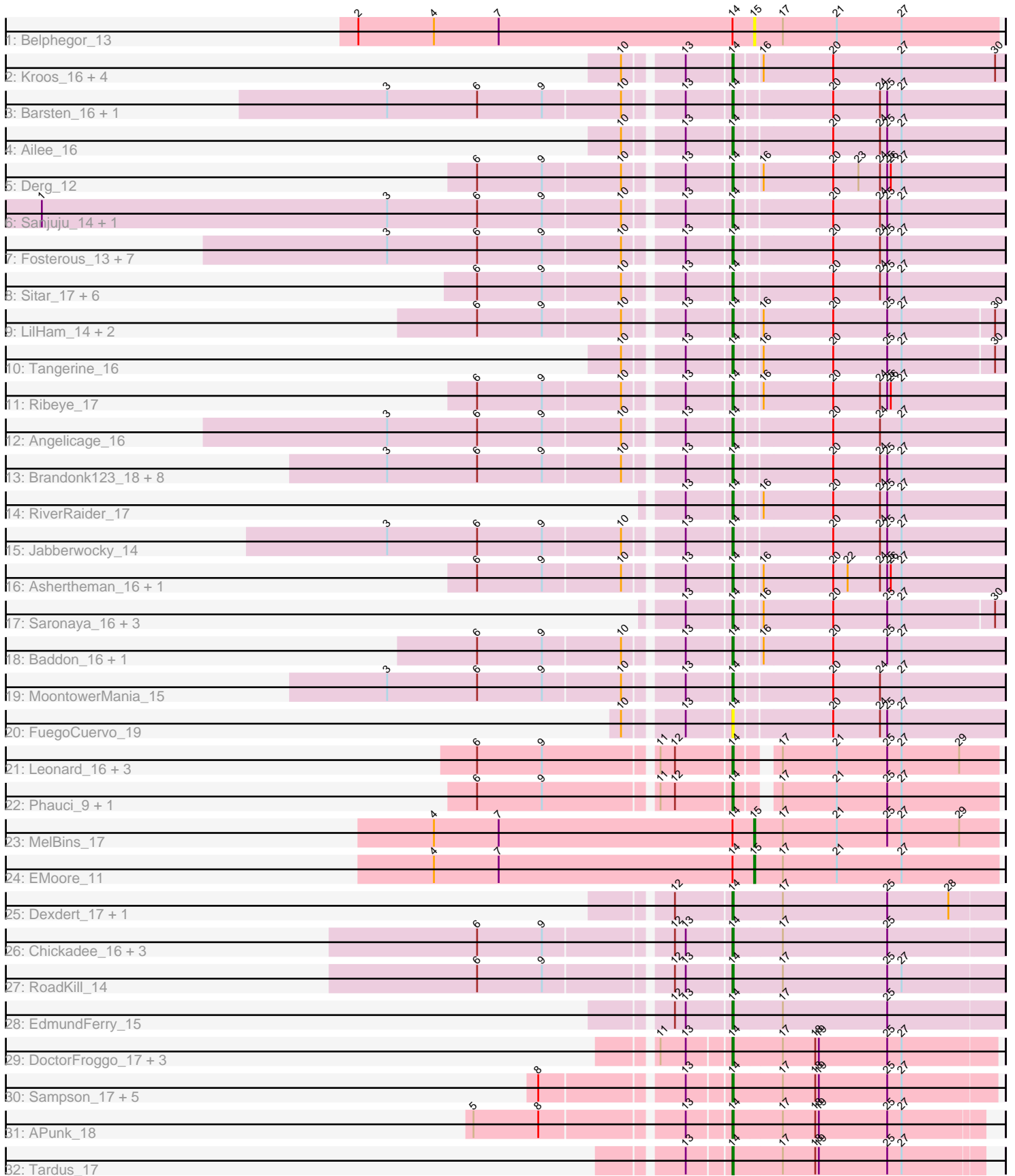


# Pham 216089



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 216089 Report

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

Pham number 216089 has 82 members, 13 are drafts.

Phages represented in each track:

- Track 1 : Belphegor\_13
- Track 2 : Kroos\_16, StorminNorm\_16, Flatwoods\_17, Bizzy\_17, Tycho\_16
- Track 3 : Barsten\_16, ChadMasterC\_16
- Track 4 : Ailee\_16
- Track 5 : Derg\_12
- Track 6 : Sanjuju\_14, Fitzgerald\_14
- Track 7 : Fosterous\_13, Rofo\_15, Keitabear\_17, Affeca\_16, Vivi2\_15, Kamashten\_17, Sedona\_17, Thing3\_17
- Track 8 : Sitar\_17, Stultus\_16, Shivanishola\_16, Kewpiedoll\_17, Lennon\_17, Bibwit\_16, Geodirt\_15
- Track 9 : LilHam\_14, YorkOnyx\_16, SchottB\_15
- Track 10 : Tangerine\_16
- Track 11 : Ribeye\_17
- Track 12 : Angelicage\_16
- Track 13 : Brandonk123\_18, Paries\_16, Nordenberg\_10, Tangent\_13, McKinley\_17, Galadriel\_17, Charming\_13, Love\_17, BobBob\_13
- Track 14 : RiverRaider\_17
- Track 15 : Jabberwocky\_14
- Track 16 : Ashertheman\_16, JKSyngboy\_15
- Track 17 : Saronaya\_16, Gaea\_16, Baumdotcom\_16, Gustavo\_16
- Track 18 : Baddon\_16, Kwobi\_16
- Track 19 : MoontowerMania\_15
- Track 20 : FuegoCuervo\_19
- Track 21 : Leonard\_16, Inspectinfecti\_17, Ali17\_14, Phinally\_16
- Track 22 : Phauci\_9, Hans\_18
- Track 23 : MelBins\_17
- Track 24 : EMoore\_11
- Track 25 : Dxdert\_17, Kwekel\_16
- Track 26 : Chickadee\_16, GTE6\_17, Tiamoceli\_17, Twonlo\_14
- Track 27 : RoadKill\_14
- Track 28 : EdmundFerry\_15
- Track 29 : DoctorFroggo\_17, Zipp\_17, Delrey21\_17, Verity\_17
- Track 30 : Sampson\_17, Scioto\_17, ViaConlectus\_17, Natkenzie\_17, Abblin\_17, Zitch\_18
- Track 31 : APunk\_18
- Track 32 : Tardus\_17

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

The start number called the most often in the published annotations is 14, it was called in 67 of the 69 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- APunk\_18, Abblin\_17, Affeca\_16, Ailee\_16, Ali17\_14, Angelicage\_16, Ashertheman\_16, Baddon\_16, Barsten\_16, Baumdotcom\_16, Bibwit\_16, Bizzy\_17, BobBob\_13, Brandonk123\_18, ChadMasterC\_16, Charming\_13, Chickadee\_16, Delrey21\_17, Derg\_12, Dexdert\_17, DoctorFroggo\_17, EdmundFerry\_15, Fitzgerald\_14, Flatwoods\_17, Fosterous\_13, FuegoCuervo\_19, GTE6\_17, Gaea\_16, Galadriel\_17, Geodirt\_15, Gustavo\_16, Hans\_18, Inspectinfecti\_17, JKSyngboy\_15, Jabberwocky\_14, Kamashten\_17, Keitabear\_17, Kewpiedoll\_17, Kroos\_16, Kwekel\_16, Kwobi\_16, Lennon\_17, Leonard\_16, LilHam\_14, Love\_17, McKinley\_17, MoontowerMania\_15, Natkenzie\_17, Nordenberg\_10, Paries\_16, Phauci\_9, Phinally\_16, Ribeye\_17, RiverRaider\_17, RoadKill\_14, Rofo\_15, Sampson\_17, Sanjuju\_14, Saronaya\_16, SchottB\_15, Scioto\_17, Sedona\_17, Shivanishola\_16, Sitar\_17, StorminNorm\_16, Stultus\_16, Tangent\_13, Tangerine\_16, Tardus\_17, Thing3\_17, Tiamoceli\_17, Twonlo\_14, Tycho\_16, Verity\_17, ViaConlectus\_17, Vivi2\_15, YorkOnyx\_16, Zipp\_17, Zitch\_18,

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

- Belphegor\_13, EMoore\_11, MelBins\_17,

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

- 

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

Start 14:

- Found in 82 of 82 ( 100.0% ) of genes in pham
- Manual Annotations of this start: 67 of 69
- Called 96.3% of time when present
- Phage (with cluster) where this start called: APunk\_18 (DE4), Abblin\_17 (DE4), Affeca\_16 (DE1), Ailee\_16 (DE1), Ali17\_14 (DE2), Angelicage\_16 (DE1), Ashertheman\_16 (DE1), Baddon\_16 (DE1), Barsten\_16 (DE1), Baumdotcom\_16 (DE1), Bibwit\_16 (DE1), Bizzy\_17 (DE1), BobBob\_13 (DE1), Brandonk123\_18 (DE1), ChadMasterC\_16 (DE1), Charming\_13 (DE1), Chickadee\_16 (DE3), Delrey21\_17 (DE4), Derg\_12 (DE1), Dexdert\_17 (DE3), DoctorFroggo\_17 (DE4), EdmundFerry\_15 (DE3), Fitzgerald\_14 (DE1), Flatwoods\_17 (DE1), Fosterous\_13 (DE1), FuegoCuervo\_19 (DE1), GTE6\_17 (DE3), Gaea\_16 (DE1), Galadriel\_17 (DE1), Geodirt\_15 (DE1), Gustavo\_16 (DE1), Hans\_18 (DE2), Inspectinfecti\_17 (DE2), JKSyngboy\_15 (DE1), Jabberwocky\_14 (DE1), Kamashten\_17 (DE1), Keitabear\_17 (DE1), Kewpiedoll\_17 (DE1), Kroos\_16 (DE1), Kwekel\_16 (DE3), Kwobi\_16 (DE1), Lennon\_17 (DE1), Leonard\_16 (DE2), LilHam\_14 (DE1), Love\_17 (DE1), McKinley\_17 (DE1), MoontowerMania\_15 (DE1), Natkenzie\_17 (DE4), Nordenberg\_10 (DE1), Paries\_16 (DE1), Phauci\_9 (DE2), Phinally\_16 (DE2), Ribeye\_17 (DE1), RiverRaider\_17 (DE1), RoadKill\_14 (DE3), Rofo\_15 (DE1), Sampson\_17 (DE4), Sanjuju\_14 (DE1), Saronaya\_16 (DE1), SchottB\_15 (DE1), Scioto\_17 (DE4), Sedona\_17 (DE1), Shivanishola\_16 (DE1), Sitar\_17 (DE1),

