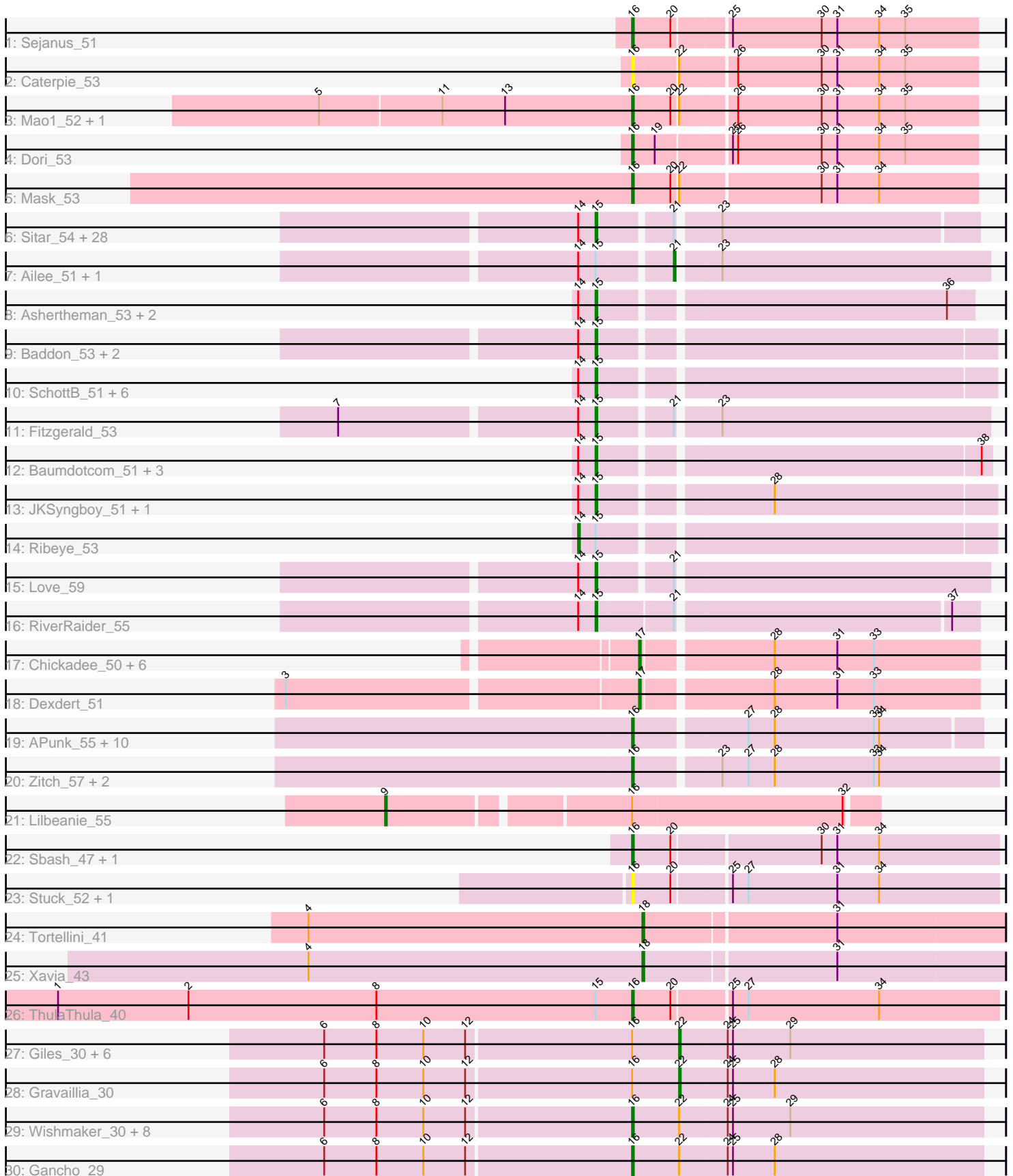


# Pham 294580



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 294580 Report

This analysis was run 04/18/26 on database version 643.

Pham number 294580 has 108 members, 12 are drafts.

Phages represented in each track:

- Track 1 : Sejanus\_51
- Track 2 : Caterpie\_53
- Track 3 : Mao1\_52, JohnLord\_56
- Track 4 : Dori\_53
- Track 5 : Mask\_53
- Track 6 : Sitar\_54, Charming\_55, Sanjuju\_53, FuegoCuervo\_58, Angelicage\_52, MoontowerMania\_54, Tangent\_55, Galadriel\_55, McKinley\_57, Barsten\_55, Kewpiedoll\_55, Thing3\_53, Brandonk123\_56, Affeca\_52, Vivi2\_58, Geodirt\_53, Jabberwocky\_52, Fosterous\_55, Stultus\_52, Keitabear\_54, Paries\_58, Sedona\_54, Kamashten\_53, Shivanishola\_54, Lennon\_54, McCrothy\_55, BobBob\_53, ChadMasterC\_55, Rofo\_54
- Track 7 : Ailee\_51, Nordenberg\_50
- Track 8 : Ashertheman\_53, Bibwit\_52, Gaea\_52
- Track 9 : Baddon\_53, Bizzy\_53, Derg\_48
- Track 10 : SchottB\_51, Gustavo\_53, YorkOnyx\_54, Saronaya\_53, Kwobi\_55, Tangerine\_52, Kroos\_53
- Track 11 : Fitzgerald\_53
- Track 12 : Baumdotcom\_51, Tycho\_52, StorminNorm\_52, LilHam\_50
- Track 13 : JKSyngboy\_51, Flatwoods\_53
- Track 14 : Ribeye\_53
- Track 15 : Love\_59
- Track 16 : RiverRaider\_55
- Track 17 : Chickadee\_50, EdmundFerry\_49, RoadKill\_48, Kwekel\_50, Tiamoceli\_51, Twonlo\_48, GTE6\_50
- Track 18 : Dxdert\_51
- Track 19 : APunk\_55, Sampson\_54, Zipp\_55, Delrey21\_54, ViaConlectus\_54, Tardus\_56, DoctorFroggo\_54, Scioto\_55, Verity\_54, Natkenzie\_54, Abblin\_54
- Track 20 : Zitch\_57, Pumpkiney\_55, BigHunkinEater\_56
- Track 21 : Lilbeanie\_55
- Track 22 : Sbash\_47, Che9c\_50
- Track 23 : Stuck\_52, Bluvara\_43
- Track 24 : Tortellini\_41
- Track 25 : Xavia\_43
- Track 26 : ThulaThula\_40
- Track 27 : Giles\_30, Dewey\_30, Forge\_30, Hail\_30, HH92\_30, Ubuntu\_30, Luna22\_30
- Track 28 : Gravaillia\_30

