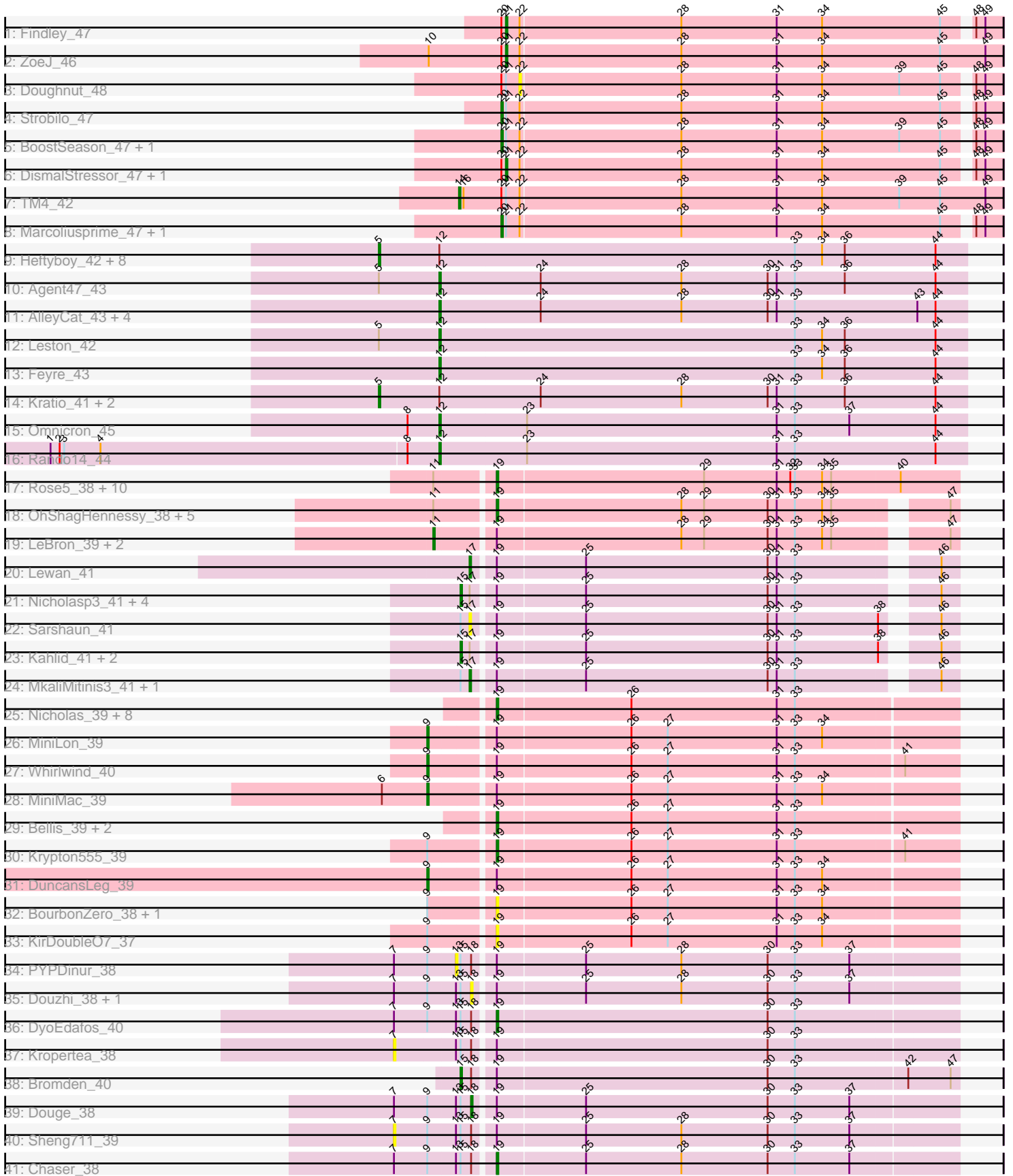


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Note: Tracks are now grouped by subcluster and scaled. Switching in subcluster is indicated by changes in track color. Track scale is now set by default to display the region 30 bp upstream of start 1 to 30 bp downstream of the last possible start. 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 216048 Report

This analysis was run 02/22/25 on database version 588.

Pham number 216048 has 94 members, 14 are drafts.

Phages represented in each track:

- Track 1 : Findley\_47
- Track 2 : ZoeJ\_46
- Track 3 : Doughnut\_48
- Track 4 : Strobilo\_47
- Track 5 : BoostSeason\_47, Mufasa\_47
- Track 6 : DismalStressor\_47, Milly\_47
- Track 7 : TM4\_42
- Track 8 : Marcoliusprime\_47, DismalFunk\_47
- Track 9 : Heftyboy\_42, Guillsminger\_43, Gengar\_42, OkiRoe\_42, Waterfoul\_43, Paola\_42, Thyatira\_44, Miryou\_44, SoSeph\_42
- Track 10 : Agent47\_43
- Track 11 : AlleyCat\_43, Edugator\_42, Psycho\_43, Larva\_43, Dadosky\_43
- Track 12 : Leston\_42
- Track 13 : Feyre\_43
- Track 14 : Kratio\_41, InvictusManeo\_42, Collard\_42
- Track 15 : Omnicron\_45
- Track 16 : Rando14\_44
- Track 17 : Rose5\_38, Calm\_39, Tyson\_38, CicholasNage\_39, Wyatt2\_39, MAckerman\_39, Zaria\_39, Acquire49\_39, Silverleaf\_38, AvadaKedavra\_39, Halena\_38
- Track 18 : OhShagHennessy\_38, Poochiewood\_38, Wamburgrxpress\_39, Enceladus\_38, Appletree2\_38, DirkDirk\_38
- Track 19 : LeBron\_39, UPIE\_39, JoeDirt\_38
- Track 20 : Lewan\_41
- Track 21 : Nicholasp3\_41, Winky\_41, Breezona\_41, Rumpelstiltskin\_41, Faith1\_41
- Track 22 : Sarshaun\_41
- Track 23 : Kahlid\_41, Loadrie\_41, Wigglewiggles\_41
- Track 24 : MkaliMitinis3\_41, LilDestine\_41
- Track 25 : Nicholas\_39, Red305\_39, Lumos\_39, Jubie\_39, Snenia\_39, Clautastrophe\_39, MsGreen\_39, Kingsolomon\_39, TriFive\_39
- Track 26 : MiniLon\_39
- Track 27 : Whirlwind\_40
- Track 28 : MiniMac\_39
- Track 29 : Bellis\_39, Moostard\_39, Finnry\_39
- Track 30 : Krypton555\_39
- Track 31 : DuncansLeg\_39
- Track 32 : BourbonZero\_38, Ellson\_39

