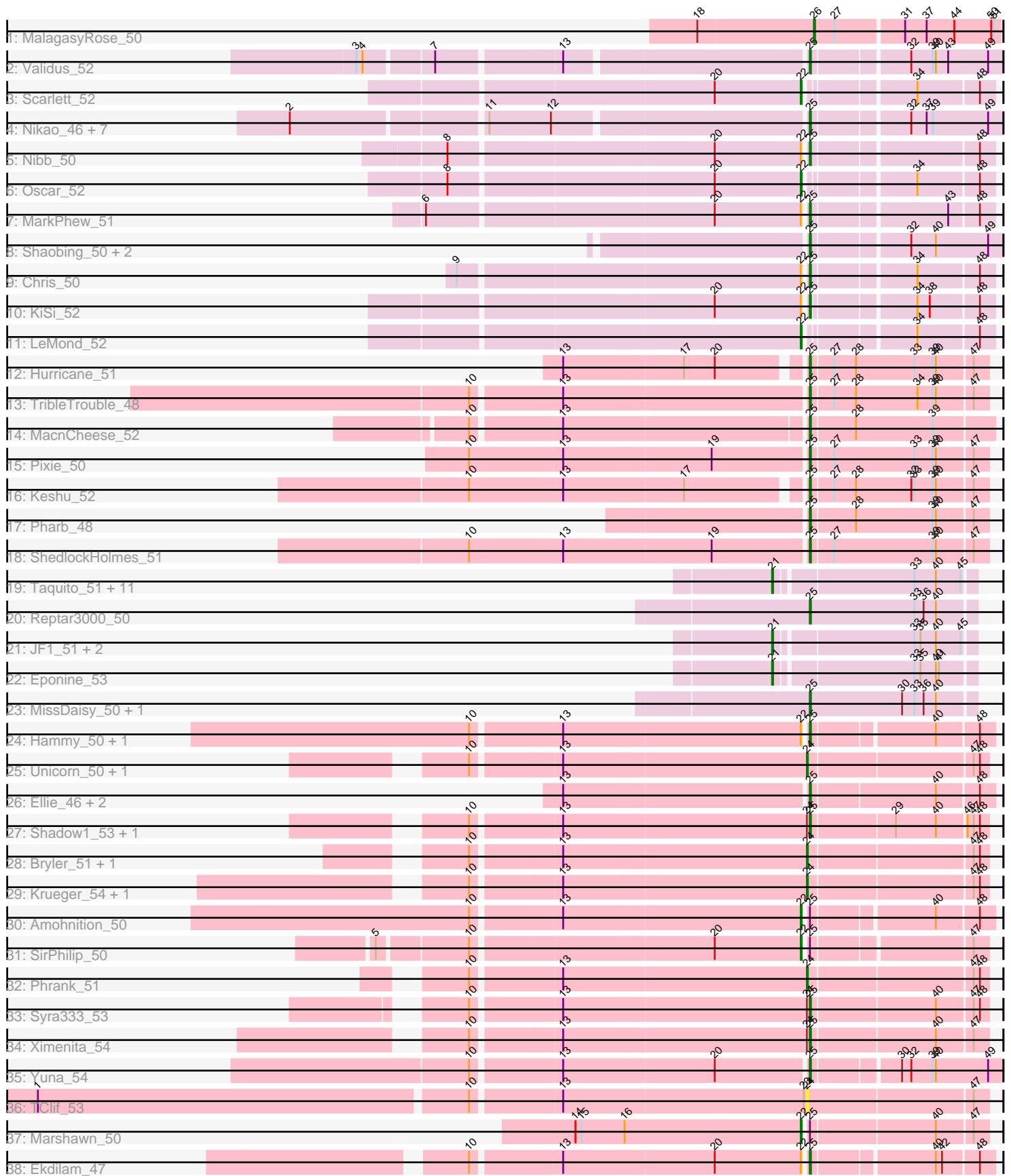


# Pham 144102



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 144102 Report

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

Pham number 144102 has 68 members, 1 are drafts.

