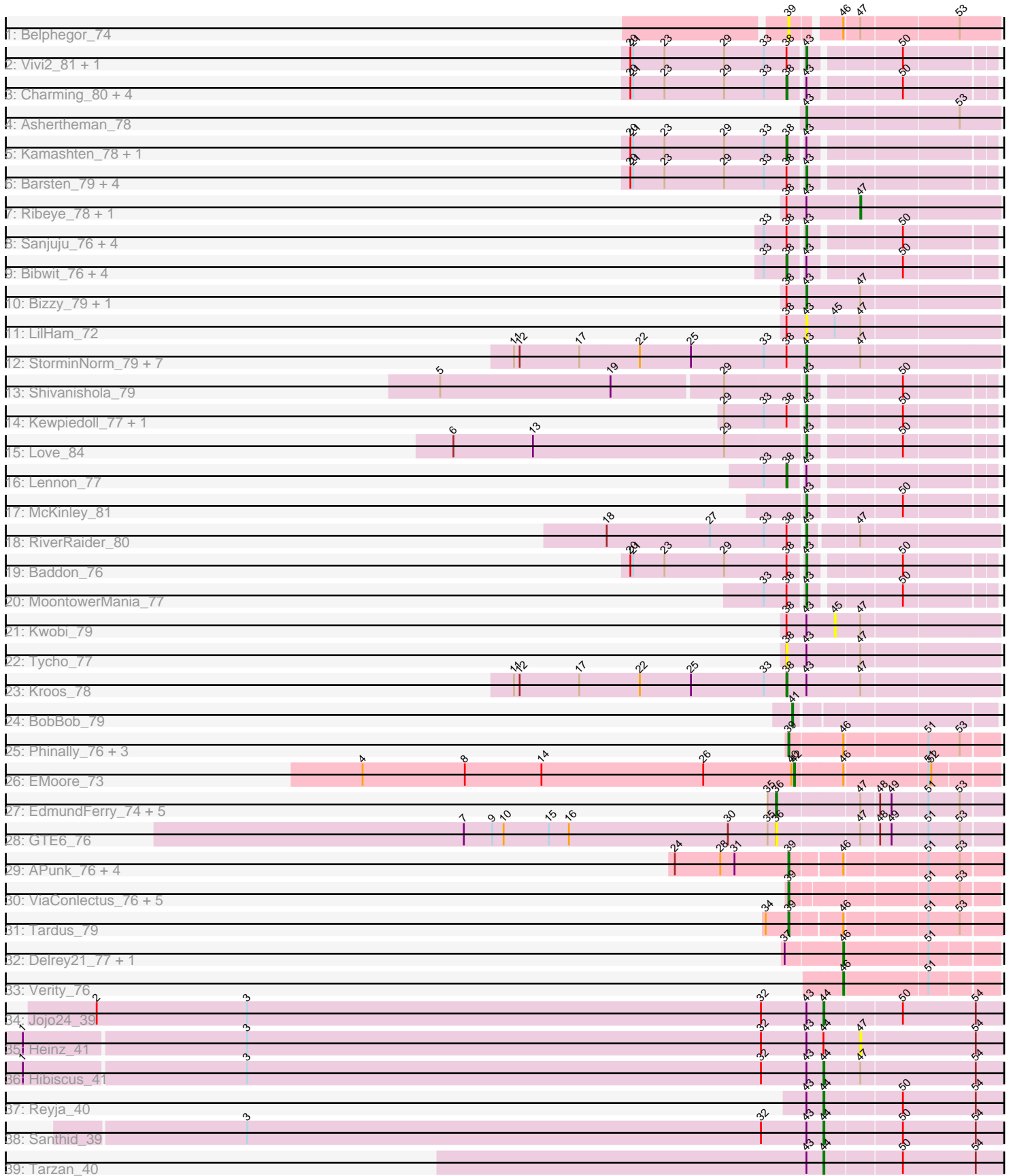


# Pham 195552



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 195552 Report

This analysis was run 12/09/24 on database version 580.

Pham number 195552 has 85 members, 14 are drafts.

Phages represented in each track:

