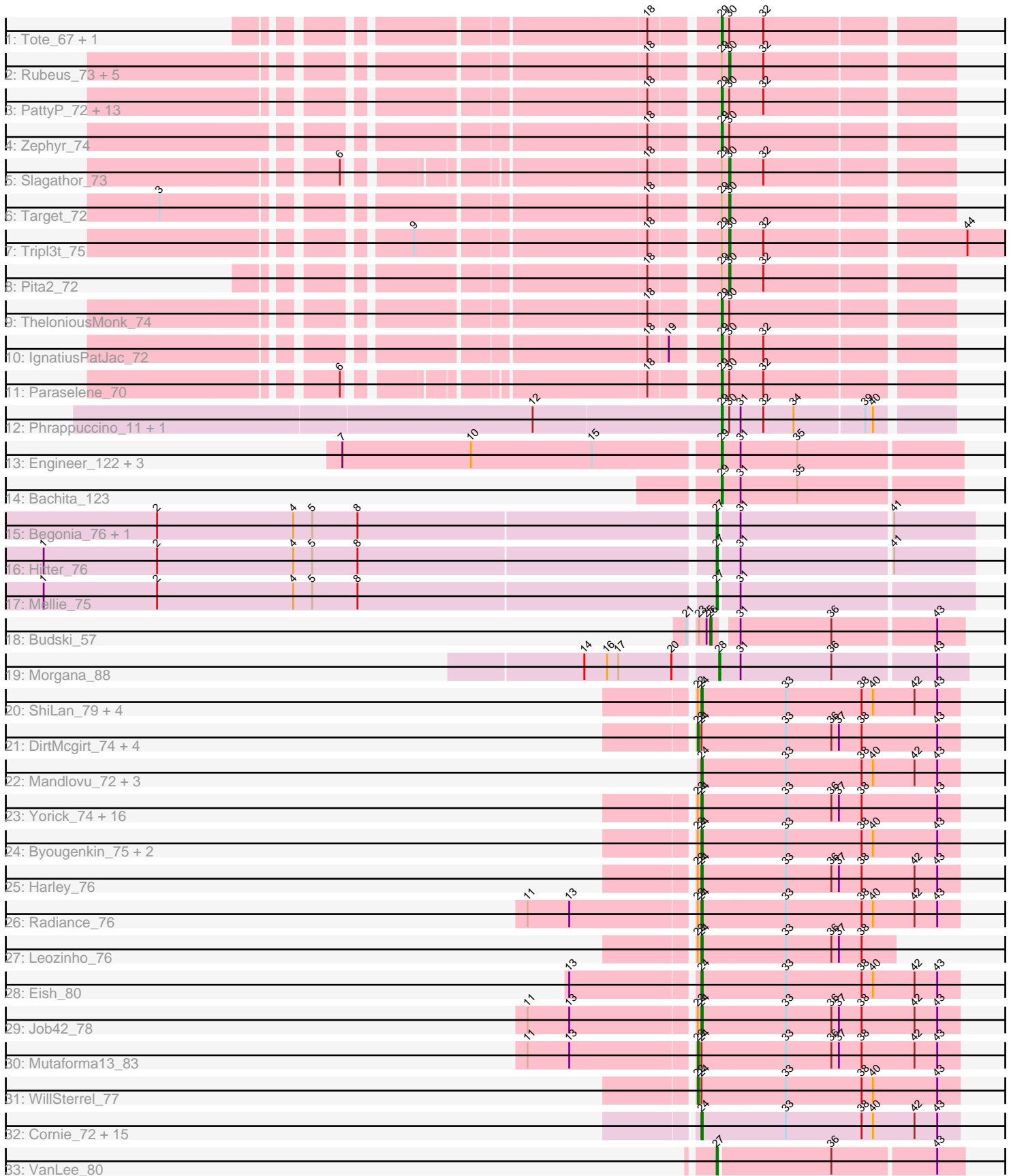


# Pham 1042



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 1042 Report

This analysis was run 04/28/24 on database version 559.

Pham number 1042 has 101 members, 3 are drafts.

Phages represented in each track:

- Track 1 : Tote\_67, JuliaChild\_72
- Track 2 : Rubeus\_73, Rufus\_75, Sibs6\_72, Moose\_74, BigMau\_75, Molly\_72
- Track 3 : PattyP\_72, Alvin\_70, Hermia\_67, Burton\_73, Pinto\_72, NEHalo\_68, HermioneGrange\_76, Petp2012\_73, Museum\_72, SpikeBT\_69, Rohr\_75, Jerm2\_74, Forsytheast\_74, Ciao\_69
- Track 4 : Zephyr\_74
- Track 5 : Slagathor\_73
- Track 6 : Target\_72
- Track 7 : Tripl3t\_75
- Track 8 : Pita2\_72
- Track 9 : TheloniousMonk\_74
- Track 10 : IgnatiusPatJac\_72
- Track 11 : Paraselene\_70
- Track 12 : Phrappuccino\_11, Settecandela\_11
- Track 13 : Engineer\_122, Lozinak\_121, Aphelion\_121, Smoothie\_122
- Track 14 : Bachita\_123
- Track 15 : Begonia\_76, Malachai\_76
- Track 16 : Hitter\_76
- Track 17 : Mellie\_75
- Track 18 : Budski\_57
- Track 19 : Morgana\_88
- Track 20 : ShiLan\_79, Avani\_84, Ramsey\_81, Ibhubesi\_74, Phasih\_73
- Track 21 : DirtMcgirt\_74, Blexus\_73, Enby\_76, Poenanya\_81, Empress\_76
- Track 22 : Mandlovu\_72, Batiatus\_76, Hlubikazi\_72, Strokeseat\_72
- Track 23 : Yorick\_74, UncleRicky\_74, KingMidas\_77, Polka14\_82, DaddyRickover\_81, Sparkdehlily\_81, Doomphist\_81, Martik\_78, Pippy\_73, Tootsieroll\_75, Drago\_72, TDanisky\_82, Lorde\_75, Marker\_83, Phatniss\_72, Llij\_71, Scottish\_76
- Track 24 : Byougenkin\_75, Bubbles123\_72, IrishSherpFalk\_77
- Track 25 : Harley\_76
- Track 26 : Radiance\_76
- Track 27 : Leozinho\_76
- Track 28 : Eish\_80
- Track 29 : Job42\_78
- Track 30 : Mutaforma13\_83
- Track 31 : WillSterrel\_77

