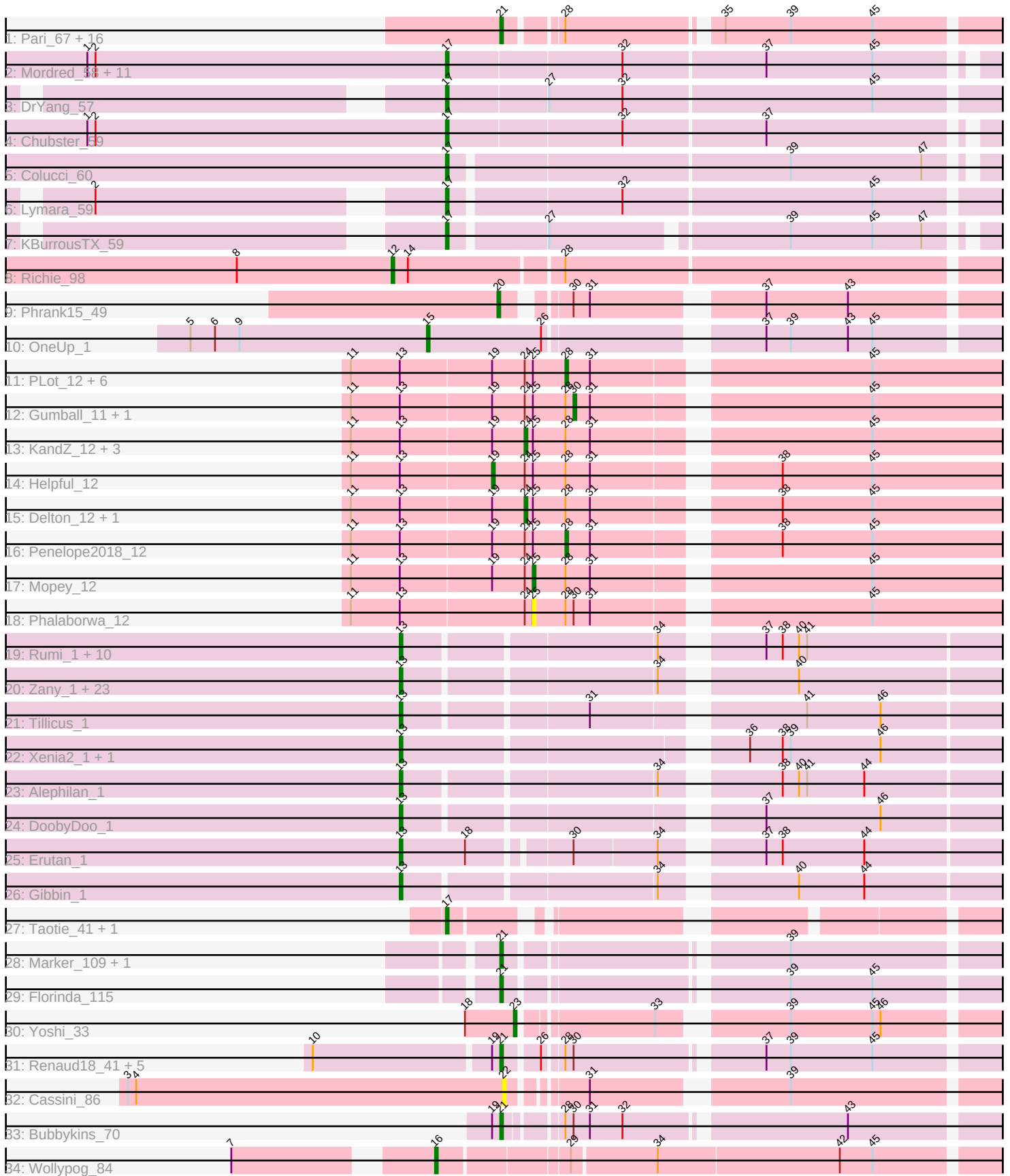


# Pham 326863



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 326863 Report

This analysis was run 09/05/26 on database version 662.

Pham number 326863 has 113 members, 10 are drafts.

Phages represented in each track:

- Track 1 : Pari\_67, DD5\_63, Marco3\_69, MrGordo\_66, Lockley\_62, BPBiebs31\_66, Fenn\_68, Naira\_67, GMonster\_61, Bethlehem\_63, Ruotula\_69, ConceptII\_67, Magnito\_64, Nerujay\_67, Ringer\_66, PattyP\_66, Petruchio\_65
- Track 2 : Mordred\_58, JaNo\_58, MoyaNatalis\_58, Chipper1996\_580, Kabreeze\_58, Scavito\_58, JayCookie\_59, PrincessTrina\_58, Linus\_58, HumptyDumpty\_58, Chocolat\_58, Tophat\_58
- Track 3 : DrYang\_57
- Track 4 : Chubster\_59
- Track 5 : Colucci\_60
- Track 6 : Lymara\_59
- Track 7 : KBurrousTX\_59
- Track 8 : Richie\_98
- Track 9 : Phrank15\_49
- Track 10 : OneUp\_1
- Track 11 : PLOT\_12, Visconti\_12, WaldoWhy\_12, Nova\_12, Chill\_12, Giuseppe\_12, Adjutor\_12
- Track 12 : Gumball\_11, SirHarley\_11
- Track 13 : KandZ\_12, Butterscotch\_12, Erk16\_12, PBI1\_12
- Track 14 : Helpful\_12
- Track 15 : Delton\_12, Troll4\_12
- Track 16 : Penelope2018\_12
- Track 17 : Mopey\_12
- Track 18 : Phalaborwa\_12
- Track 19 : Rumi\_1, RazorC\_1, Riduram\_1, Genamy16\_1, NovaSharks\_1, Jamemuya19\_1, Stormer\_1, Avian\_1, Astralis\_1, Alyssamiracle\_1, Charminar\_1
- Track 20 : Zany\_1, Sadboi\_1, DaviePasture\_1, BirthdayBoy\_1, Rukungu\_1, LavAbarElk\_1, Lambo\_1, Rota\_1, Ranch\_1, Nettle\_1, Patos\_1, Pywacket\_1, Fulcrum\_1, OtterstedtS21\_1, Lila22\_1, Sampudon\_1, Mima20\_1, ParvusTarda\_1, MoiGyank\_1, GOATification\_1, Wojtek\_1, NorManre\_1, GretelLyn\_1, Yikes\_1
- Track 21 : Tillicus\_1
- Track 22 : Xenia2\_1, DumpTruck\_1
- Track 23 : Alephilan\_1
- Track 24 : DoobyDoo\_1
- Track 25 : Erutan\_1
- Track 26 : Gibbin\_1
- Track 27 : Taotie\_41, PSonyx\_43
- Track 28 : Marker\_109, Cornucopia\_104

