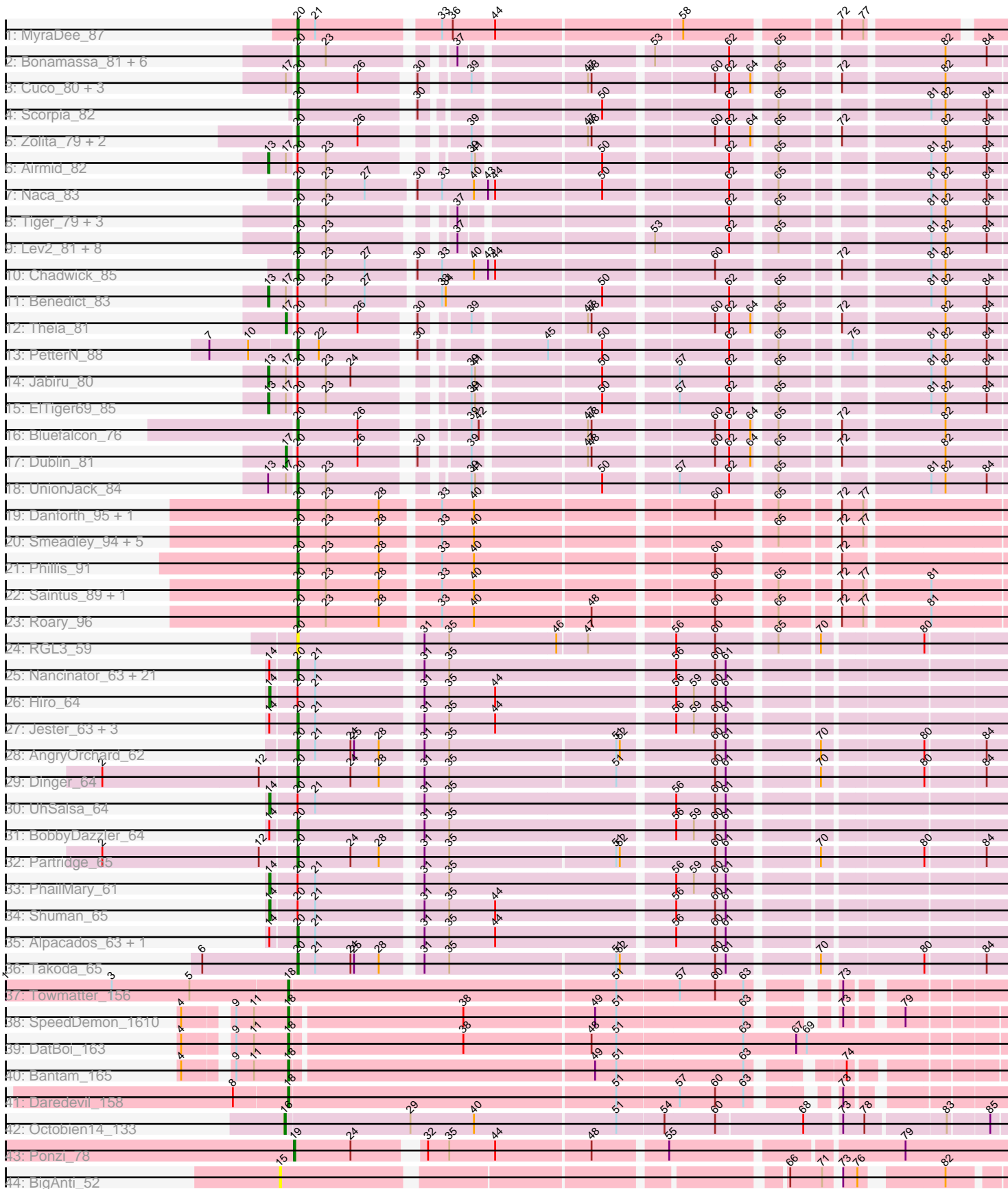


Pham 308384



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 308384 Report

This analysis was run 06/27/26 on database version 652.

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

Pham number 308384 has 98 members, 5 are drafts.

Phages represented in each track:

- Track 1 : MyraDee\_87
- Track 2 : Bonamassa\_81, Micasa\_82, George\_75, HuhtaEnerson15\_79, LittleCherry\_79, Milcery\_79, Tarynearal\_81
- Track 3 : Cuco\_80, MarysWell\_81, Coog\_78, Midas2\_78
- Track 4 : Scorpia\_82
- Track 5 : Zolita\_79, Ghoulboy\_81, SydNat\_80
- Track 6 : Airmid\_82
- Track 7 : Naca\_83
- Track 8 : Tiger\_79, Phlorence\_79, AgentM\_80, Conspiracy\_81
- Track 9 : Lev2\_81, PickleBack\_82, ForGetIt\_82, Twigg\_81, Jovo\_79, Florence1\_79, Discoknowium\_78, Prinash11\_80, Aragog\_81
- Track 10 : Chadwick\_85
- Track 11 : Benedict\_83
- Track 12 : Theia\_81
- Track 13 : PetterN\_88
- Track 14 : Jabiru\_80
- Track 15 : EITiger69\_85
- Track 16 : Bluefalcon\_76
- Track 17 : Dublin\_81
- Track 18 : UnionJack\_84
- Track 19 : Danforth\_95, Stephig9\_95
- Track 20 : Smeadley\_94, Expelliarmus\_91, Dixon\_93, Caitlin\_93, Groundhog\_91, Astro\_93
- Track 21 : Phillis\_91
- Track 22 : Saintus\_89, NearlyHeadless\_95
- Track 23 : Roary\_96
- Track 24 : RGL3\_59
- Track 25 : Nancinator\_63, RexFury\_63, Espica\_65, Naiad\_63, Gollum\_64, Bonanza\_65, Belenaria\_65, Natosaleda\_63, Alatin\_63, Bradshaw\_64, Rasputin\_64, Swann\_64, RER2\_58, CosmicSans\_64, Rhodalysa\_64, Krishelle\_64, TWAMP\_64, Yogi\_65, StCroix\_63, AppleCloud\_61, Lillie\_64, Erik\_64
- Track 26 : Hiro\_64
- Track 27 : Jester\_63, Yoncess\_63, Harlequin\_64, Bryce\_63