- Track 33 : KirDoubleO7\_37
- Track 34 : PYPDinur\_38
- Track 35 : Douzhi\_38, BrainDrainer\_39
- Track 36 : DyoEdafos\_40
- Track 37 : Kropertea\_38
- Track 38 : Bromden\_40
- Track 39 : Douge\_38
- Track 40 : Sheng711\_39
- Track 41 : Chaser\_38

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

The start number called the most often in the published annotations is 19, it was called in 28 of the 80 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Acquire49\_39, Appletree2\_38, AvadaKedavra\_39, Bellis\_39, BourbonZero\_38, Calm\_39, Chaser\_38, CicholasNage\_39, Clautastrophe\_39, DirkDirk\_38, DyoEdafos\_40, Ellson\_39, Enceladus\_38, Finnry\_39, Halena\_38, Jubie\_39, Kingsolomon\_39, KirDoubleO7\_37, Krypton555\_39, Lumos\_39, MAckerman\_39, Moostard\_39, MsGreen\_39, Nicholas\_39, OhShagHennessy\_38, Poochiewood\_38, Red305\_39, Rose5\_38, Silverleaf\_38, Snenia\_39, TriFive\_39, Tyson\_38, Wamburgxpress\_39, Wyatt2\_39, Zaria\_39,

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

- BrainDrainer\_39, Breezona\_41, Bromden\_40, Douge\_38, Douzhi\_38, DuncansLeg\_39, Faith1\_41, JoeDirt\_38, Kahlid\_41, Kropertea\_38, LeBron\_39, Lewan\_41, LilDestine\_41, Loadrie\_41, MiniLon\_39, MiniMac\_39, MkaliMitinis3\_41, Nicholasp3\_41, PYPDinur\_38, Rumpelstiltskin\_41, Sarshaun\_41, Sheng711\_39, UPIE\_39, Whirlwind\_40, Wigglewiggle\_41, Winky\_41,

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

- Agent47\_43, AlleyCat\_43, BoostSeason\_47, Collard\_42, Dadosky\_43, DismalFunk\_47, DismalStressor\_47, Doughnut\_48, Edugator\_42, Feyre\_43, Findley\_47, Gengar\_42, Guillsminger\_43, Heftyboy\_42, InvictusManeo\_42, Kratio\_41, Larva\_43, Leston\_42, Marcoliusprime\_47, Milly\_47, Miryou\_44, Mufasa\_47, OkiRoe\_42, Omnicron\_45, Paola\_42, Psycho\_43, Rando14\_44, SoSeph\_42, Strobilo\_47, TM4\_42, Thyatira\_44, Waterfoul\_43, ZoeJ\_46,

**Summary by start number:**

Start 5:

- Found in 14 of 94 ( 14.9% ) of genes in pham
- Manual Annotations of this start: 12 of 80
- Called 85.7% of time when present
- Phage (with cluster) where this start called: Collard\_42 (K5), Gengar\_42 (K5), Guillsminger\_43 (K5), Heftyboy\_42 (K5), InvictusManeo\_42 (K5), Kratio\_41 (K5), Miryou\_44 (K5), OkiRoe\_42 (K5), Paola\_42 (K5), SoSeph\_42 (K5), Thyatira\_44 (K5), Waterfoul\_43 (K5),

Start 7:

- Found in 8 of 94 ( 8.5% ) of genes in pham
- No Manual Annotations of this start.
- Called 25.0% of time when present
- Phage (with cluster) where this start called: Kropertea\_38 (L4), Sheng711\_39 (L4),

Start 9:

- Found in 15 of 94 ( 16.0% ) of genes in pham
- Manual Annotations of this start: 4 of 80
- Called 26.7% of time when present
- Phage (with cluster) where this start called: DuncansLeg\_39 (L3), MiniLon\_39 (L3), MiniMac\_39 (L3), Whirlwind\_40 (L3),

Start 11:

- Found in 20 of 94 ( 21.3% ) of genes in pham
- Manual Annotations of this start: 3 of 80
- Called 15.0% of time when present
- Phage (with cluster) where this start called: JoeDirt\_38 (L1), LeBron\_39 (L1), UPIE\_39 (L1),

Start 12:

- Found in 22 of 94 ( 23.4% ) of genes in pham
- Manual Annotations of this start: 10 of 80
- Called 45.5% of time when present
- Phage (with cluster) where this start called: Agent47\_43 (K5), AlleyCat\_43 (K5), Dadosky\_43 (K5), Edugator\_42 (K5), Feyre\_43 (K5), Larva\_43 (K5), Leston\_42 (K5), Omnicron\_45 (K5), Psycho\_43 (K5), Rando14\_44 (K5),

Start 13:

- Found in 8 of 94 ( 8.5% ) of genes in pham
- No Manual Annotations of this start.
- Called 12.5% of time when present
- Phage (with cluster) where this start called: PYPDinur\_38 (L4),

Start 14:

- Found in 1 of 94 ( 1.1% ) of genes in pham
- Manual Annotations of this start: 1 of 80
- Called 100.0% of time when present
- Phage (with cluster) where this start called: TM4\_42 (K2),

Start 15:

- Found in 20 of 94 ( 21.3% ) of genes in pham
- Manual Annotations of this start: 9 of 80
- Called 45.0% of time when present
- Phage (with cluster) where this start called: Breezona\_41 (L2), Bromden\_40 (L4), Faith1\_41 (L2), Kahlid\_41 (L2), Loadrie\_41 (L2), Nicholasp3\_41 (L2), Rumpelstiltskin\_41 (L2), Wigglewiggles\_41 (L2), Winky\_41 (L2),

