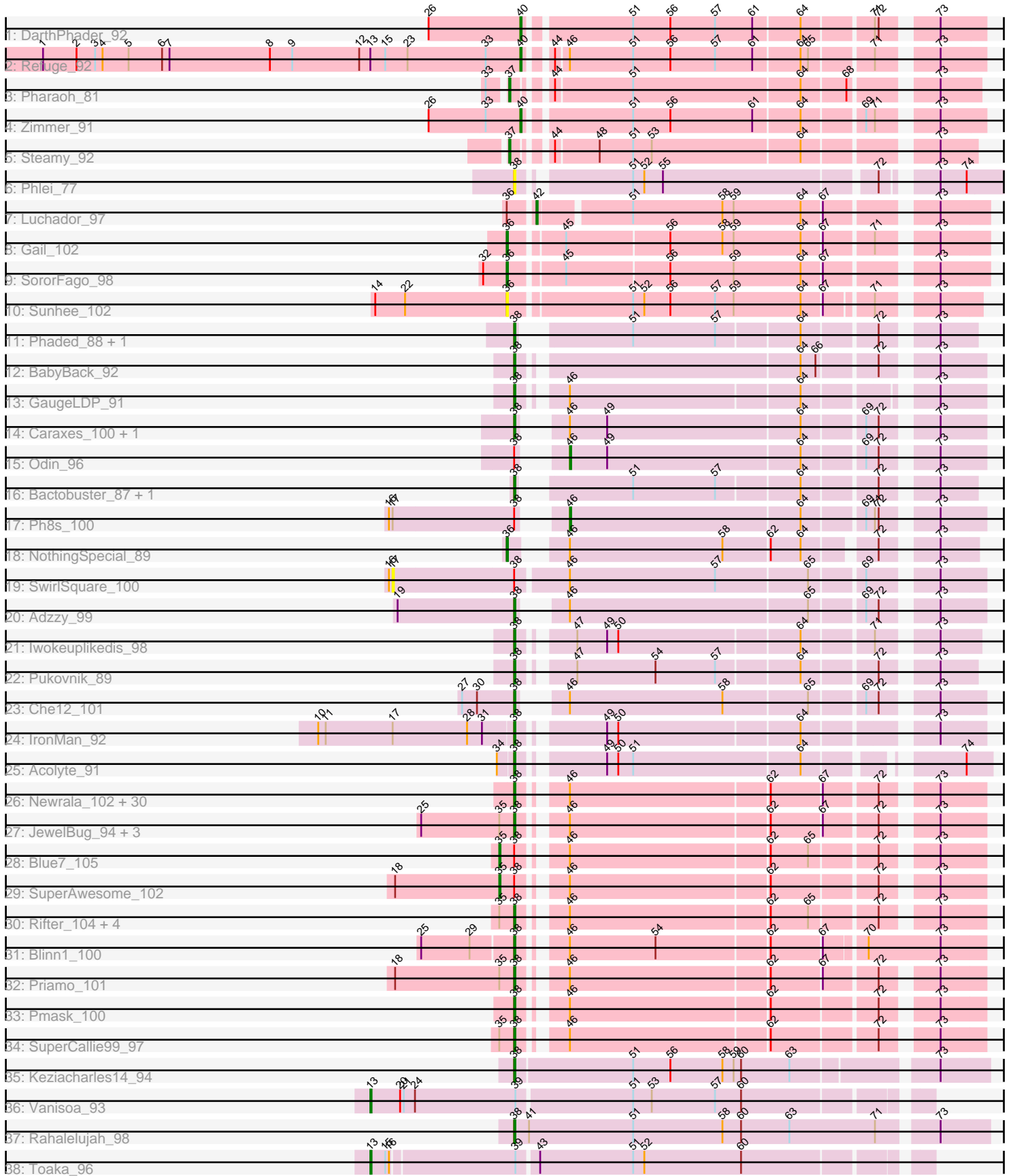


Pham 193953



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 193953 Report

This analysis was run 11/02/24 on database version 579.

Pham number 193953 has 78 members, 8 are drafts.

Phages represented in each track:

- Track 1 : DarthPhader\_92
- Track 2 : Refuge\_92
- Track 3 : Pharaoh\_81
- Track 4 : Zimmer\_91
- Track 5 : Steamy\_92
- Track 6 : Phlei\_77
- Track 7 : Luchador\_97
- Track 8 : Gail\_102
- Track 9 : SororFago\_98
- Track 10 : Sunhee\_102
- Track 11 : Phaded\_88, Jaan\_91
- Track 12 : BabyBack\_92
- Track 13 : GaugeLDP\_91
- Track 14 : Caraxes\_100, Superchunk\_99
- Track 15 : Odin\_96
- Track 16 : Bactobuster\_87, Landor\_93
- Track 17 : Ph8s\_100
- Track 18 : NothingSpecial\_89
- Track 19 : SwirlSquare\_100
- Track 20 : Adzzy\_99
- Track 21 : Iwokeuplikedis\_98
- Track 22 : Pukovnik\_89
- Track 23 : Che12\_101
- Track 24 : IronMan\_92
- Track 25 : Acolyte\_91
- Track 26 : Newrala\_102, Yokurt\_102, Indra\_105, BABullseye\_96, CloudWang3\_106, Candra\_100, VohminGhazi\_103, Wiks\_103, Neeharika16\_99, Garak\_104, Zulu\_104, Lilbunny\_99, Helmet\_105, SmellyB\_103, EricB\_100, DaVinci\_100, Chartreuse\_100, McFly\_102, Tucker\_104, Hexamo\_105, GreedyLawyer\_91, Roksolana\_106, ToneTone\_99, Hoot\_98, Cookiedough\_101, WunderPhul\_92, Artemis2UCLA\_105, Jeffabunny\_94, Isiphiwo\_99, Zaka\_104, Kazan\_104
- Track 27 : JewelBug\_94, Jordennis\_99, Kipper29\_101, Dorothea\_102
- Track 28 : Blue7\_105
- Track 29 : SuperAwesome\_102
- Track 30 : Rifter\_104, Gruunaga\_104, Koko\_105, Hammer\_104, Gladiator\_99
- Track 31 : Blinn1\_100

- Track 32 : Priamo\_101
- Track 33 : Pmask\_100
- Track 34 : SuperCallie99\_97
- Track 35 : Keziacharles14\_94
- Track 36 : Vanisoa\_93
- Track 37 : Rahalelujah\_98
- Track 38 : Toaka\_96

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

The start number called the most often in the published annotations is 38, it was called in 55 of the 70 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Acolyte\_91, Adzzy\_99, Artemis2UCLA\_105, BABullseye\_96, BabyBack\_92, Bactobuster\_87, Blinn1\_100, Candra\_100, Caraxes\_100, Chartreuse\_100, Che12\_101, CloudWang3\_106, Cookiedough\_101, DaVinci\_100, Dorothea\_102, EricB\_100, Garak\_104, GaugeLDP\_91, Gladiator\_99, GreedyLawyer\_91, Gruunaga\_104, Hammer\_104, Helmet\_105, Hexamo\_105, Hoot\_98, Indra\_105, IronMan\_92, Isiphiwo\_99, Iwokeuplikedis\_98, Jaan\_91, Jeffabunny\_94, JewelBug\_94, Jordennis\_99, Kazan\_104, Keziacharles14\_94, Kipper29\_101, Koko\_105, Landor\_93, Lilbunny\_99, McFly\_102, Neeharika16\_99, Newrala\_102, Phaded\_88, Phlei\_77, Pmask\_100, Priamo\_101, Pukovnik\_89, Rahalelujah\_98, Rifter\_104, Roksolana\_106, SmellyB\_103, SuperCallie99\_97, Superchunk\_99, ToneTone\_99, Tucker\_104, VohminGhazi\_103, Wiks\_103, WunderPhul\_92, Yokurt\_102, Zaka\_104, Zulu\_104,

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

- Blue7\_105, Odin\_96, Ph8s\_100, SuperAwesome\_102, SwirlSquare\_100,

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

- DarthPhader\_92, Gail\_102, Luchador\_97, NothingSpecial\_89, Pharaoh\_81, Refuge\_92, SororFago\_98, Steamy\_92, Sunhee\_102, Toaka\_96, Vanisoa\_93, Zimmer\_91,

**Summary by start number:**

Start 13:

- Found in 3 of 78 ( 3.8% ) of genes in pham
- Manual Annotations of this start: 2 of 70
- Called 66.7% of time when present
- Phage (with cluster) where this start called: Toaka\_96 (A9), Vanisoa\_93 (A9),

Start 17:

- Found in 3 of 78 ( 3.8% ) of genes in pham
- No Manual Annotations of this start.
- Called 33.3% of time when present
- Phage (with cluster) where this start called: SwirlSquare\_100 (A2),

Start 35:

- Found in 13 of 78 ( 16.7% ) of genes in pham
- Manual Annotations of this start: 2 of 70
- Called 15.4% of time when present
- Phage (with cluster) where this start called: Blue7\_105 (A6), SuperAwesome\_102 (A6),

#### Start 36:

- Found in 5 of 78 ( 6.4% ) of genes in pham
- Manual Annotations of this start: 3 of 70
- Called 80.0% of time when present
- Phage (with cluster) where this start called: Gail\_102 (A14), NothingSpecial\_89 (A2), SororFago\_98 (A14), Sunhee\_102 (A14),

#### Start 37:

- Found in 2 of 78 ( 2.6% ) 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: Pharaoh\_81 (A12), Steamy\_92 (A12),