- Track 28 : AngryOrchard\_62
- Track 29 : Dinger\_64
- Track 30 : UhSalsa\_64
- Track 31 : BobbyDazzler\_64
- Track 32 : Partridge\_65
- Track 33 : PhailMary\_61
- Track 34 : Shuman\_65
- Track 35 : Alpacados\_63, Phrankenstein\_64
- Track 36 : Takoda\_65
- Track 37 : Towmatter\_156
- Track 38 : SpeedDemon\_1610
- Track 39 : DatBoi\_163
- Track 40 : Bantam\_165
- Track 41 : Daredevil\_158
- Track 42 : Octobien14\_133
- Track 43 : Ponzi\_78
- Track 44 : BigAnti\_52

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

The start number called the most often in the published annotations is 20, it was called in 76 of the 93 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- AgentM\_80, Alatin\_63, Alpacados\_63, AngryOrchard\_62, AppleCloud\_61, Aragog\_81, Astro\_93, Belenaria\_65, Bluefalcon\_76, BobbyDazzler\_64, Bonamassa\_81, Bonanza\_65, Bradshaw\_64, Bryce\_63, Caitlin\_93, Chadwick\_85, Conspiracy\_81, Coog\_78, CosmicSans\_64, Cuco\_80, Danforth\_95, Dinger\_64, Discoknowium\_78, Dixon\_93, Erik\_64, Espica\_65, Expelliarmus\_91, Florence1\_79, ForGetIt\_82, George\_75, Ghoulboy\_81, Gollum\_64, Groundhog\_91, Harlequin\_64, HuhtaEnerson15\_79, Jester\_63, Jovo\_79, Krishelle\_64, Lev2\_81, Lillie\_64, LittleCherry\_79, MarysWell\_81, Micasa\_82, Midas2\_78, Milcery\_79, MyraDee\_87, Naca\_83, Naiad\_63, Nancinator\_63, Natosaleda\_63, NearlyHeadless\_95, Partridge\_65, PetterN\_88, Phillis\_91, Phlorence\_79, Phrankenstein\_64, PickleBack\_82, Prinashe11\_80, RER2\_58, RGL3\_59, Rasputin\_64, RexFury\_63, Rhodalysa\_64, Roary\_96, Saintus\_89, Scorpia\_82, Smeadley\_94, StCroix\_63, Stephig9\_95, Swann\_64, SydNat\_80, TWAMP\_64, Takoda\_65, Tarynearal\_81, Tiger\_79, Twigg\_81, UnionJack\_84, Yogi\_65, Yoncess\_63, Zolita\_79,

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

- Airmid\_82, Benedict\_83, Dublin\_81, ElTiger69\_85, Hiro\_64, Jabiru\_80, PhailMary\_61, Shuman\_65, Theia\_81, UhSalsa\_64,

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

- Bantam\_165, BigAnti\_52, Daredevil\_158, DatBoi\_163, Octobien14\_133, Ponzi\_78, SpeedDemon\_1610, Towmatter\_156,

**Summary by start number:**

Start 13:

- Found in 5 of 98 ( 5.1% ) of genes in pham
- Manual Annotations of this start: 4 of 93
- Called 80.0% of time when present
- Phage (with cluster) where this start called: Airmid\_82 (A5), Benedict\_83 (A5), EITiger69\_85 (A5), Jabiru\_80 (A5),

Start 14:

- Found in 33 of 98 ( 33.7% ) of genes in pham
- Manual Annotations of this start: 4 of 93
- Called 12.1% of time when present
- Phage (with cluster) where this start called: Hiro\_64 (CA), PhailMary\_61 (CA), Shuman\_65 (CA), UhSalsa\_64 (CA),

Start 15:

- Found in 1 of 98 ( 1.0% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: BigAnti\_52 (singleton),

Start 16:

- Found in 1 of 98 ( 1.0% ) of genes in pham
- Manual Annotations of this start: 1 of 93
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Octobien14\_133 (DU1),

Start 17:

- Found in 11 of 98 ( 11.2% ) of genes in pham
- Manual Annotations of this start: 2 of 93
- Called 18.2% of time when present
- Phage (with cluster) where this start called: Dublin\_81 (A5), Theia\_81 (A5),

Start 18:

- Found in 5 of 98 ( 5.1% ) of genes in pham
- Manual Annotations of this start: 5 of 93
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Bantam\_165 (DL), Daredevil\_158 (DL), DatBoi\_163 (DL), SpeedDemon\_1610 (DL), Towmatter\_156 (DL),

Start 19:

- Found in 1 of 98 ( 1.0% ) of genes in pham
- Manual Annotations of this start: 1 of 93
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Ponzi\_78 (singleton),

Start 20:

- Found in 90 of 98 ( 91.8% ) of genes in pham
- Manual Annotations of this start: 76 of 93
- Called 88.9% of time when present
- Phage (with cluster) where this start called: AgentM\_80 (A5), Alatin\_63 (CA), Alpacados\_63 (CA), AngryOrchard\_62 (CA), AppleCloud\_61 (CA), Aragog\_81 (A5), Astro\_93 (A8), Belenaria\_65 (CA), Bluefalcon\_76 (A5), BobbyDazzler\_64 (CA), Bonamassa\_81 (A5), Bonanza\_65 (CA), Bradshaw\_64 (CA), Bryce\_63 (CA), Caitlin\_93 (A8), Chadwick\_85 (A5), Conspiracy\_81 (A5), Coog\_78 (A5),