- Track 29 : Florinda\_115
- Track 30 : Yoshi\_33
- Track 31 : Renaud18\_41, Blarby\_49, DeadP\_41, Estave1\_38, Taj\_40, Wee\_41
- Track 32 : Cassini\_86
- Track 33 : Bubbykins\_70
- Track 34 : Wollypog\_84

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

The start number called the most often in the published annotations is 13, it was called in 37 of the 103 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Alephlan\_1, Alyssamiracle\_1, Astralis\_1, Avian\_1, BirthdayBoy\_1, Charminar\_1, DaviePasture\_1, DoobyDoo\_1, DumpTruck\_1, Erutan\_1, Fulcrum\_1, GOATification\_1, Genamy16\_1, Gibbin\_1, GretelLyn\_1, Jamemuya19\_1, Lambo\_1, LavAbarElk\_1, Lila22\_1, Mima20\_1, MoiGyank\_1, Nettle\_1, NorManre\_1, NovaSharks\_1, OtterstedtS21\_1, ParvusTarda\_1, Patos\_1, Pywacket\_1, Ranch\_1, RazorC\_1, Riduram\_1, Rota\_1, Rukungu\_1, Rumi\_1, Sadboi\_1, Sampudon\_1, Stormer\_1, Tillicus\_1, Wojtek\_1, Xenia2\_1, Yikes\_1, Zany\_1,

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

- Adjutor\_12, Butterscotch\_12, Chill\_12, Delton\_12, Erk16\_12, Giuseppe\_12, Gumball\_11, Helpful\_12, KandZ\_12, Mopey\_12, Nova\_12, PBI1\_12, PLOT\_12, Penelope2018\_12, Phalaborwa\_12, SirHarley\_11, Troll4\_12, Visconti\_12, WaldoWhy\_12,

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

- BPBiebs31\_66, Bethlehem\_63, Blarby\_49, Bubbykins\_70, Cassini\_86, Chipper1996\_580, Chocolat\_58, Chubster\_59, Colucci\_60, ConceptII\_67, Cornucopia\_104, DD5\_63, DeadP\_41, DrYang\_57, Estave1\_38, Fenn\_68, Florinda\_115, GMonster\_61, HumptyDumpty\_58, JaNo\_58, JayCookie\_59, KBurroustX\_59, Kabreeze\_58, Linus\_58, Lockley\_62, Lymara\_59, Magnito\_64, Marco3\_69, Marker\_109, Mordred\_58, MoyaNatalis\_58, MrGordo\_66, Naira\_67, Nerujay\_67, OneUp\_1, PSonyx\_43, Pari\_67, PattyP\_66, Petruchio\_65, Phrank15\_49, PrincessTrina\_58, Renaud18\_41, Richie\_98, Ringer\_66, Ruotula\_69, Scavito\_58, Taj\_40, Taotie\_41, Tophat\_58, Wee\_41, Wollypog\_84, Yoshi\_33,

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

Start 12:

- Found in 1 of 113 ( 0.9% ) of genes in pham
- Manual Annotations of this start: 1 of 103
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Richie\_98 (AY),

Start 13:

- Found in 61 of 113 ( 54.0% ) of genes in pham
- Manual Annotations of this start: 37 of 103
- Called 68.9% of time when present

- Phage (with cluster) where this start called: Alephlan\_1 (DV), Alyssamiracle\_1 (DV), Astralis\_1 (DV), Avian\_1 (DV), BirthdayBoy\_1 (DV), Charminar\_1 (DV), DaviePasture\_1 (DV), DoobyDoo\_1 (DV), DumpTruck\_1 (DV), Erutan\_1 (DV), Fulcrum\_1 (DV), GOATification\_1 (DV), Genamy16\_1 (DV), Gibbin\_1 (DV), Gretellyn\_1 (DV), Jamemuya19\_1 (DV), Lambo\_1 (DV), LavAbarElk\_1 (DV), Lila22\_1 (DV), Mima20\_1 (DV), MoiGyank\_1 (DV), Nettle\_1 (DV), NorManre\_1 (DV), NovaSharks\_1 (DV), OtterstedtS21\_1 (DV), ParvusTarda\_1 (DV), Patos\_1 (DV), Pywacket\_1 (DV), Ranch\_1 (DV), RazorC\_1 (DV), Riduram\_1 (DV), Rota\_1 (DV), Rukungu\_1 (DV), Rumi\_1 (DV), Sadboi\_1 (DV), Sampudon\_1 (DV), Stormer\_1 (DV), Tillicus\_1 (DV), Wojtek\_1 (DV), Xenia2\_1 (DV), Yikes\_1 (DV), Zany\_1 (DV),

