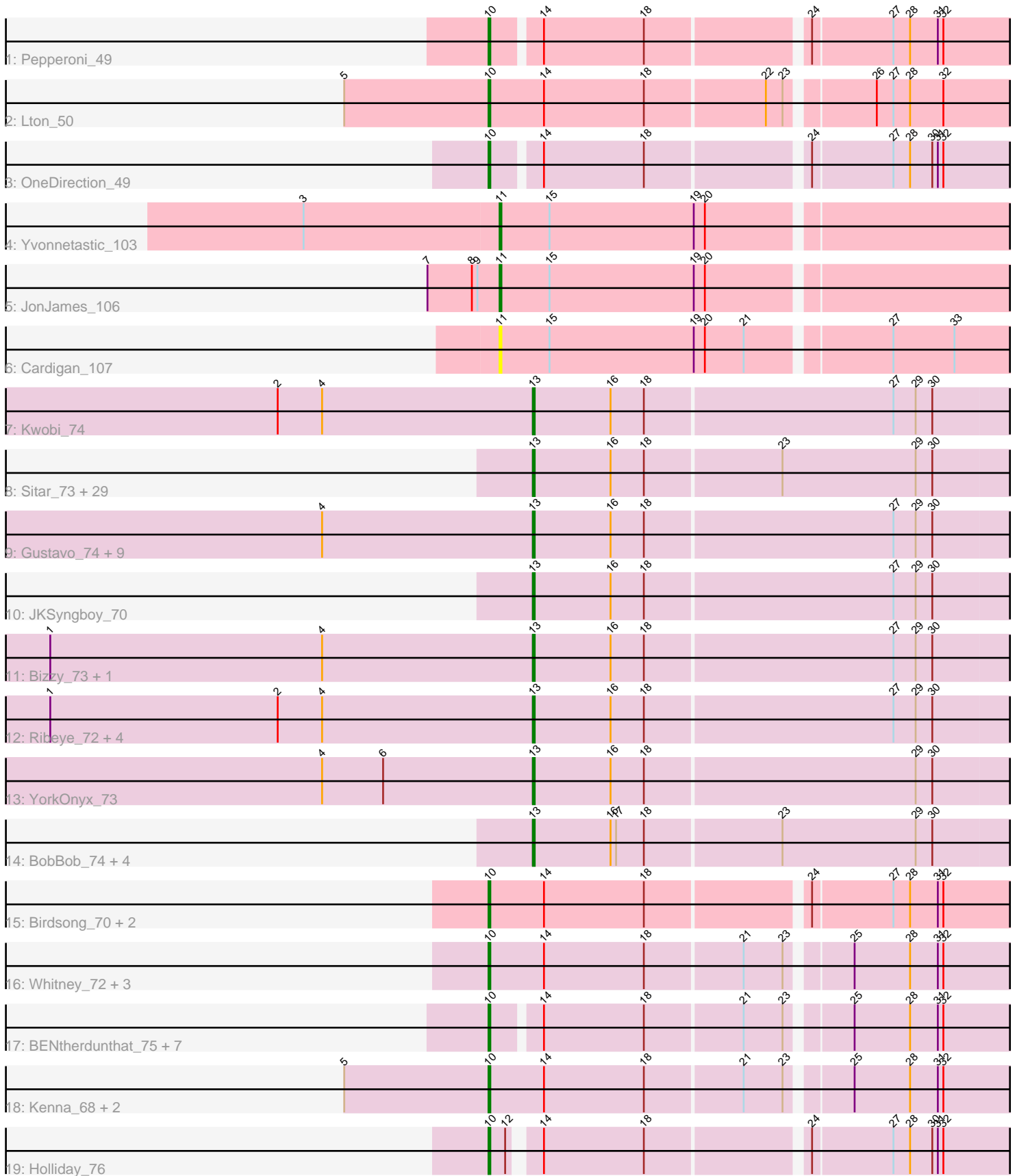


Pham 300033



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 300033 Report

This analysis was run 06/08/26 on database version 649.

Pham number 300033 has 80 members, 6 are drafts.

