



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 294591 Report

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

WARNING: Pham size does not match number of genes in report. Either unphamerated genes have been added (by you) or starterator has removed genes due to invalid start codon.

Pham number 294591 has 100 members, 3 are drafts.

Phages represented in each track:

- Track 1 : Celeste\_15, Lannister\_16, Goby\_15, Dattran\_16, Toma\_15
- Track 2 : Bovely\_15, Esperer\_15, SunsetPointe\_15, Indigo\_15, Nerdos\_15, Ozzie\_15, Caliburn\_15, Hydra\_17, Aaronocolus\_15, Leviticus\_15, Unstoppable\_15, Legacy\_15, BeardedLady\_16, Phettuccine\_15
- Track 3 : Werner\_15, Yasdnil\_15, Whatever\_15, Chucky\_15, OzzyJ\_16, Hippo\_15, Snorlax\_15, TagePhighter\_16, SarahRose\_15, BarryBee\_17, Emaanora\_17, TuanPN\_15, Asten\_15, Dwayne\_15, Maneekul\_15, Triste\_15, Ejemplo\_15
- Track 4 : Nanodon\_17
- Track 5 : Brataylor\_16, Zemlya\_16, Nabi\_15, Lorelei\_15, Lika\_15, Rana\_15, Danzina\_16
- Track 6 : BryanRecycles\_16, Oliynyk\_16, Rusticus\_16, Eddasa\_16, Izzy\_16, EnochSoames\_16, Jash\_16
- Track 7 : Godpower\_16
- Track 8 : Katalie\_16, RedBear\_17, South40\_16
- Track 9 : Sujidade\_16
- Track 10 : TrvxScott\_14, Bowden\_16, TinaBelcher\_15
- Track 11 : Hank144\_16
- Track 12 : Janus\_16, GirlDinner\_15, Animus\_16
- Track 13 : Triumph\_17, Axiom\_16
- Track 14 : Paolo\_17, Zainub\_17
- Track 15 : Puginator\_17
- Track 16 : Marav\_18
- Track 17 : Omar\_16
- Track 18 : Daudau\_15
- Track 19 : Caelum\_16
- Track 20 : ELB20\_14, R4\_15
- Track 21 : Alvy\_17, BartholomewSD\_17
- Track 22 : SqueakyClean\_16
- Track 23 : Amethyst\_15, Haizum\_15, Tefunt\_15, Nishikigoi\_15, Diane\_15
- Track 24 : Paedore\_15, Loofah\_16
- Track 25 : Jevington\_17
- Track 26 : Issmi\_16
- Track 27 : Thestral\_16

- Track 28 : Andris\_15
- Track 29 : Superstar\_18
- Track 30 : Pablito\_15
- Track 31 : Verse\_15, SunkenRoot\_17, Amela\_15
- Track 32 : GreenWeasel\_17, BroPlease\_16, phiHau3\_17
- Track 33 : VieEnRose\_15
- Track 34 : Itza\_15, Celia\_15, Urza\_15

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

The start number called the most often in the published annotations is 6, it was called in 93 of the 97 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Aaronocolus\_15, Alvy\_17, Amela\_15, Amethyst\_15, Andris\_15, Animus\_16, Asten\_15, Axiom\_16, BarryBee\_17, BartholomewSD\_17, BeardedLady\_16, Bovely\_15, Bowden\_16, Brataylor\_16, BroPlease\_16, BryanRecycles\_16, Caelum\_16, Caliburn\_15, Celeste\_15, Celia\_15, Chucky\_15, Danzina\_16, Dattran\_16, Daudau\_15, Diane\_15, Dwayne\_15, ELB20\_14, Eddasa\_16, Ejemplo\_15, Emaanora\_17, EnochSoames\_16, Esperer\_15, GirlDinner\_15, Goby\_15, Godpower\_16, GreenWeasel\_17, Haizum\_15, Hank144\_16, Hippo\_15, Hydra\_17, Indigo\_15, Issmi\_16, Itza\_15, Izzy\_16, Janus\_16, Jash\_16, Jevington\_17, Katalie\_16, Lannister\_16, Legacy\_15, Leviticus\_15, Lika\_15, Loofah\_16, Lorelei\_15, Maneekul\_15, Nabi\_15, Nanodon\_17, Nerdos\_15, Nishikigoi\_15, Oliynyk\_16, Omar\_16, Ozzie\_15, OzzyJ\_16, Pablito\_15, Paedore\_15, Phettuccine\_15, R4\_15, Rana\_15, RedBear\_17, Rusticus\_16, SarahRose\_15, Snorlax\_15, South40\_16, SqueakyClean\_16, Sujidade\_16, SunkenRoot\_17, SunsetPointe\_15, Superstar\_18, TagePhighter\_16, Tefunt\_15, Thestral\_16, TinaBelcher\_15, Toma\_15, Triste\_15, Triumph\_17, TrvxScott\_14, TuanPN\_15, Unstoppable\_15, Urza\_15, Verse\_15, VieEnRose\_15, Werner\_15, Whatever\_15, Yasdnil\_15, Zemlya\_16, phiHau3\_17,