- Track 32 : Cornie\_72, Zizzle\_79, SG4\_74, Ogopogo\_82, Quico\_86, VRedHorse\_77, Girafales\_86, Cornucopia\_78, Shauna1\_76, PhesterPhotato\_79, Kingsley\_80, CaptainTrips\_76, Phanphagia\_75, MinionDave\_72, Whatsapiecost\_71, Florinda\_89
- Track 33 : VanLee\_80

### ***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 47 of the 98 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Avani\_84, Batiatius\_76, Bubbles123\_72, Byougenkin\_75, CaptainTrips\_76, Cornie\_72, Cornucopia\_78, DaddyRickover\_81, Doomphist\_81, Drago\_72, Eish\_80, Florinda\_89, Girafales\_86, Harley\_76, Hlubikazi\_72, Ibhubesi\_74, IrishSherpFalk\_77, Job42\_78, KingMidas\_77, Kingsley\_80, Leozinho\_76, Llij\_71, Lorde\_75, Mandlovu\_72, Marker\_83, Martik\_78, MinionDave\_72, Ogopogo\_82, Phanphagia\_75, Phasih\_73, Phatniss\_72, PhesterPhotato\_79, Pippy\_73, Polka14\_82, Quico\_86, Radiance\_76, Ramsey\_81, SG4\_74, Scottish\_76, Shauna1\_76, ShiLan\_79, Sparkdehlily\_81, Strokeseat\_72, TDanisky\_82, Tootsieroll\_75, UncleRicky\_74, VRedHorse\_77, Whatsapiecost\_71, Yorick\_74, Zizzle\_79,

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

- Blexus\_73, DirtMcgirt\_74, Empress\_76, Enby\_76, Mutaforma13\_83, Poenanya\_81, WillSterrel\_77,

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

- Alvin\_70, Aphelion\_121, Bachita\_123, Begonia\_76, BigMau\_75, Budski\_57, Burton\_73, Ciao\_69, Engineer\_122, Forsytheast\_74, Hermia\_67, HermioneGrange\_76, Hitter\_76, IgnatiusPatJac\_72, Jerm2\_74, JuliaChild\_72, Lozinak\_121, Malachai\_76, Mellie\_75, Molly\_72, Moose\_74, Morgana\_88, Museum\_72, NEHalo\_68, Paraselene\_70, PattyP\_72, Petp2012\_73, Phrappuccino\_11, Pinto\_72, Pita2\_72, Rohr\_75, Rubeus\_73, Rufus\_75, Settecandela\_11, Sibs6\_72, Slagathor\_73, Smoothie\_122, SpikeBT\_69, Target\_72, TheloniousMonk\_74, Tote\_67, Tripl3t\_75, VanLee\_80, Zephyr\_74,

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

Start 22:

- Found in 36 of 101 ( 35.6% ) of genes in pham
- Manual Annotations of this start: 7 of 98
- Called 19.4% of time when present
- Phage (with cluster) where this start called: Blexus\_73 (F1), DirtMcgirt\_74 (F1), Empress\_76 (F1), Enby\_76 (F1), Mutaforma13\_83 (F1), Poenanya\_81 (F1), WillSterrel\_77 (F1),

Start 24:

- Found in 57 of 101 ( 56.4% ) of genes in pham
- Manual Annotations of this start: 47 of 98
- Called 87.7% of time when present

- Phage (with cluster) where this start called: Avani\_84 (F2), Batiatus\_76 (F1), Bubbles123\_72 (F1), Byougenkin\_75 (F1), CaptainTrips\_76 (F1), Cornie\_72 (F5), Cornucopia\_78 (F1), DaddyRickover\_81 (F1), Doomphist\_81 (F1), Drago\_72 (F1), Eish\_80 (F1), Florinda\_89 (F1), Girafales\_86 (F1), Harley\_76 (F1), Hlubikazi\_72 (F1), Ibhubesi\_74 (F1), IrishSherpFalk\_77 (F1), Job42\_78 (F1), KingMidas\_77 (F1), Kingsley\_80 (F1), Leozinho\_76 (F1), Llij\_71 (F1), Lorde\_75 (F1), Mandlovu\_72 (F1), Marker\_83 (F1), Martik\_78 (F1), MinionDave\_72 (F1), Ogopogo\_82 (F1), Phanphagia\_75 (F1), Phasih\_73 (F1), Phatniss\_72 (F1), PhesterPhotato\_79 (F1), Pippy\_73 (F1), Polka14\_82 (F1), Quico\_86 (F1), Radiance\_76 (F1), Ramsey\_81 (F1), SG4\_74 (F1), Scottish\_76 (F1), Shauna1\_76 (F1), ShiLan\_79 (F1), Sparkdehlily\_81 (F1), Strokeseat\_72 (F1), TDanisky\_82 (F1), Tootsieroll\_75 (F1), UncleRicky\_74 (F1), VRedHorse\_77 (F1), Whatsapiecost\_71 (F1), Yorick\_74 (F1), Zizzle\_79 (F1),

