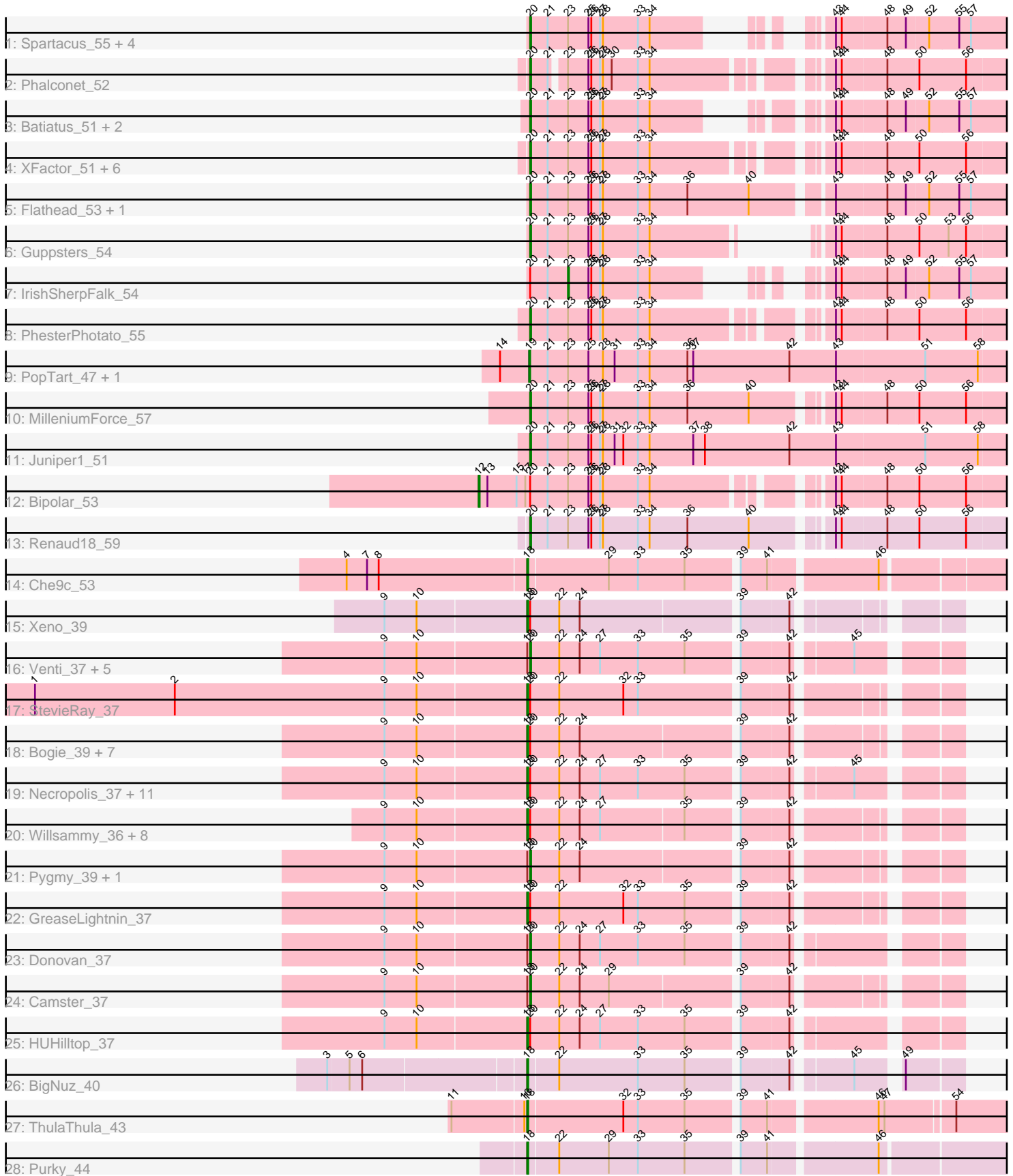


# Pham 195580



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 195580 Report

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

Pham number 195580 has 74 members, 4 are drafts.

Phages represented in each track:

- Track 1 : Spartacus\_55, WillSterrel\_54, Shauna1\_52, SuperGrey\_57, Phanphagia\_51
- Track 2 : Phalconet\_52
- Track 3 : Batiatus\_51, Filuzino\_51, IMpilo\_50
- Track 4 : XFactor\_51, Sparkdehlily\_61, Doug\_56, Zerg\_53, DaWorst\_55, RockyHorror\_54, TDanisky\_61
- Track 5 : Flathead\_53, JalFarm20\_65
- Track 6 : Guppsters\_54
- Track 7 : IrishSherpFalk\_54
- Track 8 : PhesterPhotato\_55
- Track 9 : PopTart\_47, SassyB\_47
- Track 10 : MilleniumForce\_57
- Track 11 : Juniper1\_51
- Track 12 : Bipolar\_53
- Track 13 : Renaud18\_59
- Track 14 : Che9c\_53
- Track 15 : Xen0\_39
- Track 16 : Venti\_37, Dynamo\_37, Langerak\_37, FirstPlacePfu\_37, Sonah\_37, Phegasus\_37
- Track 17 : StevieRay\_37
- Track 18 : Bogie\_39, Bunnies\_37, Brusacoram\_37, Malithi\_37, Ksquared\_37, Thespis\_37, Atcoo\_37, Shipwreck\_39
- Track 19 : Necropolis\_37, Jebeks\_38, Fishburne\_37, Mangethe\_37, Phineas\_37, Zilizebeth\_37, Arib1\_37, Techage\_37, Kari\_37, Vidya\_37, Majeke\_37, Bartholomew\_36
- Track 20 : Willsammy\_36, KilKor\_37, Polkaroo\_37, Jung\_36, Phalm\_37, Megiddo\_37, Glaske\_37, StressBall\_37, CactusJack\_37
- Track 21 : Pygmy\_39, Juniormint\_37
- Track 22 : GreaseLightnin\_37
- Track 23 : Donovan\_37
- Track 24 : Camster\_37
- Track 25 : HUHilltop\_37
- Track 26 : BigNuz\_40
- Track 27 : ThulaThula\_43
- Track 28 : Purky\_44