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

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

- Marav\_18, Paolo\_17, Puginator\_17, Zainub\_17,

**Summary by start number:**

Start 5:

- Found in 1 of 100 ( 1.0% ) of genes in pham
- Manual Annotations of this start: 1 of 97
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Marav\_18 (BD2),

Start 6:

- Found in 96 of 100 ( 96.0% ) of genes in pham
- Manual Annotations of this start: 93 of 97
- Called 100.0% of time when present

- Phage (with cluster) where this start called: Aaronocolus\_15 (BD1), Alvy\_17 (BD2), Amela\_15 (BD3), Amethyst\_15 (BD2), Andris\_15 (BD2), Animus\_16 (BD2), Asten\_15 (BD1), Axiom\_16 (BD2), BarryBee\_17 (BD1), BartholomewSD\_17 (BD2), BeardedLady\_16 (BD1), Bovely\_15 (BD1), Bowden\_16 (BD2), Brataylor\_16 (BD1), BroPlease\_16 (BD4), BryanRecycles\_16 (BD1), Caelum\_16 (BD2), Caliburn\_15 (BD1), Celeste\_15 (BD1), Celia\_15 (BD6), Chucky\_15 (BD1), Danzina\_16 (BD1), Dattran\_16 (BD1), Daudau\_15 (BD2), Diane\_15 (BD2), Dwayne\_15 (BD1), ELB20\_14 (BD2), Eddasa\_16 (BD1), Ejemplo\_15 (BD1), Emaanora\_17 (BD1), EnochSoames\_16 (BD1), Esperer\_15 (BD1), GirlDinner\_15 (BD2), Goby\_15 (BD1), Godpower\_16 (BD1), GreenWeasel\_17 (BD4), Haizum\_15 (BD2), Hank144\_16 (BD2), Hippo\_15 (BD1), Hydra\_17 (BD1), Indigo\_15 (BD1), Issmi\_16 (BD2), Itza\_15 (BD6), Izzy\_16 (BD1), Janus\_16 (BD2), Jash\_16 (BD1), Jevington\_17 (BD2), Katalie\_16 (BD1), Lannister\_16 (BD1), Legacy\_15 (BD1), Leviticus\_15 (BD1), Lika\_15 (BD1), Loofah\_16 (BD2), Lorelei\_15 (BD1), Maneekul\_15 (BD1), Nabi\_15 (BD1), Nanodon\_17 (BD1), Nerdos\_15 (BD1), Nishikigoi\_15 (BD2), Oliynyk\_16 (BD1), Omar\_16 (BD2), Ozzie\_15 (BD1), OzzyJ\_16 (BD1), Pablito\_15 (BD2), Paedore\_15 (BD2), Phettuccine\_15 (BD1), R4\_15 (BD2), Rana\_15 (BD1), RedBear\_17 (BD1), Rusticus\_16 (BD1), SarahRose\_15 (BD1), Snorlax\_15 (BD1), South40\_16 (BD1), SqueakyClean\_16 (BD2), Sujidade\_16 (BD1), SunkenRoot\_17 (BD3), SunsetPointe\_15 (BD1), Superstar\_18 (BD2), TagePhighter\_16 (BD1), Tefunt\_15 (BD2), Thestral\_16 (BD2), TinaBelcher\_15 (BD2), Toma\_15 (BD1), Triste\_15 (BD1), Triumph\_17 (BD2), TrvxScott\_14 (BD2), TuanPN\_15 (BD1), Unstoppable\_15 (BD1), Urza\_15 (BD6), Verse\_15 (BD3), VieEnRose\_15 (BD6), Werner\_15 (BD1), Whatever\_15 (BD1), Yasdnii\_15 (BD1), Zemlya\_16 (BD1), phiHau3\_17 (BD4),

Start 7:

- Found in 3 of 100 ( 3.0% ) of genes in pham
- Manual Annotations of this start: 3 of 97
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Paolo\_17 (BD2), Puginator\_17 (BD2), Zainub\_17 (BD2),

### Summary by clusters:

There are 5 clusters represented in this pham: BD4, BD6, BD1, BD3, BD2,

Info for manual annotations of cluster BD1:

- Start number 6 was manually annotated 55 times for cluster BD1.

Info for manual annotations of cluster BD2:

- Start number 5 was manually annotated 1 time for cluster BD2.
- Start number 6 was manually annotated 29 times for cluster BD2.
- Start number 7 was manually annotated 3 times for cluster BD2.

Info for manual annotations of cluster BD3:

- Start number 6 was manually annotated 2 times for cluster BD3.

Info for manual annotations of cluster BD4:

- Start number 6 was manually annotated 3 times for cluster BD4.

Info for manual annotations of cluster BD6:

- Start number 6 was manually annotated 4 times for cluster BD6.