Phages represented in each track:

- Track 1 : Pepperoni\_49
- Track 2 : Lton\_50
- Track 3 : OneDirection\_49
- Track 4 : Yvonnetastic\_103
- Track 5 : JonJames\_106
- Track 6 : Cardigan\_107
- Track 7 : Kwobi\_74
- Track 8 : Sitar\_73, Barsten\_74, Kamashten\_72, Nordenberg\_72, Keitabear\_72, FuegoCuervo\_76, Sanjuju\_72, Thing3\_72, MoontowerMania\_73, McCrothy\_72, Brandonk123\_78, Shivanishola\_74, Brawn1\_71, Affeca\_74, Fosterous\_76, Lennon\_73, Angelicage\_72, Ailee\_71, Kewpiedoll\_72, Love\_78, Paries\_75, Fitzgerald\_72, ChadMasterC\_73, Sedona\_72, Jabberwocky\_72, Stultus\_69, Galadriel\_74, Bibwit\_72, McKinley\_75, Geodirt\_72
- Track 9 : Gustavo\_74, StorminNorm\_73, Baumdotcom\_70, Ashertheman\_72, Kroos\_72, Saronaya\_74, SchottB\_70, Baddon\_70, LilHam\_66, Gaea\_73
- Track 10 : JKSyngboy\_70
- Track 11 : Bizzy\_73, Tangerine\_73
- Track 12 : Ribeye\_72, Derg\_66, Stichling\_69, Flatwoods\_72, Tycho\_71
- Track 13 : YorkOnyx\_73
- Track 14 : BobBob\_74, Vivi2\_78, Charming\_77, Rofo\_74, Tangent\_76
- Track 15 : Birdsong\_70, Frickyeah\_77, Asapag\_71
- Track 16 : Whitney\_72, Budski\_77, Lucky10\_52, ShawBrad\_77
- Track 17 : BENtherdunthat\_75, Periwinkle\_81, Crater\_71, Leroy\_71, Apricot\_71, Phistory\_70, Kamaru\_68, Morkie\_54
- Track 18 : Kenna\_68, Getalong\_74, Lutum\_74
- Track 19 : Holliday\_76

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

The start number called the most often in the published annotations is 13, it was called in 52 of the 74 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Affeca\_74, Ailee\_71, Angelicage\_72, Ashertheman\_72, Baddon\_70, Barsten\_74, Baumdotcom\_70, Bibwit\_72, Bizzy\_73, BobBob\_74, Brandonk123\_78, Brawn1\_71, ChadMasterC\_73, Charming\_77, Derg\_66, Fitzgerald\_72, Flatwoods\_72, Fosterous\_76, FuegoCuervo\_76, Gaea\_73, Galadriel\_74, Geodirt\_72, Gustavo\_74, JKSyngboy\_70, Jabberwocky\_72, Kamashten\_72, Keitabear\_72, Kewpiedoll\_72, Kroos\_72, Kwobi\_74, Lennon\_73, LilHam\_66, Love\_78, McCrothy\_72, McKinley\_75, MoontowerMania\_73, Nordenberg\_72, Paries\_75, Ribeye\_72, Rofo\_74, Sanjuju\_72, Saronaya\_74, SchottB\_70, Sedona\_72, Shivanishola\_74, Sitar\_73, Stichling\_69, StorminNorm\_73, Stultus\_69, Tangent\_76, Tangerine\_73, Thing3\_72, Tycho\_71, Vivi2\_78, YorkOnyx\_73,

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

- 

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

- Apricot\_71, Asapag\_71, BENtherdunthat\_75, Birdsong\_70, Budski\_77, Cardigan\_107, Crater\_71, Frickyeah\_77, Getalong\_74, Holliday\_76, JonJames\_106, Kamaru\_68, Kenna\_68, Leroy\_71, Lton\_50, Lucky10\_52, Lutum\_74, Morkie\_54, OneDirection\_49, Pepperoni\_49, Periwinkle\_81, Phistory\_70, ShawBrad\_77, Whitney\_72, Yvonnestic\_103,

### Summary by start number:

Start 10:

- Found in 22 of 80 ( 27.5% ) of genes in pham
- Manual Annotations of this start: 20 of 74
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Apricot\_71 (DN3), Asapag\_71 (DN1), BENtherdunthat\_75 (DN1), Birdsong\_70 (DN), Budski\_77 (DN), Crater\_71 (DN3), Frickyeah\_77 (DN1), Getalong\_74 (DN1), Holliday\_76 (DN1), Kamaru\_68 (DN1), Kenna\_68 (DN1), Leroy\_71 (DN1), Lton\_50 (CZ), Lucky10\_52 (DH), Lutum\_74 (DN1), Morkie\_54 (DH), OneDirection\_49 (CZ6), Pepperoni\_49 (CZ), Periwinkle\_81 (DN1), Phistory\_70 (DN1), ShawBrad\_77 (DN1), Whitney\_72 (DN1),

Start 11:

- Found in 3 of 80 ( 3.8% ) of genes in pham
- Manual Annotations of this start: 2 of 74
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Cardigan\_107 (DD), JonJames\_106 (DD), Yvonnestic\_103 (DD),

Start 13:

- Found in 55 of 80 ( 68.8% ) of genes in pham
- Manual Annotations of this start: 52 of 74
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Affeca\_74 (DE1), Ailee\_71 (DE1), Angelicage\_72 (DE1), Ashertheman\_72 (DE1), Baddon\_70 (DE1), Barsten\_74 (DE1), Baumdotcom\_70 (DE1), Bibwit\_72 (DE1), Bizzy\_73 (DE1), BobBob\_74 (DE1), Brandonk123\_78 (DE1), Brawn1\_71 (DE1), ChadMasterC\_73 (DE1), Charming\_77 (DE1), Derg\_66 (DE1), Fitzgerald\_72 (DE1), Flatwoods\_72 (DE1), Fosterous\_76 (DE1), FuegoCuervo\_76 (DE1), Gaea\_73 (DE1), Galadriel\_74 (DE1), Geodirt\_72 (DE1), Gustavo\_74 (DE1), JKSyngboy\_70 (DE1), Jabberwocky\_72 (DE1), Kamashten\_72 (DE1), Keitabear\_72 (DE1), Kewpiedoll\_72 (DE1), Kroos\_72 (DE1),

Kwobi\_74 (DE1), Lennon\_73 (DE1), LilHam\_66 (DE1), Love\_78 (DE1), McCrothy\_72 (DE1), McKinley\_75 (DE1), MoontowerMania\_73 (DE1), Nordenberg\_72 (DE1), Paries\_75 (DE1), Ribeye\_72 (DE1), Rofo\_74 (DE1), Sanjuju\_72 (DE1), Saronaya\_74 (DE1), SchottB\_70 (DE1), Sedona\_72 (DE1), Shivanishola\_74 (DE1), Sitar\_73 (DE1), Stichling\_69 (DE1), StorminNorm\_73 (DE1), Stultus\_69 (DE1), Tangent\_76 (DE1), Tangerine\_73 (DE1), Thing3\_72 (DE1), Tycho\_71 (DE1), Vivi2\_78 (DE1), YorkOnyx\_73 (DE1),

### **Summary by clusters:**

There are 8 clusters represented in this pham: DN, DH, DE1, DD, CZ6, CZ, DN1, DN3,

Info for manual annotations of cluster CZ:

- Start number 10 was manually annotated 2 times for cluster CZ.

Info for manual annotations of cluster CZ6:

- Start number 10 was manually annotated 1 time for cluster CZ6.

Info for manual annotations of cluster DD:

- Start number 11 was manually annotated 2 times for cluster DD.

Info for manual annotations of cluster DE1:

- Start number 13 was manually annotated 52 times for cluster DE1.

Info for manual annotations of cluster DH:

- Start number 10 was manually annotated 2 times for cluster DH.

Info for manual annotations of cluster DN:

- Start number 10 was manually annotated 2 times for cluster DN.

Info for manual annotations of cluster DN1:

- Start number 10 was manually annotated 11 times for cluster DN1.

Info for manual annotations of cluster DN3:

- Start number 10 was manually annotated 2 times for cluster DN3.

### **Gene Information:**

Gene: Affeca\_74 Start: 55215, Stop: 55478, Start Num: 13

Candidate Starts for Affeca\_74:

(Start: 13 @55215 has 52 MA's), (16, 55257), (18, 55275), (23, 55347), (29, 55419), (30, 55428),

Gene: Ailee\_71 Start: 54203, Stop: 54466, Start Num: 13

Candidate Starts for Ailee\_71:

(Start: 13 @54203 has 52 MA's), (16, 54245), (18, 54263), (23, 54335), (29, 54407), (30, 54416),

Gene: Angelicage\_72 Start: 55142, Stop: 55405, Start Num: 13

Candidate Starts for Angelicage\_72:

(Start: 13 @55142 has 52 MA's), (16, 55184), (18, 55202), (23, 55274), (29, 55346), (30, 55355),

Gene: Apricot\_71 Start: 42366, Stop: 42629, Start Num: 10  
Candidate Starts for Apricot\_71:  
(Start: 10 @42366 has 20 MA's), (14, 42390), (18, 42444), (21, 42495), (23, 42516), (25, 42546), (28, 42576), (31, 42591), (32, 42594),