#### Start 38:

- Found in 66 of 78 ( 84.6% ) of genes in pham
- Manual Annotations of this start: 55 of 70
- Called 92.4% of time when present
- Phage (with cluster) where this start called: Acolyte\_91 (A2), Adzzy\_99 (A2), Artemis2UCLA\_105 (A6), BABullseye\_96 (A6), BabyBack\_92 (A2), Bactobuster\_87 (A2), Blinn1\_100 (A6), Candra\_100 (A6), Caraxes\_100 (A2), Chartreuse\_100 (A6), Che12\_101 (A2), CloudWang3\_106 (A6), Cookiedough\_101 (A6), DaVinci\_100 (A6), Dorothea\_102 (A6), EricB\_100 (A6), Garak\_104 (A6), GaugeLDP\_91 (A2), Gladiator\_99 (A6), GreedyLawyer\_91 (A6), Gruunaga\_104 (A6), Hammer\_104 (A6), Helmet\_105 (A6), Hexamo\_105 (A6), Hoot\_98 (A6), Indra\_105 (A6), IronMan\_92 (A2), Isiphiwo\_99 (A6), Iwokeuplikedis\_98 (A2), Jaan\_91 (A2), Jeffabunny\_94 (A6), JewelBug\_94 (A6), Jordennis\_99 (A6), Kazan\_104 (A6), Keziacharles14\_94 (A9), Kipper29\_101 (A6), Koko\_105 (A6), Landor\_93 (A2), Lilbunny\_99 (A6), McFly\_102 (A6), Neeharika16\_99 (A6), Newrala\_102 (A6), Phaded\_88 (A2), Phlei\_77 (A13), Pmask\_100 (A6), Priamo\_101 (A6), Pukovnik\_89 (A2), Rahalelujah\_98 (A9), Rifter\_104 (A6), Roksolana\_106 (A6), SmellyB\_103 (A6), SuperCallie99\_97 (A6), Superchunk\_99 (A2), ToneTone\_99 (A6), Tucker\_104 (A6), VohminGhazi\_103 (A6), Wiks\_103 (A6), WunderPhul\_92 (A6), Yokurt\_102 (A6), Zaka\_104 (A6), Zulu\_104 (A6),

#### Start 40:

- Found in 3 of 78 ( 3.8% ) of genes in pham
- Manual Annotations of this start: 3 of 70
- Called 100.0% of time when present
- Phage (with cluster) where this start called: DARTHPhader\_92 (A12), Refuge\_92 (A12), Zimmer\_91 (A12),

#### Start 42:

- Found in 1 of 78 ( 1.3% ) 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: Luchador\_97 (A14),

Start 46:

- Found in 56 of 78 ( 71.8% ) of genes in pham
- Manual Annotations of this start: 2 of 70
- Called 3.6% of time when present
- Phage (with cluster) where this start called: Odin\_96 (A2), Ph8s\_100 (A2),

### **Summary by clusters:**

There are 6 clusters represented in this pham: A14, A13, A12, A2, A6, A9,

Info for manual annotations of cluster A12:

- Start number 37 was manually annotated 2 times for cluster A12.
- Start number 40 was manually annotated 3 times for cluster A12.

Info for manual annotations of cluster A14:

- Start number 36 was manually annotated 2 times for cluster A14.
- Start number 42 was manually annotated 1 time for cluster A14.

Info for manual annotations of cluster A2:

- Start number 36 was manually annotated 1 time for cluster A2.
- Start number 38 was manually annotated 13 times for cluster A2.
- Start number 46 was manually annotated 2 times for cluster A2.

Info for manual annotations of cluster A6:

- Start number 35 was manually annotated 2 times for cluster A6.
- Start number 38 was manually annotated 40 times for cluster A6.

Info for manual annotations of cluster A9:

- Start number 13 was manually annotated 2 times for cluster A9.
- Start number 38 was manually annotated 2 times for cluster A9.

### **Gene Information:**

Gene: Acolyte\_91 Start: 51451, Stop: 51122, Start Num: 38

Candidate Starts for Acolyte\_91:

(34, 51463), (Start: 38 @51451 has 55 MA's), (49, 51394), (50, 51385), (51, 51373), (64, 51241), (74, 51142),

Gene: Adzzy\_99 Start: 51234, Stop: 50908, Start Num: 38

Candidate Starts for Adzzy\_99:

(19, 51327), (Start: 38 @51234 has 55 MA's), (Start: 46 @51216 has 2 MA's), (65, 51027), (69, 50988), (72, 50979), (73, 50943),

Gene: Artemis2UCLA\_105 Start: 51118, Stop: 50786, Start Num: 38

Candidate Starts for Artemis2UCLA\_105:

(Start: 38 @51118 has 55 MA's), (Start: 46 @51091 has 2 MA's), (62, 50935), (67, 50896), (72, 50857), (73, 50821),