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

The start number called the most often in the published annotations is 18, it was called in 34 of the 70 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Arib1\_37, Atcoo\_37, Bartholomew\_36, BigNuz\_40, Bogie\_39, Brusacoram\_37, Bunnies\_37, CactusJack\_37, Che9c\_53, Fishburne\_37, Glaske\_37, GreaseLightnin\_37, HUHilltop\_37, Jebeks\_38, Jung\_36, Kari\_37, KilKor\_37, Ksquared\_37, Majeke\_37, Malithi\_37, Mangethe\_37, Megiddo\_37, Necropolis\_37, Phalm\_37, Phineas\_37, Polkaroo\_37, Purky\_44, Shipwreck\_39, StevieRay\_37, StressBall\_37, Techage\_37, Thespis\_37, ThulaThula\_43, Vidya\_37, Willsammy\_36, Xeno\_39, Zilizebeth\_37,

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

- Camster\_37, Donovan\_37, Dynamo\_37, FirstPlacePfu\_37, Juniormint\_37, Langerak\_37, Phegasus\_37, Pygmy\_39, Sonah\_37, Venti\_37,

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

- Batiatus\_51, Bipolar\_53, DaWorst\_55, Doug\_56, Filuzino\_51, Flathead\_53, Guppsters\_54, IMpilo\_50, IrishSherpFalk\_54, JalFarm20\_65, Juniper1\_51, MilleniumForce\_57, Phalconet\_52, Phanphagia\_51, PhesterPhotato\_55, PopTart\_47, Renaud18\_59, RockyHorror\_54, SassyB\_47, Shauna1\_52, Sparkdehlily\_61, Spartacus\_55, SuperGrey\_57, TDanisky\_61, WillSterrel\_54, XFactor\_51, Zerg\_53,

## **Summary by start number:**

Start 12:

- Found in 1 of 74 ( 1.4% ) of genes in pham
- Manual Annotations of this start: 1 of 70
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Bipolar\_53 (F1),

Start 18:

- Found in 47 of 74 ( 63.5% ) of genes in pham
- Manual Annotations of this start: 34 of 70
- Called 78.7% of time when present
- Phage (with cluster) where this start called: Arib1\_37 (P1), Atcoo\_37 (P1), Bartholomew\_36 (P1), BigNuz\_40 (P4), Bogie\_39 (P1), Brusacoram\_37 (P1), Bunnies\_37 (P1), CactusJack\_37 (P1), Che9c\_53 (I2), Fishburne\_37 (P1), Glaske\_37 (P1), GreaseLightnin\_37 (P1), HUHilltop\_37 (P1), Jebeks\_38 (P1), Jung\_36 (P1), Kari\_37 (P1), KilKor\_37 (P1), Ksquared\_37 (P1), Majeke\_37 (P1), Malithi\_37 (P1), Mangethe\_37 (P1), Megiddo\_37 (P1), Necropolis\_37 (P1), Phalm\_37 (P1), Phineas\_37 (P1), Polkaroo\_37 (P1), Purky\_44 (P6), Shipwreck\_39 (P1), StevieRay\_37 (P1), StressBall\_37 (P1), Techage\_37 (P1), Thespis\_37 (P1), ThulaThula\_43 (P5), Vidya\_37 (P1), Willsammy\_36 (P1), Xeno\_39 (N), Zilizebeth\_37 (P1),

Start 19:

- Found in 2 of 74 ( 2.7% ) of genes in pham
- Manual Annotations of this start: 2 of 70
- Called 100.0% of time when present

- Phage (with cluster) where this start called: PopTart\_47 (F1), SassyB\_47 (F1),

Start 20:

- Found in 68 of 74 ( 91.9% ) of genes in pham
- Manual Annotations of this start: 32 of 70
- Called 48.5% of time when present
- Phage (with cluster) where this start called: Batiatus\_51 (F1), Camster\_37 (P1), DaWorst\_55 (F1), Donovan\_37 (P1), Doug\_56 (F1), Dynamo\_37 (P1), Filuzino\_51 (F1), FirstPlacePfu\_37 (P1), Flathead\_53 (F1), Guppsters\_54 (F1), IMpilo\_50 (F1), JalFarm20\_65 (F1), Juniormint\_37 (P1), Juniper1\_51 (F1), Langerak\_37 (P1), MilleniumForce\_57 (F1), Phalconet\_52 (F1), Phanphagia\_51 (F1), Phegasus\_37 (P1), PhesterPhotato\_55 (F1), Pygmy\_39 (P1), Renaud18\_59 (F4), RockyHorror\_54 (F1), Shauna1\_52 (F1), Sonah\_37 (P1), Sparkdehlily\_61 (F1), Spartacus\_55 (F1), SuperGrey\_57 (F1), TDanisky\_61 (F1), Venti\_37 (P1), WillSterrel\_54 (F1), XFactor\_51 (F1), Zerg\_53 (F1),