**Gene Information:**

Gene: Aaronocolus\_15 Start: 10095, Stop: 10838, Start Num: 6

Candidate Starts for Aaronocolus\_15:

(Start: 6 @10095 has 93 MA's), (8, 10167), (11, 10329), (12, 10356), (14, 10413), (17, 10461), (18, 10467), (23, 10575), (24, 10584), (28, 10695),

Gene: Alvy\_17 Start: 10094, Stop: 10834, Start Num: 6

Candidate Starts for Alvy\_17:

(Start: 6 @10094 has 93 MA's), (9, 10208), (10, 10268), (11, 10328), (15, 10418), (17, 10460), (18, 10466), (23, 10574), (24, 10583),

Gene: Amela\_15 Start: 10262, Stop: 11005, Start Num: 6

Candidate Starts for Amela\_15:

(Start: 6 @10262 has 93 MA's), (11, 10496), (18, 10634), (23, 10742), (24, 10751),

Gene: Amethyst\_15 Start: 9916, Stop: 10656, Start Num: 6

Candidate Starts for Amethyst\_15:

(Start: 6 @9916 has 93 MA's), (11, 10150), (13, 10216), (16, 10264), (17, 10282), (20, 10351), (23, 10396), (24, 10405), (29, 10537),

Gene: Andris\_15 Start: 9902, Stop: 10642, Start Num: 6

Candidate Starts for Andris\_15:

(Start: 6 @9902 has 93 MA's), (11, 10136), (15, 10226), (18, 10274), (20, 10337), (23, 10382), (24, 10391), (30, 10532),

Gene: Animus\_16 Start: 10255, Stop: 10995, Start Num: 6

Candidate Starts for Animus\_16:

(2, 10087), (Start: 6 @10255 has 93 MA's), (11, 10489), (15, 10579), (17, 10621), (20, 10690), (23, 10735), (24, 10744),

Gene: Asten\_15 Start: 10053, Stop: 10805, Start Num: 6

Candidate Starts for Asten\_15:

(3, 9957), (Start: 6 @10053 has 93 MA's), (11, 10287), (12, 10314), (16, 10401), (18, 10425), (24, 10542),

Gene: Axiom\_16 Start: 9940, Stop: 10680, Start Num: 6

Candidate Starts for Axiom\_16:

(Start: 6 @9940 has 93 MA's), (11, 10174), (15, 10264), (17, 10306), (18, 10312), (20, 10375), (23, 10420), (24, 10429), (30, 10570),

Gene: BarryBee\_17 Start: 10060, Stop: 10815, Start Num: 6

Candidate Starts for BarryBee\_17:

(3, 9964), (Start: 6 @10060 has 93 MA's), (11, 10294), (12, 10321), (16, 10408), (18, 10432), (24, 10549),

Gene: BartholomewSD\_17 Start: 10094, Stop: 10834, Start Num: 6

Candidate Starts for BartholomewSD\_17:

(Start: 6 @10094 has 93 MA's), (9, 10208), (10, 10268), (11, 10328), (15, 10418), (17, 10460), (18, 10466), (23, 10574), (24, 10583),

Gene: BeardedLady\_16 Start: 10342, Stop: 11085, Start Num: 6

Candidate Starts for BeardedLady\_16:

(Start: 6 @10342 has 93 MA's), (8, 10414), (11, 10576), (12, 10603), (14, 10660), (17, 10708), (18, 10714), (23, 10822), (24, 10831), (28, 10942),

Gene: Bovely\_15 Start: 10101, Stop: 10844, Start Num: 6

Candidate Starts for Bovely\_15:

(Start: 6 @10101 has 93 MA's), (8, 10173), (11, 10335), (12, 10362), (14, 10419), (17, 10467), (18, 10473), (23, 10581), (24, 10590), (28, 10701),

Gene: Bowden\_16 Start: 10011, Stop: 10751, Start Num: 6

Candidate Starts for Bowden\_16:

(Start: 6 @10011 has 93 MA's), (9, 10125), (11, 10245), (15, 10335), (18, 10383), (23, 10491), (24, 10500),

Gene: Brataylor\_16 Start: 10066, Stop: 10821, Start Num: 6

Candidate Starts for Brataylor\_16:

(Start: 6 @10066 has 93 MA's), (11, 10300), (12, 10327), (16, 10414), (18, 10438), (24, 10555), (25, 10609),

Gene: BroPlease\_16 Start: 10267, Stop: 11007, Start Num: 6

Candidate Starts for BroPlease\_16:

(Start: 6 @10267 has 93 MA's), (11, 10501), (12, 10528), (14, 10585), (18, 10639), (23, 10747), (24, 10756), (26, 10810), (30, 10897),

Gene: BryanRecycles\_16 Start: 10258, Stop: 11001, Start Num: 6

Candidate Starts for BryanRecycles\_16:

(4, 10168), (Start: 6 @10258 has 93 MA's), (8, 10330), (11, 10492), (12, 10519), (17, 10624), (18, 10630), (23, 10738), (24, 10747), (28, 10858),

Gene: Caelum\_16 Start: 9887, Stop: 10624, Start Num: 6

Candidate Starts for Caelum\_16:

(Start: 6 @9887 has 93 MA's), (11, 10121), (17, 10253), (18, 10259), (20, 10322), (23, 10367), (24, 10376), (29, 10508), (34, 10562),