- Track 29 : Wishmaker\_30, Evanesce\_30, DeepSoil15\_30, Amymech\_30, BloominB\_30, Webster2\_30, Ein37\_30, OBUpride\_30, Amochick\_30
- Track 30 : Gancho\_29

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

The start number called the most often in the published annotations is 15, it was called in 50 of the 96 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Affeca\_52, Angelicage\_52, Ashertheman\_53, Baddon\_53, Barsten\_55, Baumdotcom\_51, Bibwit\_52, Bizzy\_53, BobBob\_53, Brandonk123\_56, ChadMasterC\_55, Charming\_55, Derg\_48, Fitzgerald\_53, Flatwoods\_53, Fosterous\_55, FuegoCuervo\_58, Gaea\_52, Galadriel\_55, Geodirt\_53, Gustavo\_53, JKSyngboy\_51, Jabberwocky\_52, Kamashten\_53, Keitabear\_54, Kewpiedoll\_55, Kroos\_53, Kwobi\_55, Lennon\_54, LilHam\_50, Love\_59, McCrothy\_55, McKinley\_57, MoontowerMania\_54, Paries\_58, RiverRaider\_55, Rofo\_54, Sanjuju\_53, Saronaya\_53, SchottB\_51, Sedona\_54, Shivanishola\_54, Sitar\_54, StorminNorm\_52, Stultus\_52, Tangent\_55, Tangerine\_52, Thing3\_53, Tycho\_52, Vivi2\_58, YorkOnyx\_54,

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

- Ailee\_51, Nordenberg\_50, Ribeye\_53, ThulaThula\_40,

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

- APunk\_55, Abblin\_54, Amochick\_30, Amymech\_30, BigHunkinEater\_56, BloominB\_30, Bluvara\_43, Caterpie\_53, Che9c\_50, Chickadee\_50, DeepSoil15\_30, Delrey21\_54, Dewey\_30, Dexdert\_51, DoctorFroggo\_54, Dori\_53, EdmundFerry\_49, Ein37\_30, Evanesce\_30, Forge\_30, GTE6\_50, Gancho\_29, Giles\_30, Gravaillia\_30, HH92\_30, Hail\_30, JohnLord\_56, Kwekel\_50, Lilbeanie\_55, Luna22\_30, Mao1\_52, Mask\_53, Natkenzie\_54, OBUpride\_30, Pumpkiney\_55, RoadKill\_48, Sampson\_54, Sbash\_47, Scioto\_55, Sejanus\_51, Stuck\_52, Tardus\_56, Tiamoceli\_51, Tortellini\_41, Twonlo\_48, Ubuntu\_30, Verity\_54, ViaConlectus\_54, Webster2\_30, Wishmaker\_30, Xavia\_43, Zipp\_55, Zitch\_57,

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

Start 9:

- Found in 1 of 108 ( 0.9% ) of genes in pham
- Manual Annotations of this start: 1 of 96
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Lilbeanie\_55 (DE5),

Start 14:

- Found in 54 of 108 ( 50.0% ) of genes in pham
- Manual Annotations of this start: 1 of 96
- Called 1.9% of time when present
- Phage (with cluster) where this start called: Ribeye\_53 (DE1),

Start 15:

- Found in 55 of 108 ( 50.9% ) of genes in pham
- Manual Annotations of this start: 50 of 96
- Called 92.7% of time when present
- Phage (with cluster) where this start called: Affeca\_52 (DE1), Angelicage\_52 (DE1), Ashertheman\_53 (DE1), Baddon\_53 (DE1), Barsten\_55 (DE1), Baumdotcom\_51 (DE1), Bibwit\_52 (DE1), Bizzy\_53 (DE1), BobBob\_53 (DE1), Brandonk123\_56 (DE1), ChadMasterC\_55 (DE1), Charming\_55 (DE1), Derg\_48 (DE1), Fitzgerald\_53 (DE1), Flatwoods\_53 (DE1), Fosterous\_55 (DE1), FuegoCuervo\_58 (DE1), Gaea\_52 (DE1), Galadriel\_55 (DE1), Geodirt\_53 (DE1), Gustavo\_53 (DE1), JKSyngboy\_51 (DE1), Jabberwocky\_52 (DE1), Kamashten\_53 (DE1), Keitabear\_54 (DE1), Kewpiedoll\_55 (DE1), Kroos\_53 (DE1), Kwobi\_55 (DE1), Lennon\_54 (DE1), LilHam\_50 (DE1), Love\_59 (DE1), McCrothy\_55 (DE1), McKinley\_57 (DE1), MoontowerMania\_54 (DE1), Paries\_58 (DE1), RiverRaider\_55 (DE1), Rofo\_54 (DE1), Sanjuju\_53 (DE1), Saronaya\_53 (DE1), SchottB\_51 (DE1), Sedona\_54 (DE1), Shivanishola\_54 (DE1), Sitar\_54 (DE1), StorminNorm\_52 (DE1), Stultus\_52 (DE1), Tangent\_55 (DE1), Tangerine\_52 (DE1), Thing3\_53 (DE1), Tycho\_52 (DE1), Vivi2\_58 (DE1), YorkOnyx\_54 (DE1),