Gene: BABullseye\_96 Start: 49256, Stop: 48924, Start Num: 38

Candidate Starts for BABullseye\_96:

(Start: 38 @49256 has 55 MA's), (Start: 46 @49229 has 2 MA's), (62, 49073), (67, 49034), (72, 48995), (73, 48959),

Gene: BabyBack\_92 Start: 52424, Stop: 52089, Start Num: 38

Candidate Starts for BabyBack\_92:

(Start: 38 @52424 has 55 MA's), (64, 52214), (66, 52202), (72, 52160), (73, 52124),

Gene: Bactobuster\_87 Start: 50956, Stop: 50639, Start Num: 38

Candidate Starts for Bactobuster\_87:

(Start: 38 @50956 has 55 MA's), (51, 50887), (57, 50821), (64, 50758), (72, 50704), (73, 50668),

Gene: Blinn1\_100 Start: 50561, Stop: 50217, Start Num: 38

Candidate Starts for Blinn1\_100:

(25, 50633), (29, 50594), (Start: 38 @50561 has 55 MA's), (Start: 46 @50534 has 2 MA's), (54, 50465), (62, 50378), (67, 50339), (70, 50309), (73, 50252),

Gene: Blue7\_105 Start: 51037, Stop: 50693, Start Num: 35

Candidate Starts for Blue7\_105:

(Start: 35 @51037 has 2 MA's), (Start: 38 @51025 has 55 MA's), (Start: 46 @50998 has 2 MA's), (62, 50842), (65, 50812), (72, 50764), (73, 50728),

Gene: Candra\_100 Start: 50964, Stop: 50632, Start Num: 38

Candidate Starts for Candra\_100:

(Start: 38 @50964 has 55 MA's), (Start: 46 @50937 has 2 MA's), (62, 50781), (67, 50742), (72, 50703), (73, 50667),

Gene: Caraxes\_100 Start: 51590, Stop: 51264, Start Num: 38

Candidate Starts for Caraxes\_100:

(Start: 38 @51590 has 55 MA's), (Start: 46 @51572 has 2 MA's), (49, 51542), (64, 51389), (69, 51344), (72, 51335), (73, 51299),

Gene: Chartreuse\_100 Start: 50265, Stop: 49933, Start Num: 38

Candidate Starts for Chartreuse\_100:

(Start: 38 @50265 has 55 MA's), (Start: 46 @50238 has 2 MA's), (62, 50082), (67, 50043), (72, 50004), (73, 49968),

Gene: Che12\_101 Start: 51704, Stop: 51378, Start Num: 38

Candidate Starts for Che12\_101:

(27, 51746), (30, 51734), (Start: 38 @51704 has 55 MA's), (Start: 46 @51686 has 2 MA's), (58, 51563), (65, 51497), (69, 51458), (72, 51449), (73, 51413),

Gene: CloudWang3\_106 Start: 51647, Stop: 51315, Start Num: 38

Candidate Starts for CloudWang3\_106:

(Start: 38 @51647 has 55 MA's), (Start: 46 @51620 has 2 MA's), (62, 51464), (67, 51425), (72, 51386), (73, 51350),

Gene: Cookiedough\_101 Start: 51239, Stop: 50907, Start Num: 38

Candidate Starts for Cookiedough\_101:

(Start: 38 @51239 has 55 MA's), (Start: 46 @51212 has 2 MA's), (62, 51056), (67, 51017), (72, 50978), (73, 50942),

Gene: DaVinci\_100 Start: 50319, Stop: 49987, Start Num: 38

Candidate Starts for DaVinci\_100:

(Start: 38 @50319 has 55 MA's), (Start: 46 @50292 has 2 MA's), (62, 50136), (67, 50097), (72, 50058), (73, 50022),

Gene: DarthPhader\_92 Start: 52006, Stop: 51671, Start Num: 40

Candidate Starts for DarthPhader\_92:

(26, 52078), (Start: 40 @52006 has 3 MA's), (51, 51928), (56, 51898), (57, 51862), (61, 51832), (64, 51796), (71, 51745), (72, 51742), (73, 51706),

Gene: Dorothea\_102 Start: 51419, Stop: 51087, Start Num: 38

Candidate Starts for Dorothea\_102:

(25, 51494), (Start: 35 @51431 has 2 MA's), (Start: 38 @51419 has 55 MA's), (Start: 46 @51392 has 2 MA's), (62, 51236), (67, 51197), (72, 51158), (73, 51122),

Gene: EricB\_100 Start: 50464, Stop: 50132, Start Num: 38

Candidate Starts for EricB\_100:

(Start: 38 @50464 has 55 MA's), (Start: 46 @50437 has 2 MA's), (62, 50281), (67, 50242), (72, 50203), (73, 50167),