StorminNorm\_16 (DE1), Stultus\_16 (DE1), Tangent\_13 (DE1), Tangerine\_16 (DE1), Tardus\_17 (DE4), Thing3\_17 (DE1), Tiamoceli\_17 (DE3), Twonlo\_14 (DE3), Tycho\_16 (DE1), Verity\_17 (DE4), ViaConlectus\_17 (DE4), Vivi2\_15 (DE1), YorkOnyx\_16 (DE1), Zipp\_17 (DE4), Zitch\_18 (DE4),

Start 15:

- Found in 3 of 82 ( 3.7% ) of genes in pham
- Manual Annotations of this start: 2 of 69
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Belphegor\_13 (DE), EMOore\_11 (DE2), MelBins\_17 (DE2),

### **Summary by clusters:**

There are 5 clusters represented in this pham: DE1, DE2, DE3, DE4, DE,

Info for manual annotations of cluster DE1:

- Start number 14 was manually annotated 45 times for cluster DE1.

Info for manual annotations of cluster DE2:

- Start number 14 was manually annotated 6 times for cluster DE2.
- Start number 15 was manually annotated 2 times for cluster DE2.

Info for manual annotations of cluster DE3:

- Start number 14 was manually annotated 7 times for cluster DE3.

Info for manual annotations of cluster DE4:

- Start number 14 was manually annotated 9 times for cluster DE4.

### **Gene Information:**

Gene: APunk\_18 Start: 12612, Stop: 12815, Start Num: 14

Candidate Starts for APunk\_18:

(5, 12417), (8, 12471), (13, 12579), (Start: 14 @12612 has 67 MA's), (17, 12651), (18, 12678), (19, 12681), (25, 12738), (27, 12750),

Gene: Abblin\_17 Start: 12098, Stop: 12313, Start Num: 14

Candidate Starts for Abblin\_17:

(8, 11957), (13, 12065), (Start: 14 @12098 has 67 MA's), (17, 12137), (18, 12164), (19, 12167), (25, 12224), (27, 12236),

Gene: Affeca\_16 Start: 12078, Stop: 12296, Start Num: 14

Candidate Starts for Affeca\_16:

(3, 11808), (6, 11883), (9, 11937), (10, 12000), (13, 12042), (Start: 14 @12078 has 67 MA's), (20, 12153), (24, 12192), (25, 12198), (27, 12210),

Gene: Ailee\_16 Start: 11968, Stop: 12186, Start Num: 14

Candidate Starts for Ailee\_16:

(10, 11890), (13, 11932), (Start: 14 @11968 has 67 MA's), (20, 12043), (24, 12082), (25, 12088), (27, 12100),

Gene: Ali17\_14 Start: 10793, Stop: 10996, Start Num: 14

Candidate Starts for Ali17\_14:

(6, 10595), (9, 10649), (11, 10736), (12, 10748), (Start: 14 @10793 has 67 MA's), (17, 10817), (21, 10862), (25, 10904), (27, 10916), (29, 10964),

Gene: Angelicage\_16 Start: 12501, Stop: 12719, Start Num: 14

Candidate Starts for Angelicage\_16:

(3, 12231), (6, 12306), (9, 12360), (10, 12423), (13, 12465), (Start: 14 @12501 has 67 MA's), (20, 12576), (24, 12615), (27, 12633),

Gene: Ashertheman\_16 Start: 10750, Stop: 10968, Start Num: 14

Candidate Starts for Ashertheman\_16:

(6, 10555), (9, 10609), (10, 10672), (13, 10714), (Start: 14 @10750 has 67 MA's), (16, 10768), (20, 10825), (22, 10837), (24, 10864), (25, 10870), (26, 10873), (27, 10882),