#### Start 26:

- Found in 1 of 101 ( 1.0% ) of genes in pham
- Manual Annotations of this start: 1 of 98
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Budski\_57 (DN),

#### Start 27:

- Found in 5 of 101 ( 5.0% ) of genes in pham
- Manual Annotations of this start: 5 of 98
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Begonia\_76 (CV), Hitter\_76 (CV), Malachai\_76 (CV), Mellie\_75 (CV), VanLee\_80 (singleton),

#### Start 28:

- Found in 1 of 101 ( 1.0% ) of genes in pham
- Manual Annotations of this start: 1 of 98
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Morgana\_88 (DZ),

#### Start 29:

- Found in 37 of 101 ( 36.6% ) of genes in pham
- Manual Annotations of this start: 27 of 98
- Called 73.0% of time when present
- Phage (with cluster) where this start called: Alvin\_70 (A1), Aphelion\_121 (CQ1), Bachita\_123 (CQ1), Burton\_73 (A1), Ciao\_69 (A1), Engineer\_122 (CQ1), Forsytheast\_74 (A1), Hermia\_67 (A1), HermioneGrange\_76 (A1), IgnatiusPatJac\_72 (A1), Jerm2\_74 (A1), JuliaChild\_72 (A1), Lozinak\_121 (CQ1), Museum\_72 (A1), NEHalo\_68 (A1), Paraselene\_70 (A1), PattyP\_72 (A1), Petp2012\_73 (A1), Phrappuccino\_11 (AA), Pinto\_72 (A1), Rohr\_75 (A1), Settecandela\_11 (AA), Smoothie\_122 (CQ1), SpikeBT\_69 (A1), TheloniousMonk\_74 (A1), Tote\_67 (A1), Zephyr\_74 (A1),

#### Start 30:

- Found in 32 of 101 ( 31.7% ) of genes in pham
- Manual Annotations of this start: 10 of 98
- Called 31.2% of time when present
- Phage (with cluster) where this start called: BigMau\_75 (A1), Molly\_72 (A1), Moose\_74 (A1), Pita2\_72 (A1), Rubeus\_73 (A1), Rufus\_75 (A1), Sibs6\_72 (A1), Slagathor\_73 (A1), Target\_72 (A1), Tripl3t\_75 (A1),

## **Summary by clusters:**

There are 10 clusters represented in this pham: AA, F1, F2, F5, DN, singleton, A1, DZ, CQ1, CV,

Info for manual annotations of cluster A1:

- Start number 29 was manually annotated 20 times for cluster A1.
- Start number 30 was manually annotated 10 times for cluster A1.

Info for manual annotations of cluster AA:

- Start number 29 was manually annotated 2 times for cluster AA.

Info for manual annotations of cluster CQ1:

- Start number 29 was manually annotated 5 times for cluster CQ1.

Info for manual annotations of cluster CV:

- Start number 27 was manually annotated 4 times for cluster CV.

Info for manual annotations of cluster DN:

- Start number 26 was manually annotated 1 time for cluster DN.

Info for manual annotations of cluster DZ:

- Start number 28 was manually annotated 1 time for cluster DZ.

Info for manual annotations of cluster F1:

- Start number 22 was manually annotated 7 times for cluster F1.
- Start number 24 was manually annotated 45 times for cluster F1.

Info for manual annotations of cluster F2:

- Start number 24 was manually annotated 1 time for cluster F2.

Info for manual annotations of cluster F5:

- Start number 24 was manually annotated 1 time for cluster F5.

## **Gene Information:**

Gene: Alvin\_70 Start: 44438, Stop: 44265, Start Num: 29

Candidate Starts for Alvin\_70:

(18, 44486), (Start: 29 @44438 has 27 MA's), (Start: 30 @44432 has 10 MA's), (32, 44405),

Gene: Aphelion\_121 Start: 69486, Stop: 69671, Start Num: 29

Candidate Starts for Aphelion\_121:

(7, 69192), (10, 69294), (15, 69390), (Start: 29 @69486 has 27 MA's), (31, 69501), (35, 69546),

Gene: Avani\_84 Start: 45696, Stop: 45899, Start Num: 24

Candidate Starts for Avani\_84:

(Start: 22 @45693 has 7 MA's), (Start: 24 @45696 has 47 MA's), (33, 45762), (38, 45822), (40, 45831), (42, 45864), (43, 45882),

Gene: Bachita\_123 Start: 69265, Stop: 69450, Start Num: 29

Candidate Starts for Bachita\_123:

(Start: 29 @69265 has 27 MA's), (31, 69280), (35, 69325),

Gene: Batiatus\_76 Start: 47875, Stop: 48078, Start Num: 24

Candidate Starts for Batiatus\_76:

(Start: 24 @47875 has 47 MA's), (33, 47941), (38, 48001), (40, 48010), (42, 48043), (43, 48061),

Gene: Begonia\_76 Start: 50013, Stop: 50207, Start Num: 27

Candidate Starts for Begonia\_76:

(2, 49581), (4, 49689), (5, 49704), (8, 49740), (Start: 27 @50013 has 5 MA's), (31, 50028), (41, 50145),

