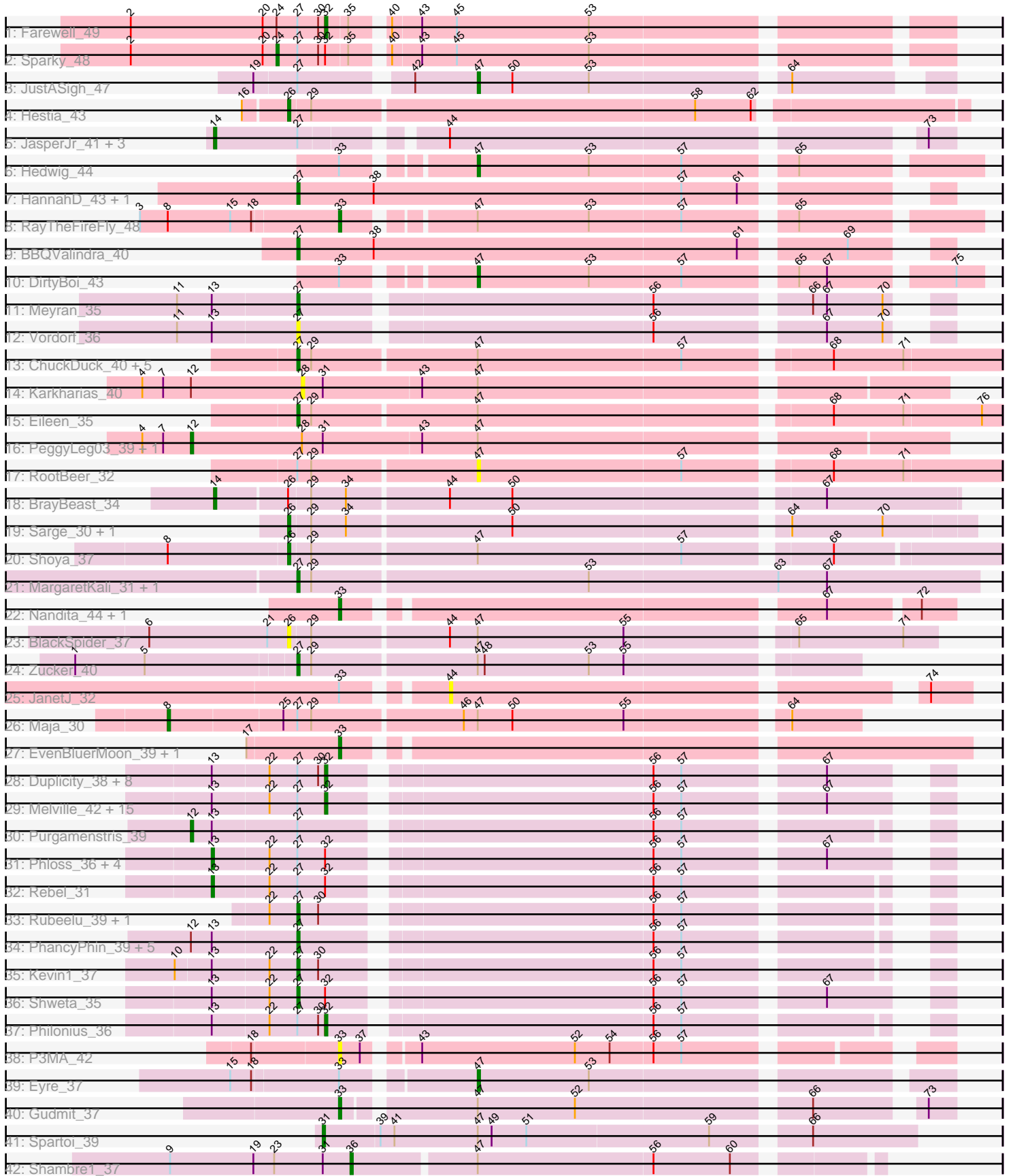


Pham 163522



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 163522 Report

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

Pham number 163522 has 89 members, 14 are drafts.

Phages represented in each track:

- Track 1 : Farewell\_49
- Track 2 : Sparky\_48
- Track 3 : JustASigh\_47
- Track 4 : Hestia\_43
- Track 5 : JasperJr\_41, Walrus\_42, Hitter\_44, Guacamole\_41
- Track 6 : Hedwig\_44
- Track 7 : HannahD\_43, GEazy\_45
- Track 8 : RayTheFireFly\_48
- Track 9 : BBQValindra\_40
- Track 10 : DirtyBoi\_43
- Track 11 : Meyran\_35
- Track 12 : Vordorf\_36
- Track 13 : ChuckDuck\_40, Judy\_40, Constance\_39, Peas\_36, GlobiWarming\_39, Bridgette\_39
- Track 14 : Karkharias\_40
- Track 15 : Eileen\_35
- Track 16 : PeggyLeg03\_39, Pucara\_36
- Track 17 : RootBeer\_32
- Track 18 : BrayBeast\_34
- Track 19 : Sarge\_30, Bauer\_41
- Track 20 : Shoya\_37
- Track 21 : MargaretKali\_31, Kumotta\_31
- Track 22 : Nandita\_44, Ryan\_44
- Track 23 : BlackSpider\_37
- Track 24 : Zucker\_40
- Track 25 : JanetJ\_32
- Track 26 : Maja\_30
- Track 27 : EvenBluerMoon\_39, Aoka\_33
- Track 28 : Duplicity\_38, Tapioca\_39, Silvy\_38, Charlie\_36, Gex\_38, Journey\_39, Aggie\_36, Scitech\_35, Xeno\_35
- Track 29 : Melville\_42, Jamie19\_35, Phrann\_39, Parmesanjohn\_38, Panchino\_34, Smurph\_38, Silvafighter\_39, Magsby\_38, SpongeBob\_35, MichelleMyBell\_36, Pipsqueaks\_38, SkinnyPete\_33, Bosection6\_38, Fulbright\_37, Xerxes\_38, Snekmaggedon\_35
- Track 30 : Purgamenstris\_39
- Track 31 : Phloss\_36, Andies\_35, Carcharodon\_38, Chewbacca\_39, Schnauzer\_38
- Track 32 : Rebel\_31