Gene: Baddon\_16 Start: 11337, Stop: 11555, Start Num: 14

Candidate Starts for Baddon\_16:

(6, 11142), (9, 11196), (10, 11259), (13, 11301), (Start: 14 @11337 has 67 MA's), (16, 11355), (20, 11412), (25, 11457), (27, 11469),

Gene: Barsten\_16 Start: 11562, Stop: 11780, Start Num: 14

Candidate Starts for Barsten\_16:

(3, 11292), (6, 11367), (9, 11421), (10, 11484), (13, 11526), (Start: 14 @11562 has 67 MA's), (20, 11637), (24, 11676), (25, 11682), (27, 11694),

Gene: Baumdotcom\_16 Start: 10671, Stop: 10886, Start Num: 14

Candidate Starts for Baumdotcom\_16:

(13, 10635), (Start: 14 @10671 has 67 MA's), (16, 10689), (20, 10746), (25, 10791), (27, 10803), (30, 10878),

Gene: Belphegor\_13 Start: 10042, Stop: 10245, Start Num: 15

Candidate Starts for Belphegor\_13:

(2, 9712), (4, 9775), (7, 9829), (Start: 14 @10024 has 67 MA's), (Start: 15 @10042 has 2 MA's), (17, 10066), (21, 10111), (27, 10165),

Gene: Bibwit\_16 Start: 11809, Stop: 12027, Start Num: 14

Candidate Starts for Bibwit\_16:

(6, 11614), (9, 11668), (10, 11731), (13, 11773), (Start: 14 @11809 has 67 MA's), (20, 11884), (24, 11923), (25, 11929), (27, 11941),

Gene: Bizzy\_17 Start: 10947, Stop: 11165, Start Num: 14

Candidate Starts for Bizzy\_17:

(10, 10869), (13, 10911), (Start: 14 @10947 has 67 MA's), (16, 10965), (20, 11022), (27, 11079), (30, 11157),

Gene: BobBob\_13 Start: 10392, Stop: 10610, Start Num: 14

Candidate Starts for BobBob\_13:

(3, 10122), (6, 10197), (9, 10251), (10, 10314), (13, 10356), (Start: 14 @10392 has 67 MA's), (20, 10467), (24, 10506), (25, 10512), (27, 10524),

Gene: Brandonk123\_18 Start: 11539, Stop: 11757, Start Num: 14

Candidate Starts for Brandonk123\_18:

(3, 11269), (6, 11344), (9, 11398), (10, 11461), (13, 11503), (Start: 14 @11539 has 67 MA's), (20, 11614), (24, 11653), (25, 11659), (27, 11671),

Gene: ChadMasterC\_16 Start: 11192, Stop: 11410, Start Num: 14

Candidate Starts for ChadMasterC\_16:

(3, 10922), (6, 10997), (9, 11051), (10, 11114), (13, 11156), (Start: 14 @11192 has 67 MA's), (20, 11267), (24, 11306), (25, 11312), (27, 11324),

Gene: Charming\_13 Start: 10394, Stop: 10612, Start Num: 14

Candidate Starts for Charming\_13:

(3, 10124), (6, 10199), (9, 10253), (10, 10316), (13, 10358), (Start: 14 @10394 has 67 MA's), (20, 10469), (24, 10508), (25, 10514), (27, 10526),

Gene: Chickadee\_16 Start: 10244, Stop: 10465, Start Num: 14

Candidate Starts for Chickadee\_16:

(6, 10049), (9, 10103), (12, 10199), (13, 10208), (Start: 14 @10244 has 67 MA's), (17, 10283), (25, 10370),

Gene: Delrey21\_17 Start: 11558, Stop: 11773, Start Num: 14

Candidate Starts for Delrey21\_17:

(11, 11504), (13, 11525), (Start: 14 @11558 has 67 MA's), (17, 11597), (18, 11624), (19, 11627), (25, 11684), (27, 11696),

Gene: Derg\_12 Start: 9963, Stop: 10181, Start Num: 14

Candidate Starts for Derg\_12:

(6, 9768), (9, 9822), (10, 9885), (13, 9927), (Start: 14 @9963 has 67 MA's), (16, 9981), (20, 10038), (23, 10059), (24, 10077), (25, 10083), (26, 10086), (27, 10095),

Gene: Dexpert\_17 Start: 10675, Stop: 10896, Start Num: 14

Candidate Starts for Dexpert\_17:

(12, 10630), (Start: 14 @10675 has 67 MA's), (17, 10714), (25, 10801), (28, 10852),

Gene: DoctorFroggo\_17 Start: 11558, Stop: 11773, Start Num: 14

Candidate Starts for DoctorFroggo\_17:

(11, 11504), (13, 11525), (Start: 14 @11558 has 67 MA's), (17, 11597), (18, 11624), (19, 11627), (25, 11684), (27, 11696),

