
- Called 100.0% of time when present
- Phage (with cluster) where this start called: EnochSoames\_71 (BD1), Lannister\_67 (BD1), Nanodon\_69 (BD1), Oliynyk\_69 (BD1),

Start 18:

- Found in 40 of 73 ( 54.8% ) of genes in pham
- Manual Annotations of this start: 14 of 58
- Called 45.0% of time when present
- Phage (with cluster) where this start called: Alsaber\_71 (BD3), Amela\_70 (BD3), Celery\_75 (BD3), Celia\_68 (BD6), Conan\_72 (BD3), Dexers\_69 (BD3), ElGato\_72

(BD3), Itza\_71 (BD6), Jhitchelle\_68 (BD3), Kaine\_71 (BD3), Pavo\_72 (BD3), Provolone\_72 (BD3), Sudan\_71 (BD3), SunkenRoot\_72 (BD3), Urza\_70 (BD6), Vanseggelen\_76 (BD3), Verabelle\_73 (BD3), Verse\_71 (BD3),

Start 19:

- Found in 3 of 73 ( 4.1% ) of genes in pham
- Manual Annotations of this start: 2 of 58
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Maruru\_98 (FG), Sonali\_98 (FG), Sunshine23\_100 (FG),

### **Summary by clusters:**

There are 8 clusters represented in this pham: FC, BD6, BD1, AT, BD3, FG, FH, UNK,

Info for manual annotations of cluster AT:

- Start number 9 was manually annotated 4 times for cluster AT.

Info for manual annotations of cluster BD1:

- Start number 7 was manually annotated 1 time for cluster BD1.
- Start number 8 was manually annotated 3 times for cluster BD1.
- Start number 14 was manually annotated 1 time for cluster BD1.
- Start number 16 was manually annotated 14 times for cluster BD1.
- Start number 17 was manually annotated 3 times for cluster BD1.

Info for manual annotations of cluster BD3:

- Start number 11 was manually annotated 1 time for cluster BD3.
- Start number 12 was manually annotated 1 time for cluster BD3.
- Start number 15 was manually annotated 1 time for cluster BD3.
- Start number 18 was manually annotated 11 times for cluster BD3.

Info for manual annotations of cluster BD6:

- Start number 18 was manually annotated 3 times for cluster BD6.

Info for manual annotations of cluster FC:

- Start number 16 was manually annotated 10 times for cluster FC.

Info for manual annotations of cluster FG:

- Start number 19 was manually annotated 2 times for cluster FG.

Info for manual annotations of cluster FH:

- Start number 12 was manually annotated 2 times for cluster FH.
- Start number 13 was manually annotated 1 time for cluster FH.

### **Gene Information:**

Gene: Aaronocolus\_67 Start: 45850, Stop: 45521, Start Num: 8

Candidate Starts for Aaronocolus\_67:

(Start: 7 @45856 has 1 MA's), (Start: 8 @45850 has 3 MA's), (Start: 16 @45778 has 24 MA's), (Start: 18 @45769 has 14 MA's), (33, 45571),

Gene: Alsaber\_71 Start: 45844, Stop: 45596, Start Num: 18  
Candidate Starts for Alsaber\_71:  
(10, 45856), (Start: 18 @45844 has 14 MA's), (27, 45697), (33, 45646), (35, 45631),

Gene: Altadena\_74 Start: 46046, Stop: 45783, Start Num: 13  
Candidate Starts for Altadena\_74:  
(Start: 13 @46046 has 1 MA's),

Gene: Amela\_70 Start: 46491, Stop: 46243, Start Num: 18  
Candidate Starts for Amela\_70:  
(Start: 18 @46491 has 14 MA's), (27, 46344), (33, 46293), (35, 46278),

Gene: BeardedLady\_68 Start: 46230, Stop: 45901, Start Num: 8  
Candidate Starts for BeardedLady\_68:  
(Start: 7 @46236 has 1 MA's), (Start: 8 @46230 has 3 MA's), (Start: 16 @46158 has 24 MA's), (Start: 18 @46149 has 14 MA's), (33, 45951),

Gene: BeatusComedenti\_45 Start: 32843, Stop: 33130, Start Num: 9  
Candidate Starts for BeatusComedenti\_45:  
(Start: 9 @32843 has 4 MA's), (Start: 12 @32852 has 3 MA's), (24, 32975), (35, 33092),