Gene: Asapag\_71 Start: 42662, Stop: 42931, Start Num: 10  
Candidate Starts for Asapag\_71:  
(Start: 10 @42662 has 20 MA's), (14, 42692), (18, 42746), (24, 42827), (27, 42869), (28, 42878), (31, 42893), (32, 42896),

Gene: Ashertheman\_72 Start: 53356, Stop: 53622, Start Num: 13  
Candidate Starts for Ashertheman\_72:  
(4, 53242), (Start: 13 @53356 has 52 MA's), (16, 53398), (18, 53416), (27, 53548), (29, 53560), (30, 53569),

Gene: BENtherdunthat\_75 Start: 43714, Stop: 43977, Start Num: 10  
Candidate Starts for BENtherdunthat\_75:  
(Start: 10 @43714 has 20 MA's), (14, 43738), (18, 43792), (21, 43843), (23, 43864), (25, 43894), (28, 43924), (31, 43939), (32, 43942),

Gene: Baddon\_70 Start: 54008, Stop: 54274, Start Num: 13  
Candidate Starts for Baddon\_70:  
(4, 53894), (Start: 13 @54008 has 52 MA's), (16, 54050), (18, 54068), (27, 54200), (29, 54212), (30, 54221),

Gene: Barsten\_74 Start: 54975, Stop: 55238, Start Num: 13  
Candidate Starts for Barsten\_74:  
(Start: 13 @54975 has 52 MA's), (16, 55017), (18, 55035), (23, 55107), (29, 55179), (30, 55188),

Gene: Baumdotcom\_70 Start: 53327, Stop: 53593, Start Num: 13  
Candidate Starts for Baumdotcom\_70:  
(4, 53213), (Start: 13 @53327 has 52 MA's), (16, 53369), (18, 53387), (27, 53519), (29, 53531), (30, 53540),

Gene: Bibwit\_72 Start: 53844, Stop: 54107, Start Num: 13  
Candidate Starts for Bibwit\_72:  
(Start: 13 @53844 has 52 MA's), (16, 53886), (18, 53904), (23, 53976), (29, 54048), (30, 54057),

Gene: Birdsong\_70 Start: 42398, Stop: 42667, Start Num: 10  
Candidate Starts for Birdsong\_70:  
(Start: 10 @42398 has 20 MA's), (14, 42428), (18, 42482), (24, 42563), (27, 42605), (28, 42614), (31, 42629), (32, 42632),

Gene: Bizzy\_73 Start: 53240, Stop: 53506, Start Num: 13  
Candidate Starts for Bizzy\_73:  
(1, 52979), (4, 53126), (Start: 13 @53240 has 52 MA's), (16, 53282), (18, 53300), (27, 53432), (29, 53444), (30, 53453),

Gene: BobBob\_74 Start: 54378, Stop: 54641, Start Num: 13  
Candidate Starts for BobBob\_74:  
(Start: 13 @54378 has 52 MA's), (16, 54420), (17, 54423), (18, 54438), (23, 54510), (29, 54582), (30, 54591),

Gene: Brandonk123\_78 Start: 54847, Stop: 55110, Start Num: 13  
Candidate Starts for Brandonk123\_78:  
(Start: 13 @54847 has 52 MA's), (16, 54889), (18, 54907), (23, 54979), (29, 55051), (30, 55060),

Gene: Brawn1\_71 Start: 53987, Stop: 54250, Start Num: 13  
Candidate Starts for Brawn1\_71:  
(Start: 13 @53987 has 52 MA's), (16, 54029), (18, 54047), (23, 54119), (29, 54191), (30, 54200),

Gene: Budski\_77 Start: 44519, Stop: 44788, Start Num: 10  
Candidate Starts for Budski\_77:  
(Start: 10 @44519 has 20 MA's), (14, 44549), (18, 44603), (21, 44654), (23, 44675), (25, 44705), (28, 44735), (31, 44750), (32, 44753),

Gene: Cardigan\_107 Start: 62658, Stop: 62927, Start Num: 11  
Candidate Starts for Cardigan\_107:  
(Start: 11 @62658 has 2 MA's), (15, 62685), (19, 62763), (20, 62769), (21, 62790), (27, 62862), (33, 62895),

Gene: ChadMasterC\_73 Start: 56203, Stop: 56466, Start Num: 13  
Candidate Starts for ChadMasterC\_73:  
(Start: 13 @56203 has 52 MA's), (16, 56245), (18, 56263), (23, 56335), (29, 56407), (30, 56416),