Gene: Caliburn\_15 Start: 10075, Stop: 10818, Start Num: 6

Candidate Starts for Caliburn\_15:

(Start: 6 @10075 has 93 MA's), (8, 10147), (11, 10309), (12, 10336), (14, 10393), (17, 10441), (18, 10447), (23, 10555), (24, 10564), (28, 10675),

Gene: Celeste\_15 Start: 10064, Stop: 10816, Start Num: 6

Candidate Starts for Celeste\_15:

(Start: 6 @10064 has 93 MA's), (11, 10298), (12, 10325), (16, 10412), (18, 10436), (24, 10553),

Gene: Celia\_15 Start: 10381, Stop: 11133, Start Num: 6

Candidate Starts for Celia\_15:

(Start: 6 @10381 has 93 MA's), (11, 10615), (20, 10816), (23, 10861), (24, 10870), (31, 11023),

Gene: Chucky\_15 Start: 10061, Stop: 10816, Start Num: 6

Candidate Starts for Chucky\_15:

(3, 9965), (Start: 6 @10061 has 93 MA's), (11, 10295), (12, 10322), (16, 10409), (18, 10433), (24, 10550),

Gene: Danzina\_16 Start: 10268, Stop: 11023, Start Num: 6  
Candidate Starts for Danzina\_16:  
(Start: 6 @10268 has 93 MA's), (11, 10502), (12, 10529), (16, 10616), (18, 10640), (24, 10757), (25, 10811),

Gene: Dattran\_16 Start: 10063, Stop: 10815, Start Num: 6  
Candidate Starts for Dattran\_16:  
(Start: 6 @10063 has 93 MA's), (11, 10297), (12, 10324), (16, 10411), (18, 10435), (24, 10552),

Gene: Daudau\_15 Start: 9998, Stop: 10738, Start Num: 6  
Candidate Starts for Daudau\_15:  
(Start: 6 @9998 has 93 MA's), (11, 10232), (18, 10370), (23, 10478), (24, 10487), (33, 10670),

Gene: Diane\_15 Start: 9915, Stop: 10655, Start Num: 6  
Candidate Starts for Diane\_15:  
(Start: 6 @9915 has 93 MA's), (11, 10149), (13, 10215), (16, 10263), (17, 10281), (20, 10350), (23, 10395), (24, 10404), (29, 10536),

Gene: Dwayne\_15 Start: 10060, Stop: 10812, Start Num: 6  
Candidate Starts for Dwayne\_15:  
(3, 9964), (Start: 6 @10060 has 93 MA's), (11, 10294), (12, 10321), (16, 10408), (18, 10432), (24, 10549),

Gene: ELB20\_14 Start: 10026, Stop: 10766, Start Num: 6  
Candidate Starts for ELB20\_14:  
(Start: 6 @10026 has 93 MA's), (9, 10140), (11, 10260), (17, 10392), (18, 10398), (19, 10413), (20, 10461), (23, 10506), (24, 10515),

Gene: Eddasa\_16 Start: 10258, Stop: 11001, Start Num: 6  
Candidate Starts for Eddasa\_16:  
(4, 10168), (Start: 6 @10258 has 93 MA's), (8, 10330), (11, 10492), (12, 10519), (17, 10624), (18, 10630), (23, 10738), (24, 10747), (28, 10858),

Gene: Ejemplo\_15 Start: 10063, Stop: 10815, Start Num: 6  
Candidate Starts for Ejemplo\_15:  
(3, 9967), (Start: 6 @10063 has 93 MA's), (11, 10297), (12, 10324), (16, 10411), (18, 10435), (24, 10552),

Gene: Emaanora\_17 Start: 10060, Stop: 10815, Start Num: 6  
Candidate Starts for Emaanora\_17:  
(3, 9964), (Start: 6 @10060 has 93 MA's), (11, 10294), (12, 10321), (16, 10408), (18, 10432), (24, 10549),

Gene: EnochSoames\_16 Start: 10254, Stop: 10997, Start Num: 6  
Candidate Starts for EnochSoames\_16:  
(4, 10164), (Start: 6 @10254 has 93 MA's), (8, 10326), (11, 10488), (12, 10515), (17, 10620), (18, 10626), (23, 10734), (24, 10743), (28, 10854),

Gene: Esperer\_15 Start: 10095, Stop: 10838, Start Num: 6  
Candidate Starts for Esperer\_15:  
(Start: 6 @10095 has 93 MA's), (8, 10167), (11, 10329), (12, 10356), (14, 10413), (17, 10461), (18, 10467), (23, 10575), (24, 10584), (28, 10695),

Gene: GirlDinner\_15 Start: 9917, Stop: 10657, Start Num: 6

Candidate Starts for GirlDinner\_15:

(2, 9749), (Start: 6 @9917 has 93 MA's), (11, 10151), (15, 10241), (17, 10283), (20, 10352), (23, 10397), (24, 10406),

Gene: Goby\_15 Start: 10066, Stop: 10818, Start Num: 6

Candidate Starts for Goby\_15:

(Start: 6 @10066 has 93 MA's), (11, 10300), (12, 10327), (16, 10414), (18, 10438), (24, 10555),