#### Start 15:

- Found in 1 of 113 ( 0.9% ) of genes in pham
- Manual Annotations of this start: 1 of 103
- Called 100.0% of time when present
- Phage (with cluster) where this start called: OneUp\_1 (CQ2),

#### Start 16:

- Found in 1 of 113 ( 0.9% ) of genes in pham
- Manual Annotations of this start: 1 of 103
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Wollypog\_84 (singleton),

#### Start 17:

- Found in 19 of 113 ( 16.8% ) of genes in pham
- Manual Annotations of this start: 17 of 103
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Chipper1996\_580 (AR), Chocolat\_58 (AR), Chubster\_59 (AR), Colucci\_60 (AR), DrYang\_57 (AR), HumptyDumpty\_58 (AR), JaNo\_58 (AR), JayCookie\_59 (AR), KBurrousTX\_59 (AR), Kabreeze\_58 (AR), Linus\_58 (AR), Lymara\_59 (AR), Mordred\_58 (AR), MoyaNatalis\_58 (AR), PSonyx\_43 (EQ), PrincessTrina\_58 (AR), Scavito\_58 (AR), Taotie\_41 (EQ), Tophat\_58 (AR),

#### Start 19:

- Found in 25 of 113 ( 22.1% ) of genes in pham
- Manual Annotations of this start: 1 of 103
- Called 4.0% of time when present
- Phage (with cluster) where this start called: Helpful\_12 (D1),

#### Start 20:

- Found in 1 of 113 ( 0.9% ) of genes in pham
- Manual Annotations of this start: 1 of 103
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Phrank15\_49 (AY),

#### Start 21:

- Found in 27 of 113 ( 23.9% ) of genes in pham
- Manual Annotations of this start: 26 of 103
- Called 100.0% of time when present
- Phage (with cluster) where this start called: BPBiebs31\_66 (A1), Bethlehem\_63 (A1), Blarby\_49 (F), Bubbykins\_70 (UNK), ConceptII\_67 (A1), Cornucopia\_104 (F1), DD5\_63 (A1), DeadP\_41 (F1), Estave1\_38 (F1), Fenn\_68 (A1), Florinda\_115 (F1),

GMonster\_61 (A1), Lockley\_62 (A1), Magnito\_64 (A1), Marco3\_69 (A1), Marker\_109 (F1), MrGordo\_66 (A1), Naira\_67 (A1), Nerujay\_67 (A1), Pari\_67 (A1), PattyP\_66 (A1), Petruchio\_65 (A1), Renaud18\_41 (F4), Ringer\_66 (A1), Ruotula\_69 (A1), Taj\_40 (F1), Wee\_41 (F1),

Start 22:

- Found in 1 of 113 ( 0.9% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Cassini\_86 (FN),

Start 23:

- Found in 1 of 113 ( 0.9% ) of genes in pham
- Manual Annotations of this start: 1 of 103
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Yoshi\_33 (F2),

Start 24:

- Found in 19 of 113 ( 16.8% ) of genes in pham
- Manual Annotations of this start: 6 of 103
- Called 31.6% of time when present
- Phage (with cluster) where this start called: Butterscotch\_12 (D1), Delton\_12 (D1), Erk16\_12 (D1), KandZ\_12 (D1), PBI1\_12 (D1), Troll4\_12 (D1),

Start 25:

- Found in 19 of 113 ( 16.8% ) of genes in pham
- Manual Annotations of this start: 1 of 103
- Called 10.5% of time when present
- Phage (with cluster) where this start called: Mopey\_12 (D1), Phalaborwa\_12 (D1),

Start 28:

- Found in 44 of 113 ( 38.9% ) of genes in pham
- Manual Annotations of this start: 8 of 103
- Called 18.2% of time when present
- Phage (with cluster) where this start called: Adjutor\_12 (D1), Chill\_12 (D1), Giuseppe\_12 (D1), Nova\_12 (D1), PLOT\_12 (D1), Penelope2018\_12 (D1), Visconti\_12 (D1), WaldoWhy\_12 (D1),

Start 30:

- Found in 12 of 113 ( 10.6% ) of genes in pham
- Manual Annotations of this start: 2 of 103
- Called 16.7% of time when present
- Phage (with cluster) where this start called: Gumball\_11 (D1), SirHarley\_11 (D1),

### **Summary by clusters:**

There are 14 clusters represented in this pham: F1, F2, F4, F, singleton, A1, AY, AR, DV, CQ2, UNK, EQ, FN, D1,

Info for manual annotations of cluster A1:

- Start number 21 was manually annotated 17 times for cluster A1.

Info for manual annotations of cluster AR:

- Start number 17 was manually annotated 16 times for cluster AR.

Info for manual annotations of cluster AY:

- Start number 12 was manually annotated 1 time for cluster AY.
- Start number 20 was manually annotated 1 time for cluster AY.

Info for manual annotations of cluster CQ2:

- Start number 15 was manually annotated 1 time for cluster CQ2.

Info for manual annotations of cluster D1:

- Start number 19 was manually annotated 1 time for cluster D1.
- Start number 24 was manually annotated 6 times for cluster D1.
- Start number 25 was manually annotated 1 time for cluster D1.
- Start number 28 was manually annotated 8 times for cluster D1.
- Start number 30 was manually annotated 2 times for cluster D1.