Start 23:

- Found in 27 of 74 ( 36.5% ) of genes in pham
- Manual Annotations of this start: 1 of 70
- Called 3.7% of time when present
- Phage (with cluster) where this start called: IrishSherpFalk\_54 (F1),

### Summary by clusters:

There are 8 clusters represented in this pham: F1, P1, P6, P4, P5, I2, N, F4,

Info for manual annotations of cluster F1:

- Start number 12 was manually annotated 1 time for cluster F1.
- Start number 19 was manually annotated 2 times for cluster F1.
- Start number 20 was manually annotated 21 times for cluster F1.
- Start number 23 was manually annotated 1 time for cluster F1.

Info for manual annotations of cluster F4:

- Start number 20 was manually annotated 1 time for cluster F4.

Info for manual annotations of cluster I2:

- Start number 18 was manually annotated 1 time for cluster I2.

Info for manual annotations of cluster N:

- Start number 18 was manually annotated 1 time for cluster N.

Info for manual annotations of cluster P1:

- Start number 18 was manually annotated 29 times for cluster P1.
- Start number 20 was manually annotated 10 times for cluster P1.

Info for manual annotations of cluster P4:

- Start number 18 was manually annotated 1 time for cluster P4.

Info for manual annotations of cluster P5:

- Start number 18 was manually annotated 1 time for cluster P5.

Info for manual annotations of cluster P6:

- Start number 18 was manually annotated 1 time for cluster P6.

**Gene Information:**

Gene: Arib1\_37 Start: 29346, Stop: 29747, Start Num: 18

Candidate Starts for Arib1\_37:

(9, 29202), (10, 29235), (Start: 18 @29346 has 34 MA's), (Start: 20 @29349 has 32 MA's), (22, 29379), (24, 29400), (27, 29421), (33, 29460), (35, 29508), (39, 29556), (42, 29604), (45, 29655),

Gene: Atcoo\_37 Start: 29830, Stop: 30222, Start Num: 18

Candidate Starts for Atcoo\_37:

(9, 29686), (10, 29719), (Start: 18 @29830 has 34 MA's), (Start: 20 @29833 has 32 MA's), (22, 29863), (24, 29884), (39, 30037), (42, 30085),

Gene: Bartholomew\_36 Start: 29343, Stop: 29744, Start Num: 18

Candidate Starts for Bartholomew\_36:

(9, 29199), (10, 29232), (Start: 18 @29343 has 34 MA's), (Start: 20 @29346 has 32 MA's), (22, 29376), (24, 29397), (27, 29418), (33, 29457), (35, 29505), (39, 29553), (42, 29601), (45, 29652),

Gene: Batiatus\_51 Start: 37273, Stop: 37695, Start Num: 20

Candidate Starts for Batiatus\_51:

(Start: 20 @37273 has 32 MA's), (21, 37291), (Start: 23 @37312 has 1 MA's), (25, 37333), (26, 37336), (27, 37345), (28, 37348), (33, 37384), (34, 37396), (43, 37507), (44, 37513), (48, 37558), (49, 37576), (52, 37597), (55, 37627), (57, 37639),

Gene: BigNuz\_40 Start: 31449, Stop: 31847, Start Num: 18

Candidate Starts for BigNuz\_40:

(3, 31257), (5, 31278), (6, 31290), (Start: 18 @31449 has 34 MA's), (22, 31479), (33, 31560), (35, 31608), (39, 31656), (42, 31704), (45, 31755), (49, 31791),

Gene: Bipolar\_53 Start: 37987, Stop: 38499, Start Num: 12

Candidate Starts for Bipolar\_53:

(Start: 12 @37987 has 1 MA's), (13, 37996), (15, 38026), (17, 38035), (Start: 20 @38038 has 32 MA's), (21, 38056), (Start: 23 @38077 has 1 MA's), (25, 38098), (26, 38101), (27, 38110), (28, 38113), (33, 38149), (34, 38161), (43, 38311), (44, 38317), (48, 38362), (50, 38392), (56, 38440),

Gene: Bogie\_39 Start: 31126, Stop: 31521, Start Num: 18

Candidate Starts for Bogie\_39:

(9, 30982), (10, 31015), (Start: 18 @31126 has 34 MA's), (Start: 20 @31129 has 32 MA's), (22, 31159), (24, 31180), (39, 31333), (42, 31381),

Gene: Brusacoram\_37 Start: 29336, Stop: 29728, Start Num: 18

Candidate Starts for Brusacoram\_37:

(9, 29192), (10, 29225), (Start: 18 @29336 has 34 MA's), (Start: 20 @29339 has 32 MA's), (22, 29369), (24, 29390), (39, 29543), (42, 29591),

Gene: Bunnies\_37 Start: 29357, Stop: 29752, Start Num: 18

Candidate Starts for Bunnies\_37:

(9, 29213), (10, 29246), (Start: 18 @29357 has 34 MA's), (Start: 20 @29360 has 32 MA's), (22, 29390), (24, 29411), (39, 29564), (42, 29612),

