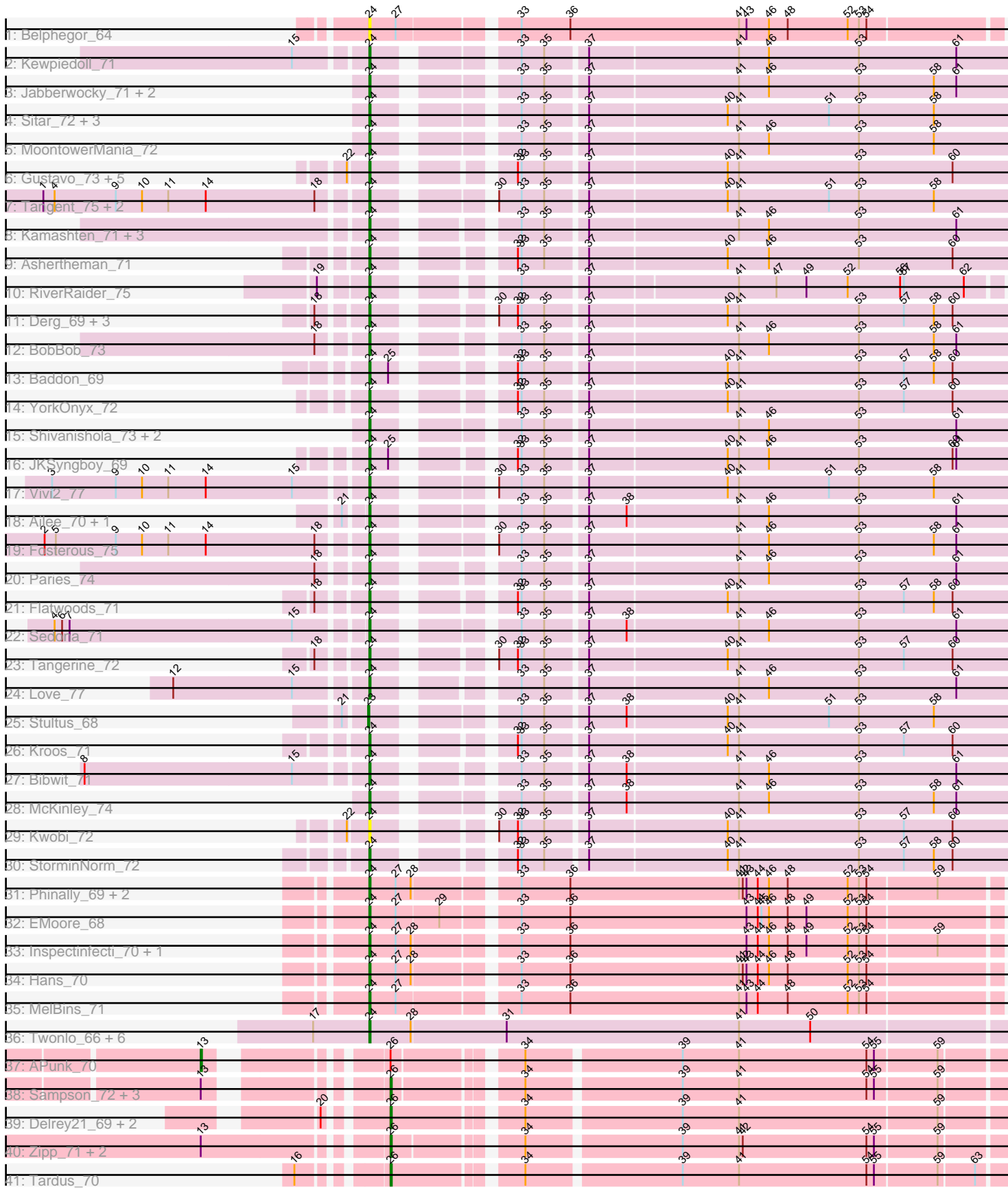


Pham 193946



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 193946 Report

This analysis was run 11/02/24 on database version 579.

Pham number 193946 has 78 members, 13 are drafts.

Phages represented in each track:

- Track 1 : Belphegor\_64
- Track 2 : Kewpiedoll\_71
- Track 3 : Jabberwocky\_71, Brandonk123\_77, Fitzgerald\_71
- Track 4 : Sitar\_72, Sanjuju\_71, Angelicage\_71, Affeca\_73
- Track 5 : MoontowerMania\_72
- Track 6 : Gustavo\_73, Baumdotcom\_69, Saronaya\_73, Gaea\_72, LilHam\_65, SchottB\_69
- Track 7 : Tangent\_75, Charming\_76, Rofo\_73
- Track 8 : Kamashten\_71, Barsten\_73, Thing3\_71, Galadriel\_73
- Track 9 : Ashertheman\_71
- Track 10 : RiverRaider\_75
- Track 11 : Derg\_69, Bizzy\_72, Ribeye\_71, Tycho\_70
- Track 12 : BobBob\_73
- Track 13 : Baddon\_69
- Track 14 : YorkOnyx\_72
- Track 15 : Shivanishola\_73, Geodirt\_71, ChadMasterC\_72
- Track 16 : JKSyngboy\_69
- Track 17 : Vivi2\_77
- Track 18 : Ailee\_70, Lennon\_72
- Track 19 : Fosterous\_75
- Track 20 : Paries\_74
- Track 21 : Flatwoods\_71
- Track 22 : Sedona\_71
- Track 23 : Tangerine\_72
- Track 24 : Love\_77
- Track 25 : Stultus\_68
- Track 26 : Kroos\_71
- Track 27 : Bibwit\_71
- Track 28 : McKinley\_74
- Track 29 : Kwobi\_72
- Track 30 : StorminNorm\_72
- Track 31 : Phinally\_69, Leonard\_69, Phauci\_61
- Track 32 : EMoore\_68
- Track 33 : Inspectinfecti\_70, Ali17\_66
- Track 34 : Hans\_70
- Track 35 : MelBins\_71

- Track 36 : Twonlo\_66, Tiamoceli\_67, EdmundFerry\_66, GTE6\_69, Chickadee\_68, Kwekel\_68, RoadKill\_65
- Track 37 : APunk\_70
- Track 38 : Sampson\_72, Scioto\_70, Natkenzie\_70, Abblin\_70
- Track 39 : Delrey21\_69, Verity\_69, DoctorFroggo\_69
- Track 40 : Zipp\_71, ViaConlectus\_69, Zitch\_72
- Track 41 : Tardus\_70

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

The start number called the most often in the published annotations is 24, it was called in 55 of the 65 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Affeca\_73, Ailee\_70, Ali17\_66, Angelicage\_71, Ashertheman\_71, Baddon\_69, Barsten\_73, Baumdotcom\_69, Belphegor\_64, Bibwit\_71, Bizzy\_72, BobBob\_73, Brandonk123\_77, ChadMasterC\_72, Charming\_76, Chickadee\_68, Derg\_69, EMOore\_68, EdmundFerry\_66, Fitzgerald\_71, Flatwoods\_71, Fosterous\_75, GTE6\_69, Gaea\_72, Galadriel\_73, Geodirt\_71, Gustavo\_73, Hans\_70, Inspectinfecti\_70, JKSyngboy\_69, Jabberwocky\_71, Kamashten\_71, Kewpiedoll\_71, Kroos\_71, Kwekel\_68, Kwobi\_72, Lennon\_72, Leonard\_69, LilHam\_65, Love\_77, McKinley\_74, MelBins\_71, MoontowerMania\_72, Paries\_74, Phauci\_61, Phinally\_69, Ribeye\_71, RiverRaider\_75, RoadKill\_65, Rofo\_73, Sanjuju\_71, Saronaya\_73, SchottB\_69, Sedona\_71, Shivanishola\_73, Sitar\_72, StorminNorm\_72, Tangent\_75, Tangerine\_72, Thing3\_71, Tiamoceli\_67, Twonlo\_66, Tycho\_70, Vivi2\_77, YorkOnyx\_72,

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

- 

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

- APunk\_70, Abblin\_70, Delrey21\_69, DoctorFroggo\_69, Natkenzie\_70, Sampson\_72, Scioto\_70, Stultus\_68, Tardus\_70, Verity\_69, ViaConlectus\_69, Zipp\_71, Zitch\_72,

**Summary by start number:**

Start 13:

- Found in 8 of 78 ( 10.3% ) of genes in pham
- Manual Annotations of this start: 1 of 65
- Called 12.5% of time when present
- Phage (with cluster) where this start called: APunk\_70 (DE4),

Start 23:

- Found in 1 of 78 ( 1.3% ) of genes in pham
- Manual Annotations of this start: 1 of 65
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Stultus\_68 (DE1),

Start 24:

- Found in 65 of 78 ( 83.3% ) of genes in pham
- Manual Annotations of this start: 55 of 65
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Affeca\_73 (DE1), Ailee\_70 (DE1), Ali17\_66 (DE2), Angelicage\_71 (DE1), Ashertheman\_71 (DE1), Baddon\_69 (DE1), Barsten\_73 (DE1), Baumdotcom\_69 (DE1), Belphegor\_64 (DE), Bibwit\_71 (DE1), Bizzy\_72 (DE1), BobBob\_73 (DE1), Brandonk123\_77 (DE1), ChadMasterC\_72 (DE1), Charming\_76 (DE1), Chickadee\_68 (DE3), Derg\_69 (DE1), EMoore\_68 (DE2), EdmundFerry\_66 (DE3), Fitzgerald\_71 (DE1), Flatwoods\_71 (DE1), Fosterous\_75 (DE1), GTE6\_69 (DE3), Gaea\_72 (DE1), Galadriel\_73 (DE1), Geodirt\_71 (DE1), Gustavo\_73 (DE1), Hans\_70 (DE2), Inspectinfecti\_70 (DE2), JKSyngboy\_69 (DE1), Jabberwocky\_71 (DE1), Kamashten\_71 (DE1), Kewpiedoll\_71 (DE1), Kroos\_71 (DE1), Kwekel\_68 (DE3), Kwobi\_72 (DE1), Lennon\_72 (DE1), Leonard\_69 (DE2), LilHam\_65 (DE1), Love\_77 (DE1), McKinley\_74 (DE1), MelBins\_71 (DE2), MoontowerMania\_72 (DE1), Paries\_74 (DE1), Phauci\_61 (DE2), Phinally\_69 (DE2), Ribeye\_71 (DE1), RiverRaider\_75 (DE1), RoadKill\_65 (DE3), Rofo\_73 (DE1), Sanjuju\_71 (DE1), Saronaya\_73 (DE1), SchottB\_69 (DE1), Sedona\_71 (DE1), Shivanishola\_73 (DE1), Sitar\_72 (DE1), StorminNorm\_72 (DE1), Tangent\_75 (DE1), Tangerine\_72 (DE1), Thing3\_71 (DE1), Tiamoceli\_67 (DE3), Twonlo\_66 (DE3), Tycho\_70 (DE1), Vivi2\_77 (DE1), YorkOnyx\_72 (DE1),

Start 26:

- Found in 12 of 78 ( 15.4% ) of genes in pham
- Manual Annotations of this start: 8 of 65
- Called 91.7% of time when present
- Phage (with cluster) where this start called: Abblin\_70 (DE4), Delrey21\_69 (DE4), DoctorFroggo\_69 (DE4), Natkenzie\_70 (DE4), Sampson\_72 (DE4), Scioto\_70 (DE4), Tardus\_70 (DE4), Verity\_69 (DE4), ViaConlectus\_69 (DE4), Zipp\_71 (DE4), Zitch\_72 (DE4),

### **Summary by clusters:**

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

Info for manual annotations of cluster DE1:

- Start number 23 was manually annotated 1 time for cluster DE1.
- Start number 24 was manually annotated 41 times for cluster DE1.

Info for manual annotations of cluster DE2:

- Start number 24 was manually annotated 8 times for cluster DE2.

Info for manual annotations of cluster DE3:

- Start number 24 was manually annotated 6 times for cluster DE3.

Info for manual annotations of cluster DE4:

- Start number 13 was manually annotated 1 time for cluster DE4.
- Start number 26 was manually annotated 8 times for cluster DE4.

### **Gene Information:**

Gene: APunk\_70 Start: 52521, Stop: 53081, Start Num: 13

Candidate Starts for APunk\_70:

(Start: 13 @52521 has 1 MA's), (Start: 26 @52629 has 8 MA's), (34, 52716), (39, 52833), (41, 52878), (54, 52980), (55, 52986), (59, 53034),

Gene: Abblin\_70 Start: 52787, Stop: 53239, Start Num: 26

Candidate Starts for Abblin\_70:

(Start: 13 @52679 has 1 MA's), (Start: 26 @52787 has 8 MA's), (34, 52874), (39, 52991), (41, 53036), (54, 53138), (55, 53144), (59, 53192),

Gene: Affeca\_73 Start: 54755, Stop: 55222, Start Num: 24

Candidate Starts for Affeca\_73:

(Start: 24 @54755 has 55 MA's), (33, 54842), (35, 54860), (37, 54890), (40, 54998), (41, 55007), (51, 55079), (53, 55103), (58, 55163),

Gene: Ailee\_70 Start: 53740, Stop: 54210, Start Num: 24

Candidate Starts for Ailee\_70:

(21, 53725), (Start: 24 @53740 has 55 MA's), (33, 53830), (35, 53848), (37, 53878), (38, 53908), (41, 53995), (46, 54019), (53, 54091), (61, 54169),

Gene: Ali17\_66 Start: 51680, Stop: 52162, Start Num: 24

Candidate Starts for Ali17\_66:

(Start: 24 @51680 has 55 MA's), (27, 51701), (28, 51713), (33, 51785), (36, 51824), (43, 51965), (44, 51974), (46, 51983), (48, 51998), (49, 52013), (52, 52046), (53, 52055), (54, 52061), (59, 52115),

Gene: Angelicage\_71 Start: 54682, Stop: 55149, Start Num: 24

Candidate Starts for Angelicage\_71:

(Start: 24 @54682 has 55 MA's), (33, 54769), (35, 54787), (37, 54817), (40, 54925), (41, 54934), (51, 55006), (53, 55030), (58, 55090),

Gene: Ashertheman\_71 Start: 52896, Stop: 53363, Start Num: 24

Candidate Starts for Ashertheman\_71:

(Start: 24 @52896 has 55 MA's), (32, 52980), (33, 52983), (35, 53001), (37, 53031), (40, 53139), (46, 53172), (53, 53244), (60, 53319),

Gene: Baddon\_69 Start: 53548, Stop: 54018, Start Num: 24

Candidate Starts for Baddon\_69:

(Start: 24 @53548 has 55 MA's), (25, 53563), (32, 53632), (33, 53635), (35, 53653), (37, 53683), (40, 53791), (41, 53800), (53, 53896), (57, 53932), (58, 53956), (60, 53971),

Gene: Barsten\_73 Start: 54515, Stop: 54982, Start Num: 24

Candidate Starts for Barsten\_73:

(Start: 24 @54515 has 55 MA's), (33, 54602), (35, 54620), (37, 54650), (41, 54767), (46, 54791), (53, 54863), (61, 54941),

Gene: Baumdotcom\_69 Start: 52867, Stop: 53334, Start Num: 24

Candidate Starts for Baumdotcom\_69:

(22, 52852), (Start: 24 @52867 has 55 MA's), (32, 52951), (33, 52954), (35, 52972), (37, 53002), (40, 53110), (41, 53119), (53, 53215), (60, 53290),

Gene: Belphegor\_64 Start: 51428, Stop: 51910, Start Num: 24

Candidate Starts for Belphegor\_64:

(Start: 24 @51428 has 55 MA's), (27, 51449), (33, 51533), (36, 51572), (41, 51707), (43, 51713), (46, 51731), (48, 51746), (52, 51794), (53, 51803), (54, 51809),

Gene: Bibwit\_71 Start: 53384, Stop: 53854, Start Num: 24

Candidate Starts for Bibwit\_71:

(8, 53168), (15, 53333), (Start: 24 @53384 has 55 MA's), (33, 53471), (35, 53489), (37, 53519), (38, 53549), (41, 53636), (46, 53660), (53, 53732), (61, 53810),

Gene: Bizzy\_72 Start: 52780, Stop: 53247, Start Num: 24

Candidate Starts for Bizzy\_72:

(18, 52747), (Start: 24 @52780 has 55 MA's), (30, 52849), (32, 52864), (33, 52867), (35, 52885), (37, 52915), (40, 53023), (41, 53032), (53, 53128), (57, 53164), (58, 53188), (60, 53203),

Gene: BobBob\_73 Start: 53918, Stop: 54385, Start Num: 24

Candidate Starts for BobBob\_73:

(18, 53885), (Start: 24 @53918 has 55 MA's), (33, 54005), (35, 54023), (37, 54053), (41, 54170), (46, 54194), (53, 54266), (58, 54326), (61, 54344),

Gene: Brandonk123\_77 Start: 54387, Stop: 54854, Start Num: 24

Candidate Starts for Brandonk123\_77:

(Start: 24 @54387 has 55 MA's), (33, 54474), (35, 54492), (37, 54522), (41, 54639), (46, 54663), (53, 54735), (58, 54795), (61, 54813),

Gene: ChadMasterC\_72 Start: 55740, Stop: 56210, Start Num: 24

Candidate Starts for ChadMasterC\_72:

(Start: 24 @55740 has 55 MA's), (33, 55830), (35, 55848), (37, 55878), (41, 55995), (46, 56019), (53, 56091), (61, 56169),

Gene: Charming\_76 Start: 53666, Stop: 54136, Start Num: 24

Candidate Starts for Charming\_76:

(1, 53417), (4, 53426), (9, 53474), (10, 53495), (11, 53516), (14, 53546), (18, 53633), (Start: 24 @53666 has 55 MA's), (30, 53738), (33, 53756), (35, 53774), (37, 53804), (40, 53912), (41, 53921), (51, 53993), (53, 54017), (58, 54077),

Gene: Chickadee\_68 Start: 49457, Stop: 49957, Start Num: 24

Candidate Starts for Chickadee\_68:

(17, 49412), (Start: 24 @49457 has 55 MA's), (28, 49490), (31, 49565), (41, 49751), (50, 49808),

Gene: Delrey21\_69 Start: 54127, Stop: 54582, Start Num: 26

Candidate Starts for Delrey21\_69:

(20, 54088), (Start: 26 @54127 has 8 MA's), (34, 54217), (39, 54334), (41, 54379), (59, 54535),

Gene: Derg\_69 Start: 51580, Stop: 52047, Start Num: 24

Candidate Starts for Derg\_69:

(18, 51547), (Start: 24 @51580 has 55 MA's), (30, 51649), (32, 51664), (33, 51667), (35, 51685), (37, 51715), (40, 51823), (41, 51832), (53, 51928), (57, 51964), (58, 51988), (60, 52003),

Gene: DoctorFroggo\_69 Start: 54127, Stop: 54582, Start Num: 26

Candidate Starts for DoctorFroggo\_69:

(20, 54088), (Start: 26 @54127 has 8 MA's), (34, 54217), (39, 54334), (41, 54379), (59, 54535),

Gene: EMoore\_68 Start: 53300, Stop: 53782, Start Num: 24

Candidate Starts for EMoore\_68:

(Start: 24 @53300 has 55 MA's), (27, 53321), (29, 53354), (33, 53405), (36, 53444), (43, 53585), (44, 53594), (45, 53597), (46, 53603), (48, 53618), (49, 53633), (52, 53666), (53, 53675), (54, 53681),

Gene: EdmundFerry\_66 Start: 49005, Stop: 49505, Start Num: 24

Candidate Starts for EdmundFerry\_66:

(17, 48960), (Start: 24 @49005 has 55 MA's), (28, 49038), (31, 49113), (41, 49299), (50, 49356),

Gene: Fitzgerald\_71 Start: 54530, Stop: 54997, Start Num: 24

Candidate Starts for Fitzgerald\_71:

(Start: 24 @54530 has 55 MA's), (33, 54617), (35, 54635), (37, 54665), (41, 54782), (46, 54806), (53, 54878), (58, 54938), (61, 54956),

Gene: Flatwoods\_71 Start: 52089, Stop: 52556, Start Num: 24

Candidate Starts for Flatwoods\_71:

(18, 52056), (Start: 24 @52089 has 55 MA's), (32, 52173), (33, 52176), (35, 52194), (37, 52224), (40, 52332), (41, 52341), (53, 52437), (57, 52473), (58, 52497), (60, 52512),

Gene: Fosterous\_75 Start: 54660, Stop: 55130, Start Num: 24

Candidate Starts for Fosterous\_75:

(2, 54411), (5, 54420), (9, 54468), (10, 54489), (11, 54510), (14, 54540), (18, 54627), (Start: 24 @54660 has 55 MA's), (30, 54732), (33, 54750), (35, 54768), (37, 54798), (41, 54915), (46, 54939), (53, 55011), (58, 55071), (61, 55089),

Gene: GTE6\_69 Start: 50250, Stop: 50750, Start Num: 24

Candidate Starts for GTE6\_69:

(17, 50205), (Start: 24 @50250 has 55 MA's), (28, 50283), (31, 50358), (41, 50544), (50, 50601),

Gene: Gaea\_72 Start: 52676, Stop: 53143, Start Num: 24

Candidate Starts for Gaea\_72:

(22, 52661), (Start: 24 @52676 has 55 MA's), (32, 52760), (33, 52763), (35, 52781), (37, 52811), (40, 52919), (41, 52928), (53, 53024), (60, 53099),

Gene: Galadriel\_73 Start: 54623, Stop: 55090, Start Num: 24

Candidate Starts for Galadriel\_73:

(Start: 24 @54623 has 55 MA's), (33, 54710), (35, 54728), (37, 54758), (41, 54875), (46, 54899), (53, 54971), (61, 55049),

Gene: Geodirt\_71 Start: 54989, Stop: 55459, Start Num: 24

Candidate Starts for Geodirt\_71:

(Start: 24 @54989 has 55 MA's), (33, 55079), (35, 55097), (37, 55127), (41, 55244), (46, 55268), (53, 55340), (61, 55418),

Gene: Gustavo\_73 Start: 53661, Stop: 54128, Start Num: 24

Candidate Starts for Gustavo\_73:

(22, 53646), (Start: 24 @53661 has 55 MA's), (32, 53745), (33, 53748), (35, 53766), (37, 53796), (40, 53904), (41, 53913), (53, 54009), (60, 54084),

Gene: Hans\_70 Start: 52553, Stop: 53035, Start Num: 24

Candidate Starts for Hans\_70:

(Start: 24 @52553 has 55 MA's), (27, 52574), (28, 52586), (33, 52658), (36, 52697), (41, 52832), (42, 52835), (43, 52838), (44, 52847), (46, 52856), (48, 52871), (52, 52919), (53, 52928), (54, 52934),

Gene: Inspectinfecti\_70 Start: 52524, Stop: 53006, Start Num: 24

Candidate Starts for Inspectinfecti\_70:

(Start: 24 @52524 has 55 MA's), (27, 52545), (28, 52557), (33, 52629), (36, 52668), (43, 52809), (44, 52818), (46, 52827), (48, 52842), (49, 52857), (52, 52890), (53, 52899), (54, 52905), (59, 52959),

Gene: JKSyngboy\_69 Start: 53569, Stop: 54036, Start Num: 24

Candidate Starts for JKSyngboy\_69:

(Start: 24 @53569 has 55 MA's), (25, 53584), (32, 53653), (33, 53656), (35, 53674), (37, 53704), (40, 53812), (41, 53821), (46, 53845), (53, 53917), (60, 53992), (61, 53995),

Gene: Jabberwocky\_71 Start: 54753, Stop: 55226, Start Num: 24

Candidate Starts for Jabberwocky\_71:

(Start: 24 @54753 has 55 MA's), (33, 54843), (35, 54861), (37, 54891), (41, 55008), (46, 55032), (53, 55104), (58, 55164), (61, 55182),

Gene: Kamashten\_71 Start: 53749, Stop: 54216, Start Num: 24

Candidate Starts for Kamashten\_71:

(Start: 24 @53749 has 55 MA's), (33, 53836), (35, 53854), (37, 53884), (41, 54001), (46, 54025), (53, 54097), (61, 54175),

Gene: Kewpiedoll\_71 Start: 54676, Stop: 55146, Start Num: 24

Candidate Starts for Kewpiedoll\_71:

(15, 54625), (Start: 24 @54676 has 55 MA's), (33, 54766), (35, 54784), (37, 54814), (41, 54931), (46, 54955), (53, 55027), (61, 55105),

Gene: Kroos\_71 Start: 53215, Stop: 53682, Start Num: 24

Candidate Starts for Kroos\_71:

(Start: 24 @53215 has 55 MA's), (32, 53299), (33, 53302), (35, 53320), (37, 53350), (40, 53458), (41, 53467), (53, 53563), (57, 53599), (60, 53638),

Gene: Kwekel\_68 Start: 49370, Stop: 49870, Start Num: 24

Candidate Starts for Kwekel\_68:

(17, 49325), (Start: 24 @49370 has 55 MA's), (28, 49403), (31, 49478), (41, 49664), (50, 49721),

Gene: Kwobi\_72 Start: 53480, Stop: 53947, Start Num: 24

Candidate Starts for Kwobi\_72:

(22, 53465), (Start: 24 @53480 has 55 MA's), (30, 53549), (32, 53564), (33, 53567), (35, 53585), (37, 53615), (40, 53723), (41, 53732), (53, 53828), (57, 53864), (60, 53903),

Gene: Lennon\_72 Start: 55403, Stop: 55873, Start Num: 24

Candidate Starts for Lennon\_72:

(21, 55388), (Start: 24 @55403 has 55 MA's), (33, 55493), (35, 55511), (37, 55541), (38, 55571), (41, 55658), (46, 55682), (53, 55754), (61, 55832),

Gene: Leonard\_69 Start: 52587, Stop: 53069, Start Num: 24

Candidate Starts for Leonard\_69:

(Start: 24 @52587 has 55 MA's), (27, 52608), (28, 52620), (33, 52692), (36, 52731), (41, 52866), (42, 52869), (43, 52872), (44, 52881), (46, 52890), (48, 52905), (52, 52953), (53, 52962), (54, 52968), (59, 53022),

Gene: LilHam\_65 Start: 50562, Stop: 51029, Start Num: 24

Candidate Starts for LilHam\_65:

(22, 50547), (Start: 24 @50562 has 55 MA's), (32, 50646), (33, 50649), (35, 50667), (37, 50697), (40, 50805), (41, 50814), (53, 50910), (60, 50985),



Gene: Love\_77 Start: 55148, Stop: 55615, Start Num: 24

Candidate Starts for Love\_77:

(12, 55004), (15, 55097), (Start: 24 @55148 has 55 MA's), (33, 55235), (35, 55253), (37, 55283), (41, 55400), (46, 55424), (53, 55496), (61, 55574),

Gene: McKinley\_74 Start: 54263, Stop: 54736, Start Num: 24

Candidate Starts for McKinley\_74:

(Start: 24 @54263 has 55 MA's), (33, 54353), (35, 54371), (37, 54401), (38, 54431), (41, 54518), (46, 54542), (53, 54614), (58, 54674), (61, 54692),

Gene: MelBins\_71 Start: 52795, Stop: 53277, Start Num: 24

Candidate Starts for MelBins\_71:

(Start: 24 @52795 has 55 MA's), (27, 52816), (33, 52900), (36, 52939), (41, 53074), (43, 53080), (44, 53089), (48, 53113), (52, 53161), (53, 53170), (54, 53176),

Gene: MoontowerMania\_72 Start: 55099, Stop: 55569, Start Num: 24

Candidate Starts for MoontowerMania\_72:

(Start: 24 @55099 has 55 MA's), (33, 55189), (35, 55207), (37, 55237), (41, 55354), (46, 55378), (53, 55450), (58, 55510),

Gene: Natkenzie\_70 Start: 52787, Stop: 53239, Start Num: 26

Candidate Starts for Natkenzie\_70:

(Start: 13 @52679 has 1 MA's), (Start: 26 @52787 has 8 MA's), (34, 52874), (39, 52991), (41, 53036), (54, 53138), (55, 53144), (59, 53192),

Gene: Paries\_74 Start: 54767, Stop: 55234, Start Num: 24

Candidate Starts for Paries\_74:

(18, 54734), (Start: 24 @54767 has 55 MA's), (33, 54854), (35, 54872), (37, 54902), (41, 55019), (46, 55043), (53, 55115), (61, 55193),

Gene: Phauci\_61 Start: 49630, Stop: 50112, Start Num: 24

Candidate Starts for Phauci\_61:

(Start: 24 @49630 has 55 MA's), (27, 49651), (28, 49663), (33, 49735), (36, 49774), (41, 49909), (42, 49912), (43, 49915), (44, 49924), (46, 49933), (48, 49948), (52, 49996), (53, 50005), (54, 50011), (59, 50065),