- Track 1 : Belphegor\_74
- Track 2 : Vivi2\_81, Tangent\_80
- Track 3 : Charming\_80, Nordenberg\_77, Fosterous\_79, Brandonk123\_81, Rofo\_77
- Track 4 : Ashertheman\_78
- Track 5 : Kamashten\_78, Galadriel\_78
- Track 6 : Barsten\_79, Thing3\_78, Paries\_81, Sedona\_76, ChadMasterC\_78
- Track 7 : Ribeye\_78, Derg\_77
- Track 8 : Sanjuju\_76, Affeca\_79, Sitar\_77, Fitzgerald\_76, Jabberwocky\_76
- Track 9 : Bibwit\_76, Keitabear\_76, Stultus\_73, Angelicage\_76, Ailee\_75
- Track 10 : Bizzy\_79, Tangerine\_79
- Track 11 : LilHam\_72
- Track 12 : StorminNorm\_79, JKSyngboy\_76, SchottB\_76, Gustavo\_80, Gaea\_79, Saronaya\_80, Baumdotcom\_76, Flatwoods\_78
- Track 13 : Shivanishola\_79
- Track 14 : Kewpiedoll\_77, Geodirt\_77
- Track 15 : Love\_84
- Track 16 : Lennon\_77
- Track 17 : McKinley\_81
- Track 18 : RiverRaider\_80
- Track 19 : Baddon\_76
- Track 20 : MoontowerMania\_77
- Track 21 : Kwobi\_79
- Track 22 : Tycho\_77
- Track 23 : Kroos\_78
- Track 24 : BobBob\_79
- Track 25 : Phinally\_76, Leonard\_76, Inspectinfecti\_77, MelBins\_78
- Track 26 : EMoore\_73
- Track 27 : EdmundFerry\_74, Chickadee\_76, RoadKill\_73, Dexdert\_71, Kwekel\_76, Twonlo\_73
- Track 28 : GTE6\_76
- Track 29 : APunk\_76, Natkenzie\_76, Sampson\_78, Abblin\_76, Scioto\_76
- Track 30 : ViaConlectus\_76, Ali17\_73, Zipp\_77, Zitch\_78, Hans\_77, Phauci\_68
- Track 31 : Tardus\_79
- Track 32 : Delrey21\_77, DoctorFroggo\_77
- Track 33 : Verity\_76
- Track 34 : Jojo24\_39
- Track 35 : Heinz\_41

- Track 36 : Hibiscus\_41
- Track 37 : Reyja\_40
- Track 38 : Santhid\_39
- Track 39 : Tarzan\_40

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

The start number called the most often in the published annotations is 43, it was called in 28 of the 71 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Affeca\_79, Ashertheman\_78, Baddon\_76, Barsten\_79, Baumdotcom\_76, Bizzy\_79, ChadMasterC\_78, Fitzgerald\_76, Flatwoods\_78, Gaea\_79, Geodirt\_77, Gustavo\_80, JKSyngboy\_76, Jabberwocky\_76, Kewpiedoll\_77, LilHam\_72, Love\_84, McKinley\_81, MoontowerMania\_77, Paries\_81, RiverRaider\_80, Sanjuju\_76, Saronaya\_80, SchottB\_76, Sedona\_76, Shivanishola\_79, Sitar\_77, StorminNorm\_79, Tangent\_80, Tangerine\_79, Thing3\_78, Vivi2\_81,

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

- Ailee\_75, Angelicage\_76, Bibwit\_76, Brandonk123\_81, Charming\_80, Derg\_77, Fosterous\_79, Galadriel\_78, Heinz\_41, Hibiscus\_41, Jojo24\_39, Kamashten\_78, Keitabear\_76, Kroos\_78, Kwobi\_79, Lennon\_77, Nordenberg\_77, Reyja\_40, Ribeye\_78, Rofo\_77, Santhid\_39, Stultus\_73, Tarzan\_40, Tycho\_77,

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

- APunk\_76, Abblin\_76, Ali17\_73, Belphegor\_74, BobBob\_79, Chickadee\_76, Delrey21\_77, Dxdert\_71, DoctorFroggo\_77, EMOore\_73, EdmundFerry\_74, GTE6\_76, Hans\_77, Inspectinfecti\_77, Kwekel\_76, Leonard\_76, MelBins\_78, Natkenzie\_76, Phauci\_68, Phinally\_76, RoadKill\_73, Sampson\_78, Scioto\_76, Tardus\_79, Twonlo\_73, Verity\_76, ViaConlectus\_76, Zipp\_77, Zitch\_78,

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

Start 36:

- Found in 7 of 85 ( 8.2% ) of genes in pham
- Manual Annotations of this start: 6 of 71
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Chickadee\_76 (DE3), Dxdert\_71 (DE3), EdmundFerry\_74 (DE3), GTE6\_76 (DE3), Kwekel\_76 (DE3), RoadKill\_73 (DE3), Twonlo\_73 (DE3),

Start 38:

- Found in 46 of 85 ( 54.1% ) of genes in pham
- Manual Annotations of this start: 13 of 71
- Called 32.6% of time when present
- Phage (with cluster) where this start called: Ailee\_75 (DE1), Angelicage\_76 (DE1), Bibwit\_76 (DE1), Brandonk123\_81 (DE1), Charming\_80 (DE1), Fosterous\_79 (DE1), Galadriel\_78 (DE1), Kamashten\_78 (DE1), Keitabear\_76 (DE1), Kroos\_78 (DE1), Lennon\_77 (DE1), Nordenberg\_77 (DE1), Rofo\_77 (DE1), Stultus\_73 (DE1), Tycho\_77 (DE1),

Start 39:

- Found in 17 of 85 ( 20.0% ) of genes in pham
- Manual Annotations of this start: 13 of 71
- Called 100.0% of time when present
- Phage (with cluster) where this start called: APunk\_76 (DE4), Abblin\_76 (DE4), Ali17\_73 (DE2), Belphegor\_74 (DE), Hans\_77 (DE2), Inspectinfecti\_77 (DE2), Leonard\_76 (DE2), MelBins\_78 (DE2), Natkenzie\_76 (DE4), Phauci\_68 (DE2), Phinally\_76 (DE2), Sampson\_78 (DE4), Scioto\_76 (DE4), Tardus\_79 (DE4), ViaConlectus\_76 (DE4), Zipp\_77 (DE4), Zitch\_78 (DE4),

Start 41:

- Found in 1 of 85 ( 1.2% ) of genes in pham
- Manual Annotations of this start: 1 of 71
- Called 100.0% of time when present
- Phage (with cluster) where this start called: BobBob\_79 (DE1),

Start 42:

- Found in 1 of 85 ( 1.2% ) of genes in pham
- Manual Annotations of this start: 1 of 71
- Called 100.0% of time when present
- Phage (with cluster) where this start called: EMoore\_73 (DE2),

Start 43:

- Found in 56 of 85 ( 65.9% ) of genes in pham
- Manual Annotations of this start: 28 of 71
- Called 57.1% of time when present
- Phage (with cluster) where this start called: Affeca\_79 (DE1), Ashertheman\_78 (DE1), Baddon\_76 (DE1), Barsten\_79 (DE1), Baumdotcom\_76 (DE1), Bizzy\_79 (DE1), ChadMasterC\_78 (DE1), Fitzgerald\_76 (DE1), Flatwoods\_78 (DE1), Gaea\_79 (DE1), Geodirt\_77 (DE1), Gustavo\_80 (DE1), JKSyngboy\_76 (DE1), Jabberwocky\_76 (DE1), Kewpiedoll\_77 (DE1), LilHam\_72 (DE1), Love\_84 (DE1), McKinley\_81 (DE1), MoontowerMania\_77 (DE1), Paries\_81 (DE1), RiverRaider\_80 (DE1), Sanjuju\_76 (DE1), Saronaya\_80 (DE1), SchottB\_76 (DE1), Sedona\_76 (DE1), Shivanishola\_79 (DE1), Sitar\_77 (DE1), StorminNorm\_79 (DE1), Tangent\_80 (DE1), Tangerine\_79 (DE1), Thing3\_78 (DE1), Vivi2\_81 (DE1),

Start 44:

- Found in 6 of 85 ( 7.1% ) of genes in pham
- Manual Annotations of this start: 5 of 71
- Called 83.3% of time when present
- Phage (with cluster) where this start called: Hibiscus\_41 (DY), Jojo24\_39 (DY), Reyja\_40 (DY), Santhid\_39 (DY), Tarzan\_40 (DY),

Start 45:

- Found in 2 of 85 ( 2.4% ) of genes in pham
- No Manual Annotations of this start.
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Kwobi\_79 (DE1),

Start 46:

- Found in 15 of 85 ( 17.6% ) of genes in pham
- Manual Annotations of this start: 3 of 71

- Called 20.0% of time when present
- Phage (with cluster) where this start called: Delrey21\_77 (DE4), DoctorFroggo\_77 (DE4), Verity\_76 (DE4),

Start 47:

- Found in 27 of 85 ( 31.8% ) of genes in pham
- Manual Annotations of this start: 1 of 71
- Called 11.1% of time when present
- Phage (with cluster) where this start called: Derg\_77 (DE1), Heinz\_41 (DY), Ribeye\_78 (DE1),

### **Summary by clusters:**

There are 6 clusters represented in this pham: DE, DE1, DE2, DE3, DE4, DY,

Info for manual annotations of cluster DE1:

- Start number 38 was manually annotated 13 times for cluster DE1.
- Start number 41 was manually annotated 1 time for cluster DE1.
- Start number 43 was manually annotated 28 times for cluster DE1.
- Start number 47 was manually annotated 1 time for cluster DE1.

Info for manual annotations of cluster DE2:

- Start number 39 was manually annotated 7 times for cluster DE2.
- Start number 42 was manually annotated 1 time for cluster DE2.

Info for manual annotations of cluster DE3:

- Start number 36 was manually annotated 6 times for cluster DE3.

Info for manual annotations of cluster DE4:

- Start number 39 was manually annotated 6 times for cluster DE4.
- Start number 46 was manually annotated 3 times for cluster DE4.

Info for manual annotations of cluster DY:

- Start number 44 was manually annotated 5 times for cluster DY.