Gene: Gail\_102 Start: 52375, Stop: 52022, Start Num: 36

Candidate Starts for Gail\_102:

(Start: 36 @52375 has 3 MA's), (45, 52336), (56, 52255), (58, 52213), (59, 52204), (64, 52150), (67, 52135), (71, 52099), (73, 52060),

Gene: Garak\_104 Start: 51265, Stop: 50933, Start Num: 38

Candidate Starts for Garak\_104:

(Start: 38 @51265 has 55 MA's), (Start: 46 @51238 has 2 MA's), (62, 51082), (67, 51043), (72, 51004), (73, 50968),

Gene: GaugeLDP\_91 Start: 51816, Stop: 51487, Start Num: 38

Candidate Starts for GaugeLDP\_91:

(Start: 38 @51816 has 55 MA's), (Start: 46 @51789 has 2 MA's), (64, 51609), (73, 51522),

Gene: Gladiator\_99 Start: 50976, Stop: 50644, Start Num: 38

Candidate Starts for Gladiator\_99:

(Start: 35 @50988 has 2 MA's), (Start: 38 @50976 has 55 MA's), (Start: 46 @50949 has 2 MA's), (62, 50793), (65, 50763), (72, 50715), (73, 50679),

Gene: GreedyLawyer\_91 Start: 50897, Stop: 50565, Start Num: 38

Candidate Starts for GreedyLawyer\_91:

(Start: 38 @50897 has 55 MA's), (Start: 46 @50870 has 2 MA's), (62, 50714), (67, 50675), (72, 50636), (73, 50600),

Gene: Gruunaga\_104 Start: 50932, Stop: 50600, Start Num: 38

Candidate Starts for Gruunaga\_104:

(Start: 35 @50944 has 2 MA's), (Start: 38 @50932 has 55 MA's), (Start: 46 @50905 has 2 MA's), (62, 50749), (65, 50719), (72, 50671), (73, 50635),

Gene: Hammer\_104 Start: 50626, Stop: 50297, Start Num: 38

Candidate Starts for Hammer\_104:

(Start: 35 @50638 has 2 MA's), (Start: 38 @50626 has 55 MA's), (Start: 46 @50599 has 2 MA's), (62, 50443), (65, 50413), (72, 50368), (73, 50332),

Gene: Helmet\_105 Start: 51401, Stop: 51069, Start Num: 38

Candidate Starts for Helmet\_105:

(Start: 38 @51401 has 55 MA's), (Start: 46 @51374 has 2 MA's), (62, 51218), (67, 51179), (72, 51140), (73, 51104),

Gene: Hexamo\_105 Start: 51133, Stop: 50801, Start Num: 38

Candidate Starts for Hexamo\_105:

(Start: 38 @51133 has 55 MA's), (Start: 46 @51106 has 2 MA's), (62, 50950), (67, 50911), (72, 50872), (73, 50836),

Gene: Hoot\_98 Start: 48781, Stop: 48449, Start Num: 38

Candidate Starts for Hoot\_98:

(Start: 38 @48781 has 55 MA's), (Start: 46 @48754 has 2 MA's), (62, 48598), (67, 48559), (72, 48520), (73, 48484),

Gene: Indra\_105 Start: 51266, Stop: 50934, Start Num: 38

Candidate Starts for Indra\_105:

(Start: 38 @51266 has 55 MA's), (Start: 46 @51239 has 2 MA's), (62, 51083), (67, 51044), (72, 51005), (73, 50969),

Gene: IronMan\_92 Start: 52365, Stop: 52033, Start Num: 38

Candidate Starts for IronMan\_92:

(10, 52521), (11, 52515), (17, 52461), (28, 52401), (31, 52389), (Start: 38 @52365 has 55 MA's), (49, 52308), (50, 52299), (64, 52158), (73, 52068),

Gene: Isiphiwo\_99 Start: 50683, Stop: 50351, Start Num: 38

Candidate Starts for Isiphiwo\_99:

(Start: 38 @50683 has 55 MA's), (Start: 46 @50656 has 2 MA's), (62, 50500), (67, 50461), (72, 50422), (73, 50386),

Gene: Iwokeuplikedis\_98 Start: 52088, Stop: 51759, Start Num: 38

Candidate Starts for Iwokeuplikedis\_98:

(Start: 38 @52088 has 55 MA's), (47, 52055), (49, 52031), (50, 52022), (64, 51881), (71, 51830), (73, 51791),

Gene: Jaan\_91 Start: 51391, Stop: 51071, Start Num: 38

Candidate Starts for Jaan\_91:

(Start: 38 @51391 has 55 MA's), (51, 51322), (57, 51256), (64, 51193), (72, 51142), (73, 51106),

Gene: Jeffabunny\_94 Start: 47736, Stop: 47404, Start Num: 38

Candidate Starts for Jeffabunny\_94:

(Start: 38 @47736 has 55 MA's), (Start: 46 @47709 has 2 MA's), (62, 47553), (67, 47514), (72, 47475), (73, 47439),

Gene: JewelBug\_94 Start: 49112, Stop: 48780, Start Num: 38

Candidate Starts for JewelBug\_94:

(25, 49187), (Start: 35 @49124 has 2 MA's), (Start: 38 @49112 has 55 MA's), (Start: 46 @49085 has 2 MA's), (62, 48929), (67, 48890), (72, 48851), (73, 48815),

Gene: Jordennis\_99 Start: 51016, Stop: 50684, Start Num: 38

Candidate Starts for Jordennis\_99:

(25, 51091), (Start: 35 @51028 has 2 MA's), (Start: 38 @51016 has 55 MA's), (Start: 46 @50989 has 2 MA's), (62, 50833), (67, 50794), (72, 50755), (73, 50719),



Gene: Kazan\_104 Start: 50934, Stop: 50602, Start Num: 38

Candidate Starts for Kazan\_104:

(Start: 38 @50934 has 55 MA's), (Start: 46 @50907 has 2 MA's), (62, 50751), (67, 50712), (72, 50673), (73, 50637),

Gene: Keziacharles14\_94 Start: 52148, Stop: 51786, Start Num: 38

Candidate Starts for Keziacharles14\_94:

(Start: 38 @52148 has 55 MA's), (51, 52055), (56, 52025), (58, 51983), (59, 51974), (60, 51968), (63, 51929), (73, 51824),

Gene: Kipper29\_101 Start: 50791, Stop: 50459, Start Num: 38

Candidate Starts for Kipper29\_101:

(25, 50866), (Start: 35 @50803 has 2 MA's), (Start: 38 @50791 has 55 MA's), (Start: 46 @50764 has 2 MA's), (62, 50608), (67, 50569), (72, 50530), (73, 50494),

Gene: Koko\_105 Start: 51643, Stop: 51314, Start Num: 38

Candidate Starts for Koko\_105:

(Start: 35 @51655 has 2 MA's), (Start: 38 @51643 has 55 MA's), (Start: 46 @51616 has 2 MA's), (62, 51460), (65, 51430), (72, 51385), (73, 51349),

Gene: Landor\_93 Start: 52502, Stop: 52185, Start Num: 38

Candidate Starts for Landor\_93:

(Start: 38 @52502 has 55 MA's), (51, 52433), (57, 52367), (64, 52304), (72, 52250), (73, 52214),

Gene: Lilbunny\_99 Start: 49513, Stop: 49181, Start Num: 38

Candidate Starts for Lilbunny\_99:

(Start: 38 @49513 has 55 MA's), (Start: 46 @49486 has 2 MA's), (62, 49330), (67, 49291), (72, 49252), (73, 49216),

Gene: Luchador\_97 Start: 52062, Stop: 51730, Start Num: 42

Candidate Starts for Luchador\_97:

(Start: 36 @52080 has 3 MA's), (Start: 42 @52062 has 1 MA's), (51, 51993), (58, 51921), (59, 51912), (64, 51858), (67, 51843), (73, 51768),

Gene: McFly\_102 Start: 51273, Stop: 50941, Start Num: 38

Candidate Starts for McFly\_102:

(Start: 38 @51273 has 55 MA's), (Start: 46 @51246 has 2 MA's), (62, 51090), (67, 51051), (72, 51012), (73, 50976),

Gene: Neeharika16\_99 Start: 50690, Stop: 50358, Start Num: 38

Candidate Starts for Neeharika16\_99:

(Start: 38 @50690 has 55 MA's), (Start: 46 @50663 has 2 MA's), (62, 50507), (67, 50468), (72, 50429), (73, 50393),

Gene: Newrala\_102 Start: 51372, Stop: 51040, Start Num: 38

Candidate Starts for Newrala\_102:

(Start: 38 @51372 has 55 MA's), (Start: 46 @51345 has 2 MA's), (62, 51189), (67, 51150), (72, 51111), (73, 51075),

Gene: NothingSpecial\_89 Start: 51297, Stop: 50974, Start Num: 36

Candidate Starts for NothingSpecial\_89:

(Start: 36 @51297 has 3 MA's), (Start: 46 @51270 has 2 MA's), (58, 51147), (62, 51111), (64, 51087), (72, 51039), (73, 51003),

Gene: Odin\_96 Start: 51483, Stop: 51175, Start Num: 46

Candidate Starts for Odin\_96:

(Start: 38 @51501 has 55 MA's), (Start: 46 @51483 has 2 MA's), (49, 51453), (64, 51300), (69, 51255), (72, 51246), (73, 51210),

Gene: Ph8s\_100 Start: 51547, Stop: 51239, Start Num: 46

Candidate Starts for Ph8s\_100:

(16, 51664), (17, 51661), (Start: 38 @51565 has 55 MA's), (Start: 46 @51547 has 2 MA's), (64, 51364), (69, 51319), (71, 51313), (72, 51310), (73, 51274),

Gene: Phaded\_88 Start: 52515, Stop: 52198, Start Num: 38

Candidate Starts for Phaded\_88:

(Start: 38 @52515 has 55 MA's), (51, 52446), (57, 52380), (64, 52317), (72, 52263), (73, 52227),

Gene: Pharaoh\_81 Start: 49009, Stop: 48674, Start Num: 37

Candidate Starts for Pharaoh\_81:

(33, 49021), (Start: 37 @49009 has 2 MA's), (44, 48988), (51, 48928), (64, 48796), (68, 48763), (73, 48706),

Gene: Phlei\_77 Start: 47718, Stop: 47371, Start Num: 38

Candidate Starts for Phlei\_77:

(Start: 38 @47718 has 55 MA's), (51, 47640), (52, 47631), (55, 47616), (72, 47454), (73, 47421), (74, 47400),

Gene: Pmask\_100 Start: 51382, Stop: 51050, Start Num: 38

Candidate Starts for Pmask\_100:

(Start: 38 @51382 has 55 MA's), (Start: 46 @51355 has 2 MA's), (62, 51199), (72, 51121), (73, 51085),

Gene: Priamo\_101 Start: 50425, Stop: 50093, Start Num: 38

Candidate Starts for Priamo\_101:

(18, 50521), (Start: 35 @50437 has 2 MA's), (Start: 38 @50425 has 55 MA's), (Start: 46 @50398 has 2 MA's), (62, 50242), (67, 50203), (72, 50164), (73, 50128),

Gene: Pukovnik\_89 Start: 51834, Stop: 51508, Start Num: 38

Candidate Starts for Pukovnik\_89:

(Start: 38 @51834 has 55 MA's), (47, 51801), (54, 51738), (57, 51690), (64, 51627), (72, 51573), (73, 51537),

Gene: Rahalelujah\_98 Start: 51421, Stop: 51050, Start Num: 38

Candidate Starts for Rahalelujah\_98:

(Start: 38 @51421 has 55 MA's), (41, 51409), (51, 51325), (58, 51253), (60, 51238), (63, 51199), (71, 51130), (73, 51088),

Gene: Refuge\_92 Start: 52220, Stop: 51888, Start Num: 40

Candidate Starts for Refuge\_92:

(1, 52604), (2, 52577), (3, 52562), (4, 52556), (5, 52535), (6, 52508), (7, 52502), (8, 52421), (9, 52403), (12, 52349), (Start: 13 @52340 has 2 MA's), (15, 52328), (23, 52310), (33, 52247), (Start: 40 @52220 has 3 MA's), (44, 52205), (Start: 46 @52196 has 2 MA's), (51, 52145), (56, 52115), (57, 52079), (61, 52049), (64, 52013), (65, 52007), (71, 51962), (73, 51923),

Gene: Rifter\_104 Start: 50424, Stop: 50092, Start Num: 38

Candidate Starts for Rifter\_104:

(Start: 35 @50436 has 2 MA's), (Start: 38 @50424 has 55 MA's), (Start: 46 @50397 has 2 MA's), (62, 50241), (65, 50211), (72, 50163), (73, 50127),

Gene: Roksolana\_106 Start: 51476, Stop: 51144, Start Num: 38

Candidate Starts for Roksolana\_106:

(Start: 38 @51476 has 55 MA's), (Start: 46 @51449 has 2 MA's), (62, 51293), (67, 51254), (72, 51215), (73, 51179),

Gene: SmellyB\_103 Start: 50928, Stop: 50596, Start Num: 38

Candidate Starts for SmellyB\_103:

(Start: 38 @50928 has 55 MA's), (Start: 46 @50901 has 2 MA's), (62, 50745), (67, 50706), (72, 50667), (73, 50631),

Gene: SororFago\_98 Start: 52138, Stop: 51785, Start Num: 36

Candidate Starts for SororFago\_98:

(32, 52156), (Start: 36 @52138 has 3 MA's), (45, 52099), (56, 52018), (59, 51967), (64, 51913), (67, 51898), (73, 51823),

Gene: Steamy\_92 Start: 52060, Stop: 51728, Start Num: 37

Candidate Starts for Steamy\_92:

(Start: 37 @52060 has 2 MA's), (44, 52039), (48, 52006), (51, 51979), (53, 51964), (64, 51847), (73, 51757),

Gene: Sunhee\_102 Start: 50973, Stop: 50626, Start Num: 36

Candidate Starts for Sunhee\_102:

(14, 51078), (22, 51054), (Start: 36 @50973 has 3 MA's), (51, 50880), (52, 50871), (56, 50850), (57, 50814), (59, 50799), (64, 50745), (67, 50730), (71, 50697), (73, 50658),