- Track 33 : Rubeelu\_39, Butters\_39
- Track 34 : PhancyPhin\_39, BabeRuth\_40, Redi\_39, Nenae\_39, Raymond7\_33, ShrimpFriedEgg\_39
- Track 35 : Kevin1\_37
- Track 36 : Shweta\_35
- Track 37 : Philonius\_36
- Track 38 : P3MA\_42
- Track 39 : Eyre\_37
- Track 40 : Gudmit\_37
- Track 41 : Spartoi\_39
- Track 42 : Shambre1\_37

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

The start number called the most often in the published annotations is 27, it was called in 23 of the 75 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- BBQValindra\_40, BabeRuth\_40, Bridgette\_39, Butters\_39, ChuckDuck\_40, Constance\_39, Eileen\_35, GEazy\_45, GlobiWarming\_39, HannahD\_43, Judy\_40, Kevin1\_37, Kumotta\_31, MargaretKali\_31, Meyran\_35, Nenae\_39, Peas\_36, PhancyPhin\_39, Raymond7\_33, Redi\_39, Rubeelu\_39, ShrimpFriedEgg\_39, Shweta\_35, Vordorf\_36, Zucker\_40,

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

- Aggie\_36, Andies\_35, Bosection6\_38, Carcharodon\_38, Charlie\_36, Chewbacca\_39, Duplicity\_38, Farewell\_49, Fulbright\_37, Gex\_38, Guacamole\_41, Hitter\_44, Jamie19\_35, JasperJr\_41, Journey\_39, JustASigh\_47, Magsby\_38, Maja\_30, Melville\_42, MichelleMyBell\_36, Panchino\_34, Parmesanjohn\_38, Philonius\_36, Phloss\_36, Phrann\_39, Pipsqueaks\_38, Purgamenstris\_39, Rebel\_31, RootBeer\_32, Schnauzer\_38, Scitech\_35, Silvafighter\_39, Silvy\_38, SkinnyPete\_33, Smurph\_38, Snekmaggedon\_35, Sparky\_48, SpongeBob\_35, Tapioca\_39, Walrus\_42, Xeno\_35, Xerxes\_38,

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

- Aoka\_33, Bauer\_41, BlackSpider\_37, BrayBeast\_34, DirtyBoi\_43, EvenBluerMoon\_39, Eyre\_37, Gudmit\_37, Hedwig\_44, Hestia\_43, JanetJ\_32, Karkharias\_40, Nandita\_44, P3MA\_42, PeggyLeg03\_39, Pucara\_36, RayTheFireFly\_48, Ryan\_44, Sarge\_30, Shambre1\_37, Shoya\_37, Spartoi\_39,

**Summary by start number:**

Start 8:

- Found in 3 of 89 ( 3.4% ) of genes in pham
- Manual Annotations of this start: 1 of 75
- Called 33.3% of time when present
- Phage (with cluster) where this start called: Maja\_30 (FO),

Start 12:

- Found in 10 of 89 ( 11.2% ) of genes in pham

- Manual Annotations of this start: 2 of 75
- Called 30.0% of time when present
- Phage (with cluster) where this start called: PeggyLeg03\_39 (FA), Pucara\_36 (FA), Purgamenstris\_39 (N),

#### Start 13:

- Found in 43 of 89 ( 48.3% ) of genes in pham
- Manual Annotations of this start: 6 of 75
- Called 14.0% of time when present
- Phage (with cluster) where this start called: Andies\_35 (N), Carcharodon\_38 (N), Chewbacca\_39 (N), Phloss\_36 (N), Rebel\_31 (N), Schnauzer\_38 (N),

#### Start 14:

- Found in 5 of 89 ( 5.6% ) of genes in pham
- Manual Annotations of this start: 5 of 75
- Called 100.0% of time when present
- Phage (with cluster) where this start called: BrayBeast\_34 (FB), Guacamole\_41 (CV), Hitter\_44 (CV), JasperJr\_41 (CV), Walrus\_42 (CV),

#### Start 24:

- Found in 2 of 89 ( 2.2% ) of genes in pham
- Manual Annotations of this start: 1 of 75
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Sparky\_48 (AF),

#### Start 26:

- Found in 6 of 89 ( 6.7% ) of genes in pham
- Manual Annotations of this start: 4 of 75
- Called 83.3% of time when present
- Phage (with cluster) where this start called: Bauer\_41 (FN), BlackSpider\_37 (FN), Hestia\_43 (AY), Sarge\_30 (FB), Shoya\_37 (FB),

#### Start 27:

- Found in 67 of 89 ( 75.3% ) of genes in pham
- Manual Annotations of this start: 23 of 75
- Called 37.3% of time when present
- Phage (with cluster) where this start called: BBQValindra\_40 (DB), BabeRuth\_40 (N), Bridgette\_39 (FA), Butters\_39 (N), ChuckDuck\_40 (FA), Constance\_39 (FA), Eileen\_35 (FA), GEazy\_45 (DB), GlobiWarming\_39 (FA), HannahD\_43 (DB), Judy\_40 (FA), Kevin1\_37 (N), Kumotta\_31 (FB), MargaretKali\_31 (FB), Meyran\_35 (DT), Nенаe\_39 (N), Peas\_36 (FA), PhancyPhin\_39 (N), Raymond7\_33 (N), Redi\_39 (N), Rubeelu\_39 (N), ShrimpFriedEgg\_39 (N), Shweta\_35 (N), Vordorf\_36 (DT), Zucker\_40 (FN),