### **Gene Information:**

Gene: APunk\_76 Start: 54169, Stop: 54375, Start Num: 39

Candidate Starts for APunk\_76:

(24, 54049), (28, 54097), (31, 54112), (Start: 39 @54169 has 13 MA's), (Start: 46 @54220 has 3 MA's), (51, 54301), (53, 54334),

Gene: Abblin\_76 Start: 54327, Stop: 54533, Start Num: 39

Candidate Starts for Abblin\_76:

(24, 54207), (28, 54255), (31, 54270), (Start: 39 @54327 has 13 MA's), (Start: 46 @54378 has 3 MA's), (51, 54459), (53, 54492),

Gene: Affeca\_79 Start: 56213, Stop: 56392, Start Num: 43

Candidate Starts for Affeca\_79:

(33, 56174), (Start: 38 @56198 has 13 MA's), (Start: 43 @56213 has 28 MA's), (50, 56300),

Gene: Ailee\_75 Start: 55227, Stop: 55421, Start Num: 38

Candidate Starts for Ailee\_75:

(33, 55203), (Start: 38 @55227 has 13 MA's), (Start: 43 @55242 has 28 MA's), (50, 55329),

Gene: Ali17\_73 Start: 53690, Stop: 53893, Start Num: 39

Candidate Starts for Ali17\_73:

(Start: 39 @53690 has 13 MA's), (51, 53822), (53, 53855),

Gene: Angelicage\_76 Start: 56166, Stop: 56360, Start Num: 38

Candidate Starts for Angelicage\_76:

(33, 56142), (Start: 38 @56166 has 13 MA's), (Start: 43 @56181 has 28 MA's), (50, 56268),

Gene: Ashertheman\_78 Start: 54713, Stop: 54907, Start Num: 43

Candidate Starts for Ashertheman\_78:

(Start: 43 @54713 has 28 MA's), (53, 54866),

Gene: Baddon\_76 Start: 55365, Stop: 55541, Start Num: 43

Candidate Starts for Baddon\_76:

(20, 55185), (21, 55188), (23, 55221), (29, 55284), (Start: 38 @55350 has 13 MA's), (Start: 43 @55365 has 28 MA's), (50, 55452),

Gene: Barsten\_79 Start: 56149, Stop: 56325, Start Num: 43

Candidate Starts for Barsten\_79:

(20, 55969), (21, 55972), (23, 56005), (29, 56068), (33, 56110), (Start: 38 @56134 has 13 MA's), (Start: 43 @56149 has 28 MA's),

Gene: Baumdotcom\_76 Start: 54819, Stop: 55016, Start Num: 43

Candidate Starts for Baumdotcom\_76:

(11, 54513), (12, 54519), (17, 54582), (22, 54645), (25, 54699), (33, 54774), (Start: 38 @54798 has 13 MA's), (Start: 43 @54819 has 28 MA's), (Start: 47 @54876 has 1 MA's),

Gene: Belphegor\_74 Start: 55556, Stop: 55756, Start Num: 39

Candidate Starts for Belphegor\_74:

(Start: 39 @55556 has 13 MA's), (Start: 46 @55601 has 3 MA's), (Start: 47 @55616 has 1 MA's), (53, 55715),

Gene: Bibwit\_76 Start: 54868, Stop: 55062, Start Num: 38

Candidate Starts for Bibwit\_76:

(33, 54844), (Start: 38 @54868 has 13 MA's), (Start: 43 @54883 has 28 MA's), (50, 54970),

Gene: Bizzy\_79 Start: 54892, Stop: 55089, Start Num: 43

Candidate Starts for Bizzy\_79:

(Start: 38 @54871 has 13 MA's), (Start: 43 @54892 has 28 MA's), (Start: 47 @54949 has 1 MA's),

Gene: BobBob\_79 Start: 55393, Stop: 55587, Start Num: 41

Candidate Starts for BobBob\_79:

(Start: 41 @55393 has 1 MA's),

Gene: Brandonk123\_81 Start: 55560, Stop: 55754, Start Num: 38

Candidate Starts for Brandonk123\_81:

(20, 55395), (21, 55398), (23, 55431), (29, 55494), (33, 55536), (Start: 38 @55560 has 13 MA's), (Start: 43 @55575 has 28 MA's), (50, 55662),

Gene: ChadMasterC\_78 Start: 57131, Stop: 57307, Start Num: 43  
Candidate Starts for ChadMasterC\_78:  
(20, 56951), (21, 56954), (23, 56987), (29, 57050), (33, 57092), (Start: 38 @57116 has 13 MA's),  
(Start: 43 @57131 has 28 MA's),

Gene: Charming\_80 Start: 54842, Stop: 55033, Start Num: 38  
Candidate Starts for Charming\_80:  
(20, 54677), (21, 54680), (23, 54713), (29, 54776), (33, 54818), (Start: 38 @54842 has 13 MA's),  
(Start: 43 @54857 has 28 MA's), (50, 54944),

Gene: Chickadee\_76 Start: 52030, Stop: 52266, Start Num: 36  
Candidate Starts for Chickadee\_76:  
(35, 52021), (Start: 36 @52030 has 6 MA's), (Start: 47 @52111 has 1 MA's), (48, 52129), (49, 52141),  
(51, 52177), (53, 52210),

Gene: Delrey21\_77 Start: 56160, Stop: 56312, Start Num: 46  
Candidate Starts for Delrey21\_77:  
(37, 56103), (Start: 46 @56160 has 3 MA's), (51, 56244),