Gene: Phinally\_69 Start: 52584, Stop: 53066, Start Num: 24

Candidate Starts for Phinally\_69:

(Start: 24 @52584 has 55 MA's), (27, 52605), (28, 52617), (33, 52689), (36, 52728), (41, 52863), (42, 52866), (43, 52869), (44, 52878), (46, 52887), (48, 52902), (52, 52950), (53, 52959), (54, 52965), (59, 53019),

Gene: Ribeye\_71 Start: 52819, Stop: 53286, Start Num: 24

Candidate Starts for Ribeye\_71:

(18, 52786), (Start: 24 @52819 has 55 MA's), (30, 52888), (32, 52903), (33, 52906), (35, 52924), (37, 52954), (40, 53062), (41, 53071), (53, 53167), (57, 53203), (58, 53227), (60, 53242),

Gene: RiverRaider\_75 Start: 52799, Stop: 53251, Start Num: 24

Candidate Starts for RiverRaider\_75:

(19, 52766), (Start: 24 @52799 has 55 MA's), (33, 52883), (37, 52931), (41, 53045), (47, 53075), (49, 53099), (52, 53132), (56, 53174), (57, 53177), (62, 53225),

Gene: RoadKill\_65 Start: 48875, Stop: 49375, Start Num: 24

Candidate Starts for RoadKill\_65:

(17, 48830), (Start: 24 @48875 has 55 MA's), (28, 48908), (31, 48983), (41, 49169), (50, 49226),

Gene: Rofo\_73 Start: 54242, Stop: 54712, Start Num: 24

Candidate Starts for Rofo\_73:

(1, 53993), (4, 54002), (9, 54050), (10, 54071), (11, 54092), (14, 54122), (18, 54209), (Start: 24 @54242 has 55 MA's), (30, 54314), (33, 54332), (35, 54350), (37, 54380), (40, 54488), (41, 54497), (51, 54569), (53, 54593), (58, 54653),

Gene: Sampson\_72 Start: 52938, Stop: 53390, Start Num: 26

Candidate Starts for Sampson\_72:

(Start: 13 @52830 has 1 MA's), (Start: 26 @52938 has 8 MA's), (34, 53025), (39, 53142), (41, 53187), (54, 53289), (55, 53295), (59, 53343),

Gene: Sanjuju\_71 Start: 54617, Stop: 55087, Start Num: 24

Candidate Starts for Sanjuju\_71:

(Start: 24 @54617 has 55 MA's), (33, 54707), (35, 54725), (37, 54755), (40, 54863), (41, 54872), (51, 54944), (53, 54968), (58, 55028),

Gene: Saronaya\_73 Start: 53661, Stop: 54128, Start Num: 24

Candidate Starts for Saronaya\_73:

(22, 53646), (Start: 24 @53661 has 55 MA's), (32, 53745), (33, 53748), (35, 53766), (37, 53796), (40, 53904), (41, 53913), (53, 54009), (60, 54084),

Gene: SchottB\_69 Start: 53282, Stop: 53749, Start Num: 24

Candidate Starts for SchottB\_69:

(22, 53267), (Start: 24 @53282 has 55 MA's), (32, 53366), (33, 53369), (35, 53387), (37, 53417), (40, 53525), (41, 53534), (53, 53630), (60, 53705),

Gene: Scioto\_70 Start: 52788, Stop: 53240, Start Num: 26

Candidate Starts for Scioto\_70:

(Start: 13 @52680 has 1 MA's), (Start: 26 @52788 has 8 MA's), (34, 52875), (39, 52992), (41, 53037), (54, 53139), (55, 53145), (59, 53193),

Gene: Sedona\_71 Start: 55187, Stop: 55660, Start Num: 24

Candidate Starts for Sedona\_71:

(4, 54950), (6, 54956), (7, 54962), (15, 55139), (Start: 24 @55187 has 55 MA's), (33, 55277), (35, 55295), (37, 55325), (38, 55355), (41, 55442), (46, 55466), (53, 55538), (61, 55616),

Gene: Shivanishola\_73 Start: 52967, Stop: 53437, Start Num: 24

Candidate Starts for Shivanishola\_73:

(Start: 24 @52967 has 55 MA's), (33, 53057), (35, 53075), (37, 53105), (41, 53222), (46, 53246), (53, 53318), (61, 53396),

Gene: Sitar\_72 Start: 55161, Stop: 55631, Start Num: 24

Candidate Starts for Sitar\_72:

(Start: 24 @55161 has 55 MA's), (33, 55251), (35, 55269), (37, 55299), (40, 55407), (41, 55416), (51, 55488), (53, 55512), (58, 55572),

Gene: StorminNorm\_72 Start: 53449, Stop: 53916, Start Num: 24

Candidate Starts for StorminNorm\_72:

(Start: 24 @53449 has 55 MA's), (32, 53533), (33, 53536), (35, 53554), (37, 53584), (40, 53692), (41, 53701), (53, 53797), (57, 53833), (58, 53857), (60, 53872),