#### Start 28:

- Found in 3 of 89 ( 3.4% ) of genes in pham
- No Manual Annotations of this start.
- Called 33.3% of time when present
- Phage (with cluster) where this start called: Karkharias\_40 (FA),

#### Start 31:

- Found in 5 of 89 ( 5.6% ) of genes in pham
- Manual Annotations of this start: 1 of 75

- Called 20.0% of time when present
- Phage (with cluster) where this start called: Spartoi\_39 (singleton),

#### Start 32:

- Found in 35 of 89 ( 39.3% ) of genes in pham
- Manual Annotations of this start: 22 of 75
- Called 77.1% of time when present
- Phage (with cluster) where this start called: Aggie\_36 (N), Bosection6\_38 (N), Charlie\_36 (N), Duplicity\_38 (N), Farewell\_49 (AF), Fulbright\_37 (N), Gex\_38 (N), Jamie19\_35 (N), Journey\_39 (N), Magsby\_38 (N), Melville\_42 (N), MichelleMyBell\_36 (N), Panchino\_34 (N), Parmesanjohn\_38 (N), Philonius\_36 (N), Phrann\_39 (N), Pipsqueaks\_38 (N), Scitech\_35 (N), Silvafighter\_39 (N), Silvy\_38 (N), SkinnyPete\_33 (N), Smurph\_38 (N), Snekmaggedon\_35 (N), SpongeBob\_35 (N), Tapioca\_39 (N), Xeno\_35 (N), Xerxes\_38 (N),

#### Start 33:

- Found in 11 of 89 ( 12.4% ) of genes in pham
- Manual Annotations of this start: 5 of 75
- Called 63.6% of time when present
- Phage (with cluster) where this start called: Aoka\_33 (FO), EvenBluerMoon\_39 (FO), Gudmit\_37 (singleton), Nandita\_44 (FF), P3MA\_42 (UNK), RayTheFireFly\_48 (DB), Ryan\_44 (FF),

#### Start 36:

- Found in 1 of 89 ( 1.1% ) of genes in pham
- Manual Annotations of this start: 1 of 75
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Shambre1\_37 (singleton),

#### Start 44:

- Found in 7 of 89 ( 7.9% ) of genes in pham
- No Manual Annotations of this start.
- Called 14.3% of time when present
- Phage (with cluster) where this start called: JanetJ\_32 (FO),

#### Start 47:

- Found in 23 of 89 ( 25.8% ) of genes in pham
- Manual Annotations of this start: 4 of 75
- Called 21.7% of time when present
- Phage (with cluster) where this start called: DirtyBoi\_43 (DB), Eyre\_37 (singleton), Hedwig\_44 (DB), JustASigh\_47 (AH), RootBeer\_32 (FA),

### Summary by clusters:

There are 14 clusters represented in this pham: singleton, AF, AH, DB, N, FA, FB, FF, AY, DT, UNK, CV, FN, FO,

#### Info for manual annotations of cluster AF:

- Start number 24 was manually annotated 1 time for cluster AF.
- Start number 32 was manually annotated 1 time for cluster AF.

#### Info for manual annotations of cluster AH:

- Start number 47 was manually annotated 1 time for cluster AH.

Info for manual annotations of cluster AY:

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

Info for manual annotations of cluster CV:

- Start number 14 was manually annotated 4 times for cluster CV.

Info for manual annotations of cluster DB:

- Start number 27 was manually annotated 3 times for cluster DB.
- Start number 33 was manually annotated 1 time for cluster DB.
- Start number 47 was manually annotated 2 times for cluster DB.

Info for manual annotations of cluster DT:

- Start number 27 was manually annotated 1 time for cluster DT.

Info for manual annotations of cluster FA:

- Start number 12 was manually annotated 1 time for cluster FA.
- Start number 27 was manually annotated 6 times for cluster FA.

Info for manual annotations of cluster FB:

- Start number 14 was manually annotated 1 time for cluster FB.
- Start number 26 was manually annotated 2 times for cluster FB.
- Start number 27 was manually annotated 2 times for cluster FB.

Info for manual annotations of cluster FF:

- Start number 33 was manually annotated 2 times for cluster FF.

Info for manual annotations of cluster FN:

- Start number 26 was manually annotated 1 time for cluster FN.
- Start number 27 was manually annotated 1 time for cluster FN.

Info for manual annotations of cluster FO:

- Start number 8 was manually annotated 1 time for cluster FO.
- Start number 33 was manually annotated 1 time for cluster FO.

Info for manual annotations of cluster N:

- Start number 12 was manually annotated 1 time for cluster N.
- Start number 13 was manually annotated 6 times for cluster N.
- Start number 27 was manually annotated 10 times for cluster N.
- Start number 32 was manually annotated 21 times for cluster N.