#### Start 16:

- Found in 44 of 108 ( 40.7% ) of genes in pham
- Manual Annotations of this start: 25 of 96
- Called 79.5% of time when present
- Phage (with cluster) where this start called: APunk\_55 (DE4), Abblin\_54 (DE4), Amochick\_30 (Q), Amymech\_30 (Q), BigHunkinEater\_56 (DE4), BloominB\_30 (Q), Bluvara\_43 (I3), Caterpie\_53 (AD), Che9c\_50 (I2), DeepSoil15\_30 (Q), Delrey21\_54 (DE4), DoctorFroggo\_54 (DE4), Dori\_53 (AD), Ein37\_30 (Q), Evanesce\_30 (Q), Gancho\_29 (Q), JohnLord\_56 (AD), Mao1\_52 (AD), Mask\_53 (AD), Natkenzie\_54 (DE4), OBUpride\_30 (Q), Pumpkiney\_55 (DE4), Sampson\_54 (DE4), Sbash\_47 (I2), Scioto\_55 (DE4), Sejanus\_51 (AD), Stuck\_52 (I2), Tardus\_56 (DE4), ThulaThula\_40 (P5), Verity\_54 (DE4), ViaConlectus\_54 (DE4), Webster2\_30 (Q), Wishmaker\_30 (Q), Zipp\_55 (DE4), Zitch\_57 (DE4),

#### Start 17:

- Found in 8 of 108 ( 7.4% ) of genes in pham
- Manual Annotations of this start: 7 of 96
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Chickadee\_50 (DE3), Dextert\_51 (DE3), EdmundFerry\_49 (DE3), GTE6\_50 (DE3), Kwekel\_50 (DE3), RoadKill\_48 (DE3), Tiamoceli\_51 (DE3), Twonlo\_48 (DE3),

#### Start 18:

- Found in 2 of 108 ( 1.9% ) of genes in pham
- Manual Annotations of this start: 2 of 96
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Tortellini\_41 (P2), Xavia\_43 (P3),

#### Start 21:

- Found in 34 of 108 ( 31.5% ) of genes in pham
- Manual Annotations of this start: 2 of 96
- Called 5.9% of time when present
- Phage (with cluster) where this start called: Ailee\_51 (DE1), Nordenberg\_50 (DE1),

#### Start 22:

- Found in 22 of 108 ( 20.4% ) of genes in pham
- Manual Annotations of this start: 8 of 96
- Called 36.4% of time when present
- Phage (with cluster) where this start called: Dewey\_30 (Q), Forge\_30 (Q), Giles\_30 (Q), Gravallia\_30 (Q), HH92\_30 (Q), Hail\_30 (Q), Luna22\_30 (Q), Ubuntu\_30 (Q),

### **Summary by clusters:**

There are 11 clusters represented in this pham: P2, P3, I2, AD, P5, DE1, I3, DE3, DE4, DE5, Q,

Info for manual annotations of cluster AD:

- Start number 16 was manually annotated 4 times for cluster AD.

Info for manual annotations of cluster DE1:

- Start number 14 was manually annotated 1 time for cluster DE1.
- Start number 15 was manually annotated 50 times for cluster DE1.
- Start number 21 was manually annotated 2 times for cluster DE1.

Info for manual annotations of cluster DE3:

- Start number 17 was manually annotated 7 times for cluster DE3.

Info for manual annotations of cluster DE4:

- Start number 16 was manually annotated 9 times for cluster DE4.

Info for manual annotations of cluster DE5:

- Start number 9 was manually annotated 1 time for cluster DE5.

Info for manual annotations of cluster I2:

- Start number 16 was manually annotated 2 times for cluster I2.

Info for manual annotations of cluster P2:

- Start number 18 was manually annotated 1 time for cluster P2.

Info for manual annotations of cluster P3:

- Start number 18 was manually annotated 1 time for cluster P3.

Info for manual annotations of cluster P5:

- Start number 16 was manually annotated 1 time for cluster P5.

Info for manual annotations of cluster Q:

- Start number 16 was manually annotated 9 times for cluster Q.
- Start number 22 was manually annotated 8 times for cluster Q.

### **Gene Information:**

Gene: APunk\_55 Start: 44818, Stop: 45009, Start Num: 16

Candidate Starts for APunk\_55:

(Start: 16 @44818 has 25 MA's), (27, 44878), (28, 44893), (33, 44950), (34, 44953),

Gene: Abblin\_54 Start: 45304, Stop: 45495, Start Num: 16  
Candidate Starts for Abblin\_54:  
(Start: 16 @45304 has 25 MA's), (27, 45364), (28, 45379), (33, 45436), (34, 45439),

Gene: Affeca\_52 Start: 44537, Stop: 44749, Start Num: 15  
Candidate Starts for Affeca\_52:  
(Start: 14 @44528 has 1 MA's), (Start: 15 @44537 has 50 MA's), (Start: 21 @44576 has 2 MA's), (23, 44597),

Gene: Ailee\_51 Start: 44184, Stop: 44357, Start Num: 21  
Candidate Starts for Ailee\_51:  
(Start: 14 @44136 has 1 MA's), (Start: 15 @44145 has 50 MA's), (Start: 21 @44184 has 2 MA's), (23, 44205),

Gene: Amochick\_30 Start: 26628, Stop: 26828, Start Num: 16  
Candidate Starts for Amochick\_30:  
(6, 26454), (8, 26484), (10, 26511), (12, 26535), (Start: 16 @26628 has 25 MA's), (Start: 22 @26655 has 8 MA's), (24, 26682), (25, 26685), (29, 26718),

Gene: Amymech\_30 Start: 26622, Stop: 26822, Start Num: 16  
Candidate Starts for Amymech\_30:  
(6, 26448), (8, 26478), (10, 26505), (12, 26529), (Start: 16 @26622 has 25 MA's), (Start: 22 @26649 has 8 MA's), (24, 26676), (25, 26679), (29, 26712),