Gene: Stultus\_68 Start: 53408, Stop: 53878, Start Num: 23

Candidate Starts for Stultus\_68:

(21, 53393), (Start: 23 @53408 has 1 MA's), (33, 53498), (35, 53516), (37, 53546), (38, 53576), (40, 53654), (41, 53663), (51, 53735), (53, 53759), (58, 53819),

Gene: Tangent\_75 Start: 53947, Stop: 54417, Start Num: 24

Candidate Starts for Tangent\_75:

(1, 53698), (4, 53707), (9, 53755), (10, 53776), (11, 53797), (14, 53827), (18, 53914), (Start: 24 @53947 has 55 MA's), (30, 54019), (33, 54037), (35, 54055), (37, 54085), (40, 54193), (41, 54202), (51, 54274), (53, 54298), (58, 54358),

Gene: Tangerine\_72 Start: 52955, Stop: 53422, Start Num: 24

Candidate Starts for Tangerine\_72:

(18, 52922), (Start: 24 @52955 has 55 MA's), (30, 53024), (32, 53039), (33, 53042), (35, 53060), (37, 53090), (40, 53198), (41, 53207), (53, 53303), (57, 53339), (60, 53378),

Gene: Tardus\_70 Start: 52842, Stop: 53297, Start Num: 26

Candidate Starts for Tardus\_70:

(16, 52788), (Start: 26 @52842 has 8 MA's), (34, 52932), (39, 53049), (41, 53094), (54, 53196), (55, 53202), (59, 53250), (63, 53277),

Gene: Thing3\_71 Start: 53749, Stop: 54216, Start Num: 24

Candidate Starts for Thing3\_71:

(Start: 24 @53749 has 55 MA's), (33, 53836), (35, 53854), (37, 53884), (41, 54001), (46, 54025), (53, 54097), (61, 54175),

Gene: Tiamoceli\_67 Start: 50337, Stop: 50837, Start Num: 24

Candidate Starts for Tiamoceli\_67:

(17, 50292), (Start: 24 @50337 has 55 MA's), (28, 50370), (31, 50445), (41, 50631), (50, 50688),

Gene: Twonlo\_66 Start: 49429, Stop: 49929, Start Num: 24

Candidate Starts for Twonlo\_66:

(17, 49384), (Start: 24 @49429 has 55 MA's), (28, 49462), (31, 49537), (41, 49723), (50, 49780),

Gene: Tycho\_70 Start: 52768, Stop: 53235, Start Num: 24

Candidate Starts for Tycho\_70:

(18, 52735), (Start: 24 @52768 has 55 MA's), (30, 52837), (32, 52852), (33, 52855), (35, 52873), (37, 52903), (40, 53011), (41, 53020), (53, 53116), (57, 53152), (58, 53176), (60, 53191),

Gene: Verity\_69 Start: 54127, Stop: 54582, Start Num: 26

Candidate Starts for Verity\_69:

(20, 54088), (Start: 26 @54127 has 8 MA's), (34, 54217), (39, 54334), (41, 54379), (59, 54535),

Gene: ViaConlectus\_69 Start: 51742, Stop: 52194, Start Num: 26

Candidate Starts for ViaConlectus\_69:

(Start: 13 @51613 has 1 MA's), (Start: 26 @51742 has 8 MA's), (34, 51829), (39, 51946), (41, 51991), (42, 51994), (54, 52093), (55, 52099), (59, 52147),

Gene: Vivi2\_77 Start: 55003, Stop: 55473, Start Num: 24

Candidate Starts for Vivi2\_77:

(3, 54760), (9, 54811), (10, 54832), (11, 54853), (14, 54883), (15, 54952), (Start: 24 @55003 has 55 MA's), (30, 55075), (33, 55093), (35, 55111), (37, 55141), (40, 55249), (41, 55258), (51, 55330), (53, 55354), (58, 55414),

Gene: YorkOnyx\_72 Start: 52969, Stop: 53439, Start Num: 24

Candidate Starts for YorkOnyx\_72:

(Start: 24 @52969 has 55 MA's), (32, 53053), (33, 53056), (35, 53074), (37, 53104), (40, 53212), (41, 53221), (53, 53317), (57, 53353), (60, 53392),

Gene: Zipp\_71 Start: 54166, Stop: 54618, Start Num: 26

Candidate Starts for Zipp\_71:

(Start: 13 @54037 has 1 MA's), (Start: 26 @54166 has 8 MA's), (34, 54253), (39, 54370), (41, 54415), (42, 54418), (54, 54517), (55, 54523), (59, 54571),

Gene: Zitch\_72 Start: 52448, Stop: 52903, Start Num: 26

Candidate Starts for Zitch\_72:

(Start: 13 @52319 has 1 MA's), (Start: 26 @52448 has 8 MA's), (34, 52538), (39, 52655), (41, 52700), (42, 52703), (54, 52802), (55, 52808), (59, 52856),