Gene: SuperAwesome\_102 Start: 51433, Stop: 51089, Start Num: 35

Candidate Starts for SuperAwesome\_102:

(18, 51517), (Start: 35 @51433 has 2 MA's), (Start: 38 @51421 has 55 MA's), (Start: 46 @51394 has 2 MA's), (62, 51238), (72, 51160), (73, 51124),

Gene: SuperCallie99\_97 Start: 50848, Stop: 50516, Start Num: 38

Candidate Starts for SuperCallie99\_97:

(Start: 35 @50860 has 2 MA's), (Start: 38 @50848 has 55 MA's), (Start: 46 @50821 has 2 MA's), (62, 50665), (72, 50587), (73, 50551),

Gene: Superchunk\_99 Start: 51590, Stop: 51264, Start Num: 38

Candidate Starts for Superchunk\_99:

(Start: 38 @51590 has 55 MA's), (Start: 46 @51572 has 2 MA's), (49, 51542), (64, 51389), (69, 51344), (72, 51335), (73, 51299),

Gene: SwirlSquare\_100 Start: 51042, Stop: 50599, Start Num: 17

Candidate Starts for SwirlSquare\_100:

(16, 51045), (17, 51042), (Start: 38 @50946 has 55 MA's), (Start: 46 @50907 has 2 MA's), (57, 50790), (65, 50718), (69, 50679), (73, 50634),

Gene: Toaka\_96 Start: 51786, Stop: 51364, Start Num: 13

Candidate Starts for Toaka\_96:

(Start: 13 @51786 has 2 MA's), (15, 51774), (16, 51771), (39, 51675), (43, 51660), (51, 51585), (52, 51576), (60, 51498),

Gene: ToneTone\_99 Start: 50816, Stop: 50484, Start Num: 38

Candidate Starts for ToneTone\_99:

(Start: 38 @50816 has 55 MA's), (Start: 46 @50789 has 2 MA's), (62, 50633), (67, 50594), (72, 50555), (73, 50519),

Gene: Tucker\_104 Start: 51019, Stop: 50687, Start Num: 38

Candidate Starts for Tucker\_104:

(Start: 38 @51019 has 55 MA's), (Start: 46 @50992 has 2 MA's), (62, 50836), (67, 50797), (72, 50758), (73, 50722),

Gene: Vanisoa\_93 Start: 52085, Stop: 51657, Start Num: 13

Candidate Starts for Vanisoa\_93:

(Start: 13 @52085 has 2 MA's), (20, 52061), (21, 52058), (24, 52049), (39, 51968), (51, 51878), (53, 51863), (57, 51812), (60, 51791),

Gene: VohminGhazi\_103 Start: 50929, Stop: 50597, Start Num: 38

Candidate Starts for VohminGhazi\_103:

(Start: 38 @50929 has 55 MA's), (Start: 46 @50902 has 2 MA's), (62, 50746), (67, 50707), (72, 50668), (73, 50632),

Gene: Wiks\_103 Start: 50896, Stop: 50564, Start Num: 38

Candidate Starts for Wiks\_103:

(Start: 38 @50896 has 55 MA's), (Start: 46 @50869 has 2 MA's), (62, 50713), (67, 50674), (72, 50635), (73, 50599),

Gene: WunderPhul\_92 Start: 47498, Stop: 47166, Start Num: 38

Candidate Starts for WunderPhul\_92:

(Start: 38 @47498 has 55 MA's), (Start: 46 @47471 has 2 MA's), (62, 47315), (67, 47276), (72, 47237), (73, 47201),

Gene: Yokurt\_102 Start: 50896, Stop: 50564, Start Num: 38

Candidate Starts for Yokurt\_102:

(Start: 38 @50896 has 55 MA's), (Start: 46 @50869 has 2 MA's), (62, 50713), (67, 50674), (72, 50635), (73, 50599),

Gene: Zaka\_104 Start: 50896, Stop: 50564, Start Num: 38

Candidate Starts for Zaka\_104:

(Start: 38 @50896 has 55 MA's), (Start: 46 @50869 has 2 MA's), (62, 50713), (67, 50674), (72, 50635), (73, 50599),

Gene: Zimmer\_91 Start: 51677, Stop: 51342, Start Num: 40

Candidate Starts for Zimmer\_91:

(26, 51749), (33, 51704), (Start: 40 @51677 has 3 MA's), (51, 51599), (56, 51569), (61, 51503), (64, 51467), (69, 51422), (71, 51416), (73, 51377),

Gene: Zulu\_104 Start: 51273, Stop: 50941, Start Num: 38

Candidate Starts for Zulu\_104:

(Start: 38 @51273 has 55 MA's), (Start: 46 @51246 has 2 MA's), (62, 51090), (67, 51051), (72, 51012), (73, 50976),