Gene: EMoore\_11 Start: 9124, Stop: 9327, Start Num: 15

Candidate Starts for EMoore\_11:

(4, 8857), (7, 8911), (Start: 14 @9106 has 67 MA's), (Start: 15 @9124 has 2 MA's), (17, 9148), (21, 9193), (27, 9247),

Gene: EdmundFerry\_15 Start: 10262, Stop: 10483, Start Num: 14

Candidate Starts for EdmundFerry\_15:

(12, 10217), (13, 10226), (Start: 14 @10262 has 67 MA's), (17, 10301), (25, 10388),

Gene: Fitzgerald\_14 Start: 11299, Stop: 11517, Start Num: 14

Candidate Starts for Fitzgerald\_14:

(1, 10741), (3, 11029), (6, 11104), (9, 11158), (10, 11221), (13, 11263), (Start: 14 @11299 has 67 MA's), (20, 11374), (24, 11413), (25, 11419), (27, 11431),

Gene: Flatwoods\_17 Start: 10951, Stop: 11169, Start Num: 14

Candidate Starts for Flatwoods\_17:

(10, 10873), (13, 10915), (Start: 14 @10951 has 67 MA's), (16, 10969), (20, 11026), (27, 11083), (30, 11161),

Gene: Fosterous\_13 Start: 11322, Stop: 11540, Start Num: 14

Candidate Starts for Fosterous\_13:

(3, 11052), (6, 11127), (9, 11181), (10, 11244), (13, 11286), (Start: 14 @11322 has 67 MA's), (20, 11397), (24, 11436), (25, 11442), (27, 11454),

Gene: FuegoCuervo\_19 Start: 11024, Stop: 11242, Start Num: 14

Candidate Starts for FuegoCuervo\_19:

(10, 10946), (13, 10988), (Start: 14 @11024 has 67 MA's), (20, 11099), (24, 11138), (25, 11144), (27, 11156),

Gene: GTE6\_17 Start: 10760, Stop: 10981, Start Num: 14

Candidate Starts for GTE6\_17:

(6, 10565), (9, 10619), (12, 10715), (13, 10724), (Start: 14 @10760 has 67 MA's), (17, 10799), (25, 10886),

Gene: Gaea\_16 Start: 10651, Stop: 10866, Start Num: 14

Candidate Starts for Gaea\_16:

(13, 10615), (Start: 14 @10651 has 67 MA's), (16, 10669), (20, 10726), (25, 10771), (27, 10783), (30, 10858),

Gene: Galadriel\_17 Start: 11160, Stop: 11378, Start Num: 14

Candidate Starts for Galadriel\_17:

(3, 10890), (6, 10965), (9, 11019), (10, 11082), (13, 11124), (Start: 14 @11160 has 67 MA's), (20, 11235), (24, 11274), (25, 11280), (27, 11292),

Gene: Geodirt\_15 Start: 11049, Stop: 11267, Start Num: 14

Candidate Starts for Geodirt\_15:

(6, 10854), (9, 10908), (10, 10971), (13, 11013), (Start: 14 @11049 has 67 MA's), (20, 11124), (24, 11163), (25, 11169), (27, 11181),

Gene: Gustavo\_16 Start: 10762, Stop: 10977, Start Num: 14

Candidate Starts for Gustavo\_16:

(13, 10726), (Start: 14 @10762 has 67 MA's), (16, 10780), (20, 10837), (25, 10882), (27, 10894), (30, 10969),

Gene: Hans\_18 Start: 11337, Stop: 11540, Start Num: 14

Candidate Starts for Hans\_18:

(6, 11139), (9, 11193), (11, 11280), (12, 11292), (Start: 14 @11337 has 67 MA's), (17, 11361), (21, 11406), (25, 11448), (27, 11460),

Gene: Inspectinfecti\_17 Start: 11796, Stop: 11999, Start Num: 14

Candidate Starts for Inspectinfecti\_17:

(6, 11598), (9, 11652), (11, 11739), (12, 11751), (Start: 14 @11796 has 67 MA's), (17, 11820), (21, 11865), (25, 11907), (27, 11919), (29, 11967),

Gene: JKSyngboy\_15 Start: 11150, Stop: 11368, Start Num: 14

Candidate Starts for JKSyngboy\_15:

(6, 10955), (9, 11009), (10, 11072), (13, 11114), (Start: 14 @11150 has 67 MA's), (16, 11168), (20, 11225), (22, 11237), (24, 11264), (25, 11270), (26, 11273), (27, 11282),

Gene: Jabberwocky\_14 Start: 11712, Stop: 11930, Start Num: 14

Candidate Starts for Jabberwocky\_14:

(3, 11442), (6, 11517), (9, 11571), (10, 11634), (13, 11676), (Start: 14 @11712 has 67 MA's), (20, 11787), (24, 11826), (25, 11832), (27, 11844),