Gene: BigMau\_75 Start: 46596, Stop: 46429, Start Num: 30

Candidate Starts for BigMau\_75:

(18, 46650), (Start: 29 @46602 has 27 MA's), (Start: 30 @46596 has 10 MA's), (32, 46569),

Gene: Blexus\_73 Start: 48037, Stop: 48243, Start Num: 22

Candidate Starts for Blexus\_73:

(Start: 22 @48037 has 7 MA's), (Start: 24 @48040 has 47 MA's), (33, 48106), (36, 48142), (37, 48148), (38, 48166), (43, 48226),

Gene: Bubbles123\_72 Start: 47667, Stop: 47870, Start Num: 24

Candidate Starts for Bubbles123\_72:

(Start: 22 @47664 has 7 MA's), (Start: 24 @47667 has 47 MA's), (33, 47733), (38, 47793), (40, 47802), (43, 47853),

Gene: Budski\_57 Start: 37493, Stop: 37678, Start Num: 26

Candidate Starts for Budski\_57:

(21, 37481), (23, 37484), (25, 37490), (Start: 26 @37493 has 1 MA's), (31, 37508), (36, 37580), (43, 37658),

Gene: Burton\_73 Start: 47285, Stop: 47112, Start Num: 29

Candidate Starts for Burton\_73:

(18, 47333), (Start: 29 @47285 has 27 MA's), (Start: 30 @47279 has 10 MA's), (32, 47252),

Gene: Byougenkin\_75 Start: 45536, Stop: 45739, Start Num: 24

Candidate Starts for Byougenkin\_75:

(Start: 22 @45533 has 7 MA's), (Start: 24 @45536 has 47 MA's), (33, 45602), (38, 45662), (40, 45671), (43, 45722),

Gene: CaptainTrips\_76 Start: 47326, Stop: 47529, Start Num: 24

Candidate Starts for CaptainTrips\_76:

(Start: 24 @47326 has 47 MA's), (33, 47392), (38, 47452), (40, 47461), (42, 47494), (43, 47512),

Gene: Ciao\_69 Start: 43695, Stop: 43522, Start Num: 29

Candidate Starts for Ciao\_69:

(18, 43743), (Start: 29 @43695 has 27 MA's), (Start: 30 @43689 has 10 MA's), (32, 43662),

Gene: Cornie\_72 Start: 46257, Stop: 46460, Start Num: 24

Candidate Starts for Cornie\_72:

(Start: 24 @46257 has 47 MA's), (33, 46323), (38, 46383), (40, 46392), (42, 46425), (43, 46443),

Gene: Cornucopia\_78 Start: 46861, Stop: 47064, Start Num: 24

Candidate Starts for Cornucopia\_78:

(Start: 24 @46861 has 47 MA's), (33, 46927), (38, 46987), (40, 46996), (42, 47029), (43, 47047),

Gene: DaddyRickover\_81 Start: 49606, Stop: 49809, Start Num: 24

Candidate Starts for DaddyRickover\_81:

(Start: 22 @49603 has 7 MA's), (Start: 24 @49606 has 47 MA's), (33, 49672), (36, 49708), (37, 49714), (38, 49732), (43, 49792),

Gene: DirtMcgirt\_74 Start: 44924, Stop: 45130, Start Num: 22

Candidate Starts for DirtMcgirt\_74:

(Start: 22 @44924 has 7 MA's), (Start: 24 @44927 has 47 MA's), (33, 44993), (36, 45029), (37, 45035), (38, 45053), (43, 45113),

Gene: Doomphist\_81 Start: 49015, Stop: 49218, Start Num: 24

Candidate Starts for Doomphist\_81:

(Start: 22 @49012 has 7 MA's), (Start: 24 @49015 has 47 MA's), (33, 49081), (36, 49117), (37, 49123), (38, 49141), (43, 49201),

Gene: Drago\_72 Start: 44930, Stop: 45133, Start Num: 24

Candidate Starts for Drago\_72:

(Start: 22 @44927 has 7 MA's), (Start: 24 @44930 has 47 MA's), (33, 44996), (36, 45032), (37, 45038), (38, 45056), (43, 45116),

Gene: Eish\_80 Start: 48843, Stop: 49046, Start Num: 24

Candidate Starts for Eish\_80:

(13, 48747), (Start: 24 @48843 has 47 MA's), (33, 48909), (38, 48969), (40, 48978), (42, 49011), (43, 49029),

Gene: Empress\_76 Start: 47823, Stop: 48029, Start Num: 22

Candidate Starts for Empress\_76:

(Start: 22 @47823 has 7 MA's), (Start: 24 @47826 has 47 MA's), (33, 47892), (36, 47928), (37, 47934), (38, 47952), (43, 48012),

Gene: Enby\_76 Start: 45203, Stop: 45409, Start Num: 22

Candidate Starts for Enby\_76:

(Start: 22 @45203 has 7 MA's), (Start: 24 @45206 has 47 MA's), (33, 45272), (36, 45308), (37, 45314), (38, 45332), (43, 45392),

Gene: Engineer\_122 Start: 69238, Stop: 69423, Start Num: 29

Candidate Starts for Engineer\_122:

(7, 68944), (10, 69046), (15, 69142), (Start: 29 @69238 has 27 MA's), (31, 69253), (35, 69298),

Gene: Florinda\_89 Start: 50468, Stop: 50671, Start Num: 24

Candidate Starts for Florinda\_89:

(Start: 24 @50468 has 47 MA's), (33, 50534), (38, 50594), (40, 50603), (42, 50636), (43, 50654),