Gene: Angelicage\_52 Start: 44952, Stop: 45164, Start Num: 15  
Candidate Starts for Angelicage\_52:  
(Start: 14 @44943 has 1 MA's), (Start: 15 @44952 has 50 MA's), (Start: 21 @44991 has 2 MA's), (23, 45012),

Gene: Ashertheman\_53 Start: 44252, Stop: 44455, Start Num: 15  
Candidate Starts for Ashertheman\_53:  
(Start: 14 @44243 has 1 MA's), (Start: 15 @44252 has 50 MA's), (36, 44441),

Gene: Baddon\_53 Start: 45240, Stop: 45455, Start Num: 15  
Candidate Starts for Baddon\_53:  
(Start: 14 @45231 has 1 MA's), (Start: 15 @45240 has 50 MA's),

Gene: Barsten\_55 Start: 44908, Stop: 45120, Start Num: 15  
Candidate Starts for Barsten\_55:  
(Start: 14 @44899 has 1 MA's), (Start: 15 @44908 has 50 MA's), (Start: 21 @44947 has 2 MA's), (23, 44968),

Gene: Baumdotcom\_51 Start: 43667, Stop: 43879, Start Num: 15  
Candidate Starts for Baumdotcom\_51:  
(Start: 14 @43658 has 1 MA's), (Start: 15 @43667 has 50 MA's), (38, 43874),

Gene: Bibwit\_52 Start: 43778, Stop: 43969, Start Num: 15  
Candidate Starts for Bibwit\_52:  
(Start: 14 @43769 has 1 MA's), (Start: 15 @43778 has 50 MA's), (36, 43955),

Gene: BigHunkinEater\_56 Start: 44564, Stop: 44767, Start Num: 16  
Candidate Starts for BigHunkinEater\_56:  
(Start: 16 @44564 has 25 MA's), (23, 44609), (27, 44624), (28, 44639), (33, 44696), (34, 44699),

Gene: Bizzy\_53 Start: 43955, Stop: 44170, Start Num: 15  
Candidate Starts for Bizzy\_53:  
(Start: 14 @43946 has 1 MA's), (Start: 15 @43955 has 50 MA's),

Gene: BloominB\_30 Start: 26622, Stop: 26822, Start Num: 16  
Candidate Starts for BloominB\_30:  
(6, 26448), (8, 26478), (10, 26505), (12, 26529), (Start: 16 @26622 has 25 MA's), (Start: 22 @26649 has 8 MA's), (24, 26676), (25, 26679), (29, 26712),

Gene: Bluvara\_43 Start: 34561, Stop: 34764, Start Num: 16  
Candidate Starts for Bluvara\_43:  
(Start: 16 @34561 has 25 MA's), (20, 34582), (25, 34612), (27, 34621), (31, 34672), (34, 34696),

Gene: BobBob\_53 Start: 44135, Stop: 44347, Start Num: 15  
Candidate Starts for BobBob\_53:  
(Start: 14 @44126 has 1 MA's), (Start: 15 @44135 has 50 MA's), (Start: 21 @44174 has 2 MA's), (23, 44195),

Gene: Brandonk123\_56 Start: 45095, Stop: 45298, Start Num: 15  
Candidate Starts for Brandonk123\_56:  
(Start: 14 @45086 has 1 MA's), (Start: 15 @45095 has 50 MA's), (Start: 21 @45134 has 2 MA's), (23, 45155),

Gene: Caterpie\_53 Start: 44845, Stop: 45036, Start Num: 16  
Candidate Starts for Caterpie\_53:  
(Start: 16 @44845 has 25 MA's), (Start: 22 @44869 has 8 MA's), (26, 44899), (30, 44947), (31, 44956), (34, 44980), (35, 44995),

Gene: ChadMasterC\_55 Start: 46307, Stop: 46519, Start Num: 15  
Candidate Starts for ChadMasterC\_55:  
(Start: 14 @46298 has 1 MA's), (Start: 15 @46307 has 50 MA's), (Start: 21 @46346 has 2 MA's), (23, 46367),

Gene: Charming\_55 Start: 44589, Stop: 44792, Start Num: 15  
Candidate Starts for Charming\_55:  
(Start: 14 @44580 has 1 MA's), (Start: 15 @44589 has 50 MA's), (Start: 21 @44628 has 2 MA's), (23, 44649),

Gene: Che9c\_50 Start: 39879, Stop: 40082, Start Num: 16  
Candidate Starts for Che9c\_50:  
(Start: 16 @39879 has 25 MA's), (20, 39900), (30, 39981), (31, 39990), (34, 40014),

Gene: Chickadee\_50 Start: 41096, Stop: 41281, Start Num: 17  
Candidate Starts for Chickadee\_50:  
(Start: 17 @41096 has 7 MA's), (28, 41165), (31, 41201), (33, 41222),

Gene: DeepSoil15\_30 Start: 26622, Stop: 26822, Start Num: 16  
Candidate Starts for DeepSoil15\_30:  
(6, 26448), (8, 26478), (10, 26505), (12, 26529), (Start: 16 @26622 has 25 MA's), (Start: 22 @26649 has 8 MA's), (24, 26676), (25, 26679), (29, 26712),

Gene: Delrey21\_54 Start: 46075, Stop: 46278, Start Num: 16

Candidate Starts for Delrey21\_54:

(Start: 16 @46075 has 25 MA's), (27, 46135), (28, 46150), (33, 46207), (34, 46210),

Gene: Derg\_48 Start: 43547, Stop: 43762, Start Num: 15

Candidate Starts for Derg\_48:

(Start: 14 @43538 has 1 MA's), (Start: 15 @43547 has 50 MA's),

Gene: Dewey\_30 Start: 26649, Stop: 26822, Start Num: 22

Candidate Starts for Dewey\_30:

(6, 26448), (8, 26478), (10, 26505), (12, 26529), (Start: 16 @26622 has 25 MA's), (Start: 22 @26649 has 8 MA's), (24, 26676), (25, 26679), (29, 26712),

Gene: Dextert\_51 Start: 41380, Stop: 41565, Start Num: 17

Candidate Starts for Dextert\_51:

(3, 41188), (Start: 17 @41380 has 7 MA's), (28, 41449), (31, 41485), (33, 41506),

Gene: DoctorFroggo\_54 Start: 46075, Stop: 46278, Start Num: 16

Candidate Starts for DoctorFroggo\_54:

(Start: 16 @46075 has 25 MA's), (27, 46135), (28, 46150), (33, 46207), (34, 46210),

Gene: Dori\_53 Start: 45995, Stop: 46186, Start Num: 16

Candidate Starts for Dori\_53:

(Start: 16 @45995 has 25 MA's), (19, 46007), (25, 46046), (26, 46049), (30, 46097), (31, 46106), (34, 46130), (35, 46145),

Gene: EdmundFerry\_49 Start: 41164, Stop: 41349, Start Num: 17

Candidate Starts for EdmundFerry\_49:

(Start: 17 @41164 has 7 MA's), (28, 41233), (31, 41269), (33, 41290),

Gene: Ein37\_30 Start: 26622, Stop: 26822, Start Num: 16

Candidate Starts for Ein37\_30:

(6, 26448), (8, 26478), (10, 26505), (12, 26529), (Start: 16 @26622 has 25 MA's), (Start: 22 @26649 has 8 MA's), (24, 26676), (25, 26679), (29, 26712),

Gene: Evanesce\_30 Start: 26622, Stop: 26822, Start Num: 16

Candidate Starts for Evanesce\_30:

(6, 26448), (8, 26478), (10, 26505), (12, 26529), (Start: 16 @26622 has 25 MA's), (Start: 22 @26649 has 8 MA's), (24, 26676), (25, 26679), (29, 26712),

Gene: Fitzgerald\_53 Start: 45574, Stop: 45786, Start Num: 15

Candidate Starts for Fitzgerald\_53:

(7, 45433), (Start: 14 @45565 has 1 MA's), (Start: 15 @45574 has 50 MA's), (Start: 21 @45613 has 2 MA's), (23, 45634),

Gene: Flatwoods\_53 Start: 43896, Stop: 44111, Start Num: 15

Candidate Starts for Flatwoods\_53:

(Start: 14 @43887 has 1 MA's), (Start: 15 @43896 has 50 MA's), (28, 43986),

Gene: Forge\_30 Start: 26649, Stop: 26822, Start Num: 22

Candidate Starts for Forge\_30:

(6, 26448), (8, 26478), (10, 26505), (12, 26529), (Start: 16 @26622 has 25 MA's), (Start: 22 @26649 has 8 MA's), (24, 26676), (25, 26679), (29, 26712),

Gene: Fosterous\_55 Start: 45041, Stop: 45244, Start Num: 15  
Candidate Starts for Fosterous\_55:  
(Start: 14 @45032 has 1 MA's), (Start: 15 @45041 has 50 MA's), (Start: 21 @45080 has 2 MA's), (23, 45101),

Gene: FuegoCuervo\_58 Start: 44178, Stop: 44390, Start Num: 15  
Candidate Starts for FuegoCuervo\_58:  
(Start: 14 @44169 has 1 MA's), (Start: 15 @44178 has 50 MA's), (Start: 21 @44217 has 2 MA's), (23, 44238),

Gene: GTE6\_50 Start: 41632, Stop: 41817, Start Num: 17  
Candidate Starts for GTE6\_50:  
(Start: 17 @41632 has 7 MA's), (28, 41701), (31, 41737), (33, 41758),

Gene: Gaea\_52 Start: 43552, Stop: 43755, Start Num: 15  
Candidate Starts for Gaea\_52:  
(Start: 14 @43543 has 1 MA's), (Start: 15 @43552 has 50 MA's), (36, 43741),

Gene: Galadriel\_55 Start: 45037, Stop: 45249, Start Num: 15  
Candidate Starts for Galadriel\_55:  
(Start: 14 @45028 has 1 MA's), (Start: 15 @45037 has 50 MA's), (Start: 21 @45076 has 2 MA's), (23, 45097),

Gene: Gancho\_29 Start: 26345, Stop: 26545, Start Num: 16  
Candidate Starts for Gancho\_29:  
(6, 26171), (8, 26201), (10, 26228), (12, 26252), (Start: 16 @26345 has 25 MA's), (Start: 22 @26372 has 8 MA's), (24, 26399), (25, 26402), (28, 26426),

Gene: Geodirt\_53 Start: 45656, Stop: 45868, Start Num: 15  
Candidate Starts for Geodirt\_53:  
(Start: 14 @45647 has 1 MA's), (Start: 15 @45656 has 50 MA's), (Start: 21 @45695 has 2 MA's), (23, 45716),

Gene: Giles\_30 Start: 26649, Stop: 26822, Start Num: 22  
Candidate Starts for Giles\_30:  
(6, 26448), (8, 26478), (10, 26505), (12, 26529), (Start: 16 @26622 has 25 MA's), (Start: 22 @26649 has 8 MA's), (24, 26676), (25, 26679), (29, 26712),

Gene: Gravaillia\_30 Start: 26378, Stop: 26551, Start Num: 22  
Candidate Starts for Gravaillia\_30:  
(6, 26177), (8, 26207), (10, 26234), (12, 26258), (Start: 16 @26351 has 25 MA's), (Start: 22 @26378 has 8 MA's), (24, 26405), (25, 26408), (28, 26432),

Gene: Gustavo\_53 Start: 44178, Stop: 44393, Start Num: 15  
Candidate Starts for Gustavo\_53:  
(Start: 14 @44169 has 1 MA's), (Start: 15 @44178 has 50 MA's),