Gene: Kamashten\_17 Start: 12392, Stop: 12610, Start Num: 14

Candidate Starts for Kamashten\_17:

(3, 12122), (6, 12197), (9, 12251), (10, 12314), (13, 12356), (Start: 14 @12392 has 67 MA's), (20, 12467), (24, 12506), (25, 12512), (27, 12524),

Gene: Keitabear\_17 Start: 13525, Stop: 13743, Start Num: 14

Candidate Starts for Keitabear\_17:

(3, 13255), (6, 13330), (9, 13384), (10, 13447), (13, 13489), (Start: 14 @13525 has 67 MA's), (20, 13600), (24, 13639), (25, 13645), (27, 13657),

Gene: Kewpiedoll\_17 Start: 11773, Stop: 11991, Start Num: 14

Candidate Starts for Kewpiedoll\_17:

(6, 11578), (9, 11632), (10, 11695), (13, 11737), (Start: 14 @11773 has 67 MA's), (20, 11848), (24, 11887), (25, 11893), (27, 11905),

Gene: Kroos\_16 Start: 10788, Stop: 11006, Start Num: 14

Candidate Starts for Kroos\_16:

(10, 10710), (13, 10752), (Start: 14 @10788 has 67 MA's), (16, 10806), (20, 10863), (27, 10920), (30, 10998),

Gene: Kwekel\_16 Start: 10216, Stop: 10437, Start Num: 14

Candidate Starts for Kwekel\_16:

(12, 10171), (Start: 14 @10216 has 67 MA's), (17, 10255), (25, 10342), (28, 10393),

Gene: Kwobi\_16 Start: 10753, Stop: 10971, Start Num: 14

Candidate Starts for Kwobi\_16:

(6, 10558), (9, 10612), (10, 10675), (13, 10717), (Start: 14 @10753 has 67 MA's), (16, 10771), (20, 10828), (25, 10873), (27, 10885),

Gene: Lennon\_17 Start: 12632, Stop: 12850, Start Num: 14

Candidate Starts for Lennon\_17:

(6, 12437), (9, 12491), (10, 12554), (13, 12596), (Start: 14 @12632 has 67 MA's), (20, 12707), (24, 12746), (25, 12752), (27, 12764),

Gene: Leonard\_16 Start: 11391, Stop: 11594, Start Num: 14

Candidate Starts for Leonard\_16:

(6, 11193), (9, 11247), (11, 11334), (12, 11346), (Start: 14 @11391 has 67 MA's), (17, 11415), (21, 11460), (25, 11502), (27, 11514), (29, 11562),

Gene: LilHam\_14 Start: 10069, Stop: 10284, Start Num: 14

Candidate Starts for LilHam\_14:

(6, 9874), (9, 9928), (10, 9991), (13, 10033), (Start: 14 @10069 has 67 MA's), (16, 10087), (20, 10144), (25, 10189), (27, 10201), (30, 10276),

Gene: Love\_17 Start: 11471, Stop: 11689, Start Num: 14

Candidate Starts for Love\_17:

(3, 11201), (6, 11276), (9, 11330), (10, 11393), (13, 11435), (Start: 14 @11471 has 67 MA's), (20, 11546), (24, 11585), (25, 11591), (27, 11603),



Gene: McKinley\_17 Start: 11930, Stop: 12148, Start Num: 14

Candidate Starts for McKinley\_17:

(3, 11660), (6, 11735), (9, 11789), (10, 11852), (13, 11894), (Start: 14 @11930 has 67 MA's), (20, 12005), (24, 12044), (25, 12050), (27, 12062),

Gene: MelBins\_17 Start: 11587, Stop: 11790, Start Num: 15

Candidate Starts for MelBins\_17:

(4, 11320), (7, 11374), (Start: 14 @11569 has 67 MA's), (Start: 15 @11587 has 2 MA's), (17, 11611), (21, 11656), (25, 11698), (27, 11710), (29, 11758),

Gene: MoontowerMania\_15 Start: 10935, Stop: 11153, Start Num: 14

Candidate Starts for MoontowerMania\_15:

(3, 10665), (6, 10740), (9, 10794), (10, 10857), (13, 10899), (Start: 14 @10935 has 67 MA's), (20, 11010), (24, 11049), (27, 11067),

Gene: Natkenzie\_17 Start: 12098, Stop: 12313, Start Num: 14

Candidate Starts for Natkenzie\_17:

(8, 11957), (13, 12065), (Start: 14 @12098 has 67 MA's), (17, 12137), (18, 12164), (19, 12167), (25, 12224), (27, 12236),

Gene: Nordenberg\_10 Start: 9821, Stop: 10039, Start Num: 14

Candidate Starts for Nordenberg\_10:

(3, 9551), (6, 9626), (9, 9680), (10, 9743), (13, 9785), (Start: 14 @9821 has 67 MA's), (20, 9896), (24, 9935), (25, 9941), (27, 9953),