Phages represented in each track:

- Track 1 : MalagasyRose\_50
- Track 2 : Validus\_52
- Track 3 : Scarlett\_52
- Track 4 : Nikao\_46, LilPharaoh\_43, Binglebops\_43, Nutello\_43, SgtBeansprout\_43, Enkosi\_45, Mdavu\_44, Amelie\_43
- Track 5 : Nibb\_50
- Track 6 : Oscar\_52
- Track 7 : MarkPhew\_51
- Track 8 : Shaobing\_50, Peanam\_50, Niklas\_50
- Track 9 : Chris\_50
- Track 10 : KiSi\_52
- Track 11 : LeMond\_52
- Track 12 : Hurricane\_51
- Track 13 : TribbleTrouble\_48
- Track 14 : MacnCheese\_52
- Track 15 : Pixie\_50
- Track 16 : Keshu\_52
- Track 17 : Pharb\_48
- Track 18 : ShedlockHolmes\_51
- Track 19 : Taquito\_51, Ruthiejr\_52, Malthus\_52, Fionnbharth\_51, Slarp\_51, SamScheppers\_49, Chancellor\_51, Wintermute\_51, Juliette\_53, Mitti\_51, Cheetobro\_51, OmniCritical\_50
- Track 20 : Reptar3000\_50
- Track 21 : JF1\_51, Y2\_50, Y10\_50
- Track 22 : Eponine\_53
- Track 23 : MissDaisy\_50, Patt\_49
- Track 24 : Hammy\_50, DarthP\_50
- Track 25 : Unicorn\_50, PhelpsODU\_50
- Track 26 : Ellie\_46, Amgine\_48, Fefferhead\_48
- Track 27 : Shadow1\_53, Sunflower1121\_54
- Track 28 : Bryler\_51, Cain\_51
- Track 29 : Krueger\_54, Tierra\_51
- Track 30 : Amohnition\_50
- Track 31 : SirPhilip\_50
- Track 32 : Phrank\_51
- Track 33 : Syra333\_53
- Track 34 : Ximenita\_54

- Track 35 : Yuna\_54
- Track 36 : TClif\_53
- Track 37 : Marshawn\_50
- Track 38 : Ekdilam\_47

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

The start number called the most often in the published annotations is 25, it was called in 37 of the 67 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Amelie\_43, Amgine\_48, Biglebops\_43, Chris\_50, DarthP\_50, Ekdilam\_47, Ellie\_46, Enkosi\_45, Fefferhead\_48, Hammy\_50, Hurricane\_51, Keshu\_52, KiSi\_52, LilPharaoh\_43, MacnCheese\_52, MarkPhew\_51, Mdavu\_44, MissDaisy\_50, Nibb\_50, Nikao\_46, Niklas\_50, Nutello\_43, Patt\_49, Peanam\_50, Pharb\_48, Pixie\_50, Reptar3000\_50, SgtBeansprout\_43, Shadow1\_53, Shaobing\_50, ShedlockHolmes\_51, Sunflower1121\_54, Syra333\_53, TribbleTrouble\_48, Validus\_52, Ximenita\_54, Yuna\_54,

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

- Amohnition\_50, Marshawn\_50, SirPhilip\_50,

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

- Bryler\_51, Cain\_51, Chancellor\_51, Cheetobro\_51, Eponine\_53, Fionnbharth\_51, JF1\_51, Juliette\_53, Krueger\_54, LeMond\_52, MalagasyRose\_50, Malthus\_52, Mitti\_51, OmniCritical\_50, Oscar\_52, PhelpsODU\_50, Phrank\_51, Ruthiejr\_52, SamScheppers\_49, Scarlett\_52, Slarp\_51, TClif\_53, Taquito\_51, Tierra\_51, Unicorn\_50, Wintermute\_51, Y10\_50, Y2\_50,

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

Start 21:

- Found in 16 of 68 ( 23.5% ) of genes in pham
- Manual Annotations of this start: 16 of 67
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Chancellor\_51 (K4), Cheetobro\_51 (K4), Eponine\_53 (K4), Fionnbharth\_51 (K4), JF1\_51 (K4), Juliette\_53 (K4), Malthus\_52 (K4), Mitti\_51 (K4), OmniCritical\_50 (K4), Ruthiejr\_52 (K4), SamScheppers\_49 (K4), Slarp\_51 (K4), Taquito\_51 (K4), Wintermute\_51 (K4), Y10\_50 (K4), Y2\_50 (K4),

Start 22:

- Found in 13 of 68 ( 19.1% ) of genes in pham
- Manual Annotations of this start: 6 of 67
- Called 46.2% of time when present
- Phage (with cluster) where this start called: Amohnition\_50 (K6), LeMond\_52 (K1), Marshawn\_50 (K6), Oscar\_52 (K1), Scarlett\_52 (K1), SirPhilip\_50 (K6),