Start 17:

- Found in 12 of 94 ( 12.8% ) of genes in pham
- Manual Annotations of this start: 3 of 80
- Called 33.3% of time when present

- Phage (with cluster) where this start called: Lewan\_41 (L2), LilDestine\_41 (L2), MkaliMitinis3\_41 (L2), Sarshaun\_41 (L2),

#### Start 18:

- Found in 9 of 94 ( 9.6% ) of genes in pham
- Manual Annotations of this start: 1 of 80
- Called 33.3% of time when present
- Phage (with cluster) where this start called: BrainDrainer\_39 (L4), Douge\_38 (L4), Douzhi\_38 (L4),

#### Start 19:

- Found in 61 of 94 ( 64.9% ) of genes in pham
- Manual Annotations of this start: 28 of 80
- Called 57.4% of time when present
- Phage (with cluster) where this start called: Acquire49\_39 (L1), Appletree2\_38 (L1), AvadaKedavra\_39 (L1), Bellis\_39 (L3), BourbonZero\_38 (L3), Calm\_39 (L1), Chaser\_38 (L4), CicholasNage\_39 (L1), Clautastrophe\_39 (L3), DirkDirk\_38 (L1), DyoEdafos\_40 (L4), Ellson\_39 (L3), Enceladus\_38 (L1), Finnry\_39 (L3), Halena\_38 (L1), Jubie\_39 (L3), Kingsolomon\_39 (L3), KirDoubleO7\_37 (L3), Krypton555\_39 (L3), Lumos\_39 (L3), MAckerman\_39 (L1), Moostard\_39 (L3), MsGreen\_39 (L3), Nicholas\_39 (L3), OhShagHennessy\_38 (L1), Poochiewood\_38 (L1), Red305\_39 (L3), Rose5\_38 (L1), Silverleaf\_38 (L1), Snenia\_39 (L3), TriFive\_39 (L3), Tyson\_38 (L1), Wamburgrxpress\_39 (L1), Wyatt2\_39 (L1), Zaria\_39 (L1),

#### Start 20:

- Found in 11 of 94 ( 11.7% ) of genes in pham
- Manual Annotations of this start: 5 of 80
- Called 45.5% of time when present
- Phage (with cluster) where this start called: BoostSeason\_47 (K2), DismalFunk\_47 (K2), Marcoliusprime\_47 (K2), Mufasa\_47 (K2), Strobilo\_47 (K2),

#### Start 21:

- Found in 11 of 94 ( 11.7% ) of genes in pham
- Manual Annotations of this start: 4 of 80
- Called 36.4% of time when present
- Phage (with cluster) where this start called: DismalStressor\_47 (K2), Findley\_47 (K2), Milly\_47 (K2), ZoeJ\_46 (K2),

#### Start 22:

- Found in 11 of 94 ( 11.7% ) of genes in pham
- No Manual Annotations of this start.
- Called 9.1% of time when present
- Phage (with cluster) where this start called: Doughnut\_48 (K2),

### Summary by clusters:

There are 6 clusters represented in this pham: K2, L4, L2, L3, K5, L1,

#### Info for manual annotations of cluster K2:

- Start number 14 was manually annotated 1 time for cluster K2.
- Start number 20 was manually annotated 5 times for cluster K2.
- Start number 21 was manually annotated 4 times for cluster K2.

Info for manual annotations of cluster K5:

- Start number 5 was manually annotated 12 times for cluster K5.
- Start number 12 was manually annotated 10 times for cluster K5.

Info for manual annotations of cluster L1:

- Start number 11 was manually annotated 3 times for cluster L1.
- Start number 19 was manually annotated 16 times for cluster L1.

Info for manual annotations of cluster L2:

- Start number 15 was manually annotated 8 times for cluster L2.
- Start number 17 was manually annotated 3 times for cluster L2.

Info for manual annotations of cluster L3:

- Start number 9 was manually annotated 4 times for cluster L3.
- Start number 19 was manually annotated 10 times for cluster L3.

Info for manual annotations of cluster L4:

- Start number 15 was manually annotated 1 time for cluster L4.
- Start number 18 was manually annotated 1 time for cluster L4.
- Start number 19 was manually annotated 2 times for cluster L4.

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

Gene: Acquire49\_39 Start: 33043, Stop: 33345, Start Num: 19

Candidate Starts for Acquire49\_39:

(Start: 11 @33007 has 3 MA's), (Start: 19 @33043 has 28 MA's), (29, 33178), (31, 33226), (32, 33235), (33, 33238), (34, 33256), (35, 33262), (40, 33307),

Gene: Agent47\_43 Start: 34663, Stop: 35010, Start Num: 12

Candidate Starts for Agent47\_43:

(Start: 5 @34624 has 12 MA's), (Start: 12 @34663 has 10 MA's), (24, 34729), (28, 34822), (30, 34879), (31, 34885), (33, 34897), (36, 34930), (44, 34990),

Gene: AlleyCat\_43 Start: 34517, Stop: 34864, Start Num: 12

Candidate Starts for AlleyCat\_43:

(Start: 12 @34517 has 10 MA's), (24, 34583), (28, 34676), (30, 34733), (31, 34739), (33, 34751), (43, 34832), (44, 34844),

Gene: Appletree2\_38 Start: 32985, Stop: 33272, Start Num: 19

Candidate Starts for Appletree2\_38:

(Start: 11 @32949 has 3 MA's), (Start: 19 @32985 has 28 MA's), (28, 33105), (29, 33120), (30, 33162), (31, 33168), (33, 33180), (34, 33198), (35, 33204), (47, 33267),

Gene: AvadaKedavra\_39 Start: 33052, Stop: 33354, Start Num: 19

Candidate Starts for AvadaKedavra\_39:

(Start: 11 @33016 has 3 MA's), (Start: 19 @33052 has 28 MA's), (29, 33187), (31, 33235), (32, 33244), (33, 33247), (34, 33265), (35, 33271), (40, 33316),