Gene: HH92\_30 Start: 26649, Stop: 26822, Start Num: 22  
Candidate Starts for HH92\_30:  
(6, 26448), (8, 26478), (10, 26505), (12, 26529), (Start: 16 @26622 has 25 MA's), (Start: 22 @26649 has 8 MA's), (24, 26676), (25, 26679), (29, 26712),

Gene: Hail\_30 Start: 26649, Stop: 26822, Start Num: 22

Candidate Starts for Hail\_30:

(6, 26448), (8, 26478), (10, 26505), (12, 26529), (Start: 16 @26622 has 25 MA's), (Start: 22 @26649 has 8 MA's), (24, 26676), (25, 26679), (29, 26712),

Gene: JKSyngboy\_51 Start: 44771, Stop: 44986, Start Num: 15

Candidate Starts for JKSyngboy\_51:

(Start: 14 @44762 has 1 MA's), (Start: 15 @44771 has 50 MA's), (28, 44861),

Gene: Jabberwocky\_52 Start: 45716, Stop: 45919, Start Num: 15

Candidate Starts for Jabberwocky\_52:

(Start: 14 @45707 has 1 MA's), (Start: 15 @45716 has 50 MA's), (Start: 21 @45755 has 2 MA's), (23, 45776),

Gene: JohnLord\_56 Start: 45281, Stop: 45472, Start Num: 16

Candidate Starts for JohnLord\_56:

(5, 45104), (11, 45173), (13, 45209), (Start: 16 @45281 has 25 MA's), (20, 45302), (Start: 22 @45305 has 8 MA's), (26, 45335), (30, 45383), (31, 45392), (34, 45416), (35, 45431),

Gene: Kamashten\_53 Start: 44248, Stop: 44460, Start Num: 15

Candidate Starts for Kamashten\_53:

(Start: 14 @44239 has 1 MA's), (Start: 15 @44248 has 50 MA's), (Start: 21 @44287 has 2 MA's), (23, 44308),

Gene: Keitabear\_54 Start: 45767, Stop: 45979, Start Num: 15

Candidate Starts for Keitabear\_54:

(Start: 14 @45758 has 1 MA's), (Start: 15 @45767 has 50 MA's), (Start: 21 @45806 has 2 MA's), (23, 45827),

Gene: Kewpiedoll\_55 Start: 45199, Stop: 45411, Start Num: 15

Candidate Starts for Kewpiedoll\_55:

(Start: 14 @45190 has 1 MA's), (Start: 15 @45199 has 50 MA's), (Start: 21 @45238 has 2 MA's), (23, 45259),

Gene: Kroos\_53 Start: 44455, Stop: 44670, Start Num: 15

Candidate Starts for Kroos\_53:

(Start: 14 @44446 has 1 MA's), (Start: 15 @44455 has 50 MA's),

Gene: Kwekel\_50 Start: 41057, Stop: 41242, Start Num: 17

Candidate Starts for Kwekel\_50:

(Start: 17 @41057 has 7 MA's), (28, 41126), (31, 41162), (33, 41183),

Gene: Kwobi\_55 Start: 44881, Stop: 45096, Start Num: 15

Candidate Starts for Kwobi\_55:

(Start: 14 @44872 has 1 MA's), (Start: 15 @44881 has 50 MA's),

Gene: Lennon\_54 Start: 45871, Stop: 46074, Start Num: 15

Candidate Starts for Lennon\_54:

(Start: 14 @45862 has 1 MA's), (Start: 15 @45871 has 50 MA's), (Start: 21 @45910 has 2 MA's), (23, 45931),

Gene: LilHam\_50 Start: 43066, Stop: 43278, Start Num: 15

Candidate Starts for LilHam\_50:

(Start: 14 @43057 has 1 MA's), (Start: 15 @43066 has 50 MA's), (38, 43273),

Gene: Lilbeanie\_55 Start: 40602, Stop: 40868, Start Num: 9  
Candidate Starts for Lilbeanie\_55:  
(Start: 9 @40602 has 1 MA's), (Start: 16 @40731 has 25 MA's), (32, 40851),

Gene: Love\_59 Start: 46477, Stop: 46689, Start Num: 15  
Candidate Starts for Love\_59:  
(Start: 14 @46468 has 1 MA's), (Start: 15 @46477 has 50 MA's), (Start: 21 @46516 has 2 MA's),

Gene: Luna22\_30 Start: 26649, Stop: 26822, Start Num: 22  
Candidate Starts for Luna22\_30:  
(6, 26448), (8, 26478), (10, 26505), (12, 26529), (Start: 16 @26622 has 25 MA's), (Start: 22 @26649 has 8 MA's), (24, 26676), (25, 26679), (29, 26712),

Gene: Mao1\_52 Start: 44284, Stop: 44475, Start Num: 16  
Candidate Starts for Mao1\_52:  
(5, 44107), (11, 44176), (13, 44212), (Start: 16 @44284 has 25 MA's), (20, 44305), (Start: 22 @44308 has 8 MA's), (26, 44338), (30, 44386), (31, 44395), (34, 44419), (35, 44434),

Gene: Mask\_53 Start: 46842, Stop: 47033, Start Num: 16  
Candidate Starts for Mask\_53:  
(Start: 16 @46842 has 25 MA's), (20, 46863), (Start: 22 @46866 has 8 MA's), (30, 46944), (31, 46953), (34, 46977),

Gene: McCrothy\_55 Start: 45607, Stop: 45819, Start Num: 15  
Candidate Starts for McCrothy\_55:  
(Start: 14 @45598 has 1 MA's), (Start: 15 @45607 has 50 MA's), (Start: 21 @45646 has 2 MA's), (23, 45667),

Gene: McKinley\_57 Start: 45605, Stop: 45817, Start Num: 15  
Candidate Starts for McKinley\_57:  
(Start: 14 @45596 has 1 MA's), (Start: 15 @45605 has 50 MA's), (Start: 21 @45644 has 2 MA's), (23, 45665),