Gene: CactusJack\_37 Start: 29597, Stop: 29992, Start Num: 18

Candidate Starts for CactusJack\_37:

(9, 29453), (10, 29486), (Start: 18 @29597 has 34 MA's), (Start: 20 @29600 has 32 MA's), (22, 29630), (24, 29651), (27, 29672), (35, 29756), (39, 29804), (42, 29852),

Gene: Camster\_37 Start: 29376, Stop: 29768, Start Num: 20

Candidate Starts for Camster\_37:

(9, 29229), (10, 29262), (Start: 18 @29373 has 34 MA's), (Start: 20 @29376 has 32 MA's), (22, 29406), (24, 29427), (29, 29457), (39, 29580), (42, 29628),

Gene: Che9c\_53 Start: 40661, Stop: 41131, Start Num: 18

Candidate Starts for Che9c\_53:

(4, 40478), (7, 40499), (8, 40511), (Start: 18 @40661 has 34 MA's), (29, 40742), (33, 40772), (35, 40820), (39, 40868), (41, 40895), (46, 40997),

Gene: DaWorst\_55 Start: 38273, Stop: 38734, Start Num: 20

Candidate Starts for DaWorst\_55:

(Start: 20 @38273 has 32 MA's), (21, 38291), (Start: 23 @38312 has 1 MA's), (25, 38333), (26, 38336), (27, 38345), (28, 38348), (33, 38384), (34, 38396), (43, 38546), (44, 38552), (48, 38597), (50, 38627), (56, 38675),

Gene: Donovan\_37 Start: 29365, Stop: 29763, Start Num: 20

Candidate Starts for Donovan\_37:

(9, 29218), (10, 29251), (Start: 18 @29362 has 34 MA's), (Start: 20 @29365 has 32 MA's), (22, 29395), (24, 29416), (27, 29437), (33, 29476), (35, 29524), (39, 29572), (42, 29620),

Gene: Doug\_56 Start: 38539, Stop: 39000, Start Num: 20

Candidate Starts for Doug\_56:

(Start: 20 @38539 has 32 MA's), (21, 38557), (Start: 23 @38578 has 1 MA's), (25, 38599), (26, 38602), (27, 38611), (28, 38614), (33, 38650), (34, 38662), (43, 38812), (44, 38818), (48, 38863), (50, 38893), (56, 38941),

Gene: Dynamo\_37 Start: 29754, Stop: 30152, Start Num: 20

Candidate Starts for Dynamo\_37:

(9, 29607), (10, 29640), (Start: 18 @29751 has 34 MA's), (Start: 20 @29754 has 32 MA's), (22, 29784), (24, 29805), (27, 29826), (33, 29865), (35, 29913), (39, 29961), (42, 30009), (45, 30060),

Gene: Filuzino\_51 Start: 36320, Stop: 36742, Start Num: 20

Candidate Starts for Filuzino\_51:

(Start: 20 @36320 has 32 MA's), (21, 36338), (Start: 23 @36359 has 1 MA's), (25, 36380), (26, 36383), (27, 36392), (28, 36395), (33, 36431), (34, 36443), (43, 36554), (44, 36560), (48, 36605), (49, 36623), (52, 36644), (55, 36674), (57, 36686),

Gene: FirstPlacePfu\_37 Start: 29378, Stop: 29776, Start Num: 20

Candidate Starts for FirstPlacePfu\_37:

(9, 29231), (10, 29264), (Start: 18 @29375 has 34 MA's), (Start: 20 @29378 has 32 MA's), (22, 29408), (24, 29429), (27, 29450), (33, 29489), (35, 29537), (39, 29585), (42, 29633), (45, 29684),

Gene: Fishburne\_37 Start: 29343, Stop: 29744, Start Num: 18

Candidate Starts for Fishburne\_37:

(9, 29199), (10, 29232), (Start: 18 @29343 has 34 MA's), (Start: 20 @29346 has 32 MA's), (22, 29376), (24, 29397), (27, 29418), (33, 29457), (35, 29505), (39, 29553), (42, 29601), (45, 29652),

Gene: Flathead\_53 Start: 37749, Stop: 38234, Start Num: 20

Candidate Starts for Flathead\_53:

(Start: 20 @37749 has 32 MA's), (21, 37767), (Start: 23 @37788 has 1 MA's), (25, 37809), (26, 37812), (27, 37821), (28, 37824), (33, 37860), (34, 37872), (36, 37911), (40, 37974), (43, 38046), (48, 38097), (49, 38115), (52, 38136), (55, 38166), (57, 38178),

Gene: Glaske\_37 Start: 29597, Stop: 29992, Start Num: 18

Candidate Starts for Glaske\_37:

(9, 29453), (10, 29486), (Start: 18 @29597 has 34 MA's), (Start: 20 @29600 has 32 MA's), (22, 29630), (24, 29651), (27, 29672), (35, 29756), (39, 29804), (42, 29852),

Gene: GreaseLightnin\_37 Start: 29583, Stop: 29981, Start Num: 18

Candidate Starts for GreaseLightnin\_37:

(9, 29439), (10, 29472), (Start: 18 @29583 has 34 MA's), (Start: 20 @29586 has 32 MA's), (22, 29616), (32, 29682), (33, 29697), (35, 29745), (39, 29793), (42, 29841),

Gene: Guppsters\_54 Start: 36848, Stop: 37258, Start Num: 20

Candidate Starts for Guppsters\_54:

(Start: 20 @36848 has 32 MA's), (21, 36866), (Start: 23 @36887 has 1 MA's), (25, 36908), (26, 36911), (27, 36920), (28, 36923), (33, 36959), (34, 36971), (43, 37070), (44, 37076), (48, 37121), (50, 37151), (53, 37181), (56, 37199),

Gene: HUHilltop\_37 Start: 29373, Stop: 29774, Start Num: 18

Candidate Starts for HUHilltop\_37:

(9, 29229), (10, 29262), (Start: 18 @29373 has 34 MA's), (Start: 20 @29376 has 32 MA's), (22, 29406), (24, 29427), (27, 29448), (33, 29487), (35, 29535), (39, 29583), (42, 29631),

Gene: IMPilo\_50 Start: 35763, Stop: 36185, Start Num: 20

Candidate Starts for IMPilo\_50:

(Start: 20 @35763 has 32 MA's), (21, 35781), (Start: 23 @35802 has 1 MA's), (25, 35823), (26, 35826), (27, 35835), (28, 35838), (33, 35874), (34, 35886), (43, 35997), (44, 36003), (48, 36048), (49, 36066), (52, 36087), (55, 36117), (57, 36129),

Gene: IrishSherpFalk\_54 Start: 38745, Stop: 39116, Start Num: 23

Candidate Starts for IrishSherpFalk\_54:

(Start: 20 @38706 has 32 MA's), (21, 38724), (Start: 23 @38745 has 1 MA's), (25, 38766), (26, 38769), (27, 38778), (28, 38781), (33, 38817), (34, 38829), (43, 38928), (44, 38934), (48, 38979), (49, 38997), (52, 39018), (55, 39048), (57, 39060),

Gene: JalFarm20\_65 Start: 40779, Stop: 41264, Start Num: 20

Candidate Starts for JalFarm20\_65:

(Start: 20 @40779 has 32 MA's), (21, 40797), (Start: 23 @40818 has 1 MA's), (25, 40839), (26, 40842), (27, 40851), (28, 40854), (33, 40890), (34, 40902), (36, 40941), (40, 41004), (43, 41076), (48, 41127), (49, 41145), (52, 41166), (55, 41196), (57, 41208),

Gene: Jebeks\_38 Start: 29328, Stop: 29729, Start Num: 18

Candidate Starts for Jebeks\_38:

(9, 29184), (10, 29217), (Start: 18 @29328 has 34 MA's), (Start: 20 @29331 has 32 MA's), (22, 29361), (24, 29382), (27, 29403), (33, 29442), (35, 29490), (39, 29538), (42, 29586), (45, 29637),

Gene: Jung\_36 Start: 29304, Stop: 29699, Start Num: 18

Candidate Starts for Jung\_36:

(9, 29160), (10, 29193), (Start: 18 @29304 has 34 MA's), (Start: 20 @29307 has 32 MA's), (22, 29337), (24, 29358), (27, 29379), (35, 29463), (39, 29511), (42, 29559),

Gene: Juniormint\_37 Start: 29382, Stop: 29774, Start Num: 20

Candidate Starts for Juniormint\_37:

(9, 29235), (10, 29268), (Start: 18 @29379 has 34 MA's), (Start: 20 @29382 has 32 MA's), (22, 29412), (24, 29433), (39, 29586), (42, 29634),

Gene: Juniper1\_51 Start: 36864, Stop: 37370, Start Num: 20

Candidate Starts for Juniper1\_51:

(Start: 20 @36864 has 32 MA's), (21, 36882), (Start: 23 @36903 has 1 MA's), (25, 36924), (26, 36927), (27, 36936), (28, 36939), (31, 36951), (32, 36960), (33, 36975), (34, 36987), (37, 37032), (38, 37044), (42, 37131), (43, 37179), (51, 37269), (58, 37323),

Gene: Kari\_37 Start: 29340, Stop: 29741, Start Num: 18

Candidate Starts for Kari\_37:

(9, 29196), (10, 29229), (Start: 18 @29340 has 34 MA's), (Start: 20 @29343 has 32 MA's), (22, 29373), (24, 29394), (27, 29415), (33, 29454), (35, 29502), (39, 29550), (42, 29598), (45, 29649),

Gene: KilKor\_37 Start: 29597, Stop: 29992, Start Num: 18

Candidate Starts for KilKor\_37:

(9, 29453), (10, 29486), (Start: 18 @29597 has 34 MA's), (Start: 20 @29600 has 32 MA's), (22, 29630), (24, 29651), (27, 29672), (35, 29756), (39, 29804), (42, 29852),

Gene: Ksquared\_37 Start: 29357, Stop: 29752, Start Num: 18

Candidate Starts for Ksquared\_37:

(9, 29213), (10, 29246), (Start: 18 @29357 has 34 MA's), (Start: 20 @29360 has 32 MA's), (22, 29390), (24, 29411), (39, 29564), (42, 29612),

Gene: Langerak\_37 Start: 29359, Stop: 29757, Start Num: 20

Candidate Starts for Langerak\_37:

(9, 29212), (10, 29245), (Start: 18 @29356 has 34 MA's), (Start: 20 @29359 has 32 MA's), (22, 29389), (24, 29410), (27, 29431), (33, 29470), (35, 29518), (39, 29566), (42, 29614), (45, 29665),