Gene: Derg\_77 Start: 53571, Stop: 53711, Start Num: 47  
Candidate Starts for Derg\_77:  
(Start: 38 @53496 has 13 MA's), (Start: 43 @53517 has 28 MA's), (Start: 47 @53571 has 1 MA's),

Gene: Dxdert\_71 Start: 50488, Stop: 50724, Start Num: 36  
Candidate Starts for Dxdert\_71:  
(35, 50479), (Start: 36 @50488 has 6 MA's), (Start: 47 @50569 has 1 MA's), (48, 50587), (49, 50599),  
(51, 50635), (53, 50668),

Gene: DoctorFroggo\_77 Start: 56160, Stop: 56312, Start Num: 46  
Candidate Starts for DoctorFroggo\_77:  
(37, 56103), (Start: 46 @56160 has 3 MA's), (51, 56244),

Gene: EMoore\_73 Start: 55058, Stop: 55258, Start Num: 42  
Candidate Starts for EMoore\_73:  
(4, 54602), (8, 54710), (14, 54791), (26, 54962), (40, 55055), (Start: 42 @55058 has 1 MA's), (Start:  
46 @55106 has 3 MA's), (51, 55190), (52, 55193),

Gene: EdmundFerry\_74 Start: 51573, Stop: 51809, Start Num: 36  
Candidate Starts for EdmundFerry\_74:  
(35, 51564), (Start: 36 @51573 has 6 MA's), (Start: 47 @51654 has 1 MA's), (48, 51672), (49, 51684),  
(51, 51720), (53, 51753),

Gene: Fitzgerald\_76 Start: 56029, Stop: 56208, Start Num: 43  
Candidate Starts for Fitzgerald\_76:  
(33, 55990), (Start: 38 @56014 has 13 MA's), (Start: 43 @56029 has 28 MA's), (50, 56116),

Gene: Flatwoods\_78 Start: 54041, Stop: 54238, Start Num: 43  
Candidate Starts for Flatwoods\_78:  
(11, 53735), (12, 53741), (17, 53804), (22, 53867), (25, 53921), (33, 53996), (Start: 38 @54020 has 13  
MA's), (Start: 43 @54041 has 28 MA's), (Start: 47 @54098 has 1 MA's),

Gene: Fosterous\_79 Start: 55836, Stop: 56027, Start Num: 38

Candidate Starts for Fosterous\_79:

(20, 55671), (21, 55674), (23, 55707), (29, 55770), (33, 55812), (Start: 38 @55836 has 13 MA's), (Start: 43 @55851 has 28 MA's), (50, 55938),

Gene: GTE6\_76 Start: 52833, Stop: 53069, Start Num: 36

Candidate Starts for GTE6\_76:

(7, 52503), (9, 52533), (10, 52545), (15, 52593), (16, 52614), (30, 52782), (35, 52824), (Start: 36 @52833 has 6 MA's), (Start: 47 @52914 has 1 MA's), (48, 52932), (49, 52944), (51, 52980), (53, 53013),

Gene: Gaea\_79 Start: 54628, Stop: 54825, Start Num: 43

Candidate Starts for Gaea\_79:

(11, 54322), (12, 54328), (17, 54391), (22, 54454), (25, 54508), (33, 54583), (Start: 38 @54607 has 13 MA's), (Start: 43 @54628 has 28 MA's), (Start: 47 @54685 has 1 MA's),

Gene: Galadriel\_78 Start: 56042, Stop: 56233, Start Num: 38

Candidate Starts for Galadriel\_78:

(20, 55877), (21, 55880), (23, 55913), (29, 55976), (33, 56018), (Start: 38 @56042 has 13 MA's), (Start: 43 @56057 has 28 MA's),

Gene: Geodirt\_77 Start: 56380, Stop: 56556, Start Num: 43

Candidate Starts for Geodirt\_77:

(29, 56299), (33, 56341), (Start: 38 @56365 has 13 MA's), (Start: 43 @56380 has 28 MA's), (50, 56467),

Gene: Gustavo\_80 Start: 55613, Stop: 55807, Start Num: 43

Candidate Starts for Gustavo\_80:

(11, 55307), (12, 55313), (17, 55376), (22, 55439), (25, 55493), (33, 55568), (Start: 38 @55592 has 13 MA's), (Start: 43 @55613 has 28 MA's), (Start: 47 @55667 has 1 MA's),

Gene: Hans\_77 Start: 54617, Stop: 54820, Start Num: 39

Candidate Starts for Hans\_77:

(Start: 39 @54617 has 13 MA's), (51, 54749), (53, 54782),

Gene: Heinz\_41 Start: 27911, Stop: 28060, Start Num: 47

Candidate Starts for Heinz\_41:

(1, 27035), (3, 27266), (32, 27809), (Start: 43 @27857 has 28 MA's), (Start: 44 @27875 has 5 MA's), (Start: 47 @27911 has 1 MA's), (54, 28028),

Gene: Hibiscus\_41 Start: 27824, Stop: 28009, Start Num: 44

Candidate Starts for Hibiscus\_41:

(1, 26984), (3, 27215), (32, 27758), (Start: 43 @27806 has 28 MA's), (Start: 44 @27824 has 5 MA's), (Start: 47 @27860 has 1 MA's), (54, 27977),

Gene: Inspectinfecti\_77 Start: 54591, Stop: 54797, Start Num: 39

Candidate Starts for Inspectinfecti\_77:

(Start: 39 @54591 has 13 MA's), (Start: 46 @54645 has 3 MA's), (51, 54726), (53, 54759),

Gene: JKSyngboy\_76 Start: 55527, Stop: 55724, Start Num: 43

Candidate Starts for JKSyngboy\_76:

(11, 55221), (12, 55227), (17, 55290), (22, 55353), (25, 55407), (33, 55482), (Start: 38 @55506 has 13 MA's), (Start: 43 @55527 has 28 MA's), (Start: 47 @55584 has 1 MA's),



Gene: Jabberwocky\_76 Start: 56255, Stop: 56434, Start Num: 43  
Candidate Starts for Jabberwocky\_76:  
(33, 56216), (Start: 38 @56240 has 13 MA's), (Start: 43 @56255 has 28 MA's), (50, 56342),

Gene: Jojo24\_39 Start: 28425, Stop: 28610, Start Num: 44  
Candidate Starts for Jojo24\_39:  
(2, 27657), (3, 27816), (32, 28359), (Start: 43 @28407 has 28 MA's), (Start: 44 @28425 has 5 MA's),  
(50, 28503), (54, 28578),

Gene: Kamashten\_78 Start: 55936, Stop: 56127, Start Num: 38  
Candidate Starts for Kamashten\_78:  
(20, 55771), (21, 55774), (23, 55807), (29, 55870), (33, 55912), (Start: 38 @55936 has 13 MA's),  
(Start: 43 @55951 has 28 MA's),

Gene: Keitabear\_76 Start: 56789, Stop: 56983, Start Num: 38  
Candidate Starts for Keitabear\_76:  
(33, 56765), (Start: 38 @56789 has 13 MA's), (Start: 43 @56804 has 28 MA's), (50, 56891),

Gene: Kewpiedoll\_77 Start: 56043, Stop: 56219, Start Num: 43  
Candidate Starts for Kewpiedoll\_77:  
(29, 55962), (33, 56004), (Start: 38 @56028 has 13 MA's), (Start: 43 @56043 has 28 MA's), (50,  
56130),

Gene: Kroos\_78 Start: 55146, Stop: 55364, Start Num: 38  
Candidate Starts for Kroos\_78:  
(11, 54861), (12, 54867), (17, 54930), (22, 54993), (25, 55047), (33, 55122), (Start: 38 @55146 has 13  
MA's), (Start: 43 @55167 has 28 MA's), (Start: 47 @55224 has 1 MA's),

Gene: Kwekel\_76 Start: 51943, Stop: 52179, Start Num: 36  
Candidate Starts for Kwekel\_76:  
(35, 51934), (Start: 36 @51943 has 6 MA's), (Start: 47 @52024 has 1 MA's), (48, 52042), (49, 52054),  
(51, 52090), (53, 52123),

Gene: Kwobi\_79 Start: 55707, Stop: 55874, Start Num: 45  
Candidate Starts for Kwobi\_79:  
(Start: 38 @55656 has 13 MA's), (Start: 43 @55677 has 28 MA's), (45, 55707), (Start: 47 @55734 has  
1 MA's),

Gene: Lennon\_77 Start: 56905, Stop: 57096, Start Num: 38  
Candidate Starts for Lennon\_77:  
(33, 56881), (Start: 38 @56905 has 13 MA's), (Start: 43 @56920 has 28 MA's),

Gene: Leonard\_76 Start: 54654, Stop: 54860, Start Num: 39  
Candidate Starts for Leonard\_76:  
(Start: 39 @54654 has 13 MA's), (Start: 46 @54708 has 3 MA's), (51, 54789), (53, 54822),

Gene: LilHam\_72 Start: 52759, Stop: 52956, Start Num: 43  
Candidate Starts for LilHam\_72:  
(Start: 38 @52738 has 13 MA's), (Start: 43 @52759 has 28 MA's), (45, 52789), (Start: 47 @52816 has  
1 MA's),

Gene: Love\_84 Start: 56974, Stop: 57150, Start Num: 43  
Candidate Starts for Love\_84:

(6, 56608), (13, 56692), (29, 56893), (Start: 43 @56974 has 28 MA's), (50, 57061),

Gene: McKinley\_81 Start: 56038, Stop: 56214, Start Num: 43

Candidate Starts for McKinley\_81:

(Start: 43 @56038 has 28 MA's), (50, 56125),

Gene: MelBins\_78 Start: 54859, Stop: 55068, Start Num: 39

Candidate Starts for MelBins\_78:

(Start: 39 @54859 has 13 MA's), (Start: 46 @54913 has 3 MA's), (51, 54994), (53, 55027),