Gene: Bloom\_318 Start: 187214, Stop: 187450, Start Num: 16  
Candidate Starts for Bloom\_318:  
(Start: 16 @187214 has 24 MA's), (33, 187400), (34, 187406), (37, 187436),

Gene: Bloom\_31 Start: 13739, Stop: 13975, Start Num: 16  
Candidate Starts for Bloom\_31:  
(Start: 16 @13739 has 24 MA's), (33, 13925), (34, 13931), (37, 13961),

Gene: Bovely\_67 Start: 45781, Stop: 45524, Start Num: 16  
Candidate Starts for Bovely\_67:  
(Start: 7 @45859 has 1 MA's), (Start: 8 @45853 has 3 MA's), (Start: 16 @45781 has 24 MA's), (Start: 18 @45772 has 14 MA's), (33, 45574),

Gene: BryanRecycles\_69 Start: 46276, Stop: 46019, Start Num: 16  
Candidate Starts for BryanRecycles\_69:  
(Start: 14 @46282 has 1 MA's), (Start: 16 @46276 has 24 MA's), (Start: 18 @46267 has 14 MA's), (22, 46222), (33, 46069),

Gene: Bumble\_75 Start: 47160, Stop: 46906, Start Num: 12  
Candidate Starts for Bumble\_75:  
(Start: 12 @47160 has 3 MA's),

Gene: Caliburn\_67 Start: 46166, Stop: 45909, Start Num: 16  
Candidate Starts for Caliburn\_67:  
(Start: 7 @46244 has 1 MA's), (Start: 8 @46238 has 3 MA's), (Start: 16 @46166 has 24 MA's), (Start: 18 @46157 has 14 MA's), (33, 45959),

Gene: Celery\_75 Start: 45542, Stop: 45294, Start Num: 18  
Candidate Starts for Celery\_75:  
(Start: 13 @45548 has 1 MA's), (Start: 18 @45542 has 14 MA's), (27, 45395), (33, 45344), (35, 45329),

Gene: Celia\_68 Start: 45223, Stop: 44972, Start Num: 18  
Candidate Starts for Celia\_68:  
(1, 45601), (4, 45454), (6, 45331), (Start: 18 @45223 has 14 MA's), (20, 45199), (22, 45178), (28, 45073), (33, 45022), (34, 45016), (37, 44986),

Gene: Circuit\_74 Start: 47524, Stop: 47270, Start Num: 12  
Candidate Starts for Circuit\_74:  
(Start: 12 @47524 has 3 MA's),

Gene: Conan\_72 Start: 46096, Stop: 45848, Start Num: 18  
Candidate Starts for Conan\_72:  
(10, 46108), (Start: 18 @46096 has 14 MA's), (27, 45949), (35, 45883),

Gene: DanielleIgnace\_36 Start: 30716, Stop: 31006, Start Num: 9  
Candidate Starts for DanielleIgnace\_36:  
(Start: 9 @30716 has 4 MA's), (Start: 12 @30725 has 3 MA's), (25, 30890), (30, 30911), (31, 30917),

Gene: Dexers\_69 Start: 46070, Stop: 45822, Start Num: 18  
Candidate Starts for Dexers\_69:  
(Start: 8 @46142 has 3 MA's), (Start: 18 @46070 has 14 MA's), (27, 45923), (33, 45872), (35, 45857),

Gene: Eddasa\_70 Start: 46815, Stop: 46558, Start Num: 16  
Candidate Starts for Eddasa\_70:  
(Start: 14 @46821 has 1 MA's), (Start: 16 @46815 has 24 MA's), (Start: 18 @46806 has 14 MA's), (22, 46761), (33, 46608),

Gene: ElGato\_72 Start: 45973, Stop: 45725, Start Num: 18  
Candidate Starts for ElGato\_72:  
(Start: 8 @46045 has 3 MA's), (Start: 18 @45973 has 14 MA's), (27, 45826), (35, 45760),

Gene: EnochSoames\_71 Start: 46067, Stop: 45816, Start Num: 17  
Candidate Starts for EnochSoames\_71:  
(Start: 17 @46067 has 3 MA's), (20, 46040), (21, 46028), (33, 45866),

Gene: Esperer\_68 Start: 46124, Stop: 45867, Start Num: 16  
Candidate Starts for Esperer\_68:  
(Start: 7 @46202 has 1 MA's), (Start: 8 @46196 has 3 MA's), (Start: 16 @46124 has 24 MA's), (Start: 18 @46115 has 14 MA's), (33, 45917),