### **Gene Information:**

Gene: Aggie\_36 Start: 27900, Stop: 28133, Start Num: 32

Candidate Starts for Aggie\_36:

(Start: 13 @27852 has 6 MA's), (22, 27876), (Start: 27 @27888 has 23 MA's), (30, 27897), (Start: 32 @27900 has 22 MA's), (56, 28029), (57, 28041), (67, 28095),

Gene: Andies\_35 Start: 28370, Stop: 28651, Start Num: 13

Candidate Starts for Andies\_35:

(Start: 13 @28370 has 6 MA's), (22, 28394), (Start: 27 @28406 has 23 MA's), (Start: 32 @28418 has 22 MA's), (56, 28547), (57, 28559), (67, 28613),

Gene: Aoka\_33 Start: 26261, Stop: 26512, Start Num: 33

Candidate Starts for Aoka\_33:

(17, 26222), (Start: 33 @26261 has 5 MA's),

Gene: BBQValindra\_40 Start: 33028, Stop: 33285, Start Num: 27

Candidate Starts for BBQValindra\_40:

(Start: 27 @33028 has 23 MA's), (38, 33061), (61, 33217), (69, 33256),

Gene: BabeRuth\_40 Start: 29534, Stop: 29776, Start Num: 27

Candidate Starts for BabeRuth\_40:

(Start: 12 @29489 has 2 MA's), (Start: 13 @29498 has 6 MA's), (Start: 27 @29534 has 23 MA's), (56, 29675), (57, 29687),

Gene: Bauer\_41 Start: 28925, Stop: 28644, Start Num: 26

Candidate Starts for Bauer\_41:

(Start: 26 @28925 has 4 MA's), (29, 28916), (34, 28901), (50, 28832), (64, 28721), (70, 28682),

Gene: BlackSpider\_37 Start: 28105, Stop: 27839, Start Num: 26

Candidate Starts for BlackSpider\_37:

(6, 28165), (21, 28114), (Start: 26 @28105 has 4 MA's), (29, 28096), (44, 28039), (Start: 47 @28027 has 4 MA's), (55, 27964), (65, 27898), (71, 27853),

Gene: Bosection6\_38 Start: 27921, Stop: 28154, Start Num: 32

Candidate Starts for Bosection6\_38:

(Start: 13 @27873 has 6 MA's), (22, 27897), (Start: 27 @27909 has 23 MA's), (Start: 32 @27921 has 22 MA's), (56, 28050), (57, 28062), (67, 28116),

Gene: BrayBeast\_34 Start: 25453, Stop: 25148, Start Num: 14

Candidate Starts for BrayBeast\_34:

(Start: 14 @25453 has 5 MA's), (Start: 26 @25423 has 4 MA's), (29, 25414), (34, 25399), (44, 25357), (50, 25330), (67, 25204),

Gene: Bridgette\_39 Start: 28174, Stop: 27884, Start Num: 27

Candidate Starts for Bridgette\_39:

(Start: 27 @28174 has 23 MA's), (29, 28168), (Start: 47 @28099 has 4 MA's), (57, 28012), (68, 27955), (71, 27925),

Gene: Butters\_39 Start: 29960, Stop: 30202, Start Num: 27

Candidate Starts for Butters\_39:

(22, 29948), (Start: 27 @29960 has 23 MA's), (30, 29969), (56, 30101), (57, 30113),

Gene: Carcharodon\_38 Start: 29181, Stop: 29462, Start Num: 13

Candidate Starts for Carcharodon\_38:

(Start: 13 @29181 has 6 MA's), (22, 29205), (Start: 27 @29217 has 23 MA's), (Start: 32 @29229 has 22 MA's), (56, 29358), (57, 29370), (67, 29424),

Gene: Charlie\_36 Start: 27920, Stop: 28153, Start Num: 32

Candidate Starts for Charlie\_36:

(Start: 13 @27872 has 6 MA's), (22, 27896), (Start: 27 @27908 has 23 MA's), (30, 27917), (Start: 32 @27920 has 22 MA's), (56, 28049), (57, 28061), (67, 28115),

Gene: Chewbacca\_39 Start: 29181, Stop: 29462, Start Num: 13

Candidate Starts for Chewbacca\_39:

(Start: 13 @29181 has 6 MA's), (22, 29205), (Start: 27 @29217 has 23 MA's), (Start: 32 @29229 has 22 MA's), (56, 29358), (57, 29370), (67, 29424),

Gene: ChuckDuck\_40 Start: 27998, Stop: 27708, Start Num: 27

Candidate Starts for ChuckDuck\_40:

(Start: 27 @27998 has 23 MA's), (29, 27992), (Start: 47 @27923 has 4 MA's), (57, 27836), (68, 27779), (71, 27749),

Gene: Constance\_39 Start: 28327, Stop: 28037, Start Num: 27

Candidate Starts for Constance\_39:

(Start: 27 @28327 has 23 MA's), (29, 28321), (Start: 47 @28252 has 4 MA's), (57, 28165), (68, 28108), (71, 28078),

Gene: DirtyBoi\_43 Start: 31965, Stop: 32165, Start Num: 47

Candidate Starts for DirtyBoi\_43:

(Start: 33 @31917 has 5 MA's), (Start: 47 @31965 has 4 MA's), (53, 32013), (57, 32052), (65, 32094), (67, 32106), (75, 32154),

Gene: Duplicity\_38 Start: 29238, Stop: 29471, Start Num: 32

Candidate Starts for Duplicity\_38:

(Start: 13 @29190 has 6 MA's), (22, 29214), (Start: 27 @29226 has 23 MA's), (30, 29235), (Start: 32 @29238 has 22 MA's), (56, 29367), (57, 29379), (67, 29433),

Gene: Eileen\_35 Start: 26405, Stop: 26115, Start Num: 27

Candidate Starts for Eileen\_35:

(Start: 27 @26405 has 23 MA's), (29, 26399), (Start: 47 @26330 has 4 MA's), (68, 26186), (71, 26156), (76, 26123),