CosmicSans\_64 (CA), Cuco\_80 (A5), Danforth\_95 (A8), Dinger\_64 (CA), Discoknowium\_78 (A5), Dixon\_93 (A8), Erik\_64 (CA), Espica\_65 (CA), Expelliarmus\_91 (A8), Florence1\_79 (A5), ForGetIt\_82 (A5), George\_75 (A5), Ghoulboy\_81 (A5), Gollum\_64 (CA), Groundhog\_91 (A8), Harlequin\_64 (CA), HuhtaEnerson15\_79 (A5), Jester\_63 (CA), Jovo\_79 (A5), Krishelle\_64 (CA), Lev2\_81 (A5), Lillie\_64 (CA), LittleCherry\_79 (A5), MarysWell\_81 (A5), Micasa\_82 (A5), Midas2\_78 (A5), Milcery\_79 (A5), MyraDee\_87 (A18), Naca\_83 (A5), Naiad\_63 (CA), Nancinator\_63 (CA), Natosaleda\_63 (CA), NearlyHeadless\_95 (A8), Partridge\_65 (CA), PetterN\_88 (A5), Phillis\_91 (A8), Phlorence\_79 (A5), Phrankenstien\_64 (CA), PickleBack\_82 (A5), Prinash11\_80 (A5), RER2\_58 (CA), RGL3\_59 (CA), Rasputin\_64 (CA), RexFury\_63 (CA), Rhodalysa\_64 (CA), Roary\_96 (A8), Saintus\_89 (A8), Scorpia\_82 (A5), Smeadley\_94 (A8), StCroix\_63 (CA), StepHig9\_95 (A8), Swann\_64 (CA), SydNat\_80 (A5), TWAMP\_64 (CA), Takoda\_65 (CA), Tarynearl\_81 (A5), Tiger\_79 (A5), Twigg\_81 (A5), UnionJack\_84 (A5), Yogi\_65 (CA), Yoncess\_63 (CA), Zolita\_79 (A5),

### **Summary by clusters:**

There are 7 clusters represented in this pham: DL, CA, A18, A5, DU1, A8, singleton,

Info for manual annotations of cluster A18:

- Start number 20 was manually annotated 1 time for cluster A18.

Info for manual annotations of cluster A5:

- Start number 13 was manually annotated 4 times for cluster A5.
- Start number 17 was manually annotated 2 times for cluster A5.
- Start number 20 was manually annotated 31 times for cluster A5.

Info for manual annotations of cluster A8:

- Start number 20 was manually annotated 12 times for cluster A8.

Info for manual annotations of cluster CA:

- Start number 14 was manually annotated 4 times for cluster CA.
- Start number 20 was manually annotated 32 times for cluster CA.

Info for manual annotations of cluster DL:

- Start number 18 was manually annotated 5 times for cluster DL.

Info for manual annotations of cluster DU1:

- Start number 16 was manually annotated 1 time for cluster DU1.

### **Gene Information:**

Gene: AgentM\_80 Start: 46929, Stop: 46414, Start Num: 20

Candidate Starts for AgentM\_80:

(Start: 20 @46929 has 76 MA's), (23, 46905), (37, 46818), (62, 46614), (65, 46581), (81, 46476), (82, 46464), (84, 46431),

Gene: Airmid\_82 Start: 47299, Stop: 46763, Start Num: 13

Candidate Starts for Airmid\_82:

(Start: 13 @47299 has 4 MA's), (Start: 17 @47284 has 2 MA's), (Start: 20 @47278 has 76 MA's), (23, 47254), (39, 47158), (41, 47155), (50, 47059), (62, 46963), (65, 46930), (81, 46825), (82, 46813), (84, 46780),

Gene: Alatin\_63 Start: 43109, Stop: 42558, Start Num: 20

Candidate Starts for Alatin\_63:

(Start: 14 @43130 has 4 MA's), (Start: 20 @43109 has 76 MA's), (21, 43094), (31, 43013), (35, 42992), (56, 42809), (60, 42776), (61, 42767),

Gene: Alpacados\_63 Start: 42932, Stop: 42381, Start Num: 20

Candidate Starts for Alpacados\_63:

(Start: 14 @42953 has 4 MA's), (Start: 20 @42932 has 76 MA's), (21, 42917), (31, 42836), (35, 42815), (44, 42776), (56, 42632), (60, 42599), (61, 42590),

Gene: AngryOrchard\_62 Start: 43154, Stop: 42606, Start Num: 20

Candidate Starts for AngryOrchard\_62:

(Start: 20 @43154 has 76 MA's), (21, 43139), (24, 43109), (25, 43106), (28, 43085), (31, 43058), (35, 43037), (51, 42899), (52, 42896), (60, 42824), (61, 42815), (70, 42749), (80, 42671), (84, 42623),

Gene: AppleCloud\_61 Start: 42826, Stop: 42275, Start Num: 20

Candidate Starts for AppleCloud\_61:

(Start: 14 @42847 has 4 MA's), (Start: 20 @42826 has 76 MA's), (21, 42811), (31, 42730), (35, 42709), (56, 42526), (60, 42493), (61, 42484),

Gene: Aragog\_81 Start: 47226, Stop: 46711, Start Num: 20

Candidate Starts for Aragog\_81:

(Start: 20 @47226 has 76 MA's), (23, 47202), (37, 47115), (53, 46971), (62, 46911), (65, 46878), (81, 46773), (82, 46761), (84, 46728),

Gene: Astro\_93 Start: 48792, Stop: 48250, Start Num: 20

Candidate Starts for Astro\_93:

(Start: 20 @48792 has 76 MA's), (23, 48768), (28, 48723), (33, 48678), (40, 48651), (65, 48417), (72, 48378), (77, 48360),

Gene: Bantam\_165 Start: 88764, Stop: 88222, Start Num: 18

Candidate Starts for Bantam\_165:

(4, 88839), (9, 88806), (11, 88791), (Start: 18 @88764 has 5 MA's), (49, 88515), (51, 88497), (63, 88392), (74, 88332),

Gene: Belenaria\_65 Start: 42974, Stop: 42423, Start Num: 20

Candidate Starts for Belenaria\_65:

(Start: 14 @42995 has 4 MA's), (Start: 20 @42974 has 76 MA's), (21, 42959), (31, 42878), (35, 42857), (56, 42674), (60, 42641), (61, 42632),

Gene: Benedict\_83 Start: 47142, Stop: 46579, Start Num: 13

Candidate Starts for Benedict\_83:

(Start: 13 @47142 has 4 MA's), (Start: 17 @47127 has 2 MA's), (Start: 20 @47121 has 76 MA's), (23, 47097), (27, 47064), (33, 47007), (34, 47004), (50, 46875), (62, 46779), (65, 46746), (81, 46641), (82, 46629), (84, 46596),

Gene: BigAnti\_52 Start: 45315, Stop: 45842, Start Num: 15

Candidate Starts for BigAnti\_52:

(15, 45315), (66, 45696), (71, 45723), (73, 45732), (76, 45744), (82, 45801),

Gene: Bluefalcon\_76 Start: 47511, Stop: 46996, Start Num: 20

Candidate Starts for Bluefalcon\_76:

(Start: 20 @47511 has 76 MA's), (26, 47460), (39, 47391), (42, 47385), (47, 47304), (48, 47301), (60, 47208), (62, 47196), (64, 47178), (65, 47163), (72, 47124), (82, 47046),

Gene: BobbyDazzler\_64 Start: 43080, Stop: 42529, Start Num: 20

Candidate Starts for BobbyDazzler\_64:

(Start: 14 @43101 has 4 MA's), (Start: 20 @43080 has 76 MA's), (31, 42984), (35, 42963), (56, 42780), (59, 42765), (60, 42747), (61, 42738),

Gene: Bonamassa\_81 Start: 47268, Stop: 46753, Start Num: 20

Candidate Starts for Bonamassa\_81:

(Start: 20 @47268 has 76 MA's), (23, 47244), (37, 47157), (53, 47013), (62, 46953), (65, 46920), (82, 46803), (84, 46770),

Gene: Bonanza\_65 Start: 43384, Stop: 42833, Start Num: 20

Candidate Starts for Bonanza\_65:

(Start: 14 @43405 has 4 MA's), (Start: 20 @43384 has 76 MA's), (21, 43369), (31, 43288), (35, 43267), (56, 43084), (60, 43051), (61, 43042),

Gene: Bradshaw\_64 Start: 43042, Stop: 42491, Start Num: 20

Candidate Starts for Bradshaw\_64:

(Start: 14 @43063 has 4 MA's), (Start: 20 @43042 has 76 MA's), (21, 43027), (31, 42946), (35, 42925), (56, 42742), (60, 42709), (61, 42700),

Gene: Bryce\_63 Start: 42788, Stop: 42237, Start Num: 20

Candidate Starts for Bryce\_63:

(Start: 14 @42809 has 4 MA's), (Start: 20 @42788 has 76 MA's), (21, 42773), (31, 42692), (35, 42671), (44, 42632), (56, 42488), (59, 42473), (60, 42455), (61, 42446),

Gene: Caitlin\_93 Start: 48484, Stop: 47942, Start Num: 20

Candidate Starts for Caitlin\_93:

(Start: 20 @48484 has 76 MA's), (23, 48460), (28, 48415), (33, 48370), (40, 48343), (65, 48109), (72, 48070), (77, 48052),

Gene: Chadwick\_85 Start: 47186, Stop: 46644, Start Num: 20

Candidate Starts for Chadwick\_85:

(Start: 20 @47186 has 76 MA's), (23, 47162), (27, 47129), (30, 47093), (33, 47072), (40, 47045), (43, 47033), (44, 47027), (60, 46856), (72, 46772), (81, 46706), (82, 46694),

Gene: Conspiracy\_81 Start: 47169, Stop: 46654, Start Num: 20

Candidate Starts for Conspiracy\_81:

(Start: 20 @47169 has 76 MA's), (23, 47145), (37, 47058), (62, 46854), (65, 46821), (81, 46716), (82, 46704), (84, 46671),

Gene: Coog\_78 Start: 47307, Stop: 46792, Start Num: 20

Candidate Starts for Coog\_78:

(Start: 17 @47313 has 2 MA's), (Start: 20 @47307 has 76 MA's), (26, 47256), (30, 47220), (39, 47187), (47, 47100), (48, 47097), (60, 47004), (62, 46992), (64, 46974), (65, 46959), (72, 46920), (82, 46842),

Gene: CosmicSans\_64 Start: 43033, Stop: 42482, Start Num: 20

Candidate Starts for CosmicSans\_64:

(Start: 14 @43054 has 4 MA's), (Start: 20 @43033 has 76 MA's), (21, 43018), (31, 42937), (35, 42916), (56, 42733), (60, 42700), (61, 42691),

Gene: Cuco\_80 Start: 47167, Stop: 46652, Start Num: 20

Candidate Starts for Cuco\_80:

(Start: 17 @47173 has 2 MA's), (Start: 20 @47167 has 76 MA's), (26, 47116), (30, 47080), (39, 47047), (47, 46960), (48, 46957), (60, 46864), (62, 46852), (64, 46834), (65, 46819), (72, 46780), (82, 46702),

Gene: Danforth\_95 Start: 48946, Stop: 48404, Start Num: 20

Candidate Starts for Danforth\_95:

(Start: 20 @48946 has 76 MA's), (23, 48922), (28, 48877), (33, 48832), (40, 48805), (60, 48616), (65, 48571), (72, 48532), (77, 48514),

Gene: Daredevil\_158 Start: 85762, Stop: 85220, Start Num: 18

Candidate Starts for Daredevil\_158:

(8, 85807), (Start: 18 @85762 has 5 MA's), (51, 85489), (57, 85438), (60, 85408), (63, 85384), (73, 85333),

Gene: DatBoi\_163 Start: 88717, Stop: 88133, Start Num: 18

Candidate Starts for DatBoi\_163:

(4, 88792), (9, 88759), (11, 88744), (Start: 18 @88717 has 5 MA's), (38, 88576), (48, 88471), (51, 88450), (63, 88345), (67, 88300), (69, 88291),

Gene: Dinger\_64 Start: 43172, Stop: 42624, Start Num: 20

Candidate Starts for Dinger\_64:

(2, 43334), (12, 43202), (Start: 20 @43172 has 76 MA's), (24, 43127), (28, 43103), (31, 43076), (35, 43055), (51, 42917), (60, 42842), (61, 42833), (70, 42767), (80, 42689), (84, 42641),