Info for manual annotations of cluster DV:

- Start number 13 was manually annotated 37 times for cluster DV.

Info for manual annotations of cluster EQ:

- Start number 17 was manually annotated 1 time for cluster EQ.

Info for manual annotations of cluster F1:

- Start number 21 was manually annotated 7 times for cluster F1.

Info for manual annotations of cluster F2:

- Start number 23 was manually annotated 1 time for cluster F2.

Info for manual annotations of cluster F4:

- Start number 21 was manually annotated 1 time for cluster F4.

Info for manual annotations of cluster UNK:

- Start number 21 was manually annotated 1 time for cluster UNK.

### **Gene Information:**

Gene: Adjutor\_12 Start: 8570, Stop: 8734, Start Num: 28

Candidate Starts for Adjutor\_12:

(11, 8492), (Start: 13 @8510 has 37 MA's), (Start: 19 @8543 has 1 MA's), (Start: 24 @8555 has 6 MA's), (Start: 25 @8558 has 1 MA's), (Start: 28 @8570 has 8 MA's), (31, 8579), (45, 8672),

Gene: Alephilan\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for Alephilan\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (38, 124), (40, 130), (41, 133), (44, 154),

Gene: Alyssamiracle\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for Alyssamiracle\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (37, 118), (38, 124), (40, 130), (41, 133),

Gene: Astralis\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for Astralis\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (37, 118), (38, 124), (40, 130), (41, 133),

Gene: Avian\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for Avian\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (37, 118), (38, 124), (40, 130), (41, 133),

Gene: BPBiebs31\_66 Start: 42808, Stop: 42638, Start Num: 21

Candidate Starts for BPBiebs31\_66:

(Start: 21 @42808 has 26 MA's), (Start: 28 @42790 has 8 MA's), (35, 42739), (39, 42715), (45, 42685),

Gene: Bethlehem\_63 Start: 43484, Stop: 43314, Start Num: 21

Candidate Starts for Bethlehem\_63:

(Start: 21 @43484 has 26 MA's), (Start: 28 @43466 has 8 MA's), (35, 43415), (39, 43391), (45, 43361),

Gene: BirthdayBoy\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for BirthdayBoy\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (40, 130),

Gene: Blarby\_49 Start: 31815, Stop: 31648, Start Num: 21

Candidate Starts for Blarby\_49:

(10, 31881), (Start: 19 @31818 has 1 MA's), (Start: 21 @31815 has 26 MA's), (26, 31803), (Start: 28 @31797 has 8 MA's), (Start: 30 @31794 has 2 MA's), (37, 31731), (39, 31722), (45, 31692),

Gene: Bubbykins\_70 Start: 48691, Stop: 48876, Start Num: 21

Candidate Starts for Bubbykins\_70:

(Start: 19 @48688 has 1 MA's), (Start: 21 @48691 has 26 MA's), (Start: 28 @48709 has 8 MA's), (Start: 30 @48712 has 2 MA's), (31, 48718), (32, 48730), (43, 48805),

Gene: Butterscotch\_12 Start: 8615, Stop: 8794, Start Num: 24

Candidate Starts for Butterscotch\_12:

(11, 8552), (Start: 13 @8570 has 37 MA's), (Start: 19 @8603 has 1 MA's), (Start: 24 @8615 has 6 MA's), (Start: 25 @8618 has 1 MA's), (Start: 28 @8630 has 8 MA's), (31, 8639), (45, 8732),

Gene: Cassini\_86 Start: 48915, Stop: 49079, Start Num: 22

Candidate Starts for Cassini\_86:

(3, 48777), (4, 48780), (22, 48915), (31, 48939), (39, 49002),

Gene: Charminar\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for Charminar\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (37, 118), (38, 124), (40, 130), (41, 133),

Gene: Chill\_12 Start: 8633, Stop: 8797, Start Num: 28

Candidate Starts for Chill\_12:

(11, 8555), (Start: 13 @8573 has 37 MA's), (Start: 19 @8606 has 1 MA's), (Start: 24 @8618 has 6 MA's), (Start: 25 @8621 has 1 MA's), (Start: 28 @8633 has 8 MA's), (31, 8642), (45, 8735),

Gene: Chipper1996\_580 Start: 42767, Stop: 42958, Start Num: 17

Candidate Starts for Chipper1996\_580:

(1, 42635), (2, 42638), (Start: 17 @42767 has 17 MA's), (32, 42830), (37, 42881), (45, 42920),

Gene: Chocolat\_58 Start: 42637, Stop: 42828, Start Num: 17

Candidate Starts for Chocolat\_58:

(1, 42505), (2, 42508), (Start: 17 @42637 has 17 MA's), (32, 42700), (37, 42751), (45, 42790),

Gene: Chubster\_59 Start: 42789, Stop: 42980, Start Num: 17

Candidate Starts for Chubster\_59:

(1, 42657), (2, 42660), (Start: 17 @42789 has 17 MA's), (32, 42852), (37, 42903),

Gene: Colucci\_60 Start: 42919, Stop: 43107, Start Num: 17

Candidate Starts for Colucci\_60:

(Start: 17 @42919 has 17 MA's), (39, 43039), (47, 43087),

Gene: ConceptII\_67 Start: 43443, Stop: 43276, Start Num: 21

Candidate Starts for ConceptII\_67:

(Start: 21 @43443 has 26 MA's), (Start: 28 @43425 has 8 MA's), (35, 43374), (39, 43350), (45, 43320),