Gene: EvenBluerMoon\_39 Start: 26499, Stop: 26750, Start Num: 33

Candidate Starts for EvenBluerMoon\_39:

(17, 26460), (Start: 33 @26499 has 5 MA's),

Gene: Eyre\_37 Start: 28147, Stop: 28335, Start Num: 47

Candidate Starts for Eyre\_37:

(15, 28051), (18, 28060), (Start: 33 @28096 has 5 MA's), (Start: 47 @28147 has 4 MA's), (53, 28195),

Gene: Farewell\_49 Start: 36104, Stop: 36349, Start Num: 32

Candidate Starts for Farewell\_49:

(2, 36020), (20, 36077), (Start: 24 @36083 has 1 MA's), (Start: 27 @36092 has 23 MA's), (30, 36101), (Start: 32 @36104 has 22 MA's), (35, 36113), (40, 36125), (43, 36137), (45, 36152), (53, 36209),

Gene: Fulbright\_37 Start: 28318, Stop: 28551, Start Num: 32

Candidate Starts for Fulbright\_37:

(Start: 13 @28270 has 6 MA's), (22, 28294), (Start: 27 @28306 has 23 MA's), (Start: 32 @28318 has 22 MA's), (56, 28447), (57, 28459), (67, 28513),

Gene: GEazy\_45 Start: 32607, Stop: 32864, Start Num: 27

Candidate Starts for GEazy\_45:

(Start: 27 @32607 has 23 MA's), (38, 32640), (57, 32772), (61, 32796),



Gene: Gex\_38 Start: 29245, Stop: 29478, Start Num: 32

Candidate Starts for Gex\_38:

(Start: 13 @29197 has 6 MA's), (22, 29221), (Start: 27 @29233 has 23 MA's), (30, 29242), (Start: 32 @29245 has 22 MA's), (56, 29374), (57, 29386), (67, 29440),

Gene: GlobiWarming\_39 Start: 27581, Stop: 27291, Start Num: 27

Candidate Starts for GlobiWarming\_39:

(Start: 27 @27581 has 23 MA's), (29, 27575), (Start: 47 @27506 has 4 MA's), (57, 27419), (68, 27362), (71, 27332),

Gene: Guacamole\_41 Start: 33011, Stop: 33295, Start Num: 14

Candidate Starts for Guacamole\_41:

(Start: 14 @33011 has 5 MA's), (Start: 27 @33047 has 23 MA's), (44, 33098), (73, 33284),

Gene: Gudmit\_37 Start: 27130, Stop: 27366, Start Num: 33

Candidate Starts for Gudmit\_37:

(Start: 33 @27130 has 5 MA's), (Start: 47 @27181 has 4 MA's), (52, 27223), (66, 27316), (73, 27355),

Gene: HannahD\_43 Start: 31974, Stop: 32231, Start Num: 27

Candidate Starts for HannahD\_43:

(Start: 27 @31974 has 23 MA's), (38, 32007), (57, 32139), (61, 32163),

Gene: Hedwig\_44 Start: 32388, Stop: 32588, Start Num: 47

Candidate Starts for Hedwig\_44:

(Start: 33 @32340 has 5 MA's), (Start: 47 @32388 has 4 MA's), (53, 32436), (57, 32475), (65, 32517),

Gene: Hestia\_43 Start: 28715, Stop: 28437, Start Num: 26

Candidate Starts for Hestia\_43:

(16, 28733), (Start: 26 @28715 has 4 MA's), (29, 28706), (58, 28544), (62, 28520),

Gene: Hitter\_44 Start: 32655, Stop: 32939, Start Num: 14

Candidate Starts for Hitter\_44:

(Start: 14 @32655 has 5 MA's), (Start: 27 @32691 has 23 MA's), (44, 32742), (73, 32928),

Gene: Jamie19\_35 Start: 28299, Stop: 28532, Start Num: 32

Candidate Starts for Jamie19\_35:

(Start: 13 @28251 has 6 MA's), (22, 28275), (Start: 27 @28287 has 23 MA's), (Start: 32 @28299 has 22 MA's), (56, 28428), (57, 28440), (67, 28494),

Gene: JanetJ\_32 Start: 26923, Stop: 27126, Start Num: 44

Candidate Starts for JanetJ\_32:

(Start: 33 @26887 has 5 MA's), (44, 26923), (74, 27109),

Gene: JasperJr\_41 Start: 33011, Stop: 33295, Start Num: 14

Candidate Starts for JasperJr\_41:

(Start: 14 @33011 has 5 MA's), (Start: 27 @33047 has 23 MA's), (44, 33098), (73, 33284),

Gene: Journey\_39 Start: 27920, Stop: 28153, Start Num: 32

Candidate Starts for Journey\_39:

(Start: 13 @27872 has 6 MA's), (22, 27896), (Start: 27 @27908 has 23 MA's), (30, 27917), (Start: 32 @27920 has 22 MA's), (56, 28049), (57, 28061), (67, 28115),

Gene: Judy\_40 Start: 28493, Stop: 28203, Start Num: 27

Candidate Starts for Judy\_40:

(Start: 27 @28493 has 23 MA's), (29, 28487), (Start: 47 @28418 has 4 MA's), (57, 28331), (68, 28274), (71, 28244),

Gene: JustASigh\_47 Start: 34656, Stop: 34838, Start Num: 47

Candidate Starts for JustASigh\_47:

(19, 34569), (Start: 27 @34587 has 23 MA's), (42, 34629), (Start: 47 @34656 has 4 MA's), (50, 34671), (53, 34704), (64, 34782),