Gene: Discoknowium\_78 Start: 46686, Stop: 46171, Start Num: 20

Candidate Starts for Discoknowium\_78:

(Start: 20 @46686 has 76 MA's), (23, 46662), (37, 46575), (53, 46431), (62, 46371), (65, 46338), (81, 46233), (82, 46221), (84, 46188),

Gene: Dixon\_93 Start: 48351, Stop: 47809, Start Num: 20

Candidate Starts for Dixon\_93:

(Start: 20 @48351 has 76 MA's), (23, 48327), (28, 48282), (33, 48237), (40, 48210), (65, 47976), (72, 47937), (77, 47919),

Gene: Dublin\_81 Start: 47445, Stop: 46924, Start Num: 17

Candidate Starts for Dublin\_81:

(Start: 17 @47445 has 2 MA's), (Start: 20 @47439 has 76 MA's), (26, 47388), (30, 47352), (39, 47319), (47, 47232), (48, 47229), (60, 47136), (62, 47124), (64, 47106), (65, 47091), (72, 47052), (82, 46974),

Gene: EITiger69\_85 Start: 47563, Stop: 47027, Start Num: 13

Candidate Starts for EITiger69\_85:

(Start: 13 @47563 has 4 MA's), (Start: 17 @47548 has 2 MA's), (Start: 20 @47542 has 76 MA's), (23, 47518), (39, 47422), (41, 47419), (50, 47323), (57, 47269), (62, 47227), (65, 47194), (81, 47089), (82, 47077), (84, 47044),

Gene: Erik\_64 Start: 42864, Stop: 42313, Start Num: 20

Candidate Starts for Erik\_64:

(Start: 14 @42885 has 4 MA's), (Start: 20 @42864 has 76 MA's), (21, 42849), (31, 42768), (35, 42747), (56, 42564), (60, 42531), (61, 42522),

Gene: Espica\_65 Start: 42974, Stop: 42423, Start Num: 20

Candidate Starts for Espica\_65:

(Start: 14 @42995 has 4 MA's), (Start: 20 @42974 has 76 MA's), (21, 42959), (31, 42878), (35, 42857), (56, 42674), (60, 42641), (61, 42632),

Gene: Expelliarmus\_91 Start: 48565, Stop: 48023, Start Num: 20

Candidate Starts for Expelliarmus\_91:

(Start: 20 @48565 has 76 MA's), (23, 48541), (28, 48496), (33, 48451), (40, 48424), (65, 48190), (72, 48151), (77, 48133),

Gene: Florence1\_79 Start: 47057, Stop: 46542, Start Num: 20

Candidate Starts for Florence1\_79:

(Start: 20 @47057 has 76 MA's), (23, 47033), (37, 46946), (53, 46802), (62, 46742), (65, 46709), (81, 46604), (82, 46592), (84, 46559),

Gene: ForGetIt\_82 Start: 47476, Stop: 46961, Start Num: 20

Candidate Starts for ForGetIt\_82:

(Start: 20 @47476 has 76 MA's), (23, 47452), (37, 47365), (53, 47221), (62, 47161), (65, 47128), (81, 47023), (82, 47011), (84, 46978),

Gene: George\_75 Start: 47439, Stop: 46924, Start Num: 20

Candidate Starts for George\_75:

(Start: 20 @47439 has 76 MA's), (23, 47415), (37, 47328), (53, 47184), (62, 47124), (65, 47091), (82, 46974), (84, 46941),

Gene: Ghouboy\_81 Start: 47442, Stop: 46927, Start Num: 20

Candidate Starts for Ghouboy\_81:

(Start: 20 @47442 has 76 MA's), (26, 47391), (39, 47322), (47, 47235), (48, 47232), (60, 47139), (62, 47127), (64, 47109), (65, 47094), (72, 47055), (82, 46977), (84, 46944),

Gene: Gollum\_64 Start: 42975, Stop: 42424, Start Num: 20

Candidate Starts for Gollum\_64:

(Start: 14 @42996 has 4 MA's), (Start: 20 @42975 has 76 MA's), (21, 42960), (31, 42879), (35, 42858), (56, 42675), (60, 42642), (61, 42633),

Gene: Groundhog\_91 Start: 48621, Stop: 48079, Start Num: 20

Candidate Starts for Groundhog\_91:

(Start: 20 @48621 has 76 MA's), (23, 48597), (28, 48552), (33, 48507), (40, 48480), (65, 48246), (72, 48207), (77, 48189),

Gene: Harlequin\_64 Start: 42823, Stop: 42272, Start Num: 20

Candidate Starts for Harlequin\_64:

(Start: 14 @42844 has 4 MA's), (Start: 20 @42823 has 76 MA's), (21, 42808), (31, 42727), (35, 42706), (44, 42667), (56, 42523), (59, 42508), (60, 42490), (61, 42481),

Gene: Hiro\_64 Start: 43315, Stop: 42743, Start Num: 14

Candidate Starts for Hiro\_64:

(Start: 14 @43315 has 4 MA's), (Start: 20 @43294 has 76 MA's), (21, 43279), (31, 43198), (35, 43177), (44, 43138), (56, 42994), (59, 42979), (60, 42961), (61, 42952),

Gene: HuhtaEnerson15\_79 Start: 47200, Stop: 46685, Start Num: 20

Candidate Starts for HuhtaEnerson15\_79:

(Start: 20 @47200 has 76 MA's), (23, 47176), (37, 47089), (53, 46945), (62, 46885), (65, 46852), (82, 46735), (84, 46702),

Gene: Jabiru\_80 Start: 46717, Stop: 46181, Start Num: 13

Candidate Starts for Jabiru\_80:

(Start: 13 @46717 has 4 MA's), (Start: 17 @46702 has 2 MA's), (Start: 20 @46696 has 76 MA's), (23, 46672), (24, 46651), (39, 46576), (41, 46573), (50, 46477), (57, 46423), (62, 46381), (65, 46348), (81, 46243), (82, 46231), (84, 46198),

Gene: Jester\_63 Start: 42754, Stop: 42203, Start Num: 20

Candidate Starts for Jester\_63:

(Start: 14 @42775 has 4 MA's), (Start: 20 @42754 has 76 MA's), (21, 42739), (31, 42658), (35, 42637), (44, 42598), (56, 42454), (59, 42439), (60, 42421), (61, 42412),

Gene: Jovo\_79 Start: 47732, Stop: 47217, Start Num: 20

Candidate Starts for Jovo\_79:

(Start: 20 @47732 has 76 MA's), (23, 47708), (37, 47621), (53, 47477), (62, 47417), (65, 47384), (81, 47279), (82, 47267), (84, 47234),

Gene: Krishelle\_64 Start: 43402, Stop: 42851, Start Num: 20

Candidate Starts for Krishelle\_64:

(Start: 14 @43423 has 4 MA's), (Start: 20 @43402 has 76 MA's), (21, 43387), (31, 43306), (35, 43285), (56, 43102), (60, 43069), (61, 43060),

Gene: Lev2\_81 Start: 47085, Stop: 46570, Start Num: 20

Candidate Starts for Lev2\_81:

(Start: 20 @47085 has 76 MA's), (23, 47061), (37, 46974), (53, 46830), (62, 46770), (65, 46737), (81, 46632), (82, 46620), (84, 46587),

Gene: Lillie\_64 Start: 43033, Stop: 42482, Start Num: 20

Candidate Starts for Lillie\_64:

(Start: 14 @43054 has 4 MA's), (Start: 20 @43033 has 76 MA's), (21, 43018), (31, 42937), (35, 42916), (56, 42733), (60, 42700), (61, 42691),

Gene: LittleCherry\_79 Start: 46791, Stop: 46276, Start Num: 20

Candidate Starts for LittleCherry\_79:

(Start: 20 @46791 has 76 MA's), (23, 46767), (37, 46680), (53, 46536), (62, 46476), (65, 46443), (82, 46326), (84, 46293),

Gene: MarysWell\_81 Start: 47682, Stop: 47167, Start Num: 20

Candidate Starts for MarysWell\_81:

(Start: 17 @47688 has 2 MA's), (Start: 20 @47682 has 76 MA's), (26, 47631), (30, 47595), (39, 47562), (47, 47475), (48, 47472), (60, 47379), (62, 47367), (64, 47349), (65, 47334), (72, 47295), (82, 47217),

Gene: Micasa\_82 Start: 47456, Stop: 46941, Start Num: 20

Candidate Starts for Micasa\_82:

(Start: 20 @47456 has 76 MA's), (23, 47432), (37, 47345), (53, 47201), (62, 47141), (65, 47108), (82, 46991), (84, 46958),

Gene: Midas2\_78 Start: 47307, Stop: 46792, Start Num: 20

Candidate Starts for Midas2\_78:

(Start: 17 @47313 has 2 MA's), (Start: 20 @47307 has 76 MA's), (26, 47256), (30, 47220), (39, 47187), (47, 47100), (48, 47097), (60, 47004), (62, 46992), (64, 46974), (65, 46959), (72, 46920), (82, 46842),

Gene: Milcery\_79 Start: 47085, Stop: 46570, Start Num: 20

Candidate Starts for Milcery\_79:

(Start: 20 @47085 has 76 MA's), (23, 47061), (37, 46974), (53, 46830), (62, 46770), (65, 46737), (82, 46620), (84, 46587),

Gene: MyraDee\_87 Start: 47060, Stop: 46521, Start Num: 20

Candidate Starts for MyraDee\_87:

(Start: 20 @47060 has 76 MA's), (21, 47045), (33, 46949), (36, 46940), (44, 46904), (58, 46751), (72, 46640), (77, 46622),

Gene: Naca\_83 Start: 47759, Stop: 47217, Start Num: 20

Candidate Starts for Naca\_83:

(Start: 20 @47759 has 76 MA's), (23, 47735), (27, 47702), (30, 47666), (33, 47645), (40, 47618), (43, 47606), (44, 47600), (50, 47513), (62, 47417), (65, 47384), (81, 47279), (82, 47267), (84, 47234),

Gene: Naiad\_63 Start: 43055, Stop: 42504, Start Num: 20

Candidate Starts for Naiad\_63:

(Start: 14 @43076 has 4 MA's), (Start: 20 @43055 has 76 MA's), (21, 43040), (31, 42959), (35, 42938), (56, 42755), (60, 42722), (61, 42713),

Gene: Nancinator\_63 Start: 42372, Stop: 41821, Start Num: 20

Candidate Starts for Nancinator\_63:

(Start: 14 @42393 has 4 MA's), (Start: 20 @42372 has 76 MA's), (21, 42357), (31, 42276), (35, 42255), (56, 42072), (60, 42039), (61, 42030),

Gene: Natosaleda\_63 Start: 42973, Stop: 42422, Start Num: 20

Candidate Starts for Natosaleda\_63:

(Start: 14 @42994 has 4 MA's), (Start: 20 @42973 has 76 MA's), (21, 42958), (31, 42877), (35, 42856), (56, 42673), (60, 42640), (61, 42631),

Gene: NearlyHeadless\_95 Start: 48683, Stop: 48141, Start Num: 20

Candidate Starts for NearlyHeadless\_95:

(Start: 20 @48683 has 76 MA's), (23, 48659), (28, 48614), (33, 48569), (40, 48542), (60, 48353), (65, 48308), (72, 48269), (77, 48251), (81, 48203),

Gene: Octobien14\_133 Start: 70642, Stop: 70064, Start Num: 16

Candidate Starts for Octobien14\_133:

(Start: 16 @70642 has 1 MA's), (29, 70537), (40, 70483), (51, 70366), (54, 70327), (60, 70285), (68, 70213), (73, 70186), (78, 70168), (83, 70105), (85, 70075),

Gene: Partridge\_65 Start: 43518, Stop: 42970, Start Num: 20

Candidate Starts for Partridge\_65:

(2, 43680), (12, 43548), (Start: 20 @43518 has 76 MA's), (24, 43473), (28, 43449), (31, 43422), (35, 43401), (51, 43263), (52, 43260), (60, 43188), (61, 43179), (70, 43113), (80, 43035), (84, 42987),