Gene: Majeke\_37 Start: 29381, Stop: 29782, Start Num: 18

Candidate Starts for Majeke\_37:

(9, 29237), (10, 29270), (Start: 18 @29381 has 34 MA's), (Start: 20 @29384 has 32 MA's), (22, 29414), (24, 29435), (27, 29456), (33, 29495), (35, 29543), (39, 29591), (42, 29639), (45, 29690),

Gene: Malithi\_37 Start: 29266, Stop: 29661, Start Num: 18

Candidate Starts for Malithi\_37:

(9, 29122), (10, 29155), (Start: 18 @29266 has 34 MA's), (Start: 20 @29269 has 32 MA's), (22, 29299), (24, 29320), (39, 29473), (42, 29521),

Gene: Mangethe\_37 Start: 29381, Stop: 29782, Start Num: 18

Candidate Starts for Mangethe\_37:

(9, 29237), (10, 29270), (Start: 18 @29381 has 34 MA's), (Start: 20 @29384 has 32 MA's), (22, 29414), (24, 29435), (27, 29456), (33, 29495), (35, 29543), (39, 29591), (42, 29639), (45, 29690),

Gene: Megiddo\_37 Start: 29597, Stop: 29992, Start Num: 18

Candidate Starts for Megiddo\_37:

(9, 29453), (10, 29486), (Start: 18 @29597 has 34 MA's), (Start: 20 @29600 has 32 MA's), (22, 29630), (24, 29651), (27, 29672), (35, 29756), (39, 29804), (42, 29852),

Gene: MilleniumForce\_57 Start: 39630, Stop: 40112, Start Num: 20



Candidate Starts for MilleniumForce\_57:

(Start: 20 @39630 has 32 MA's), (21, 39648), (Start: 23 @39669 has 1 MA's), (25, 39690), (26, 39693), (27, 39702), (28, 39705), (33, 39741), (34, 39753), (36, 39792), (40, 39855), (43, 39924), (44, 39930), (48, 39975), (50, 40005), (56, 40053),

Gene: Necropolis\_37 Start: 29340, Stop: 29741, Start Num: 18

Candidate Starts for Necropolis\_37:

(9, 29196), (10, 29229), (Start: 18 @29340 has 34 MA's), (Start: 20 @29343 has 32 MA's), (22, 29373), (24, 29394), (27, 29415), (33, 29454), (35, 29502), (39, 29550), (42, 29598), (45, 29649),

Gene: Phalconet\_52 Start: 36835, Stop: 37287, Start Num: 20

Candidate Starts for Phalconet\_52:

(Start: 20 @36835 has 32 MA's), (21, 36853), (Start: 23 @36865 has 1 MA's), (25, 36886), (26, 36889), (27, 36898), (28, 36901), (30, 36910), (33, 36937), (34, 36949), (43, 37099), (44, 37105), (48, 37150), (50, 37180), (56, 37228),

Gene: Phalm\_37 Start: 29597, Stop: 29992, Start Num: 18

Candidate Starts for Phalm\_37:

(9, 29453), (10, 29486), (Start: 18 @29597 has 34 MA's), (Start: 20 @29600 has 32 MA's), (22, 29630), (24, 29651), (27, 29672), (35, 29756), (39, 29804), (42, 29852),

Gene: Phanphagia\_51 Start: 37739, Stop: 38149, Start Num: 20

Candidate Starts for Phanphagia\_51:

(Start: 20 @37739 has 32 MA's), (21, 37757), (Start: 23 @37778 has 1 MA's), (25, 37799), (26, 37802), (27, 37811), (28, 37814), (33, 37850), (34, 37862), (43, 37961), (44, 37967), (48, 38012), (49, 38030), (52, 38051), (55, 38081), (57, 38093),

Gene: Phegasus\_37 Start: 29351, Stop: 29749, Start Num: 20

Candidate Starts for Phegasus\_37:

(9, 29204), (10, 29237), (Start: 18 @29348 has 34 MA's), (Start: 20 @29351 has 32 MA's), (22, 29381), (24, 29402), (27, 29423), (33, 29462), (35, 29510), (39, 29558), (42, 29606), (45, 29657),

Gene: PhesterPhotato\_55 Start: 37823, Stop: 38284, Start Num: 20

Candidate Starts for PhesterPhotato\_55:

(Start: 20 @37823 has 32 MA's), (21, 37841), (Start: 23 @37862 has 1 MA's), (25, 37883), (26, 37886), (27, 37895), (28, 37898), (33, 37934), (34, 37946), (43, 38096), (44, 38102), (48, 38147), (50, 38177), (56, 38225),

Gene: Phineas\_37 Start: 29711, Stop: 30112, Start Num: 18

Candidate Starts for Phineas\_37:

(9, 29567), (10, 29600), (Start: 18 @29711 has 34 MA's), (Start: 20 @29714 has 32 MA's), (22, 29744), (24, 29765), (27, 29786), (33, 29825), (35, 29873), (39, 29921), (42, 29969), (45, 30020),

Gene: Polkaroo\_37 Start: 29354, Stop: 29749, Start Num: 18

Candidate Starts for Polkaroo\_37:

(9, 29210), (10, 29243), (Start: 18 @29354 has 34 MA's), (Start: 20 @29357 has 32 MA's), (22, 29387), (24, 29408), (27, 29429), (35, 29513), (39, 29561), (42, 29609),