Gene: MoontowerMania\_54 Start: 45482, Stop: 45694, Start Num: 15  
Candidate Starts for MoontowerMania\_54:  
(Start: 14 @45473 has 1 MA's), (Start: 15 @45482 has 50 MA's), (Start: 21 @45521 has 2 MA's), (23, 45542),

Gene: Natkenzie\_54 Start: 45304, Stop: 45495, Start Num: 16  
Candidate Starts for Natkenzie\_54:  
(Start: 16 @45304 has 25 MA's), (27, 45364), (28, 45379), (33, 45436), (34, 45439),

Gene: Nordenberg\_50 Start: 44426, Stop: 44599, Start Num: 21  
Candidate Starts for Nordenberg\_50:  
(Start: 14 @44378 has 1 MA's), (Start: 15 @44387 has 50 MA's), (Start: 21 @44426 has 2 MA's), (23, 44447),

Gene: OBUpride\_30 Start: 26616, Stop: 26816, Start Num: 16  
Candidate Starts for OBUpride\_30:  
(6, 26442), (8, 26472), (10, 26499), (12, 26523), (Start: 16 @26616 has 25 MA's), (Start: 22 @26643 has 8 MA's), (24, 26670), (25, 26673), (29, 26706),

Gene: Paries\_58 Start: 45864, Stop: 46076, Start Num: 15  
Candidate Starts for Paries\_58:  
(Start: 14 @45855 has 1 MA's), (Start: 15 @45864 has 50 MA's), (Start: 21 @45903 has 2 MA's), (23, 45924),

Gene: Pumpkiney\_55 Start: 42641, Stop: 42844, Start Num: 16  
Candidate Starts for Pumpkiney\_55:  
(Start: 16 @42641 has 25 MA's), (23, 42686), (27, 42701), (28, 42716), (33, 42773), (34, 42776),

Gene: Ribeye\_53 Start: 44870, Stop: 45094, Start Num: 14  
Candidate Starts for Ribeye\_53:  
(Start: 14 @44870 has 1 MA's), (Start: 15 @44879 has 50 MA's),

Gene: RiverRaider\_55 Start: 43578, Stop: 43784, Start Num: 15  
Candidate Starts for RiverRaider\_55:  
(Start: 14 @43569 has 1 MA's), (Start: 15 @43578 has 50 MA's), (Start: 21 @43620 has 2 MA's), (37, 43770),

Gene: RoadKill\_48 Start: 40662, Stop: 40847, Start Num: 17  
Candidate Starts for RoadKill\_48:  
(Start: 17 @40662 has 7 MA's), (28, 40731), (31, 40767), (33, 40788),

Gene: Rofo\_54 Start: 44978, Stop: 45181, Start Num: 15  
Candidate Starts for Rofo\_54:  
(Start: 14 @44969 has 1 MA's), (Start: 15 @44978 has 50 MA's), (Start: 21 @45017 has 2 MA's), (23, 45038),

Gene: Sampson\_54 Start: 45249, Stop: 45440, Start Num: 16  
Candidate Starts for Sampson\_54:  
(Start: 16 @45249 has 25 MA's), (27, 45309), (28, 45324), (33, 45381), (34, 45384),

Gene: Sanjuju\_53 Start: 45707, Stop: 45919, Start Num: 15  
Candidate Starts for Sanjuju\_53:  
(Start: 14 @45698 has 1 MA's), (Start: 15 @45707 has 50 MA's), (Start: 21 @45746 has 2 MA's), (23, 45767),

Gene: Saronaya\_53 Start: 44178, Stop: 44393, Start Num: 15  
Candidate Starts for Saronaya\_53:  
(Start: 14 @44169 has 1 MA's), (Start: 15 @44178 has 50 MA's),

Gene: Sbash\_47 Start: 37583, Stop: 37786, Start Num: 16  
Candidate Starts for Sbash\_47:  
(Start: 16 @37583 has 25 MA's), (20, 37604), (30, 37685), (31, 37694), (34, 37718),

Gene: SchottB\_51 Start: 44715, Stop: 44930, Start Num: 15  
Candidate Starts for SchottB\_51:  
(Start: 14 @44706 has 1 MA's), (Start: 15 @44715 has 50 MA's),

Gene: Scioto\_55 Start: 45305, Stop: 45496, Start Num: 16  
Candidate Starts for Scioto\_55:  
(Start: 16 @45305 has 25 MA's), (27, 45365), (28, 45380), (33, 45437), (34, 45440),

Gene: Sedona\_54 Start: 45447, Stop: 45659, Start Num: 15

Candidate Starts for Sedona\_54:

(Start: 14 @45438 has 1 MA's), (Start: 15 @45447 has 50 MA's), (Start: 21 @45486 has 2 MA's), (23, 45507),

Gene: Sejanus\_51 Start: 45773, Stop: 45964, Start Num: 16

Candidate Starts for Sejanus\_51:

(Start: 16 @45773 has 25 MA's), (20, 45794), (25, 45824), (30, 45875), (31, 45884), (34, 45908), (35, 45923),

Gene: Shivanishola\_54 Start: 44168, Stop: 44380, Start Num: 15

Candidate Starts for Shivanishola\_54:

(Start: 14 @44159 has 1 MA's), (Start: 15 @44168 has 50 MA's), (Start: 21 @44207 has 2 MA's), (23, 44228),

Gene: Sitar\_54 Start: 45871, Stop: 46074, Start Num: 15

Candidate Starts for Sitar\_54:

(Start: 14 @45862 has 1 MA's), (Start: 15 @45871 has 50 MA's), (Start: 21 @45910 has 2 MA's), (23, 45931),

Gene: StorminNorm\_52 Start: 43806, Stop: 44018, Start Num: 15

Candidate Starts for StorminNorm\_52:

(Start: 14 @43797 has 1 MA's), (Start: 15 @43806 has 50 MA's), (38, 44013),

Gene: Stuck\_52 Start: 39414, Stop: 39617, Start Num: 16

Candidate Starts for Stuck\_52:

(Start: 16 @39414 has 25 MA's), (20, 39435), (25, 39465), (27, 39474), (31, 39525), (34, 39549),

Gene: Stultus\_52 Start: 44348, Stop: 44560, Start Num: 15

Candidate Starts for Stultus\_52:

(Start: 14 @44339 has 1 MA's), (Start: 15 @44348 has 50 MA's), (Start: 21 @44387 has 2 MA's), (23, 44408),

Gene: Tangent\_55 Start: 44601, Stop: 44804, Start Num: 15

Candidate Starts for Tangent\_55:

(Start: 14 @44592 has 1 MA's), (Start: 15 @44601 has 50 MA's), (Start: 21 @44640 has 2 MA's), (23, 44661),

Gene: Tangerine\_52 Start: 43590, Stop: 43805, Start Num: 15

Candidate Starts for Tangerine\_52:

(Start: 14 @43581 has 1 MA's), (Start: 15 @43590 has 50 MA's),

Gene: Tardus\_56 Start: 45006, Stop: 45197, Start Num: 16

Candidate Starts for Tardus\_56:

(Start: 16 @45006 has 25 MA's), (27, 45066), (28, 45081), (33, 45138), (34, 45141),

Gene: Thing3\_53 Start: 44248, Stop: 44460, Start Num: 15

Candidate Starts for Thing3\_53:

(Start: 14 @44239 has 1 MA's), (Start: 15 @44248 has 50 MA's), (Start: 21 @44287 has 2 MA's), (23, 44308),

Gene: ThulaThula\_40 Start: 32667, Stop: 32870, Start Num: 16

Candidate Starts for ThulaThula\_40:

(1, 32337), (2, 32412), (8, 32520), (Start: 15 @32646 has 50 MA's), (Start: 16 @32667 has 25 MA's), (20, 32688), (25, 32718), (27, 32727), (34, 32802),

Gene: Tiamoceli\_51 Start: 41953, Stop: 42138, Start Num: 17  
Candidate Starts for Tiamoceli\_51:  
(Start: 17 @41953 has 7 MA's), (28, 42022), (31, 42058), (33, 42079),

Gene: Tortellini\_41 Start: 35256, Stop: 35456, Start Num: 18  
Candidate Starts for Tortellini\_41:  
(4, 35064), (Start: 18 @35256 has 2 MA's), (31, 35361),

Gene: Twonlo\_48 Start: 40583, Stop: 40768, Start Num: 17  
Candidate Starts for Twonlo\_48:  
(Start: 17 @40583 has 7 MA's), (28, 40652), (31, 40688), (33, 40709),

Gene: Tycho\_52 Start: 43674, Stop: 43886, Start Num: 15  
Candidate Starts for Tycho\_52:  
(Start: 14 @43665 has 1 MA's), (Start: 15 @43674 has 50 MA's), (38, 43881),

Gene: Ubuntu\_30 Start: 26649, Stop: 26822, Start Num: 22  
Candidate Starts for Ubuntu\_30:  
(6, 26448), (8, 26478), (10, 26505), (12, 26529), (Start: 16 @26622 has 25 MA's), (Start: 22 @26649 has 8 MA's), (24, 26676), (25, 26679), (29, 26712),

Gene: Verity\_54 Start: 46075, Stop: 46278, Start Num: 16  
Candidate Starts for Verity\_54:  
(Start: 16 @46075 has 25 MA's), (27, 46135), (28, 46150), (33, 46207), (34, 46210),

Gene: ViaConlectus\_54 Start: 43958, Stop: 44149, Start Num: 16  
Candidate Starts for ViaConlectus\_54:  
(Start: 16 @43958 has 25 MA's), (27, 44018), (28, 44033), (33, 44090), (34, 44093),

Gene: Vivi2\_58 Start: 46078, Stop: 46281, Start Num: 15  
Candidate Starts for Vivi2\_58:  
(Start: 14 @46069 has 1 MA's), (Start: 15 @46078 has 50 MA's), (Start: 21 @46117 has 2 MA's), (23, 46138),

Gene: Webster2\_30 Start: 26622, Stop: 26822, Start Num: 16  
Candidate Starts for Webster2\_30:  
(6, 26448), (8, 26478), (10, 26505), (12, 26529), (Start: 16 @26622 has 25 MA's), (Start: 22 @26649 has 8 MA's), (24, 26676), (25, 26679), (29, 26712),

Gene: Wishmaker\_30 Start: 26622, Stop: 26822, Start Num: 16  
Candidate Starts for Wishmaker\_30:  
(6, 26448), (8, 26478), (10, 26505), (12, 26529), (Start: 16 @26622 has 25 MA's), (Start: 22 @26649 has 8 MA's), (24, 26676), (25, 26679), (29, 26712),

Gene: Xavia\_43 Start: 35839, Stop: 36039, Start Num: 18  
Candidate Starts for Xavia\_43:  
(4, 35647), (Start: 18 @35839 has 2 MA's), (31, 35944),

Gene: YorkOnyx\_54 Start: 44370, Stop: 44585, Start Num: 15  
Candidate Starts for YorkOnyx\_54:

(Start: 14 @44361 has 1 MA's), (Start: 15 @44370 has 50 MA's),

Gene: Zipp\_55 Start: 45990, Stop: 46193, Start Num: 16

Candidate Starts for Zipp\_55:

(Start: 16 @45990 has 25 MA's), (27, 46050), (28, 46065), (33, 46122), (34, 46125),

Gene: Zitch\_57 Start: 44113, Stop: 44316, Start Num: 16

Candidate Starts for Zitch\_57:

(Start: 16 @44113 has 25 MA's), (23, 44158), (27, 44173), (28, 44188), (33, 44245), (34, 44248),