Gene: Cornucopia\_104 Start: 54556, Stop: 54723, Start Num: 21

Candidate Starts for Cornucopia\_104:

(Start: 21 @54556 has 26 MA's), (39, 54649),

Gene: DD5\_63 Start: 42996, Stop: 42829, Start Num: 21

Candidate Starts for DD5\_63:

(Start: 21 @42996 has 26 MA's), (Start: 28 @42978 has 8 MA's), (35, 42927), (39, 42903), (45, 42873),

Gene: DaviePasture\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for DaviePasture\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (40, 130),

Gene: DeadP\_41 Start: 31512, Stop: 31345, Start Num: 21

Candidate Starts for DeadP\_41:

(10, 31578), (Start: 19 @31515 has 1 MA's), (Start: 21 @31512 has 26 MA's), (26, 31500), (Start: 28 @31494 has 8 MA's), (Start: 30 @31491 has 2 MA's), (37, 31428), (39, 31419), (45, 31389),

Gene: Delton\_12 Start: 8624, Stop: 8803, Start Num: 24

Candidate Starts for Delton\_12:

(11, 8561), (Start: 13 @8579 has 37 MA's), (Start: 19 @8612 has 1 MA's), (Start: 24 @8624 has 6 MA's), (Start: 25 @8627 has 1 MA's), (Start: 28 @8639 has 8 MA's), (31, 8648), (38, 8708), (45, 8741),

Gene: DoobyDoo\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for DoobyDoo\_1:

(Start: 13 @1 has 37 MA's), (37, 118), (46, 160),

Gene: DrYang\_57 Start: 44041, Stop: 44238, Start Num: 17

Candidate Starts for DrYang\_57:

(Start: 17 @44041 has 17 MA's), (27, 44077), (32, 44104), (45, 44194),

Gene: DumpTruck\_1 Start: 1, Stop: 207, Start Num: 13

Candidate Starts for DumpTruck\_1:

(Start: 13 @1 has 37 MA's), (36, 115), (38, 127), (39, 130), (46, 163),

Gene: Erk16\_12 Start: 8618, Stop: 8797, Start Num: 24

Candidate Starts for Erk16\_12:

(11, 8555), (Start: 13 @8573 has 37 MA's), (Start: 19 @8606 has 1 MA's), (Start: 24 @8618 has 6 MA's), (Start: 25 @8621 has 1 MA's), (Start: 28 @8633 has 8 MA's), (31, 8642), (45, 8735),



Gene: Erutan\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for Erutan\_1:

(Start: 13 @1 has 37 MA's), (18, 25), (Start: 30 @58 has 2 MA's), (34, 88), (37, 118), (38, 124), (44, 154),

Gene: Estave1\_38 Start: 30815, Stop: 30648, Start Num: 21

Candidate Starts for Estave1\_38:

(10, 30881), (Start: 19 @30818 has 1 MA's), (Start: 21 @30815 has 26 MA's), (26, 30803), (Start: 28 @30797 has 8 MA's), (Start: 30 @30794 has 2 MA's), (37, 30731), (39, 30722), (45, 30692),

Gene: Fenn\_68 Start: 43955, Stop: 43788, Start Num: 21

Candidate Starts for Fenn\_68:

(Start: 21 @43955 has 26 MA's), (Start: 28 @43937 has 8 MA's), (35, 43886), (39, 43862), (45, 43832),

Gene: Florinda\_115 Start: 58161, Stop: 58328, Start Num: 21

Candidate Starts for Florinda\_115:

(Start: 21 @58161 has 26 MA's), (39, 58254), (45, 58284),

Gene: Fulcrum\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for Fulcrum\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (40, 130),

Gene: GMonster\_61 Start: 41666, Stop: 41496, Start Num: 21

Candidate Starts for GMonster\_61:

(Start: 21 @41666 has 26 MA's), (Start: 28 @41648 has 8 MA's), (35, 41597), (39, 41573), (45, 41543),

Gene: GOATification\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for GOATification\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (40, 130),

Gene: Genamy16\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for Genamy16\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (37, 118), (38, 124), (40, 130), (41, 133),

Gene: Gibbin\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for Gibbin\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (40, 130), (44, 154),

Gene: Giuseppe\_12 Start: 8622, Stop: 8786, Start Num: 28

Candidate Starts for Giuseppe\_12:

(11, 8544), (Start: 13 @8562 has 37 MA's), (Start: 19 @8595 has 1 MA's), (Start: 24 @8607 has 6 MA's), (Start: 25 @8610 has 1 MA's), (Start: 28 @8622 has 8 MA's), (31, 8631), (45, 8724),

Gene: GretelLyn\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for GretelLyn\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (40, 130),

Gene: Gumball\_11 Start: 8580, Stop: 8741, Start Num: 30

Candidate Starts for Gumball\_11:

(11, 8499), (Start: 13 @8517 has 37 MA's), (Start: 19 @8550 has 1 MA's), (Start: 24 @8562 has 6 MA's), (Start: 25 @8565 has 1 MA's), (Start: 28 @8577 has 8 MA's), (Start: 30 @8580 has 2 MA's), (31, 8586), (45, 8679),

Gene: Helpful\_12 Start: 8603, Stop: 8794, Start Num: 19

Candidate Starts for Helpful\_12:

(11, 8552), (Start: 13 @8570 has 37 MA's), (Start: 19 @8603 has 1 MA's), (Start: 24 @8615 has 6 MA's), (Start: 25 @8618 has 1 MA's), (Start: 28 @8630 has 8 MA's), (31, 8639), (38, 8699), (45, 8732),