Gene: PetterN\_88 Start: 47519, Stop: 47004, Start Num: 20

Candidate Starts for PetterN\_88:

(7, 47588), (10, 47555), (Start: 20 @47519 has 76 MA's), (22, 47501), (30, 47432), (45, 47342), (50, 47300), (62, 47204), (65, 47171), (75, 47123), (81, 47066), (82, 47054), (84, 47021),

Gene: PhailMary\_61 Start: 42071, Stop: 41499, Start Num: 14

Candidate Starts for PhailMary\_61:

(Start: 14 @42071 has 4 MA's), (Start: 20 @42050 has 76 MA's), (21, 42035), (31, 41954), (35, 41933), (56, 41750), (59, 41735), (60, 41717), (61, 41708),

Gene: Phillis\_91 Start: 47696, Stop: 47154, Start Num: 20

Candidate Starts for Phillis\_91:

(Start: 20 @47696 has 76 MA's), (23, 47672), (28, 47627), (33, 47582), (40, 47555), (60, 47366), (72, 47282),

Gene: Phlorence\_79 Start: 46829, Stop: 46314, Start Num: 20

Candidate Starts for Phlorence\_79:

(Start: 20 @46829 has 76 MA's), (23, 46805), (37, 46718), (62, 46514), (65, 46481), (81, 46376), (82, 46364), (84, 46331),

Gene: Phrankenstein\_64 Start: 42979, Stop: 42428, Start Num: 20

Candidate Starts for Phrankenstein\_64:

(Start: 14 @43000 has 4 MA's), (Start: 20 @42979 has 76 MA's), (21, 42964), (31, 42883), (35, 42862), (44, 42823), (56, 42679), (60, 42646), (61, 42637),

Gene: PickleBack\_82 Start: 47283, Stop: 46768, Start Num: 20

Candidate Starts for PickleBack\_82:

(Start: 20 @47283 has 76 MA's), (23, 47259), (37, 47172), (53, 47028), (62, 46968), (65, 46935), (81, 46830), (82, 46818), (84, 46785),

Gene: Ponzi\_78 Start: 52065, Stop: 51508, Start Num: 19

Candidate Starts for Ponzi\_78:

(Start: 19 @52065 has 1 MA's), (24, 52017), (32, 51969), (35, 51951), (44, 51912), (48, 51834), (55, 51777), (79, 51597),

Gene: Prin Ashe11\_80 Start: 47295, Stop: 46783, Start Num: 20

Candidate Starts for Prin Ashe11\_80:

(Start: 20 @47295 has 76 MA's), (23, 47271), (37, 47184), (53, 47040), (62, 46980), (65, 46947), (81, 46842), (82, 46830), (84, 46797),

Gene: RER2\_58 Start: 39905, Stop: 39354, Start Num: 20

Candidate Starts for RER2\_58:

(Start: 14 @39926 has 4 MA's), (Start: 20 @39905 has 76 MA's), (21, 39890), (31, 39809), (35, 39788), (56, 39605), (60, 39572), (61, 39563),

Gene: RGL3\_59 Start: 41481, Stop: 40933, Start Num: 20

Candidate Starts for RGL3\_59:

(Start: 20 @41481 has 76 MA's), (31, 41385), (35, 41364), (46, 41274), (47, 41250), (56, 41184), (60, 41151), (65, 41106), (70, 41076), (80, 40998),

Gene: Rasputin\_64 Start: 43003, Stop: 42452, Start Num: 20

Candidate Starts for Rasputin\_64:

(Start: 14 @43024 has 4 MA's), (Start: 20 @43003 has 76 MA's), (21, 42988), (31, 42907), (35, 42886), (56, 42703), (60, 42670), (61, 42661),

Gene: RexFury\_63 Start: 43063, Stop: 42512, Start Num: 20

Candidate Starts for RexFury\_63:

(Start: 14 @43084 has 4 MA's), (Start: 20 @43063 has 76 MA's), (21, 43048), (31, 42967), (35, 42946), (56, 42763), (60, 42730), (61, 42721),

Gene: Rhodalysa\_64 Start: 43033, Stop: 42482, Start Num: 20

Candidate Starts for Rhodalysa\_64:

(Start: 14 @43054 has 4 MA's), (Start: 20 @43033 has 76 MA's), (21, 43018), (31, 42937), (35, 42916), (56, 42733), (60, 42700), (61, 42691),

Gene: Roary\_96 Start: 48820, Stop: 48278, Start Num: 20

Candidate Starts for Roary\_96:

(Start: 20 @48820 has 76 MA's), (23, 48796), (28, 48751), (33, 48706), (40, 48679), (48, 48583), (60, 48490), (65, 48445), (72, 48406), (77, 48388), (81, 48340),

Gene: Saintus\_89 Start: 45548, Stop: 45006, Start Num: 20

Candidate Starts for Saintus\_89:

(Start: 20 @45548 has 76 MA's), (23, 45524), (28, 45479), (33, 45434), (40, 45407), (60, 45218), (65, 45173), (72, 45134), (77, 45116), (81, 45068),

Gene: Scorpia\_82 Start: 47090, Stop: 46575, Start Num: 20

Candidate Starts for Scorpia\_82:

(Start: 20 @47090 has 76 MA's), (30, 47003), (50, 46871), (62, 46775), (65, 46742), (81, 46637), (82, 46625), (84, 46592),

Gene: Shuman\_65 Start: 43005, Stop: 42433, Start Num: 14

Candidate Starts for Shuman\_65:

(Start: 14 @43005 has 4 MA's), (Start: 20 @42984 has 76 MA's), (21, 42969), (31, 42888), (35, 42867), (44, 42828), (56, 42684), (60, 42651), (61, 42642),

Gene: Smeadley\_94 Start: 48687, Stop: 48145, Start Num: 20

Candidate Starts for Smeadley\_94:

(Start: 20 @48687 has 76 MA's), (23, 48663), (28, 48618), (33, 48573), (40, 48546), (65, 48312), (72, 48273), (77, 48255),