Gene: Karkharias\_40 Start: 28250, Stop: 28516, Start Num: 28

Candidate Starts for Karkharias\_40:

(4, 28181), (7, 28190), (Start: 12 @28202 has 2 MA's), (28, 28250), (Start: 31 @28259 has 1 MA's), (43, 28301), (Start: 47 @28325 has 4 MA's),

Gene: Kevin1\_37 Start: 29139, Stop: 29381, Start Num: 27

Candidate Starts for Kevin1\_37:

(10, 29088), (Start: 13 @29103 has 6 MA's), (22, 29127), (Start: 27 @29139 has 23 MA's), (30, 29148), (56, 29280), (57, 29292),

Gene: Kumotta\_31 Start: 25315, Stop: 25025, Start Num: 27

Candidate Starts for Kumotta\_31:

(Start: 27 @25315 has 23 MA's), (29, 25309), (53, 25192), (63, 25111), (67, 25090),

Gene: Magsby\_38 Start: 29246, Stop: 29479, Start Num: 32

Candidate Starts for Magsby\_38:

(Start: 13 @29198 has 6 MA's), (22, 29222), (Start: 27 @29234 has 23 MA's), (Start: 32 @29246 has 22 MA's), (56, 29375), (57, 29387), (67, 29441),

Gene: Maja\_30 Start: 25873, Stop: 25589, Start Num: 8

Candidate Starts for Maja\_30:

(Start: 8 @25873 has 1 MA's), (25, 25825), (Start: 27 @25819 has 23 MA's), (29, 25813), (46, 25750), (Start: 47 @25744 has 4 MA's), (50, 25729), (55, 25681), (64, 25618),

Gene: MargaretKali\_31 Start: 24950, Stop: 24660, Start Num: 27

Candidate Starts for MargaretKali\_31:

(Start: 27 @24950 has 23 MA's), (29, 24944), (53, 24827), (63, 24746), (67, 24725),

Gene: Melville\_42 Start: 29230, Stop: 29463, Start Num: 32

Candidate Starts for Melville\_42:

(Start: 13 @29182 has 6 MA's), (22, 29206), (Start: 27 @29218 has 23 MA's), (Start: 32 @29230 has 22 MA's), (56, 29359), (57, 29371), (67, 29425),

Gene: Meyran\_35 Start: 31028, Stop: 31276, Start Num: 27

Candidate Starts for Meyran\_35:

(11, 30977), (Start: 13 @30992 has 6 MA's), (Start: 27 @31028 has 23 MA's), (56, 31172), (66, 31232), (67, 31238), (70, 31262),

Gene: MichelleMyBell\_36 Start: 28237, Stop: 28470, Start Num: 32

Candidate Starts for MichelleMyBell\_36:

(Start: 13 @28189 has 6 MA's), (22, 28213), (Start: 27 @28225 has 23 MA's), (Start: 32 @28237 has 22 MA's), (56, 28366), (57, 28378), (67, 28432),

Gene: Nandita\_44 Start: 30213, Stop: 30452, Start Num: 33

Candidate Starts for Nandita\_44:

(Start: 33 @30213 has 5 MA's), (67, 30402), (72, 30438),

Gene: Nenae\_39 Start: 29536, Stop: 29778, Start Num: 27

Candidate Starts for Nenae\_39:

(Start: 12 @29491 has 2 MA's), (Start: 13 @29500 has 6 MA's), (Start: 27 @29536 has 23 MA's), (56, 29677), (57, 29689),

Gene: P3MA\_42 Start: 31122, Stop: 31355, Start Num: 33

Candidate Starts for P3MA\_42:

(18, 31086), (Start: 33 @31122 has 5 MA's), (37, 31131), (43, 31149), (52, 31215), (54, 31230), (56, 31248), (57, 31260),

Gene: Panchino\_34 Start: 29645, Stop: 29878, Start Num: 32

Candidate Starts for Panchino\_34:

(Start: 13 @29597 has 6 MA's), (22, 29621), (Start: 27 @29633 has 23 MA's), (Start: 32 @29645 has 22 MA's), (56, 29774), (57, 29786), (67, 29840),

Gene: Parmesanjohn\_38 Start: 29249, Stop: 29482, Start Num: 32

Candidate Starts for Parmesanjohn\_38:

(Start: 13 @29201 has 6 MA's), (22, 29225), (Start: 27 @29237 has 23 MA's), (Start: 32 @29249 has 22 MA's), (56, 29378), (57, 29390), (67, 29444),

Gene: Peas\_36 Start: 28552, Stop: 28262, Start Num: 27

Candidate Starts for Peas\_36:

(Start: 27 @28552 has 23 MA's), (29, 28546), (Start: 47 @28477 has 4 MA's), (57, 28390), (68, 28333), (71, 28303),

Gene: PeggyLeg03\_39 Start: 28437, Stop: 28751, Start Num: 12

Candidate Starts for PeggyLeg03\_39:

(4, 28416), (7, 28425), (Start: 12 @28437 has 2 MA's), (28, 28485), (Start: 31 @28494 has 1 MA's), (43, 28536), (Start: 47 @28560 has 4 MA's),

Gene: PhancyPhin\_39 Start: 29530, Stop: 29772, Start Num: 27

Candidate Starts for PhancyPhin\_39:

(Start: 12 @29485 has 2 MA's), (Start: 13 @29494 has 6 MA's), (Start: 27 @29530 has 23 MA's), (56, 29671), (57, 29683),

Gene: Philonius\_36 Start: 27911, Stop: 28141, Start Num: 32

Candidate Starts for Philonius\_36:

(Start: 13 @27863 has 6 MA's), (22, 27887), (Start: 27 @27899 has 23 MA's), (30, 27908), (Start: 32 @27911 has 22 MA's), (56, 28040), (57, 28052),

Gene: Phloss\_36 Start: 28608, Stop: 28889, Start Num: 13

Candidate Starts for Phloss\_36:

(Start: 13 @28608 has 6 MA's), (22, 28632), (Start: 27 @28644 has 23 MA's), (Start: 32 @28656 has 22 MA's), (56, 28785), (57, 28797), (67, 28851),

Gene: Phrann\_39 Start: 30325, Stop: 30558, Start Num: 32

Candidate Starts for Phrann\_39:

(Start: 13 @30277 has 6 MA's), (22, 30301), (Start: 27 @30313 has 23 MA's), (Start: 32 @30325 has 22 MA's), (56, 30454), (57, 30466), (67, 30520),

Gene: Pipsqueaks\_38 Start: 29226, Stop: 29459, Start Num: 32

Candidate Starts for Pipsqueaks\_38:

(Start: 13 @29178 has 6 MA's), (22, 29202), (Start: 27 @29214 has 23 MA's), (Start: 32 @29226 has 22 MA's), (56, 29355), (57, 29367), (67, 29421),

Gene: Pucara\_36 Start: 28042, Stop: 28356, Start Num: 12

Candidate Starts for Pucara\_36:

(4, 28021), (7, 28030), (Start: 12 @28042 has 2 MA's), (28, 28090), (Start: 31 @28099 has 1 MA's), (43, 28141), (Start: 47 @28165 has 4 MA's),

Gene: Purgamenstris\_39 Start: 29489, Stop: 29776, Start Num: 12

Candidate Starts for Purgamenstris\_39:

(Start: 12 @29489 has 2 MA's), (Start: 13 @29498 has 6 MA's), (Start: 27 @29534 has 23 MA's), (56, 29675), (57, 29687),

Gene: RayTheFireFly\_48 Start: 33514, Stop: 33762, Start Num: 33

Candidate Starts for RayTheFireFly\_48:

(3, 33430), (Start: 8 @33442 has 1 MA's), (15, 33469), (18, 33478), (Start: 33 @33514 has 5 MA's), (Start: 47 @33562 has 4 MA's), (53, 33610), (57, 33649), (65, 33691),

Gene: Raymond7\_33 Start: 29346, Stop: 29588, Start Num: 27

Candidate Starts for Raymond7\_33:

(Start: 12 @29301 has 2 MA's), (Start: 13 @29310 has 6 MA's), (Start: 27 @29346 has 23 MA's), (56, 29487), (57, 29499),

Gene: Rebel\_31 Start: 25628, Stop: 25906, Start Num: 13

Candidate Starts for Rebel\_31:

(Start: 13 @25628 has 6 MA's), (22, 25652), (Start: 27 @25664 has 23 MA's), (Start: 32 @25676 has 22 MA's), (56, 25805), (57, 25817),

Gene: Redi\_39 Start: 29533, Stop: 29775, Start Num: 27

Candidate Starts for Redi\_39:

(Start: 12 @29488 has 2 MA's), (Start: 13 @29497 has 6 MA's), (Start: 27 @29533 has 23 MA's), (56, 29674), (57, 29686),

Gene: RootBeer\_32 Start: 24379, Stop: 24164, Start Num: 47

Candidate Starts for RootBeer\_32:

(Start: 27 @24454 has 23 MA's), (29, 24448), (Start: 47 @24379 has 4 MA's), (57, 24292), (68, 24235), (71, 24205),

Gene: Rubeelu\_39 Start: 29960, Stop: 30202, Start Num: 27

Candidate Starts for Rubeelu\_39:

(22, 29948), (Start: 27 @29960 has 23 MA's), (30, 29969), (56, 30101), (57, 30113),

Gene: Ryan\_44 Start: 30762, Stop: 31001, Start Num: 33

Candidate Starts for Ryan\_44:

(Start: 33 @30762 has 5 MA's), (67, 30951), (72, 30987),

Gene: Sarge\_30 Start: 23262, Stop: 22981, Start Num: 26

Candidate Starts for Sarge\_30:

(Start: 26 @23262 has 4 MA's), (29, 23253), (34, 23238), (50, 23169), (64, 23058), (70, 23019),

Gene: Schnauzer\_38 Start: 29201, Stop: 29482, Start Num: 13

Candidate Starts for Schnauzer\_38:

(Start: 13 @29201 has 6 MA's), (22, 29225), (Start: 27 @29237 has 23 MA's), (Start: 32 @29249 has 22 MA's), (56, 29378), (57, 29390), (67, 29444),

Gene: Scitech\_35 Start: 27097, Stop: 27330, Start Num: 32

Candidate Starts for Scitech\_35:

(Start: 13 @27049 has 6 MA's), (22, 27073), (Start: 27 @27085 has 23 MA's), (30, 27094), (Start: 32 @27097 has 22 MA's), (56, 27226), (57, 27238), (67, 27292),

Gene: Shambre1\_37 Start: 25536, Stop: 25748, Start Num: 36

Candidate Starts for Shambre1\_37:

(9, 25458), (19, 25494), (23, 25503), (Start: 31 @25524 has 1 MA's), (Start: 36 @25536 has 1 MA's), (Start: 47 @25587 has 4 MA's), (56, 25662), (60, 25695),

Gene: Shoya\_37 Start: 25648, Stop: 25358, Start Num: 26

Candidate Starts for Shoya\_37:

(Start: 8 @25699 has 1 MA's), (Start: 26 @25648 has 4 MA's), (29, 25639), (Start: 47 @25570 has 4 MA's), (57, 25483), (68, 25426),