Gene: FloraSnap32\_311 Start: 186308, Stop: 186544, Start Num: 16  
Candidate Starts for FloraSnap32\_311:  
(Start: 16 @186308 has 24 MA's), (33, 186494), (37, 186530),

Gene: FloraSnap32\_26 Start: 12170, Stop: 12406, Start Num: 16  
Candidate Starts for FloraSnap32\_26:  
(Start: 16 @12170 has 24 MA's), (33, 12356), (37, 12392),

Gene: FrostedClock\_31 Start: 13297, Stop: 13533, Start Num: 16  
Candidate Starts for FrostedClock\_31:  
(Start: 16 @13297 has 24 MA's), (37, 13519),

Gene: FrostedClock\_316 Start: 187097, Stop: 187333, Start Num: 16  
Candidate Starts for FrostedClock\_316:

(Start: 16 @187097 has 24 MA's), (37, 187319),

Gene: GoldenEssence\_15 Start: 7548, Stop: 7784, Start Num: 16

Candidate Starts for GoldenEssence\_15:

(Start: 16 @7548 has 24 MA's), (37, 7770),

Gene: GoldenEssence\_296 Start: 178101, Stop: 178337, Start Num: 16

Candidate Starts for GoldenEssence\_296:

(Start: 16 @178101 has 24 MA's), (37, 178323),

Gene: Hydra\_70 Start: 46968, Stop: 46711, Start Num: 16

Candidate Starts for Hydra\_70:

(Start: 7 @47046 has 1 MA's), (Start: 8 @47040 has 3 MA's), (Start: 16 @46968 has 24 MA's), (Start: 18 @46959 has 14 MA's), (33, 46761),

Gene: Indigo\_66 Start: 45774, Stop: 45517, Start Num: 16

Candidate Starts for Indigo\_66:

(Start: 7 @45852 has 1 MA's), (Start: 8 @45846 has 3 MA's), (Start: 16 @45774 has 24 MA's), (Start: 18 @45765 has 14 MA's), (33, 45567),

Gene: Itza\_71 Start: 45156, Stop: 44905, Start Num: 18

Candidate Starts for Itza\_71:

(1, 45534), (4, 45387), (6, 45264), (Start: 18 @45156 has 14 MA's), (20, 45132), (22, 45111), (28, 45006), (33, 44955), (34, 44949), (37, 44919),

Gene: Izzy\_69 Start: 46329, Stop: 46066, Start Num: 14

Candidate Starts for Izzy\_69:

(Start: 14 @46329 has 1 MA's), (Start: 16 @46323 has 24 MA's), (Start: 18 @46314 has 14 MA's), (22, 46269), (33, 46116),

Gene: Jash\_69 Start: 46276, Stop: 46019, Start Num: 16

Candidate Starts for Jash\_69:

(Start: 14 @46282 has 1 MA's), (Start: 16 @46276 has 24 MA's), (Start: 18 @46267 has 14 MA's), (22, 46222), (33, 46069),

Gene: Jhitchelle\_68 Start: 45217, Stop: 44969, Start Num: 18

Candidate Starts for Jhitchelle\_68:

(Start: 18 @45217 has 14 MA's), (27, 45070), (35, 45004),

Gene: Kaine\_71 Start: 45868, Stop: 45620, Start Num: 18

Candidate Starts for Kaine\_71:

(10, 45880), (Start: 18 @45868 has 14 MA's), (27, 45721), (35, 45655),

Gene: KellEzio\_44 Start: 32637, Stop: 32924, Start Num: 9

Candidate Starts for KellEzio\_44:

(2, 32310), (3, 32343), (5, 32532), (Start: 9 @32637 has 4 MA's), (Start: 12 @32646 has 3 MA's), (24, 32769), (35, 32886),

Gene: Kitkat\_46 Start: 32939, Stop: 33226, Start Num: 9

Candidate Starts for Kitkat\_46:

(Start: 9 @32939 has 4 MA's), (Start: 12 @32948 has 3 MA's), (24, 33071), (35, 33188),

Gene: Lannister\_67 Start: 46592, Stop: 46341, Start Num: 17

Candidate Starts for Lannister\_67:

(Start: 17 @46592 has 3 MA's), (20, 46565), (33, 46391),

Gene: Laure\_334 Start: 175658, Stop: 175897, Start Num: 16

Candidate Starts for Laure\_334:

(Start: 16 @175658 has 24 MA's), (23, 175742), (33, 175847), (36, 175865),

Gene: Laure\_16 Start: 7310, Stop: 7549, Start Num: 16

Candidate Starts for Laure\_16:

(Start: 16 @7310 has 24 MA's), (23, 7394), (33, 7499), (36, 7517),

Gene: Legacy\_67 Start: 46235, Stop: 45900, Start Num: 7

Candidate Starts for Legacy\_67:

(Start: 7 @46235 has 1 MA's), (Start: 8 @46229 has 3 MA's), (Start: 16 @46157 has 24 MA's), (Start: 18 @46148 has 14 MA's), (33, 45950),

Gene: Leviticus\_68 Start: 46311, Stop: 46054, Start Num: 16

Candidate Starts for Leviticus\_68:

(Start: 7 @46389 has 1 MA's), (Start: 8 @46383 has 3 MA's), (Start: 16 @46311 has 24 MA's), (Start: 18 @46302 has 14 MA's), (33, 46104),

Gene: Maruru\_98 Start: 59257, Stop: 58997, Start Num: 19

Candidate Starts for Maruru\_98:

(Start: 19 @59257 has 2 MA's), (26, 59119),

Gene: Mimi\_29 Start: 13192, Stop: 13428, Start Num: 16

Candidate Starts for Mimi\_29:

(Start: 16 @13192 has 24 MA's), (33, 13378), (37, 13414),

Gene: Mimi\_314 Start: 185852, Stop: 186088, Start Num: 16

Candidate Starts for Mimi\_314:

(Start: 16 @185852 has 24 MA's), (33, 186038), (37, 186074),

Gene: Nanodon\_69 Start: 46521, Stop: 46270, Start Num: 17

Candidate Starts for Nanodon\_69:

(Start: 17 @46521 has 3 MA's), (20, 46494), (33, 46320),

Gene: Nerdos\_66 Start: 45773, Stop: 45516, Start Num: 16

Candidate Starts for Nerdos\_66:

(Start: 7 @45851 has 1 MA's), (Start: 8 @45845 has 3 MA's), (Start: 16 @45773 has 24 MA's), (Start: 18 @45764 has 14 MA's), (33, 45566),

Gene: Oliynyk\_69 Start: 46270, Stop: 46019, Start Num: 17

Candidate Starts for Oliynyk\_69:

(Start: 17 @46270 has 3 MA's), (20, 46243), (21, 46231), (33, 46069),

Gene: Ozzie\_67 Start: 46238, Stop: 45909, Start Num: 8

Candidate Starts for Ozzie\_67:

(Start: 7 @46244 has 1 MA's), (Start: 8 @46238 has 3 MA's), (Start: 16 @46166 has 24 MA's), (Start: 18 @46157 has 14 MA's), (33, 45959),

Gene: Patbob\_28 Start: 13355, Stop: 13591, Start Num: 16

Candidate Starts for Patbob\_28:

(Start: 16 @13355 has 24 MA's), (33, 13541), (37, 13577),

Gene: Patbob\_314 Start: 188814, Stop: 189050, Start Num: 16

Candidate Starts for Patbob\_314:

(Start: 16 @188814 has 24 MA's), (33, 189000), (37, 189036),

Gene: Pavo\_72 Start: 46044, Stop: 45796, Start Num: 18

Candidate Starts for Pavo\_72:

(10, 46056), (Start: 18 @46044 has 14 MA's), (27, 45897), (35, 45831),

Gene: Phettuccine\_67 Start: 45774, Stop: 45517, Start Num: 16

Candidate Starts for Phettuccine\_67:

(Start: 7 @45852 has 1 MA's), (Start: 8 @45846 has 3 MA's), (Start: 16 @45774 has 24 MA's), (Start: 18 @45765 has 14 MA's), (33, 45567),

Gene: Provolone\_72 Start: 46185, Stop: 45937, Start Num: 18

Candidate Starts for Provolone\_72:

(10, 46197), (Start: 18 @46185 has 14 MA's), (27, 46038), (35, 45972),

Gene: Racecar\_30 Start: 13783, Stop: 14019, Start Num: 16

Candidate Starts for Racecar\_30:

(Start: 16 @13783 has 24 MA's), (37, 14005),

Gene: Racecar\_319 Start: 187492, Stop: 187728, Start Num: 16

Candidate Starts for Racecar\_319:

(Start: 16 @187492 has 24 MA's), (37, 187714),

Gene: Rusticus\_69 Start: 46276, Stop: 46019, Start Num: 16

Candidate Starts for Rusticus\_69:

(Start: 14 @46282 has 1 MA's), (Start: 16 @46276 has 24 MA's), (Start: 18 @46267 has 14 MA's), (22, 46222), (33, 46069),

Gene: Saftant\_69 Start: 45928, Stop: 45668, Start Num: 11

Candidate Starts for Saftant\_69:

(Start: 9 @45934 has 4 MA's), (Start: 11 @45928 has 1 MA's), (27, 45769), (33, 45718), (35, 45703),

Gene: Sonali\_98 Start: 60140, Stop: 59886, Start Num: 19

Candidate Starts for Sonali\_98:

(Start: 19 @60140 has 2 MA's), (26, 60002),

Gene: Speedwell\_73 Start: 46621, Stop: 46379, Start Num: 15

Candidate Starts for Speedwell\_73:

(Start: 12 @46627 has 3 MA's), (Start: 15 @46621 has 1 MA's), (Start: 18 @46615 has 14 MA's), (20, 46591), (29, 46462),

Gene: Sudan\_71 Start: 45851, Stop: 45603, Start Num: 18

Candidate Starts for Sudan\_71:

(10, 45863), (Start: 18 @45851 has 14 MA's), (27, 45704), (35, 45638),

Gene: SunkenRoot\_72 Start: 46218, Stop: 45970, Start Num: 18

Candidate Starts for SunkenRoot\_72:

(Start: 18 @46218 has 14 MA's), (27, 46071), (33, 46020), (35, 46005),

Gene: SunsetPointe\_67 Start: 46173, Stop: 45916, Start Num: 16  
Candidate Starts for SunsetPointe\_67:  
(Start: 7 @46251 has 1 MA's), (Start: 8 @46245 has 3 MA's), (Start: 16 @46173 has 24 MA's), (Start: 18 @46164 has 14 MA's), (33, 45966),

Gene: Sunshine23\_100 Start: 59946, Stop: 59692, Start Num: 19  
Candidate Starts for Sunshine23\_100:  
(Start: 19 @59946 has 2 MA's), (26, 59808), (33, 59745),

Gene: Talia1610\_315 Start: 187677, Stop: 187913, Start Num: 16  
Candidate Starts for Talia1610\_315:  
(Start: 16 @187677 has 24 MA's), (37, 187899),

Gene: Talia1610\_29 Start: 13205, Stop: 13441, Start Num: 16  
Candidate Starts for Talia1610\_29:  
(Start: 16 @13205 has 24 MA's), (37, 13427),

Gene: Unstoppable\_67 Start: 45772, Stop: 45515, Start Num: 16  
Candidate Starts for Unstoppable\_67:  
(Start: 7 @45850 has 1 MA's), (Start: 8 @45844 has 3 MA's), (Start: 16 @45772 has 24 MA's), (Start: 18 @45763 has 14 MA's), (33, 45565),

Gene: Urza\_70 Start: 45177, Stop: 44926, Start Num: 18  
Candidate Starts for Urza\_70:  
(1, 45555), (4, 45408), (6, 45285), (Start: 18 @45177 has 14 MA's), (20, 45153), (22, 45132), (28, 45027), (33, 44976), (34, 44970), (37, 44940),

Gene: Vanseggelen\_76 Start: 45785, Stop: 45537, Start Num: 18  
Candidate Starts for Vanseggelen\_76:  
(Start: 18 @45785 has 14 MA's), (27, 45638), (35, 45572),

Gene: Verabelle\_73 Start: 45224, Stop: 44976, Start Num: 18  
Candidate Starts for Verabelle\_73:  
(Start: 18 @45224 has 14 MA's), (27, 45077), (35, 45011),

Gene: Verse\_71 Start: 46482, Stop: 46234, Start Num: 18  
Candidate Starts for Verse\_71:  
(Start: 18 @46482 has 14 MA's), (27, 46335), (33, 46284), (35, 46269),

Gene: ZamZam\_71 Start: 46239, Stop: 45997, Start Num: 12  
Candidate Starts for ZamZam\_71:  
(Start: 12 @46239 has 3 MA's), (Start: 18 @46230 has 14 MA's), (24, 46134), (28, 46083), (32, 46059), (33, 46047),

Gene: phiCAM\_67 Start: 47310, Stop: 47056, Start Num: 12  
Candidate Starts for phiCAM\_67:  
(Start: 12 @47310 has 3 MA's), (Start: 15 @47304 has 1 MA's), (Start: 18 @47292 has 14 MA's), (33, 47106),