Gene: Forsytheast\_74 Start: 45810, Stop: 45637, Start Num: 29

Candidate Starts for Forsytheast\_74:

(18, 45858), (Start: 29 @45810 has 27 MA's), (Start: 30 @45804 has 10 MA's), (32, 45777),

Gene: Girafales\_86 Start: 50073, Stop: 50276, Start Num: 24

Candidate Starts for Girafales\_86:

(Start: 24 @50073 has 47 MA's), (33, 50139), (38, 50199), (40, 50208), (42, 50241), (43, 50259),

Gene: Harley\_76 Start: 47156, Stop: 47359, Start Num: 24

Candidate Starts for Harley\_76:

(Start: 22 @47153 has 7 MA's), (Start: 24 @47156 has 47 MA's), (33, 47222), (36, 47258), (37, 47264), (38, 47282), (42, 47324), (43, 47342),

Gene: Hermia\_67 Start: 43711, Stop: 43538, Start Num: 29

Candidate Starts for Hermia\_67:

(18, 43759), (Start: 29 @43711 has 27 MA's), (Start: 30 @43705 has 10 MA's), (32, 43678),

Gene: HermioneGrange\_76 Start: 47096, Stop: 46923, Start Num: 29

Candidate Starts for HermioneGrange\_76:

(18, 47144), (Start: 29 @47096 has 27 MA's), (Start: 30 @47090 has 10 MA's), (32, 47063),

Gene: Hitter\_76 Start: 46447, Stop: 46641, Start Num: 27

Candidate Starts for Hitter\_76:

(1, 45925), (2, 46015), (4, 46123), (5, 46138), (8, 46174), (Start: 27 @46447 has 5 MA's), (31, 46462), (41, 46579),

Gene: Hlubikazi\_72 Start: 45416, Stop: 45619, Start Num: 24

Candidate Starts for Hlubikazi\_72:

(Start: 24 @45416 has 47 MA's), (33, 45482), (38, 45542), (40, 45551), (42, 45584), (43, 45602),

Gene: Ibhubesi\_74 Start: 45330, Stop: 45533, Start Num: 24

Candidate Starts for Ibhubesi\_74:

(Start: 22 @45327 has 7 MA's), (Start: 24 @45330 has 47 MA's), (33, 45396), (38, 45456), (40, 45465), (42, 45498), (43, 45516),

Gene: IgnatiusPatJac\_72 Start: 44487, Stop: 44314, Start Num: 29

Candidate Starts for IgnatiusPatJac\_72:

(18, 44535), (19, 44520), (Start: 29 @44487 has 27 MA's), (Start: 30 @44481 has 10 MA's), (32, 44454),

Gene: IrishSherpFalk\_77 Start: 48390, Stop: 48593, Start Num: 24

Candidate Starts for IrishSherpFalk\_77:

(Start: 22 @48387 has 7 MA's), (Start: 24 @48390 has 47 MA's), (33, 48456), (38, 48516), (40, 48525), (43, 48576),

Gene: Jerm2\_74 Start: 47166, Stop: 46993, Start Num: 29

Candidate Starts for Jerm2\_74:

(18, 47214), (Start: 29 @47166 has 27 MA's), (Start: 30 @47160 has 10 MA's), (32, 47133),

Gene: Job42\_78 Start: 50803, Stop: 51006, Start Num: 24

Candidate Starts for Job42\_78:

(11, 50674), (13, 50707), (Start: 22 @50800 has 7 MA's), (Start: 24 @50803 has 47 MA's), (33, 50869), (36, 50905), (37, 50911), (38, 50929), (42, 50971), (43, 50989),

Gene: JuliaChild\_72 Start: 45404, Stop: 45231, Start Num: 29

Candidate Starts for JuliaChild\_72:

(18, 45452), (Start: 29 @45404 has 27 MA's), (Start: 30 @45398 has 10 MA's), (32, 45371),

Gene: KingMidas\_77 Start: 48241, Stop: 48444, Start Num: 24

Candidate Starts for KingMidas\_77:



(Start: 22 @48238 has 7 MA's), (Start: 24 @48241 has 47 MA's), (33, 48307), (36, 48343), (37, 48349), (38, 48367), (43, 48427),

Gene: Kingsley\_80 Start: 50078, Stop: 50281, Start Num: 24

Candidate Starts for Kingsley\_80:

(Start: 24 @50078 has 47 MA's), (33, 50144), (38, 50204), (40, 50213), (42, 50246), (43, 50264),

Gene: Leozinho\_76 Start: 45725, Stop: 45877, Start Num: 24

Candidate Starts for Leozinho\_76:

(Start: 22 @45722 has 7 MA's), (Start: 24 @45725 has 47 MA's), (33, 45791), (36, 45827), (37, 45833), (38, 45851),

Gene: Llij\_71 Start: 45084, Stop: 45287, Start Num: 24

Candidate Starts for Llij\_71:

(Start: 22 @45081 has 7 MA's), (Start: 24 @45084 has 47 MA's), (33, 45150), (36, 45186), (37, 45192), (38, 45210), (43, 45270),

Gene: Lorde\_75 Start: 44371, Stop: 44574, Start Num: 24

Candidate Starts for Lorde\_75:

(Start: 22 @44368 has 7 MA's), (Start: 24 @44371 has 47 MA's), (33, 44437), (36, 44473), (37, 44479), (38, 44497), (43, 44557),

Gene: Lozinak\_121 Start: 69076, Stop: 69261, Start Num: 29

Candidate Starts for Lozinak\_121:

(7, 68782), (10, 68884), (15, 68980), (Start: 29 @69076 has 27 MA's), (31, 69091), (35, 69136),

Gene: Malachai\_76 Start: 50013, Stop: 50207, Start Num: 27

Candidate Starts for Malachai\_76:

(2, 49581), (4, 49689), (5, 49704), (8, 49740), (Start: 27 @50013 has 5 MA's), (31, 50028), (41, 50145),

Gene: Mandlovu\_72 Start: 45358, Stop: 45561, Start Num: 24

Candidate Starts for Mandlovu\_72:

(Start: 24 @45358 has 47 MA's), (33, 45424), (38, 45484), (40, 45493), (42, 45526), (43, 45544),

Gene: Marker\_83 Start: 46891, Stop: 47094, Start Num: 24

Candidate Starts for Marker\_83:

(Start: 22 @46888 has 7 MA's), (Start: 24 @46891 has 47 MA's), (33, 46957), (36, 46993), (37, 46999), (38, 47017), (43, 47077),

Gene: Martik\_78 Start: 49885, Stop: 50088, Start Num: 24

Candidate Starts for Martik\_78:

(Start: 22 @49882 has 7 MA's), (Start: 24 @49885 has 47 MA's), (33, 49951), (36, 49987), (37, 49993), (38, 50011), (43, 50071),

Gene: Mellie\_75 Start: 47165, Stop: 47359, Start Num: 27

Candidate Starts for Mellie\_75:

(1, 46643), (2, 46733), (4, 46841), (5, 46856), (8, 46892), (Start: 27 @47165 has 5 MA's), (31, 47180),

Gene: MinionDave\_72 Start: 47326, Stop: 47529, Start Num: 24

Candidate Starts for MinionDave\_72:

(Start: 24 @47326 has 47 MA's), (33, 47392), (38, 47452), (40, 47461), (42, 47494), (43, 47512),

Gene: Molly\_72 Start: 44631, Stop: 44464, Start Num: 30

Candidate Starts for Molly\_72:

(18, 44685), (Start: 29 @44637 has 27 MA's), (Start: 30 @44631 has 10 MA's), (32, 44604),

Gene: Moose\_74 Start: 45804, Stop: 45637, Start Num: 30

Candidate Starts for Moose\_74:

(18, 45858), (Start: 29 @45810 has 27 MA's), (Start: 30 @45804 has 10 MA's), (32, 45777),

Gene: Morgana\_88 Start: 53024, Stop: 53212, Start Num: 28

Candidate Starts for Morgana\_88:

(14, 52925), (16, 52943), (17, 52952), (20, 52994), (Start: 28 @53024 has 1 MA's), (31, 53039), (36, 53111), (43, 53189),

Gene: Museum\_72 Start: 45700, Stop: 45527, Start Num: 29

Candidate Starts for Museum\_72:

(18, 45748), (Start: 29 @45700 has 27 MA's), (Start: 30 @45694 has 10 MA's), (32, 45667),

Gene: Mutaforma13\_83 Start: 48851, Stop: 49057, Start Num: 22

Candidate Starts for Mutaforma13\_83:

(11, 48725), (13, 48758), (Start: 22 @48851 has 7 MA's), (Start: 24 @48854 has 47 MA's), (33, 48920), (36, 48956), (37, 48962), (38, 48980), (42, 49022), (43, 49040),

Gene: NEHalo\_68 Start: 44510, Stop: 44337, Start Num: 29

Candidate Starts for NEHalo\_68:

(18, 44558), (Start: 29 @44510 has 27 MA's), (Start: 30 @44504 has 10 MA's), (32, 44477),

Gene: Ogopogo\_82 Start: 47440, Stop: 47643, Start Num: 24

Candidate Starts for Ogopogo\_82:

(Start: 24 @47440 has 47 MA's), (33, 47506), (38, 47566), (40, 47575), (42, 47608), (43, 47626),

Gene: Paraselene\_70 Start: 44869, Stop: 44696, Start Num: 29

Candidate Starts for Paraselene\_70:

(6, 45115), (18, 44917), (Start: 29 @44869 has 27 MA's), (Start: 30 @44863 has 10 MA's), (32, 44836),

Gene: PattyP\_72 Start: 45406, Stop: 45233, Start Num: 29

Candidate Starts for PattyP\_72:

(18, 45454), (Start: 29 @45406 has 27 MA's), (Start: 30 @45400 has 10 MA's), (32, 45373),

Gene: Petp2012\_73 Start: 46187, Stop: 46014, Start Num: 29

Candidate Starts for Petp2012\_73:

(18, 46235), (Start: 29 @46187 has 27 MA's), (Start: 30 @46181 has 10 MA's), (32, 46154),

Gene: Phanphagia\_75 Start: 47874, Stop: 48077, Start Num: 24

Candidate Starts for Phanphagia\_75:

(Start: 24 @47874 has 47 MA's), (33, 47940), (38, 48000), (40, 48009), (42, 48042), (43, 48060),

Gene: Phasih\_73 Start: 46643, Stop: 46846, Start Num: 24

Candidate Starts for Phasih\_73:

(Start: 22 @46640 has 7 MA's), (Start: 24 @46643 has 47 MA's), (33, 46709), (38, 46769), (40, 46778), (42, 46811), (43, 46829),

Gene: Phatniss\_72 Start: 46179, Stop: 46382, Start Num: 24

Candidate Starts for Phatniss\_72:

(Start: 22 @46176 has 7 MA's), (Start: 24 @46179 has 47 MA's), (33, 46245), (36, 46281), (37, 46287), (38, 46305), (43, 46365),