Gene: Bellis\_39 Start: 34657, Stop: 34956, Start Num: 19

Candidate Starts for Bellis\_39:

(Start: 19 @34657 has 28 MA's), (26, 34744), (27, 34768), (31, 34840), (33, 34852),

Gene: BoostSeason\_47 Start: 36788, Stop: 37108, Start Num: 20

Candidate Starts for BoostSeason\_47:

(Start: 20 @36788 has 5 MA's), (Start: 21 @36791 has 4 MA's), (22, 36800), (28, 36905), (31, 36968), (34, 36998), (39, 37049), (45, 37076), (48, 37091), (49, 37097),

Gene: BourbonZero\_38 Start: 34636, Stop: 34935, Start Num: 19

Candidate Starts for BourbonZero\_38:

(Start: 9 @34597 has 4 MA's), (Start: 19 @34636 has 28 MA's), (26, 34723), (27, 34747), (31, 34819), (33, 34831), (34, 34849),

Gene: BrainDrainer\_39 Start: 33307, Stop: 33618, Start Num: 18

Candidate Starts for BrainDrainer\_39:

(7, 33259), (Start: 9 @33280 has 4 MA's), (13, 33298), (Start: 15 @33301 has 9 MA's), (Start: 18 @33307 has 1 MA's), (Start: 19 @33319 has 28 MA's), (25, 33376), (28, 33439), (30, 33496), (33, 33514), (37, 33550),

Gene: Breezona\_41 Start: 34392, Stop: 34697, Start Num: 15

Candidate Starts for Breezona\_41:

(Start: 15 @34392 has 9 MA's), (Start: 17 @34398 has 3 MA's), (Start: 19 @34410 has 28 MA's), (25, 34467), (30, 34587), (31, 34593), (33, 34605), (46, 34686),

Gene: Bromden\_40 Start: 33855, Stop: 34172, Start Num: 15

Candidate Starts for Bromden\_40:

(Start: 15 @33855 has 9 MA's), (Start: 18 @33861 has 1 MA's), (Start: 19 @33873 has 28 MA's), (30, 34050), (33, 34068), (42, 34140), (47, 34167),

Gene: Calm\_39 Start: 33058, Stop: 33360, Start Num: 19

Candidate Starts for Calm\_39:

(Start: 11 @33022 has 3 MA's), (Start: 19 @33058 has 28 MA's), (29, 33193), (31, 33241), (32, 33250), (33, 33253), (34, 33271), (35, 33277), (40, 33322),

Gene: Chaser\_38 Start: 33136, Stop: 33435, Start Num: 19

Candidate Starts for Chaser\_38:

(7, 33076), (Start: 9 @33097 has 4 MA's), (13, 33115), (Start: 15 @33118 has 9 MA's), (Start: 18 @33124 has 1 MA's), (Start: 19 @33136 has 28 MA's), (25, 33193), (28, 33256), (30, 33313), (33, 33331), (37, 33367),

Gene: CicholasNage\_39 Start: 33079, Stop: 33381, Start Num: 19

Candidate Starts for CicholasNage\_39:

(Start: 11 @33043 has 3 MA's), (Start: 19 @33079 has 28 MA's), (29, 33214), (31, 33262), (32, 33271), (33, 33274), (34, 33292), (35, 33298), (40, 33343),

Gene: Clautastrophe\_39 Start: 34655, Stop: 34954, Start Num: 19

Candidate Starts for Clautastrophe\_39:

(Start: 19 @34655 has 28 MA's), (26, 34742), (31, 34838), (33, 34850),

Gene: Collard\_42 Start: 34585, Stop: 34971, Start Num: 5

Candidate Starts for Collard\_42:

(Start: 5 @34585 has 12 MA's), (Start: 12 @34624 has 10 MA's), (24, 34690), (28, 34783), (30, 34840), (31, 34846), (33, 34858), (36, 34891), (44, 34951),

Gene: Dadosky\_43 Start: 34519, Stop: 34866, Start Num: 12

Candidate Starts for Dadosky\_43:

(Start: 12 @34519 has 10 MA's), (24, 34585), (28, 34678), (30, 34735), (31, 34741), (33, 34753), (43, 34834), (44, 34846),

Gene: DirkDirk\_38 Start: 33045, Stop: 33332, Start Num: 19

Candidate Starts for DirkDirk\_38:

(Start: 11 @33009 has 3 MA's), (Start: 19 @33045 has 28 MA's), (28, 33165), (29, 33180), (30, 33222), (31, 33228), (33, 33240), (34, 33258), (35, 33264), (47, 33327),

Gene: DismalFunk\_47 Start: 37222, Stop: 37542, Start Num: 20

Candidate Starts for DismalFunk\_47:

(Start: 20 @37222 has 5 MA's), (Start: 21 @37225 has 4 MA's), (22, 37234), (28, 37339), (31, 37402), (34, 37432), (45, 37510), (48, 37525), (49, 37531),

Gene: DismalStressor\_47 Start: 37225, Stop: 37542, Start Num: 21

Candidate Starts for DismalStressor\_47:

(Start: 20 @37222 has 5 MA's), (Start: 21 @37225 has 4 MA's), (22, 37234), (28, 37339), (31, 37402), (34, 37432), (45, 37510), (48, 37525), (49, 37531),

Gene: Douge\_38 Start: 33062, Stop: 33373, Start Num: 18

Candidate Starts for Douge\_38:

(7, 33014), (Start: 9 @33035 has 4 MA's), (13, 33053), (Start: 15 @33056 has 9 MA's), (Start: 18 @33062 has 1 MA's), (Start: 19 @33074 has 28 MA's), (25, 33131), (30, 33251), (33, 33269), (37, 33305),

Gene: Doughnut\_48 Start: 36847, Stop: 37155, Start Num: 22

Candidate Starts for Doughnut\_48:

(Start: 20 @36835 has 5 MA's), (Start: 21 @36838 has 4 MA's), (22, 36847), (28, 36952), (31, 37015), (34, 37045), (39, 37096), (45, 37123), (48, 37138), (49, 37144),