Gene: Paries\_16 Start: 11162, Stop: 11380, Start Num: 14

Candidate Starts for Paries\_16:

(3, 10892), (6, 10967), (9, 11021), (10, 11084), (13, 11126), (Start: 14 @11162 has 67 MA's), (20, 11237), (24, 11276), (25, 11282), (27, 11294),

Gene: Phauci\_9 Start: 7921, Stop: 8124, Start Num: 14

Candidate Starts for Phauci\_9:

(6, 7723), (9, 7777), (11, 7864), (12, 7876), (Start: 14 @7921 has 67 MA's), (17, 7945), (21, 7990), (25, 8032), (27, 8044),

Gene: Phinally\_16 Start: 11388, Stop: 11591, Start Num: 14

Candidate Starts for Phinally\_16:

(6, 11190), (9, 11244), (11, 11331), (12, 11343), (Start: 14 @11388 has 67 MA's), (17, 11412), (21, 11457), (25, 11499), (27, 11511), (29, 11559),

Gene: Ribeye\_17 Start: 10948, Stop: 11166, Start Num: 14

Candidate Starts for Ribeye\_17:

(6, 10753), (9, 10807), (10, 10870), (13, 10912), (Start: 14 @10948 has 67 MA's), (16, 10966), (20, 11023), (24, 11062), (25, 11068), (26, 11071), (27, 11080),

Gene: RiverRaider\_17 Start: 10375, Stop: 10593, Start Num: 14

Candidate Starts for RiverRaider\_17:

(13, 10339), (Start: 14 @10375 has 67 MA's), (16, 10393), (20, 10450), (24, 10489), (25, 10495), (27, 10507),

Gene: RoadKill\_14 Start: 9718, Stop: 9939, Start Num: 14

Candidate Starts for RoadKill\_14:

(6, 9523), (9, 9577), (12, 9673), (13, 9682), (Start: 14 @9718 has 67 MA's), (17, 9757), (25, 9844), (27, 9856),

Gene: Rofo\_15 Start: 11414, Stop: 11632, Start Num: 14

Candidate Starts for Rofo\_15:

(3, 11144), (6, 11219), (9, 11273), (10, 11336), (13, 11378), (Start: 14 @11414 has 67 MA's), (20, 11489), (24, 11528), (25, 11534), (27, 11546),

Gene: Sampson\_17 Start: 12043, Stop: 12258, Start Num: 14

Candidate Starts for Sampson\_17:

(8, 11902), (13, 12010), (Start: 14 @12043 has 67 MA's), (17, 12082), (18, 12109), (19, 12112), (25, 12169), (27, 12181),

Gene: Sanjuju\_14 Start: 11339, Stop: 11557, Start Num: 14

Candidate Starts for Sanjuju\_14:

(1, 10781), (3, 11069), (6, 11144), (9, 11198), (10, 11261), (13, 11303), (Start: 14 @11339 has 67 MA's), (20, 11414), (24, 11453), (25, 11459), (27, 11471),

Gene: Saronaya\_16 Start: 10762, Stop: 10977, Start Num: 14

Candidate Starts for Saronaya\_16:

(13, 10726), (Start: 14 @10762 has 67 MA's), (16, 10780), (20, 10837), (25, 10882), (27, 10894), (30, 10969),

Gene: SchottB\_15 Start: 11751, Stop: 11966, Start Num: 14

Candidate Starts for SchottB\_15:

(6, 11556), (9, 11610), (10, 11673), (13, 11715), (Start: 14 @11751 has 67 MA's), (16, 11769), (20, 11826), (25, 11871), (27, 11883), (30, 11958),

Gene: Scioto\_17 Start: 12098, Stop: 12313, Start Num: 14

Candidate Starts for Scioto\_17:

(8, 11957), (13, 12065), (Start: 14 @12098 has 67 MA's), (17, 12137), (18, 12164), (19, 12167), (25, 12224), (27, 12236),

Gene: Sedona\_17 Start: 13258, Stop: 13476, Start Num: 14

Candidate Starts for Sedona\_17:

(3, 12988), (6, 13063), (9, 13117), (10, 13180), (13, 13222), (Start: 14 @13258 has 67 MA's), (20, 13333), (24, 13372), (25, 13378), (27, 13390),

Gene: Shivanishola\_16 Start: 11656, Stop: 11874, Start Num: 14

Candidate Starts for Shivanishola\_16:

(6, 11461), (9, 11515), (10, 11578), (13, 11620), (Start: 14 @11656 has 67 MA's), (20, 11731), (24, 11770), (25, 11776), (27, 11788),

Gene: Sitar\_17 Start: 12632, Stop: 12850, Start Num: 14

Candidate Starts for Sitar\_17:

(6, 12437), (9, 12491), (10, 12554), (13, 12596), (Start: 14 @12632 has 67 MA's), (20, 12707), (24, 12746), (25, 12752), (27, 12764),

Gene: StorminNorm\_16 Start: 10639, Stop: 10857, Start Num: 14

Candidate Starts for StorminNorm\_16:

(10, 10561), (13, 10603), (Start: 14 @10639 has 67 MA's), (16, 10657), (20, 10714), (27, 10771), (30, 10849),

Gene: Stultus\_16 Start: 11631, Stop: 11849, Start Num: 14

Candidate Starts for Stultus\_16:

(6, 11436), (9, 11490), (10, 11553), (13, 11595), (Start: 14 @11631 has 67 MA's), (20, 11706), (24, 11745), (25, 11751), (27, 11763),

Gene: Tangent\_13 Start: 10394, Stop: 10612, Start Num: 14

Candidate Starts for Tangent\_13:

(3, 10124), (6, 10199), (9, 10253), (10, 10316), (13, 10358), (Start: 14 @10394 has 67 MA's), (20, 10469), (24, 10508), (25, 10514), (27, 10526),

Gene: Tangerine\_16 Start: 10648, Stop: 10863, Start Num: 14

Candidate Starts for Tangerine\_16:

(10, 10570), (13, 10612), (Start: 14 @10648 has 67 MA's), (16, 10666), (20, 10723), (25, 10768), (27, 10780), (30, 10855),

Gene: Tardus\_17 Start: 10346, Stop: 10549, Start Num: 14

Candidate Starts for Tardus\_17:

(13, 10313), (Start: 14 @10346 has 67 MA's), (17, 10385), (18, 10412), (19, 10415), (25, 10472), (27, 10484),

Gene: Thing3\_17 Start: 12392, Stop: 12610, Start Num: 14

Candidate Starts for Thing3\_17:

(3, 12122), (6, 12197), (9, 12251), (10, 12314), (13, 12356), (Start: 14 @12392 has 67 MA's), (20, 12467), (24, 12506), (25, 12512), (27, 12524),

Gene: Tiamoceli\_17 Start: 11101, Stop: 11322, Start Num: 14

Candidate Starts for Tiamoceli\_17:

(6, 10906), (9, 10960), (12, 11056), (13, 11065), (Start: 14 @11101 has 67 MA's), (17, 11140), (25, 11227),

Gene: Twonlo\_14 Start: 9718, Stop: 9939, Start Num: 14

Candidate Starts for Twonlo\_14:

(6, 9523), (9, 9577), (12, 9673), (13, 9682), (Start: 14 @9718 has 67 MA's), (17, 9757), (25, 9844),

Gene: Tycho\_16 Start: 10762, Stop: 10980, Start Num: 14

Candidate Starts for Tycho\_16:

(10, 10684), (13, 10726), (Start: 14 @10762 has 67 MA's), (16, 10780), (20, 10837), (27, 10894), (30, 10972),

Gene: Verity\_17 Start: 11558, Stop: 11773, Start Num: 14

Candidate Starts for Verity\_17:

(11, 11504), (13, 11525), (Start: 14 @11558 has 67 MA's), (17, 11597), (18, 11624), (19, 11627), (25, 11684), (27, 11696),

Gene: ViaConlectus\_17 Start: 12113, Stop: 12328, Start Num: 14

Candidate Starts for ViaConlectus\_17:

(8, 11972), (13, 12080), (Start: 14 @12113 has 67 MA's), (17, 12152), (18, 12179), (19, 12182), (25, 12239), (27, 12251),

Gene: Vivi2\_15 Start: 11586, Stop: 11804, Start Num: 14

Candidate Starts for Vivi2\_15:

(3, 11316), (6, 11391), (9, 11445), (10, 11508), (13, 11550), (Start: 14 @11586 has 67 MA's), (20, 11661), (24, 11700), (25, 11706), (27, 11718),

Gene: YorkOnyx\_16 Start: 10597, Stop: 10812, Start Num: 14

Candidate Starts for YorkOnyx\_16:

(6, 10402), (9, 10456), (10, 10519), (13, 10561), (Start: 14 @10597 has 67 MA's), (16, 10615), (20, 10672), (25, 10717), (27, 10729), (30, 10804),

Gene: Zipp\_17 Start: 11703, Stop: 11918, Start Num: 14

Candidate Starts for Zipp\_17:

(11, 11649), (13, 11670), (Start: 14 @11703 has 67 MA's), (17, 11742), (18, 11769), (19, 11772), (25, 11829), (27, 11841),

Gene: Zitch\_18 Start: 11028, Stop: 11231, Start Num: 14

Candidate Starts for Zitch\_18:

(8, 10887), (13, 10995), (Start: 14 @11028 has 67 MA's), (17, 11067), (18, 11094), (19, 11097), (25, 11154), (27, 11166),