Gene: Godpower\_16 Start: 10081, Stop: 10833, Start Num: 6

Candidate Starts for Godpower\_16:

(Start: 6 @10081 has 93 MA's), (11, 10315), (12, 10342), (16, 10429), (18, 10453), (24, 10570), (25, 10624), (28, 10684),

Gene: GreenWeasel\_17 Start: 10276, Stop: 11016, Start Num: 6

Candidate Starts for GreenWeasel\_17:

(Start: 6 @10276 has 93 MA's), (11, 10510), (12, 10537), (14, 10594), (18, 10648), (23, 10756), (24, 10765), (26, 10819), (30, 10906),

Gene: Haizum\_15 Start: 9945, Stop: 10685, Start Num: 6

Candidate Starts for Haizum\_15:

(Start: 6 @9945 has 93 MA's), (11, 10179), (13, 10245), (16, 10293), (17, 10311), (20, 10380), (23, 10425), (24, 10434), (29, 10566),

Gene: Hank144\_16 Start: 10219, Stop: 10959, Start Num: 6

Candidate Starts for Hank144\_16:

(Start: 6 @10219 has 93 MA's), (11, 10453), (17, 10585), (18, 10591), (20, 10654), (23, 10699), (24, 10708), (28, 10816),

Gene: Hippo\_15 Start: 10060, Stop: 10815, Start Num: 6

Candidate Starts for Hippo\_15:

(3, 9964), (Start: 6 @10060 has 93 MA's), (11, 10294), (12, 10321), (16, 10408), (18, 10432), (24, 10549),

Gene: Hydra\_17 Start: 10623, Stop: 11366, Start Num: 6

Candidate Starts for Hydra\_17:

(Start: 6 @10623 has 93 MA's), (8, 10695), (11, 10857), (12, 10884), (14, 10941), (17, 10989), (18, 10995), (23, 11103), (24, 11112), (28, 11223),

Gene: Indigo\_15 Start: 10095, Stop: 10838, Start Num: 6

Candidate Starts for Indigo\_15:

(Start: 6 @10095 has 93 MA's), (8, 10167), (11, 10329), (12, 10356), (14, 10413), (17, 10461), (18, 10467), (23, 10575), (24, 10584), (28, 10695),

Gene: Issmi\_16 Start: 10216, Stop: 10956, Start Num: 6

Candidate Starts for Issmi\_16:

(Start: 6 @10216 has 93 MA's), (8, 10288), (11, 10450), (16, 10564), (17, 10582), (18, 10588), (20, 10651), (23, 10696), (24, 10705), (29, 10837), (35, 10936),

Gene: Itza\_15 Start: 10304, Stop: 11056, Start Num: 6

Candidate Starts for Itza\_15:

(Start: 6 @10304 has 93 MA's), (11, 10538), (20, 10739), (23, 10784), (24, 10793), (31, 10946),

Gene: Izzy\_16 Start: 10305, Stop: 11048, Start Num: 6

Candidate Starts for Izzy\_16:

(4, 10215), (Start: 6 @10305 has 93 MA's), (8, 10377), (11, 10539), (12, 10566), (17, 10671), (18, 10677), (23, 10785), (24, 10794), (28, 10905),

Gene: Janus\_16 Start: 10255, Stop: 10995, Start Num: 6

Candidate Starts for Janus\_16:

(2, 10087), (Start: 6 @10255 has 93 MA's), (11, 10489), (15, 10579), (17, 10621), (20, 10690), (23, 10735), (24, 10744),

Gene: Jash\_16 Start: 10258, Stop: 11001, Start Num: 6

Candidate Starts for Jash\_16:

(4, 10168), (Start: 6 @10258 has 93 MA's), (8, 10330), (11, 10492), (12, 10519), (17, 10624), (18, 10630), (23, 10738), (24, 10747), (28, 10858),

Gene: Jevington\_17 Start: 10542, Stop: 11288, Start Num: 6

Candidate Starts for Jevington\_17:

(Start: 6 @10542 has 93 MA's), (9, 10656), (17, 10908), (18, 10914), (23, 11022), (24, 11031), (34, 11217),

Gene: Katalie\_16 Start: 10336, Stop: 11079, Start Num: 6

Candidate Starts for Katalie\_16:

(Start: 6 @10336 has 93 MA's), (11, 10570), (12, 10597), (16, 10684), (17, 10702), (18, 10708), (20, 10771), (24, 10825), (27, 10882), (30, 10969),

Gene: Lannister\_16 Start: 10084, Stop: 10839, Start Num: 6

Candidate Starts for Lannister\_16:

(Start: 6 @10084 has 93 MA's), (11, 10318), (12, 10345), (16, 10432), (18, 10456), (24, 10573),

Gene: Legacy\_15 Start: 10066, Stop: 10809, Start Num: 6

Candidate Starts for Legacy\_15:

(Start: 6 @10066 has 93 MA's), (8, 10138), (11, 10300), (12, 10327), (14, 10384), (17, 10432), (18, 10438), (23, 10546), (24, 10555), (28, 10666),