Gene: Douzhi\_38 Start: 33168, Stop: 33479, Start Num: 18

Candidate Starts for Douzhi\_38:

(7, 33120), (Start: 9 @33141 has 4 MA's), (13, 33159), (Start: 15 @33162 has 9 MA's), (Start: 18 @33168 has 1 MA's), (Start: 19 @33180 has 28 MA's), (25, 33237), (28, 33300), (30, 33357), (33, 33375), (37, 33411),

Gene: DuncansLeg\_39 Start: 34634, Stop: 34972, Start Num: 9

Candidate Starts for DuncansLeg\_39:

(Start: 9 @34634 has 4 MA's), (Start: 19 @34673 has 28 MA's), (26, 34760), (27, 34784), (31, 34856), (33, 34868), (34, 34886),

Gene: DyoEdafos\_40 Start: 33408, Stop: 33707, Start Num: 19

Candidate Starts for DyoEdafos\_40:

(7, 33348), (Start: 9 @33369 has 4 MA's), (13, 33387), (Start: 15 @33390 has 9 MA's), (Start: 18 @33396 has 1 MA's), (Start: 19 @33408 has 28 MA's), (30, 33585), (33, 33603),

Gene: Edugator\_42 Start: 34944, Stop: 35291, Start Num: 12

Candidate Starts for Edugator\_42:

(Start: 12 @34944 has 10 MA's), (24, 35010), (28, 35103), (30, 35160), (31, 35166), (33, 35178), (43, 35259), (44, 35271),

Gene: Ellson\_39 Start: 34649, Stop: 34948, Start Num: 19

Candidate Starts for Ellson\_39:



(Start: 9 @34610 has 4 MA's), (Start: 19 @34649 has 28 MA's), (26, 34736), (27, 34760), (31, 34832), (33, 34844), (34, 34862),

Gene: Enceladus\_38 Start: 33028, Stop: 33315, Start Num: 19

Candidate Starts for Enceladus\_38:

(Start: 11 @32992 has 3 MA's), (Start: 19 @33028 has 28 MA's), (28, 33148), (29, 33163), (30, 33205), (31, 33211), (33, 33223), (34, 33241), (35, 33247), (47, 33310),

Gene: Faith1\_41 Start: 34392, Stop: 34697, Start Num: 15

Candidate Starts for Faith1\_41:

(Start: 15 @34392 has 9 MA's), (Start: 17 @34398 has 3 MA's), (Start: 19 @34410 has 28 MA's), (25, 34467), (30, 34587), (31, 34593), (33, 34605), (46, 34686),

Gene: Feyre\_43 Start: 35869, Stop: 36216, Start Num: 12

Candidate Starts for Feyre\_43:

(Start: 12 @35869 has 10 MA's), (33, 36103), (34, 36121), (36, 36136), (44, 36196),

Gene: Findley\_47 Start: 37218, Stop: 37535, Start Num: 21

Candidate Starts for Findley\_47:

(Start: 20 @37215 has 5 MA's), (Start: 21 @37218 has 4 MA's), (22, 37227), (28, 37332), (31, 37395), (34, 37425), (45, 37503), (48, 37518), (49, 37524),

Gene: Finnry\_39 Start: 34658, Stop: 34957, Start Num: 19

Candidate Starts for Finnry\_39:

(Start: 19 @34658 has 28 MA's), (26, 34745), (27, 34769), (31, 34841), (33, 34853),

Gene: Gengar\_42 Start: 34445, Stop: 34831, Start Num: 5

Candidate Starts for Gengar\_42:

(Start: 5 @34445 has 12 MA's), (Start: 12 @34484 has 10 MA's), (33, 34718), (34, 34736), (36, 34751), (44, 34811),

Gene: Guillsminger\_43 Start: 34416, Stop: 34802, Start Num: 5

Candidate Starts for Guillsminger\_43:

(Start: 5 @34416 has 12 MA's), (Start: 12 @34455 has 10 MA's), (33, 34689), (34, 34707), (36, 34722), (44, 34782),

Gene: Halena\_38 Start: 33054, Stop: 33356, Start Num: 19

Candidate Starts for Halena\_38:

(Start: 11 @33018 has 3 MA's), (Start: 19 @33054 has 28 MA's), (29, 33189), (31, 33237), (32, 33246), (33, 33249), (34, 33267), (35, 33273), (40, 33318),

Gene: Heftyboy\_42 Start: 34566, Stop: 34952, Start Num: 5

Candidate Starts for Heftyboy\_42:

(Start: 5 @34566 has 12 MA's), (Start: 12 @34605 has 10 MA's), (33, 34839), (34, 34857), (36, 34872), (44, 34932),

Gene: InvictusManeo\_42 Start: 34628, Stop: 35014, Start Num: 5

Candidate Starts for InvictusManeo\_42:

(Start: 5 @34628 has 12 MA's), (Start: 12 @34667 has 10 MA's), (24, 34733), (28, 34826), (30, 34883), (31, 34889), (33, 34901), (36, 34934), (44, 34994),

Gene: JoeDirt\_38 Start: 32990, Stop: 33313, Start Num: 11

Candidate Starts for JoeDirt\_38:

(Start: 11 @32990 has 3 MA's), (Start: 19 @33026 has 28 MA's), (28, 33146), (29, 33161), (30, 33203), (31, 33209), (33, 33221), (34, 33239), (35, 33245), (47, 33308),

Gene: Jubie\_39 Start: 34656, Stop: 34955, Start Num: 19  
Candidate Starts for Jubie\_39:  
(Start: 19 @34656 has 28 MA's), (26, 34743), (31, 34839), (33, 34851),

Gene: Kahlid\_41 Start: 34398, Stop: 34703, Start Num: 15  
Candidate Starts for Kahlid\_41:  
(Start: 15 @34398 has 9 MA's), (Start: 17 @34404 has 3 MA's), (Start: 19 @34416 has 28 MA's), (25, 34473), (30, 34593), (31, 34599), (33, 34611), (38, 34665), (46, 34692),