Gene: SpeedDemon\_1610 Start: 90146, Stop: 89613, Start Num: 18

Candidate Starts for SpeedDemon\_1610:

(4, 90221), (9, 90188), (11, 90173), (Start: 18 @90146 has 5 MA's), (38, 90005), (49, 89897), (51, 89879), (63, 89774), (73, 89723), (79, 89687),

Gene: StCroix\_63 Start: 43055, Stop: 42504, Start Num: 20

Candidate Starts for StCroix\_63:

(Start: 14 @43076 has 4 MA's), (Start: 20 @43055 has 76 MA's), (21, 43040), (31, 42959), (35, 42938), (56, 42755), (60, 42722), (61, 42713),

Gene: Stephig9\_95 Start: 49038, Stop: 48496, Start Num: 20

Candidate Starts for Stephig9\_95:

(Start: 20 @49038 has 76 MA's), (23, 49014), (28, 48969), (33, 48924), (40, 48897), (60, 48708), (65, 48663), (72, 48624), (77, 48606),

Gene: Swann\_64 Start: 43031, Stop: 42480, Start Num: 20

Candidate Starts for Swann\_64:

(Start: 14 @43052 has 4 MA's), (Start: 20 @43031 has 76 MA's), (21, 43016), (31, 42935), (35, 42914), (56, 42731), (60, 42698), (61, 42689),

Gene: SydNat\_80 Start: 47451, Stop: 46936, Start Num: 20

Candidate Starts for SydNat\_80:

(Start: 20 @47451 has 76 MA's), (26, 47400), (39, 47331), (47, 47244), (48, 47241), (60, 47148), (62, 47136), (64, 47118), (65, 47103), (72, 47064), (82, 46986), (84, 46953),

Gene: TWAMP\_64 Start: 43033, Stop: 42482, Start Num: 20

Candidate Starts for TWAMP\_64:

(Start: 14 @43054 has 4 MA's), (Start: 20 @43033 has 76 MA's), (21, 43018), (31, 42937), (35, 42916), (56, 42733), (60, 42700), (61, 42691),

Gene: Takoda\_65 Start: 43208, Stop: 42660, Start Num: 20

Candidate Starts for Takoda\_65:

(6, 43289), (Start: 20 @43208 has 76 MA's), (21, 43193), (24, 43163), (25, 43160), (28, 43139), (31, 43112), (35, 43091), (51, 42953), (52, 42950), (60, 42878), (61, 42869), (70, 42803), (80, 42725), (84, 42677),

Gene: Tarynearal\_81 Start: 47239, Stop: 46724, Start Num: 20

Candidate Starts for Tarynearal\_81:

(Start: 20 @47239 has 76 MA's), (23, 47215), (37, 47128), (53, 46984), (62, 46924), (65, 46891), (82, 46774), (84, 46741),

Gene: Theia\_81 Start: 47799, Stop: 47278, Start Num: 17

Candidate Starts for Theia\_81:

(Start: 17 @47799 has 2 MA's), (Start: 20 @47793 has 76 MA's), (26, 47742), (30, 47706), (39, 47673), (47, 47586), (48, 47583), (60, 47490), (62, 47478), (64, 47460), (65, 47445), (72, 47406), (82, 47328), (84, 47295),

Gene: Tiger\_79 Start: 46750, Stop: 46235, Start Num: 20

Candidate Starts for Tiger\_79:

(Start: 20 @46750 has 76 MA's), (23, 46726), (37, 46639), (62, 46435), (65, 46402), (81, 46297), (82, 46285), (84, 46252),

Gene: Towmatter\_156 Start: 85944, Stop: 85402, Start Num: 18

Candidate Starts for Towmatter\_156:

(1, 86181), (3, 86091), (5, 86025), (Start: 18 @85944 has 5 MA's), (51, 85671), (57, 85620), (60, 85590), (63, 85566), (73, 85515),

Gene: Twigg\_81 Start: 47205, Stop: 46693, Start Num: 20

Candidate Starts for Twigg\_81:

(Start: 20 @47205 has 76 MA's), (23, 47181), (37, 47094), (53, 46950), (62, 46890), (65, 46857), (81, 46752), (82, 46740), (84, 46707),

Gene: UhSalsa\_64 Start: 42995, Stop: 42423, Start Num: 14

Candidate Starts for UhSalsa\_64:

(Start: 14 @42995 has 4 MA's), (Start: 20 @42974 has 76 MA's), (21, 42959), (31, 42878), (35, 42857), (56, 42674), (60, 42641), (61, 42632),

Gene: UnionJack\_84 Start: 46923, Stop: 46408, Start Num: 20

Candidate Starts for UnionJack\_84:

(Start: 13 @46944 has 4 MA's), (Start: 17 @46929 has 2 MA's), (Start: 20 @46923 has 76 MA's), (23, 46899), (39, 46803), (41, 46800), (50, 46704), (57, 46650), (62, 46608), (65, 46575), (81, 46470), (82, 46458), (84, 46425),

Gene: Yogi\_65 Start: 43384, Stop: 42833, Start Num: 20

Candidate Starts for Yogi\_65:

(Start: 14 @43405 has 4 MA's), (Start: 20 @43384 has 76 MA's), (21, 43369), (31, 43288), (35, 43267), (56, 43084), (60, 43051), (61, 43042),

Gene: Yoncess\_63 Start: 42791, Stop: 42240, Start Num: 20

Candidate Starts for Yoncess\_63:

(Start: 14 @42812 has 4 MA's), (Start: 20 @42791 has 76 MA's), (21, 42776), (31, 42695), (35, 42674), (44, 42635), (56, 42491), (59, 42476), (60, 42458), (61, 42449),

Gene: Zolita\_79 Start: 47434, Stop: 46919, Start Num: 20

Candidate Starts for Zolita\_79:

(Start: 20 @47434 has 76 MA's), (26, 47383), (39, 47314), (47, 47227), (48, 47224), (60, 47131), (62, 47119), (64, 47101), (65, 47086), (72, 47047), (82, 46969), (84, 46936),