Gene: Leviticus\_15 Start: 10095, Stop: 10838, Start Num: 6

Candidate Starts for Leviticus\_15:

(Start: 6 @10095 has 93 MA's), (8, 10167), (11, 10329), (12, 10356), (14, 10413), (17, 10461), (18, 10467), (23, 10575), (24, 10584), (28, 10695),

Gene: Lika\_15 Start: 10082, Stop: 10837, Start Num: 6

Candidate Starts for Lika\_15:

(Start: 6 @10082 has 93 MA's), (11, 10316), (12, 10343), (16, 10430), (18, 10454), (24, 10571), (25, 10625),

Gene: Loofah\_16 Start: 10057, Stop: 10797, Start Num: 6

Candidate Starts for Loofah\_16:

(Start: 6 @10057 has 93 MA's), (9, 10171), (11, 10291), (17, 10423), (18, 10429), (19, 10444), (20, 10492), (23, 10537), (24, 10546), (34, 10732),

Gene: Lorelei\_15 Start: 10054, Stop: 10806, Start Num: 6

Candidate Starts for Lorelei\_15:

(Start: 6 @10054 has 93 MA's), (11, 10288), (12, 10315), (16, 10402), (18, 10426), (24, 10543), (25, 10597),

Gene: Maneekul\_15 Start: 10062, Stop: 10814, Start Num: 6

Candidate Starts for Maneekul\_15:

(3, 9966), (Start: 6 @10062 has 93 MA's), (11, 10296), (12, 10323), (16, 10410), (18, 10434), (24, 10551),

Gene: Marav\_18 Start: 10892, Stop: 11632, Start Num: 5

Candidate Starts for Marav\_18:

(Start: 5 @10892 has 1 MA's), (9, 11006), (17, 11258), (18, 11264), (23, 11372), (24, 11381),

Gene: Nabi\_15 Start: 10054, Stop: 10806, Start Num: 6

Candidate Starts for Nabi\_15:

(Start: 6 @10054 has 93 MA's), (11, 10288), (12, 10315), (16, 10402), (18, 10426), (24, 10543), (25, 10597),

Gene: Nanodon\_17 Start: 10256, Stop: 11008, Start Num: 6

Candidate Starts for Nanodon\_17:

(Start: 6 @10256 has 93 MA's), (11, 10490), (12, 10517), (16, 10604), (17, 10622), (18, 10628), (24, 10745),

Gene: Nerdos\_15 Start: 10095, Stop: 10838, Start Num: 6

Candidate Starts for Nerdos\_15:

(Start: 6 @10095 has 93 MA's), (8, 10167), (11, 10329), (12, 10356), (14, 10413), (17, 10461), (18, 10467), (23, 10575), (24, 10584), (28, 10695),

Gene: Nishikigoi\_15 Start: 9945, Stop: 10685, Start Num: 6

Candidate Starts for Nishikigoi\_15:

(Start: 6 @9945 has 93 MA's), (11, 10179), (13, 10245), (16, 10293), (17, 10311), (20, 10380), (23, 10425), (24, 10434), (29, 10566),

Gene: Oliynyk\_16 Start: 10258, Stop: 11001, Start Num: 6

Candidate Starts for Oliynyk\_16:

(4, 10168), (Start: 6 @10258 has 93 MA's), (8, 10330), (11, 10492), (12, 10519), (17, 10624), (18, 10630), (23, 10738), (24, 10747), (28, 10858),

Gene: Omar\_16 Start: 10179, Stop: 10919, Start Num: 6

Candidate Starts for Omar\_16:

(Start: 6 @10179 has 93 MA's), (11, 10413), (17, 10545), (18, 10551), (20, 10614), (21, 10638), (22, 10650), (23, 10659), (24, 10668), (29, 10800),

Gene: Ozzie\_15 Start: 10075, Stop: 10818, Start Num: 6

Candidate Starts for Ozzie\_15:

(Start: 6 @10075 has 93 MA's), (8, 10147), (11, 10309), (12, 10336), (14, 10393), (17, 10441), (18, 10447), (23, 10555), (24, 10564), (28, 10675),

Gene: OzzyJ\_16 Start: 10054, Stop: 10806, Start Num: 6

Candidate Starts for OzzyJ\_16:

(3, 9958), (Start: 6 @10054 has 93 MA's), (11, 10288), (12, 10315), (16, 10402), (18, 10426), (24, 10543),

Gene: Pablito\_15 Start: 9915, Stop: 10655, Start Num: 6

Candidate Starts for Pablito\_15:

(Start: 6 @9915 has 93 MA's), (11, 10149), (15, 10239), (17, 10281), (18, 10287), (20, 10350), (23, 10395), (24, 10404), (28, 10512),

Gene: Paedore\_15 Start: 10057, Stop: 10797, Start Num: 6

Candidate Starts for Paedore\_15:

(Start: 6 @10057 has 93 MA's), (9, 10171), (11, 10291), (17, 10423), (18, 10429), (19, 10444), (20, 10492), (23, 10537), (24, 10546), (34, 10732),

Gene: Paolo\_17 Start: 10558, Stop: 11295, Start Num: 7

Candidate Starts for Paolo\_17:

(2, 10390), (3, 10471), (Start: 7 @10558 has 3 MA's), (9, 10669), (13, 10855), (17, 10921), (18, 10927), (24, 11044), (34, 11230),

Gene: Phettuccine\_15 Start: 10095, Stop: 10838, Start Num: 6

Candidate Starts for Phettuccine\_15:

(Start: 6 @10095 has 93 MA's), (8, 10167), (11, 10329), (12, 10356), (14, 10413), (17, 10461), (18, 10467), (23, 10575), (24, 10584), (28, 10695),

Gene: Puginator\_17 Start: 10516, Stop: 11253, Start Num: 7

Candidate Starts for Puginator\_17:

(2, 10348), (3, 10429), (Start: 7 @10516 has 3 MA's), (9, 10627), (12, 10774), (18, 10885), (23, 10993), (24, 11002),

Gene: R4\_15 Start: 10037, Stop: 10777, Start Num: 6

Candidate Starts for R4\_15:

(Start: 6 @10037 has 93 MA's), (9, 10151), (11, 10271), (17, 10403), (18, 10409), (19, 10424), (20, 10472), (23, 10517), (24, 10526),

Gene: Rana\_15 Start: 10054, Stop: 10806, Start Num: 6

Candidate Starts for Rana\_15:

(Start: 6 @10054 has 93 MA's), (11, 10288), (12, 10315), (16, 10402), (18, 10426), (24, 10543), (25, 10597),

Gene: RedBear\_17 Start: 10336, Stop: 11079, Start Num: 6

Candidate Starts for RedBear\_17:

(Start: 6 @10336 has 93 MA's), (11, 10570), (12, 10597), (16, 10684), (17, 10702), (18, 10708), (20, 10771), (24, 10825), (27, 10882), (30, 10969),

Gene: Rusticus\_16 Start: 10258, Stop: 11001, Start Num: 6

Candidate Starts for Rusticus\_16:

(4, 10168), (Start: 6 @10258 has 93 MA's), (8, 10330), (11, 10492), (12, 10519), (17, 10624), (18, 10630), (23, 10738), (24, 10747), (28, 10858),

Gene: SarahRose\_15 Start: 10060, Stop: 10812, Start Num: 6

Candidate Starts for SarahRose\_15:

(3, 9964), (Start: 6 @10060 has 93 MA's), (11, 10294), (12, 10321), (16, 10408), (18, 10432), (24, 10549),

Gene: Snorlax\_15 Start: 10060, Stop: 10815, Start Num: 6

Candidate Starts for Snorlax\_15:

(3, 9964), (Start: 6 @10060 has 93 MA's), (11, 10294), (12, 10321), (16, 10408), (18, 10432), (24, 10549),

Gene: South40\_16 Start: 10336, Stop: 11079, Start Num: 6

Candidate Starts for South40\_16:

(Start: 6 @10336 has 93 MA's), (11, 10570), (12, 10597), (16, 10684), (17, 10702), (18, 10708), (20, 10771), (24, 10825), (27, 10882), (30, 10969),

Gene: SqueakyClean\_16 Start: 10181, Stop: 10921, Start Num: 6

Candidate Starts for SqueakyClean\_16:

(2, 10013), (Start: 6 @10181 has 93 MA's), (11, 10415), (20, 10616), (23, 10661), (24, 10670),

Gene: Sujidade\_16 Start: 10358, Stop: 11113, Start Num: 6

Candidate Starts for Sujidade\_16:

(Start: 6 @10358 has 93 MA's), (11, 10592), (12, 10619), (16, 10706), (18, 10730), (24, 10847), (25, 10901), (32, 11024),

Gene: SunkenRoot\_17 Start: 10255, Stop: 10998, Start Num: 6

Candidate Starts for SunkenRoot\_17:

(Start: 6 @10255 has 93 MA's), (11, 10489), (18, 10627), (23, 10735), (24, 10744),

Gene: SunsetPointe\_15 Start: 10085, Stop: 10828, Start Num: 6

Candidate Starts for SunsetPointe\_15:

(Start: 6 @10085 has 93 MA's), (8, 10157), (11, 10319), (12, 10346), (14, 10403), (17, 10451), (18, 10457), (23, 10565), (24, 10574), (28, 10685),

Gene: Superstar\_18 Start: 11073, Stop: 11810, Start Num: 6

Candidate Starts for Superstar\_18:

(Start: 6 @11073 has 93 MA's), (9, 11187), (11, 11307), (17, 11439), (18, 11445), (20, 11508), (23, 11553), (24, 11562), (29, 11694),

Gene: TagePighter\_16 Start: 10060, Stop: 10815, Start Num: 6

Candidate Starts for TagePighter\_16:

(3, 9964), (Start: 6 @10060 has 93 MA's), (11, 10294), (12, 10321), (16, 10408), (18, 10432), (24, 10549),

Gene: Tefunt\_15 Start: 9945, Stop: 10685, Start Num: 6

Candidate Starts for Tefunt\_15:

(Start: 6 @9945 has 93 MA's), (11, 10179), (13, 10245), (16, 10293), (17, 10311), (20, 10380), (23, 10425), (24, 10434), (29, 10566),

Gene: Thestral\_16 Start: 10014, Stop: 10754, Start Num: 6

Candidate Starts for Thestral\_16:

(Start: 6 @10014 has 93 MA's), (10, 10188), (11, 10248), (15, 10338), (18, 10386), (23, 10494), (24, 10503),

Gene: TinaBelcher\_15 Start: 9962, Stop: 10702, Start Num: 6

Candidate Starts for TinaBelcher\_15:

(Start: 6 @9962 has 93 MA's), (9, 10076), (11, 10196), (15, 10286), (18, 10334), (23, 10442), (24, 10451),

Gene: Toma\_15 Start: 10066, Stop: 10818, Start Num: 6

Candidate Starts for Toma\_15:

(Start: 6 @10066 has 93 MA's), (11, 10300), (12, 10327), (16, 10414), (18, 10438), (24, 10555),

Gene: Triste\_15 Start: 10054, Stop: 10806, Start Num: 6

Candidate Starts for Triste\_15:

(3, 9958), (Start: 6 @10054 has 93 MA's), (11, 10288), (12, 10315), (16, 10402), (18, 10426), (24, 10543),

Gene: Triumph\_17 Start: 9970, Stop: 10710, Start Num: 6

Candidate Starts for Triumph\_17:

(Start: 6 @9970 has 93 MA's), (11, 10204), (15, 10294), (17, 10336), (18, 10342), (20, 10405), (23, 10450), (24, 10459), (30, 10600),

Gene: TrvxScott\_14 Start: 9963, Stop: 10703, Start Num: 6

Candidate Starts for TrvxScott\_14:

(Start: 6 @9963 has 93 MA's), (9, 10077), (11, 10197), (15, 10287), (18, 10335), (23, 10443), (24, 10452),

Gene: TuanPN\_15 Start: 10063, Stop: 10815, Start Num: 6

Candidate Starts for TuanPN\_15:

(3, 9967), (Start: 6 @10063 has 93 MA's), (11, 10297), (12, 10324), (16, 10411), (18, 10435), (24, 10552),

Gene: Unstoppable\_15 Start: 10086, Stop: 10829, Start Num: 6

Candidate Starts for Unstoppable\_15:

(Start: 6 @10086 has 93 MA's), (8, 10158), (11, 10320), (12, 10347), (14, 10404), (17, 10452), (18, 10458), (23, 10566), (24, 10575), (28, 10686),

Gene: Urza\_15 Start: 10316, Stop: 11068, Start Num: 6

Candidate Starts for Urza\_15:

(Start: 6 @10316 has 93 MA's), (11, 10550), (20, 10751), (23, 10796), (24, 10805), (31, 10958),

Gene: Verse\_15 Start: 10256, Stop: 10999, Start Num: 6

Candidate Starts for Verse\_15:

(Start: 6 @10256 has 93 MA's), (11, 10490), (18, 10628), (23, 10736), (24, 10745),

Gene: VieEnRose\_15 Start: 10386, Stop: 11135, Start Num: 6

Candidate Starts for VieEnRose\_15:

(1, 10017), (Start: 6 @10386 has 93 MA's), (11, 10620), (20, 10821), (23, 10866), (24, 10875), (31, 11028),

Gene: Werner\_15 Start: 10061, Stop: 10816, Start Num: 6

Candidate Starts for Werner\_15:

(3, 9965), (Start: 6 @10061 has 93 MA's), (11, 10295), (12, 10322), (16, 10409), (18, 10433), (24, 10550),

Gene: Whatever\_15 Start: 10061, Stop: 10816, Start Num: 6

Candidate Starts for Whatever\_15:

(3, 9965), (Start: 6 @10061 has 93 MA's), (11, 10295), (12, 10322), (16, 10409), (18, 10433), (24, 10550),

Gene: Yasdni1\_15 Start: 10059, Stop: 10811, Start Num: 6

Candidate Starts for Yasdni1\_15:

(3, 9963), (Start: 6 @10059 has 93 MA's), (11, 10293), (12, 10320), (16, 10407), (18, 10431), (24, 10548),

Gene: Zainub\_17 Start: 10516, Stop: 11253, Start Num: 7

Candidate Starts for Zainub\_17:

(2, 10348), (3, 10429), (Start: 7 @10516 has 3 MA's), (9, 10627), (13, 10813), (17, 10879), (18, 10885), (24, 11002), (34, 11188),

Gene: Zemlya\_16 Start: 10074, Stop: 10829, Start Num: 6

Candidate Starts for Zemlya\_16:

(Start: 6 @10074 has 93 MA's), (11, 10308), (12, 10335), (16, 10422), (18, 10446), (24, 10563), (25, 10617),

Gene: phiHau3\_17 Start: 10244, Stop: 10984, Start Num: 6

Candidate Starts for phiHau3\_17:

(Start: 6 @10244 has 93 MA's), (11, 10478), (12, 10505), (14, 10562), (18, 10616), (23, 10724), (24, 10733), (26, 10787), (30, 10874),