Gene: Kingsolomon\_39 Start: 34655, Stop: 34954, Start Num: 19  
Candidate Starts for Kingsolomon\_39:  
(Start: 19 @34655 has 28 MA's), (26, 34742), (31, 34838), (33, 34850),

Gene: KirDoubleO7\_37 Start: 34677, Stop: 34976, Start Num: 19  
Candidate Starts for KirDoubleO7\_37:  
(Start: 9 @34638 has 4 MA's), (Start: 19 @34677 has 28 MA's), (26, 34764), (27, 34788), (31, 34860), (33, 34872), (34, 34890),

Gene: Kratio\_41 Start: 34179, Stop: 34565, Start Num: 5  
Candidate Starts for Kratio\_41:  
(Start: 5 @34179 has 12 MA's), (Start: 12 @34218 has 10 MA's), (24, 34284), (28, 34377), (30, 34434), (31, 34440), (33, 34452), (36, 34485), (44, 34545),

Gene: Kropertea\_38 Start: 33171, Stop: 33530, Start Num: 7  
Candidate Starts for Kropertea\_38:  
(7, 33171), (13, 33210), (Start: 15 @33213 has 9 MA's), (Start: 18 @33219 has 1 MA's), (Start: 19 @33231 has 28 MA's), (30, 33408), (33, 33426),

Gene: Krypton555\_39 Start: 34572, Stop: 34871, Start Num: 19  
Candidate Starts for Krypton555\_39:  
(Start: 9 @34533 has 4 MA's), (Start: 19 @34572 has 28 MA's), (26, 34659), (27, 34683), (31, 34755), (33, 34767), (41, 34836),

Gene: Larva\_43 Start: 34386, Stop: 34733, Start Num: 12  
Candidate Starts for Larva\_43:  
(Start: 12 @34386 has 10 MA's), (24, 34452), (28, 34545), (30, 34602), (31, 34608), (33, 34620), (43, 34701), (44, 34713),

Gene: LeBron\_39 Start: 33034, Stop: 33357, Start Num: 11  
Candidate Starts for LeBron\_39:  
(Start: 11 @33034 has 3 MA's), (Start: 19 @33070 has 28 MA's), (28, 33190), (29, 33205), (30, 33247), (31, 33253), (33, 33265), (34, 33283), (35, 33289), (47, 33352),

Gene: Leston\_42 Start: 34584, Stop: 34931, Start Num: 12  
Candidate Starts for Leston\_42:  
(Start: 5 @34545 has 12 MA's), (Start: 12 @34584 has 10 MA's), (33, 34818), (34, 34836), (36, 34851), (44, 34911),

Gene: Lewan\_41 Start: 34391, Stop: 34690, Start Num: 17  
Candidate Starts for Lewan\_41:

(Start: 17 @34391 has 3 MA's), (Start: 19 @34403 has 28 MA's), (25, 34460), (30, 34580), (31, 34586), (33, 34598), (46, 34679),

Gene: LilDestine\_41 Start: 34396, Stop: 34695, Start Num: 17  
Candidate Starts for LilDestine\_41:

(Start: 15 @34390 has 9 MA's), (Start: 17 @34396 has 3 MA's), (Start: 19 @34408 has 28 MA's), (25, 34465), (30, 34585), (31, 34591), (33, 34603), (46, 34684),

Gene: Loadrie\_41 Start: 34424, Stop: 34729, Start Num: 15  
Candidate Starts for Loadrie\_41:

(Start: 15 @34424 has 9 MA's), (Start: 17 @34430 has 3 MA's), (Start: 19 @34442 has 28 MA's), (25, 34499), (30, 34619), (31, 34625), (33, 34637), (38, 34691), (46, 34718),

Gene: Lumos\_39 Start: 34652, Stop: 34951, Start Num: 19  
Candidate Starts for Lumos\_39:

(Start: 19 @34652 has 28 MA's), (26, 34739), (31, 34835), (33, 34847),

Gene: MAckerman\_39 Start: 33048, Stop: 33350, Start Num: 19  
Candidate Starts for MAckerman\_39:

(Start: 11 @33012 has 3 MA's), (Start: 19 @33048 has 28 MA's), (29, 33183), (31, 33231), (32, 33240), (33, 33243), (34, 33261), (35, 33267), (40, 33312),

Gene: Marcoliusprime\_47 Start: 37222, Stop: 37542, Start Num: 20  
Candidate Starts for Marcoliusprime\_47:

(Start: 20 @37222 has 5 MA's), (Start: 21 @37225 has 4 MA's), (22, 37234), (28, 37339), (31, 37402), (34, 37432), (45, 37510), (48, 37525), (49, 37531),

Gene: Milly\_47 Start: 37198, Stop: 37515, Start Num: 21  
Candidate Starts for Milly\_47:

(Start: 20 @37195 has 5 MA's), (Start: 21 @37198 has 4 MA's), (22, 37207), (28, 37312), (31, 37375), (34, 37405), (45, 37483), (48, 37498), (49, 37504),

Gene: MiniLon\_39 Start: 34425, Stop: 34763, Start Num: 9  
Candidate Starts for MiniLon\_39:

(Start: 9 @34425 has 4 MA's), (Start: 19 @34464 has 28 MA's), (26, 34551), (27, 34575), (31, 34647), (33, 34659), (34, 34677),

Gene: MiniMac\_39 Start: 34422, Stop: 34760, Start Num: 9  
Candidate Starts for MiniMac\_39:

(6, 34392), (Start: 9 @34422 has 4 MA's), (Start: 19 @34461 has 28 MA's), (26, 34548), (27, 34572), (31, 34644), (33, 34656), (34, 34674),

Gene: Miryou\_44 Start: 36748, Stop: 37134, Start Num: 5  
Candidate Starts for Miryou\_44:

(Start: 5 @36748 has 12 MA's), (Start: 12 @36787 has 10 MA's), (33, 37021), (34, 37039), (36, 37054), (44, 37114),