Gene: HumptyDumpty\_58 Start: 42765, Stop: 42956, Start Num: 17

Candidate Starts for HumptyDumpty\_58:

(1, 42633), (2, 42636), (Start: 17 @42765 has 17 MA's), (32, 42828), (37, 42879), (45, 42918),

Gene: JaNo\_58 Start: 42771, Stop: 42962, Start Num: 17

Candidate Starts for JaNo\_58:

(1, 42639), (2, 42642), (Start: 17 @42771 has 17 MA's), (32, 42834), (37, 42885), (45, 42924),

Gene: Jamemuya19\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for Jamemuya19\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (37, 118), (38, 124), (40, 130), (41, 133),

Gene: JayCookie\_59 Start: 43048, Stop: 43239, Start Num: 17

Candidate Starts for JayCookie\_59:

(1, 42916), (2, 42919), (Start: 17 @43048 has 17 MA's), (32, 43111), (37, 43162), (45, 43201),

Gene: KBurrousTX\_59 Start: 44136, Stop: 44318, Start Num: 17

Candidate Starts for KBurrousTX\_59:

(Start: 17 @44136 has 17 MA's), (27, 44169), (39, 44250), (45, 44280), (47, 44298),

Gene: Kabreeze\_58 Start: 42655, Stop: 42846, Start Num: 17

Candidate Starts for Kabreeze\_58:

(1, 42523), (2, 42526), (Start: 17 @42655 has 17 MA's), (32, 42718), (37, 42769), (45, 42808),

Gene: KandZ\_12 Start: 8712, Stop: 8891, Start Num: 24

Candidate Starts for KandZ\_12:

(11, 8649), (Start: 13 @8667 has 37 MA's), (Start: 19 @8700 has 1 MA's), (Start: 24 @8712 has 6 MA's), (Start: 25 @8715 has 1 MA's), (Start: 28 @8727 has 8 MA's), (31, 8736), (45, 8829),

Gene: Lambo\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for Lambo\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (40, 130),

Gene: LavAbarElk\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for LavAbarElk\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (40, 130),

Gene: Lila22\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for Lila22\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (40, 130),

Gene: Linus\_58 Start: 42778, Stop: 42969, Start Num: 17

Candidate Starts for Linus\_58:

(1, 42646), (2, 42649), (Start: 17 @42778 has 17 MA's), (32, 42841), (37, 42892), (45, 42931),

Gene: Lockley\_62 Start: 42158, Stop: 41991, Start Num: 21

Candidate Starts for Lockley\_62:

(Start: 21 @42158 has 26 MA's), (Start: 28 @42140 has 8 MA's), (35, 42089), (39, 42065), (45, 42035),

Gene: Lymara\_59 Start: 42891, Stop: 43085, Start Num: 17

Candidate Starts for Lymara\_59:

(2, 42777), (Start: 17 @42891 has 17 MA's), (32, 42951), (45, 43041),

Gene: Magnito\_64 Start: 42276, Stop: 42106, Start Num: 21

Candidate Starts for Magnito\_64:

(Start: 21 @42276 has 26 MA's), (Start: 28 @42258 has 8 MA's), (35, 42207), (39, 42183), (45, 42153),

Gene: Marco3\_69 Start: 44585, Stop: 44418, Start Num: 21

Candidate Starts for Marco3\_69:

(Start: 21 @44585 has 26 MA's), (Start: 28 @44567 has 8 MA's), (35, 44516), (39, 44492), (45, 44462),

Gene: Marker\_109 Start: 57954, Stop: 58121, Start Num: 21

Candidate Starts for Marker\_109:

(Start: 21 @57954 has 26 MA's), (39, 58047),

Gene: Mima20\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for Mima20\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (40, 130),

Gene: MoiGyank\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for MoiGyank\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (40, 130),

Gene: Mopey\_12 Start: 8618, Stop: 8794, Start Num: 25

Candidate Starts for Mopey\_12:

(11, 8552), (Start: 13 @8570 has 37 MA's), (Start: 19 @8603 has 1 MA's), (Start: 24 @8615 has 6 MA's), (Start: 25 @8618 has 1 MA's), (Start: 28 @8630 has 8 MA's), (31, 8639), (45, 8732),

Gene: Mordred\_58 Start: 42765, Stop: 42956, Start Num: 17

Candidate Starts for Mordred\_58:

(1, 42633), (2, 42636), (Start: 17 @42765 has 17 MA's), (32, 42828), (37, 42879), (45, 42918),

Gene: MoyaNatalis\_58 Start: 42624, Stop: 42815, Start Num: 17

Candidate Starts for MoyaNatalis\_58:

(1, 42492), (2, 42495), (Start: 17 @42624 has 17 MA's), (32, 42687), (37, 42738), (45, 42777),

Gene: MrGordo\_66 Start: 42620, Stop: 42450, Start Num: 21

Candidate Starts for MrGordo\_66:

(Start: 21 @42620 has 26 MA's), (Start: 28 @42602 has 8 MA's), (35, 42551), (39, 42527), (45, 42497),

Gene: Naira\_67 Start: 44011, Stop: 43844, Start Num: 21

Candidate Starts for Naira\_67:

(Start: 21 @44011 has 26 MA's), (Start: 28 @43993 has 8 MA's), (35, 43942), (39, 43918), (45, 43888),

Gene: Nerujay\_67 Start: 43590, Stop: 43423, Start Num: 21

Candidate Starts for Nerujay\_67:

(Start: 21 @43590 has 26 MA's), (Start: 28 @43572 has 8 MA's), (35, 43521), (39, 43497), (45, 43467),