Gene: Charming\_77 Start: 54129, Stop: 54392, Start Num: 13  
Candidate Starts for Charming\_77:  
(Start: 13 @54129 has 52 MA's), (16, 54171), (17, 54174), (18, 54189), (23, 54261), (29, 54333), (30, 54342),

Gene: Crater\_71 Start: 42761, Stop: 43024, Start Num: 10  
Candidate Starts for Crater\_71:  
(Start: 10 @42761 has 20 MA's), (14, 42785), (18, 42839), (21, 42890), (23, 42911), (25, 42941), (28, 42971), (31, 42986), (32, 42989),

Gene: Derg\_66 Start: 52040, Stop: 52306, Start Num: 13  
Candidate Starts for Derg\_66:  
(1, 51779), (2, 51902), (4, 51926), (Start: 13 @52040 has 52 MA's), (16, 52082), (18, 52100), (27, 52232), (29, 52244), (30, 52253),

Gene: Fitzgerald\_72 Start: 54990, Stop: 55253, Start Num: 13  
Candidate Starts for Fitzgerald\_72:  
(Start: 13 @54990 has 52 MA's), (16, 55032), (18, 55050), (23, 55122), (29, 55194), (30, 55203),

Gene: Flatwoods\_72 Start: 52549, Stop: 52815, Start Num: 13  
Candidate Starts for Flatwoods\_72:  
(1, 52288), (2, 52411), (4, 52435), (Start: 13 @52549 has 52 MA's), (16, 52591), (18, 52609), (27, 52741), (29, 52753), (30, 52762),

Gene: Fosterous\_76 Start: 55123, Stop: 55386, Start Num: 13  
Candidate Starts for Fosterous\_76:  
(Start: 13 @55123 has 52 MA's), (16, 55165), (18, 55183), (23, 55255), (29, 55327), (30, 55336),

Gene: Frickyeah\_77 Start: 43797, Stop: 44066, Start Num: 10  
Candidate Starts for Frickyeah\_77:

(Start: 10 @43797 has 20 MA's), (14, 43827), (18, 43881), (24, 43962), (27, 44004), (28, 44013), (31, 44028), (32, 44031),

Gene: FuegoCuervo\_76 Start: 54577, Stop: 54840, Start Num: 13

Candidate Starts for FuegoCuervo\_76:

(Start: 13 @54577 has 52 MA's), (16, 54619), (18, 54637), (23, 54709), (29, 54781), (30, 54790),

Gene: Gaea\_73 Start: 53136, Stop: 53402, Start Num: 13

Candidate Starts for Gaea\_73:

(4, 53022), (Start: 13 @53136 has 52 MA's), (16, 53178), (18, 53196), (27, 53328), (29, 53340), (30, 53349),

Gene: Galadriel\_74 Start: 55083, Stop: 55346, Start Num: 13

Candidate Starts for Galadriel\_74:

(Start: 13 @55083 has 52 MA's), (16, 55125), (18, 55143), (23, 55215), (29, 55287), (30, 55296),

Gene: Geodirt\_72 Start: 55452, Stop: 55715, Start Num: 13

Candidate Starts for Geodirt\_72:

(Start: 13 @55452 has 52 MA's), (16, 55494), (18, 55512), (23, 55584), (29, 55656), (30, 55665),

Gene: Getalong\_74 Start: 44955, Stop: 45224, Start Num: 10

Candidate Starts for Getalong\_74:

(5, 44877), (Start: 10 @44955 has 20 MA's), (14, 44985), (18, 45039), (21, 45090), (23, 45111), (25, 45141), (28, 45171), (31, 45186), (32, 45189),

Gene: Gustavo\_74 Start: 54121, Stop: 54387, Start Num: 13

Candidate Starts for Gustavo\_74:

(4, 54007), (Start: 13 @54121 has 52 MA's), (16, 54163), (18, 54181), (27, 54313), (29, 54325), (30, 54334),

Gene: Holliday\_76 Start: 46772, Stop: 47032, Start Num: 10

Candidate Starts for Holliday\_76:

(Start: 10 @46772 has 20 MA's), (12, 46781), (14, 46793), (18, 46847), (24, 46928), (27, 46970), (28, 46979), (30, 46991), (31, 46994), (32, 46997),

Gene: JKSyngboy\_70 Start: 54029, Stop: 54295, Start Num: 13

Candidate Starts for JKSyngboy\_70:

(Start: 13 @54029 has 52 MA's), (16, 54071), (18, 54089), (27, 54221), (29, 54233), (30, 54242),

Gene: Jabberwocky\_72 Start: 55216, Stop: 55479, Start Num: 13

Candidate Starts for Jabberwocky\_72:

(Start: 13 @55216 has 52 MA's), (16, 55258), (18, 55276), (23, 55348), (29, 55420), (30, 55429),

Gene: JonJames\_106 Start: 63189, Stop: 63458, Start Num: 11

Candidate Starts for JonJames\_106:

(7, 63150), (8, 63174), (9, 63177), (Start: 11 @63189 has 2 MA's), (15, 63216), (19, 63294), (20, 63300),

Gene: Kamaru\_68 Start: 42281, Stop: 42544, Start Num: 10

Candidate Starts for Kamaru\_68:

(Start: 10 @42281 has 20 MA's), (14, 42305), (18, 42359), (21, 42410), (23, 42431), (25, 42461), (28, 42491), (31, 42506), (32, 42509),

Gene: Kamashten\_72 Start: 54209, Stop: 54472, Start Num: 13

Candidate Starts for Kamashten\_72:

(Start: 13 @54209 has 52 MA's), (16, 54251), (18, 54269), (23, 54341), (29, 54413), (30, 54422),

Gene: Keitabear\_72 Start: 55765, Stop: 56028, Start Num: 13

Candidate Starts for Keitabear\_72:

(Start: 13 @55765 has 52 MA's), (16, 55807), (18, 55825), (23, 55897), (29, 55969), (30, 55978),

Gene: Kenna\_68 Start: 42395, Stop: 42664, Start Num: 10

Candidate Starts for Kenna\_68:

(5, 42317), (Start: 10 @42395 has 20 MA's), (14, 42425), (18, 42479), (21, 42530), (23, 42551), (25, 42581), (28, 42611), (31, 42626), (32, 42629),

Gene: Kewpiedoll\_72 Start: 55139, Stop: 55402, Start Num: 13

Candidate Starts for Kewpiedoll\_72:

(Start: 13 @55139 has 52 MA's), (16, 55181), (18, 55199), (23, 55271), (29, 55343), (30, 55352),

Gene: Kroos\_72 Start: 53675, Stop: 53941, Start Num: 13

Candidate Starts for Kroos\_72:

(4, 53561), (Start: 13 @53675 has 52 MA's), (16, 53717), (18, 53735), (27, 53867), (29, 53879), (30, 53888),

Gene: Kwobi\_74 Start: 53940, Stop: 54206, Start Num: 13

Candidate Starts for Kwobi\_74:

(2, 53802), (4, 53826), (Start: 13 @53940 has 52 MA's), (16, 53982), (18, 54000), (27, 54132), (29, 54144), (30, 54153),

Gene: Lennon\_73 Start: 55866, Stop: 56129, Start Num: 13

Candidate Starts for Lennon\_73:

(Start: 13 @55866 has 52 MA's), (16, 55908), (18, 55926), (23, 55998), (29, 56070), (30, 56079),

Gene: Leroy\_71 Start: 42697, Stop: 42960, Start Num: 10

Candidate Starts for Leroy\_71:

(Start: 10 @42697 has 20 MA's), (14, 42721), (18, 42775), (21, 42826), (23, 42847), (25, 42877), (28, 42907), (31, 42922), (32, 42925),

Gene: LilHam\_66 Start: 51022, Stop: 51288, Start Num: 13

Candidate Starts for LilHam\_66:

(4, 50908), (Start: 13 @51022 has 52 MA's), (16, 51064), (18, 51082), (27, 51214), (29, 51226), (30, 51235),

Gene: Love\_78 Start: 55608, Stop: 55871, Start Num: 13

Candidate Starts for Love\_78:

(Start: 13 @55608 has 52 MA's), (16, 55650), (18, 55668), (23, 55740), (29, 55812), (30, 55821),

Gene: Lton\_50 Start: 32177, Stop: 32449, Start Num: 10

Candidate Starts for Lton\_50:

(5, 32099), (Start: 10 @32177 has 20 MA's), (14, 32207), (18, 32261), (22, 32324), (23, 32333), (26, 32375), (27, 32384), (28, 32393), (32, 32411),

Gene: Lucky10\_52 Start: 35182, Stop: 35445, Start Num: 10

Candidate Starts for Lucky10\_52:

(Start: 10 @35182 has 20 MA's), (14, 35206), (18, 35260), (21, 35311), (23, 35332), (25, 35362), (28, 35392), (31, 35407), (32, 35410),

Gene: Lutum\_74 Start: 43558, Stop: 43827, Start Num: 10

Candidate Starts for Lutum\_74:

(5, 43480), (Start: 10 @43558 has 20 MA's), (14, 43588), (18, 43642), (21, 43693), (23, 43714), (25, 43744), (28, 43774), (31, 43789), (32, 43792),

Gene: McCrothy\_72 Start: 55649, Stop: 55912, Start Num: 13

Candidate Starts for McCrothy\_72:

(Start: 13 @55649 has 52 MA's), (16, 55691), (18, 55709), (23, 55781), (29, 55853), (30, 55862),

Gene: McKinley\_75 Start: 54726, Stop: 54989, Start Num: 13

Candidate Starts for McKinley\_75:

(Start: 13 @54726 has 52 MA's), (16, 54768), (18, 54786), (23, 54858), (29, 54930), (30, 54939),

Gene: MoontowerMania\_73 Start: 55562, Stop: 55825, Start Num: 13

Candidate Starts for MoontowerMania\_73:

(Start: 13 @55562 has 52 MA's), (16, 55604), (18, 55622), (23, 55694), (29, 55766), (30, 55775),

Gene: Morkie\_54 Start: 34409, Stop: 34672, Start Num: 10

Candidate Starts for Morkie\_54:

(Start: 10 @34409 has 20 MA's), (14, 34433), (18, 34487), (21, 34538), (23, 34559), (25, 34589), (28, 34619), (31, 34634), (32, 34637),

Gene: Nordenberg\_72 Start: 53789, Stop: 54052, Start Num: 13

Candidate Starts for Nordenberg\_72:

(Start: 13 @53789 has 52 MA's), (16, 53831), (18, 53849), (23, 53921), (29, 53993), (30, 54002),

Gene: OneDirection\_49 Start: 32104, Stop: 32367, Start Num: 10

Candidate Starts for OneDirection\_49:

(Start: 10 @32104 has 20 MA's), (14, 32128), (18, 32182), (24, 32263), (27, 32305), (28, 32314), (30, 32326), (31, 32329), (32, 32332),

Gene: Paries\_75 Start: 55227, Stop: 55490, Start Num: 13

Candidate Starts for Paries\_75:

(Start: 13 @55227 has 52 MA's), (16, 55269), (18, 55287), (23, 55359), (29, 55431), (30, 55440),

Gene: Pepperoni\_49 Start: 33565, Stop: 33828, Start Num: 10

Candidate Starts for Pepperoni\_49:

(Start: 10 @33565 has 20 MA's), (14, 33589), (18, 33643), (24, 33724), (27, 33766), (28, 33775), (31, 33790), (32, 33793),

Gene: Periwinkle\_81 Start: 45861, Stop: 46124, Start Num: 10

Candidate Starts for Periwinkle\_81:

(Start: 10 @45861 has 20 MA's), (14, 45885), (18, 45939), (21, 45990), (23, 46011), (25, 46041), (28, 46071), (31, 46086), (32, 46089),

Gene: Phistory\_70 Start: 41926, Stop: 42189, Start Num: 10

Candidate Starts for Phistory\_70:

(Start: 10 @41926 has 20 MA's), (14, 41950), (18, 42004), (21, 42055), (23, 42076), (25, 42106), (28, 42136), (31, 42151), (32, 42154),

Gene: Ribeye\_72 Start: 53279, Stop: 53545, Start Num: 13

Candidate Starts for Ribeye\_72:

(1, 53018), (2, 53141), (4, 53165), (Start: 13 @53279 has 52 MA's), (16, 53321), (18, 53339), (27, 53471), (29, 53483), (30, 53492),

Gene: Rofo\_74 Start: 54705, Stop: 54968, Start Num: 13

Candidate Starts for Rofo\_74:

(Start: 13 @54705 has 52 MA's), (16, 54747), (17, 54750), (18, 54765), (23, 54837), (29, 54909), (30, 54918),

Gene: Sanjuju\_72 Start: 55080, Stop: 55343, Start Num: 13

Candidate Starts for Sanjuju\_72:

(Start: 13 @55080 has 52 MA's), (16, 55122), (18, 55140), (23, 55212), (29, 55284), (30, 55293),

Gene: Saronaya\_74 Start: 54121, Stop: 54387, Start Num: 13

Candidate Starts for Saronaya\_74:

(4, 54007), (Start: 13 @54121 has 52 MA's), (16, 54163), (18, 54181), (27, 54313), (29, 54325), (30, 54334),

Gene: SchottB\_70 Start: 53742, Stop: 54008, Start Num: 13

Candidate Starts for SchottB\_70:

(4, 53628), (Start: 13 @53742 has 52 MA's), (16, 53784), (18, 53802), (27, 53934), (29, 53946), (30, 53955),

Gene: Sedona\_72 Start: 55650, Stop: 55913, Start Num: 13

Candidate Starts for Sedona\_72:

(Start: 13 @55650 has 52 MA's), (16, 55692), (18, 55710), (23, 55782), (29, 55854), (30, 55863),

Gene: ShawBrad\_77 Start: 43319, Stop: 43582, Start Num: 10

Candidate Starts for ShawBrad\_77:

(Start: 10 @43319 has 20 MA's), (14, 43343), (18, 43397), (21, 43448), (23, 43469), (25, 43499), (28, 43529), (31, 43544), (32, 43547),

Gene: Shivanishola\_74 Start: 53430, Stop: 53693, Start Num: 13

Candidate Starts for Shivanishola\_74:

(Start: 13 @53430 has 52 MA's), (16, 53472), (18, 53490), (23, 53562), (29, 53634), (30, 53643),

Gene: Sitar\_73 Start: 55624, Stop: 55887, Start Num: 13

Candidate Starts for Sitar\_73:

(Start: 13 @55624 has 52 MA's), (16, 55666), (18, 55684), (23, 55756), (29, 55828), (30, 55837),

Gene: Stichling\_69 Start: 52869, Stop: 53135, Start Num: 13

Candidate Starts for Stichling\_69:

(1, 52608), (2, 52731), (4, 52755), (Start: 13 @52869 has 52 MA's), (16, 52911), (18, 52929), (27, 53061), (29, 53073), (30, 53082),

Gene: StorminNorm\_73 Start: 53909, Stop: 54175, Start Num: 13

Candidate Starts for StorminNorm\_73:

(4, 53795), (Start: 13 @53909 has 52 MA's), (16, 53951), (18, 53969), (27, 54101), (29, 54113), (30, 54122),

Gene: Stultus\_69 Start: 53871, Stop: 54134, Start Num: 13

Candidate Starts for Stultus\_69:

(Start: 13 @53871 has 52 MA's), (16, 53913), (18, 53931), (23, 54003), (29, 54075), (30, 54084),

Gene: Tangent\_76 Start: 54410, Stop: 54673, Start Num: 13

Candidate Starts for Tangent\_76:

(Start: 13 @54410 has 52 MA's), (16, 54452), (17, 54455), (18, 54470), (23, 54542), (29, 54614), (30, 54623),

Gene: Tangerine\_73 Start: 53415, Stop: 53681, Start Num: 13

Candidate Starts for Tangerine\_73:

(1, 53154), (4, 53301), (Start: 13 @53415 has 52 MA's), (16, 53457), (18, 53475), (27, 53607), (29, 53619), (30, 53628),

Gene: Thing3\_72 Start: 54209, Stop: 54472, Start Num: 13

Candidate Starts for Thing3\_72:

(Start: 13 @54209 has 52 MA's), (16, 54251), (18, 54269), (23, 54341), (29, 54413), (30, 54422),

Gene: Tycho\_71 Start: 53228, Stop: 53494, Start Num: 13

Candidate Starts for Tycho\_71:

(1, 52967), (2, 53090), (4, 53114), (Start: 13 @53228 has 52 MA's), (16, 53270), (18, 53288), (27, 53420), (29, 53432), (30, 53441),

Gene: Vivi2\_78 Start: 55466, Stop: 55729, Start Num: 13

Candidate Starts for Vivi2\_78:

(Start: 13 @55466 has 52 MA's), (16, 55508), (17, 55511), (18, 55526), (23, 55598), (29, 55670), (30, 55679),

Gene: Whitney\_72 Start: 44432, Stop: 44701, Start Num: 10

Candidate Starts for Whitney\_72:

(Start: 10 @44432 has 20 MA's), (14, 44462), (18, 44516), (21, 44567), (23, 44588), (25, 44618), (28, 44648), (31, 44663), (32, 44666),

Gene: YorkOnyx\_73 Start: 53429, Stop: 53695, Start Num: 13

Candidate Starts for YorkOnyx\_73:

(4, 53315), (6, 53348), (Start: 13 @53429 has 52 MA's), (16, 53471), (18, 53489), (29, 53633), (30, 53642),

Gene: Yvonnetastic\_103 Start: 60354, Stop: 60623, Start Num: 11

Candidate Starts for Yvonnetastic\_103:

(3, 60249), (Start: 11 @60354 has 2 MA's), (15, 60381), (19, 60459), (20, 60465),