Start 24:

- Found in 12 of 68 ( 17.6% ) of genes in pham
- Manual Annotations of this start: 7 of 67

- Called 66.7% of time when present
- Phage (with cluster) where this start called: Bryler\_51 (K6), Cain\_51 (K6), Krueger\_54 (K6), PhelpsODU\_50 (K6), Phrank\_51 (K6), TClif\_53 (K6), Tierra\_51 (K6), Unicorn\_50 (K6),

Start 25:

- Found in 40 of 68 ( 58.8% ) of genes in pham
- Manual Annotations of this start: 37 of 67
- Called 92.5% of time when present
- Phage (with cluster) where this start called: Amelie\_43 (K1), Amgine\_48 (K6), Binglebops\_43 (K1), Chris\_50 (K1), DarthP\_50 (K6), Ekdilam\_47 (K6), Ellie\_46 (K6), Enkosi\_45 (K1), Fefferhead\_48 (K6), Hammy\_50 (K6), Hurricane\_51 (K3), Keshu\_52 (K3), KiSi\_52 (K1), LilPharaoh\_43 (K1), MacnCheese\_52 (K3), MarkPhew\_51 (K1), Mdavu\_44 (K1), MissDaisy\_50 (K4), Nibb\_50 (K1), Nikao\_46 (K1), Niklas\_50 (K1), Nutello\_43 (K1), Patt\_49 (K4), Peanam\_50 (K1), Pharb\_48 (K3), Pixie\_50 (K3), Reptar3000\_50 (K4), SgtBeansprout\_43 (K1), Shadow1\_53 (K6), Shaobing\_50 (K1), ShedlockHolmes\_51 (K3), Sunflower1121\_54 (K6), Syra333\_53 (K6), TripleTrouble\_48 (K3), Validus\_52 (K1), Ximenita\_54 (K6), Yuna\_54 (K6),

Start 26:

- Found in 1 of 68 ( 1.5% ) of genes in pham
- Manual Annotations of this start: 1 of 67
- Called 100.0% of time when present
- Phage (with cluster) where this start called: MalagasyRose\_50 (AG),

### **Summary by clusters:**

There are 5 clusters represented in this pham: K3, K1, K6, AG, K4,

Info for manual annotations of cluster AG:

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

Info for manual annotations of cluster K1:

- Start number 22 was manually annotated 3 times for cluster K1.
- Start number 25 was manually annotated 16 times for cluster K1.

Info for manual annotations of cluster K3:

- Start number 25 was manually annotated 7 times for cluster K3.

Info for manual annotations of cluster K4:

- Start number 21 was manually annotated 16 times for cluster K4.
- Start number 25 was manually annotated 3 times for cluster K4.

Info for manual annotations of cluster K6:

- Start number 22 was manually annotated 3 times for cluster K6.
- Start number 24 was manually annotated 7 times for cluster K6.
- Start number 25 was manually annotated 11 times for cluster K6.

### **Gene Information:**

Gene: Amelie\_43 Start: 35852, Stop: 36028, Start Num: 25

Candidate Starts for Amelie\_43:

(2, 35381), (11, 35558), (12, 35618), (Start: 25 @35852 has 37 MA's), (32, 35939), (37, 35954), (39, 35960), (49, 36014),

Gene: Amgine\_48 Start: 37350, Stop: 37520, Start Num: 25

Candidate Starts for Amgine\_48:

(13, 37119), (Start: 25 @37350 has 37 MA's), (40, 37467), (48, 37506),

Gene: Amohnition\_50 Start: 37357, Stop: 37524, Start Num: 22

Candidate Starts for Amohnition\_50:

(10, 37048), (13, 37129), (Start: 22 @37357 has 6 MA's), (Start: 25 @37360 has 37 MA's), (40, 37471), (48, 37510),

Gene: Biglebops\_43 Start: 35852, Stop: 36028, Start Num: 25

Candidate Starts for Biglebops\_43:

(2, 35381), (11, 35558), (12, 35618), (Start: 25 @35852 has 37 MA's), (32, 35939), (37, 35954), (39, 35960), (49, 36014),

Gene: Bryler\_51 Start: 36170, Stop: 36337, Start Num: 24

Candidate Starts for Bryler\_51:

(10, 35855), (13, 35936), (Start: 24 @36170 has 7 MA's), (47, 36323), (48, 36329),

Gene: Cain\_51 Start: 36158, Stop: 36325, Start Num: 24

Candidate Starts for Cain\_51:

(10, 35843), (13, 35924), (Start: 24 @36158 has 7 MA's), (47, 36311), (48, 36317),

Gene: Chancellor\_51 Start: 36908, Stop: 37090, Start Num: 21

Candidate Starts for Chancellor\_51:

(Start: 21 @36908 has 16 MA's), (33, 37034), (40, 37055), (45, 37079),

Gene: Cheetobro\_51 Start: 36905, Stop: 37087, Start Num: 21

Candidate Starts for Cheetobro\_51:

(Start: 21 @36905 has 16 MA's), (33, 37031), (40, 37052), (45, 37076),

Gene: Chris\_50 Start: 37221, Stop: 37385, Start Num: 25

Candidate Starts for Chris\_50:

(9, 36897), (Start: 22 @37218 has 6 MA's), (Start: 25 @37221 has 37 MA's), (34, 37314), (48, 37371),

Gene: DarthP\_50 Start: 37244, Stop: 37408, Start Num: 25

Candidate Starts for DarthP\_50:

(10, 36932), (13, 37013), (Start: 22 @37241 has 6 MA's), (Start: 25 @37244 has 37 MA's), (40, 37355), (48, 37394),

Gene: Ekdilam\_47 Start: 36788, Stop: 36952, Start Num: 25

Candidate Starts for Ekdilam\_47:

(10, 36476), (13, 36557), (20, 36701), (Start: 22 @36785 has 6 MA's), (Start: 25 @36788 has 37 MA's), (40, 36899), (42, 36905), (48, 36938),

Gene: Ellie\_46 Start: 36538, Stop: 36708, Start Num: 25

Candidate Starts for Ellie\_46:

(13, 36307), (Start: 25 @36538 has 37 MA's), (40, 36655), (48, 36694),

Gene: Enkosi\_45 Start: 38465, Stop: 38641, Start Num: 25

Candidate Starts for Enkosi\_45:

(2, 37994), (11, 38171), (12, 38231), (Start: 25 @38465 has 37 MA's), (32, 38552), (37, 38567), (39, 38573), (49, 38627),

Gene: Eponine\_53 Start: 37661, Stop: 37843, Start Num: 21

Candidate Starts for Eponine\_53:

(Start: 21 @37661 has 16 MA's), (33, 37787), (35, 37793), (40, 37808), (41, 37811),

Gene: Fefferhead\_48 Start: 36488, Stop: 36658, Start Num: 25

Candidate Starts for Fefferhead\_48:

(13, 36257), (Start: 25 @36488 has 37 MA's), (40, 36605), (48, 36644),

Gene: Fionnbharth\_51 Start: 37059, Stop: 37241, Start Num: 21

Candidate Starts for Fionnbharth\_51:

(Start: 21 @37059 has 16 MA's), (33, 37185), (40, 37206), (45, 37230),

Gene: Hammy\_50 Start: 37232, Stop: 37396, Start Num: 25

Candidate Starts for Hammy\_50:

(10, 36920), (13, 37001), (Start: 22 @37229 has 6 MA's), (Start: 25 @37232 has 37 MA's), (40, 37343), (48, 37382),

Gene: Hurricane\_51 Start: 36986, Stop: 37153, Start Num: 25

Candidate Starts for Hurricane\_51:

(13, 36767), (17, 36881), (20, 36911), (Start: 25 @36986 has 37 MA's), (27, 37007), (28, 37028), (33, 37085), (39, 37103), (40, 37106), (47, 37139),

Gene: JF1\_51 Start: 36976, Stop: 37158, Start Num: 21

Candidate Starts for JF1\_51:

(Start: 21 @36976 has 16 MA's), (33, 37102), (35, 37108), (40, 37123), (45, 37147),

Gene: Juliette\_53 Start: 37132, Stop: 37314, Start Num: 21

Candidate Starts for Juliette\_53:

(Start: 21 @37132 has 16 MA's), (33, 37258), (40, 37279), (45, 37303),

Gene: Keshu\_52 Start: 37053, Stop: 37220, Start Num: 25

Candidate Starts for Keshu\_52:

(10, 36744), (13, 36834), (17, 36948), (Start: 25 @37053 has 37 MA's), (27, 37074), (28, 37095), (32, 37149), (33, 37152), (39, 37170), (40, 37173), (47, 37206),

Gene: KiSi\_52 Start: 37604, Stop: 37765, Start Num: 25

Candidate Starts for KiSi\_52:

(20, 37517), (Start: 22 @37601 has 6 MA's), (Start: 25 @37604 has 37 MA's), (34, 37694), (38, 37706), (48, 37751),

Gene: Krueger\_54 Start: 37164, Stop: 37331, Start Num: 24

Candidate Starts for Krueger\_54:

(10, 36849), (13, 36930), (Start: 24 @37164 has 7 MA's), (47, 37317), (48, 37323),

Gene: LeMond\_52 Start: 37585, Stop: 37749, Start Num: 22

Candidate Starts for LeMond\_52:

(Start: 22 @37585 has 6 MA's), (34, 37678), (48, 37735),

Gene: LilPharaoh\_43 Start: 35580, Stop: 35756, Start Num: 25

Candidate Starts for LilPharaoh\_43:

(2, 35109), (11, 35286), (12, 35346), (Start: 25 @35580 has 37 MA's), (32, 35667), (37, 35682), (39, 35688), (49, 35742),

Gene: MacnCheese\_52 Start: 37944, Stop: 38117, Start Num: 25

Candidate Starts for MacnCheese\_52:

(10, 37635), (13, 37716), (Start: 25 @37944 has 37 MA's), (28, 37986), (39, 38061),

Gene: MalagasyRose\_50 Start: 35187, Stop: 35360, Start Num: 26

Candidate Starts for MalagasyRose\_50:

(18, 35076), (Start: 26 @35187 has 1 MA's), (27, 35205), (31, 35268), (37, 35289), (44, 35316), (50, 35352), (51, 35355),

Gene: Malthus\_52 Start: 36820, Stop: 37002, Start Num: 21

Candidate Starts for Malthus\_52:

(Start: 21 @36820 has 16 MA's), (33, 36946), (40, 36967), (45, 36991),

Gene: MarkPhew\_51 Start: 37053, Stop: 37217, Start Num: 25

Candidate Starts for MarkPhew\_51:

(6, 36699), (20, 36966), (Start: 22 @37050 has 6 MA's), (Start: 25 @37053 has 37 MA's), (43, 37176), (48, 37203),

Gene: Marshawn\_50 Start: 37185, Stop: 37352, Start Num: 22

Candidate Starts for Marshawn\_50:

(14, 36966), (15, 36972), (16, 37014), (Start: 22 @37185 has 6 MA's), (Start: 25 @37188 has 37 MA's), (40, 37305), (47, 37338),

Gene: Mdavu\_44 Start: 35841, Stop: 36017, Start Num: 25

Candidate Starts for Mdavu\_44:

(2, 35370), (11, 35547), (12, 35607), (Start: 25 @35841 has 37 MA's), (32, 35928), (37, 35943), (39, 35949), (49, 36003),

Gene: MissDaisy\_50 Start: 36510, Stop: 36668, Start Num: 25

Candidate Starts for MissDaisy\_50:

(Start: 25 @36510 has 37 MA's), (30, 36600), (33, 36612), (36, 36621), (40, 36633),

Gene: Mitti\_51 Start: 36996, Stop: 37178, Start Num: 21

Candidate Starts for Mitti\_51:

(Start: 21 @36996 has 16 MA's), (33, 37122), (40, 37143), (45, 37167),

Gene: Nibb\_50 Start: 36742, Stop: 36906, Start Num: 25

Candidate Starts for Nibb\_50:

(8, 36409), (20, 36655), (Start: 22 @36739 has 6 MA's), (Start: 25 @36742 has 37 MA's), (48, 36892),

Gene: Nikao\_46 Start: 38465, Stop: 38641, Start Num: 25

Candidate Starts for Nikao\_46:

(2, 37994), (11, 38171), (12, 38231), (Start: 25 @38465 has 37 MA's), (32, 38552), (37, 38567), (39, 38573), (49, 38627),

Gene: Niklas\_50 Start: 37158, Stop: 37334, Start Num: 25

Candidate Starts for Niklas\_50:

(Start: 25 @37158 has 37 MA's), (32, 37245), (40, 37269), (49, 37320),

Gene: Nutello\_43 Start: 35852, Stop: 36028, Start Num: 25

Candidate Starts for Nutello\_43:

(2, 35381), (11, 35558), (12, 35618), (Start: 25 @35852 has 37 MA's), (32, 35939), (37, 35954), (39, 35960), (49, 36014),

Gene: OmniCritical\_50 Start: 36805, Stop: 36987, Start Num: 21

Candidate Starts for OmniCritical\_50:

(Start: 21 @36805 has 16 MA's), (33, 36931), (40, 36952), (45, 36976),

Gene: Oscar\_52 Start: 37487, Stop: 37651, Start Num: 22

Candidate Starts for Oscar\_52:

(8, 37157), (20, 37403), (Start: 22 @37487 has 6 MA's), (34, 37580), (48, 37637),

Gene: Patt\_49 Start: 36234, Stop: 36392, Start Num: 25

Candidate Starts for Patt\_49:

(Start: 25 @36234 has 37 MA's), (30, 36324), (33, 36336), (36, 36345), (40, 36357),

Gene: Peanam\_50 Start: 37116, Stop: 37292, Start Num: 25

Candidate Starts for Peanam\_50:

(Start: 25 @37116 has 37 MA's), (32, 37203), (40, 37227), (49, 37278),

Gene: Pharb\_48 Start: 35749, Stop: 35916, Start Num: 25

Candidate Starts for Pharb\_48:

(Start: 25 @35749 has 37 MA's), (28, 35791), (39, 35866), (40, 35869), (47, 35902),

Gene: PhelpsODU\_50 Start: 36191, Stop: 36358, Start Num: 24

Candidate Starts for PhelpsODU\_50:

(10, 35876), (13, 35957), (Start: 24 @36191 has 7 MA's), (47, 36344), (48, 36350),

Gene: Phrank\_51 Start: 36148, Stop: 36315, Start Num: 24

Candidate Starts for Phrank\_51:

(10, 35833), (13, 35914), (Start: 24 @36148 has 7 MA's), (47, 36301), (48, 36307),

Gene: Pixie\_50 Start: 36518, Stop: 36685, Start Num: 25

Candidate Starts for Pixie\_50:

(10, 36197), (13, 36287), (19, 36428), (Start: 25 @36518 has 37 MA's), (27, 36539), (33, 36617), (39, 36635), (40, 36638), (47, 36671),

Gene: Reptar3000\_50 Start: 36222, Stop: 36380, Start Num: 25

Candidate Starts for Reptar3000\_50:

(Start: 25 @36222 has 37 MA's), (33, 36324), (36, 36333), (40, 36345),

Gene: Ruthiejr\_52 Start: 36870, Stop: 37052, Start Num: 21

Candidate Starts for Ruthiejr\_52:

(Start: 21 @36870 has 16 MA's), (33, 36996), (40, 37017), (45, 37041),

Gene: SamScheppers\_49 Start: 37299, Stop: 37481, Start Num: 21

Candidate Starts for SamScheppers\_49:

(Start: 21 @37299 has 16 MA's), (33, 37425), (40, 37446), (45, 37470),

Gene: Scarlett\_52 Start: 37479, Stop: 37643, Start Num: 22

Candidate Starts for Scarlett\_52:

(20, 37395), (Start: 22 @37479 has 6 MA's), (34, 37572), (48, 37629),



Gene: SgtBeansprout\_43 Start: 35852, Stop: 36028, Start Num: 25

Candidate Starts for SgtBeansprout\_43:

(2, 35381), (11, 35558), (12, 35618), (Start: 25 @35852 has 37 MA's), (32, 35939), (37, 35954), (39, 35960), (49, 36014),

Gene: Shadow1\_53 Start: 37312, Stop: 37476, Start Num: 25

Candidate Starts for Shadow1\_53:

(10, 36994), (13, 37075), (Start: 24 @37309 has 7 MA's), (Start: 25 @37312 has 37 MA's), (29, 37390), (40, 37429), (46, 37456), (47, 37462), (48, 37468),

Gene: Shaobing\_50 Start: 37134, Stop: 37310, Start Num: 25

Candidate Starts for Shaobing\_50:

(Start: 25 @37134 has 37 MA's), (32, 37221), (40, 37245), (49, 37296),

Gene: ShedlockHolmes\_51 Start: 37043, Stop: 37210, Start Num: 25

Candidate Starts for ShedlockHolmes\_51:

(10, 36722), (13, 36812), (19, 36953), (Start: 25 @37043 has 37 MA's), (27, 37064), (39, 37160), (40, 37163), (47, 37196),

Gene: SirPhilip\_50 Start: 37572, Stop: 37733, Start Num: 22

Candidate Starts for SirPhilip\_50:

(5, 37182), (10, 37263), (20, 37488), (Start: 22 @37572 has 6 MA's), (Start: 25 @37575 has 37 MA's), (47, 37719),

Gene: Slarp\_51 Start: 36908, Stop: 37090, Start Num: 21

Candidate Starts for Slarp\_51:

(Start: 21 @36908 has 16 MA's), (33, 37034), (40, 37055), (45, 37079),

Gene: Sunflower1121\_54 Start: 37413, Stop: 37577, Start Num: 25

Candidate Starts for Sunflower1121\_54:

(10, 37095), (13, 37176), (Start: 24 @37410 has 7 MA's), (Start: 25 @37413 has 37 MA's), (29, 37491), (40, 37530), (46, 37557), (47, 37563), (48, 37569),

Gene: Syra333\_53 Start: 37077, Stop: 37241, Start Num: 25

Candidate Starts for Syra333\_53:

(10, 36759), (13, 36840), (Start: 24 @37074 has 7 MA's), (Start: 25 @37077 has 37 MA's), (40, 37194), (47, 37227), (48, 37233),

Gene: TClif\_53 Start: 37471, Stop: 37641, Start Num: 24

Candidate Starts for TClif\_53:

(1, 36745), (10, 37156), (13, 37237), (23, 37468), (Start: 24 @37471 has 7 MA's), (47, 37627),

Gene: Taquito\_51 Start: 37155, Stop: 37337, Start Num: 21

Candidate Starts for Taquito\_51:

(Start: 21 @37155 has 16 MA's), (33, 37281), (40, 37302), (45, 37326),

Gene: Tierra\_51 Start: 36959, Stop: 37126, Start Num: 24

Candidate Starts for Tierra\_51:

(10, 36644), (13, 36725), (Start: 24 @36959 has 7 MA's), (47, 37112), (48, 37118),

Gene: TribelTrouble\_48 Start: 36399, Stop: 36566, Start Num: 25

Candidate Starts for TribelTrouble\_48:

(10, 36087), (13, 36168), (Start: 25 @36399 has 37 MA's), (27, 36420), (28, 36441), (34, 36501), (39, 36516), (40, 36519), (47, 36552),

Gene: Unicorn\_50 Start: 36191, Stop: 36358, Start Num: 24

Candidate Starts for Unicorn\_50:

(10, 35876), (13, 35957), (Start: 24 @36191 has 7 MA's), (47, 36344), (48, 36350),

Gene: Validus\_52 Start: 37178, Stop: 37354, Start Num: 25

Candidate Starts for Validus\_52:

(3, 36776), (4, 36782), (7, 36842), (13, 36956), (Start: 25 @37178 has 37 MA's), (32, 37265), (39, 37286), (40, 37289), (43, 37301), (49, 37340),

Gene: Wintermute\_51 Start: 37057, Stop: 37239, Start Num: 21

Candidate Starts for Wintermute\_51:

(Start: 21 @37057 has 16 MA's), (33, 37183), (40, 37204), (45, 37228),

Gene: Ximenita\_54 Start: 37266, Stop: 37430, Start Num: 25

Candidate Starts for Ximenita\_54:

(10, 36948), (13, 37029), (Start: 24 @37263 has 7 MA's), (Start: 25 @37266 has 37 MA's), (40, 37383), (47, 37416),

Gene: Y10\_50 Start: 36976, Stop: 37158, Start Num: 21

Candidate Starts for Y10\_50:

(Start: 21 @36976 has 16 MA's), (33, 37102), (35, 37108), (40, 37123), (45, 37147),

Gene: Y2\_50 Start: 36976, Stop: 37158, Start Num: 21

Candidate Starts for Y2\_50:

(Start: 21 @36976 has 16 MA's), (33, 37102), (35, 37108), (40, 37123), (45, 37147),

Gene: Yuna\_54 Start: 38047, Stop: 38223, Start Num: 25

Candidate Starts for Yuna\_54:

(10, 37735), (13, 37816), (20, 37960), (Start: 25 @38047 has 37 MA's), (30, 38125), (32, 38134), (39, 38155), (40, 38158), (49, 38209),