Gene: PopTart\_47 Start: 36238, Stop: 36744, Start Num: 19

Candidate Starts for PopTart\_47:

(14, 36208), (Start: 19 @36238 has 2 MA's), (21, 36256), (Start: 23 @36277 has 1 MA's), (25, 36298), (28, 36313), (31, 36325), (33, 36349), (34, 36361), (36, 36400), (37, 36406), (42, 36505), (43, 36553), (51, 36643), (58, 36697),

Gene: Purky\_44 Start: 32059, Stop: 32535, Start Num: 18

Candidate Starts for Purky\_44:

(Start: 18 @32059 has 34 MA's), (22, 32089), (29, 32140), (33, 32170), (35, 32218), (39, 32266), (41, 32293), (46, 32395),

Gene: Pygmy\_39 Start: 31185, Stop: 31577, Start Num: 20

Candidate Starts for Pygmy\_39:

(9, 31038), (10, 31071), (Start: 18 @31182 has 34 MA's), (Start: 20 @31185 has 32 MA's), (22, 31215), (24, 31236), (39, 31389), (42, 31437),

Gene: Renaud18\_59 Start: 38442, Stop: 38924, Start Num: 20

Candidate Starts for Renaud18\_59:

(Start: 20 @38442 has 32 MA's), (21, 38460), (Start: 23 @38481 has 1 MA's), (25, 38502), (26, 38505), (27, 38514), (28, 38517), (33, 38553), (34, 38565), (36, 38604), (40, 38667), (43, 38736), (44, 38742), (48, 38787), (50, 38817), (56, 38865),

Gene: RockyHorror\_54 Start: 37296, Stop: 37757, Start Num: 20

Candidate Starts for RockyHorror\_54:

(Start: 20 @37296 has 32 MA's), (21, 37314), (Start: 23 @37335 has 1 MA's), (25, 37356), (26, 37359), (27, 37368), (28, 37371), (33, 37407), (34, 37419), (43, 37569), (44, 37575), (48, 37620), (50, 37650), (56, 37698),

Gene: SassyB\_47 Start: 36238, Stop: 36744, Start Num: 19

Candidate Starts for SassyB\_47:

(14, 36208), (Start: 19 @36238 has 2 MA's), (21, 36256), (Start: 23 @36277 has 1 MA's), (25, 36298), (28, 36313), (31, 36325), (33, 36349), (34, 36361), (36, 36400), (37, 36406), (42, 36505), (43, 36553), (51, 36643), (58, 36697),

Gene: Shauna1\_52 Start: 37720, Stop: 38130, Start Num: 20

Candidate Starts for Shauna1\_52:

(Start: 20 @37720 has 32 MA's), (21, 37738), (Start: 23 @37759 has 1 MA's), (25, 37780), (26, 37783), (27, 37792), (28, 37795), (33, 37831), (34, 37843), (43, 37942), (44, 37948), (48, 37993), (49, 38011), (52, 38032), (55, 38062), (57, 38074),

Gene: Shipwreck\_39 Start: 31157, Stop: 31552, Start Num: 18

Candidate Starts for Shipwreck\_39:

(9, 31013), (10, 31046), (Start: 18 @31157 has 34 MA's), (Start: 20 @31160 has 32 MA's), (22, 31190), (24, 31211), (39, 31364), (42, 31412),

Gene: Sonah\_37 Start: 29332, Stop: 29730, Start Num: 20

Candidate Starts for Sonah\_37:

(9, 29185), (10, 29218), (Start: 18 @29329 has 34 MA's), (Start: 20 @29332 has 32 MA's), (22, 29362), (24, 29383), (27, 29404), (33, 29443), (35, 29491), (39, 29539), (42, 29587), (45, 29638),

Gene: Sparkdehlily\_61 Start: 39036, Stop: 39497, Start Num: 20

Candidate Starts for Sparkdehlily\_61:

(Start: 20 @39036 has 32 MA's), (21, 39054), (Start: 23 @39075 has 1 MA's), (25, 39096), (26, 39099), (27, 39108), (28, 39111), (33, 39147), (34, 39159), (43, 39309), (44, 39315), (48, 39360), (50, 39390), (56, 39438),

Gene: Spartacus\_55 Start: 37623, Stop: 38033, Start Num: 20

Candidate Starts for Spartacus\_55:

(Start: 20 @37623 has 32 MA's), (21, 37641), (Start: 23 @37662 has 1 MA's), (25, 37683), (26, 37686), (27, 37695), (28, 37698), (33, 37734), (34, 37746), (43, 37845), (44, 37851), (48, 37896), (49, 37914), (52, 37935), (55, 37965), (57, 37977),

Gene: StevieRay\_37 Start: 29296, Stop: 29694, Start Num: 18

Candidate Starts for StevieRay\_37:

(1, 28792), (2, 28936), (9, 29152), (10, 29185), (Start: 18 @29296 has 34 MA's), (Start: 20 @29299 has 32 MA's), (22, 29329), (32, 29395), (33, 29410), (39, 29506), (42, 29554),

Gene: StressBall\_37 Start: 29597, Stop: 29992, Start Num: 18

Candidate Starts for StressBall\_37:

(9, 29453), (10, 29486), (Start: 18 @29597 has 34 MA's), (Start: 20 @29600 has 32 MA's), (22, 29630), (24, 29651), (27, 29672), (35, 29756), (39, 29804), (42, 29852),