Gene: PhesterPhotato\_79 Start: 47842, Stop: 48045, Start Num: 24

Candidate Starts for PhesterPhotato\_79:

(Start: 24 @47842 has 47 MA's), (33, 47908), (38, 47968), (40, 47977), (42, 48010), (43, 48028),

Gene: Phrappuccino\_11 Start: 8994, Stop: 8821, Start Num: 29

Candidate Starts for Phrappuccino\_11:

(12, 9141), (Start: 29 @8994 has 27 MA's), (Start: 30 @8988 has 10 MA's), (31, 8979), (32, 8961), (34, 8937), (39, 8883), (40, 8877),

Gene: Pinto\_72 Start: 45636, Stop: 45463, Start Num: 29

Candidate Starts for Pinto\_72:

(18, 45684), (Start: 29 @45636 has 27 MA's), (Start: 30 @45630 has 10 MA's), (32, 45603),

Gene: Pippy\_73 Start: 46780, Stop: 46983, Start Num: 24

Candidate Starts for Pippy\_73:

(Start: 22 @46777 has 7 MA's), (Start: 24 @46780 has 47 MA's), (33, 46846), (36, 46882), (37, 46888), (38, 46906), (43, 46966),

Gene: Pita2\_72 Start: 44962, Stop: 44795, Start Num: 30

Candidate Starts for Pita2\_72:

(18, 45016), (Start: 29 @44968 has 27 MA's), (Start: 30 @44962 has 10 MA's), (32, 44935),

Gene: Poenanya\_81 Start: 49012, Stop: 49218, Start Num: 22

Candidate Starts for Poenanya\_81:

(Start: 22 @49012 has 7 MA's), (Start: 24 @49015 has 47 MA's), (33, 49081), (36, 49117), (37, 49123), (38, 49141), (43, 49201),

Gene: Polka14\_82 Start: 49805, Stop: 50008, Start Num: 24

Candidate Starts for Polka14\_82:

(Start: 22 @49802 has 7 MA's), (Start: 24 @49805 has 47 MA's), (33, 49871), (36, 49907), (37, 49913), (38, 49931), (43, 49991),

Gene: Quico\_86 Start: 50288, Stop: 50491, Start Num: 24

Candidate Starts for Quico\_86:

(Start: 24 @50288 has 47 MA's), (33, 50354), (38, 50414), (40, 50423), (42, 50456), (43, 50474),

Gene: Radiance\_76 Start: 48460, Stop: 48663, Start Num: 24

Candidate Starts for Radiance\_76:

(11, 48331), (13, 48364), (Start: 22 @48457 has 7 MA's), (Start: 24 @48460 has 47 MA's), (33, 48526), (38, 48586), (40, 48595), (42, 48628), (43, 48646),

Gene: Ramsey\_81 Start: 49942, Stop: 50145, Start Num: 24

Candidate Starts for Ramsey\_81:

(Start: 22 @49939 has 7 MA's), (Start: 24 @49942 has 47 MA's), (33, 50008), (38, 50068), (40, 50077), (42, 50110), (43, 50128),

Gene: Rohr\_75 Start: 47242, Stop: 47069, Start Num: 29

Candidate Starts for Rohr\_75:

(18, 47290), (Start: 29 @47242 has 27 MA's), (Start: 30 @47236 has 10 MA's), (32, 47209),

Gene: Rubeus\_73 Start: 43736, Stop: 43569, Start Num: 30

Candidate Starts for Rubeus\_73:

(18, 43790), (Start: 29 @43742 has 27 MA's), (Start: 30 @43736 has 10 MA's), (32, 43709),

Gene: Rufus\_75 Start: 46425, Stop: 46258, Start Num: 30

Candidate Starts for Rufus\_75:

(18, 46479), (Start: 29 @46431 has 27 MA's), (Start: 30 @46425 has 10 MA's), (32, 46398),

Gene: SG4\_74 Start: 46723, Stop: 46926, Start Num: 24

Candidate Starts for SG4\_74:

(Start: 24 @46723 has 47 MA's), (33, 46789), (38, 46849), (40, 46858), (42, 46891), (43, 46909),

Gene: Scottish\_76 Start: 47496, Stop: 47699, Start Num: 24

Candidate Starts for Scottish\_76:

(Start: 22 @47493 has 7 MA's), (Start: 24 @47496 has 47 MA's), (33, 47562), (36, 47598), (37, 47604), (38, 47622), (43, 47682),

Gene: Settecandela\_11 Start: 8994, Stop: 8821, Start Num: 29

Candidate Starts for Settecandela\_11:

(12, 9141), (Start: 29 @8994 has 27 MA's), (Start: 30 @8988 has 10 MA's), (31, 8979), (32, 8961), (34, 8937), (39, 8883), (40, 8877),

Gene: Shauna1\_76 Start: 48124, Stop: 48327, Start Num: 24

Candidate Starts for Shauna1\_76:

(Start: 24 @48124 has 47 MA's), (33, 48190), (38, 48250), (40, 48259), (42, 48292), (43, 48310),

Gene: ShiLan\_79 Start: 50578, Stop: 50781, Start Num: 24

Candidate Starts for ShiLan\_79:

(Start: 22 @50575 has 7 MA's), (Start: 24 @50578 has 47 MA's), (33, 50644), (38, 50704), (40, 50713), (42, 50746), (43, 50764),

Gene: Sibs6\_72 Start: 42741, Stop: 42574, Start Num: 30

Candidate Starts for Sibs6\_72:

(18, 42795), (Start: 29 @42747 has 27 MA's), (Start: 30 @42741 has 10 MA's), (32, 42714),

Gene: Slagathor\_73 Start: 46265, Stop: 46098, Start Num: 30

Candidate Starts for Slagathor\_73:

(6, 46517), (18, 46319), (Start: 29 @46271 has 27 MA's), (Start: 30 @46265 has 10 MA's), (32, 46238),

Gene: Smoothie\_122 Start: 69076, Stop: 69261, Start Num: 29

Candidate Starts for Smoothie\_122:

(7, 68782), (10, 68884), (15, 68980), (Start: 29 @69076 has 27 MA's), (31, 69091), (35, 69136),

Gene: Sparkdehlily\_81 Start: 46521, Stop: 46724, Start Num: 24

Candidate Starts for Sparkdehlily\_81:

(Start: 22 @46518 has 7 MA's), (Start: 24 @46521 has 47 MA's), (33, 46587), (36, 46623), (37, 46629), (38, 46647), (43, 46707),

Gene: SpikeBT\_69 Start: 44367, Stop: 44194, Start Num: 29

Candidate Starts for SpikeBT\_69:

(18, 44415), (Start: 29 @44367 has 27 MA's), (Start: 30 @44361 has 10 MA's), (32, 44334),

Gene: Strokeseat\_72 Start: 45415, Stop: 45618, Start Num: 24

Candidate Starts for Strokeseat\_72:

(Start: 24 @45415 has 47 MA's), (33, 45481), (38, 45541), (40, 45550), (42, 45583), (43, 45601),

Gene: TDanisky\_82 Start: 46521, Stop: 46724, Start Num: 24

Candidate Starts for TDanisky\_82:

(Start: 22 @46518 has 7 MA's), (Start: 24 @46521 has 47 MA's), (33, 46587), (36, 46623), (37, 46629), (38, 46647), (43, 46707),

Gene: Target\_72 Start: 44001, Stop: 43834, Start Num: 30

Candidate Starts for Target\_72:

(3, 44388), (18, 44055), (Start: 29 @44007 has 27 MA's), (Start: 30 @44001 has 10 MA's),

Gene: TheloniousMonk\_74 Start: 46699, Stop: 46526, Start Num: 29

Candidate Starts for TheloniousMonk\_74:

(18, 46747), (Start: 29 @46699 has 27 MA's), (Start: 30 @46693 has 10 MA's),

Gene: Tootsieroll\_75 Start: 48977, Stop: 49180, Start Num: 24

Candidate Starts for Tootsieroll\_75:

(Start: 22 @48974 has 7 MA's), (Start: 24 @48977 has 47 MA's), (33, 49043), (36, 49079), (37, 49085), (38, 49103), (43, 49163),

Gene: Tote\_67 Start: 42145, Stop: 41972, Start Num: 29

Candidate Starts for Tote\_67:

(18, 42193), (Start: 29 @42145 has 27 MA's), (Start: 30 @42139 has 10 MA's), (32, 42112),

Gene: Tripl3t\_75 Start: 48008, Stop: 47799, Start Num: 30

Candidate Starts for Tripl3t\_75:

(9, 48230), (18, 48062), (Start: 29 @48014 has 27 MA's), (Start: 30 @48008 has 10 MA's), (32, 47981), (44, 47831),

Gene: UncleRicky\_74 Start: 46427, Stop: 46630, Start Num: 24

Candidate Starts for UncleRicky\_74:

(Start: 22 @46424 has 7 MA's), (Start: 24 @46427 has 47 MA's), (33, 46493), (36, 46529), (37, 46535), (38, 46553), (43, 46613),

Gene: VRedHorse\_77 Start: 45679, Stop: 45882, Start Num: 24

Candidate Starts for VRedHorse\_77:

(Start: 24 @45679 has 47 MA's), (33, 45745), (38, 45805), (40, 45814), (42, 45847), (43, 45865),

Gene: VanLee\_80 Start: 45868, Stop: 46053, Start Num: 27

Candidate Starts for VanLee\_80:

(Start: 27 @45868 has 5 MA's), (36, 45955), (43, 46033),

Gene: Whatsapiecost\_71 Start: 43462, Stop: 43665, Start Num: 24

Candidate Starts for Whatsapiecost\_71:

(Start: 24 @43462 has 47 MA's), (33, 43528), (38, 43588), (40, 43597), (42, 43630), (43, 43648),

Gene: WillSterrel\_77 Start: 48420, Stop: 48626, Start Num: 22

Candidate Starts for WillSterrel\_77:

(Start: 22 @48420 has 7 MA's), (Start: 24 @48423 has 47 MA's), (33, 48489), (38, 48549), (40, 48558), (43, 48609),

Gene: Yorick\_74 Start: 48960, Stop: 49163, Start Num: 24

Candidate Starts for Yorick\_74:

(Start: 22 @48957 has 7 MA's), (Start: 24 @48960 has 47 MA's), (33, 49026), (36, 49062), (37, 49068), (38, 49086), (43, 49146),

Gene: Zephyr\_74 Start: 45623, Stop: 45450, Start Num: 29

Candidate Starts for Zephyr\_74:

(18, 45671), (Start: 29 @45623 has 27 MA's), (Start: 30 @45617 has 10 MA's),

Gene: Zizzle\_79 Start: 49076, Stop: 49279, Start Num: 24

Candidate Starts for Zizzle\_79:

(Start: 24 @49076 has 47 MA's), (33, 49142), (38, 49202), (40, 49211), (42, 49244), (43, 49262),