Gene: Nettle\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for Nettle\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (40, 130),

Gene: NorManre\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for NorManre\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (40, 130),

Gene: Nova\_12 Start: 9054, Stop: 9218, Start Num: 28

Candidate Starts for Nova\_12:

(11, 8976), (Start: 13 @8994 has 37 MA's), (Start: 19 @9027 has 1 MA's), (Start: 24 @9039 has 6 MA's), (Start: 25 @9042 has 1 MA's), (Start: 28 @9054 has 8 MA's), (31, 9063), (45, 9156),

Gene: NovaSharks\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for NovaSharks\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (37, 118), (38, 124), (40, 130), (41, 133),

Gene: OneUp\_1 Start: 311, Stop: 117, Start Num: 15

Candidate Starts for OneUp\_1:

(5, 398), (6, 389), (9, 380), (Start: 15 @311 has 1 MA's), (26, 269), (37, 200), (39, 191), (43, 170), (45, 161),

Gene: OtterstedtS21\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for OtterstedtS21\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (40, 130),

Gene: PBI1\_12 Start: 8546, Stop: 8725, Start Num: 24

Candidate Starts for PBI1\_12:

(11, 8483), (Start: 13 @8501 has 37 MA's), (Start: 19 @8534 has 1 MA's), (Start: 24 @8546 has 6 MA's), (Start: 25 @8549 has 1 MA's), (Start: 28 @8561 has 8 MA's), (31, 8570), (45, 8663),

Gene: PLOT\_12 Start: 8633, Stop: 8797, Start Num: 28

Candidate Starts for PLOT\_12:

(11, 8555), (Start: 13 @8573 has 37 MA's), (Start: 19 @8606 has 1 MA's), (Start: 24 @8618 has 6 MA's), (Start: 25 @8621 has 1 MA's), (Start: 28 @8633 has 8 MA's), (31, 8642), (45, 8735),

Gene: PSonyx\_43 Start: 33068, Stop: 32871, Start Num: 17

Candidate Starts for PSonyx\_43:

(Start: 17 @33068 has 17 MA's),

Gene: Pari\_67 Start: 41794, Stop: 41624, Start Num: 21

Candidate Starts for Pari\_67:

(Start: 21 @41794 has 26 MA's), (Start: 28 @41776 has 8 MA's), (35, 41725), (39, 41701), (45, 41671),

Gene: ParvusTarda\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for ParvusTarda\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (40, 130),

Gene: Patos\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for Patos\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (40, 130),

Gene: PattyP\_66 Start: 43305, Stop: 43135, Start Num: 21

Candidate Starts for PattyP\_66:

(Start: 21 @43305 has 26 MA's), (Start: 28 @43287 has 8 MA's), (35, 43236), (39, 43212), (45, 43182),

Gene: Penelope2018\_12 Start: 8630, Stop: 8794, Start Num: 28

Candidate Starts for Penelope2018\_12:

(11, 8552), (Start: 13 @8570 has 37 MA's), (Start: 19 @8603 has 1 MA's), (Start: 24 @8615 has 6 MA's), (Start: 25 @8618 has 1 MA's), (Start: 28 @8630 has 8 MA's), (31, 8639), (38, 8699), (45, 8732),

Gene: Petruchio\_65 Start: 41908, Stop: 41741, Start Num: 21

Candidate Starts for Petruchio\_65:

(Start: 21 @41908 has 26 MA's), (Start: 28 @41890 has 8 MA's), (35, 41839), (39, 41815), (45, 41785),

Gene: Phalaborwa\_12 Start: 8660, Stop: 8836, Start Num: 25

Candidate Starts for Phalaborwa\_12:

(11, 8594), (Start: 13 @8612 has 37 MA's), (Start: 24 @8657 has 6 MA's), (Start: 25 @8660 has 1 MA's), (Start: 28 @8672 has 8 MA's), (Start: 30 @8675 has 2 MA's), (31, 8681), (45, 8774),

Gene: Phrank15\_49 Start: 30399, Stop: 30593, Start Num: 20

Candidate Starts for Phrank15\_49:

(Start: 20 @30399 has 1 MA's), (Start: 30 @30417 has 2 MA's), (31, 30423), (37, 30477), (43, 30507),

Gene: PrincessTrina\_58 Start: 42801, Stop: 42992, Start Num: 17

Candidate Starts for PrincessTrina\_58:

(1, 42669), (2, 42672), (Start: 17 @42801 has 17 MA's), (32, 42864), (37, 42915), (45, 42954),

Gene: Pywacket\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for Pywacket\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (40, 130),

Gene: Ranch\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for Ranch\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (40, 130),

Gene: RazorC\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for RazorC\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (37, 118), (38, 124), (40, 130), (41, 133),

Gene: Renaud18\_41 Start: 31591, Stop: 31424, Start Num: 21

Candidate Starts for Renaud18\_41:

(10, 31657), (Start: 19 @31594 has 1 MA's), (Start: 21 @31591 has 26 MA's), (26, 31579), (Start: 28 @31573 has 8 MA's), (Start: 30 @31570 has 2 MA's), (37, 31507), (39, 31498), (45, 31468),

Gene: Richie\_98 Start: 53224, Stop: 53439, Start Num: 12

Candidate Starts for Richie\_98:

(8, 53167), (Start: 12 @53224 has 1 MA's), (14, 53230), (Start: 28 @53284 has 8 MA's),

Gene: Riduram\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for Riduram\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (37, 118), (38, 124), (40, 130), (41, 133),