Gene: ShrimpFriedEgg\_39 Start: 29533, Stop: 29775, Start Num: 27

Candidate Starts for ShrimpFriedEgg\_39:

(Start: 12 @29488 has 2 MA's), (Start: 13 @29497 has 6 MA's), (Start: 27 @29533 has 23 MA's), (56, 29674), (57, 29686),

Gene: Shweta\_35 Start: 28417, Stop: 28662, Start Num: 27

Candidate Starts for Shweta\_35:

(Start: 13 @28381 has 6 MA's), (22, 28405), (Start: 27 @28417 has 23 MA's), (Start: 32 @28429 has 22 MA's), (56, 28558), (57, 28570), (67, 28624),

Gene: Silvafighter\_39 Start: 29222, Stop: 29455, Start Num: 32

Candidate Starts for Silvafighter\_39:

(Start: 13 @29174 has 6 MA's), (22, 29198), (Start: 27 @29210 has 23 MA's), (Start: 32 @29222 has 22 MA's), (56, 29351), (57, 29363), (67, 29417),

Gene: Silvy\_38 Start: 27900, Stop: 28133, Start Num: 32

Candidate Starts for Silvy\_38:

(Start: 13 @27852 has 6 MA's), (22, 27876), (Start: 27 @27888 has 23 MA's), (30, 27897), (Start: 32 @27900 has 22 MA's), (56, 28029), (57, 28041), (67, 28095),

Gene: SkinnyPete\_33 Start: 26960, Stop: 27193, Start Num: 32

Candidate Starts for SkinnyPete\_33:

(Start: 13 @26912 has 6 MA's), (22, 26936), (Start: 27 @26948 has 23 MA's), (Start: 32 @26960 has 22 MA's), (56, 27089), (57, 27101), (67, 27155),

Gene: Smurph\_38 Start: 29249, Stop: 29482, Start Num: 32

Candidate Starts for Smurph\_38:

(Start: 13 @29201 has 6 MA's), (22, 29225), (Start: 27 @29237 has 23 MA's), (Start: 32 @29249 has 22 MA's), (56, 29378), (57, 29390), (67, 29444),

Gene: Snekmaggedon\_35 Start: 28299, Stop: 28532, Start Num: 32

Candidate Starts for Snekmaggedon\_35:

(Start: 13 @28251 has 6 MA's), (22, 28275), (Start: 27 @28287 has 23 MA's), (Start: 32 @28299 has 22 MA's), (56, 28428), (57, 28440), (67, 28494),

Gene: Sparky\_48 Start: 36514, Stop: 36780, Start Num: 24

Candidate Starts for Sparky\_48:

(2, 36451), (20, 36508), (Start: 24 @36514 has 1 MA's), (Start: 27 @36523 has 23 MA's), (30, 36532), (Start: 32 @36535 has 22 MA's), (35, 36544), (40, 36556), (43, 36568), (45, 36583), (53, 36640),

Gene: Spartoi\_39 Start: 26733, Stop: 26978, Start Num: 31

Candidate Starts for Spartoi\_39:

(Start: 31 @26733 has 1 MA's), (39, 26757), (41, 26763), (Start: 47 @26799 has 4 MA's), (49, 26805), (51, 26820), (59, 26898), (66, 26934),

Gene: SpongeBob\_35 Start: 28299, Stop: 28532, Start Num: 32

Candidate Starts for SpongeBob\_35:

(Start: 13 @28251 has 6 MA's), (22, 28275), (Start: 27 @28287 has 23 MA's), (Start: 32 @28299 has 22 MA's), (56, 28428), (57, 28440), (67, 28494),

Gene: Tapioca\_39 Start: 29215, Stop: 29448, Start Num: 32

Candidate Starts for Tapioca\_39:

(Start: 13 @29167 has 6 MA's), (22, 29191), (Start: 27 @29203 has 23 MA's), (30, 29212), (Start: 32 @29215 has 22 MA's), (56, 29344), (57, 29356), (67, 29410),

Gene: Vordorf\_36 Start: 30303, Stop: 30551, Start Num: 27

Candidate Starts for Vordorf\_36:

(11, 30252), (Start: 13 @30267 has 6 MA's), (Start: 27 @30303 has 23 MA's), (56, 30447), (67, 30513), (70, 30537),

Gene: Walrus\_42 Start: 32790, Stop: 33074, Start Num: 14

Candidate Starts for Walrus\_42:

(Start: 14 @32790 has 5 MA's), (Start: 27 @32826 has 23 MA's), (44, 32877), (73, 33063),

Gene: Xeno\_35 Start: 27686, Stop: 27919, Start Num: 32

Candidate Starts for Xeno\_35:

(Start: 13 @27638 has 6 MA's), (22, 27662), (Start: 27 @27674 has 23 MA's), (30, 27683), (Start: 32 @27686 has 22 MA's), (56, 27815), (57, 27827), (67, 27881),

Gene: Xerxes\_38 Start: 29246, Stop: 29479, Start Num: 32

Candidate Starts for Xerxes\_38:

(Start: 13 @29198 has 6 MA's), (22, 29222), (Start: 27 @29234 has 23 MA's), (Start: 32 @29246 has 22 MA's), (56, 29375), (57, 29387), (67, 29441),

Gene: Zucker\_40 Start: 29401, Stop: 29171, Start Num: 27

Candidate Starts for Zucker\_40:

(1, 29494), (5, 29464), (Start: 27 @29401 has 23 MA's), (29, 29395), (Start: 47 @29326 has 4 MA's), (48, 29323), (53, 29278), (55, 29263),