Gene: SuperGrey\_57 Start: 39146, Stop: 39556, Start Num: 20

Candidate Starts for SuperGrey\_57:

(Start: 20 @39146 has 32 MA's), (21, 39164), (Start: 23 @39185 has 1 MA's), (25, 39206), (26, 39209), (27, 39218), (28, 39221), (33, 39257), (34, 39269), (43, 39368), (44, 39374), (48, 39419), (49, 39437), (52, 39458), (55, 39488), (57, 39500),

Gene: TDanisky\_61 Start: 39036, Stop: 39497, Start Num: 20

Candidate Starts for TDanisky\_61:

(Start: 20 @39036 has 32 MA's), (21, 39054), (Start: 23 @39075 has 1 MA's), (25, 39096), (26, 39099), (27, 39108), (28, 39111), (33, 39147), (34, 39159), (43, 39309), (44, 39315), (48, 39360), (50, 39390), (56, 39438),

Gene: Techage\_37 Start: 29366, Stop: 29767, Start Num: 18

Candidate Starts for Techage\_37:

(9, 29222), (10, 29255), (Start: 18 @29366 has 34 MA's), (Start: 20 @29369 has 32 MA's), (22, 29399), (24, 29420), (27, 29441), (33, 29480), (35, 29528), (39, 29576), (42, 29624), (45, 29675),

Gene: Thespis\_37 Start: 29336, Stop: 29728, Start Num: 18

Candidate Starts for Thespis\_37:

(9, 29192), (10, 29225), (Start: 18 @29336 has 34 MA's), (Start: 20 @29339 has 32 MA's), (22, 29369), (24, 29390), (39, 29543), (42, 29591),

Gene: ThulaThula\_43 Start: 33482, Stop: 33961, Start Num: 18

Candidate Starts for ThulaThula\_43:

(11, 33407), (16, 33479), (Start: 18 @33482 has 34 MA's), (32, 33578), (33, 33593), (35, 33641), (39, 33689), (41, 33716), (46, 33818), (47, 33824), (54, 33890),

Gene: Venti\_37 Start: 29346, Stop: 29744, Start Num: 20

Candidate Starts for Venti\_37:

(9, 29199), (10, 29232), (Start: 18 @29343 has 34 MA's), (Start: 20 @29346 has 32 MA's), (22, 29376), (24, 29397), (27, 29418), (33, 29457), (35, 29505), (39, 29553), (42, 29601), (45, 29652),

Gene: Vidya\_37 Start: 29376, Stop: 29777, Start Num: 18

Candidate Starts for Vidya\_37:

(9, 29232), (10, 29265), (Start: 18 @29376 has 34 MA's), (Start: 20 @29379 has 32 MA's), (22, 29409), (24, 29430), (27, 29451), (33, 29490), (35, 29538), (39, 29586), (42, 29634), (45, 29685),

Gene: WillSterrel\_54 Start: 38739, Stop: 39149, Start Num: 20

Candidate Starts for WillSterrel\_54:

(Start: 20 @38739 has 32 MA's), (21, 38757), (Start: 23 @38778 has 1 MA's), (25, 38799), (26, 38802), (27, 38811), (28, 38814), (33, 38850), (34, 38862), (43, 38961), (44, 38967), (48, 39012), (49, 39030), (52, 39051), (55, 39081), (57, 39093),

Gene: Willsammy\_36 Start: 29080, Stop: 29475, Start Num: 18

Candidate Starts for Willsammy\_36:

(9, 28936), (10, 28969), (Start: 18 @29080 has 34 MA's), (Start: 20 @29083 has 32 MA's), (22, 29113), (24, 29134), (27, 29155), (35, 29239), (39, 29287), (42, 29335),

Gene: XFactor\_51 Start: 36239, Stop: 36700, Start Num: 20

Candidate Starts for XFactor\_51:

(Start: 20 @36239 has 32 MA's), (21, 36257), (Start: 23 @36278 has 1 MA's), (25, 36299), (26, 36302), (27, 36311), (28, 36314), (33, 36350), (34, 36362), (43, 36512), (44, 36518), (48, 36563), (50, 36593), (56, 36641),

Gene: Xeno\_39 Start: 28678, Stop: 29070, Start Num: 18

Candidate Starts for Xeno\_39:

(9, 28534), (10, 28567), (Start: 18 @28678 has 34 MA's), (Start: 20 @28681 has 32 MA's), (22, 28711), (24, 28732), (39, 28885), (42, 28933),

Gene: Zerg\_53 Start: 37405, Stop: 37866, Start Num: 20

Candidate Starts for Zerg\_53:

(Start: 20 @37405 has 32 MA's), (21, 37423), (Start: 23 @37444 has 1 MA's), (25, 37465), (26, 37468), (27, 37477), (28, 37480), (33, 37516), (34, 37528), (43, 37678), (44, 37684), (48, 37729), (50, 37759), (56, 37807),

Gene: Zilizebeth\_37 Start: 29375, Stop: 29776, Start Num: 18

Candidate Starts for Zilizebeth\_37:

(9, 29231), (10, 29264), (Start: 18 @29375 has 34 MA's), (Start: 20 @29378 has 32 MA's), (22, 29408), (24, 29429), (27, 29450), (33, 29489), (35, 29537), (39, 29585), (42, 29633), (45, 29684),