Gene: Ringer\_66 Start: 44050, Stop: 43880, Start Num: 21

Candidate Starts for Ringer\_66:

(Start: 21 @44050 has 26 MA's), (Start: 28 @44032 has 8 MA's), (35, 43981), (39, 43957), (45, 43927),

Gene: Rota\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for Rota\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (40, 130),

Gene: Rukungu\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for Rukungu\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (40, 130),

Gene: Rumi\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for Rumi\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (37, 118), (38, 124), (40, 130), (41, 133),

Gene: Ruotula\_69 Start: 44545, Stop: 44378, Start Num: 21

Candidate Starts for Ruotula\_69:

(Start: 21 @44545 has 26 MA's), (Start: 28 @44527 has 8 MA's), (35, 44476), (39, 44452), (45, 44422),

Gene: Sadboi\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for Sadboi\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (40, 130),

Gene: Sampudon\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for Sampudon\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (40, 130),

Gene: Scavito\_58 Start: 42662, Stop: 42853, Start Num: 17

Candidate Starts for Scavito\_58:

(1, 42530), (2, 42533), (Start: 17 @42662 has 17 MA's), (32, 42725), (37, 42776), (45, 42815),

Gene: SirHarley\_11 Start: 8562, Stop: 8723, Start Num: 30

Candidate Starts for SirHarley\_11:

(11, 8481), (Start: 13 @8499 has 37 MA's), (Start: 19 @8532 has 1 MA's), (Start: 24 @8544 has 6 MA's), (Start: 25 @8547 has 1 MA's), (Start: 28 @8559 has 8 MA's), (Start: 30 @8562 has 2 MA's), (31, 8568), (45, 8661),

Gene: Stormer\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for Stormer\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (37, 118), (38, 124), (40, 130), (41, 133),

Gene: Taj\_40 Start: 31514, Stop: 31347, Start Num: 21

Candidate Starts for Taj\_40:

(10, 31580), (Start: 19 @31517 has 1 MA's), (Start: 21 @31514 has 26 MA's), (26, 31502), (Start: 28 @31496 has 8 MA's), (Start: 30 @31493 has 2 MA's), (37, 31430), (39, 31421), (45, 31391),

Gene: Taotie\_41 Start: 30659, Stop: 30462, Start Num: 17

Candidate Starts for Taotie\_41:

(Start: 17 @30659 has 17 MA's),

Gene: Tillicus\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for Tillicus\_1:

(Start: 13 @1 has 37 MA's), (31, 64), (41, 133), (46, 160),

Gene: Tophat\_58 Start: 42767, Stop: 42958, Start Num: 17

Candidate Starts for Tophat\_58:

(1, 42635), (2, 42638), (Start: 17 @42767 has 17 MA's), (32, 42830), (37, 42881), (45, 42920),

Gene: Troll4\_12 Start: 8616, Stop: 8795, Start Num: 24

Candidate Starts for Troll4\_12:

(11, 8553), (Start: 13 @8571 has 37 MA's), (Start: 19 @8604 has 1 MA's), (Start: 24 @8616 has 6 MA's), (Start: 25 @8619 has 1 MA's), (Start: 28 @8631 has 8 MA's), (31, 8640), (38, 8700), (45, 8733),

Gene: Visconti\_12 Start: 8640, Stop: 8804, Start Num: 28

Candidate Starts for Visconti\_12:

(11, 8562), (Start: 13 @8580 has 37 MA's), (Start: 19 @8613 has 1 MA's), (Start: 24 @8625 has 6 MA's), (Start: 25 @8628 has 1 MA's), (Start: 28 @8640 has 8 MA's), (31, 8649), (45, 8742),

Gene: WaldoWhy\_12 Start: 8633, Stop: 8797, Start Num: 28

Candidate Starts for WaldoWhy\_12:

(11, 8555), (Start: 13 @8573 has 37 MA's), (Start: 19 @8606 has 1 MA's), (Start: 24 @8618 has 6 MA's), (Start: 25 @8621 has 1 MA's), (Start: 28 @8633 has 8 MA's), (31, 8642), (45, 8735),

Gene: Wee\_41 Start: 32088, Stop: 31921, Start Num: 21

Candidate Starts for Wee\_41:

(10, 32154), (Start: 19 @32091 has 1 MA's), (Start: 21 @32088 has 26 MA's), (26, 32076), (Start: 28 @32070 has 8 MA's), (Start: 30 @32067 has 2 MA's), (37, 32004), (39, 31995), (45, 31965),

Gene: Wojtek\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for Wojtek\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (40, 130),

Gene: Wollypog\_84 Start: 57219, Stop: 57422, Start Num: 16

Candidate Starts for Wollypog\_84:

(7, 57156), (Start: 16 @57219 has 1 MA's), (29, 57264), (34, 57294), (42, 57360), (45, 57372),

Gene: Xenia2\_1 Start: 1, Stop: 207, Start Num: 13

Candidate Starts for Xenia2\_1:

(Start: 13 @1 has 37 MA's), (36, 115), (38, 127), (39, 130), (46, 163),

Gene: Yikes\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for Yikes\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (40, 130),

Gene: Yoshi\_33 Start: 24948, Stop: 25109, Start Num: 23

Candidate Starts for Yoshi\_33:

(18, 24930), (Start: 23 @24948 has 1 MA's), (33, 24993), (39, 25032), (45, 25062), (46, 25065),

Gene: Zany\_1 Start: 1, Stop: 204, Start Num: 13

Candidate Starts for Zany\_1:

(Start: 13 @1 has 37 MA's), (34, 88), (40, 130),