Gene: MkaliMitinis3\_41 Start: 34400, Stop: 34699, Start Num: 17  
Candidate Starts for MkaliMitinis3\_41:

(Start: 15 @34394 has 9 MA's), (Start: 17 @34400 has 3 MA's), (Start: 19 @34412 has 28 MA's), (25, 34469), (30, 34589), (31, 34595), (33, 34607), (46, 34688),

Gene: Moostard\_39 Start: 34657, Stop: 34956, Start Num: 19

Candidate Starts for Moostard\_39:

(Start: 19 @34657 has 28 MA's), (26, 34744), (27, 34768), (31, 34840), (33, 34852),

Gene: MsGreen\_39 Start: 34655, Stop: 34954, Start Num: 19

Candidate Starts for MsGreen\_39:

(Start: 19 @34655 has 28 MA's), (26, 34742), (31, 34838), (33, 34850),

Gene: Mufasa\_47 Start: 36779, Stop: 37099, Start Num: 20

Candidate Starts for Mufasa\_47:

(Start: 20 @36779 has 5 MA's), (Start: 21 @36782 has 4 MA's), (22, 36791), (28, 36896), (31, 36959), (34, 36989), (39, 37040), (45, 37067), (48, 37082), (49, 37088),

Gene: Nicholas\_39 Start: 34655, Stop: 34954, Start Num: 19

Candidate Starts for Nicholas\_39:

(Start: 19 @34655 has 28 MA's), (26, 34742), (31, 34838), (33, 34850),

Gene: Nicholasp3\_41 Start: 34393, Stop: 34698, Start Num: 15

Candidate Starts for Nicholasp3\_41:

(Start: 15 @34393 has 9 MA's), (Start: 17 @34399 has 3 MA's), (Start: 19 @34411 has 28 MA's), (25, 34468), (30, 34588), (31, 34594), (33, 34606), (46, 34687),

Gene: OhShagHennessy\_38 Start: 33016, Stop: 33303, Start Num: 19

Candidate Starts for OhShagHennessy\_38:

(Start: 11 @32980 has 3 MA's), (Start: 19 @33016 has 28 MA's), (28, 33136), (29, 33151), (30, 33193), (31, 33199), (33, 33211), (34, 33229), (35, 33235), (47, 33298),

Gene: OkiRoe\_42 Start: 34418, Stop: 34804, Start Num: 5

Candidate Starts for OkiRoe\_42:

(Start: 5 @34418 has 12 MA's), (Start: 12 @34457 has 10 MA's), (33, 34691), (34, 34709), (36, 34724), (44, 34784),

Gene: Omnicron\_45 Start: 34067, Stop: 34414, Start Num: 12

Candidate Starts for Omnicron\_45:

(8, 34046), (Start: 12 @34067 has 10 MA's), (23, 34124), (31, 34289), (33, 34301), (37, 34337), (44, 34394),

Gene: PYPDinur\_38 Start: 33159, Stop: 33479, Start Num: 13

Candidate Starts for PYPDinur\_38:

(7, 33120), (Start: 9 @33141 has 4 MA's), (13, 33159), (Start: 15 @33162 has 9 MA's), (Start: 18 @33168 has 1 MA's), (Start: 19 @33180 has 28 MA's), (25, 33237), (28, 33300), (30, 33357), (33, 33375), (37, 33411),

Gene: Paola\_42 Start: 34416, Stop: 34802, Start Num: 5

Candidate Starts for Paola\_42:

(Start: 5 @34416 has 12 MA's), (Start: 12 @34455 has 10 MA's), (33, 34689), (34, 34707), (36, 34722), (44, 34782),

Gene: Pochiewood\_38 Start: 33044, Stop: 33331, Start Num: 19

Candidate Starts for Pochiewood\_38:

(Start: 11 @33008 has 3 MA's), (Start: 19 @33044 has 28 MA's), (28, 33164), (29, 33179), (30, 33221), (31, 33227), (33, 33239), (34, 33257), (35, 33263), (47, 33326),

Gene: Psycho\_43 Start: 34516, Stop: 34863, Start Num: 12

Candidate Starts for Psycho\_43:

(Start: 12 @34516 has 10 MA's), (24, 34582), (28, 34675), (30, 34732), (31, 34738), (33, 34750), (43, 34831), (44, 34843),

Gene: Rando14\_44 Start: 33637, Stop: 33984, Start Num: 12

Candidate Starts for Rando14\_44:

(1, 33382), (2, 33388), (3, 33391), (4, 33415), (8, 33616), (Start: 12 @33637 has 10 MA's), (23, 33694), (31, 33859), (33, 33871), (44, 33964),

Gene: Red305\_39 Start: 34655, Stop: 34954, Start Num: 19

Candidate Starts for Red305\_39:

(Start: 19 @34655 has 28 MA's), (26, 34742), (31, 34838), (33, 34850),

Gene: Rose5\_38 Start: 33043, Stop: 33345, Start Num: 19

Candidate Starts for Rose5\_38:

(Start: 11 @33007 has 3 MA's), (Start: 19 @33043 has 28 MA's), (29, 33178), (31, 33226), (32, 33235), (33, 33238), (34, 33256), (35, 33262), (40, 33307),

Gene: Rumpelstiltskin\_41 Start: 34659, Stop: 34964, Start Num: 15

Candidate Starts for Rumpelstiltskin\_41:

(Start: 15 @34659 has 9 MA's), (Start: 17 @34665 has 3 MA's), (Start: 19 @34677 has 28 MA's), (25, 34734), (30, 34854), (31, 34860), (33, 34872), (46, 34953),

Gene: Sarshaun\_41 Start: 34432, Stop: 34731, Start Num: 17

Candidate Starts for Sarshaun\_41:

(Start: 15 @34426 has 9 MA's), (Start: 17 @34432 has 3 MA's), (Start: 19 @34444 has 28 MA's), (25, 34501), (30, 34621), (31, 34627), (33, 34639), (38, 34693), (46, 34720),

Gene: Sheng711\_39 Start: 33120, Stop: 33479, Start Num: 7

Candidate Starts for Sheng711\_39:

(7, 33120), (Start: 9 @33141 has 4 MA's), (13, 33159), (Start: 15 @33162 has 9 MA's), (Start: 18 @33168 has 1 MA's), (Start: 19 @33180 has 28 MA's), (25, 33237), (28, 33300), (30, 33357), (33, 33375), (37, 33411),

Gene: Silverleaf\_38 Start: 33043, Stop: 33345, Start Num: 19

Candidate Starts for Silverleaf\_38:

(Start: 11 @33007 has 3 MA's), (Start: 19 @33043 has 28 MA's), (29, 33178), (31, 33226), (32, 33235), (33, 33238), (34, 33256), (35, 33262), (40, 33307),

Gene: Snenia\_39 Start: 34656, Stop: 34955, Start Num: 19

Candidate Starts for Snenia\_39:

(Start: 19 @34656 has 28 MA's), (26, 34743), (31, 34839), (33, 34851),

Gene: SoSeph\_42 Start: 34566, Stop: 34952, Start Num: 5

Candidate Starts for SoSeph\_42:

(Start: 5 @34566 has 12 MA's), (Start: 12 @34605 has 10 MA's), (33, 34839), (34, 34857), (36, 34872), (44, 34932),

Gene: Strobilo\_47 Start: 37197, Stop: 37517, Start Num: 20

Candidate Starts for Strobilo\_47:

(Start: 20 @37197 has 5 MA's), (Start: 21 @37200 has 4 MA's), (22, 37209), (28, 37314), (31, 37377), (34, 37407), (45, 37485), (48, 37500), (49, 37506),

Gene: TM4\_42 Start: 31544, Stop: 31900, Start Num: 14

Candidate Starts for TM4\_42:

(Start: 14 @31544 has 1 MA's), (16, 31547), (Start: 20 @31571 has 5 MA's), (Start: 21 @31574 has 4 MA's), (22, 31583), (28, 31688), (31, 31751), (34, 31781), (39, 31832), (45, 31859), (49, 31889),

Gene: Thyatira\_44 Start: 36765, Stop: 37151, Start Num: 5

Candidate Starts for Thyatira\_44:

(Start: 5 @36765 has 12 MA's), (Start: 12 @36804 has 10 MA's), (33, 37038), (34, 37056), (36, 37071), (44, 37131),

Gene: TriFive\_39 Start: 34655, Stop: 34954, Start Num: 19

Candidate Starts for TriFive\_39:

(Start: 19 @34655 has 28 MA's), (26, 34742), (31, 34838), (33, 34850),

Gene: Tyson\_38 Start: 33044, Stop: 33346, Start Num: 19

Candidate Starts for Tyson\_38:

(Start: 11 @33008 has 3 MA's), (Start: 19 @33044 has 28 MA's), (29, 33179), (31, 33227), (32, 33236), (33, 33239), (34, 33257), (35, 33263), (40, 33308),

Gene: UPIE\_39 Start: 33006, Stop: 33329, Start Num: 11

Candidate Starts for UPIE\_39:

(Start: 11 @33006 has 3 MA's), (Start: 19 @33042 has 28 MA's), (28, 33162), (29, 33177), (30, 33219), (31, 33225), (33, 33237), (34, 33255), (35, 33261), (47, 33324),

Gene: Wamburgexpress\_39 Start: 33057, Stop: 33344, Start Num: 19

Candidate Starts for Wamburgexpress\_39:

(Start: 11 @33021 has 3 MA's), (Start: 19 @33057 has 28 MA's), (28, 33177), (29, 33192), (30, 33234), (31, 33240), (33, 33252), (34, 33270), (35, 33276), (47, 33339),

Gene: Waterfoul\_43 Start: 34659, Stop: 35045, Start Num: 5

Candidate Starts for Waterfoul\_43:

(Start: 5 @34659 has 12 MA's), (Start: 12 @34698 has 10 MA's), (33, 34932), (34, 34950), (36, 34965), (44, 35025),

Gene: Whirlwind\_40 Start: 34375, Stop: 34713, Start Num: 9

Candidate Starts for Whirlwind\_40:

(Start: 9 @34375 has 4 MA's), (Start: 19 @34414 has 28 MA's), (26, 34501), (27, 34525), (31, 34597), (33, 34609), (41, 34678),

Gene: Wigglewobble\_41 Start: 34425, Stop: 34730, Start Num: 15

Candidate Starts for Wigglewobble\_41:

(Start: 15 @34425 has 9 MA's), (Start: 17 @34431 has 3 MA's), (Start: 19 @34443 has 28 MA's), (25, 34500), (30, 34620), (31, 34626), (33, 34638), (38, 34692), (46, 34719),

Gene: Winky\_41 Start: 34392, Stop: 34697, Start Num: 15

Candidate Starts for Winky\_41:

(Start: 15 @34392 has 9 MA's), (Start: 17 @34398 has 3 MA's), (Start: 19 @34410 has 28 MA's), (25, 34467), (30, 34587), (31, 34593), (33, 34605), (46, 34686),

Gene: Wyatt2\_39 Start: 33043, Stop: 33345, Start Num: 19

Candidate Starts for Wyatt2\_39:

(Start: 11 @33007 has 3 MA's), (Start: 19 @33043 has 28 MA's), (29, 33178), (31, 33226), (32, 33235), (33, 33238), (34, 33256), (35, 33262), (40, 33307),

Gene: Zaria\_39 Start: 33058, Stop: 33360, Start Num: 19

Candidate Starts for Zaria\_39:

(Start: 11 @33022 has 3 MA's), (Start: 19 @33058 has 28 MA's), (29, 33193), (31, 33241), (32, 33250), (33, 33253), (34, 33271), (35, 33277), (40, 33322),

Gene: ZoeJ\_46 Start: 36666, Stop: 36992, Start Num: 21

Candidate Starts for ZoeJ\_46:

(10, 36615), (Start: 20 @36663 has 5 MA's), (Start: 21 @36666 has 4 MA's), (22, 36675), (28, 36780), (31, 36843), (34, 36873), (45, 36951), (49, 36981),