Gene: MoontowerMania\_77 Start: 56599, Stop: 56775, Start Num: 43

Candidate Starts for MoontowerMania\_77:

(33, 56560), (Start: 38 @56584 has 13 MA's), (Start: 43 @56599 has 28 MA's), (50, 56686),

Gene: Natkenzie\_76 Start: 54327, Stop: 54533, Start Num: 39

Candidate Starts for Natkenzie\_76:

(24, 54207), (28, 54255), (31, 54270), (Start: 39 @54327 has 13 MA's), (Start: 46 @54378 has 3 MA's), (51, 54459), (53, 54492),

Gene: Nordenberg\_77 Start: 54678, Stop: 54869, Start Num: 38

Candidate Starts for Nordenberg\_77:

(20, 54513), (21, 54516), (23, 54549), (29, 54612), (33, 54654), (Start: 38 @54678 has 13 MA's), (Start: 43 @54693 has 28 MA's), (50, 54780),

Gene: Paries\_81 Start: 56980, Stop: 57156, Start Num: 43

Candidate Starts for Paries\_81:

(20, 56800), (21, 56803), (23, 56836), (29, 56899), (33, 56941), (Start: 38 @56965 has 13 MA's), (Start: 43 @56980 has 28 MA's),

Gene: Phauci\_68 Start: 51694, Stop: 51897, Start Num: 39

Candidate Starts for Phauci\_68:

(Start: 39 @51694 has 13 MA's), (51, 51826), (53, 51859),

Gene: Phinally\_76 Start: 54651, Stop: 54857, Start Num: 39

Candidate Starts for Phinally\_76:

(Start: 39 @54651 has 13 MA's), (Start: 46 @54705 has 3 MA's), (51, 54786), (53, 54819),

Gene: Reyja\_40 Start: 28862, Stop: 29047, Start Num: 44

Candidate Starts for Reyja\_40:

(Start: 43 @28844 has 28 MA's), (Start: 44 @28862 has 5 MA's), (50, 28940), (54, 29015),

Gene: Ribeye\_78 Start: 54810, Stop: 54950, Start Num: 47

Candidate Starts for Ribeye\_78:

(Start: 38 @54735 has 13 MA's), (Start: 43 @54756 has 28 MA's), (Start: 47 @54810 has 1 MA's),

Gene: RiverRaider\_80 Start: 54050, Stop: 54238, Start Num: 43

Candidate Starts for RiverRaider\_80:

(18, 53846), (27, 53954), (33, 54011), (Start: 38 @54035 has 13 MA's), (Start: 43 @54050 has 28 MA's), (Start: 47 @54098 has 1 MA's),

Gene: RoadKill\_73 Start: 51472, Stop: 51708, Start Num: 36

Candidate Starts for RoadKill\_73:

(35, 51463), (Start: 36 @51472 has 6 MA's), (Start: 47 @51553 has 1 MA's), (48, 51571), (49, 51583), (51, 51619), (53, 51652),

Gene: Rofo\_77 Start: 55418, Stop: 55609, Start Num: 38

Candidate Starts for Rofo\_77:

(20, 55253), (21, 55256), (23, 55289), (29, 55352), (33, 55394), (Start: 38 @55418 has 13 MA's), (Start: 43 @55433 has 28 MA's), (50, 55520),

Gene: Sampson\_78 Start: 54478, Stop: 54684, Start Num: 39

Candidate Starts for Sampson\_78:

(24, 54358), (28, 54406), (31, 54421), (Start: 39 @54478 has 13 MA's), (Start: 46 @54529 has 3 MA's), (51, 54610), (53, 54643),

Gene: Sanjuju\_76 Start: 56119, Stop: 56298, Start Num: 43

Candidate Starts for Sanjuju\_76:

(33, 56080), (Start: 38 @56104 has 13 MA's), (Start: 43 @56119 has 28 MA's), (50, 56206),

Gene: Santhid\_39 Start: 27147, Stop: 27332, Start Num: 44

Candidate Starts for Santhid\_39:

(3, 26538), (32, 27081), (Start: 43 @27129 has 28 MA's), (Start: 44 @27147 has 5 MA's), (50, 27225), (54, 27300),

Gene: Saronaya\_80 Start: 55613, Stop: 55807, Start Num: 43

Candidate Starts for Saronaya\_80:

(11, 55307), (12, 55313), (17, 55376), (22, 55439), (25, 55493), (33, 55568), (Start: 38 @55592 has 13 MA's), (Start: 43 @55613 has 28 MA's), (Start: 47 @55667 has 1 MA's),

Gene: SchottB\_76 Start: 55234, Stop: 55431, Start Num: 43

Candidate Starts for SchottB\_76:

(11, 54928), (12, 54934), (17, 54997), (22, 55060), (25, 55114), (33, 55189), (Start: 38 @55213 has 13 MA's), (Start: 43 @55234 has 28 MA's), (Start: 47 @55291 has 1 MA's),

Gene: Scioto\_76 Start: 54328, Stop: 54534, Start Num: 39

Candidate Starts for Scioto\_76:

(24, 54208), (28, 54256), (31, 54271), (Start: 39 @54328 has 13 MA's), (Start: 46 @54379 has 3 MA's), (51, 54460), (53, 54493),

Gene: Sedona\_76 Start: 56619, Stop: 56795, Start Num: 43

Candidate Starts for Sedona\_76:

(20, 56439), (21, 56442), (23, 56475), (29, 56538), (33, 56580), (Start: 38 @56604 has 13 MA's), (Start: 43 @56619 has 28 MA's),

Gene: Shivanishola\_79 Start: 54544, Stop: 54720, Start Num: 43

Candidate Starts for Shivanishola\_79:

(5, 54169), (19, 54349), (29, 54463), (Start: 43 @54544 has 28 MA's), (50, 54631),

Gene: Sitar\_77 Start: 56663, Stop: 56842, Start Num: 43

Candidate Starts for Sitar\_77:

(33, 56624), (Start: 38 @56648 has 13 MA's), (Start: 43 @56663 has 28 MA's), (50, 56750),

Gene: StorminNorm\_79 Start: 55404, Stop: 55601, Start Num: 43

Candidate Starts for StorminNorm\_79:

(11, 55098), (12, 55104), (17, 55167), (22, 55230), (25, 55284), (33, 55359), (Start: 38 @55383 has 13 MA's), (Start: 43 @55404 has 28 MA's), (Start: 47 @55461 has 1 MA's),

Gene: Stultus\_73 Start: 54895, Stop: 55089, Start Num: 38

Candidate Starts for Stultus\_73:

(33, 54871), (Start: 38 @54895 has 13 MA's), (Start: 43 @54910 has 28 MA's), (50, 54997),

Gene: Tangent\_80 Start: 55138, Stop: 55314, Start Num: 43

Candidate Starts for Tangent\_80:

(20, 54958), (21, 54961), (23, 54994), (29, 55057), (33, 55099), (Start: 38 @55123 has 13 MA's), (Start: 43 @55138 has 28 MA's), (50, 55225),

Gene: Tangerine\_79 Start: 54889, Stop: 55083, Start Num: 43

Candidate Starts for Tangerine\_79:

(Start: 38 @54868 has 13 MA's), (Start: 43 @54889 has 28 MA's), (Start: 47 @54943 has 1 MA's),

Gene: Tardus\_79 Start: 55062, Stop: 55268, Start Num: 39

Candidate Starts for Tardus\_79:

(34, 55038), (Start: 39 @55062 has 13 MA's), (Start: 46 @55113 has 3 MA's), (51, 55194), (53, 55227),

Gene: Tarzan\_40 Start: 28296, Stop: 28481, Start Num: 44

Candidate Starts for Tarzan\_40:

(Start: 43 @28278 has 28 MA's), (Start: 44 @28296 has 5 MA's), (50, 28374), (54, 28449),

Gene: Thing3\_78 Start: 55951, Stop: 56127, Start Num: 43

Candidate Starts for Thing3\_78:

(20, 55771), (21, 55774), (23, 55807), (29, 55870), (33, 55912), (Start: 38 @55936 has 13 MA's), (Start: 43 @55951 has 28 MA's),

Gene: Twonlo\_73 Start: 52012, Stop: 52248, Start Num: 36

Candidate Starts for Twonlo\_73:

(35, 52003), (Start: 36 @52012 has 6 MA's), (Start: 47 @52093 has 1 MA's), (48, 52111), (49, 52123), (51, 52159), (53, 52192),

Gene: Tycho\_77 Start: 54684, Stop: 54899, Start Num: 38

Candidate Starts for Tycho\_77:

(Start: 38 @54684 has 13 MA's), (Start: 43 @54705 has 28 MA's), (Start: 47 @54759 has 1 MA's),

Gene: Verity\_76 Start: 56022, Stop: 56174, Start Num: 46

Candidate Starts for Verity\_76:

(Start: 46 @56022 has 3 MA's), (51, 56106),

Gene: ViaConlectus\_76 Start: 53258, Stop: 53461, Start Num: 39

Candidate Starts for ViaConlectus\_76:

(Start: 39 @53258 has 13 MA's), (51, 53390), (53, 53423),

Gene: Vivi2\_81 Start: 56194, Stop: 56370, Start Num: 43

Candidate Starts for Vivi2\_81:

(20, 56014), (21, 56017), (23, 56050), (29, 56113), (33, 56155), (Start: 38 @56179 has 13 MA's), (Start: 43 @56194 has 28 MA's), (50, 56281),

Gene: Zipp\_77 Start: 55685, Stop: 55888, Start Num: 39

Candidate Starts for Zipp\_77:

(Start: 39 @55685 has 13 MA's), (51, 55817), (53, 55850),

Gene: Zitch\_78 Start: 54135, Stop: 54338, Start Num: 39

Candidate Starts for Zitch\_78:

(Start: 39 @54135 has 13 MA's), (51, 54267), (53, 54300),